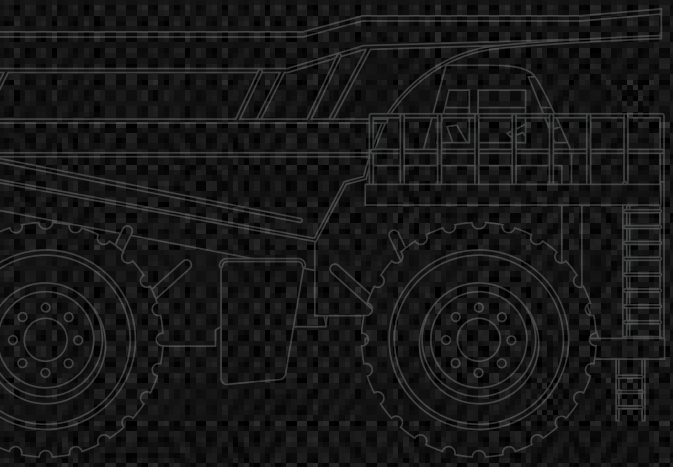
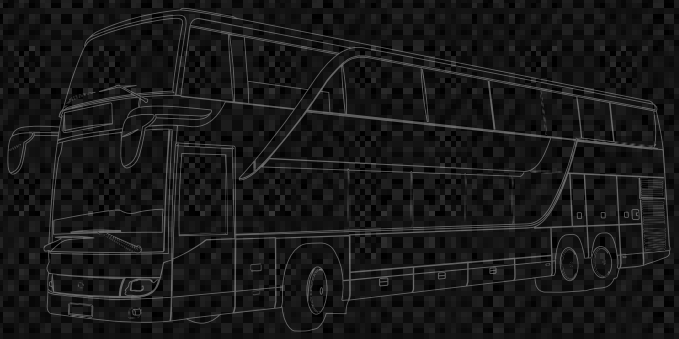
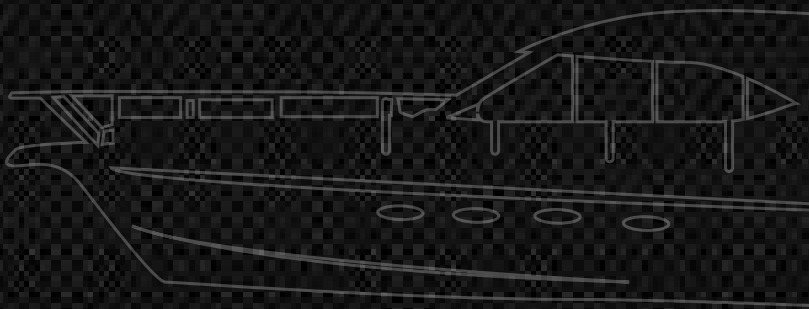
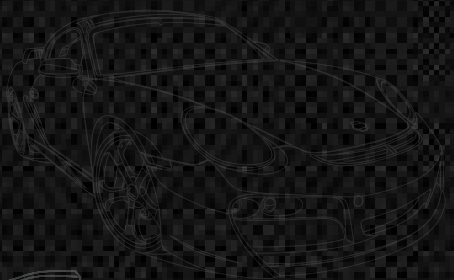
ECO™









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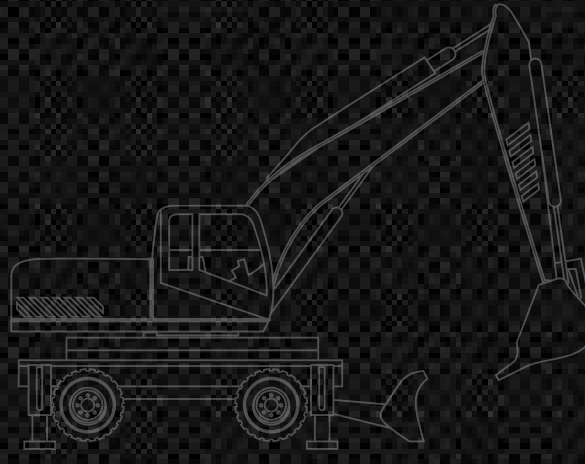


# VALVES, PISTONS AND CYLINDERS

## HOW BAD SEALS REDUCE OPERATIONAL EFFICIENCY

Exhaust valves and fuel valves must be kept clean and smooth in order to form a good seal.

