

Who Is GROWMARK?


$9.4 BILLION

LOGISTICS




AGRONOMY



GRAIN

ENERGY



FUELS

LUBRICANTS

PROPANE

FUEL ADDITIVES

DEF

ELECTRONIC PAYMENT SYSTEMS

RETAIL FUEL STATIONS

PRICE RISK MANAGEMENT

EQUIPMENT

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MINNESOTA
WISCONSIN
IOWA
Milwaukee
Chicag
UNITED STATE
Alpha, IL
ILLINOIS
INDIANA
Indianapolis
MICHIGAN
Detro
Lake Michigan
Lake Huron
Toronto
ONTARIO
Lake Ontario
Lake Erie
Tillsonburg, ONT
Lyons, NY
NEW YORK
Montreal
Ottawa
VT.
NEW HAMPSHIRE
MASS.
CONN.
Bost
New York
Philad
York, PA
N.J.
PENNSYLVANIA
Akron, OH
OHIO
Columbus
Baltimor
Washington
MD.
DE
WEST VIRGINIA
VIRGINIA
Farmville, NC
NORTH CAROLINA
Charlotte
SOUTH CAROLINA
GEORGIA
Nashville, IL
MISSOURI
Lebanon, KY
KENTUCKY
180 mi
Nashville
TENNESSEE
Memphis
ARKANSAS
MISSISSIPPI
ALABAMA
LOUISIANA
Oklahoma City
OKLAHOMA
Dallas
SAS

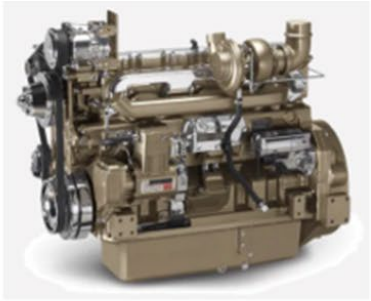

Grand Forks
Jamestown
Fargo
Aberdeen
Watertown
Wolsey
Marshall
Mankato
Rochester
Mitchell
Rock Rapids
Sioux Falls
Milford
Clear Lake
Yankton
Le Mars
Sioux City
Fort Dodge
Waterloo
Norfolk
Columbus
Osceola
Omaha
Council Bluffs
Iowa City
Des Moines
Ottumwa
North Platte
Doniphan
Lincoln
Geneva
Dupont
Denver
Fountain
Wathena
Concordia
Topeka
Kansas City
Carrollton
Columbia
Scott City
Salina
Olathe
Great Bend
Hutchinson
Wichita
Coffeyville
Jasper/Carthage
Springfield
Enid
Tulsa
Oklahoma City
Rogers
Fort Smith
North Little Rock
Bossier City
Roseville
Pine Bend
Chippewa Falls
Junction City
Green Bay
Waupun
Madison
Milwaukee
Dubuque
Arlington Heights
Rockford
Rochelle
Amboy
Blue Island
Hammond
East Chicago
Lockport
Kankakee
Ashkum
Pt Madison
Heyworth
Champaign
Harristown
Palmyra
Petersburg
Meredosia
Effingham
Hartford
Wood River
Roxana
St Louis
Morris City
Scott City
Hartford
Paducah
Cheboygan
Rogers City
Bay City
Muskegon
Owosso
Ferrysburg
Holland
Lansing
Flint
Novi
Romulus
Detroit
Taylor
Marshall
Jackson
River Rouge
Oregon
Cleveland
Youngstown
Toledo
Niles
South Bend
Brecksville
Canton
Huntington
Lima
Muncie
Zionsville
Indianapolis
Seymour
Robinson
Princeton
Evansville
Owensboro
Mt Vernon
Louisville
Lexington
Dayton
Lebanon
Cincinnati
Covington
Heath
Columbus
Marietta
Catlettsburg
Midland
Altoona
Mechanicsburg
Coraopolis
Steubenville
Delaware City
Baltimore
Salisbury
Fairfax
Newington
Fredericksburg
Richmond
Chesapeake
Roanoke
Nashville
Greensboro
Selma
North Augusta
Charleston
Refined Fuels Terminals
RF Terminals
RF Terminals with Biodiesel
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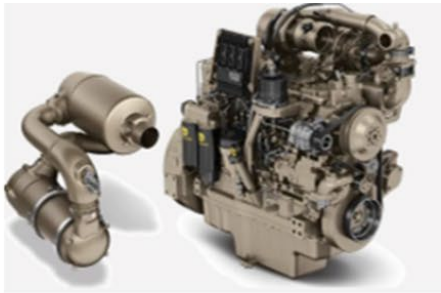

Superior
Rapid River
Crandon
Barron
Benson
Pine Bend
Owen
Tomahawk
Gaylord
Kalkaska
Rosemount
Junction City
Green Bay
Wolsey
Canton
Mankato
Hixton
Jackson
New Hampton
Mason City
Sanborn
Arena
McFarland
Yankton
Clear Lake
Janesville
Dubuque
Rockford
Norfolk
Ogden
Tampico
Lemont
Whiting
Coralville
Griffith
Des Moines
Cordova
Morris
Monee
North Platte
Greenwood
Moravia
Iowa City
Huntington
Plattsmouth
Farmington
Ft Madison
Geneva
Cantril
Lebanon
Tuscola
Plattsburg
Clay Center
Moberly
Hartford
Kearney
Robinson
Wood River
Lecompton
Bushton
East St Louis
Princeton
McPherson
Jefferson City
Conway
Madisonville
Mt Vernon
Mounds
Calvert City
Dexter
Bay City
Gateway
Watkins Glen
Selkirk
Oneonta
Marysville
Sarnia
Putnam
Hartford Mills
Grand Rapids
St Clair
Alto
Nanticoke
Warren
Toledo
Woodhaven
Bayway
Macungie
Dubois
Steelton
Canton
Hopedale
Houston
Sinking Spring
Scio
Paulding
Greenspring
Greensburg
Lancaster
Charleroi
Schaefferstown
Lima
Natrium
York
Marcus Hook
Coshocton
Baltimore
Middletown
Hastings
Stephens City
Hurlock
Seymour
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Apex
Lexington
To Borger, TX
To Mt. Belvieu, TX
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P66
PLAINS
TEPPCO

