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XREV Fuel Booster Treatment (FBT)□

A Fuel Additive for Gasoline and Diesel
In Tablet Form

Made in the USA

CONTENTS

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I. INTRODUCTION

In 1995, Xrev began development of a new gasoline and diesel fuel additive technology that is based on its proprietary iron catalyst. After three years in international test markets, Xrev FBT was introduced in the U. S. at the 2000 Automotive Aftermarket Products Expo in Las Vegas, Nevada.

The development of this product was in response to a need for an economical and effective, yet environmentally friendly, fuel additive for international customers. As a manufacturer and distributor of high quality gasoline, diesel and oil treatments and conditioners, it was apparent that the high cost of products added to the cost of shipping, storage and handling of bottles, put many markets out of reach. The need for a quality fuel additive for automotive and industrial applications is universal, but access to these products is often limited, particularly for those markets experiencing economic difficulties and concerns. Xrev FBT has proven to be the ideal answer.

A. Xrev FBT – What is it?

Xrev FBT is a proprietary combination of powdered and granulated fuel additives that have been pressed into tablet form. The resultant product is 100% active, highly soluble when added to gasoline or diesel, and the most efficient and cost-effective way to improve hydrocarbon fuels.

Xrev FBT is an EPA registered fuel additive in both the gasoline and diesel categories.

Xrev FBT is approved for use in the following applications:

- Cars and light trucks • Heavy duty trucks
- Motorcycles and motorbikes • Light and heavy duty commercial vehicles
- Diesel-powered equipment, stationary generators, pumps (i.e. irrigation pumps)
- Marine applications – personal water craft, small and large boats
- Buses • Taxis (gasoline and diesel)
- 2- and 4-stroke engines, including chainsaws, small garden equipment, snow blowers, snowmobiles and light tractors

B. Safe and Effective

Since its introduction, the Xrev FBT chemistry has been used to improve millions of gallons of gasoline and diesel fuel worldwide. Despite a general predisposition against adding a “solid” to the fuel tank, Xrev FBT has been a success because it can provide immediate and noticeable improvement. Even though some product claims, such as

improved fuel economy, are based on continuous use, the active components begin to work immediately as the tablet dissolves. Xrev FBT has proven to be extremely safe in today's increasingly complex engines. Xrev FBT is registered with the Environmental Protection Agency, and the fact that there has never been a damage claim is continuing evidence of the safety of the product. By nature of the components, Xrev FBT is inherently safe. It fully dissolves and treats the fuel rather than the fuel system. There are no components in Xrev FBT that can gel or crystallize to clog fuel filters or injection pumps. On the contrary, it is a combustion catalyst with a completely clean burn sequence, which helps to reduce hard and soft carbon in the combustion chamber, on the spark plugs and on the piston face. Xrev FBT is the safe and effective way to improve all hydrocarbon fuels.

C. Xrev FBT fully dissolves.

When added to fuel, Xrev FBT safely and fully dissolves in gasoline or diesel within 1 to 4 hours. This time frame is contingent on the type of fuel, the ambient temperature and whether the vehicle is moving or not. In a controlled test, Xrev FBT was added to a clear 16-ounce beaker of gasoline. In the subsequent one hour, the fuel tablet completely dissolved. This demonstration was done in 50-degree F weather in a moving vehicle. A similar test was performed inside in bottles that were stationary. In this test, despite the absence of any motion, the tablets fully dissolved within 4 hours.

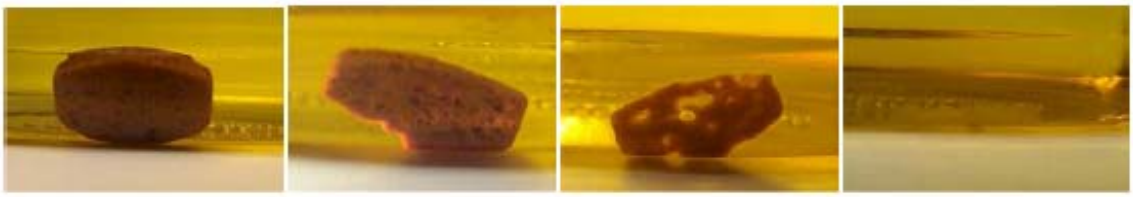

Photo A	Photo B	Photo C	Photo D
#476 15:15	#483 16:19	#486 16:48	#488 17:51
15 minutes	1 hr. 19 minutes	1 hr. 48 minutes	2 hr. 51 minutes

The color of the resultant gasoline was amber, but remained crystal clear without any undissolved debris at the bottom of the bottles.

