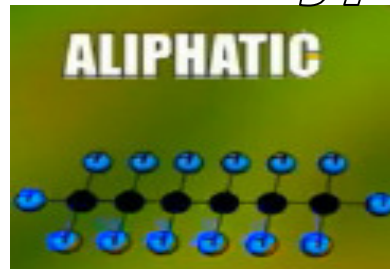
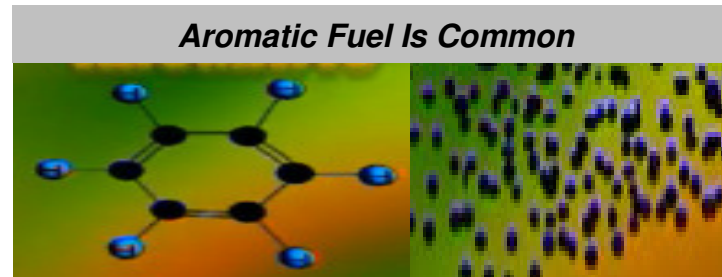


Types Of Fuel



Carbon Dioxide + Water



Carbon Dioxide + Water + Carbon

Higher Octane > Higher Carbon

Understanding Hydrocarbons & Carbonization

The gasoline burned in an engine contains many chemicals, however, it is primarily made of hydrocarbons (also referred to as HC). Hydrocarbons are chemical compounds made up of hydrogen atoms which chemically bond with carbon atoms. There are many different types of hydrocarbon compounds found in gasoline.

Inside an engine the hydrocarbons in gasoline will not burn unless they are mixed with air. Air is composed of 21% Oxygen (O₂), 78% Nitrogen (N₂) and minute amounts of other inert gases like Argon (Ar), CO₂, HC, NO_x, SO₂ and others.

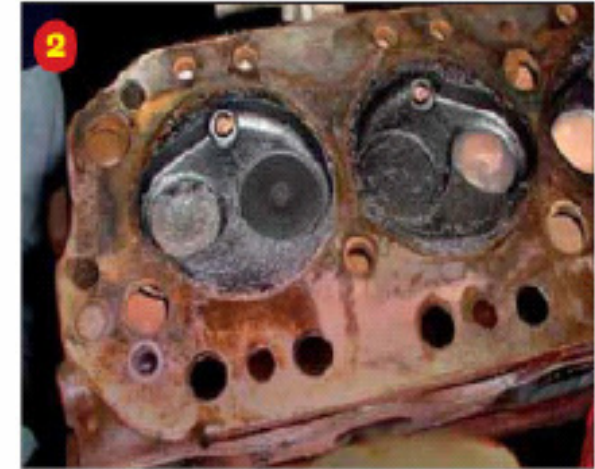
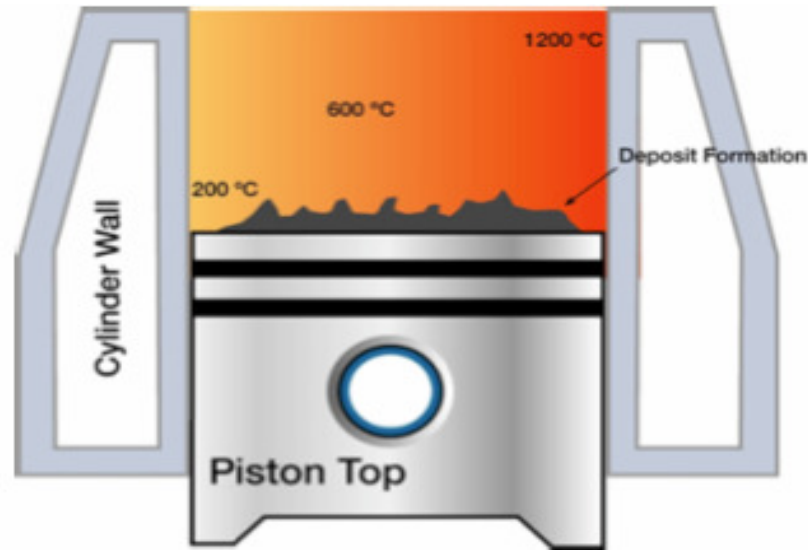
Hydrocarbons in fuel normally react only with oxygen during combustion process to form water vapor (**H₂O**) and carbon dioxide (**CO₂**), creating the desirable effect of heat and pressure with the cylinder. Unfortunately, under certain engine operating conditions, the oxygen also reacts with the nitrogen to form nitrogen oxides (**NO_x**), a criteria air pollutant.

