

TECHNICAL TRAINING

Our company's presentation

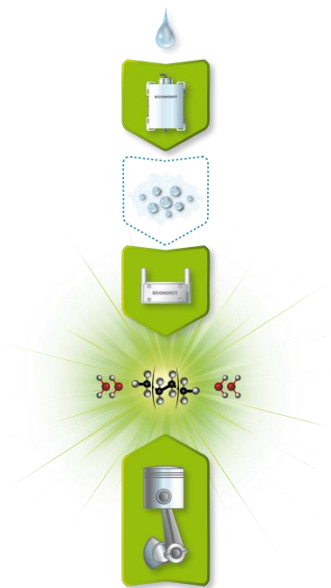
The Company UBIQUITY is a French company created in 2008 which insures the promotion and the exclusive distribution of all our ECONOKIT products around the world. It was able to quickly prove the efficiency of its system allowing the reduction of fuel consumption as well as and foremost the reduction of the emissions of polluting gases of combustion engines and therefore sale and develop its products around the world.

Our products are compatible with all types of combustion engines equipping numerous machines of everyday life of private and professional people (cars, trucks, bus, agricultural machines, handling machines...).

Contact us:

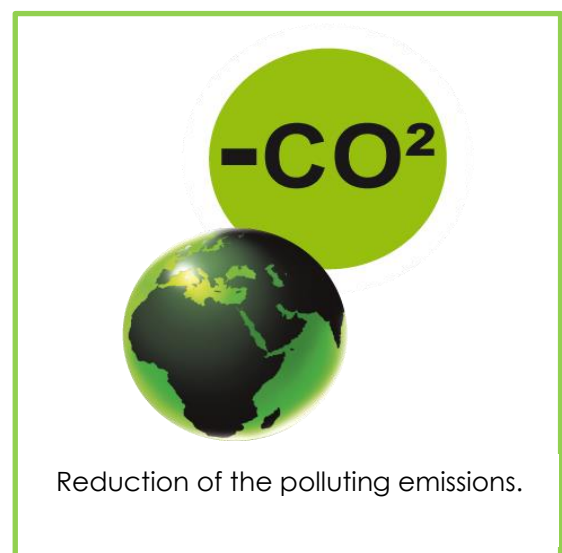
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Presentation of Econokit's system



The process used by Econokit's system is simple: **modify the composition of the air admitted** in the engine, necessary for the combustion of the fuel **without modifying the engine**.

The engine needs these two elements to work: fuel (diesel, gasoline) and combustive (oxygen from air). Econokit intervenes on the second component: **it transforms the humid air, produced in the bubbler, into polarized gas (that we mixes up with the air sucked by the engine), with the aim to optimize the fuel combustion and therefore improve the engine's efficiency.**



1. The principle of Econokit



The specific conception of the diffuser inserted in the air admission hose of the engine creates a suction effect. This one has for effect to create an aspiration throughout the entire Econokit's circuit which entry is below the bubbler. By passing through the water, the air created has a "bubbling" effect (it does not boil) which combined with the heat produced by the heating probe creates an artificial fog. This humidified air is then sucked into the reactor which, with the heat effect, transforms it into gas (steam). The specific alloy in the reactor polarizes this gas which is then taken to the combustion chamber through the air admission.

This modification of the admitted air to the combustion chamber allows a better burning of the fuel. The engine needs therefore less fuel to develop the same power, so the consumption is reduced in the case of identical use of the engine.