The Xrev FBT chemistry was developed to begin to work immediately upon introduction to the fuel and reaches full potential when it has fully dissolved.

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II. BACKGROUND

This report was written to provide an overview of Xrev FBT from both a technical and marketing point of view. The test documentation used to support the data included in this report is cumulative and is based on both in-house and independent research. Xrev FBT continues to monitor and accumulate test data from many sources around the world, as it is recognized that conditions vary in different markets. Test results and benefits experienced by users may vary widely, depending on many factors, but particularly on the quality of fuel and condition of the vehicles

Xrev FBT suggests and encourages independent evaluation in different markets prior to purchase, in order to determine if Xrev FBT meets the required targets for intended use.

III. BENEFITS OF Xrev FBT

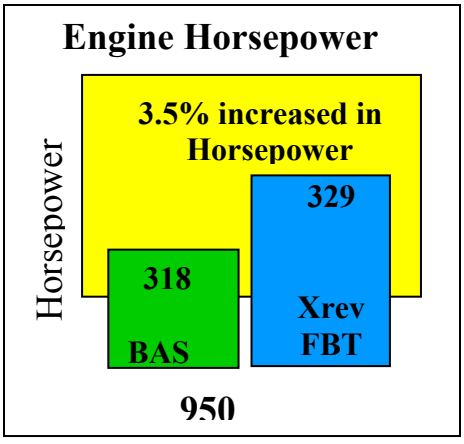
A. INCREASED OCTANE

Xrev FBT iron catalyst is an octane-boosting gasoline additive that shows the same effectiveness that lead provides, and at low concentrations without the environmental downside of lead. A concentration of 15 ppm is recommended for continuous use as an environmentally beneficial and functionally equivalent substitute for Tetra Ethyl Lead (TEL). The octane benefit is shown in Figures I, II and III. These figures illustrate that Xrev FBT will provide on average, a 0.5 R + M/2 octane increase at 15 ppm in regular gasoline.

B. INCREASED POWER AND PERFORMANCE

When added to fuel, the Xrev FBT chemistry is designed to promote a cleaner, more complete burn of the hydrocarbon-oxygen mix that is present in the combustion chamber. This results in several benefits, the most readily apparent to the consumer being an improvement in power and performance. In a 950-hour controlled lab test conducted in the United States (Figure IV), the addition of Xrev FBT resulted in a 3.5% increase in horsepower.

950-hour horsepower test data results



This increase in power and performance can be seen in a series of dynamometer tests conducted on a Toyota Camry (Figure V), a BMW 320i (Figure VI) and a Mercedes 380 SEC (Table I). These tests involved a redundant protocol comparing engine power from treated versus untreated fuel. The result demonstrated repeatable improvements in power output across the entire power curve.

Sydney Australia Dynamometer Testing		Before	After	Comments
Figure V	Power Curve for Toyota Camry	64 HP Unleaded Fuel	69 HP	7% increase in power
Figure VI	Power Curve for BMW 320i	Torque Lbs 1880	2600	At 115 kph, 38% improvement in power
Figure VII	Power Curve for Mercedes	Torque Lbs 2250	2400	6.6% increase in power

TABLE I

Dynamometer tests in Sydney, Australia show improved power with the use of Xrev FBT.

