



PRECISION PERFORMANCE
SINCE 2002



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MODERN FUELS AND YOUR CLASSIC (OR PERFORMANCE) CAR

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Everyone with a classic car understands the need for high zinc oils, but what about fuels? With the advent of modern E10 fuels and E15 fuels just around the corner, older vehicles made before 2007 have fuel systems not rated for use with E15 (15% ethanol) fuels.

Vehicles manufactured in or after 2006 should be compatible with E10 fuels according to numerous sources, but what makes these fuel systems compatible with E10? Modern fuel systems have PTFE lined fuel hoses capable of resisting degradation caused by ethanol fuels, but older vehicles do not. So if your car is older than 2006, you may need to take additional steps to protect your engine and fuel system from the effects of ethanol fuels.

ETHANOL IS HYGROSCOPIC, MEANING IT ABSORBS WATER.

We all know what water in the fuel system is not good and can lead to damage to paper filters, water contamination, and fuel phase separation. Ethanol is also very corrosive and will promote rusting where air meets metal once exposed to ethanol fuels. Ethanol is a solvent and will cause deterioration of rubber, plastics and fiberglass that are not rated for use with ethanol fuels. Lastly, ethanol enriched fuels have much shorter shelf lives than non-ethanol fuels.

TOP TIER™ FUELS

Regardless of choice of E10 or ethanol-free fuels, choosing a Top Tier™ detergent gasoline is very important. This standard, developed in 2004, ensures the fuel you receive from brand to brand and station to station meets the stringent requirements to qualify as a Top Tier fuel. Lower detergent and additive levels found in non-Top Tier™ fuels can have adverse effects on injector, valve, and chamber deposits that can cause drivability issues leading to engine damage and costly repairs. Lead, copper, and tin are most commonly found in rod and main bearings.

FUEL CONTAMINATION

Next time you go to put gas and see the station is accepting a fuel delivery, just keep driving by. It is a good practice not to pump when stations are receiving a fuel delivery, as contaminants can be stirred up and even though the fuel is filtered at the pump, why risk getting contaminated fuel?

ETHANOL-FREE FUELS

Although uncommon, some gas stations offer ethanol-free fuels. There are websites and apps for your phone that will help you find ethanol-free fuel suppliers. For lack of ethanol-free or race fuels, some hot odders have taken to using aviation fuels, known more commonly as AV gas – please don't. These fuels have a lower density than automotive fuels and will make your car run leaner. Additives in 100LL AV gas will also cause damage to O₂ sensors and catalytic converters, so these fuels might cause more harm than good.

FUEL ADDITIVES

Once you have chosen the right fuel another consideration are fuel additives. Normally we are not for additives, but in this case, additional steps are required to ensure that older fuel systems are protected and that newer fuel systems are kept at peak performance. Even modern fuel systems can suffer from poor fuel quality and aging components. Regular use of Top Tier™ fuels extended component life and cleanliness, but additional steps can be taken to further improve the situation.

KNOW YOUR FUEL

In most places, premium fuels are minimum 91 octane (AKI or R+M/2 measurement method) and some locations in the United States and Canada have access to 92, 93, or even 94 octane pump premium fuels. Most race tracks have 100 octane unleaded and even higher octane leaded fuels. AKI ratings are on average 4-6 points lower than RON or MON measurement method used worldwide.

First and foremost, never use leaded fuel in a fuel injected engine with O₂ sensors. Lead will foul O₂ sensors in as little as one tank of fuel and can lead to engine damage. Leaded fuel also contaminates the engine oil, increasing wear, so stay away from leaded fuel unless required by the engine. Older engines without hardened valve seats requiring leaded fuels (pre 1970s) can use lead substitute additives to prevent seat damage. Redline's Lead Substitute™ uses sodium as the dissimilar metal to protect unhardened valve seats.

KNOW YOUR FUEL - CT'D

Most modern engines with knock-sensing are designed to take advantage of modern, higher octane fuels, increasing performance and efficiency by allowing for advanced timing to make the most of the higher octane fuel, but what is octane? The octane rating is basically a number that relates to the fuel's resistance to combustion or to fight pre-ignition and detonation. In a perfect world, to maximize performance, you want to use the lowest octane required to prevent pre-ignition and detonation. Likewise, a high-performance engine or one upgraded with higher compression pistons requires premium high-octane fuel to prevent knock. The side effect is the engine makes more power. So, unless your engine requires or has modern engine management to take advantage of higher octane fuel, use of higher octane fuels is a waste of money. It's best to refer to your engine builder's recommendations or if your car is stock, the octane requirements stated by the manufacturer, to ensure you use the right fuel.

If you need higher octane fuel but it is not available to you, beware of octane boosters claiming boosting levels by X points – for example, a 5 point increase would actually increase 91 octane to 91.5 octane unless the manufacturer provides a table to calculate actual octane, as is commonly done with race gas concentrates like that sold by Torco Race Fuels™ or additives like Driven's Injector Defender™ with Octane Booster.

Lastly, when it comes to older vehicles and fuel systems not designed for E10 ethanol fuels, use of additives to prevent damage is a must. For cars driven regularly, as defined by a tank of fuel used in 30 days or less, adding Driven's Carb or Injector Defender™ will protect against damage caused by ethanol enriched fuels, and is based on the additives used in South America where E85 and E100 fuels are the norm. For vehicles that are going to be stored, use of a product such as Driven's Storage Defender™ provides added fuel system corrosion protection and should be added to a full tank of fuel to help minimize the accumulation of moisture in the fuel tank and corrosion. Be sure to run the car after adding these additives to ensure the entire fuel system is protected.

IN SUMMARY, WHAT STEPS CAN BE TAKEN?

- ▶ **Update fuel lines and filters to multi-fuel compatible type. Lines and filters rated for E85 fuels will perform very well and provide excellent life with E10 fuels.**
- ▶ **Replace seals and gaskets with modern materials that are compatible with ethanol fuels.**
- ▶ **Add a water separator to the fuel system.**
- ▶ **Have older fuel tanks professionally cleaned and sealed to prevent corrosion.**
- ▶ **Replace mechanical fuel pumps with modern electric fuel pumps compatible with ethanol fuels.**
- ▶ **Use ethanol-free fuels.**
- ▶ **Always use premium high octane fuels if your vehicle can benefit from them.**
- ▶ **Use ethanol fuel additives to protect older fuel systems or those vehicles in storage with every fill up.**
- ▶ **Use concentrated fuel system cleaner like Liqui Moly Jectron #2007™ at least every oil change.**