

Ethanol Resource Kit

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Bell Performance, Inc.

Ethanol Problem Solver: MIX-I-GO



Your customers are having ethanol problems with their gas-powered equipment and vehicles.

Now you can help them solve their ethanol issues with **Bell Performance MIX-I-GO**. **MIX-I-GO** is a multi-purpose ethanol treatment that enhances fuel combustion, eliminates water, stabilizes fuel and cleans and lubricates upper cylinder areas, solving all of the most common ethanol-related problems that consumers face today.

MIX-I-GO is the only commercial-grade solution for ethanol problems.

For more information on problems and solutions to ethanol's effects on cars, trucks, small engines, lawn equipment and other gas-powered equipment, check out Bell's resource section at:

www.WeFixFuel.com

Bell Performance invented the first fuel additive in the United States in 1909. Not every company can lay claim to over a century of customer satisfaction.

Bell Performance can provide you with the educational & training materials you need to get your store's team up to speed so they can better assist your customers in solving their fuel-related problems. This means more satisfied customers for you.

Just send an email at sales@bellperformance.net or call **407-831-5021** to request more information.



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TRAINING TIPS - ETHANOL AND WATER ATTRACTION

- Ethanol has an extreme attraction to water, pulling water vapor out of the air around it. If the water collected exceeds the solubility limit of the ethanol blend, it will separate in a process called “phase separation”. This reduces fuel octane value and destroys the quality of the fuel.
- Due to its attraction to water, E-15 gasoline can have a shelf life as short as 90 days.
- Gasoline with only 10% ethanol can dissolve up to 50 times more water than regular gasoline.
- As little as 0.5% water by volume can cause phase separation in E10. As the temperature goes down, this number goes down, meaning ethanol is able to absorb less water as the temperature drops.
- Older vehicles, boats, outboards and small equipment like lawn mowers aren’t designed to run on ethanol-blend fuels.

TRAINING TIPS - SOLVING ETHANOL ISSUES: PREVENTION IS THE BEST WEAPON

- Keep fuel tanks as full as possible to limit air space on top of the fuel. This will limit condensation from the air into the ethanol fuel.
- Use of water-controlling fuel stabilizers are vital to preserving ethanol fuel quality and preventing phase separation with all of the problems it entails.
- Once phase separation has occurred in ethanol, there is no product on the market which can restore the fuel blend to new condition.
- When storing generators and other gas-powered equipment with a fuel shut-off, turn off the fuel and allow the engine to run until it stops. This will drain the engine of fuel and prevent any water buildup which may prevent startup.

AVOIDING ETHANOL ADDITIVES CONTAINING ALCOHOL

Ethanol is a water magnet which will pull water out of the air right through your gas tank vent hose. In high-humidity climates, this can be especially harmful to your engine. There are a number of additives on the market today that claim they have the ability to remove water from your fuel tank. Many of these products contain alcohol, which is the very thing that contributes to causing the “phase separation” problem in the first place. Adding additional alcohol therefore makes no sense and will only increase the amount of water absorbed into the fuel.

Also, if you increase the overall percentage of alcohol in the fuel, there is an increased risk that severe engine damage will result. The ideal additive for removing water would not contain any alcohol and should suspend the water throughout the fuel supply. This would allow the suspended water to pass harmlessly through the fuel system and would be vaporized in the engine. Bell Performance specially formulates non-alcohol **Mix-I-Go** to effectively deal with the water absorption “phase separation” problem.



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ETHANOL PROBLEMS FACING CONSUMERS

The blending of ethanol into gasoline across the nation is now unavoidable. The problems with this bio-fuel only stand to get worse due to the recent EPA approval in October 2010 of an ***increase in ethanol percentage in gasoline from 10% to 15%***.

The ethanol mandate is aimed at improving air quality and reducing air pollution from vehicle emissions, which ethanol blends achieve through the lowering of harmful pollutants. Ethanol blends cause major issues for consumers, who face loss of mileage, storage issues and a tendency for ethanol to corrode plastic and fiberglass tanks and parts, especially in marine applications and small equipment.