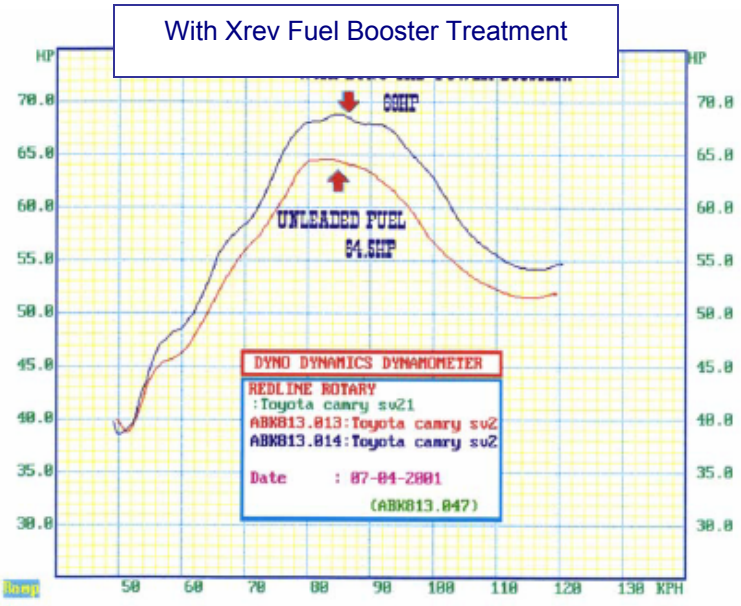


FIGURE V

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C. REDUCED EMISSIONS

The Xrev FBT chemistry is a well-tested combustion catalyst that results in improved burn characteristics for all hydrocarbon fuel, particularly gasoline and diesel. Use of Xrev FBT results in reduced emissions and cleaner exhaust virtually across the board, however results may vary, depending on a variety of conditions.

Manganese (MMT) vs. Xrev FBT

MMT is a commonly used aftermarket octane booster. A filing for a waiver under Section 211F of the Clean Air Act for a manganese gasoline additive (MMT) has indicated that use of MMT causes a rapid increase in hydrocarbon emission (in the first 5,000 miles of operation). This is thought to be attributable to manganese deposits building up in the combustion chamber.

Conversely, a study of long-term use of Xrev FBT as a gasoline additive documents that Xrev FBT reduces harmful emissions. Unlike MMT, use of Xrev FBT is proven to reduce combustion chamber deposits. At 15 ppm, in a controlled field test conducted in Europe, data shows that Xrev FBT reduced hydrocarbons by 25%, carbon monoxide by 78% and smoke/particulates by 73%. Test data regarding NOX is inconclusive. Some tests show a reduction of NOX while some tests resulted in no reduction.

Additional independent tests (Table II below) show significant reductions in harmful emissions with the use of Xrev FBT.

California Smog Test 2001	Before adding	After Adding	Comments
Unburned Hydrocarbons – 15 mph	40 PPM	20PPM	50%
Unburned Hydrocarbons – 25 mph	28 PPM	20PPM	28.57%
Singapore Productivity and Standards Board 1998			
Unburned Hydrocarbons – 400 km at Idle (rover 280Si 4	6	4	33% Reduction
Unburned Hydrocarbons – 400 km High speed (Rover 280Si	8	4	50% Reduction
Unburned Hydrocarbons – 1400 km	886	155	83% Reduction
Sydney Australia Dynamometer			
Carbon Monoxide Emissions	2.83	2.07	26.86% Reduction

Table

D. REDUCED COMBUSTION CHAMBER AND SPARK PLUG DEPOSITS

The addition of lead to gasoline provided many benefits beyond octane improvement. A little known benefit was deposit control. Lead formed a nonconductive coating that retarded the formation of deposits in the combustion chamber, in the exhaust valve areas and on the spark plugs. When lead was eliminated from gasoline, the use of unleaded gasoline resulted in increased deposits within these critical areas, and related performance problems.

Use of the Xrev FBT technology will restore this deposit-retarding feature to any grade of gasoline. Similar to the coating from the use of leaded gasoline, this barrier is one nanometer thick and non-conductive to electric charges. Two important studies verified this phenomenon:

Dynamometer tests were performed using two identical engine blocks with unleaded fuel for the equivalent of 50,000 miles (800 hours total). The test protocol involved running one engine with no additive and one with Xrev FBT at 15 ppm for 25,000 miles. Deposits were measured and cleaned. The engines were switched and the test repeated, running one engine with Xrev FBT and one without for 25,000 miles. The results showed a 29% reduction in piston deposit thickness with Xrev FBT treatment and a reduction in octane requirement increase (ORI) (Figure IX). Similarly, two 1.8-liter engines were operated on the highway for 50,000 miles each. After 50,000 miles, the unleaded fuel engine without Xrev FBT showed 2.4 times thicker deposit than the Xrev FBT treated fuel engine and, again, the Xrev FBT fueled engine showed significantly lower octane requirement increase.

Additional tests performed in Europe confirm the ORI control benefits of Xrev FBT.