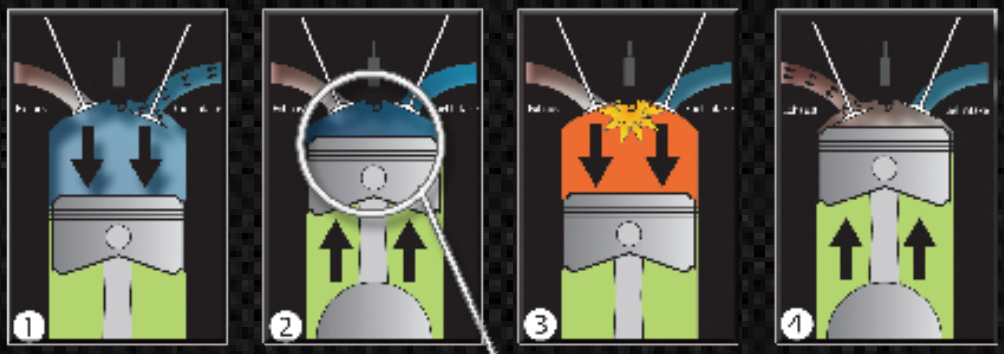
## HOW A FOUR STROKE ENGINE SHOULD WORK

Fuel and air enter the cylinder.

The fuel mixture is compressed.

Compressed fuel is ignited; the explosion forces the piston downwards.

Exhaust gasses are forced out.



## HOW CAN ECO PILL AND ECO FXO HELP YOU?

The basis of a four stroke engine is COMPRESSION and EXPANSION. Without adequate valve seals, there is not enough fuel compression and therefore no efficient combustion, and the explosive expansion is significantly reduced. **ECO PILL and ECO FXO solid additives for renewing fuel efficiency can quickly remove this problem and return your engine to an optimal working condition.** This product does not promote increase of engine power, but rather restores your vehicles original working capabilities, resulting in reduced, but more efficient power consumption. You will save money on fuel and maintenance expenses in the future.

# INJECTORS, FUEL DELIVERY SYSTEM AND EXHAUST PIPES

## YOUR VEHICLE NEEDS TO FEED AND BREATHE

### SIMPLIFIED FUEL DELIVERY SYSTEMS

Fuel delivery system works in the following way:

- Fuel flows from the fuel tank through fuel delivery lines.
- Fuel is then delivered to cylinders through the carburetor or fuel injectors.
- Fuel is then ignited in order to create expansion in the cylinder.

Some factors have to be adhered to in order to provide an optimal combustion.

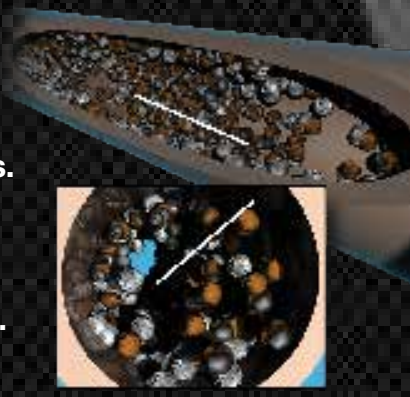
1. Combustion mixture must have a correct fuel to air ratio.
2. Mixture of fuel/air must be uniform in order to oxidize quickly.
3. Particles and debris should not prevent the fuel flow from the fuel tank to the engine.

