

I.C. ENGINES AND COMBUSTION

December 21 - 24, 1978

WARANGAL, A. P. (INDIA)

Proceedings

Volume I

Sponsored by

Regional Engineering College, Warangal.
 Kakatiya University, Warangal.
 Bharat Heavy Electricals Limited, Hyderabad.
 Defence Research and Development Laboratories, Hyderabad.
 Carburettors Limited, Madras.
 Council of Scientific & Industrial Research, New Delhi.

CONTENTS

Volume I

I 1 : Invited Paper

Paper No.	Title
I-1	A review of combustion process in the dual fuel engine - the gas diesel engine <i>Ghazi A. Karim</i>

E1 : Pollution and Control

Paper No.	Title
E1-1	Some studies on NO formation in SI engines <i>B.P.Pundir and V.A. Zvonow</i>
E1-2	Reduction of exhaust emissions in the internal combustion engines: Detailed survey and suggestion of reasearch areas <i>N.Baluswamy</i>
E1-3	Control of exhaust NO _x emissions by EGR-A preliminary experimental study <i>H.B. Mathur, J.P. Subramanyam, P.R.Nayyar and S.K. Ratsogi</i>
E1-4	Reduction of smoke, exhaust hydro-carbon and carbon monoxide emissions from an automotive multicylinder diesel engine <i>H.B. Mathur, R. Rana, D. Bhanot, A.K. Misra and J.H. Bohari</i>
E1-5	An analytical investigation to study the nitric oxide formation in combustion systems <i>B. Haragopal Rao and V. Singh</i>
E1-6	Intake manifold water introduction to reduce exhaust nitric oxide emissions for a compression ignition engine <i>B. Haragopal Rao and V. Singh</i>
E1-7	Mathematical modelling of a catalytic converter system <i>B. Nagalingam, M.K. Gajendra Babu and B.S. Murthy</i>
E1-8	Use of rare earth oxide as catalyst for reduction of NO in automobile exhaust <i>S. Narayanan, B. Nagalingam, M. R. Sridharan Nair and B. S. Murthy</i>
E1-9	Emission characteristics of spark ignition engine using petrol and kerosene blends with and without surge chamber <i>D. Bhattacharjee and B. B. Ghosh</i>

E2 : Alternate Fuels

Paper No.	Title
E2-1	Benzole blended gasoline as automotive fuel-Engine performance, fuel economy and exhaust emissions <i>H.B. Mathur and M. R. Madan</i>
E2-2	Hydrogen supplementation-A near term partial solution to the energy crisis <i>B. B. Bansal and H. B. Mathur</i>
E2-3	Some factors affecting the compression and combustion process in Alcohol-diesel oil dual-fuel engines <i>M. Nasmullah, N. R. Panchapakesan, K. V. Gopalakrishnan and B. S. Murthy</i>
E2-4	Some tests with gobar gas diesel oil dual-fuel engines <i>B. L. Sridhar, G. Viswanathan, N. R. Panchapakesan, K.V. Gopalakrishnan and B. S. Murthy</i>
E2-5	Some tests with Ethyl Alcohol as S.I engine fuel <i>K. Subba Rao, K. V. Gopalakrishnan and B. S. Murthy</i>
E2-6	Comparative studies of engine performance with methanol as a supplementary fuel for S.I and C.I engines <i>K. P. Bhat, N. Tyagarajan, B.S. Samaga and K. Mahadevan</i>
E2-7	Characteristics of hydrogen fueled S.I. engine <i>G.S. Kumara Swamy, B. S. Samaga and B. S. Murthy</i>
E2-8	Performance of a diesel engine with increasing proportion of gobar gas induction <i>C. P. Kothandaraman and S. Krishna Murthy</i>
E2-9	An investigation of using alcohol as a secondary fuel in a multicylinder automotive C.I. engine <i>L. Namperumal and T. R. Jagadesan</i>

