

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

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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*

Communication Technology and Computing Vishal Goar, Manoj Kuri, Rajesh Kumar, Tomonobu Senjyu, 2022-05-09 The book is a collection of best selected research papers presented at the International Conference on Advances in Information Communication Technology and Computing AICTC 2021 held in Government Engineering College Bikaner Bikaner India during 20 21 December 2021 The book covers ICT based approaches in the areas of ICT for energy efficiency life cycle assessment of ICT green IT green information systems environmental informatics energy informatics sustainable HCI or Artificial intelli computational sustainability *Proceedings of the XV Ibero-American Congress of Mechanical Engineering*

Antonio Vizán Idoipe, Juan Carlos García Prada, 2023-08-02 This open access book shows some of the highlights presented at the XV Ibero American Congress of Mechanical Engineering The papers explore the forefront of Mechanical Engineering containing research into fluid mechanics energy systems tribology materials science robotics mechatronics biomechanics instrumentation thermodynamics and mechanical sustainability **Environmental Crisis: Pollution and Governance**

Dongfei Han, Mukesh Khare, Siyue Li, 2025-07-03 This book presents cutting edge research findings on environmental pollution and remediation covering key areas such as pollution analysis and monitoring as well as pollution control and restoration At the 2024 UN Environment Assembly environmental pollution and remediation were once again defined as one of the three major crises facing the planet The global environmental pollution issue remains severe despite the efforts of many countries and regions the situation is still far from optimistic Issues such as heavy metals and radioactive contamination in seawater are gradually becoming significant topics in environmental pollution Accurate composition

analysis and effective remediation strategies are essential in addressing pollution and enhancing the accuracy of pollutant source analysis and the effectiveness of harmless pollution management are key subjects of discussion in this book Furthermore the book aims to facilitate the exchange of scientific information among scholars from leading universities research centers and high tech enterprises around the world This book will be highly beneficial to scholars engineers and researchers in the fields of environmental engineering and environmental remediation **Federal Register** ,1994

Vehicle Electronics to Digital Mobility ,2004 **Evaluation of Portable Emissions Measurement Systems (PEMS) for Inventory Purposes and the Not-to-exceed Heavy-duty Diesel Engine Regulation** J. Wayne Miller,2006

The Development of an Advanced Telematics Based Automatic Vehicle Monitoring System (AVeMS) Joseph C. Silva,2010 **BOSCH Automotive Handbook** Robert Bosch GmbH,2004 BOSCH Automotive Handbook Sixth Edition the latest update to the world s definitive automotive technology reference is expanded by twenty five percent and covers the entire range of modern passenger car and commercial vehicle systems Detailed enough to address complex technical issues yet small enough to take everywhere it is the reference of choice for designers engineers mechanicss students and enthusiasts New topics include Analog and digital signal transmission Coating systems Development methods and application tools for electronic systems Diagnosis Emission reduction systems Engine lubrication Environmental management Fleet management Fluid mechanics Frictional joints Hydrostatics Mechantronics Mobile information systems Multimedia systems Positive or form closed joints Sound design Truck brake management as a platform for truck driver assistance systems Vehicle wind tunnels Workshop technology **Automotive Diagnostics** ,1990 A collection of papers from an Institute of Mechanical Engineers conference which discuss the latest developments and likely future trends in automotive diagnostics Coverage is given to all types of vehicles and all types of vehicle diagnostic systems whether on or off board Particular emphasis is given to driver information systems on board diagnostics off board diagnostic equipment data collections testing industry standardization training and operator skills and design considerations **Traffic-related Air Pollution** Health Effects Institute. Panel on the Health Effects of Traffic-Related Air Pollution,2010 [Annual Index/abstracts of SAE Technical Papers](#) ,2007 [Technical Literature Abstracts](#) Society of Automotive Engineers,2000 **Traffic Engineering & Control** ,1987 [Oil & Gas Science and Technology](#) ,1999 *Illinois Register* ,2001 *Automotive Engineering* ,1986 *History of Automotive Electronics* Ronald K. Jurgen,1998 **Cumulative Index [of The] SAE Papers** Society of Automotive Engineers,1965 *Data Acquisition from Light-duty Vehicles Using OBD and CAN* Eric Walter,Richard Waters,2018 This 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

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