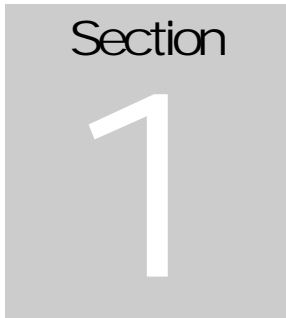


Eco Global Solutions

TRAINING WORKSHOP

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Introduction

Welcome to Eco Global Solutions, Inc.'s 2009 training workshop on our line of innovative products.

The purpose of this training workshop is to offer a thorough approach to learning about EGS products from the experts who innovated them. Each session will not only provide in-depth knowledge on individual products, but also serve as a great means of networking with colleagues in the trade as well as the EGS staff. The workshop will be lead by EGS Chief Technical Officer, Phil Hastings and Director of Global Drilling Operations, Armando Navarro.

P R O D U C T S	
①	Fuel Supplements
②	Oil Supplements
③	Protectants
④	Hydraulics
⑤	Motor Oil
⑥	Industrial Greases
⑦	Oil & Gas Industry Applications

Our Family of Products

Our products are organized into seven distinct categories. Technology, test results, and applications will be discussed for each, with an emphasis on the Fuel Supplement line of products. For further information, Technical Data Sheets are available in the Appendices of this manual as well as on our website www.egs-ic.com. Copies of training materials and useful training videos, including footage of today's training workshop will be accessible at the conclusion of this seminar.

Who We Are

Our Mission

Initiate revolutionary product development through innovative technology and a commitment to environmental awareness.

Our Story

Eco Global Solutions, Inc. (EGS) was founded on the principles that quality products, strong technical expertise and entrepreneurial ability will ensure we meet our objectives. EGS is part of a worldwide family of companies that have a track record of success. Our Founders and principals are forward thinking with a global orientation about pioneering business practices to preserve our planet.

Our Focus

EGS develops, manufactures and distributes a line of technologically innovative products that will enhance the way many industries approach their business. Using leading-edge technological advancement, EGS has developed products that have been scientifically proven to lower emissions, enhance fuel economy and performance, as well as reduce maintenance requirements on equipment and machinery in the transportation, marine, agricultural and manufacturing industries. EGS has also developed a line of high-performance lubricant additives for drilling and mining operations, including extended reach.

Fuel Supplements

Fuel Supplements
Five products belong to this family.

Fuel Supplements are administered to the fuel tank and address issues that affect the quality of fuel.



EGS BOOST Diesel Fuel Supplement



EGS BOOST is an advanced multi-function diesel fuel treatment formulated to rejuvenate and replenish diesel engines for maximum fuel economy and longer life. EGS BOOST surpasses other fuel supplements as one of the best as it has been demonstrated to excel in a variety of independent tests.

EGS BOOST was designed and perfected to compensate for the disparities in quality among different types of diesel and bio diesel fuels thereby maximizing engine capabilities regardless of fuel quality.

- Increases lubricity
- Fuel Economy up to 10-15%
- Decreases cumulative harmful emissions up to 60%
- Improves lubricity for regulated low-sulfur diesel fuels up to 400%
- Is a non-regulated formula that contains no alcohol or cetane boosters
- Reduces water content and prevents bacteria growth
- Stabilizes diesel fuel for storage up to one year
- Protects fuel from gelling down to -15°F
- Works well with diesel and bio-diesel fuels
- Reduces carbon deposits in the combustion chamber and lubricating oils

SIZES	CASE	TREATS
Quart	6	736 gal
Gallon	4	3000 gal
55-gal Drum	-	165,000

EPA Registration



EGS BOOST is registered with the United States Environmental Protection Agency.
EPA Number: 23892001

Problems with Fuel

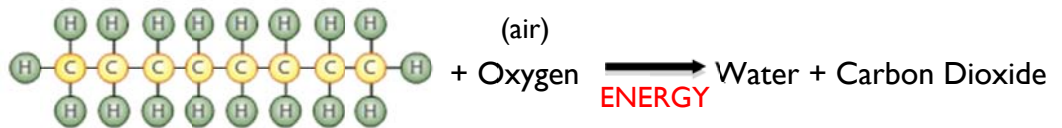


FIGURE 1. FUEL COMBUSTION Fuel is an aliphatic hydrocarbon, made up of molecules composed of hydrogen and carbon arranged in chains.

Harmful Emissions
CO = Carbon Monoxide
NO_x = Nitrogen Oxides
HC = Hydrocarbons

This complex molecule tends to clump together and only under ideal conditions will burn completely. Typical engines are not ideal so you have the problem of **incomplete combustion**, which means not only inefficient use of your expensive fuel but also means that harmful byproducts are being emitted into the environment.

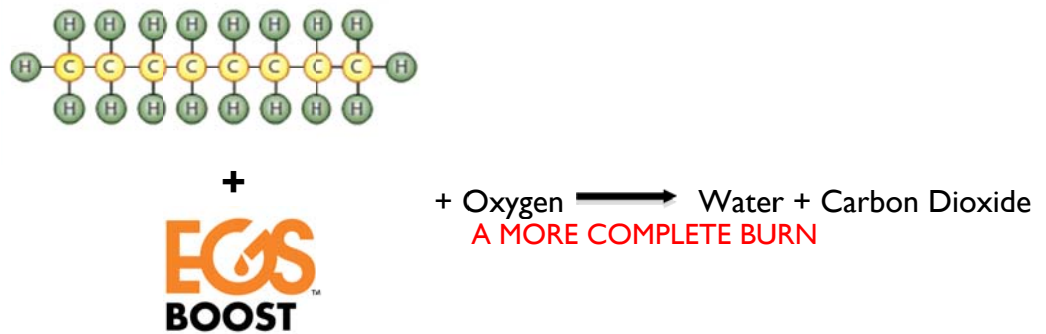
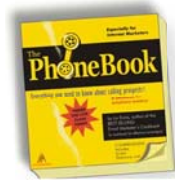


FIGURE 2. FUEL COMBUSTION WITH EGS BOOST Addition of EGS BOOST to fuel provides a more complete burn.

How does this work?



Imagine you have a phone book that you light on fire. The outside of the phone book will burn but the fire will go out before reaching the inside pages. Fuel molecules are like that phone book. EGS BOOST separates the atoms in fuel molecules making them easier to burn. Think of it as if you tear the pages of the phone book out and individually burn them--you will be able to burn the entire book.

EPA laws came into effect in 2007 mandating that fuel manufacturers reduce the sulfur content from 500 PPM to 15 PPM. Reducing Sulfur levels reduces emissions, however there are effects on diesel fuel:

- Low sulfur fuel has less lubricity.
- Low sulfur fuel absorbs water more readily and water is an abrasive. Untreated fuel often causes excessive wear on fuel pumps and injector tips.
- With ULSD (Ultra Low Sulfur Diesel) the lift pump can leak between the bracket and pump or at the electrical connection. Cummins, Detroit, Caterpillar, International and others sent out "alerts" to let their users know the potential failure.
- Leaky o-rings, worn tips and clogged injectors will cause diesels to run sluggishly and cause low mileage and smoke.

FIGURE 3. WATER CONTAMINATION The above images show how water contamination can affect fuel.

“Fuel For Thought”

David O. Ahrens, Commercial Marine Manager Caterpillar Engine Products Division

Article discusses:

- The nature of diesel fuel
- Water and sediment contamination
- High and low sulfur side effects
- Cetane ratings
- Viscosity
- Pour Points
- Fuel Quality
- Microorganism

Note

“Fuel For Thought” full article available in APPENDIX

The Competition


Competitive Analysis	Eco Global Solutions	Well Worth	Power Service	Bitron Global	Howes Lubricator Products	Standadyne	Duralt	Conklin Lubricants	B&A International Inc
Using Marketing Claim: & Materials		Summit Diesel Fuel Treatment	Diesel Kleen & Cetane Boost	Diesel Conditioner	Diesel Treat	Performance Formula	Diesel Conditioner	Diesel Plus	FPE
Designed Specifically for Diesel Engines	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
Compatible with all Diesel Fuel including Bio-Diesel	Δ						Δ		
Meets Worldwide Fuel Charter Specifications for Additives	Δ						Δ		
Emission Reduction Properties	Δ			Δ			Δ		Δ
Reduces Friction through Enhanced Lubrication	Δ	Δ		Δ	Δ	Δ	Δ	Δ	
Reduces Carbon Deposits	Δ	Δ		Δ	Δ		Δ	Δ	Δ
Health and Safety Ratings on MSDS "Low"	Δ				Δ				
Improves Fuel Economy	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
Reduces Water in Fuel	Δ	Δ		Δ	Δ	Δ	Δ	Δ	
Eliminates Bacteria in fuel	Δ		Δ					Δ	
Combustion Improver Without the Use of Cetane Boosters	Δ						Δ	Δ	
Solvent Free	Δ				Δ				
Detergent Free	Δ								
Alcohol Free	Δ				Δ	Δ	Δ		
No Reportable Chemicals	Δ								

FIGURE 4. COMPETITOR ANALYSIS A copy of this diagram is available in the APPENDIX.