The ratio of air to fuel plays an important role in the efficiency of the combustion process. The ideal air/fuel ratio for optimum emissions, fuel economy, and good engine performance is around 14.7 pounds of air for every pound of fuel. This "ideal air ratio" is referred to as stoichiometry or Lambda of 1.0, and is the target that the feedback control system constantly shoots for.

At air/fuel ratios richer than stoichiometry, (Lambda < 1.0), fuel economy and emissions will suffer. At air/fuel ratios leaner than stoichiometry (Lambda > 1.0), power, drivability and emissions will suffer.

Max-Zone Action #1, #2 & #3 ensure most of the hydrocarbons are burnt, leaving minimum carbon deposits. **Action #4** turns the +30,000V ignition to plasmatic which will dissolve the carbon deposits to be exhausted by the exhaust valves. Thus all the combustion chambers interior surfaces are cleaned, including cylinders, pistons, spark plugs, intake and exhaust valves and injector nozzles.

Carbon Deposits In Chamber



Photos courtesy David Strickland

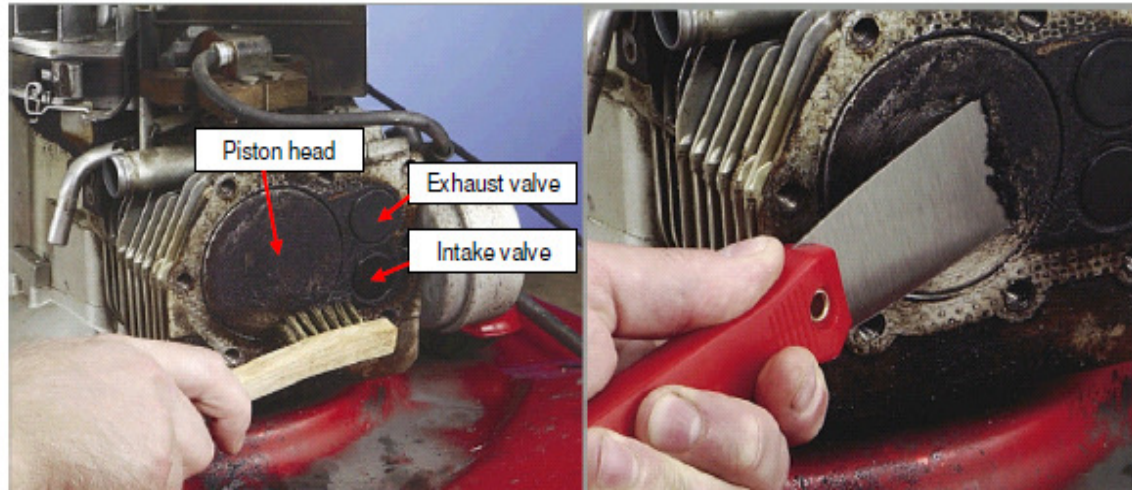
Because of the impurities in petroleum-based fuels, carbon deposits form along the surfaces of the combustion chamber, which will not combust at temperatures lower than 600°C. This becomes a problem because the surfaces of the combustion chamber stay cooler than 600°C, which means that these deposits will not burn off by themselves.

These deposits are the problem. They are what cause your fuel mileage to drop over the life of your vehicle, they are what cause you to have to use higher octane fuels, they are the primary cause of automotive emissions, they are what cause your motor oil to get dirtier faster, they are what plug up your fuel injectors, and they are what cause a decline in overall engine performance.

