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# Technical Part

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# Problem:

# Uncomplete combustion

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# Why does this problem exist?
# 2 reasons:

## 1) The respect of the OPTIMAL stoichiometric report, between oxygen and fuel, is never reached in combustion

IDEAL stoichiometric ratio:
14,7 Kg of oxygen to burn 1 Kg of fuel
14 Kg of oxygen to burn 1 Kg of diesel
34 Kg of oxygen to burn 1 Kg of hydrogen

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# 2)Van Der Waals' aggregation forces:

**According to this law, HC molecules result to be too aggregated, thus forbidding an optimal interaction with oxygen, therefore creating uncombusted.**

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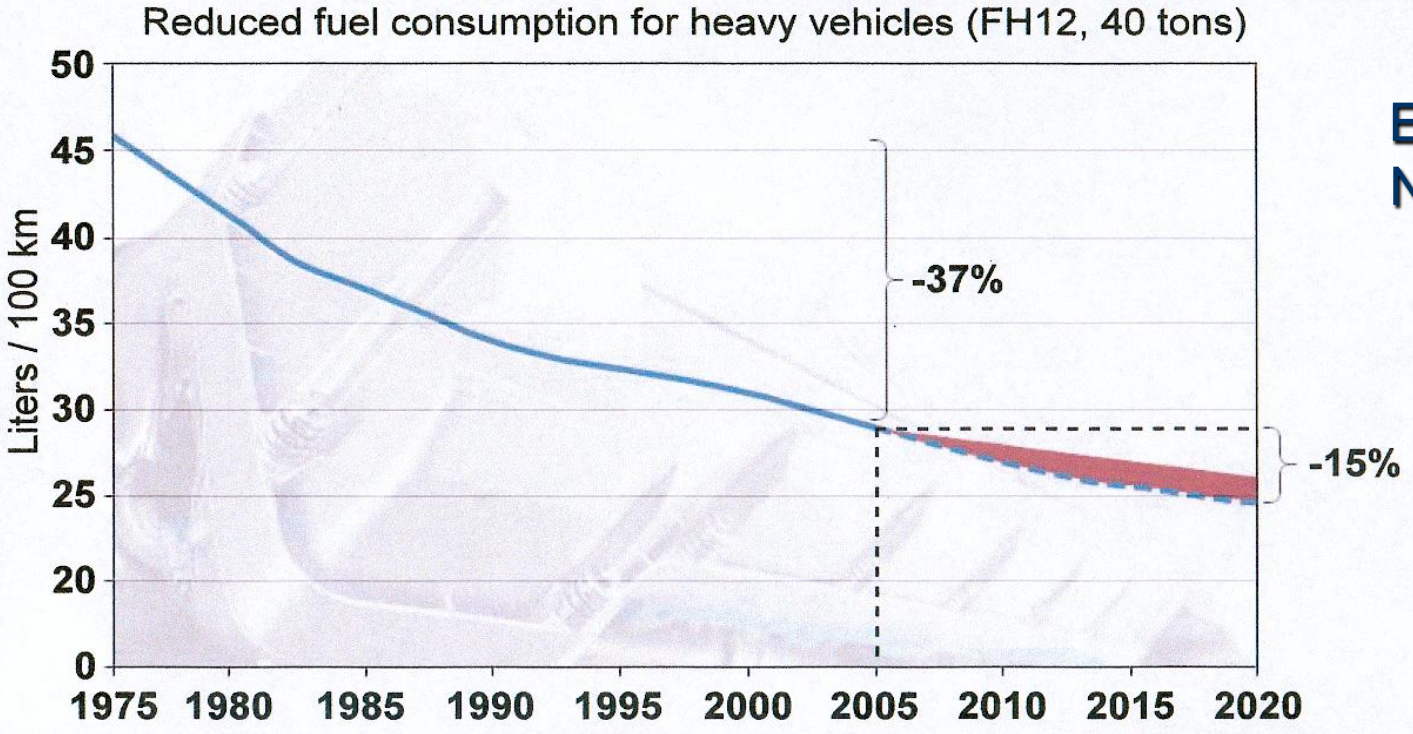
THE STOICHIOMETRIC REPORT NEVER REACHES A PERFECT COMBUSTION, THUS CREATING UNCOMBSUTED WHICH 30 YEARS AGO REPRESENTED MORE THAN 50% OF THE FUEL, WHILE TODAY, THANKS TO THE NEW ENGINES' TECHNOLOGIES, HAVE BEEN REDUCED TO MORE OR LESS 15%. ACCORDNG TO VOLVO, WITHIN 2020, THE SAME WILL CONTINUE TO DECREASE.