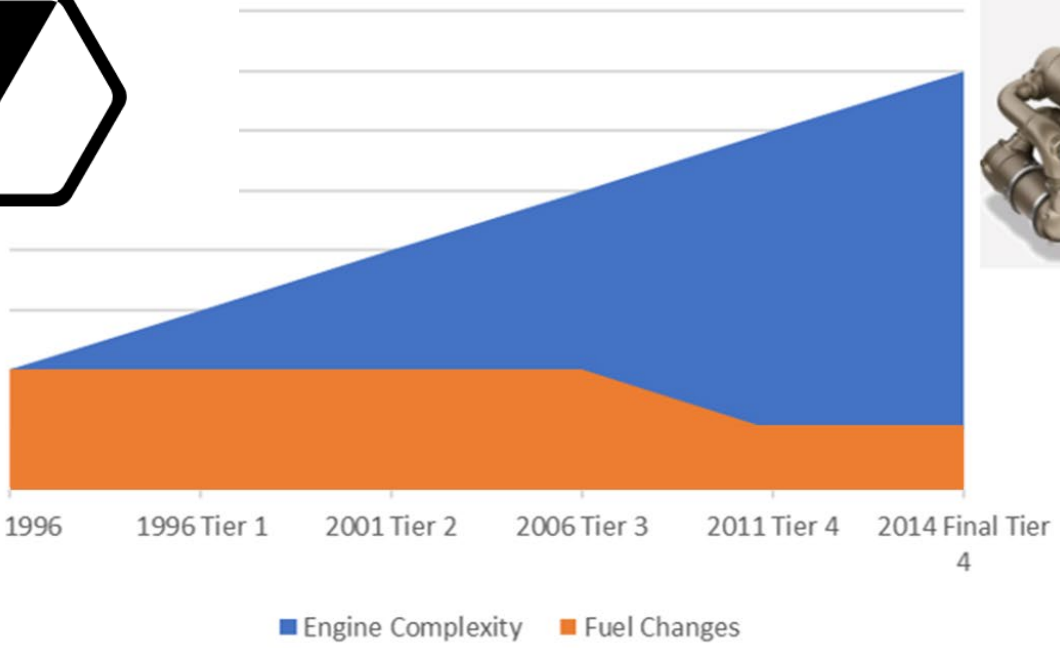
Fuels

- Gasoline
- Diesel
- #1
- Biodiesel
- Renewable Diesel
- Propane

Fuels and Engines Have Changed





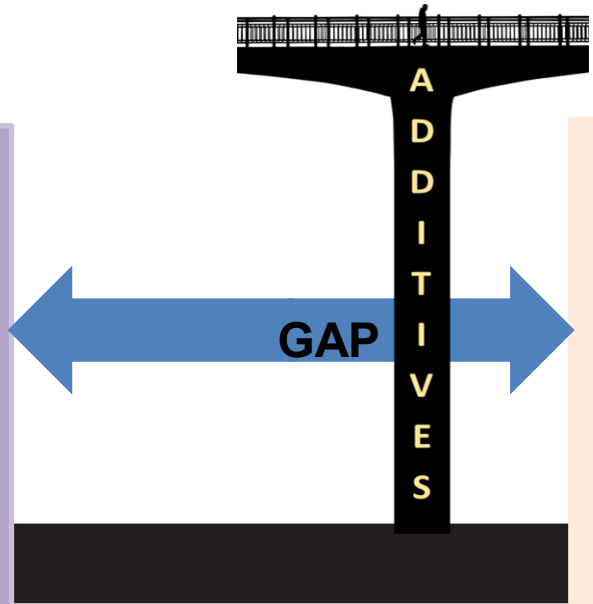


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A Gap Exists

Refinery/Terminal fuel meeting ASTM D975





Fuel meeting the needs to run todays High Pressure Common Rail (HPCR) engines with the most efficiency, power, and protection.

Additive Program

Diesel Fuel Additive Components

Diesel Performance Additive

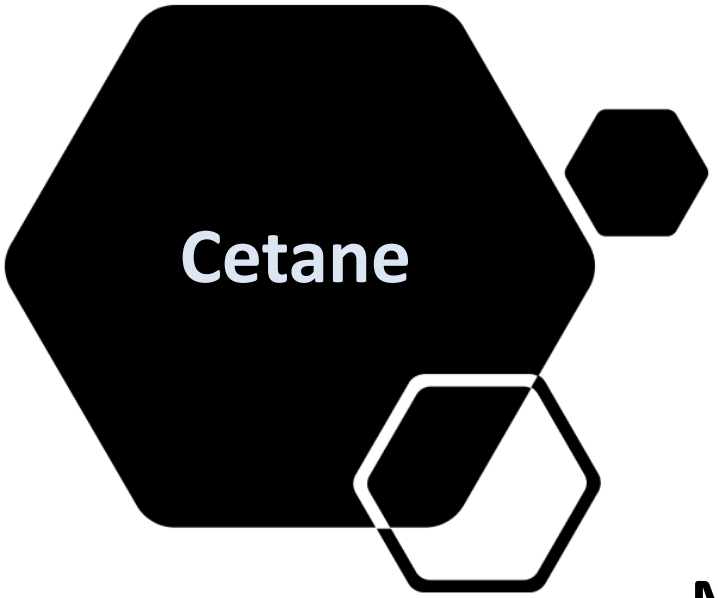
- Cetane Improver
- Detergent
- Corrosion Inhibitors
- Lubricity Enhancer
- Oxidation Inhibitors
- Fuel Stabilizers
- Demulsifier
- Moisture Control

Cold Flow

- De-Icer
- Wax Modifier
- WASA

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So What?

Quicker Starts

Smoother Running

Quieter Operation

More Complete Combustion

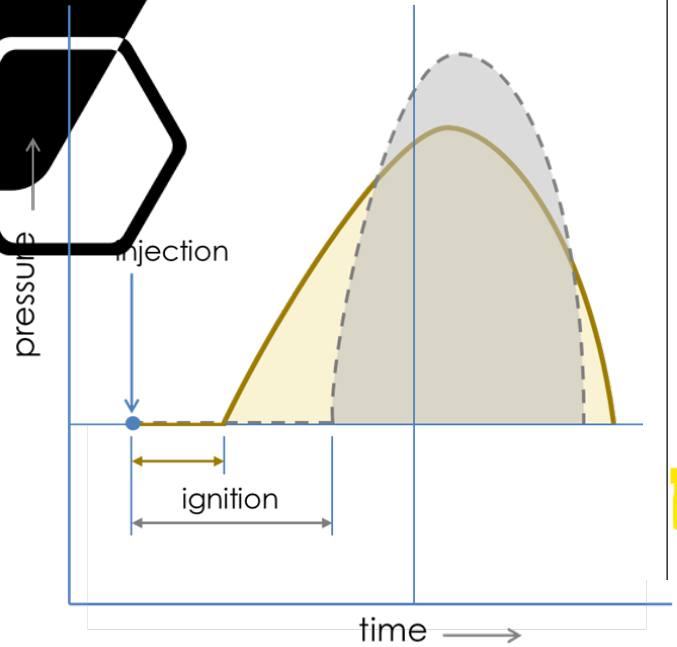
Reduced Emissions

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Cetane

What Do OEM's Say?