### CARBURETOR VS FUEL INJECTON

**All new vehicles are equipped with fuel injectors instead of the old system that used a large and cumbersome device called a carburetor. The working principle is the same. Fuel must be mixed with air in order to create an efficient combustion mixture to deliver a sufficient amount of energy during the ignition sequence.**

### HOW CLEAN ARE YOUR FUEL INJECTORS?

**The only way to achieve efficient fuel combustion is a uniform mixture of fuel/air. Dirty and plugged-up injectors simply cannot provide this. It is up to you to ensure that your injectors are capable of creating a fine mixture of fuel and air necessary for combustion.**



### ...IS THE PATH TO YOUR ENGINE CLEAR?

**Fuel delivery lines must be kept clean and without residue and sediments. These sediments appear from natural impurities that can be found in fuel. Sediment can limit fuel flow or damage and plug-up your injectors.**
**ECO PILL and ECO FXO dissolve impurities and sediment and enable their safe burning off and exhaust, eliminating them from the system completely.**

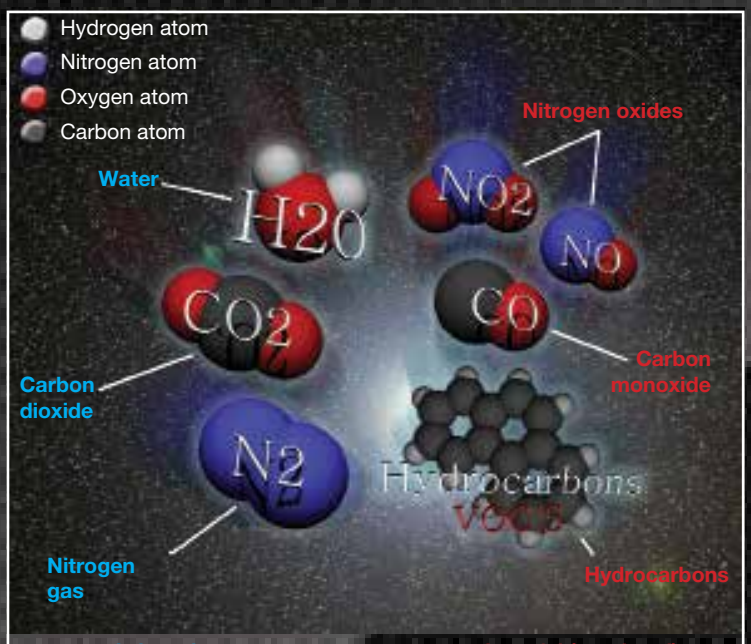


### HOW CAN ECO PILL or ECO FXO HELP YOU?

**ECO PILL or ECO FXO will clean carbon deposits, debris and dirt from fuel delivery lines of your vehicle. It dissolves debris and carries them to be burned off in a safe way. This unique formula will also clean your injectors and injector nozzles in order to make them function as originally intended. Your sparkplugs are also susceptible to creation of deposits. If the spark generating electrodes are covered in sediment they will not function correctly. Special ingredients in the pellet will dissolve and remove carbon deposits inside the expansion chamber and enable your sparkplugs to function correctly. ECO PILL or ECO FXO solid additives for fuel consumption reduction and reduction of harmful particles in exhaust gasses are the right choice.**
**Let your engine work as it was intended to.**

ECO pill

ECO FXO

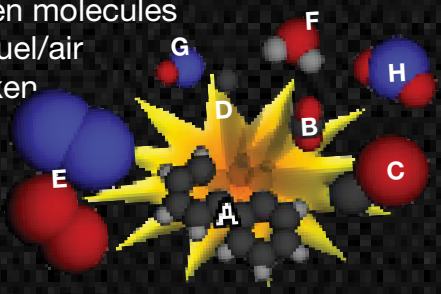



- Nitrogen gas comprises 78% of our air and mostly passes directly through the engine.
- Carbon dioxide is produced during combustion by binding carbon from fuel to oxygen
- Water steam is also created during combustion by binding oxygen with hydrogen from the fuel.
- Hydrocarbons are broken into oxidants under sunlight which reacts with nitrogen and creates ground ozone, the largest integral part of smog.
- Nitrogen oxides contribute to smog and irritate the respiratory tract.
- Carbon monoxide is poisonous, without color and odorless.

All these molecules are found naturally in our universe. What is unnatural is the quantity we produce. Emissions of nitrogen gas, carbon dioxide and water are NOT HARMFULL. Although carbon dioxide partially contributes to global warming, none of these compounds are as harmful as REGULATED emissions known as hydrocarbons (volatile organic compounds), carbon monoxide and nitrogen oxide.