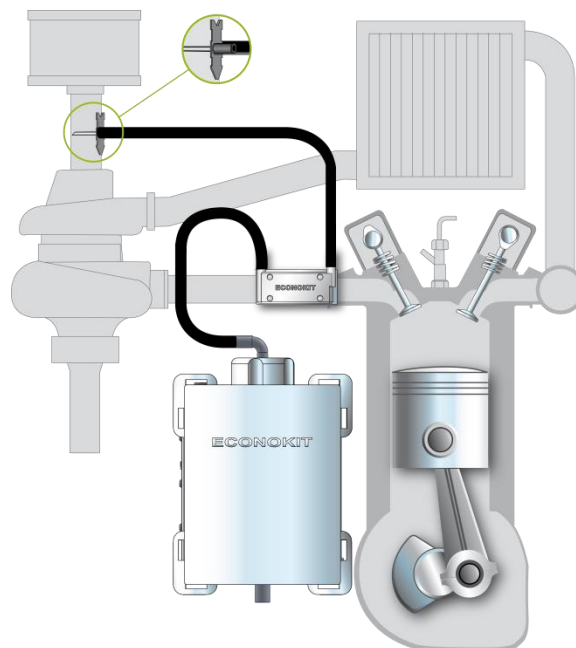


Diagram 1 – Installation of Econokit

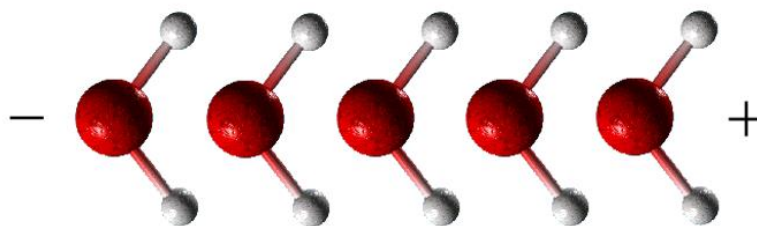
2. The effects of Econokit in details

The polarized gas at the exit of the reactor has two different actions:

- First, the addition of steam in the combustion chamber has for effect to reduce the global temperature of this one. A raised temperature being a catalyst for the oxidation of the nitrogen, it lowers the production of NO_x .
The oxygen which is not used for the oxidation of the nitrogen becomes available for the oxidation of the carbon chains of the fuel (we're talking about combustion). The combustion is therefore improved by reducing the un-burnt fuel (HC), while reducing the production of CO and fine particles in the diesel engines.
- How does the polarization of the molecules of water work on the carbon chains of the fuel:
 - The specific conception of the reactor allows the distortion of the electronic cloud while the water molecule passes through it. The water molecule being a natural dipole, it increases this already existent polarization.



- At the exit of the reactor, we therefore find a highly polarized molecule but still electrically neutral. The positive pole is insured by the Hydrogen side (H) of the molecule where as the negative pole is located on the Oxygen (O). The conglomeration of these molecules increases the polarized effect.



- The molecules of fuel being long carbon chains associated with hydrogen atoms (Diesel: $\text{C}_{16}\text{H}_{34}$ - Gasoline: C_8H_{18}), they tend to fold back on themselves. This fold-back is unfavorable for the combustion. It is possible to imagine this with a sheet of paper. When you crease it and we try to consume it, its combustion will be slow and superficial. If you do the same action with a flat paper sheet, the combustion will be faster and total. The idea is the same and the unfolding of the carbon chains will be done by addition of the polarized molecules of water.

- Therefore, by increasing the availability of the oxygen for the combustion and by unfolding the fuel molecules, Econokit allows a better combustion of the gasoline or diesel. This has for effect a diminution of the rate of un-burnt fuel, polluting components that the CO, and the NO_x as well as fine particles. Furthermore, the augmentation of efficiency of the combustion supplies more power with the same quantity of fuel injected. Therefore, a diminution of consumption, and CO₂ and the augmentation of the engine torque.

3. The different components of Econokit

3.1. THE KIT:

- An ECONOKIT reactor



This is the key piece of the Econokit. The reactor is in charge to use the heat produced by the engine by being fixed preferably on the exhaust manifold (the warmest piece of the engine). So that it has an optimum efficiency, the reactor must reach at minimum 200°C. The collected heat allows the humid air created in the bubbler to be transformed into polarized steam while passing through the reactor.

At the exit of the reactor the polarized steam is then taken to the combustion chamber of the engine through the air admission circuit.

- The gasoline diffuser

The gasoline diffuser creates the necessary aspiration for the Econokit's function. It is directly inserted into the air admission system of the engine.

It is used in the Econokit's installation on a gasoline engine. The connection is done preferably on the canister's hose (mechanism of recovery of fuel steams from tank) or otherwise on the crank-case breather (recycling of oil steams due to the engine's functioning). These two hoses are in aspiration which is primordial for the good functioning of Econokit. They can be spotted by looking for the gas' opening shutter because they are always located behind it, the canister is also always connected to a solenoid valve. The connection is done in force and doesn't need any before-hand drilling.