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Diesel Fuel

Consult your local fuel distributor for properties of the diesel fuel available in your area.

In general, diesel fuels are blended to satisfy the low temperature requirements of the geographical area in which they are marketed.

Diesel fuels specified to EN 590 or ASTM D975 are recommended. Renewable diesel fuel produced by hydrotreating animal fats and vegetable oils is basically identical to petroleum diesel fuel. Renewable diesel that meets EN 590, ASTM D975, or EN 15940 is acceptable for use at all percentage mixture levels.

Required fuel properties

In all cases, the fuel shall meet the following properties:

Cetane number of 40 minimum. Cetane number greater than 47 is preferred, especially for temperatures below –20°C (–4°F) or elevations above 1675 m (5500 ft).

Sulfur conte
III B, and Sta

- Use ONL
  a maximu

Sulfur conte

- Use of die
  1000 mg/
- Use of die
  to 2000 m
  REDUCE
- BEFORE
  greater th
  John Dee

Sulfur conte

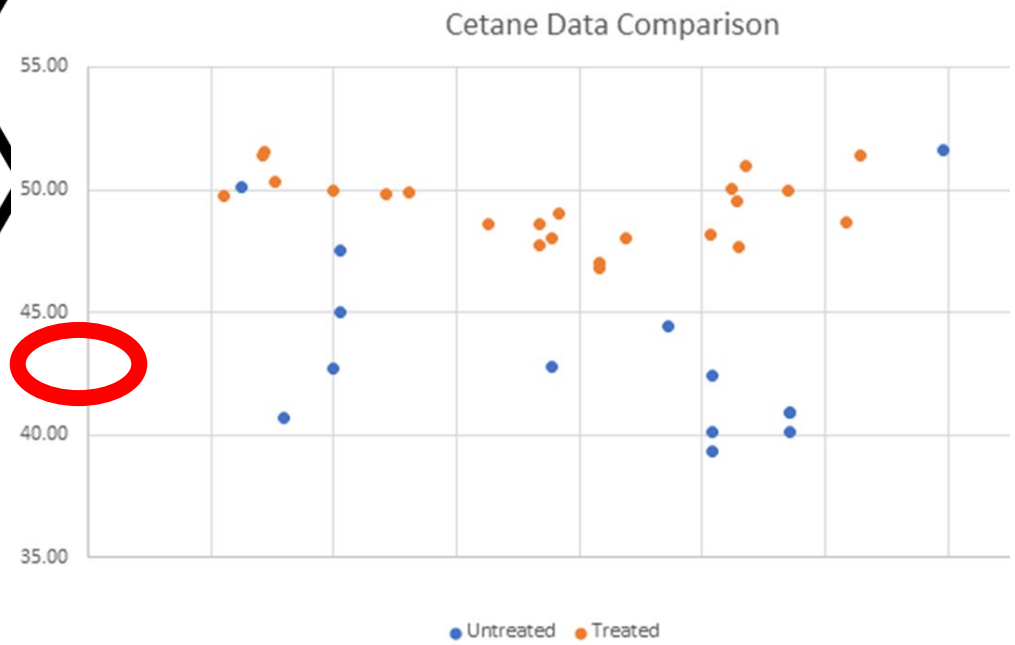
- Use of die
  2000 mg/
- Use of die
  to 5000 m

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How Do We Change This?

Cetane



52

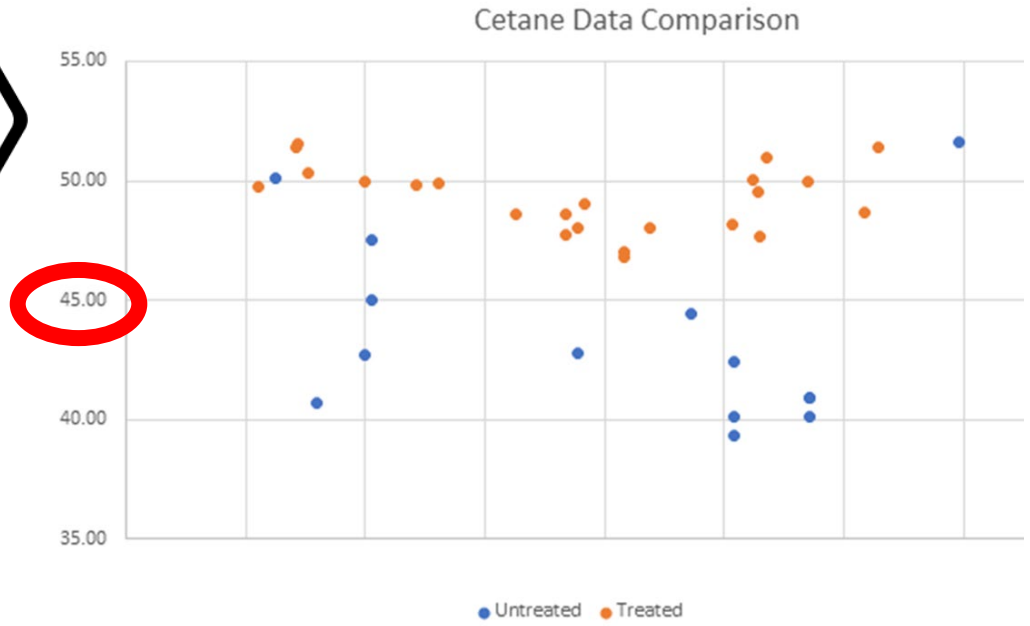
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Cetane

How Do We Change This?



52
47

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Detergent

So What?