# The diesel engine – highly efficient technology




**EVEN ENGINES OF NEW GENERATION CREATE UNCOMBUSTED.**

Source: Volvo Trucks

AB Volvo 2007
Leif Johansson

VOLVO

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# Stoichiometric Report

## Definition:

Definition: Stoichiometric Report is the report, in exact weight for combustion, between air and fuel. It is necessary to have 14,7 kg. of air to burn 1kg. of fuel, and 14kg of air for 1kg of diesel; 34kg for one 1kg of hydrogen.

Fuel must have the capacity to prepare a mixture of homogeneous air-fuel, therefore it must have the capacity of vaporizing fuel through powderers and mixing the vaporized fuel with air creating an inflammable mixture . This mixture will obviously be composed of a part of air and a part of fuel and this report is so-called- Stoichiometric Report. The value of the stoichiometric report is fixed in 14/1- 15/1

# Stoichiometric Combustion

Stoichiometric or theoretical combustion is the ideal combustion process whereby a fuel is burned completely.
Complete combustion is a process whereby all carbon (C) to ($CO_2$), all hydrogen (H) to ($H_2O$) and all of the sulfur (S) to ($SO_2$) are burned.
If unburnt components such as C, $H_2$, CO are present among the exhaust gases, the combustion process has been incomplete.

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# Stoichiometric Report

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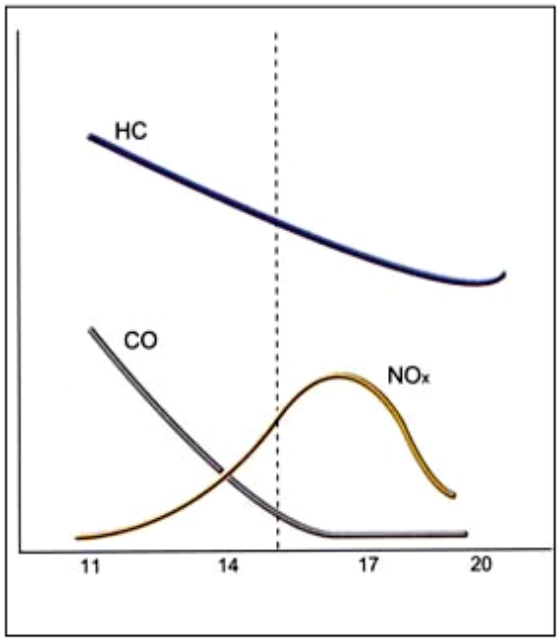


The combustion process which forms the basis of engine operation occurs between a **combustible fuel** (petrol) and a **gas** (atmospheric oxygen), contained in the intake air. The chemical reaction between oxygen and petrol, i.e. combustion, never occurs in a perfect manner. Firstly, there will be a small amount of fuel not burnt because of poorly homogeneous distribution of the air-fuel mixture within the combustion chamber; secondly, there will be some reaction "by-products". All this results in the release of exhaust gases. When excessive quantities of these pollutants build up in the environment, considerable damages can be caused.

**"The chemical reaction between oxygen and petrol, i.e combustion, never occurs in a perfect way. Firstly, there will be a small amount of fuel not burnt..."**

**Web: www.ducati.com**

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# Solution:

# SUPERTECH®

Combustion optimizer,
working on uncombusted

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# Principle of functioning

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When SUPER TECH enters in contact with fuel and thanks to kinetic energy (of movement) given by the vibration of the vehicle, it emits

**Infrared electromagnetic waves**

that temporarily weaken **VAN DER WAALS** inter-molecular bonds

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The benefit given by the temporary weakening of the intermolecular bonds is to

**INCREASE THE SURFACE OF REACTION**

therefore creating a partial vaporization which

**optimizes the process of combustion.**