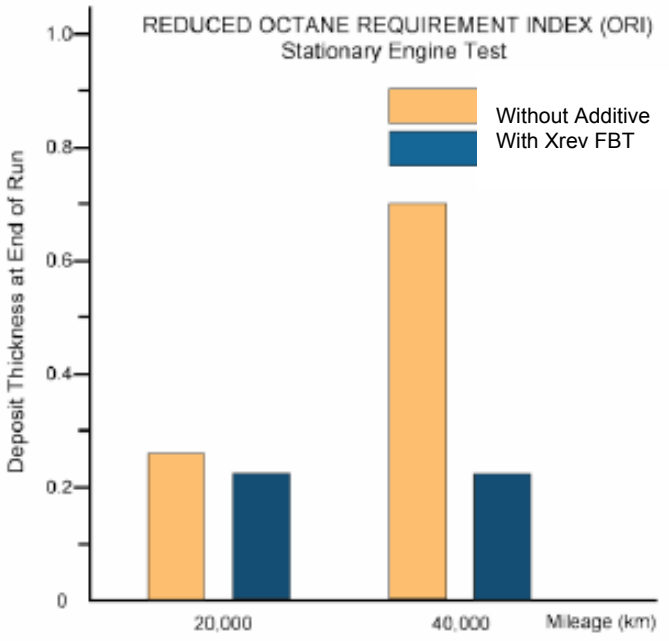

FIGURE IX

The deposit-retarding barrier that Xrev FBT lays down on the combustion chamber and spark plug surface has a distinctive reddish brown color as shown in Photo E. This looks somewhat like a stain, or to someone unfamiliar with the product, it may appear to be rust. This coloration is noticeable when pulling spark plugs. Photo E shows a normal spark plug after using Xrev FBT additized gasoline for approximately 5,000 miles.

Photo E

Xrev FBT lays down a reddish-brown color barrier that retards deposit accumulations.

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E. IMPROVED FUEL ECONOMY

Another benefit of using all the hydrocarbons in the combustion chamber is increased fuel economy. It stands to reason that the lower the hydrocarbon exhaust from the tailpipe, the greater the economy. A Ford Fleet Economy Test (Figure X) shows a typical fuel economy improvement of 8 to 12 percent. A test on General Motors vehicles (Table III) resulted in similar improvements in fuel economy.

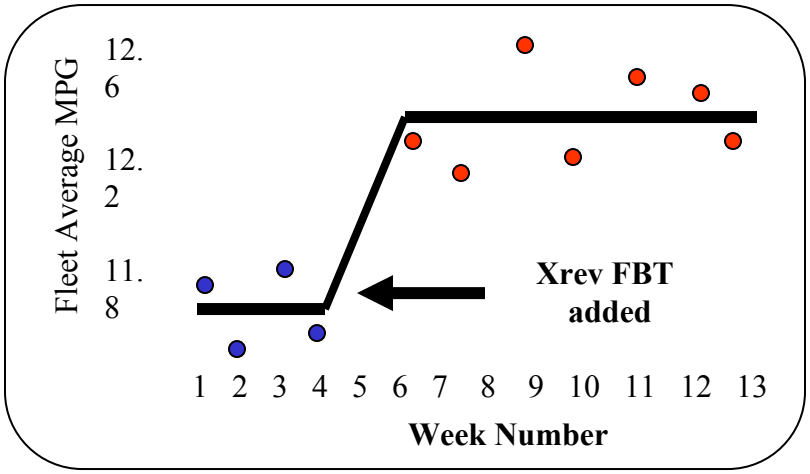

FIGURE X
Ford Fleet Economy Test

GENERAL MOTORS DYNAMOMETER TEST COMPARISON OF DETERGENT VS. XREV FBT IN DIESEL FUEL		
530 Hour Diesel Dynamometer Test	**Improvement**	
	Typical Detergent	**Xrev FBT**
Fuel Economy (300-530 hrs.avg)	**2%**	**12%**
Smoke Reduction	**None**	**53%**
Engine Cleanliness:		
Valve Deposits	**38%**	**85%**
Combustion Chamber Deposits	**22%**	**51%**

TABLE III - General Motors Protocol Dynamometer Test

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In 1994/1995 we conducted a major automotive fleet update of the performance documentation for our CPX45400 gasoline treatment (Field Test Report 45400-1994-02). The largest fleet documentation data previously conducted was a fleet test of 163 cars. Because this test is now dated, and the engine technology has progressed from carburetor/leaded fuel to closed loop port injected engines, we decided to run another largescale double blind automotive fleet test. The continued excellent response of electronically controlled port fuel injected engines with CPX45400, which was proven in the treated universe, was confirmed in this new test.