Removes Engine Deposits

Keeps Engines Clean

Improves Fuel Filterability

Efficient Operation

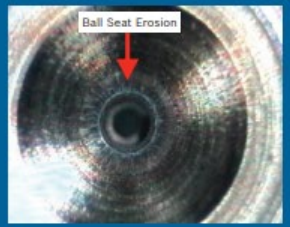
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Why Are We Concerned?

Detergent

Filtration





Causes:
- Inadequate filtration
- Poor quality fuel supply
- Inadequate maintenance intervals

Effect:
- Starting problems
- Poor performance
- Idling problems (vibration)

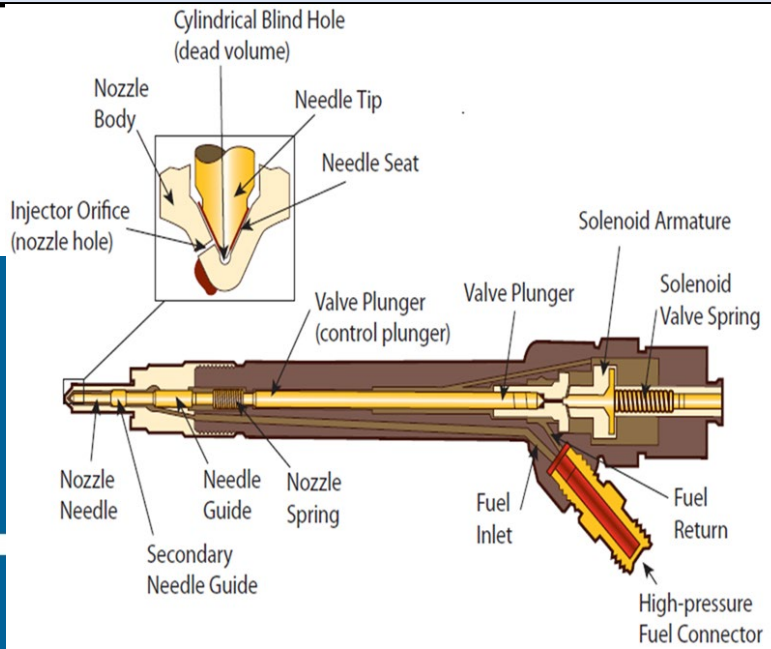
Fuel Contamination and Corrosion





Causes:
- Water in fuel
- Poor quality fuel supply
- Inadequate filtration, water separation
- Inadequate maintenance interval

Effect:
- Poor performance
- Idling problems (vibration)

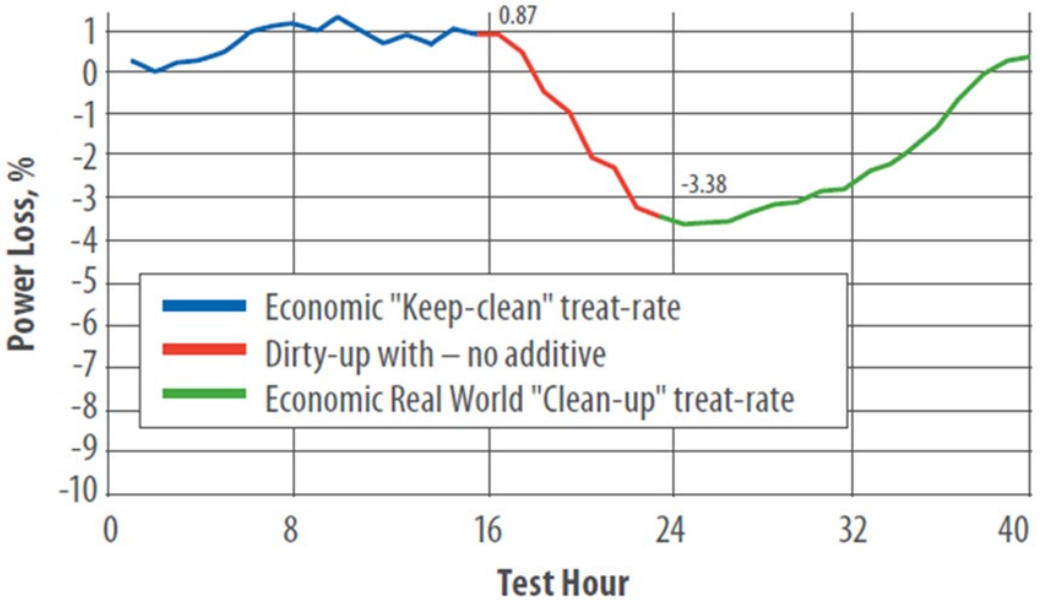


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Detergent

How Do We Change This?