- Blends oil with alcohol which only changes fuel burn rate and does little for lubrication during the combustion cycle.
- Lubrication will ignite under 300°F, not providing any protection during the combustion cycle while also creating more emissions released via exhaust.
- Dilutes water with alcohol in order to pass through filters and enter injectors a non-lubricating fluid.
- No long-term solution for bacteria growth. Alcohol evaporates and bacteria continues to grow in water.
- Increases exhaust temperatures, allowing an increase in emissions.
- Decreases fuel economy due to negative changes in fuel burn rate, allowing unburned fuel to enter exhaust.
- Does little or nothing for bio-diesel.

Test Results

Testing in B-20 Bio Diesel

Test 1

Testing Facility:
Independent Testing
Laboratory,
Testing in No. 2 Diesel Fuel

NO _x Emissions	Reduced 35%
Carbon Monoxide (CO)	Reduced 37%
Gas Temperature	Reduced 19%
Fuel Burn Efficiency	Increased 6.3%

Fuel:
Conventional No. 2
Diesel Fuel
B-20 Bio-Diesel

Carbon Monoxide (CO) Emissions	Reduced 20%
Hydrocarbon (HC) Emissions	Reduced 14%
Black Smoke (Opacity)	Reduced
Particulate Carbon	Reduced 26%
Solid Particulate Emissions	Reduced 43%
NO _x Emissions	Reduced

Note

Full reports of Test Results and Case Studies are available online at our website www.egs-ic.com.

Test 2

ASTM D6522 Testing

Testing Facility:
Battelle Columbus
Division

Engine:
Superior Model
2406D/Mitsubishi Model
S6U-PTA

Carbon Monoxide (CO) Emissions	Reduced 10%
Hydrocarbon (HC) Emissions	Reduced 9%
Particulate Carbon	Reduced 26%
Particulate Emissions	Reduced 43%
Combustion Efficiency	Increased 0.4%
NO _x Emissions	Reduced

Engine Specifications:
4-stroke, 6-cylinder, 4300
cubic inch diesel engine
rated at 1,400 brake
horsepower and 1,200
RPM

Field Tests by Ontario Power Generation at the Gull Bay remote generation station on diesel gensets ranging from 130 kW to 250 kW under actual operating conditions confirmed Battelle results and also quantified *fuel savings at 3-5%*.

EGS BOOST offers a unique, cost-effective means to reduce diesel engine particulates without aggravating NO_x emissions or diminishing fuel economy.

Test 3

Testing Facility:
Southwest Research Institute

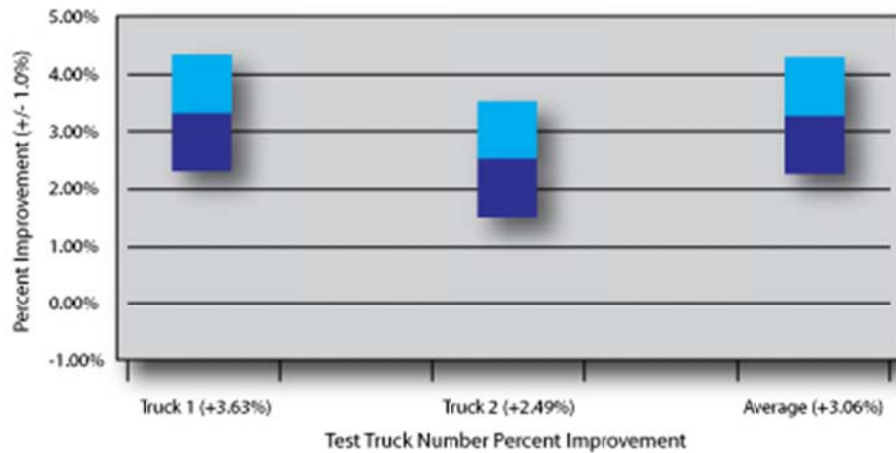
Vehicles tested:
Two (2) identical 2003 Freightliner tractors with 48-foot flat beds with concrete ballast

Engine Specifications:
Detroit Diesel 60 Series with exhaust gas recirculation (EGR), Eaton Fuller FRO-15120C transmissions

Fuel:
Conventional No. 2 Diesel Fuel

Fleet and Field Evaluation

	Truck 1	Truck 2
Average J1321 T/C Ratio	0.9668	0.9544
% Fuel Economy	3.63%	2.49%
Average Fuel Economy	3.06% lbs, 10% cost savings	



Test 4

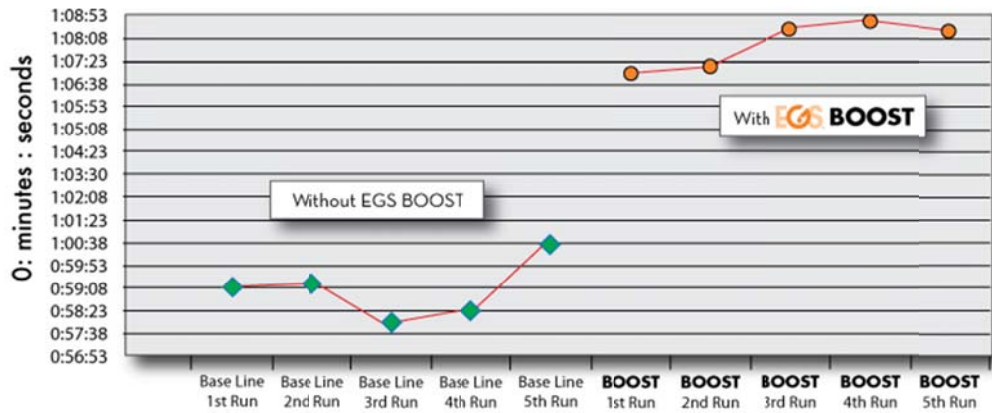
Testing Facility:
LubeTrak Laboratories

Engine:
Cummins N-14

Fuel:
Sinclair No. 2 Diesel Fuel

Treat Ratio:
1 oz EGS BOOST to every 25 gallons of fuel

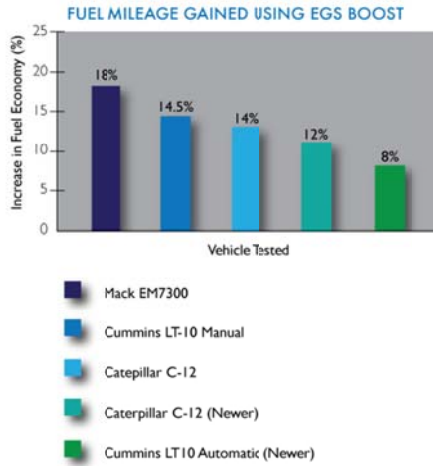
MPG SAE J1321 Fuel Consumption Test
TMC/SAE TEST developed to meet needs of trucking industry



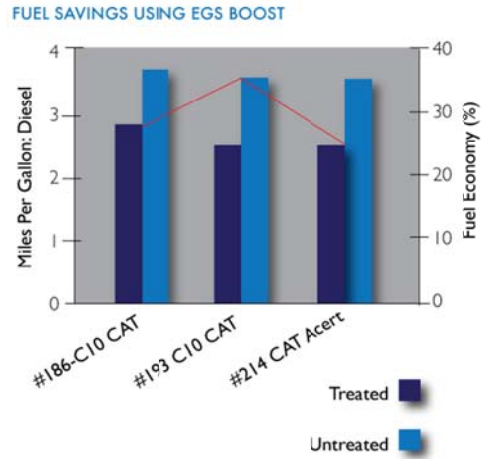
Baseline Average	0:59:07
EGS BOOST Average	1:08:05
Difference	0:08:58
% Improvement	15.17%