The most recent fleet demonstration was conducted in the U. S. in 1994/1995 with two universes of a utility fleet company.

The first universe, with CPX45400, had 300 vehicles (233 gasoline and 67 diesel). Its performance was compared during twenty months prior to the test, five months during the test and three months after the test.

The second universe was used as the placebo group and consisted of 350 vehicles similar to the first group. They received bulk fuel treatment with the detergent component of CPX45400, but without the other active components. The results are presented in the attached percentage deviation plot to show:

1. The twenty months of history is completely within the +/- 4.2% - 95% confidence band.

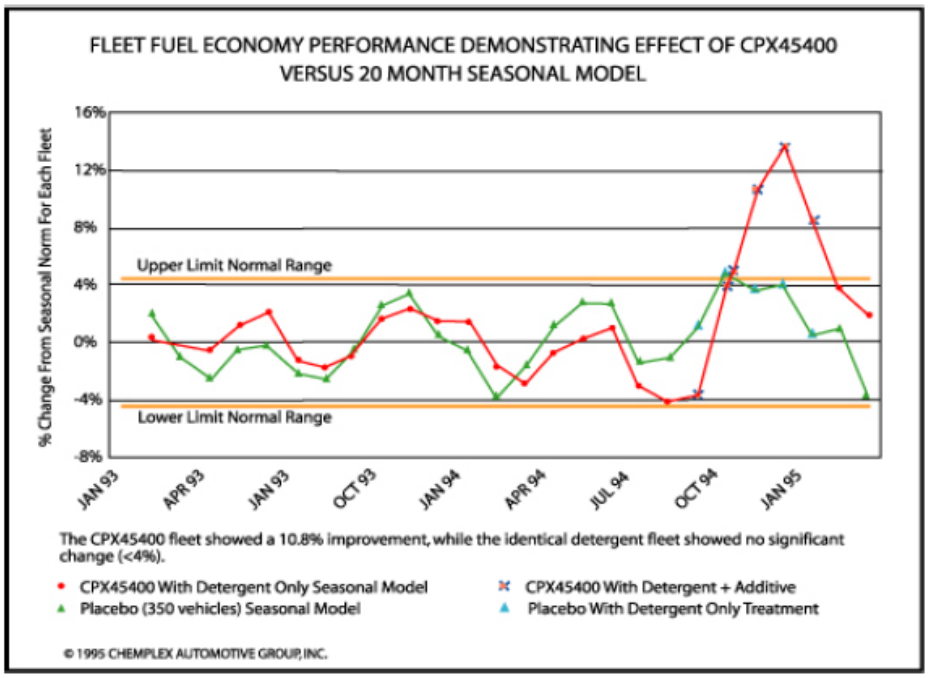
2. Only one of the five test data points for the placebo group is beyond the 95% limit, so there is no significant placebo effect.

3. After 170 gallons of CPX45400 treated fuel was consumed in the first two test months, the CPX45400 treated fleet averaged a 10.8% MPG improvement in the last three test months.

4. When additive treatment was terminated in early January, there was a brief carryover of the benefit (December, January, and February average still within 95% limit of 10.8% improvement). This brief carryover is due to the surface catalytic effect of using CPX45400 and is usually noticeable.

5. The last two three-month averages show the treated universe returned (and placebo remained) completely within the 95% range for their twenty-month history, so the effect was solely attributable to the use of CPX45400.

Field Test Report 45400-1994-02
CPX45400 – Fuel Economy
Summary of Results



Because fuels differ considerably from country to country, extensive testing has been conducted in a variety of markets internationally using locally available indigenous fuels. In markets where fuel quality is less regulated, the results from using Xrev FBT tend to show additional improvements. Table IV below shows the results of a field test conducted by the Singapore Productivity and Standards Board.

Singapore Productivity and Standards Board (PSB)		October 1998. One-dimensional test for fuel economy only. Vehicle: Rover. Driving distance 486 km
Before	After Adding Xrev FBT	Comments
34.996 liters fuel consumed	33.034 liters Fuel consumed	Fuel Efficiency Improvement: 5.9% Note: Second test results were 3.4%, but noted traffic jam at second Causeway. Results: 4.65% average.