## HYDROCARBONS?

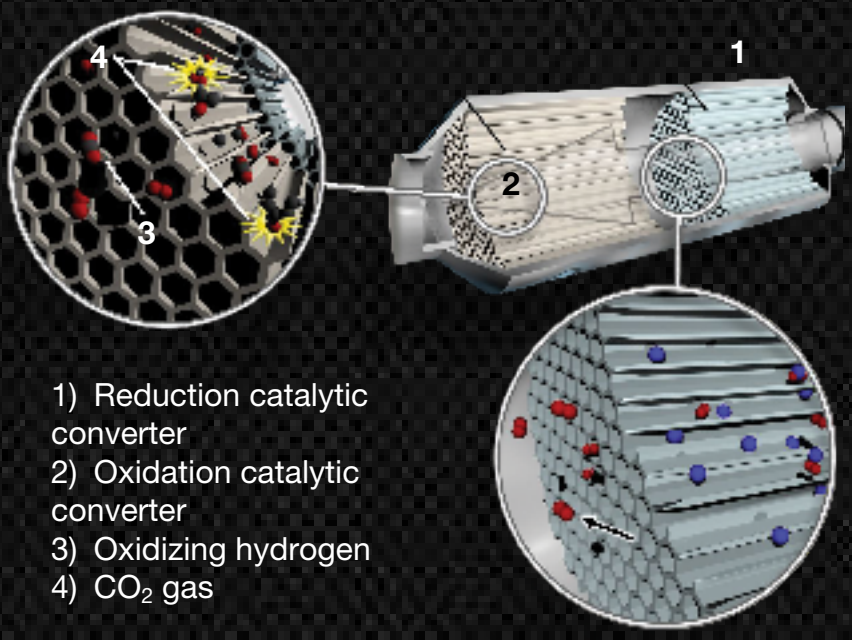
Hydrocarbons are basically your fuel (A). Some of the hydrocarbon compounds remain intact after combustion and become a part of emission gasses. Carbon atoms are broken off from the compound and bind to oxygen to form carbon dioxide (B), carbon monoxide (C), but also remain as individual atoms and form carbon deposits (D).
Oxygen and nitrogen molecules that enter into the fuel/air mixture (E) are broken up and form water steam (F) and various nitrogen oxides (G & H).




## YOUR CATALYTIC CONVERTER CAN REALLY GET DIRTY

1. Reduction catalytic converter collects nitrogen atoms from harmful NO2 molecules leaving only oxygen in the form of O2. This occurs on the ceramic structure in the shape of a honeycomb, covered with platinum and rhodium.

2. Oxidation catalytic converter uses the remaining oxygen and helps with further oxidation or “burning off” the rest of hydrocarbons in exhaust gasses. This occurs on the ceramic structure in the shape of a honeycomb, covered with platinum and rhodium.




1) Reduction catalytic converter
2) Oxidation catalytic converter
3) Oxidizing hydrogen
4) $CO_2$ gas

## HOW CAN ECO PILL OR ECO FXO HELP YOU?

Don’t allow your catalytic converter to get plugged-up before time. ECO PILL and ECO FXO are specially formulated to enable your fuel to burn with a minimal amount of harmful substances in exhaust gases. Preventing emissions where they start, ECO PILL and ECO FXO will ensure you get the maximum use out of the lifespan of your catalytic converter. Not only will you save money on maintenance, but you will also help protect the environment and yourself when you successfully pass the eco-test.