ii

E3 : Combustion and Heat Transfer in I.C. Engines

Paper No.	Title
E3-1	On flame radiation in internal combustion engines <i>G. V. Ramanaiah</i>
E3-2	Heat transfer in an engine running on natural gas <i>B. T. Nijaguna</i>
E3-3	Effect of charge dilution on heat transfer rates in a small compression-ignition engine <i>P. S. Mehta, D. S. Mishra, C. P. Gupta and B. Haragopal Rao</i>
E3-4	A simple method of heat release analysis based on experimental pressure-crank angle diagrams by computer simulation <i>N. Baluswamy</i>
E3-5	Carbon gasification mechanisms of diesel engine smoke suppressant additives <i>G. Devapaul, P. Ram Mohan and N. Sidheswar</i>
E3-6	Turbulent flame propagation in a closed vessel <i>D. D. Agrawal</i>

E4 : Engine Development

Paper No.	Title
E4-1	Stratified charge engine development-prospects and possibilities <i>F. G. Kadoli and B. S. Samaga</i>
E4-2	On the charge stratification of an automotive multicylinder S. I. engine <i>S. V. Rajamanickam and T. R. Jagadesan, S. Seetharaman</i>
E4-3	An analytical study of potentialities of U-cylinder arrangement for blower scavenged two-stroke diesel engines <i>M. R. Raghavan and K. Narayanaswamy</i>
E4-4	Detailed model analysis of U-cylinder blower scavenged two-stroke diesel engines <i>M. R. Raghavan and K. Narayanaswamy</i>
E4-5	Design and development of engine mounted cooling water pump for heavy duty marine diesel engine <i>S. Chattopadhyay and P. Banerjee</i>
E4-6	Improvement in turbulence in carburetors for power gain <i>K. S. Shah and B. K. Dube</i>
E4-7	Effect of oil dilution and low jacket water temperature on wear of piston rings and cylinder liner of a diesel engine <i>G. T. Rajagopala Charyulu and N. Raman</i>
E4-8	A study of engine tribology <i>R. Jagannatham</i>

iii

E5 : Engine Analysis and Performance

Paper No.	Title
E5-1	Response of a fuel pump to unsteady processes of operation of a diesel engine <i>N. K. Samaria, N. K. Dyachenko, A. K. Kostin and E. E. Kvasov</i>
E5-2	Analysis of exhaust gas velocity fluctuations in an internal combustion engine under motoring conditions <i>P. A. Lakshminarayanan, M. K. Gajendra Babu, P. A. Janakaraman and B. S. Murthy</i>
E5-3	Simulation of a fuel injection process in a diesel engine <i>K. Kumar, R. R. Gaur and R. D. Garg</i>
E5-4	An analytical investigation of the problems of high specific output diesel engines <i>J. K. Sharma, R. R. Gaur and R. D. Garg</i>
E5-5	Study of performance characteristics of spark ignition engine working on 'surge cycle' <i>N. S. Murthy</i>
E5-6	Performance of compression ignition engine with masked valve <i>B. Sundara Rao, V. Rameshwar Rao and C. M. Vara Prasad</i>
E5-7	An investigation on the performance of a stationary diesel engine with a multi masked valve <i>V. Narayana and C. M. Vara Prasad</i>
E5-8	Performance of a 5 HP diesel engine under minimal cooling conditions <i>C. P. Kothandaraman</i>
E5-9	Swirl combustion chambers for high speed diesel engines <i>Y. V. Gulve, S. Panchmal, P. Ram Mohan and V. Rameshwar Rao</i>

