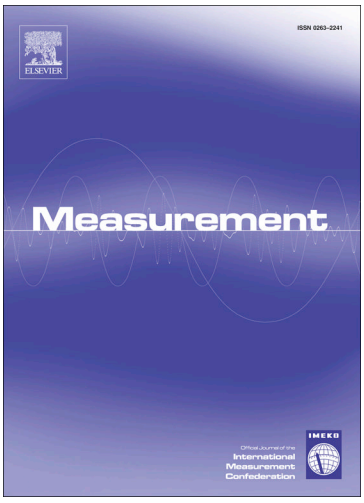

Dynamic measuring of performance parameters for vehicles engines

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PII: S0263-2241(17)30455-4
DOI: http://dx.doi.org/10.1016/j.measurement.2017.07.021
Reference: MEASUR 4861

To appear in: *Measurement*

Received Date: 17 January 2017
Revised Date: 11 July 2017
Accepted Date: 13 July 2017

Please cite this article as: M. Pexa, M. Muller, S. Hloch, Dynamic measuring of performance parameters for vehicles engines, *Measurement* (2017), doi: http://dx.doi.org/10.1016/j.measurement.2017.07.021

Dynamic measuring of performance parameters for vehicles engines

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Abstract:

Paper deals with dynamic measurement of performance parameters for selected vehicles engines using incremental sensor attached to the rest bed roller. Data collection was performed with an eight-channel collector. The moment of the inertia is the result of the measurement, which can also be used in the measurement of performance parameters. The external speed characteristics of the engine primarily resulting from the dynamic measurement is the absolute result of the measurement. It can be concluded on the technical conditions of the motor vehicle based on the evaluation of external speed characteristics of the engine. It is possible to maintain consistently good technical state of the motor engine with an appropriate maintenance and contribute to the ecology and the economy of the vehicle operation.

Keywords: moment of inertia of engine, performance parameters, roll test bed

Nomenclature

a_{abm}	acceleration of rollers of test bed during acceleration of motors, all inertial masses are reduced to the roller circumference, but without moment of inertia of motor (m/s^2)	
a_{asm}	acceleration of rollers of test bed during acceleration of motors, all inertial masses are reduced to the roller circumference	(m/s^2)
$a_{av(1,2)}$	acceleration of roller of test bed during acceleration of electric motors on the left (1) and right (2) side of the test bed	(m/s^2)
a_{dbm}	acceleration of rollers of test bed during deceleration of motors, all inertial masses are reduced to the roller circumference, but without moment of inertia of motor (m/s^2)	
a_{dsm}	acceleration of rollers of test bed during deceleration of motors, all inertial masses are reduced to the roller circumference	(m/s^2)
a_{dsme}	acceleration of the roller during deceleration testing of electric motors (motors connected), all the inertial masses are reduced to the roller circumference (m/s^2),	
$a_{dv(1,2)}$	acceleration of roller of test bed during deceleration of electric motors on the left (1) and right (2) side of the test bed	(m/s^2)
$a_v(n)$	acceleration of rollers of test bed during the acceleration of combustion engine (full supply of fuel)	(m/s^2)
$d_v(n)$	acceleration of rollers of test bed while the steps on the clutch	(m/s^2)
F_e	the overall strength of the electric motors	(N)
I	moment of inertia of the engines	($kg.m^2$)
i_c	overall gear ratio	(-)
$M(n)$	engine torque as a function of engine speed	(Nm)
m_{bm}	mass inertia of the rotating masses reduced to the circumference of rollers excluding an inertia of motor	(kg)
m_{sm}	mass inertia of the rotating masses reduced to the circumference of rollers including an inertia of motor	(kg)
m_v	inertial mass of rollers of test bed reduced on the circumference (equal for left and right side of test bed)	(kg)
$m_{v(1,2)}$	inertial mass in the left roller (1) or right (2) side of test bed reduced on the circumference	(kg)
n	measured and calculated combustion engine speed	(rpm)