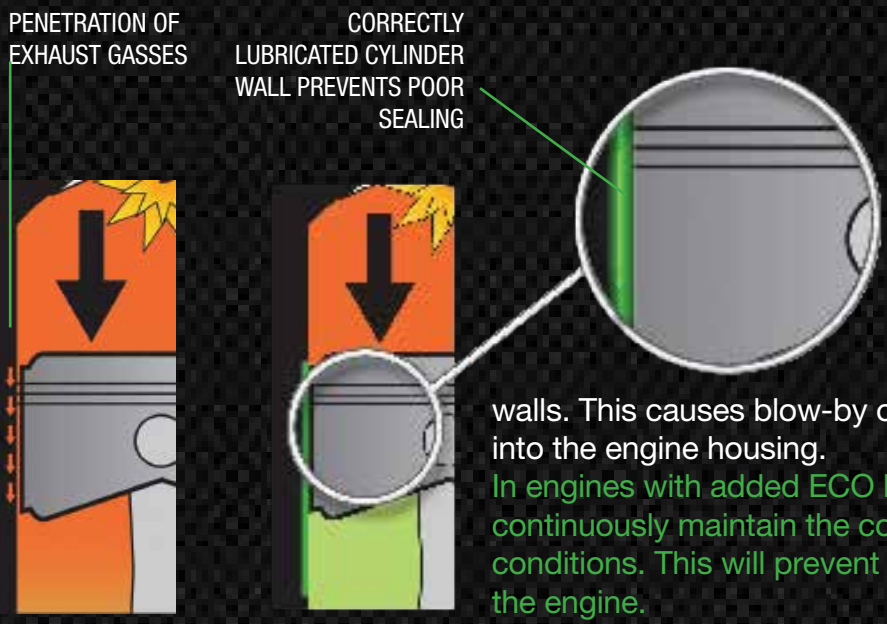
## COMPRESSION / OIL RINGS

are used to create a seal between the piston and cylinder walls. It is very important that exhaust gasses do not penetrate this seal. Otherwise the oil will get dirty and have a shorter lifespan. Also, small grains can form that can cause cracks and permanent damage to cylinder walls and damage to other movable engine parts as well, since the dirty oil flows around the engine.

It is also important that oil does not enter the combustion chamber. If this occurs, the oil will ignite and exhaust gases will be a bluish color.

## WHAT IS BLOW-BY?

Blow-by is a term used for a condition that occurs when hot gasses from the combustion pass by the compression rings into the cylinder during the ignition stroke. This literally means that open flames and exhaust particles enter into the engine housing. With the intake of carbon and increase of oil temperature in the engine housing, the necessary engine power is greatly reduced and the engine does not function properly.




## ABOUT SEALING

When the oil goes bad and starts to dilute, this causes another problem: the thin oil layer which enables free movement of piston rings is unable to perform its other function, which is creation of a vacuum tight seal between piston rings and cylinder walls. This causes blow-by of exhaust gasses and other particles into the engine housing.

In engines with added ECO DTM or ECO STABIFLEX, oil will continuously maintain the correct viscosity, even in extreme conditions. This will prevent power loss and creation of sediments in the engine.

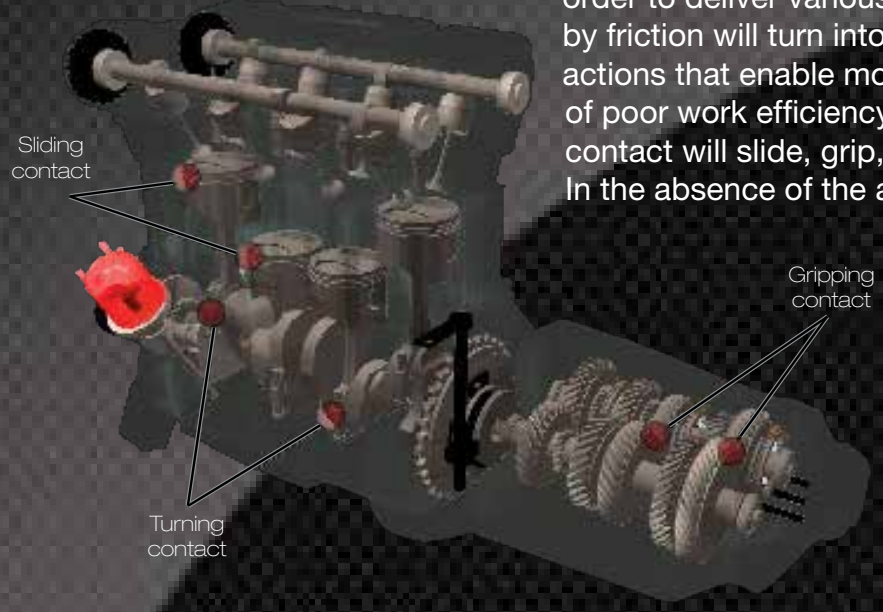
## HOW CAN FLEX-O HELP YOU?