Customer Case Studies

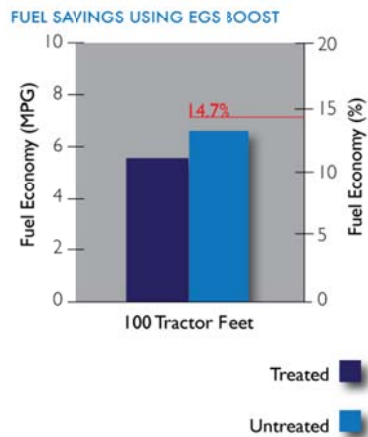
Ready Mix Fleet in the Southwest has an average 14% Increase in Fuel Economy Using **EGS BOOST**



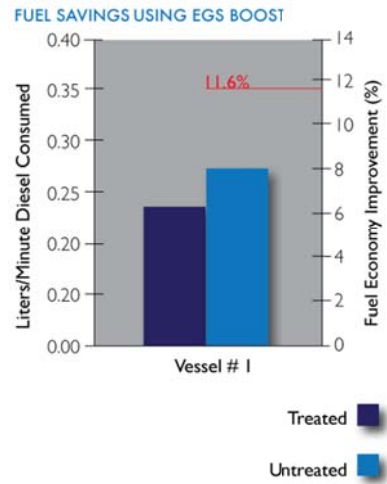
13% Increase in Fuel Economy and 1200% ROI for Construction Fleet in Pacific Northwest with **EGS BOOST**



National Food Industry Fleet in Pacific Northwest Realizes 1000% Return on Investment with **EGS BOOST**



Japanese Fishing Fleet Improves Fuel Economy Over 11% with **EGS BOOST**



EGS BOOST X Gasoline & Diesel Fuel Supplement



EGS BOOST X was developed with advanced combustion catalyst technology to provide and maintain a catalytically active surface coating in the combustion chambers of your vehicle's engine. What this translates to is enhanced engine performance, increased gas mileage by making better use of the fuel and a reduction in harmful exhaust emissions. In numerous tests performed under controlled conditions, EGS BOOST X have been shown to provide enormous success with increases in fuel efficiency by up to 10% or more with repeated and regular usage in most vehicles, generating annual fuel cost savings.

- Super concentrated formula
- Increases fuel economy up to 10-15%
- Reduces heat and lowers friction
- Aids in prevention of bacteria growth and virtually eliminates water associated with fuels
- Improves lubricity for regulated low-sulfur diesel fuels up to 400%
- Improves combustion efficiency reducing fouling and corrosion and potentially extending equipment life and reducing maintenance
- Stabilizes fuel for storage up to one year
- Protects fuel from gelling down to -15°F
- Works well with diesel and bio-diesel fuels
- Promotes combustion of carbon particles reducing smoke and cumulative emissions by up to 60%

SIZES	CASE	TREATS
Quart	6	875 gal
Gallon	4	1:3000 gal
55-gal Drum	-	165,000
(2) tablet packet	-	30-50 gal

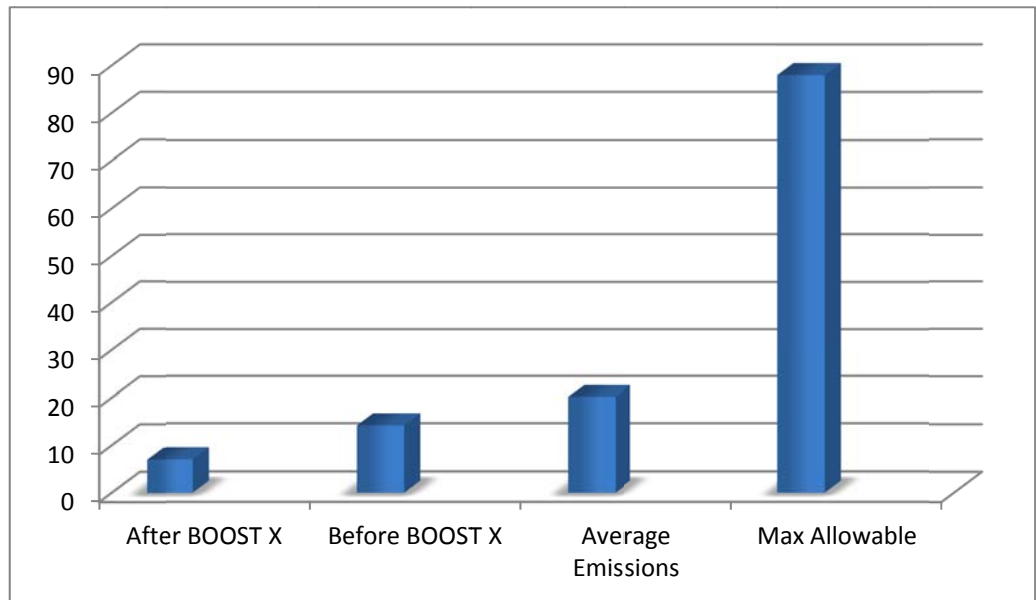
EPA Registration



EGS BOOST X is registered with the United States Environmental Protection Agency.
 EPA Number: 238920002

Test Results

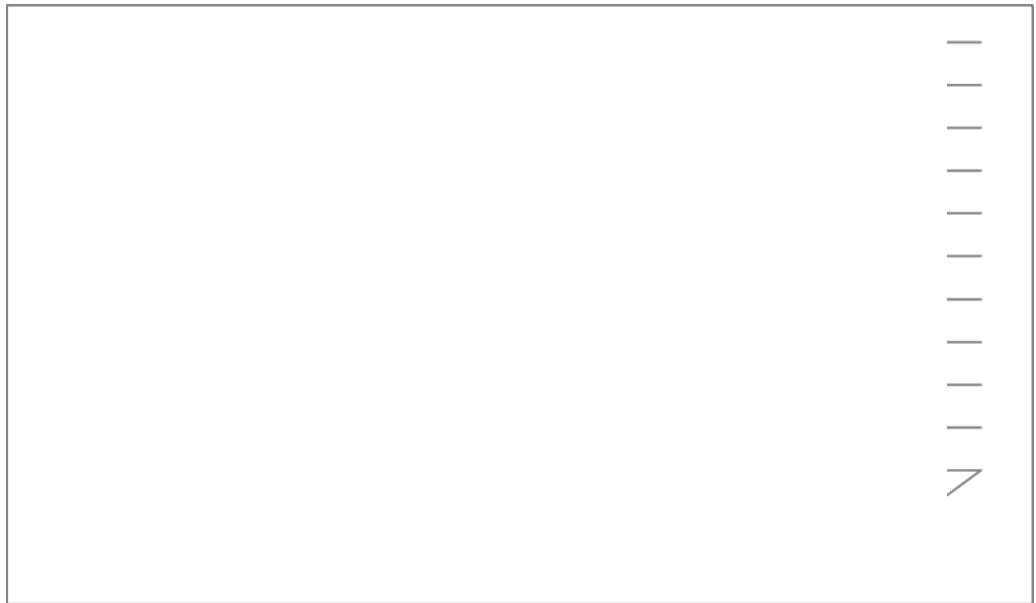
Emissions Reductions



Hydrocarbons (HC) in PPM

	Maximum allowable Emissions	Average Emissions for Passing Vehicles (Utah)	Before EGS BOOST	After EGS BOOST
@ 25 mph	88	20	14	7

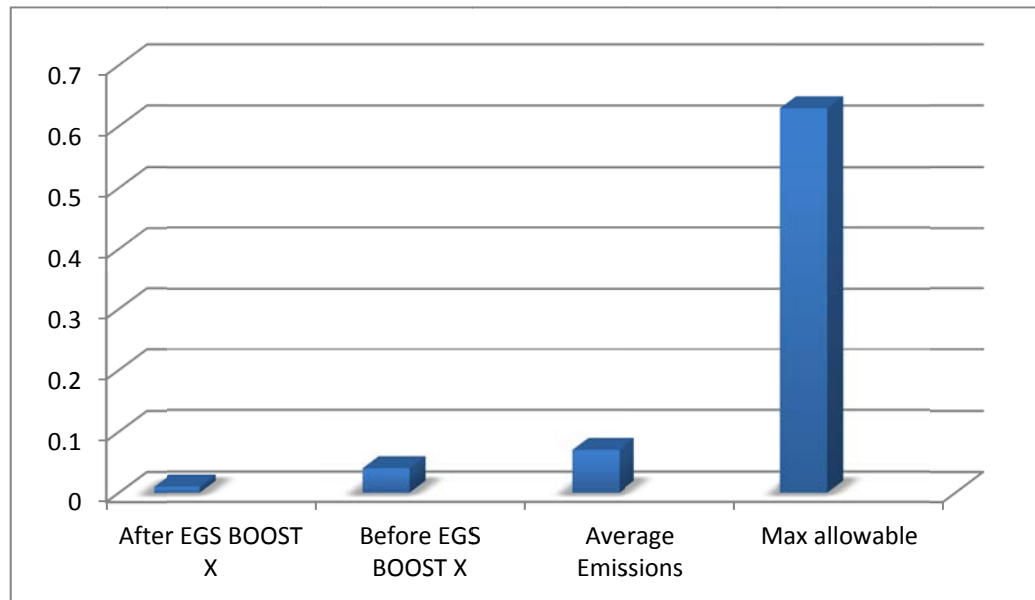
% Difference Before & After BOOST	50%
% Below State Average	65%
% Below Maximum Allowable	92%