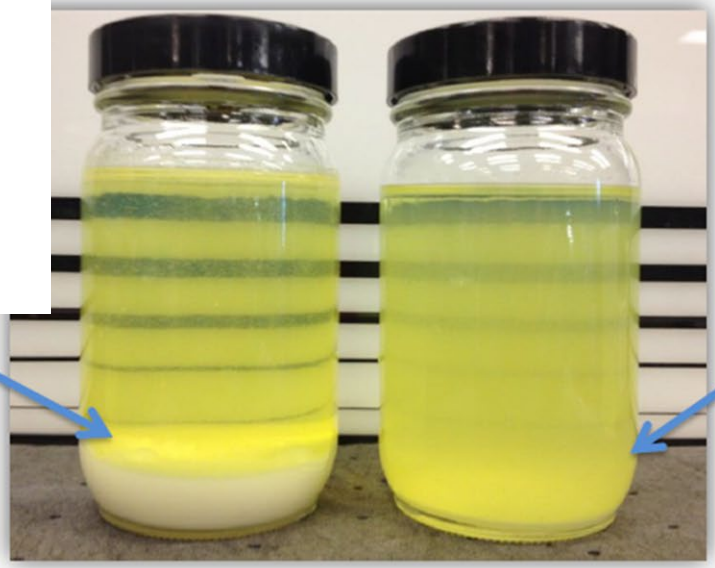


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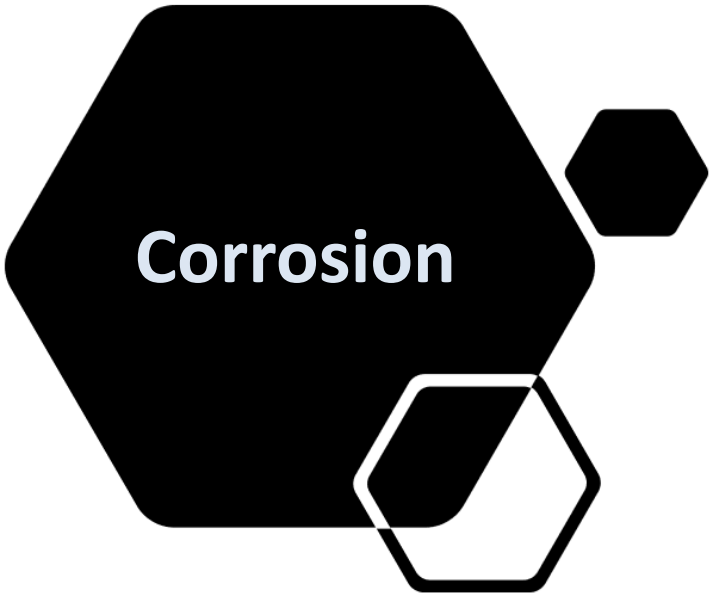
How Do We Change This?

Detergent



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So What?

Enhanced Corrosion Resistance

Tank & Fuel System Protection

Reduced Risk Of Particles

Extended Filter Life

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Corrosion

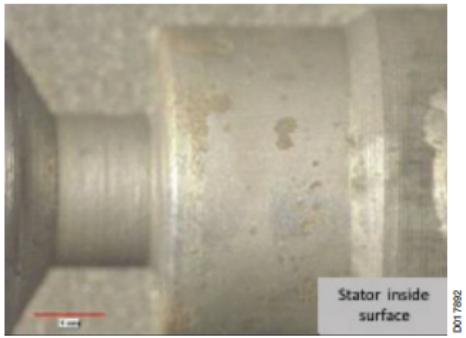
What Do OEM's Say?

Southwest Research Institute®

Investigation of Corrosion in Fuel Systems

Widespread use of biodiesels and ultra-low sulfur diesel (ULSD) fuels has raised corrosion concerns in the engine manufacturing, fuel storage and regulatory communities. Biofuels derived from vegetable oils or animal fat age rapidly during storage, leading to the formation of aggressive species that react with storage tanks or engine parts, causing corrosion. With ethanol blends, water separation (for E5-E20) and stress corrosion cracking (E85) are the main concerns. ULSD is thought to be more corrosive than diesel fuels containing higher amounts of sulfur. Microbiologically induced corrosion (MIC) is also a potential problem in all fuel systems, since they provide a readily available food source to microorganisms, including bacteria and fungi.

Southwest Research Institute® (SwRI®) has been assisting government and industry in investigating corrosion and finding mitigation techniques for corrosion

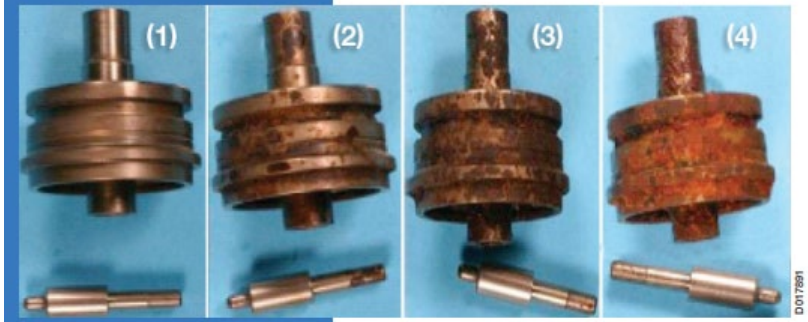


Low magnification microscope image of the inside surface of test specimen (4) showing corroded areas.

Fuel Analysis

The Fuels and Lubricants Division is equipped to fully characterize fuels in its analytical laboratory, including the following measurements:

- Sulfur content



Test specimens exposed to ULSD fuels with different water contents. (1) No water; (2) 7,500 ppm distilled water; (3) 7,500 ppm tap water; (4) ULSD without additives + 105 ppm tap water.

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Corrosion

How Do We Change This?

Steel Corrosion, NACE Rating
B+, <5%
B++, <0.1%
A, 0%



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Lubricity

So What?

Protection For Moving Parts

Extended Pump and Injector Life

Efficient Fuel Delivery

Reduced Downtime

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Lubricity

What Do OEM's Say?

Service Bulletin

Fuels for Cummins® Engines

Introduction

This bulletin covers information about Fuels for Cummins® Engines. The purpose of this bulletin is to help the user understand proper fuel selection and problems associated with fuel.

Diesel Fuel

Diesel fuel performs three major functions in a Cummins® diesel engine.

1. It supplies all the energy for the engine.
2. It cools and lubricates the precision parts of the engine's fuel pump and injectors.
3. It enables emissions controlled engines to meet regulated emissions levels.

- ULSD has lower lubricity than LSD, so lubricity additives need to be added by the fuel supplier to prevent fuel system damage. More information on fuel additives can be found in the "Additives" section of this service bulletin.

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Stability

So What?

Improved Biodiesel Stability

Protection From Thermal and Oxidative Breakdown

Extends Fuel Storage Life

Reduces Filter Plugging

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Stability

What Do OEM's Say?

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JDS-G135

Handling and Storing Diesel Fuel

CAUTION: Reduce the risk of fire. Handle fuel carefully. DO NOT fill the fuel tank when engine is running. DO NOT smoke while you fill the fuel tank or service the fuel system.

Fill the fuel tank at the end of each day's operation to prevent water condensation and freezing during cold weather.

Keep all storage tanks as full as practicable to minimize condensation.

Ensure that all fuel tank caps and covers are installed properly to prevent moisture from entering. Monitor water content of the fuel regularly.

When using biodiesel fuel, the fuel filter may require more frequent replacement due to premature plugging.

Check engine oil level daily prior to starting engine. A rising oil level may indicate fuel dilution of the engine oil.

IMPORTANT: The fuel tank is vented through the filler cap. If a new filler cap is required, always replace it with an original vented cap.

When fuel is stored for an extended period or if there is a slow turnover of fuel, add a fuel conditioner to stabilize the fuel and prevent water condensation. Contact your fuel supplier or John Deere dealer for recommendations.

DX,FUEL4 15FEB13-1/1

Figure 3 Handling and Storing Diesel Fuel

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Stability

Why Are We Concerned?