FLEX-O Canada has developed a specially engineered line of oil stabilizers in order to protect your seals from normal wear- and –tear within the engine. Not only are short term benefits immediately visible, but long term benefits of a properly lubricated combustion system mean less maintenance hours and less oil changes, and also fuel savings.

# YOUR ENGINES ENEMY

## WHAT IS EFFICIENCY REDUCTION?

Your vehicle is designed and tuned to operate at a set “basic” number of revolutions at idle speed. When you press on the accelerator, a very small number of revolutions per minute is transmitted in order to deliver various speed ranges. Any resistance caused by friction will turn into lost work efficiency. A whole range of actions that enable movement can also hide various reasons of poor work efficiency. Any surface that represents a place of contact will slide, grip, turn or require lubrication.




In the absence of the above mentioned, motor oil will degrade as the engine heats up, and a catastrophic chain reaction of events will occur. The motor heats up, oil looses viscosity, friction increases, the motor heats up even more, oil continues to degrade, friction increases further and so on. This creates the greatest loss of power and eventually the breakdown of the engine/machine.

**RESISTANCE = FRICTION = HEAT = LOSS OF VISCOSITY = MORE RESISTANCE**

## VISCOSITY AND OILS

Viscosity is a measure of the oils ability to resist flow. In other words, it is a measure of oil density. Heat speed up all chemical and molecular reactions. This means when your engine heats up, it actually cooks the oil and makes it thinner. Lower quality oils will degrade even faster and cause more frequent appearance of problems.

This happens because molecules rub against each other just as parts in your vehicle. This friction, at a microscopic level, together with the heat already generated in the end causes a breakup of oil molecules, eliminating their lubricating capabilities.

## WHY AM I USING MORE FUEL THAN BEFORE?

The answer is simple. The harder your engine needs to work to deliver the power your need, the more fuel it will combust and exchange. Remove friction and you will reduce some of your expenses related to fuel, not to mention expenses for maintenance and repairs of your engine caused by damage caused by use.

## HOW CAN I PROTECT MY OIL?

Flex-O Canada has a solution. ECO DTM (stands for Differential, Transmission, Motor) and ECO STABIFLEX are designed to protect the oil and its stability at higher temperatures, enabling your engine to function more efficiently according to determined specifications.

By enabling your engine to work with less friction, it will generate less heat. The oil will also benefit from the “shield” crated by ECO DTM or ECO STABIFLEX, and it will keep working with optimal efficiency. You will save money for fuel and maintenance and reduce harmful substances in exhaust gases.