Above is a diagram of a combustion chamber, where as you can see, the areas around the Piston Tops and Cylinder walls are relatively cooler. *These are the areas where impurities tend to build up and form deposits.*

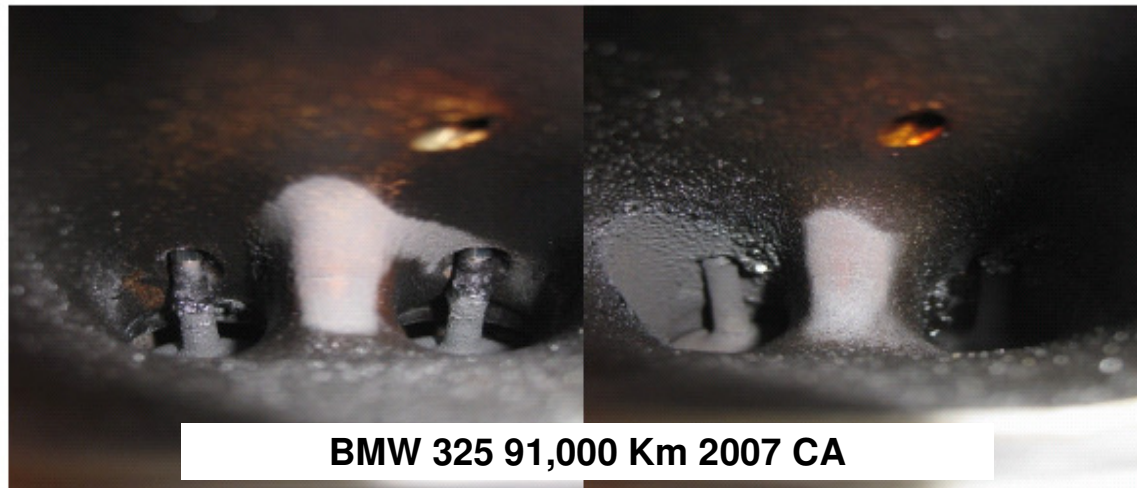
Carbon deposits are inherent and are cumulative, over time the engine may loss up to 20% efficiency.

Carbon Deposits In Chamber



Brushing may remove light deposit

Observe how thick is the carbon deposits

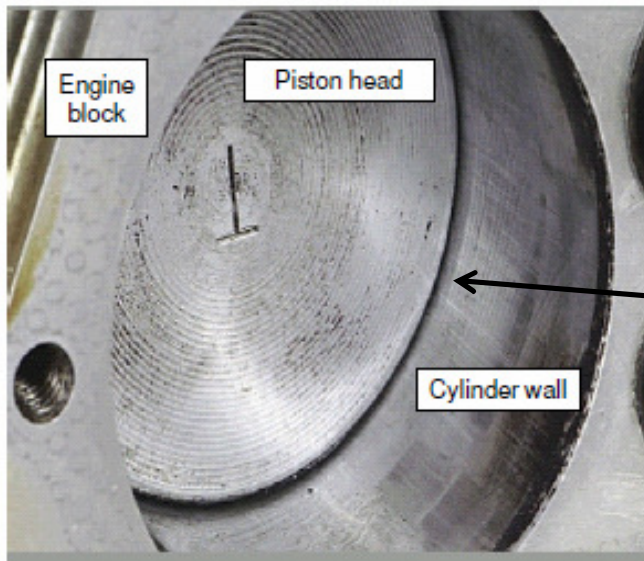
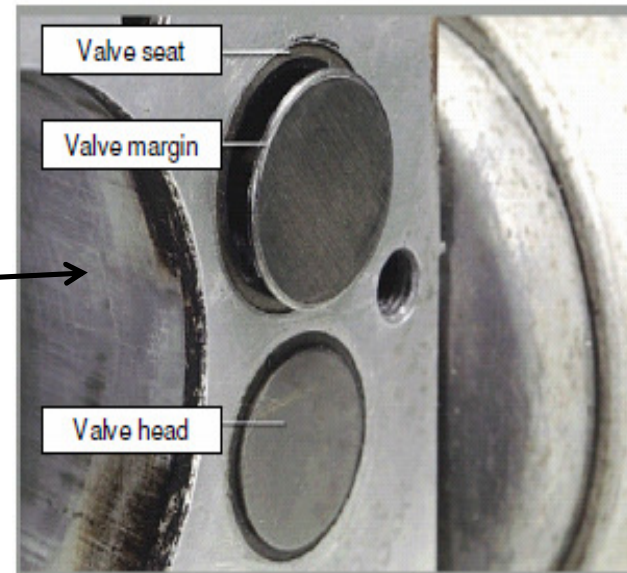


