

Post Ethanol Blend Fuel Introduction

Service Advisory Post Fuel Storage Tank E-10 Ethanol Preparation 2009

This service advisory assists in determining service that may be required to resolve fuel delivery speed and fuel quality issues at typical retail fueling sites. This advisory identifies some fuel delivery issues that facilities with fuel dispensing operations should consider after switching to ethanol-blended fuels. Once a gasoline fuel storage tank has received ethanol blended fuel without being surveyed and or prepared, tank managers can expect resident debris to interfere with normal fuel flow, dispensing rates and or fuel quality. Removing resident water and attached sodium debris will reduce the risk of ethanol/debris contamination and possible ethanol/water fuel phasing.

Investigative Phase

- After survey and removal of all water and debris a percentage of prepared tanks will experience fuel storage and delivery problems.
- Make sure that the ATG monitor is set for a zero water tolerance.
- Make sure all tank top components are tight.
- Insist that fuel delivery drivers check for water with compatible water and phase finding paste before and after delivery "Gasolita" recommended.
- Install a "tank debris present" monitoring filter on the highest throughput dispenser.
- Be prepared to sample and check the octane value of the fuel being stored and delivered.

If a fuel delivery speed problem becomes apparent within 24 hours of ethanol blend fuel introduction the following conditions may exist;

- All water and debris may not have been removed during the tank ethanol preparation process or procedure.
- Contaminated fuel, part of the pipeline or transportation conversion process may have been delivered.
- Inline filters have not been changed out or are not compatible with ethanol-blended fuel.

In all cases the tank should be re-surveyed, water, debris and possible ethanol phase removed. The inline dispenser filters should be rechecked for ethanol compatibility.

If fuel delivery speed problems become apparent within two weeks of ethanol blend fuel introduction the following conditions may exist and intermittently persist;

- Contaminated fuel typically has been delivered and has contaminated the inline filter. Contaminated fuel will typically affect the inline filter monitoring the highest throughput dispenser first. The number of actual inline filters affected typically determines the degree of contamination present in tank.
- Ethanol blended fuel may have reacted with the STP discharge head assembly gasket; its integrity and bolt tightness should be checked.

If fuel delivery speed problems have become apparent and intermittently persist;

If the STP is removed in tank preparation it is strongly advised that the motor position (elevation referenced to tank bottom) be checked. The pump head functional element o-rings and diaphragm should be checked and or replaced. The pump head check valve checked and or replaced as well. Replace motor interface gasket and tighten bolts.

It is important to point out that some problems causing slow delivery may not be obvious. Trouble shooting slow or no product delivery after ethanol blended fuels have been introduced should be kept simple. The following questions should be asked and their answers considered if a fuel delivery speed or a fuel quality problem exists or is suspected.

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Slow product delivery?

- Some service contractors only change the affected filters and it is reported or assumed that all filters have been changed out. Remember that the highest throughput dispenser filter will typically signal a problem and generate the most customer complaints. Conversion to ethanol typically requires two or three dispenser filter changes in the first three months after introduction. The need for all dispensing filter changes determines the degree of contamination that may exist in tank.
- **Check to make sure that the correct filters compatible with ethanol are being installed. The amount of water mandated or allowed in the blending ethanol used can vary depending on the region and or time of year. Water or phase sensing filters will be more or less sensitive to this water. Slower than normal dispenser product flow and or more frequent filter changes can be expected or may be required. The recommended filters are depending on dispenser “CIM-TEK 70015-400-10 typically Gilbarco or CIM-TEK 70010-300-10 typically Dresser-Wayne, Tokheim and older Gilbarco dispensing units.**
- Filters really are clogging THE contaminated fuel, phase or debris should be removed.
- Check for sudden increase in water or debris monitoring alarms contaminated fuel may have been delivered.

Slow product delivery only when more than one dispenser is in use?

- Ethanol introduction may have affected the integrity of the STP discharge head gasket and the tightness of the connecting bolts (Red Jacket part numbers 852-044-5 and 136-056-5 are interchangeable with FE Petro (blue pump head).

Slow or intermittent product delivery?

- The wrong filters, not compatible with ethanol are being used.
- The STP check valve requires replacement (Red Jacket part number 144-184-5) the check valve requiring replacement has caused a leak detection trip.
- The functional element diaphragm gasket (Red Jacket part number 017-165-5) has failed and caused a leak detection trip.

No product flow?

- Ethanol blended fuels conduct electricity. Check STP start capacitor housing for leaking butt seal and shorted wiring. Replace capacitor, wire harness and butt seal.
- Replace STP motor **if mature.**
- Rags and plastic bags as moving debris are present in most tanks. Check motor position from tank bottom and remove moving and motor intake clogging debris.

Realize again, the storage and marketing of ethanol-blended fuels can and will present unique or unfamiliar storage and delivery scenarios to the customer, the marketer and site-servicing contractors.

It is important as well to realize that the blending ethanol (E-100) will have up to .85% water inherently suspended during summer months. This amount of water in solution will tend to affect the sensitivity of phase monitoring filters.

Water phasing can lower the affected fuels octane equal to rbob or cbob base blend stock value. If by region different base blend stocks are initially used, problems and or customer fuel complaints may be more or less severe.

The amount of ethanol blended with available base blend stock can change with wholesale and regional availability or shortages. Ethanol blended fuel depending on the gasoline base stock values and ethanol blend ratio becomes more or less sensitive to water phasing. Premium and mid-grade octane fuels, often ethanol blended up (more ethanol and or more methanol) from the available unleaded base blend stocks can be more sensitive to ethanol phasing in storage tanks. For this reason, site monitoring and ethanol water phasing alarms may be more prevalent in premium fuel storage tanks.

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The tank top tightness and component conditions are important and vital if water intrusion and fuel phase contamination is to be prevented.

The weight, ionic strength and the solvent properties of the newly introduced ethanol blended fuel can and will affect mature system components.

As the marketer or the marketers servicing contractor, recognizing the differences between ethanol phases and simple inline system component failures is vital when making the transition to ethanol-blended fuels.

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