Nitrogen Oxides (NO_x) in PPM

	Maximum allowable Emissions	Average Emissions for Passing Vehicles (Utah)	Before EGS BOOST	After EGS BOOST
@ 25 mph	988	87	54	5

% Difference Before & After BOOST	91%
% Below State Average	94%
% Below Maximum Allowable	99%



Carbon Monoxide (CO)

	Maximum allowable Emissions	Average Emissions for Passing Vehicles (Utah)	Before EGS BOOST	After EGS BOOST
@ 25 mph	0.63%	0.07%	0.04%	0.01%

% Difference Before & After BOOST	60%
% Below State Average	77%
% Below Maximum Allowable	97%

Test:

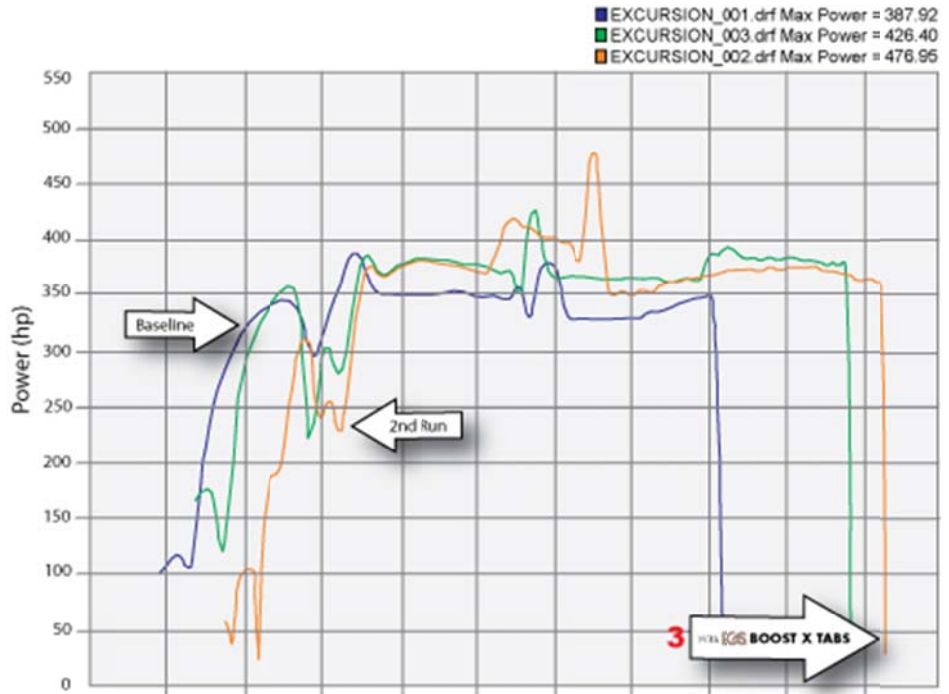
Dynamometer readings to compare the effect of EGS BOOST TABS on horsepower compared to an air intake chip.

Engine:

2005 Ford Excursion

Treat Ratio:

1 tablet for every 15-25 gallons



EGS BOOST X TABS
Dyno Test 2005 Ford Excursion

Baseline Test: Stock OEM settings--387 HP

2nd Run: Exhaust, Air Intake, Chip--426 HP

3rd Run: Same equipment as 2nd Run,
plus **EGS BOOST X TABS--476 HP**

Testing Ratio: 1 Tablet per 25 gallons

EGS HEAVY Heavy Fuel Oil Supplement



Due to less efficient refining and blending processes, today's heavy fuel oils have and produce more sludge particles than ever before. In order to operate efficiently, storage tanks require heavy fuel oils that are clean and free of sludge build-up and carbon and soot deposits. EGS HEAVY is a well-formulated treatment designed to condition engines running on fuel oil by preventing and slowing down sludge formation, dispersing particles of solid chemical compounds and eliminating moisture to keep engine components cleaner and more reliable. Incomplete combustion is a common problem for engines burning heavy fuel oils. The major benefit from using EGS HEAVY is the substantial improvement to combustion. By improving combustion efficiency, EGS HEAVY allows engine to operate consistently at peak performance levels for much longer. In the boiler, EGS HEAVY combines a combustion catalyst system, emulsifying agents and solvents to protect and clean interior surfaces by deactivating vanadium oxides and sodium salts that deposit on boiler tubes and walls.

- Overcomes challenges associated with today's heavy fuel oil qualities
- Stabilizes fuel oil to minimize sludge formation
- Uniformly disperses water
- Conditions fuel for improved atomization and combustion
- Reduces harmful emissions and ash generation

SIZES	CASE	TREATS
Quart	12	750 – 1250 gal
Gallon	4	15K – 25K gal
55-gal Drum	-	165K – 275K gal

EGS HEAVY allows engines to run at considerably lower load with minimal black smoke



Soot Blowing Before EGS HEAVY



Soot Blowing After EGS HEAVY

EGS CATALYST Hydrocarbon Combustion Catalyst



EGS CATALYST is a hydrocarbon powder developed to specifically facilitate in the combustion of coal and hard-to-burn fuels such as petroleum coke. The quantitative burnout of carbon in flames of solid and liquid fossil fuels remains a continuing combustion-engineering challenge, made more difficult by the use of many NO_x (nitrogen oxide) control strategies. Because unburned fuel carbon represents a source of both pollution and efficiency, there is an increasing need for the development of technologies that enhance carbon burnout. The introduction of EGS CATALYST provides a new option for industry use in resolving fuel and site-specific combustion problems. EGS CATALYST improves carbon efficiency by up to 99.88% and reduces harmful emissions, including NO_x, by up to 25%. Standardized combustion tests were performed under simulated furnace, boiler and internal combustion engines conditions to determine with certainty the effect of EGS CATALYST, which proved to be a viable supplement hydrocarbon catalyst for both environmental and economical reasons.

- Powdered formulation for safer handling
- Improves burn efficiency up to 99.88%
- Concentrated and non-regulated formula
- May be mixed with fuel or injected in flame
- Provides a return in fuel savings
- Reduces harmful emissions including NO_x up to 25%
- Reduces carbon deposits

SIZES	CASE
334-gram bag	Up to 5 metric tons

Test Results

A typical power station was selected to be the test subject for EGS CATALYST powdered formula and is administered to coal furnaces.

	Without CATALYST	With CATALYST
Carbon Efficiency	97.26%	99.88%
Excess Air	26%	10%
BTU	11,000/lb	12,770/lb
Carbon	70.4	67.0
Oxygen	25.6	9.2

The test proved to be successful as both an increase in combustion efficiency and a decrease in harmful emissions were accomplished.

EGS COLD Cold Flow Supplement

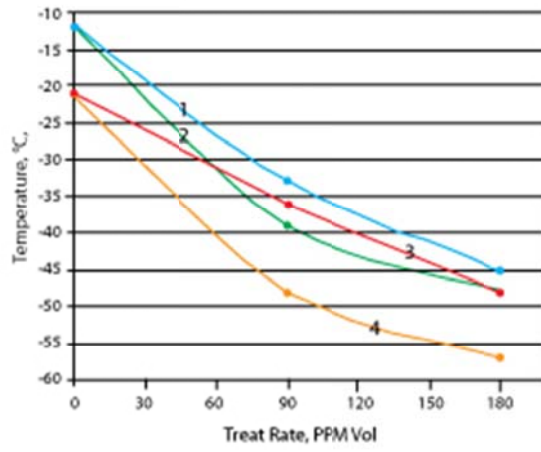


Standard #2 diesel fuel can experience significant engine problems in severe cold weather. As the temperature drops during winter operation, the paraffin wax naturally found in diesel fuel begins to crystallize causing the engine to lose power. To prevent gelling or the formation of crystals, EGS COLD has been specially formulated to provide maximum cold flow capabilities in diesel and biodiesel fuels. EGS COLD is an organic polymer that improves low temperature pour and flow properties of fuel. The advanced formulation provides superior performance to help prevent filter plugging in cold temperatures and to eliminate the problems associated with water present in fuel. To ensure satisfactory cold weather performance, EGS COLD is capable of preventing gelling of #2 diesel fuels from as low as -40°C.

