

Consumption calculation of vehicles using OBD data

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Abstract

The European type approval procedure, based on a fixed driving cycle for all vehicles, is not representative of their real on-road usage: the driving style and its influence on consumption and emissions cannot be neglected and their real-world environmental impact is not simple to measure.

The objective of this work is to develop a methodology to calculate in real-time the energy and environmental impact of spark ignition and diesel vehicles.

An on-board instrumentation capable to communicate with the electronic system of the vehicle (OBD/CAN) have been developed to collect all the sensor data available (rpm, vehicle speed, engine load, lambda sensor voltage, catalyst temperature, intake airflow, pressure and temperature etc.) and use them as input for power and consumption models.

The models have been applied on several vehicles and validated on a dynamometer chassis running NEDC and ARTEMIS cycles. Consumption has been measured with the CVS and with a portable emission analyzer (HORIBA OBS-1300).

A calibration procedure has been also developed in which 3 tests on a dynamometer chassis are needed: the maximum power curve, the curve at idle and a curve at fixed rpm varying the engine load. For spark ignition engines, an additional test should be needed to calibrate a coefficient that takes into account of the enrichment during accelerator pedal gradients, but this coefficient is not much variable for different vehicles (~10).

All the vehicles show a difference between measurements and models never greater than 4% so this can be an accurate methodology to calculate the power and consumption of vehicles during their real use.

Keywords: Instantaneous Vehicle Consumption, Engine Power, OBD, On-Board Data Collection.

Consumption Calculation Of Vehicles Using Obd Data

Dongfei Han, Mukesh Khare, Siyue Li



Consumption Calculation Of Vehicles Using Obd Data:

Data Acquisition from Light-Duty Vehicles Using OBD and CAN Eric Walter, Richard Walter, 2018-11-15 Modern vehicles have multiple electronic control units ECU to control various subsystems such as the engine brakes steering air conditioning and infotainment These ECUs are networked together to share information directly with each other This in vehicle network provides a data opportunity for improved maintenance fleet management warranty and legal issues reliability and accident reconstruction Data Acquisition from LD Vehicles Using OBD and CAN is a guide for the reader on how to acquire and correctly interpret data from the in vehicle network of light duty LD vehicles The reader will learn how to determine what data is available on the vehicle s network acquire messages and convert them to scaled engineering parameters apply more than 25 applicable standards and understand 15 important test modes Topics featured in this book include Calculated fuel economy Duty cycle analysis Capturing intermittent faults Written by two specialists in this field Richard P Walter and Eric P Walter of HEM Data the book provides a unique roadmap for the data acquisition user The authors give a clear and concise description of the CAN protocol plus a review of all 19 parts of the SAE International J1939 standard family Data Acquisition from LD Vehicles Using OBD and CAN is a must have reference for product engineers service technicians fleet managers and all interested in acquiring data effectively from the SAE J1939 equipped vehicles **Advances in Information**

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Table of Contents Consumption Calculation Of Vehicles Using Obd Data

1. Understanding the eBook Consumption Calculation Of Vehicles Using Obd Data
 - The Rise of Digital Reading Consumption Calculation Of Vehicles Using Obd Data
 - Advantages of eBooks Over Traditional Books
2. Identifying Consumption Calculation Of Vehicles Using Obd Data
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Consumption Calculation Of Vehicles Using Obd Data
 - User-Friendly Interface
4. Exploring eBook Recommendations from Consumption Calculation Of Vehicles Using Obd Data

- Personalized Recommendations
 - Consumption Calculation Of Vehicles Using Obd Data User Reviews and Ratings
 - Consumption Calculation Of Vehicles Using Obd Data and Bestseller Lists
5. Accessing Consumption Calculation Of Vehicles Using Obd Data Free and Paid eBooks
 - Consumption Calculation Of Vehicles Using Obd Data Public Domain eBooks
 - Consumption Calculation Of Vehicles Using Obd Data eBook Subscription Services
 - Consumption Calculation Of Vehicles Using Obd Data Budget-Friendly Options
 6. Navigating Consumption Calculation Of Vehicles Using Obd Data eBook Formats
 - ePub, PDF, MOBI, and More
 - Consumption Calculation Of Vehicles Using Obd Data Compatibility with Devices
 - Consumption Calculation Of Vehicles Using Obd Data Enhanced eBook Features
 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Consumption Calculation Of Vehicles Using Obd Data
 - Highlighting and Note-Taking Consumption Calculation Of Vehicles Using Obd Data
 - Interactive Elements Consumption Calculation Of Vehicles Using Obd Data
 8. Staying Engaged with Consumption Calculation Of Vehicles Using Obd Data
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Consumption Calculation Of Vehicles Using Obd Data
 9. Balancing eBooks and Physical Books Consumption Calculation Of Vehicles Using Obd Data
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Consumption Calculation Of Vehicles Using Obd Data
 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
 11. Cultivating a Reading Routine Consumption Calculation Of Vehicles Using Obd Data
 - Setting Reading Goals Consumption Calculation Of Vehicles Using Obd Data
 - Carving Out Dedicated Reading Time
 12. Sourcing Reliable Information of Consumption Calculation Of Vehicles Using Obd Data

- Fact-Checking eBook Content of Consumption Calculation Of Vehicles Using Obd Data
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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