B20 DIESEL OXIDIZED BY RANCIMAT (EN 14112)



B20 Prior to Rancimat Oxidation



B20 Post Rancimat Oxidation

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Moisture

So What?

Keeps Tanks Drier

Reduced Microbial Risk

Less chance of Rust

Extends Filter Life

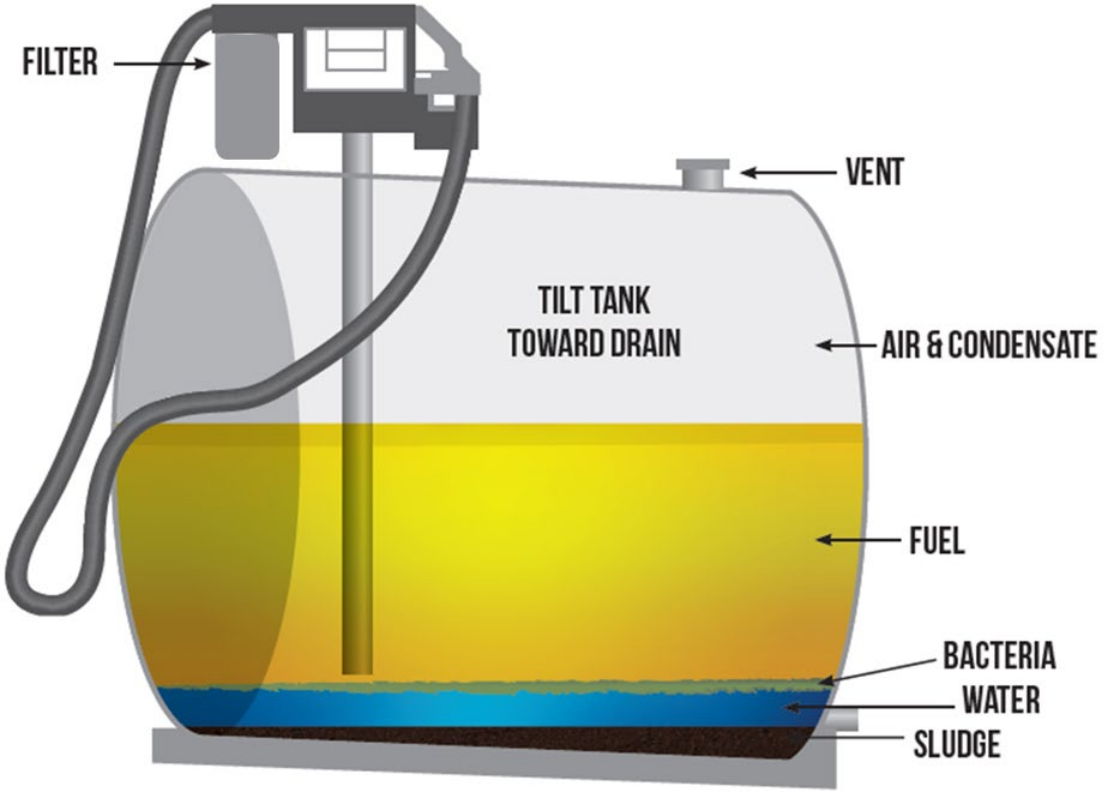
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Why Are We Concerned?

Moisture

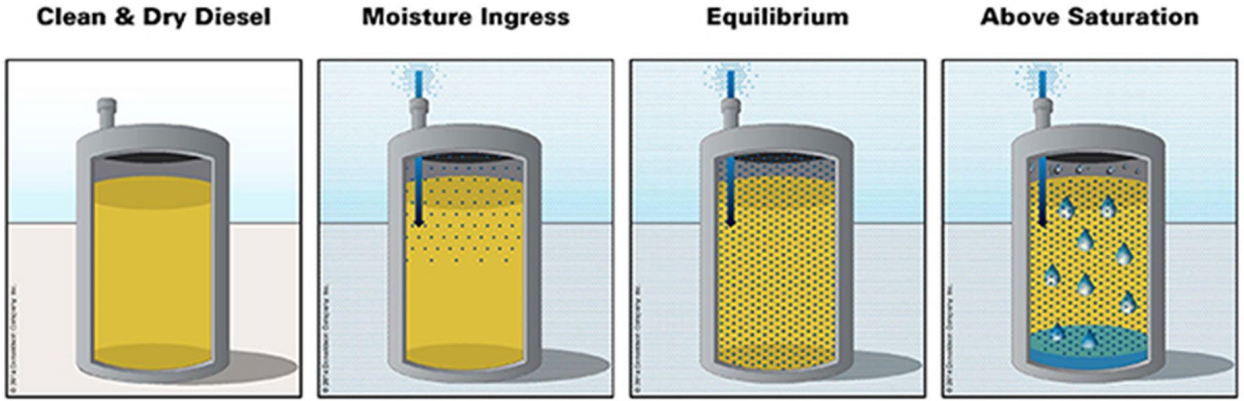




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Moisture

How Do We Change This?









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De-Icer

So What?

Avoids Fuel Line Freezing

Avoids Filter Freezing

Reduced Filter Plugging

Less Down Time

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Why Are We Concerned?

De-Icer

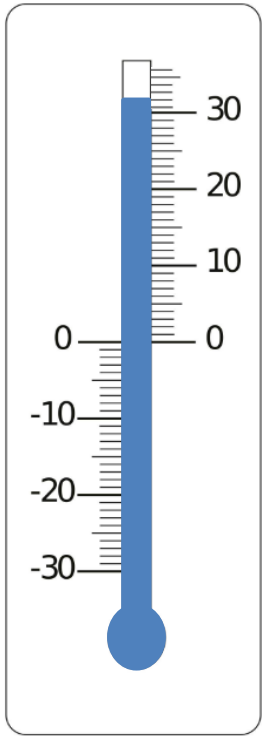
H_2O



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De-Icer

How Do We Change This?

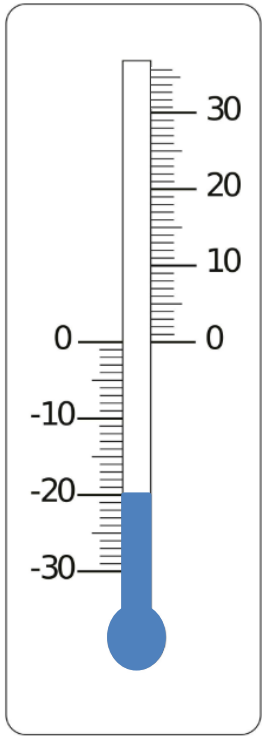


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De-Icer

How Do We Change This?



