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

J. Wayne Miller

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

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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

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The Development of an Advanced Telematics Based Automatic Vehicle Monitoring System (AVeMS) Joseph C. Silva,2010

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