

# **<sup>1</sup> CONTRIBUTION IN DEFINING PARAMETERS OF THE EQUIVALENT SYSTEM OF TORSIONAL VIBRATIONS WITH THE SIGNIFICANT INTERNAL DAMPING ELEMENTS**

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UDC: 534.1:621.43

## **Abstract**

In the development of internal combustion engine as propulsion systems for road vehicles, a large emphasis is on increasing the efficiency by means of down-sizing. On the one hand it requires the reduction of specific weight and specific volume of internal combustion engine, that includes reducing mass of individual parts like the crank mechanism, and on the other hand it is expected to increase the effective engine parameters per unite of volume. Considering that internal combustion engines belong to the category of the extremely dynamic mechanical systems, any change in the masses and in the construction of the components requires a detailed vibration phenomena analysis.

In the paper are presented aspects of choosing equivalent torsional vibration systems, ways in defining the individual elements of the system, with special emphasis on the elastic torsional vibration damper as an element of highly nonlinear characteristics of internal damping and stiffness.

**Key words:** torsional vibration, internal damping, elastic damper.

## **DOPRINOS DEFINISANJU PARAMETARA EKVIVALENTNOG TORZIONO OSCILATORNOG SISTEMA SA ELEMENTIMA SA ZNAČAJNIM UNUTRAŠNJIM PRIGUŠENJEM**

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**Rezime:** U okviru razvoja motora sus, kao pogonskog agregata za drumska vozila, veliki akcenat se stavlja na povećanje efikasnosti putem tzv. down sizing-a. S jedne strane zahtjeva se smanjivanje specifične težine i specifične zapremine motora sus, što zahtjeva smanjenje mase pojedinih dijelova uključujući i krivajni mehanizam, a s druge strane očekuje se povećanje efektivnih parametara po jedinici zapremine. S obzirom da motor sus spada u kategoriju visoko dinamičkih mašinskih sistema, svaka promjena u masama i konstrukciji dijelova zahtjeva i detaljno razmatranje oscilatornih fenomena.

U okviru rada predstavljeni su aspekti izbora ekvivalentnog torziona oscilatornog sistema, načina definisanja pojedinih elemenata sistema, s posebnim naglaskom na elastični

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<sup>1</sup> Received: October 2010.

Accepted: December 2010.

Primljen: oktobar, 2010.god.

Prihvaćen: decembar, 2010.god.

prigušivač torzionih oscilacija kao element sistema sa izrazito nelinearnim karakteristikama unutrašnjeg prigušenja i krutosti elastičnog elementa.

**Ključne reči:** torzione oscilacije, unutrašnje prigušenje, elastični prigušivač.