On the contrary to a diesel engine, with a gasoline engine it is not necessary to create a suction effect. Indeed, due to its conception, the gasoline engine works with an important aspiration which is moreover more powerful at low revs than at high revs.



It is eventually possible to re-cut the needle of the diffuser with the help of a metal-saw when the hose of the canister has a too small diameter. But it is important to keep the same level at the exit of the diffuser.

➤ The diesel diffuser

The diesel diffuser will allow, due to its conception, the creation of a vacuum effect which creates an aspiration in the entire Econokit circuit.

The installation of the diesel diffuser is done directly on the air admission tube, in ideal 5 to 10cm before the turbo if there is one, if not as close to the air entry of the engine. It is essential to drill a hole of 16mm-diameter to ensure the passage of the diffuser.



Careful, it is crucial to remove the air admission hose before drilling a hole in it; so that the shavings from the drilling won't be sucked into the turbo.



The diesel diffuser is divisible. In the case of an admission hose with a diameter less than 80mm a cut will be needed following the marking. Otherwise, the diffuser can be used as is.



The minimum aspiration to ensure the functioning of Econokit on a diesel engine is of 120 millibars. It is advised before installation to measure this value inside the air admission tube using an aspiration manometer for example.



Do not block more than 25% of the air admission hose with the diffuser and its deflector.

➤ The silicone hose

The hose supplied in the package is 2-meters long and is used to connect the bubbler and the reactor, and the reactor to the diffuser. The chosen material in the conception is silicone which resists to a temperature of 250°C.



The silicone hose is heat-resistant but cannot be in contact with a metal piece of the exhaust for example. Indeed, these pieces can reach temperatures above 250°C and therefore melt the hose.



It is to be noted that the lengths of the hoses connecting the different components to the reactor must be as short as possible especially the length reactor/diffuser.

A silicone hose

A set of ties

A set of fixating metal rings

A metal clamp

A BUBBLER

In addition to the package described before, another component has an essential role for the functioning of Econokit: the bubbler.

Depending on the engine to be equipped, you can choose the most adequate bubbler. The choice is between two products, the bubbler S and the bubbler L. Please, note that the bubbler contains a floater which slides on the stalk connected to the air entry. Do not remove the floater. Its role is to maintain the necessary water level constantly. Indeed, it immerses 2 cm exactly and allows the steadiness of the bubbling no matter the water level in the bubbler.



It is important to never exceed the maximum water level. If you do, there will be a siphon effect which will empty the bubbler entirely.

Bubbler S: the bubbler S is advised for an installation of Econokit on a vehicle, like a car, where there isn't much available room under the hood. The difference between the two bubblers is its volume. The bubbler S contains around 600ml.



Or

Bubbler L: The bubbler L is advised in the installation of Econokit on a vehicle, like a truck, bus, tractor...where there is room to place the bubbler. The bubbler L contains around 1500mL and can be combined with the option « additional bubbler ».



The accessories

The heating probe

It heats up the water at an ideal temperature. It is advised for the use of Econokit in cold countries during winter. The heating probe is screwed on top of the bubbler and maintains the water at a temperature between 25 to 45°C to ensure an optimum relative humidity for the functioning of Econokit.



The probe auto regulates. It is important to understand that it is designed to maintain the water between 25 and 45°C only during usage (when there is bubbling).

The probe is plugged on an after-contact electrical beam which can be found using a multi-meter. You can plug it on a fuse of fusible 15A 20A present in the fuse box to protect the probe from an eventual overvoltage.



A prolonged use of Econokit without water in the bubbler can damage the floater inside the bubbler.



Make sure to remove the probe in summer when the temperatures are above 25°C.

The deflector

The deflector is an accessory that can be added on the diffuser in the case of insufficient bubbling for diesel engines. In order to control the bubbling you can run the engine in neutral and press on the gas pedal. The bubbling should happen normally around 1800 turn/min minimum (see details Page 12, paragraph 1.4 Verification of bubbling).

This piece has for effect to increase the necessary surface of the diffuser to get a more important vacuum effect and therefore increase the necessary aspiration for the good functioning of Econokit.