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So What?

Keeps Wax Small

Lowers CFPP of the fuel

Reduced Filter Plugging

Less Down Time

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WASA: Wax Anti-Settling Agent

So What?

Uniform Fuel

Reduced Filter Plugging

Extended Storage Protection

Less Down Time

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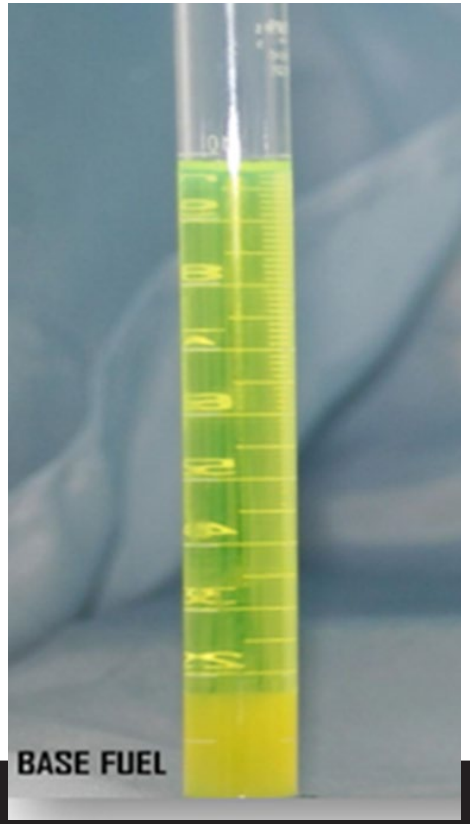
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Why Are We Concerned?

WASA: Wax Anti-Settling Agent

Base Cloud Point: 7^0F

Bottom 20% Cloud Point: 30^0F

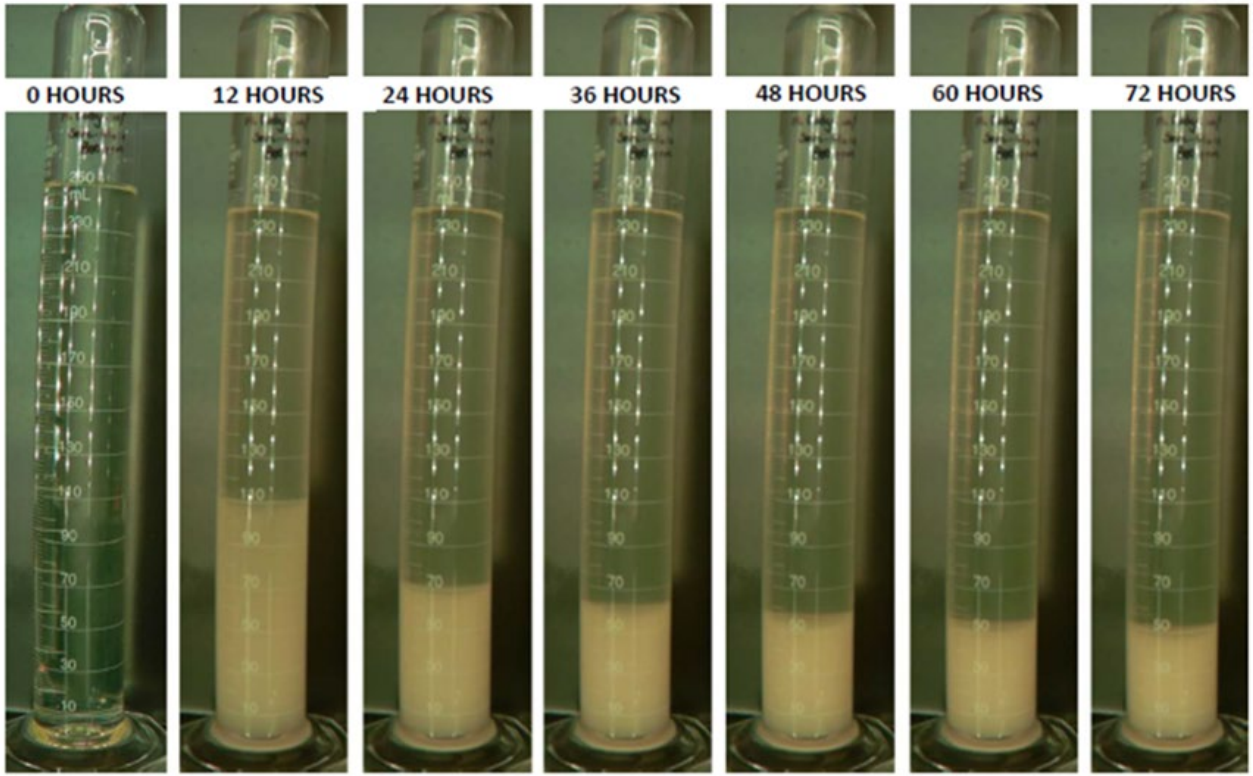


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WASA: Wax Anti-Settling Agent