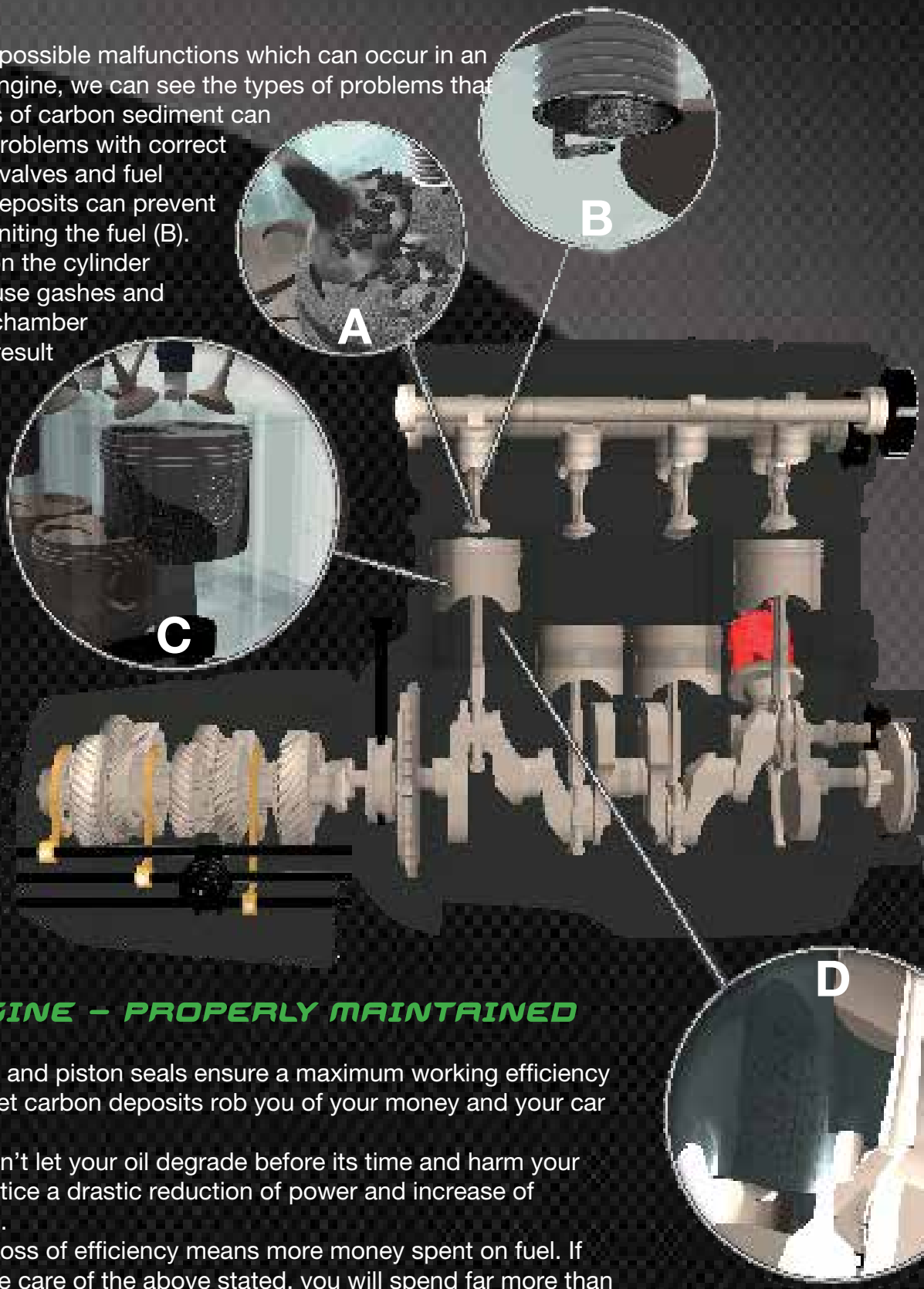
ECO STABIFLEX™

ECO DTM™

# WHAT HAPPENS?

## VISUAL DEPICTION OF THE PROBLEM

In the depiction of possible malfunctions which can occur in an UNMAINTAINED engine, we can see the types of problems that can arise. Deposits of carbon sediment can create numerous problems with correct sealing of exhaust valves and fuel valves (A). These deposits can prevent sparkplugs from igniting the fuel (B). Deposits created on the cylinder pistons (C) can cause gashes and small holes in the chamber walls (D). This will result in a decrease of work efficiency and can lead to catastrophic and irreversible damage. Also, you will need to use more fuel in order to get where you are going to. All this means only one thing: more expenses for your vehicle.




## CLEAN ENGINE – PROPERLY MAINTAINED

**Seals -** valve seals and piston seals ensure a maximum working efficiency of your car. Don't let carbon deposits rob you of your money and your car of horsepower.

**Oil efficiency -** Don't let your oil degrade before its time and harm your engine. You will notice a drastic reduction of power and increase of maintenance costs.

**Fuel efficiency -** Loss of efficiency means more money spent on fuel. If your neglect to take care of the above stated, you will spend far more than necessary to get to your destination. Don't spend more than you need! Keep your engine clean!

ECO pill ECO STABILFLEX™ ECO DTM

www.flexoeco.com

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