Intake N Exhaust Valves Open Position

Intake N Exhaust Valves Close Position

What Happens When Chamber Is Carbonized

When valve seat and valve margin of Intake valve has carbon deposits (carbonized) it cannot close properly causes erratic air-fuel mixture leading to erratic Lambda control, misfire and high carbon deposits. Somehow engine noises increased. Engine performance suffers.



When piston head and cylinder wall have carbon deposits, friction between these components causes increase engine noises, increase temperature, increase fuel consumption, Increase emission and power loss. **Cost of ownership increases.**

Max~Zone DeCarbonization

How Plasma Cleaning Works

Plasma cleaning removes organic contamination from surfaces primarily via chemical reactions with physical ablation being secondary. During cleaning the plasma species react with the surface, resulting in contaminant being "lifted off". In the case of **oxygen plasma**, excited oxygen species decompose low molecular weight organic molecules breaking the **C-H** and **C-C** bonds to form water vapor and **CO₂** which are then evacuated from the chamber via the vacuum pump. Continual replenishment and elimination of the gas eliminates cross contamination.

Plasma works by converting gas atoms into ions and radicals. High frequency magnetic fields oscillate gas atoms into a frenzy, both breaking bonds and producing a luminescent glow. The ions and radicals then do all the work. Oxygen ions and radicals are very effective cleaning agents. The cleaning process involves the oxygen gas ions and radicals reacting with the hydrocarbons inside the chambers. These reactions yield **H₂O, CO, and CO₂** that are then removed from the system by the vacuum pumps.

Oxygen plasma is an effective, economical, environmentally safe method for critical cleaning. The VUV energy is very effective in the breaking of most organic bonds (i.e., C-H, C-C, C=C, C-O, and C-N) of surface contaminants.

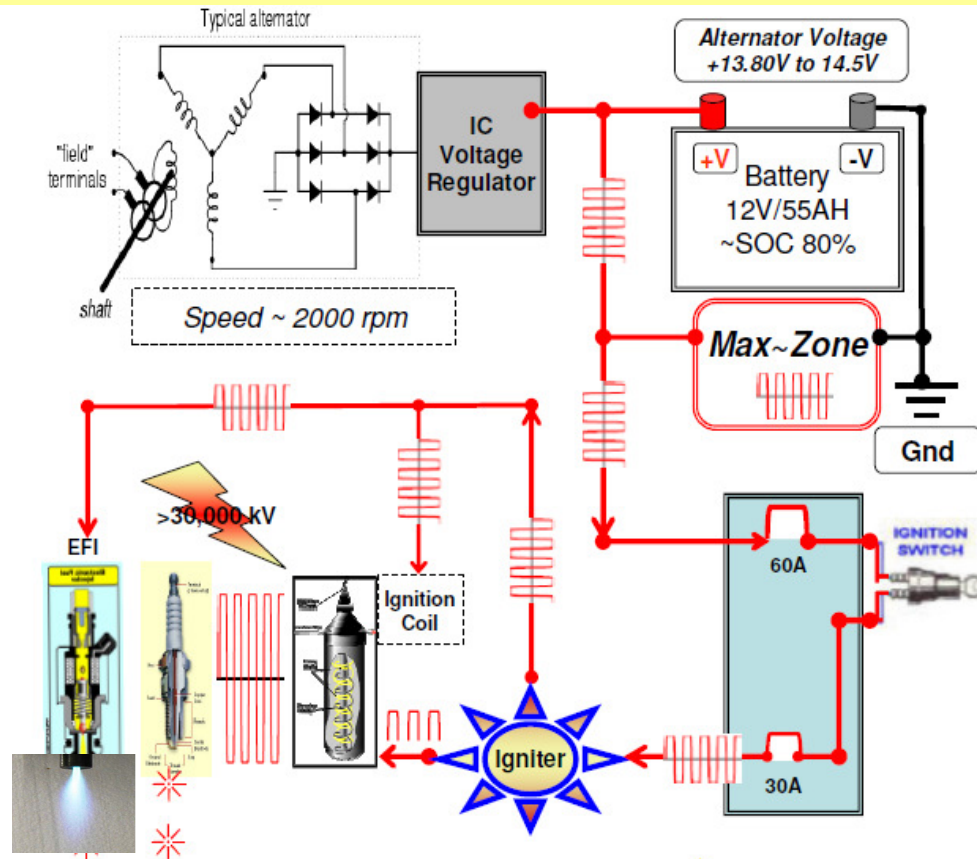
This helps to break apart high molecular weight contaminants. A second cleaning action is carried out by the oxygen species created in the plasma (O₂⁺, O₂⁻, O₃, O, O⁺, O⁻, ionised ozone, metastably-excited oxygen, and free electrons).

