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Vibration Analysis and Experimental Testing of Existing 3-Wheeler Automotive Muffler Using Modal and FFT Analyzer

Kshitij Anil Waghmare[1], Shivali Jitendra Daware[2], Karishma Harun Inamdar[3], Harish Raju Fulsaunder[4]
Students, Department of Mechanical Engineering, Pune [1,2,3,4]
ISBM College of Engineering, Nande Village, Mulshi, Pune, Maharashtra, India

Abstract: *A muffler is a device used to reduce the noise and vibration of gas emitted by internal combustion engine. So, it become a necessary equipment in automobile to have a proper emission of gases to surrounding. Due to improper design some muffler decreases the mass flow rate due to which there is increase in fuel consumption, large pressure drops across its cross section and higher knock sensitivity. In present project existing 3-wheeler vehicle muffler is experimentally tested with FFT analyser (Impact Hammer Test) technique to determine the mode shapes, natural frequencies and thermal heat flux analysis and FEA analysis is performed in ANSYS software to validate the experimental results.*

Keywords: Modal Analysis, Exhaust system, Structural Dynamics, Finite Element Method, FFT Analyzer.

REFERENCES

[1]. OPTIMAL AUTOMOBILE MUFFLER VIBRATION AND NOISE ANALYSIS, Sujit Kumar Jha and Ajay Sharma, International Journal of Automotive and Mechanical Engineering (IJAME) ISSN: 2229-8649 (Print); ISSN: 2180-1606 (Online); Volume 7, pp. 864-881, January-June 2013
[2]. Acoustic attenuation performance of perforated dissipative mufflers with empty inlet/outlet extensions F.D. Deniaa, _, A. Selametb, F.J. Fuenmayora, R. Kirby, Journal of Sound and Vibration 302 (2007) 1000–1017
[3]. Modal Analysis of Exhaust System, Marcus Myrén, Jörgen Olsson, Research gate
[4]. Experimental Modal Analysis of Automotive Exhaust Structures, SAE TECHNICALPAPER SERIES 2001-01-0662
[5]. VIBRATION ANALYSIS OF MUFFLER BY USING FEM AND FFT ANALYZER Mr. Tushar Chindha Jagtap, Prof.Sunil S. Raut Prof. Arvind. Ambesange, IJARIIE-ISSN(O)-2395-4396, Vol-4 Issue-2 2018
[6]. Transmission loss prediction on a single-inlet/double-outlet cylindrical expansion-chamber muffler by using the modal meshing approach, Applied Acoustics 69 (2008) 173–178
[7]. Vibrational Analysis of Muffler, Mr. Anmol Rathan Simon, Dr. K. Ashok Reddy, B. Prashanth, ISSN: 2455-2631, February 2017 IJSDR | Volume 2, Issue 2
[8]. Experimental Modal Analysis of Automotive Exhaust Muffler Using Fem and FFT Analyzer" Sunil, Dr Suresh P M, International Journal of Recent Development in Engineering and Technology, (ISSN 2347-6435(Online) Volume 3, Issue 1, July 2014) 185
[9]. CFD Topology and Shape Optimization of Ford Applications using Tosca Fluid by Dr. Anselm Hopf, Ford Motor Company, Aachen, Germany.
[10]. Integration of exhaust manifold with engine cylinder head towards size and weight reduction by M.A. Neshan, A. Keshavarz, K. Khosravi.
[11]. Exhaust System Muffler Volume Optimization of Light Commercial Vehicle Using CFD Simulation by C.P. OM ARIARA GUHANa, G. ARTHANAREESWARAN, K.N. VARADARAJAN, S. KRISHNAN.
[12]. Methods for evaluating in-duct noise attenuation performance in a muffler design problem by Jong Kyeom Lee, Kee Seung Oh, and Jin Woo Lee.
[13]. A Nonlinear Quasi-3D Approach for the Modeling of Mufflers with Perforated Elements and Sound-Absorbing

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Material by G. Montenegro, A. Della Torre, A. Onorati, and R. Fairbrother.

[14]. Modification of Muffler design to increase exit velocity by Nagisetty Lokhesh Kumar and K. Veladri .

[15]. Enhancement of Engine Performance through analyzing internal part design on Modenas CT115s exhaust using CFD Simulation by Efi N E, Shahriman A B, Rojan M A, I Zunaidi1, Z M Razlan, W K Wan, M S M Hashim, N S Kamarrudin, A Harun, I Ibrahim and Azizul Aziz I.

[16]. Commercial Vehicles Muffler Volume Optimization using CFD Simulation by Ashok Patidar, Shivdayal Prasad, Umashanker Gupta, and Mohan Subbarao.