TRAINING TIPS - IMPORTANT POINTS TO REMEMBER ABOUT ETHANOL IN CARS AND TRUCKS

- The percentage of ethanol in a gasoline blend is designated by the term "E-xx". Hence E10 refers to a gasoline blend containing 10% ethanol and E15 refers to 15% ethanol in gasoline.
- Ethanol is impossible to avoid due to EPA mandates for its use in gasoline as an "oxygenate". This means that it adds more oxygen to the gasoline when it is blended into the mixture. Adding more oxygen to gasoline has been shown to lower some of the more harmful emissions gases (like carbon monoxide) that contribute to poor air quality, especially in urban areas that struggle to meet federal EPA air quality standards.
- On October 14th 2010, the EPA approved an increase in ethanol concentration from 10 to 15%. This approval was "conditional" and only for 2007 and later vehicles. However it is not clear how gasoline retailers will handle offering this fuel. One thing that seems clear is the conditional approval by the EPA seems to be an admission that 15% ethanol can cause damage in all but the most recent vehicles and equipment.
- "Flex-fuel" vehicles are those with certain engine modifications (such as compression ratio and injector timing) that enable them to run on both regular gasoline and a high concentration of ethanol, like E85. In an unmodified car or truck, you cannot use ethanol at concentrations higher than 10-15% without performance problems and potential engine damage.
- Ethanol contains less energy than gasoline, so E10 or E15 users face a drop in fuel mileage.
- Pure ethanol has an octane rating over 110, enabling refineries to use lower-octane gasoline in their blend to end up with the same overall octane rating as normal gasoline.
- Ethanol blends chemically attract water from the air. It only takes a little bit of water (less than 0.5% by volume) to cause "phase separation", where the ethanol will separate from the fuel blend, mix with the water and sink to the bottom of the tank. When this happens, it strips the octane value from the remaining gasoline (because the molecules in the gasoline that contribute most to good octane value will actually dissolve in the ethanol itself and be carried away), leaving very poor quality gasoline to be burned by the engine.
- Phase separation is dangerous for an engine because the fuel line can suck up some of the water/ethanol layer at the tank bottom and draw it into the combustion chamber. This ethanol/water layer burns very "lean" (meaning the fuel-air mixture has less fuel and more air. A lean mixture is much hotter than a normal fuel-air mix and this can cause catastrophic engine damage.



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TRAINING TIPS - IMPORTANT POINTS TO REMEMBER ABOUT ETHANOL IN 2-CYCLE EQUIPMENT

- Ethanol is a highly effective solvent, which means that it dissolves plastic and rubber engine and fuel system parts. This is especially true in older vehicles and in lawn and small equipment, both of which are more likely to have parts made out of materials that are susceptible to dissolving in ethanol. Over time, this causes leaky fuel lines and buildup of harmful deposits in the engine and filters. You may start to notice these kind of problems in as little as 2 weeks of exposure.



Buildup of ethanol-dissolved resin on valve stems

- The dissolved plastic and rubber resins in the fuel do not burn efficiently like pure fuel. This creates not only black and white smoke on startup, but leads to the buildup of deposits in other areas of the engine like fuel injectors and valves. When this happens, the performance and efficiency of the engine and equipment goes down.
- If you leave ethanol sitting for weeks in your lawn mower or other small equipment, expect problems when you try to restart them. The worst case scenario could be complete inoperability of the equipment.
- Using ethanol in 2-cycle engines like lawnmowers can cause major problems with the engine lubrication. 2-cycle engines mix fuel and oil to impart lubrication to metal surfaces. As the ethanol attracts water into the fuel, the water will displace the dissolved oil and interfere with the oil's ability to bond with critical metal parts and provide lubrication.

SOLVING ETHANOL PROBLEMS IN FUEL

Most of the problems that ethanol causes in engines can be reduced or eliminated by treating the fuel. A good ethanol treatment like Bell Performance's **Mix-I-Go** should have the following features:

- **EPA-Registered** - to ensure it is safe to use in gasoline engines.
- **Combustion Improver** – to restore lost mileage caused by ethanol blends.
- **Multiple Detergent Packages** – needed to clean all of the areas ethanol deposits can accumulate, including injectors, valves, pistons and combustion chambers.
- **Water Control** – vital to keeping water from accumulating and causing phase separation with all of the problems this brings.
- **Protection for Vulnerable Parts** – to slow or eliminate ethanol-solvency damage to essential engine and fuel system parts.

Bell Performance Mix-I-Go is the only *commercial grade* solution for preventing and eliminating costly ethanol problems.

Your customers need Mix-I-Go to solve their ethanol problems.

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