- Stops fuel filters from plugging with wax formations
- Inhibits CFPP behavior
- Reduces need for blending with No. 1 diesel fuel or kerosene dilution for pour or flow control
- Eliminates cold-climate operational problems associated with the use of diesel and bio diesel fuels
- Prevents fuel gelling in diesel fuels in temperatures as low as -40°C and keeps fuel liquid during extended engine shutdowns
- Improves diesel fuel performance while reducing downtime and maintenance
- Effectively improves diesel fuel cold temperature qualities

SIZES	CASE
5-gal bucket	-
55-gal drum	-

Pour Point Response



- 1) B20 Bio Diesel
- 2) B2 Bio Diesel
- 3) B5 Bio Diesel
- 4) #2 Diesel

PPM treat rate 1 to 5000 gallons equals 180 PPM
May be used up to 1000 PPM equals 1 to 1000 gallons



Oil Supplements

Oil Supplements
Three products belong to
this family.

Oil Supplements are administered to oil and address issues that
affect the engine quality.



EGS EXTEND Engine Oil Extender



EGS EXTEND is specially designed and formulated with protective additives to coat the metal surfaces of both gasoline and diesel fueled engines operating with either synthetic or petroleum based motor oils. As motor oil is pumped through the engine, EGS EXTEND interacts with all of the metal surfaces to create a protective layer that reduces damaging friction and heat. Clean and efficiently running engines perform better by consuming less gas, requiring fewer repairs and run smoother and quieter.

- Engine will run smoother and potentially produce more power
- Reduces harmful friction and extreme heat in both gasoline and diesel fueled engines
- Helps protect the engine during cold starts
- Helps restore engine efficiency to optimize fuel economy
- For both new and older vehicles

SIZES	CASE
Quart	12
Gallon	4
Drum	-

Test Results

Usage Testing with Toyota 0W20W Engine Oil Overview

TEST 1

Viscosity @ 100°C	Test method ASTM D-445	Performed By: LubeTrak
Baseline	Toyota 0W20W	7.9 viscosity Normal
Test	Toyota 0W20W with EXTEND	8.5 viscosity Normal

EGS EXTEND raised viscosity index by 0.6 as verified by LubeTrak at 100°C

TEST 2

Precipitation Number, vol %: <0.1%
 Test Method ASTM D-91
 Performed by: Harris Testing Laboratories, Inc.

This test measures the amount of naphtha insoluble material in oils. This quantity is reported as the precipitation number

TEST 3

Flash Point °C: 215
 Test Method ASTM D-92
 Performed by: Harris Testing Laboratories, Inc.

The flash point is one measure of the test specimen to form a flammable mixture with air under controlled laboratory conditions

TEST 4

Water, wt%: 0.15
 Test Method ASTM D-95
 Performed by: Harris Testing Laboratories, Inc.

This test method covers the determination of water in the range from 0-25% volume in petroleum products by distillation method. Volatile water-soluble material if present may be measured as water.

TEST 5

Oxidation Stability: 120
 Test Method ASTM D-2272
 Performed by: Harris Testing Laboratories, Inc.

The estimate of oxidation stability is useful in controlling the continuity if this property for batch acceptance of production lots having the same operation used to compare service life of new oils

TEST 6

Foaming Tendency
 Test Method ASTM D-892 IP 146

Foam Volume, mL at end of % minute blowing period		Foam Volume, mL at end of 10 minute setting
Sequence I	5 mL	0
Sequence II	20 mL	0
Sequence III	10 mL	0

The tendency of oils to foam can be a serious problem in systems such as high speed gearing, high volume pumping and splash lubrication. Inadequate lubrication, cavitation and overflow loss of lubrication can lead to mechanical failure. This method is used in the evaluation of oils for such operating conditions.

EGS STABILIZE Heavy Duty Oil Stabilizer



EGS STABILIZE is specially formulated and perfected with a unique blend of premium synthetic oils, polymers, and the compliment of extreme pressure agents to repair common engine oil-related problems that can be detrimental to engines. It helps maintain the quality of your oil in-between changes by increasing oil pressure, eliminating dry starts and wear, lowering oil temperature and helps to control oil leaks and overheating in engines. It also helps to raise oil pressure, reduces smoking, leaking and knocking. EGS STABILIZE is recommended for engines and gear boxes with a significant amount of wear. EGS STABILIZE can play a critical role in providing protection for motorhomes, construction equipment or boats as it safeguards these vehicles from rust and corrosion caused by long periods of non-use.

- Reduces dry starts, overheating and corrosive wear
- Cools and lubricates moving engine parts
- Excellent oxidation inhibition properties
- Maintains lubricity and shear stability by inhibiting viscosity breakdown
- Mixes with both synthetic and non-synthetic oils
- Significantly reduces leaks

SIZES	CASE	TREATS
Quart	12	0.5 – 1 gal
Gallon	4	2 – 4 gal
Drum		110 – 220 gal

EGS GEAR Manual Gear & Differential



EGS GEAR is a premium synthetic manual transmission fluid supplement that is specifically formulated with advanced technology to offer maximum lubrication protection and superior anti-wear protection to the gear and bearing surfaces of manual transmissions. EGS GEAR is capable of withstanding extreme high temperatures by over 1000°F and provides better performance over a wider temperature range than conventional manual transmission fluids. EGS GEAR is recommended for manual transmissions.

- Reduces friction, heat and wear
- Increases performance and the life of your equipment
- Superior high temperature stability
- Excellent oxidation, acid buildup and varnish resistance
- Improves shifting, controls gear noises and increases power transfer
- Protects against corrosion and moisture contamination
- Reduces parasitic friction present in all gear systems
- Protects seals from aging, drying and cracking
- Potentially extends lubricant life and serviceability
- Increases lubrication film strength up to 230,000 psi
- Creates extra protection in extreme environments
- Is Eco-Responsible

SIZES	CASE
Quart	12
Gallon	4
Drum	

Protectants

Protectants Two spray products belong to this family.

Protectants are versatile products that have a multitude of functional uses.



EGS CLEAN Waterless Wash & Shine



Conserve water the next time you wash your vehicle with EGS CLEAN. Our premium formula is designed to penetrate and disintegrate tough and unsightly oil, grease, tree sap and grime stains with minimal effort and no water, hoses, buckets, or messes. Even though this product is tough on grease and dirt, it is designed to be safe and effective to use on all painted, clear coat, vinyl, rubber, and plastic surfaces to provide a streak-free shine. This product is versatile enough to accomplish the cleaning needs for a variety of surfaces and purposes. Not only will EGS CLEAN leave your car with a professional showroom shine, it also offers the convenience of being able to wash your car virtually anywhere.

- Fresh citrus scented
- Easy to apply and may be used on wet or dry surfaces
- Lifts and emulsifies dust and dirt particles off paint surfaces
- Safe for most surfaces including painted, vinyl, rubber, and plastic
- Does not leave behind sticky residue or buildup – only a brilliant shine
- Does not contain petroleum distillates, abrasive or other harmful chemicals
- Eco-Friendly – conserves thousands of gallons of water that normally would be used
- Non-aerosol formula contains no chlorofluorocarbons (CFCs)

SIZES	CASE
16-oz spray bottles	6
55-gallon drum	-

EGS PROTECT Protectant Lubricating Spray



EGS PROTECT is a multi-purpose spray lubricant that protects, inhibits rust and corrosion, frees sticky mechanisms, stops squeaks and displaces moisture all in one. EGS PROTECT is conveniently designed in an eco-responsible non-aerosol pump spray and does not contain any harmful chlorofluorocarbons (CFCs). When used, EGS PROTECT leaves an ultra-thin, transparent and rust preventive coating that actively seals and protects all metal surfaces and other mechanisms for optimum performance.

- Multiple uses
- Lubricates and protects against friction, corrosion and squeaks
- Helps free rusted parts
- Penetrates and inhibits rust and corrosion
- Cleans and protects electrical connections
- Resists water and creates a moisture barrier
- Protects metal parts from contaminants
- Non-aerosol formula contains no chlorofluorocarbons (CFCs)

SIZES	CASE
16-oz spray bottles	6
55-gallon drum	-

Hydraulics

Hydraulics Two products belong to this family.

