

# Engine and Auxiliary Systems

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Edited by  
Prof. Dr. A.K.M. Mohiuddin



IIUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

# **Engine and Auxiliary Systems**

*Edited by Prof. Dr. A.K.M. Mohiuddin*



**IIUM Press**

Published by:  
IIUM Press  
International Islamic University Malaysia

First Edition, 2011  
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Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

A.K.M. Mohiuddin  
Engine and Auxiliary Systems  
A.K.M. Mohiuddin

ISBN: 978-967-418-216-8

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM  
(Malaysian Scholarly Publishing Council)

Printed by :  
**IIUM PRINTING SDN. BHD.**  
No. 1, Jalan Industri Batu Caves 1/3  
Taman Perindustrian Batu Caves  
Batu Caves Centre Point  
68100 Batu Caves  
Selangor Darul Ehsan

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Investigation of Spark Ignition Multipoint Engine Using Water Addition - Part I: Simulation

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**Introduction**

The internal combustion engine is an engine in which the air fuel mixture mixes together then burns in the combustion chamber. The combustion process produces the expansion of high temperature and high pressure gasses that exert force on top of the piston, thus creating useful work for the engine. This useful work comes from the force that produces from pressure exerted on the top of the piston.

The term *internal combustion engine* usually refers to an engine in which combustion intermittent, such as the more familiar four-stroke and two-stroke piston engines, along variants, such as the six-stroke piston engine and the Wankel rotary engine. A second class internal combustion engines use continuous combustion: gas turbines, jet engines and rocket engines, each of which are internal combustion engines on the same principle previously described [1,2,3,4].

Water addition using water injection techniques is a separate liquid or emulsion with gasoline as a vapour, has been thoroughly researched. J.A Harrington [5] made an important contribution to this area. If calibrated engines operate with a small amount of water, knock can be suppressed, hydrocarbon emissions will be slightly higher, NO<sub>x</sub> emissions decrease, CO does not change significantly and fuel consumption is increased.

According to Goran Hellen [6], in the four stroke turbocharged engine injecting water or steam into the combustion chamber would reduce the nitrogen oxide emissions. The water injection is carried out at least substantially during the intake stroke of the engine. The NO<sub>x</sub> emissions from gasoline engine are reduced by mixing water in the gasoline to reduce combustion temperature. The water is dispersed in the gasoline as the gasoline is delivered to the cylinders [6].