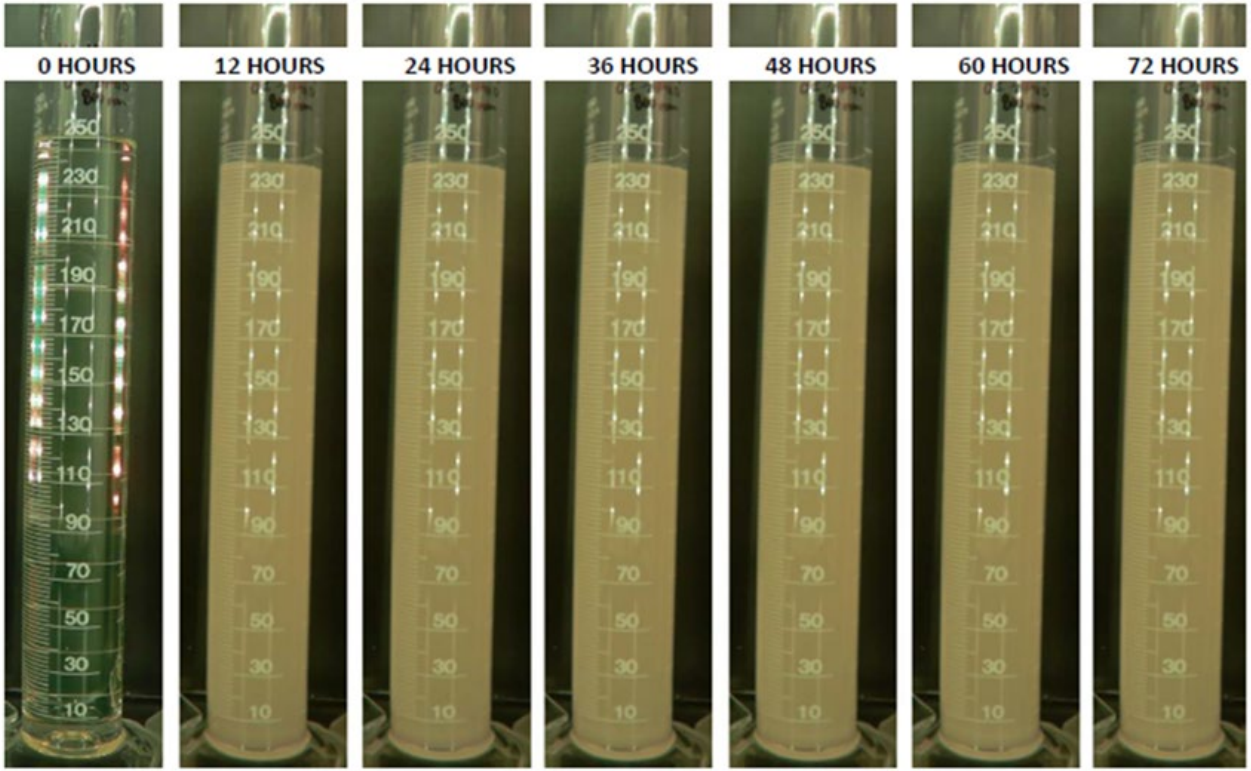
How Do We Change This?



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WASA: Wax Anti-Settling Agent

How Do We Change This?



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Summary

So What?

Clean Engine
Efficient Operation
Maximized Power
Fuel System Protection
Reduced Emissions
Reduced Downtime

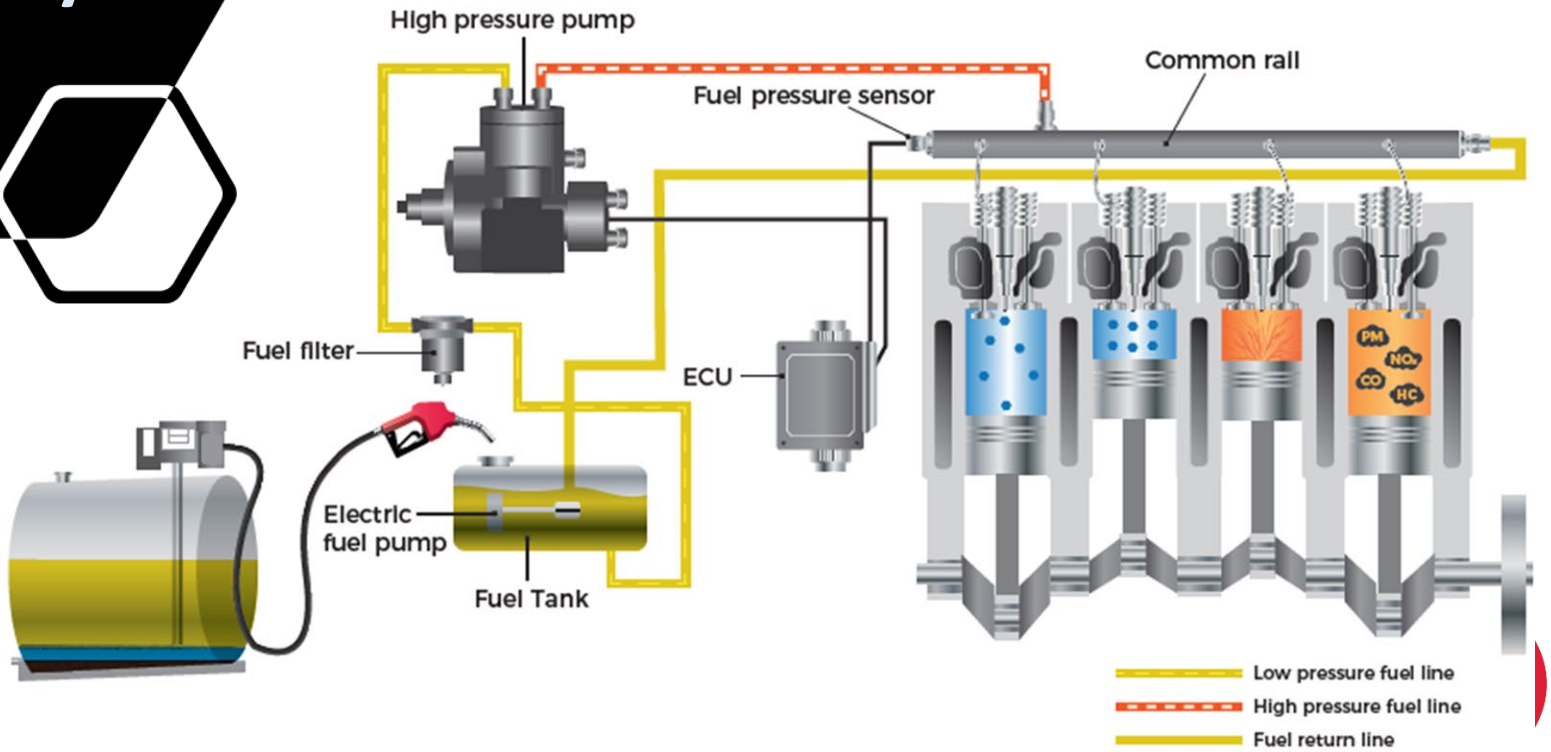
Fuel Quality Program + Additives
= Quality/Consistent Fuel

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Summary

Total Fuel System Protection



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FUELS LUBRICANTS PROPANE
ELECTRONIC PAYMENT SYSTEMS
DEF ADDITIVES EQUIPMENT
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WE HAVE THE PRODUCTS TO TAKE YOU FURTHER

Questions?