Hydraulic fluids are the medium by which power is transferred in hydraulic machinery. Examples of equipment that might use hydraulic fluids include excavators, brakes, power steering systems, transmissions, backhoes, garbage trucks, aircraft flight control systems and industrial machinery.



EGS LIFT Hydraulic Fluid Supplement

Operators of heavy-duty machinery using hydraulic lifts often experience the problems of high temperatures and pressures as lifts increase their performance under added stress. EGS LIFT is formulated with extreme pressure agents, corrosion inhibitors and emulsifiers for hydraulic systems that prevent malfunctioning in both high and low pressure hydraulic systems for industrial and mobile applications. EGS LIFT is designed for extending standard hydraulic fluid service life by lowering wear and oil temperatures. It minimizes wear and heat build-up by coating hydraulic mechanisms with a polarized layer of molecules. EGS LIFT prevents slippage, fortifies seals and gaskets, stabilizes hydraulic pressure, reduces operating temperatures and stops any corrosion-causing acid buildup



- Increases in load bearing capacity
- Reduces the temperature in all hydraulic systems
- Improves thermal stability of hydraulic systems
- Aids in displacing water or moisture content
- Reduces power consumption
- Can withstand up to 1000°F without compromising lubrication and protection
- Increases film strength to over 200,000 psi

SIZES	CASE
quart	12
gallon	4
drum	-

EGS ISO Bio-degradable Hydraulic Fluid



EGS ISO is a high-performance and biodegradable hydraulic fluid that exhibits some of the best overall properties while ensuring ecological compatibility in hydraulic applications. EGS ISO was developed as an alternative to mineral-based hydraulic fluids where low temperature qualities, improved oxidation stability, low toxicity and fluid biodegradation properties are required. It is free of heavy metals, non-toxic, biodegradable and recyclable. EGS ISO has exceptional oxidation stability which provides maximum oil life compared to other conventional hydraulic fluids which translates into less sludge and varnish buildup. EGS ISO is suitable for application in industrial and mobile applications operating in environmentally sensitive areas where incidental contact of hydraulic fluid and the environment is possible. By using a hydraulic fluid that is biodegradable, the materials collected in the cleanup of a spill or hydraulic line break will not lead to the introduction of pollutants or contaminants into the environment.

- Maintains fire and water resistant properties while controlling acid problems
- Protects equipment while preventing the risk of soil, ground and surface water contamination
- Contains excellent anti-wear properties, friction inhibitors and anti-oxidants to protect equipment
- Increases lubricity to improve hydraulic system durability
- Reduces maintenance costs and environmental fines in the event of a spill of hydraulic line break
- Highly biodegradable, non-toxic and non-hazardous
- Available in ISO grades 32, 46, and 68
- Extended drain intervals

SIZES	CASE
5-gal buckets	-
55-gallon drum	-

Certifications:

- Vickers I-286-S, M-2950-S
- Cincinnati Milacron P-68, P-69, P-70
- DIN 51524 Part 2
- Racine, Variable, Volume Vane Pumps
- AFNOR NFE 48-603HM
- Lee-Norse 100-1
- Jeffrey No. 87
- Ford M-6C32
- B.F. Goodrich 0152
- General Motors LH-04-1, LH-06-1, LH-15-1

GRADE SAE	46	68
Spec. Gravity @ 15.6°C	0.924	0.924
Viscosity CST @ 40°C	42.50	65
Viscosity @ -25°C Brookfield	3200CSP	3500CSP
Pour Point, °C	-15	-15
4 Ball Wear		
- 1 hour @ 167f, 1200 rpm, 40kg	0.30/0.30	0.30/0.30
- 1 hour @ 130f, 1800 rpm, 20kg	0.30/0.30	0.30/0.30
- 1 hour @ 130f, 1800 rpm, 40kg	0.30/0.33	0.30/0.33
Biodegradability CEC STRUM	100%	100%
Demulsibility	40-40-0[10]	40-40-0[10]
Flash PMCC, °C	>250 °C	>250 °C

EGS BAMO Motor Oil



EGS BAMO is a high quality fully synthetic 5W-40 diesel motor oil that is formulated with a special blend of premium synthetic base oils to deliver exceptional overall performance in all model-year 2007 and newer emission compliant diesel engines. Many newer low-emission diesel engines produce more soot and operate at higher temperatures than older engines. EGS BAMO has unequaled thermal and oxidation stability to provide excellent performance at considerably high or low temperatures. It can withstand oxidation and shearing under extremely hot temperatures and conditions. Its quick-flowing base oils stay fluid in low temperatures, reaching vital engine parts faster than conventional oils - especially during cold start-ups when most engine wear occurs. EGS BAMO is formulated to equip the oil with outstanding TBN (total base number) retention ability, so it maintains a high TBN for the life of the oil for up to 50,000 miles. EGS BAMO is a low-sulfated ash formulation (SAPS) that surpasses the requirements for low-emission quality diesel oil. EGS BAMO delivers excellent lubrication in diesel engines found in personal, commercial and fleet vehicles.

- Maintains fire and water resistant properties while controlling acid problems
- Provides up to 3% increase in fuel economy
- Excellent wear and corrosion protection helps extend engine life
- Superior soot control for better startups
- Maximum protection against high-temperature breakdown and low-temperature thickening
- Excellent piston deposit control for longer lasting power
- Superior cold weather pumpability for enhanced cold start wear protection
- Meets and exceeds current EPA compliant engine requirements
- High-TBN formulation with low-SAPS for added protection
- DPF (diesel particulate filter) and all ATD (aftertreatment device) compatible

