

## LIST OF SYMBOLS

$g$	-	Acceleration due to gravity
$V(t)$	-	Activation energy
$RCO$	-	Acyl radical
$R^*$	-	Alkyl radical
$A$	-	Ampere
$A_2$	-	Area of cross section of orifice
$A_1$	-	Area of cross section of pipe
$CO_2$	-	Carbon Dioxide
$CO$	-	Carbon Monoxide
$C_j$	-	Column total
$X$	-	Compound
cc	-	Cubic Centimetre
dfc	-	Degree of freedom columns
dfr	-	Degree of freedom rows
$\rho$	-	Density of fuel
$\rho_{air}$	-	Density of air
$\rho_{exh}$	-	Density of exhaust
$Q_a$	-	Flow Rate
SE4	-	Four-Stroke Engine
$f_c$	-	Fuel Volume
g/kWh	-	grams per kilowatt hour

T	-	Grand Total
HC	-	Hydrocarbon
H	-	Hydrogen
OH	-	Hydrogen Oxide
kJ	-	Kilojoule
kg	-	Kilograms
kg/kWh	-	Kilograms per kilowatt hour
kV	-	Kilovolt
kW	-	Kilowatt
kWh	-	Kilowatt-hour
MgO	-	Magnesium Oxide
ms	-	Milliseconds
N	-	Nitrogen atom / Total
NO <sub>2</sub>	-	Nitrogen Dioxide
NO	-	Nitrogen oxide
NO <sub>x</sub>	-	Oxides of Nitrogen
RO*	-	Oxyalkyl radical
O	-	Oxygen atom
O <sub>2</sub>	-	Oxygen molecule
O <sub>3</sub>	-	Ozone
$\partial$	-	Partial Differential
%	-	Percentage
RO <sub>2</sub>	-	Peroxyalkyl
df	-	Product of degree of freedoms

$K_f$	-	Rate Constant forward
$K_R$	-	Rate constant reverse
E	-	Residual Sum of Squares
rpm	-	Revolutions per minute
$R_j$	-	Row total
s	-	seconds
$SiO_2$	-	Silicon Dioxide
$h_2$	-	Static Pressure downstream end cm of water
$P_1$	-	Static Pressure upstream end
$P_2$	-	Static Pressure upstream end
$h_1$	-	Static Pressure upstream end cm of water
$F_C$	-	Statistic value for columns
$F_R$	-	Statistic value for rows
F	-	Statistic value from table
k- $\epsilon$	-	Turbulent Kinetic Energy-Dissipation of Turbulent Kinetic Energy Model
SE2	-	Two-Stroke Engine
2SD4P10C	-	Two-Stroke Engine modified with 4 mm orifice and 10 % cooled EGR
2SD4P10UC	-	Two-Stroke Engine modified with 4 mm orifice and 10 % uncooled EGR
2SD4P15C	-	Two-Stroke Engine modified with 4 mm orifice and 15 % cooled EGR
2SD4P15UC	-	Two-Stroke Engine modified with 4 mm orifice and 15 % uncooled EGR

2SD4P5UC	-	Two-Stroke Engine modified with 4 mm orifice and 5 % uncooled EGR
2SD6P10C	-	Two-Stroke Engine modified with 6 mm orifice and 10 % cooled EGR
2SD6P10UC	-	Two-Stroke Engine modified with 6 mm orifice and 10 % uncooled EGR
2SD6P15C	-	Two-Stroke Engine modified with 6 mm orifice and 15 % cooled EGR
2SD6P15UC	-	Two-Stroke Engine modified with 6 mm orifice and 15 % uncooled EGR
2SD6P5C	-	Two-Stroke Engine modified with 6 mm orifice and 5 % cooled EGR
2SD6P5UC	-	Two-Stroke Engine modified with 6 mm orifice and 5 % uncooled EGR
2SD8P10C	-	Two-Stroke Engine modified with 8 mm orifice and 10 % cooled EGR
2SD8P10UC	-	Two-Stroke Engine modified with 8 mm orifice and 10 % uncooled EGR
2SD8P15C	-	Two-Stroke Engine modified with 8 mm orifice and 15 % cooled EGR
2SD8P15UC	-	Two-Stroke Engine modified with 8 mm orifice and 15 % uncooled EGR
2SD8P5C	-	Two-Stroke Engine modified with 8 mm orifice and 5 % cooled EGR
2SD8P5UC	-	Two-Stroke Engine modified with 8 mm orifice and 5 % uncooled EGR
2SD4P5C	-	Two-Stroke Engine modified with 4 mm orifice and 5 % cooled EGR
$\omega$	-	Uncertainty in measurement
$x_n$	-	Variable

H<sub>2</sub>O - Water molecules

**LIST OF ABBREVIATIONS**

A	-	Air
AFR	-	Air Fuel Ratio
ATDC	-	After Top Dead Centre
B-20	-	20 % Blend with 80 % Diesel
BDC	-	Bottom Dead Centre
BP	-	Brake Power
BSFC	-	Brake Specific Fuel consumption
BTDC	-	Before Top Dead Centre
BTE	-	Brake Thermal Efficiency
CA	-	Crank Angle
CAD	-	Crank Angle Degree
Cd	-	Discharge Coefficient
CF	-	Correction Factor
CFD	-	Computational Fluid Dynamics
CI	-	Compression Ignition
CNG	-	Compressed Natural Gas
CV	-	Calorific Value
D-EGR	-	Dedicated EGR
DF	-	Diesel Fuel
DI	-	Direct Ignition
EGR	-	Exhaust Gas Recirculation
EGT	-	Exhaust Gas Temperature
f	-	Function
F	-	Fuel
FFE	-	Fluid Flow Equation

FOME	-	Fish Oil Methyl Ester
IC	-	Internal Combustion
JO	-	Jatropha Oil
LHR	-	Low Heat Rejection
LPG	-	Liquefied Petroleum Gas
MFR	-	Mass Flow Rate
NDIR	-	Nondispersive infrared sensor
PIV	-	Particle Image Velocimetry
ppm	-	Parts per Million
PPME	-	Prickly Poppy Methyl Ester
R	-	Result Function
RBD	-	Rice Bran Oil BioDiesel
RBME	-	Rice Bran Oil Methyl Ester
SFC	-	Specific Fuel Consumption
SI	-	Spark Ignition
SS	-	Sum of Squares
SSC	-	Sum of Squares column
SSR	-	Sum of Squares row
TDC	-	Top Dead Centre
TFC	-	Total Fuel Consumption
TKE	-	Turbulent Kinetic Energy
TR	-	Tumble Ratio
TSS	-	Total Sum of Squares
UCME	-	Used Cooking oil Methyl Ester
WOT	-	Wide Open Throttle
WPLME	-	Waste Pork Lard Methyl Ester