

Alternative fuel for a standard diesel engine

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Abstract: Alternative fuels have been developed for the commercial diesel products Mk1 and EN590. Appropriate additives were selected from a broad range of oxygenates including alcohols, acetals, ethers, esters, and nitrates by a process of systematic elimination. The resulting fuels called Biodiesel 15 meet all existing standards in force for diesel fuel, are stable, and have similar performance characteristics to standard diesel. Significantly Biodiesel 15 is much cleaner than standard diesel with around 30 per cent or more reductions in particulate matter in the exhaust emissions. Carbon dioxide (CO₂) emissions are much lower with Biodiesel 15 than with standard diesel products. Other regulated emissions are on a par with Mk1. The fuel consumption of Biodiesel 15 is 2 per cent lower than that of conventional Mk1.

Keywords: alternative diesel fuel, oxygenates, diesel engine performance, diesel engine emissions, particulate emissions

1 INTRODUCTION

Industry worldwide has a strong incentive to develop alternative motor fuels to protect the environment and adhere to tighter emissions requirements. In 1997 in Kyoto, representatives from 105 states signed the Kyoto Protocol [1], which is designed to reduce excess carbon dioxide (CO₂) emissions produced when burning oil, mineral gas, coal, and related products.

The combustion of motor fuels adds considerably to the imbalance of CO₂ in the atmosphere. Nitrogen and sulphuroxides (NO_x and SO_x) are also formed and cause the acidification of lakes and other fresh water supplies, affecting the vital functions of humans, animals, and vegetation. Finally, solid particles, which are the products of incomplete combustion, cause cancers in humans and animals.

The use of motor fuel components derived from renewable raw materials, so-called bio-components, enables a reduction of the harmful impact of burning fuel on the environment. Accordingly in 2003 the European Commission passed a directive [2] to

member states promoting the use of biocomponents in motor fuel starting from 2005. The European Commission has also defined requirements on the amount of harmful pollutants in exhaust emissions of internal combustion engines, specifically for SO_x, NO_x, and particulates.

The stipulations of the directive are such that by 2010 the amount of harmful pollutants in exhaust emissions will reach an entirely new level. Clearly, reaching such a reduced level of harmful pollutants will require considerable investment from motor fuel producers. The existing inventory of vehicles and machinery with standard engines prevents the use of motor fuels consisting completely of bio-components within the time frame set by the European Commission. So it is evident that in the years to come the role of mixed fuels produced partly from petroleum and partly from renewable raw materials will grow considerably. Gasoline-ethanol blends for spark ignition (SI) engines and diesel mixtures containing methyl ethers of higher fatty acids for use in diesel engines are examples of this type of fuel.

The development and marketing of a diesel fuel containing bio-components, a biodiesel, is complicated by the standards requirements [3] for diesel fuel, which impose substantial restrictions on potential

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Alternative Fuel For A Standard Diesel Engine

Mohd Fadzli Bin Abdollah



Alternative Fuel For A Standard Diesel Engine:

The book delves into Alternative Fuel For A Standard Diesel Engine. Alternative Fuel For A Standard Diesel Engine is a crucial topic that must be grasped by everyone, from students and scholars to the general public. This book will furnish comprehensive and in-depth insights into Alternative Fuel For A Standard Diesel Engine, encompassing both the fundamentals and more intricate discussions.

1. This book is structured into several chapters, namely:
 - Chapter 1: Introduction to Alternative Fuel For A Standard Diesel Engine
 - Chapter 2: Essential Elements of Alternative Fuel For A Standard Diesel Engine
 - Chapter 3: Alternative Fuel For A Standard Diesel Engine in Everyday Life
 - Chapter 4: Alternative Fuel For A Standard Diesel Engine in Specific Contexts
 - Chapter 5: Conclusion
 2. In chapter 1, the author will provide an overview of Alternative Fuel For A Standard Diesel Engine. The first chapter will explore what Alternative Fuel For A Standard Diesel Engine is, why Alternative Fuel For A Standard Diesel Engine is vital, and how to effectively learn about Alternative Fuel For A Standard Diesel Engine.
 3. In chapter 2, the author will delve into the foundational concepts of Alternative Fuel For A Standard Diesel Engine. This chapter will elucidate the essential principles that must be understood to grasp Alternative Fuel For A Standard Diesel Engine in its entirety.
 4. In chapter 3, this book will examine the practical applications of Alternative Fuel For A Standard Diesel Engine in daily life. The third chapter will showcase real-world examples of how Alternative Fuel For A Standard Diesel Engine can be effectively utilized in everyday scenarios.
 5. In chapter 4, this book will scrutinize the relevance of Alternative Fuel For A Standard Diesel Engine in specific contexts. This chapter will explore how Alternative Fuel For A Standard Diesel Engine is applied in specialized fields, such as education, business, and technology.
 6. In chapter 5, the author will draw a conclusion about Alternative Fuel For A Standard Diesel Engine. This chapter will summarize the key points that have been discussed throughout the book.
- This book is crafted in an easy-to-understand language and is complemented by engaging illustrations. This book is highly recommended for anyone seeking to gain a comprehensive understanding of Alternative Fuel For A Standard Diesel Engine.

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Alternative Fuel For A Standard Diesel Engine Introduction

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