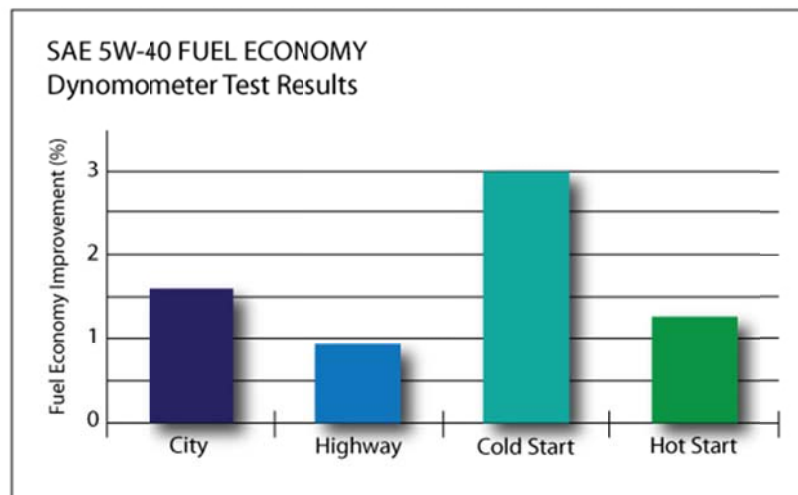
SIZES	CASE
gallon	4
drum	-

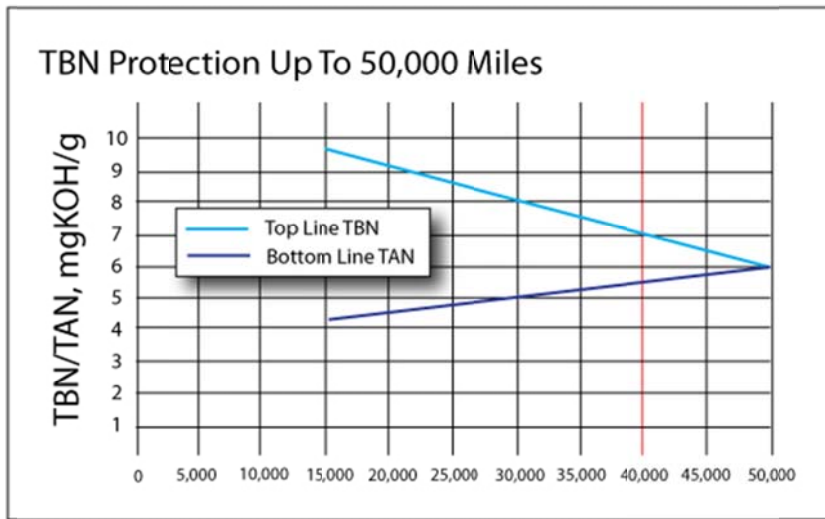
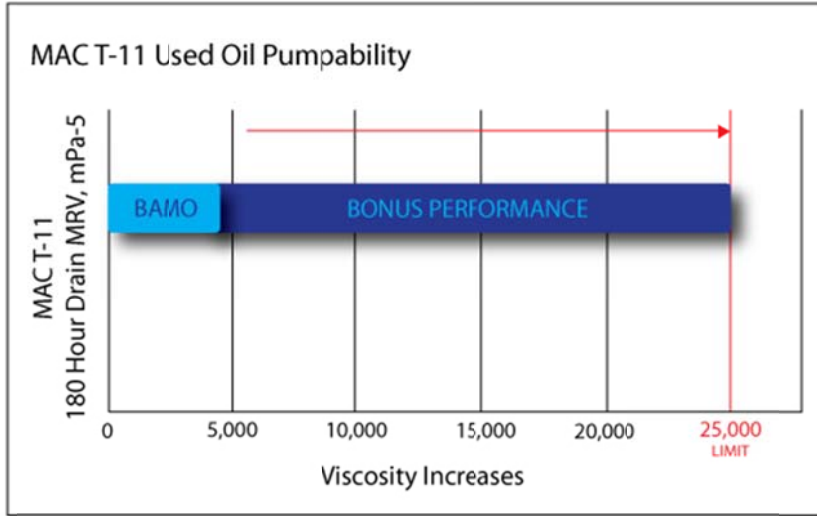
Certifications:

- API CJ-4, CI-4 Plus, CI-4, CH-4, CF-4, CF, SM
- ACEA E7
- Mack EO-O Premium Plus '07
- MB 228.31
- Volvo VDS-4
- Cummins CES 20081
- Caterpillar ECF-3, ECF-1
- DDC Power Guard 93K218
- MAN 3275

Typical Specifications:

Gravity, ° API	30.5
Flash Point, °F	460
Pour Point, °F	-30
Viscosity cSt. @ 100 °C cCS @ -30 °C	16.0 5000
Viscosity Index	140
Color	3.0
Sulfated Ash (Wt. %)	1.0
Zinc (Wt. %)	0.12
Phosphorous (Wt. %)	0.10
TBN	10.0





Industrial Greases

Designed for a variety of industrial, construction, agriculture and automotive applications. EGS greases have a wide range of uses and are superior to other products on the market.



CHAMELEON ORANGE Lithium Complex Grease



CHAMELEON ORANGE is a high performance, multi-purpose, orange lithium-complex synthetic grease that provides excellent lubricating properties that is suitable and highly recommended for use in heavy-duty applications involving heavy or shock loads, and water contamination as well as general purpose use. It is specially formulated to contain extreme pressure, anti-wear and anti-oxidation properties for high performance applications in a wide variety of industrial and automotive applications. CHAMELEON ORANGE possesses low temperature mobility and superior high temperature stability. It is also an excellent wheel bearing and chassis lubricant.

- Multi-purpose grease for use in a wide variety of applications
- Fortified with polyethylene for superior water and washout resistance
- Distinctive orange colored tacky grease for better detection
- Excellent shear stability to retain consistency over long periods of use
- Protects metal surfaces from rust and corrosion in wet or dry environments
- Stable at high temperatures with a dropping point in excess of 550°F
- Helps to clean and free bearings of deposits for better performance

SIZES	CASE
14-oz tubes	50
120-lb keg	-

CHAMELEON CLEAR Food Grade Grease



EGS CHAMELEON CLEAR is a premium food grade machinery grease that is physiologically inert and neutral in odor and taste. Chameleon Clear offers superior protection against friction, rust, corrosion and oxidation and contains extraordinary anti-wear properties. It has excellent resistance to water washout and maintains consistency when exposed to excessive amounts of water, which means less grease is required. It will effectively dissipate heat and transfer power; and is compatible with rubber and other sealing materials. This specially formulated grease is derived from synthetic base oils and an inorganic thickener.

- Multi-purpose grease for use in a wide variety of applications
- Ability to perform well in extreme temperatures, down to -40°C and up to 260°C (-40°F to 600°F)
- Will not melt when exposed to high temperatures
- Resists degradation from food products, chemicals and water/steam
- Exhibits neutral behavior toward plastics and elastomers
- Has shear and mechanical stability
- Has the ability to dissolve sugars
- Has adhesive properties and retains tacky consistency where applied
- Certified Kosher and Pareve
- Complies with U.S. Food and Drug Administration (FDA) Federal Regulation 21 CFR 178.3620
- National Sanitation Foundation (NSF) classified as an H-1 lubricant where incidental food contact may occur

SIZES	CASE
14-oz tubes	50
120-lb keg	-

APPENDIX

Competitive Analysis	Eco Global Solutions	Well Worth	Power Service	Bitron Global	Howes Lubricator Products	Standadyne	Durait	Conklin Lubricants	B&A International Inc
Using Marketing Claims & Materials	BOOST								
Designed Specifically for Diesel Engines	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
Compatible with all Diesel Fuel Including Bio-Diesel	Δ						Δ		
Meets Worldwide Fuel Charter Specifications for Additives	Δ						Δ		
Emission Reduction Properties	Δ			Δ			Δ		Δ
Reduces Friction through Enhanced Lubrication	Δ	Δ		Δ	Δ	Δ	Δ	Δ	
Reduces Carbon Deposits	Δ	Δ		Δ	Δ		Δ	Δ	Δ
Health and Safety Ratings on MSDS "Low"	Δ				Δ				
Improves Fuel Economy	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ
Reduces Water in Fuel	Δ	Δ		Δ	Δ	Δ	Δ	Δ	
Eliminates Bacteria in Fuel	Δ		Δ					Δ	
Combustion Improver Without the Use of Cetane Boosters	Δ						Δ	Δ	
Solvent Free	Δ				Δ				
Detergent Free	Δ								
Alcohol Free	Δ				Δ		Δ		
No Reportable Chemicals	Δ								

Special to Seaway Review

HEADLINE: **Fuel for Thought**

BYLINE: **David O. Ahrens, Commercial Marine Manager, Caterpillar Engine
Products Division**

Why is it that breakdowns associated with diesel engines often seem to be directly related to poor fuel and inadequate fuel system maintenance? The answer to that question requires a close look at diesel fuel itself and some of the measures you can and should take to avoid unnecessary delays on your next trip.

The Nature of Diesel Fuel

Fuel oils range from highly refined distillates (ASTM No. 1) to the heaviest residual fuel classified as ASTM No. 6. Caterpillar recommends ASTM No. 2 or an equivalently graded fuel to ensure optimum engine performance and fuel efficiency.

Using a fuel that falls outside the requirements of an ASTM No. 2 fuel can result in shortened component life, poor fuel efficiency or low power, to name just a few problems. However, there are things to consider when using the recommended No. 2 fuel:

Buyer Beware

When you fill your tank, the fuel you're pumping may have been handled numerous times during transportation and distribution. The more it's handled, the better the chance for it to become contaminated. Water is a common contaminant that can be introduced into the fuel during shipment, typically via condensation. If not removed, it will cause costly damage to a diesel engine's fuel system.

High and Low Sulfur Side Effects

In addition to water and sediment, diesel fuels contain some sulfur. Refineries will remove enough of it to meet ASTM standards or the "national" standards for the specific fuel grade before marketing it. However, if a diesel fuel with a "high" sulfur content is used, it can cause problems. Sulfur levels for marine diesel should be less than 0.5 percent. In some areas of the world, particularly Mexico and other South American regions, sulfur levels may be as high as 1.5 percent. Sulfur in fuel, when combined with water vapor formed during the combustion process, forms sulfuric acid. The result is corrosive wear on valve guides and cylinder liners, which could ultimately lead to a premature overhaul. The use of proper lubricants and correct oil drain intervals reduces the degree of corrosive damage. Using the proper lubricant depends on your engine's fuel injection system (See illustration 1). To help combat the effects of sulfur with a direct injection diesel engine, use an American Petroleum Institute (API) CF-4 or CG-4 class oil that has a minimum "total base number" (TBN) equal to ten times the fuel's sulfur level. TBN is a measure of an oil's ability to neutralize sulfur byproducts. For older precombustion chamber diesel engines, use an API CF-4, CG-4 or CF class oil that has a minimum TBN equal to twenty times the fuel's sulfur level. Keep the normal operating temperature in your cooling system

above 180 degrees F (74 degrees C). This will limit the condensation of sulfur compound vapors that are formed during the combustion process on cylinder liner walls and the associated corrosive damage.