These species react with organic contaminants to form H₂O, CO, CO₂, and lower molecular weight hydrocarbons. These compounds have relatively high vapour pressures and are evacuated from the chamber during processing. The resulting surface is **ultra-clean**.

The above paragraphs are extracts from various articles in the semiconductor net, oxygen plasma cleaning is mandatory in its assembly process.

Max~Zone Actions #4 creates an oxygenized plasma ignition that has the same characteristic as described above. Evidence of this actions are shown, herein.

Max~Zone Action #4 DeCarbonizes



Plasmatic Ignition

Max~Zone causes ignition to be plasmatic that decarbonizes pistons, spark plugs, intake and exhaust valves, injector nozzles, and interior surfaces of the combustion chambers.

How Plasma Cleaning Works

Plasma works by converting gas atoms into ions and radicals. High frequency magnetic fields oscillate gas atoms into a frenzy, both breaking bonds and producing a luminescent glow. The ions and radicals then do all the work. Oxygen ions and radicals are very effective cleaning agents. The cleaning process involves the oxygen gas ions and radicals reacting with the hydrocarbons inside the chambers.

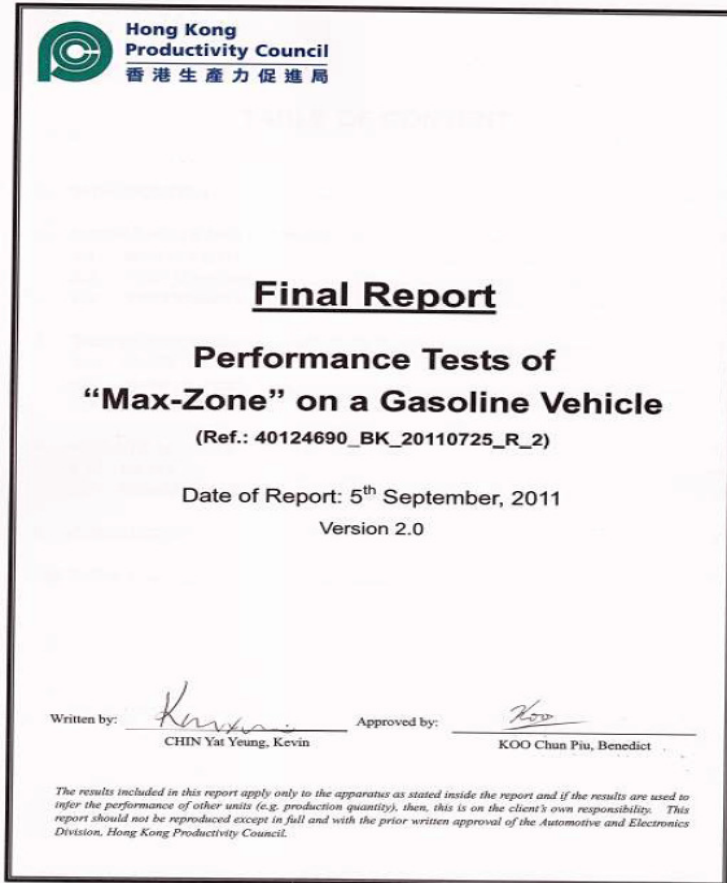
These reactions yield **H₂O**, **CO**, and **CO₂** that are then removed by the exhaust cycles.