iv

Volume II

C1 : Experimental Techniques and Combustion Properties

Paper No.	Title
C1-1	Experimental investigations on a modified Hartmann burner <i>S. K. Pande, U. S. P. Shet, R. Natarajan and M. C. Gupta</i>
C1-2	Design and Development of a burning velocity meter <i>S. P. Sharma, S. C. Srivastava, R. k. Bakshi and R. N. Sahay</i>
C1-3	Bench-scale test facilities for coal-reactivity measurements <i>K. M. V. Malarkkan and K. Ganapathi</i>
C1-4	Experimental studies on simulated droplet diffusion flames in turbulent air stream <i>C. Jagannathan and A. K. Ghosh</i>
C1-5	Coaxial graphical technique as a tool for the design of a char producer for MHD power generation <i>P. K. Nag and V. Mahadevan</i>
C1-6	Computation of equilibrium composition in carbon-hydrogen-oxygen-nitrogen argon system on a speed digital computer <i>H. B. Mathur, T. V. Vareed and H. Nagesh Hebbar</i>
C1-7	Computation of equilibrium constants for chemical reactions <i>K. Natarajan, K. M. Karuppannan and K. A. Bhaskaran</i>
C1-8	Computation of ignition delay of acetylene-oxygen-argon mixtures <i>R. Ravikumar and T. A. Venkatachalam</i>
C1-9	Specific heat data for thermochemical computations <i>R. Ravi knmar and K. S. Krishnan</i>

v

C2 : Rocket Combustion

Paper No.	Title
C2-1	A survey of steady state combustion models for solid propellants <i>V. Swaminathan and S. Rajagopalam</i>
C2-2	An experimental study of hot wire ignition of composite propellants <i>B. C. Kumar and K. Ramamurthy</i>
C2-3	Theoretical estimation of ignition energy for composite propellants by the thermal model <i>K. Ramamurthy and K. Sankara Narayan</i>
C2-4	Effect of oxidizer particle size on ignition delay of a composite solid propellant <i>R. Ramaprabhu and K. A. Bhaskaran</i>
C2-5	Application of zones theory for the prediction of the growth constant of a solid propellant <i>K. Ramamurthy</i>
C2-6	Test facilities for liquid propellant rocket engines <i>J. Narayandas</i>
C2-7	Studies on behaviour of star shaped solid propellant grains with differential erosive burning characteristics at star point and recess <i>A. Subhananda Rao</i>

C3 : Combustion of Fuels

Paper No.	Title
C3-1	Reaction mechanism of ethylene oxidation <i>K. M. Karuppannan, K. Natarajan, K. A. Bhaskaran and V. Sriramulu</i>
C3-2	Combustion of multi-component liquid fuels <i>R. Natarajan</i>
C3-3	A shock tube study of the ignition characteristics of Methanol at high temperatures <i>K. Natarajan and K. A. Bhaskaran</i>
C3-4	Kinetics of combustion of coal in fixed, pulsed and fluidized beds <i>P. K. Nag and V. Mahadevan</i>

vi

C4 : Flames and Gas Turbine Combustion

Paper No.	Title
C4-1	Studies on combustion kinetics in diffusion flames <i>B. S. Chitwadgi and R. S. Mate</i>
C4-2	Effect of burner port protrusion on stability of piloted open flames <i>U. S. P. Shet, B. K. Chayapathi, V. Sriramulu and M. C. Gupta</i>
C4-3	Laminar burning velocity and stability of LPG air flames with and without vitiation of combustion air <i>S. P. Sharma, R. C. Jain, R. N. Sahay and C. P. Gupta</i>
C4-4	Investigations of burning rates and flame geometry of simulated droplet diffusion flames <i>C. P. Sarathy and R. Natarajan</i>
C4-5	Prediction of flame tube wall temperatures for Aero - gas turbine combustors <i>H. B. Mathur, T. V. Vareed, N. Subramanian and Venkataramani</i>
C4-6	Flame stabilization in co-axial swirl burners <i>G. V. S. N. Rao and V. Sriramulu</i>
C4-7	Effect of mass addition on the behaviour of swirl produced flow reversal zones <i>V. M. Domkundwar, V. Sriramulu and M. C. Gupta</i>
C4-8	Spray pattern studies of swirling water jets in a swirling air flow <i>A. N. Rao, V. Ganesan, R. Natarajan, K. V. Gopalakrishnan and B. S. Murthy</i>

vii