In the case of the installation of a deflector it is essential not to block the air admission tube more than 25% of its section to avoid an aspiration too important of the vapors from the air valves, which can cause a racing of the turbo till it brakes.

The deflector is only installed in tubes that are at least 10 cm of diameter. Although this rule is not a sufficient condition.

3.2. The options

To level up with the necessities of adaptation depending on the places of the use of Econokit, we have two options. These different options are detailed in the following paragraphs.

3.2.1. Anti-dust Option

Dust is an enemy of Econokit. Indeed, if the air sucked in is full of dust, the water will be used as a filter and will be filled with dust quickly until it turns into mud and therefore, block the aspiration. You can counteract this fatal effect with additional silicone hoses as well as a spoon-piece.



The goal here is to catch the air beforehand filtered by the air filter in the engine equipped with the spoon. To do that, you fix the spoon before the diffuser; the ideal would be to keep a filter between the diffuser and the spoon. Don't forget to check the airtightness of the assembly.

You then connect this piece to the air entry of the bubbler (at the bottom) using the supplied hose.

3.2.2. Option for additional bubbler

In certain cases, a bubbler might not be enough and it can be interesting, even necessary to increase the autonomy of the system. So each bubbler L has a threaded bore which allows it to be connected to a second bubbler using fitted nozzles and hoses supplied by us.



4. The different steps for set-up

To be able to install Econokit properly, it is recommended to read the instructions supplied with the kit and to refer to the following steps:

- Fixation of the silicone hose on the reactor with tightening of the clamps.

- Installation of the heating probe on the bubbler: unscrew the cap intended for this use, then screw on the probe while making sure of the airtightness of the assembly.
- Installation of the diffuser:
 - On a diesel engine, remove and drill a hole in the air admission hose using a drill of 16mm diameter. Then, insert diesel diffuser (with the arrow pointing towards the air flow).
 - If the diameter of the hose is less than 80mm make sure you cut the diffuser following the marking on it.
 - On a gasoline engine, you can force in the gasoline diffuser on the canister or crank case breather.
 - In the case of a turbo gasoline engine, you can refer to the assembly of a diesel engine.
 - Then, tie-up the diffuser with the ties supplied in the kit while making sure of the airtightness of the assembly.
- Set-up of the reactor on the exhaust manifold, the exit of the turbo or the exhaust line. You fix it with the metal clamp supplied.



The minimum temperature of functioning of the reactor is 200°C. It is therefore essential to fix it on the hottest point of the engine (between 250°C and 350°C. That is why it is preferable to install the reactor on the exhaust manifold.

- Reassembly of the air admission hose if it had been removed.
- Place the bubbler (S or L) as close as possible as the reactor and fix it with the supplied strips with scratches. Make sure that the window is visible to verify bubbling and water level.



It is essential to let the maximum space at the air entry of the bubbler underneath it not to interfere with the aspiration.

- Cut the silicone hose in two and connect to the diffuser at one side and to the bubbler at the other side. There is no direction to follow.
- Connection of the heating probe on a 12V after-contact (or with the use of a relay) or 24V depending on the battery coupled with the engine. Don't forget to add a 15A fuse in the case where you won't connect on an existing fuse. The connection to the ground is of course necessary.
- Verification of the bubbling
 - For a car engine equipped with a turbo, the bubbling should appear at around 1800 turn/min.
 - For a gasoline engine, the bubbling should appear as soon as you slow down.
 - For all the other types of engines, it is important to have bubbling at the regular using pattern. For example, a truck's bubbling should appear around 800 turn/min.

4.1. The critical phases of the installation



In the case of the installation of a deflector, never block the admission tube more than 25% of its section. It could damage the turbo.



Avoid fixing the diffuser before the air rate meter so that it doesn't disrupt its measures, which can cause engine's anomalies and contrary effects to which we are aiming for by using Econokit.



Don't forget to locate the crank case breather before installing the diffuser. You have to be as far as possible from it not to have oil in the silicone hoses or the bubbler.



Never insert anything but demineralized water or filtered rain water in the bubbler not to damage the reactor.



No Econokit silicone hose should ever be in contact with an engine hot piece like the exhaust manifold, the turbo or the exhaust line. You might need to isolate these hoses in order to protect them.