An oxygen plasma is highly effective in removing hydrocarbon contamination. The disassociated oxygen created by the plasma chemically reacts with the hydrocarbon material present on the object being processed, converting it to CO, CO₂, and H₂O, which are evacuated by the vacuum system.

Extract from Mat. Res. Soc. Symp. Proc. Vol. 523 Q 1998 Materials Research Society

Max~Zone Action #4 Plasma DeCarbonizes

Mr. Loh Pong Tuan, Managing Director of Equipment Engineering Pte. Ltd, Singapore (hereinafter named as “the Company”) invited HKPC (hereinafter named as “the Council”) to submit a proposal for evaluating their product – Max-Zone (hereinafter named as “the Test Sample”).



Hong Kong Productivity Council with Equipment Engineering Pte Ltd engaged Environmental Technology Consultants HK Ltd to conduct tests for emission, fuel economy, engine noises and decarbonization in Toyota WISH with Max~Zone over a 6 day period. Next page shows the decarbonization result.

Max~Zone Action #4 Plasma DeCarbonizes

Toyota WISH DeCarbonization Result

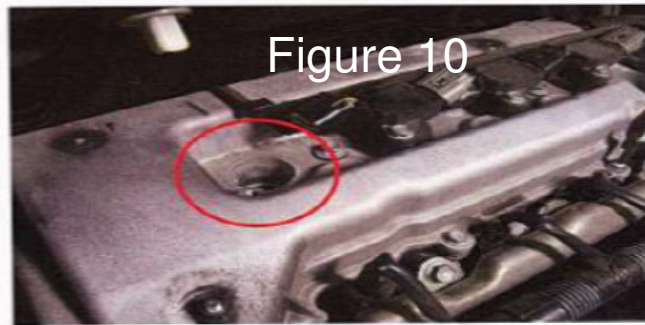
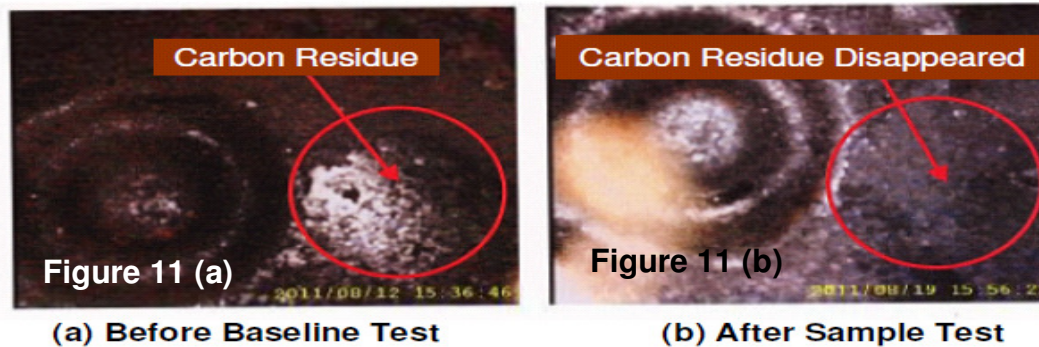


Fig 10. Entry for endoscope



(a) Before Baseline Test

(b) After Sample Test

Figure 10 and Figure 11 shows the location for endoscopic inspection inside an engine cylinder of the Test Vehicle and the condition inside the cylinder respectively. It could be observed that the carbon residues were removed after applying the Test Sample.