If you don't know the fuel's sulfur content, use an oil with the highest TBN available of the correct API class. Consider using a reliable oil analysis service to define the oil drain interval.

Be aware that "low" sulfur fuel can also cause problems. The process refineries use to remove sulfur in ASTM No. 1 and 2 fuels also remove compounds that contribute to a fuel's lubricity. (Lubricity describes the ability of a fluid to minimize friction between, and damage to, moving parts.) The effects of lowered lubricity on a fuel system can be compared to running an engine without oil. Without proper lubricity, the steel in a fuel injector becomes very hot, causing the fuel injector plunger to weld itself to the barrel, seizing the injector. Caterpillar recognized this problem and now provides fuel lubricity specifications, as has the International Standards Organization (ISO). (See attached sidebar for specifics.)

There are many additives available to increase fuel lubricity. However, not all additives perform well in all fuels or fuel systems. Some lubricity improvers may form deposits in the fuel injection system, so ask your fuel supplier for the proper additive recommendation.

Easy Starting

When purchasing fuel, you should also be aware of cetane ratings. The cetane number is a measure of diesel fuel ignition quality -- how easily the fuel will ignite under pressure -- which affects engine starting and acceleration. Check your engine manufacturer's recommendation, but usually diesel fuel should have a minimum cetane rating of 40 for direct injection diesel engines

and 35 for precombustion (old) diesel engines. Fuel with cetane ratings below that recommendation contribute to harder starting, ignition delay, power loss and decreased fuel economy. Using a cetane improver additive, when required, can improve ignition and reduce white smoke during cold weather startups.

Go With the Flow

Another important fuel characteristic is viscosity, a measure of a diesel fuel's resistance to flow. Fuel with either too high or too low viscosity can cause system damage. The main concern with lighter fuels is low viscosity, and whether they provide adequate lubrication to plungers, barrels and injectors. Fuel, as delivered to the injection pump or unit injectors, should have a kinematic viscosity between 1.4 centistokes (cSt) and 20 cSt. Your fuel supplier can provide the typical kinematic viscosity of the fuel they supply.

Waxing Woes

Other important diesel fuel characteristics are cloud and pour points. Cloud point is the temperature at which fuel turns hazy or cloudy. When the temperature drops to a fuel's cloud point, paraffin waxes that occur naturally in fuel crystallize and cling together. This is known as "waxing" which plugs filters and stops fuel flow to the engine. The pour point of a fuel is typically 5 degrees F above the temperature at which the fuel fails to flow or turns solid. Those working in cold climates can prevent waxing by using fuel with a low cloud point or by providing some source of heat to the tanks. Lower cloud point fuels can better handle colder temperatures without waxing than those with a higher cloud point. Or, consider using a cloud point improver, which separates the clinging wax particles so they can pass through the filters. If you plan to go

from a warm climate (where waxing isn't an issue), to a cold climate, consider installing a heater on your tank. Or, use a "wintergrade" fuel blended by the supplier for cold weather operation. You can also make your own winter blend by mixing a No. 1D fuel with low cloud point with a No. 2D fuel. A 50/50 blend covers most areas, unless you operate in extreme cold. In northern climates, some fuel marketers only handle "winterized" diesel fuel during late fall and winter.

In the Tank

The best way to make sure you're getting good fuel is to be informed. Ask other boat owners about their experiences. Choose a reliable fuel supplier, not necessarily based on lowest price. Your fuel supplier should be able to tell you how much water, sediment and sulfur is in the fuel -- at least as delivered to him by his supplier. Make sure the amounts are no more than the maximums recommended by your engine manufacturer. If they exceed the limits, avoid them. But, you're not out of the woods yet because once it's in your tank, even top quality fuel can be subject to demise when condensation, sediment and microorganisms invade your fuel tank.

Water Contamination

Water can get into your fuel if it's mishandled by your fuel supplier. Most often, however, water gets into fuel tanks by condensation from the atmosphere. As the tank empties, air enters the tank. Water condenses on the walls and runs down the sides. The water never evaporates because it's heavier than fuel and goes to the bottom of the tank. After this process is repeated several times you may have a significant amount of water in the bottom of your tank.

Water in your fuel can cause injector seizures and failures at sea. It also accelerates wear of expensive fuel system components. Add salt spray and wear increases rapidly.

Water separators are critical to fuel treatment and should be used on all marine diesel installations. Operators of large vessels often install centrifuges which continuously recycle the fuel to remove water and sediment.

Sediment

Sediment consists of items like rust, scale, weld slag, dirt and other debris that can often get into fuel tanks. As sediment levels increase, fuel filters clog and deposits form, resulting in reduced power and excessive fuel system wear if not trapped by the fuel filter.

All marine installations should combat water and sediment contamination with a fuel filter/water separator. This device is usually installed between the fuel tanks and the engine fuel system inlet connection and contains a coalescer and separator. The coalescer filters 5-micron (large) pieces of sediment, algae and gums, while the separator separates the water from the fuel and drains it into a water collection bowl. Some fuel filter/water separators include a feature that can activate an alarm when the water reaches a maximum level.

Microorganisms

Water and fuel offer a habitat for bacteria, algae and other organisms. Because water is heavier than fuel, it settles at the bottom of the tank. The organisms live in the water and actually feed off the fuel. Bacteria is generally black, brown or green, grows in long strings and has a slimy appearance. As they reproduce, masses of bacteria and their excrement clog filters, cause corrosion and impose costly repairs on a diesel engine's fuel system -- if not stopped by the engine's fuel filters.

You can check for bacterial contamination by using commercially available test kits. Ask your local fuel supplier for recommendations concerning test kits and biocides. Biocides are chemical additives that kill microorganisms. As the organisms die, they fall into the fuel stream and plug the fuel filters, so be prepared to replace the filters regularly. Eventually, the microorganisms may develop resistance to the biocide, which means you'll need to switch to a different brand. The best way to prevent microorganisms from growing in the fuel tank is to limit storage periods and keep your tank as water-free as possible.

Contacting the Pros

If your fuel filters become plugged one operating day after changing them, you have a problem that needs expert attention before serious fuel system or engine problems occur. In this case, contact a fuel treatment specialist who will clean out the tank by “recycling” your fuel.

Fuel recycling is done with a portable filtering device. Generally, one end of an electrical or air pressurized pump will be inserted into the fuel tank. The contaminated fuel is drawn into the recycling device and filtered to remove solid impurities, then routed back into the fuel tank. At the same time, any excess water is separated from the fuel. A healthy dose of additives usually follows to help treat microorganisms, enhance engine combustion and eliminate any hint of moisture. The process is repeated until the fuel filters no longer clog prematurely and no water collects in the reservoir. Boats with limited access tanks are a challenge for the fuel experts. But as long as fuel tanks are accessible, the fuel tank can be cleaned.

Poor quality and contaminated fuels are the culprits of many fuel system and engine-related problems. But they can be avoided if you follow some simple preventive maintenance

procedures, such as limiting water in the tank and filtering your fuel. A clean fuel tank is the first step toward a trouble-free trip.

Illustration 1

Engine Type	API Oil Class		
	CF-4	CG-4	CF
Direct-Injection Engine	Minimum TBN: 10 times fuel's sulfur level	Minimum TBN: 10 times fuel's sulfur level	(Not recommended)
Precombustion-Chamber Engine	Minimum TBN: 20 times fuel's sulfur level	Minimum TBN: 20 times fuel's sulfur level	Minimum TBN: 20 times fuel's sulfur level

Sidebar

Lubricity Specifications

There are three recognized lubricity bench tests available:

- High Frequency Reciprocating Rig (HFRR)
- Scuffing Load Ball On Cylinder Evaluator (SLBOCE)
- Modified ASTM D5001 Scuffing Bocle (SBOCLE)

The International Standards Organization (ISO) has recently approved a fuel lubricity specification. ISO specifies fuel lubricity using the HFRR test, operated at 60°C (140°F). Fuel test results must meet a maximum wear scar of .45 mm (.018 in.). The Engine Manufactures Association (EMA) has included a preferred diesel fuel lubricity specification. The new EMA FQP1 Fuel Specification measures fuel lubricity by the proposed ASTM SBOCLE test. The FQP1 Specification must meet the 3100 g minimum limit. Alternately, the HFRR test at 60°C (140°F) may be used with a .45 mm (.018 in.) maximum wear scar limit or 25°C (77°F) .38 mm (.015 in.) maximum wear scar limit.