F. LEAD SUBSTITUTE AND VALVE SEAT RECESSION

Background – The Removal of Lead

Tetra Ethyl Lead (TEL) is a Class B poison and environmentally unacceptable for health reasons. Beginning in 1973,The U.S. Environmental Protection Agency required the reduction of lead in gasoline. All new cars manufactured in the U.S. from 1978 on were required to run on unleaded gasoline. When fully implemented in the 1980's, this program effectively removed an environmental contaminant, but resulted in justified concern about equipment durability and performance for consumers who owned pre-1978 vehicles. This durability concern was verified as fact in a joint U.S. Department of Agriculture/EPA report to the President and Congress (October, 1988) which stated "…medium and high speed engines with soft valve seats and some high speed truck engines with induction hardened cast-iron or soft steel valve seats will experience excessive valve-seat wear if operated on unleaded gasoline."

After the removal of lead, vehicles manufactured before 1978 required that a qualified lead substitute be added to unleaded gasoline to avoid valve seat recession (VSR). Leaded gasoline provided lubrication for valves, and without lead to buffer the valve seat, older engines were vulnerable to damage. The newer post 1978 engines were designed with hardened valve seats.

The Xrev FBT Alternative

This report provides technical documentation for Xrev FBT as a lead replacement in engines susceptible to valve seat recession.

Xrev FBT is a safe and logical option for petroleum distributors and aftermarket suppliers to offer to those needing an alternative, while avoiding the environmental and toxicological problems associated with lead. Xrev FBT is an iron catalyst and this report documents its efficacy as a total replacement to provide the functional and durability benefits of TEL.

Specifically, Xrev FBT provides:

- Environmental and toxicological acceptability
- Anti-knock efficacy
- Valve recession elimination

SPECIAL NOTE: Xrev FBT offers the protection of lead, and poses no risk to engines that do not require the protection of lead. Xrev FBT is not lead and does not threaten newer engine technologies like the catalytic converter or oxygen sensor. It is 100% safe for use in today's engines that are designed for lead-free gasoline.

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IV. ENVIRONMENTAL AND TOXICOLOGICAL ISSUES

The Ninth edition of the Merck Index lists the lethal dose (orally for rats) for Tetra Ethyl Lead (TEL) as LD50 = 12.3 mg/kg which compares to a LD50 of 1,890 mg/kg for Xrev FBT. This comparison suggests Xrev FBT has 150 times higher tolerance. More importantly, the above reference regarding TEL states "Caution: acute or chronic poisoning may occur if inhaled or absorbed through the skin" (page 1186). Animal studies included in the Material Safety Data Sheet showed Xrev FBT to be non-irritating to either abraded or intact skin, and dust inhalation studies with mice failed to produce any fatalities at the maximum achievable concentration of 150 mg/m3 (about 20 ppm in air).

Use of Xrev FBT in fuel results in inorganic iron (iron oxides) in the particulate emission from motor vehicles, with no statistically significant increase in iron concentration. Furthermore, iron is already the largest metallic in automotive exhaust. This is due to metal-to-metal wear and exhaust pipe slough contributions to emissions. Consequently, incorporation of Xrev FBT in automotive gasoline contributes no new or increased exposure to metallic emissions. The Environmental Protection Agency of the U.S. requires registration of additives for gasoline dispensed through large diameter nozzles or in aftermarket containers, and Xrev FBT is fully registered for both gasoline and diesel applications.

V. CONCLUSIONS

Xrev FBT has been demonstrated to provide substantial improvements in critical performance areas:

1. Octane increase

2. Engine performance

- Reduces combustion chamber deposits that can cause octane requirement increase, dieseling, and performance problems
- Adds power
- Improves drivability and performance

3. Harmful emissions and smoke

- Reduces smoke up to 53%
- Reduces up to 75% of unburned hydrocarbons

4. Fuel Economy

- Improves fuel economy by up to 8-12%

5. Prevents Valve Recession

LABORATORY AND FIELD-TESTED, EPA REGISTERED - XREV FBT IS THE SAFEST, MOST ECONOMICAL AND EFFECTIVE FUEL ADDITIVE AVAILABLE.