Figure 11 Comparison of the Condition inside an Engine Cylinder of the Test Vehicle between (a) Before Baseline Test and (b) After Sample Test

Figure 11, Fig (a) photo was taken on 2011/08/12 without Max~Zone Fig (b) was taken on 2011/08/19 after Max~Zone

Emission & Decarbonization Reports

Max~Zone Hong Kong Business Associate

Mercedes Benz S300 3 Years Old

BOSCH Emission Test

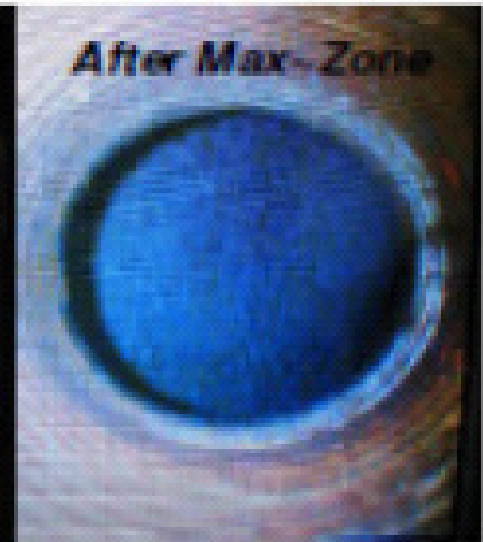


BOSCH ETT 855 /861

Endoscope Piston Inspection



*Pentax Endoscope
through spark plug socket*



Mercedes S300 DeCarbonized Within 45 Minutes At 2000 RPM

Report in next page

Max~Zone Hong Kong Associate CM Green

案例二：易跑王助蓝鸟车主彻底清理积碳

长沙某4S点一台行驶了八万一千公里的蓝鸟汽车，在安装易跑王汽车匹配器之前，拆下火花塞通过内窥镜观察缸内积碳十分严重。安装了易跑王之后，经过汽车匹配仪半个小时的匹配工作，再拆下火花塞通过内窥镜进行观察发现，缸内积碳已经被清理干净，在场工作人员及车主都感到十分震惊。

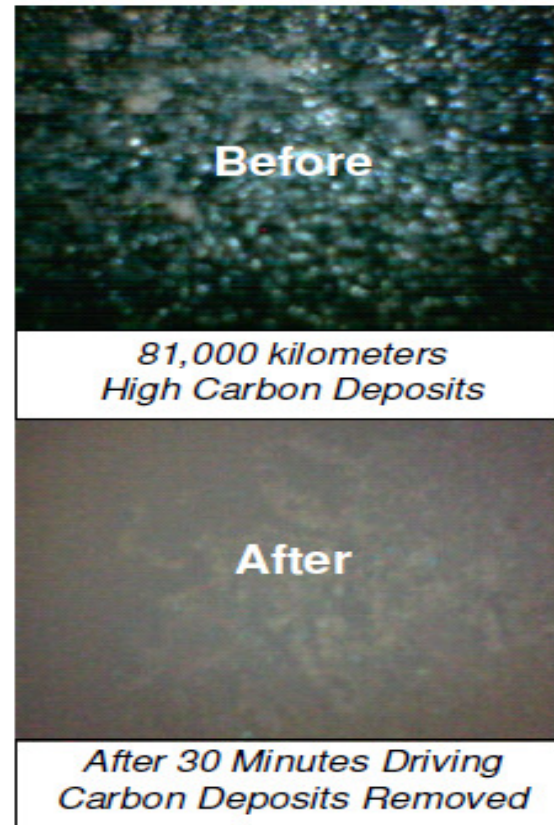
内窥镜观察（安装易跑王之前，积碳严重）



内窥镜观察（安装易跑王之后，积碳清除

Endoscopic observation showed
carbon deposits removed

来源：易跑王汽车匹配器官方网站
Source: Wang Yi run car matcher



Before

81,000 kilometers
High Carbon Deposits

After

After 30 Minutes Driving
Carbon Deposits Removed

Max~Zone~GTS-4 Emission & Decarbonization Report

Mercedes Benz S300 3 Years Old

*This is an extract from the finding on the testing of **MMB**. Objective of the test is to prove beyond reasonable doubt on the numerous claim made by the product supplier who incidentally is a MB independent distributor in Hong Kong. Test is twofold and sufficient to expand into many sub-categories for further investigation. It must be read in conjunction with the attachments.*

Emission: Test was carried with a Bosch ETT 855 / 861, the test was carried on 06.11.2010 at 60 minutes interval. At 11.31 hr tests was carried out on tailpipe emission without MMB. With engine shut down, product MMB was installed and engine restarted to run continuously for 45 minutes at 2000 rpm. Thereafter tailpipe emission was taken again @12.33 hr.

*De-carbonization: An endoscope was used to take picture inside the combustion chamber thru the spark plug hole. One was taken before the commencement of test (**w/o MMB**) and the other taken after the test (**with MMB**). Our initial scepticism that a small device can remove carbon accumulation in the combustion chamber has proven us wrong.*

1) Emission

- CO (Carbon Monoxide) reduce from 80ppm to 40ppm, **a 50% reduction.**
- CO₂ (Carbon Dioxide) increase from 149K to 150K ppm, indicate effective combustion and in today's measurement criteria considered good by USEPA.
- O₂ (Oxygen) reduce from 1700ppm to 600ppm, indicate effective combustion, **64,7% reduction.**
- HC (Hydrocarbon) reduce from 8ppm to 2ppm, again indicate effective combustion, **75% reduction.**
- Lambda down from 1.007 to 1.003 which is very close to ideal range

2) De-carbonization:

The above photos are evidence of carbon removal from the combustion chamber after the installation of MZ~GTS-4.

Report Summary

It is quite clear from the test that MZ~GTS-4 is capable of enhancing the engine's performances as stated by its supplier. From the emission test result it can be seen that the device has been able to bring the engine to a near perfect combustion which equate thus:

*Fuel (hydrocarbons) + Air (Oxygen + Nitrogen) *Combustion* = CO₂ + Water + Nitrogen as against a Typical Engine Combustion:*

*Fuel (hydrocarbon) + Air (oxygen and Nitrogen) *Combustion* = Unburned hydrocarbon + Nitrogen Oxides + Carbon Monoxide + Carbon Dioxide + Water*

The other most convincing aspect of the test is the Lambda drop from 1.007 to 1.003 which is close to perfect engine combustion of stoichiometric 1. All of these reading indicate that with the installation of MMB, one can safely confirm with a certain amount of certainty that the improvement is quite obvious and warrant further investigation.

MMB IS EQUIVALENT TO MAX~ZONE

Max~Zone Hong Kong Associate CM Green

3 Element Catalyst Comparison



At 100,000 km, Max~Zone was installed. Car was driven to 180,000 km. Endoscope showed **NO** carbon deposit.

At 100,000 km, Endoscope showed carbon deposit.

Chemical DeCarbonization



Chemical decarbonization is an acceptable process.

It is recommended for every 20,000 km.

Unfortunately due to carbon deposits are inherent and accumulative, clean engine will start to carbonize after the chemical treatment.

Engine performance gradually deteriorates before it reaches next treatment schedule.

You think chemical decarbonization is compatible to Max~Zone?



Do U Still Need Chemical DeCarb When U Have Max~Zone?

Max~Zone 4th Generation DeCarbonization

Max~Zone Action #4 creates an oxygenized plasmatic condition that break-up the carbon deposits in the combustion chamber that are formed on the surfaces of;

- **Intake valves**
- ❖ **Cylinder walls**
- **Piston heads**
- ❖ **Injector nozzles**
- **Spark plugs**
- ❖ **Exhaust valves**

*The dissolved carbons are exhausted during the exhaust cycles. Max~Zone continuously decarbonizes the engine while it is driven at 2000 rpm or higher, keeping the **chambers clean** resulting in;*

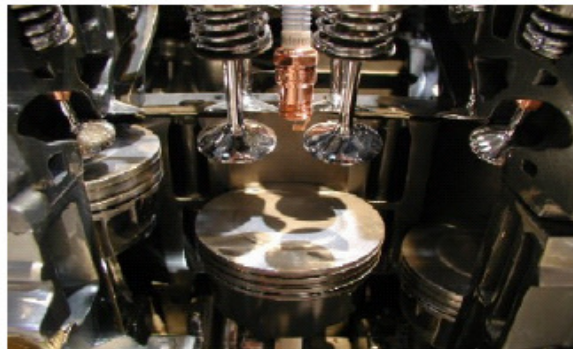
Less engine noises because cylinders/pistons are friction free, intake and exhaust valves open and close perfectly and lower engine heat.

Torque and power increased – smoother acceleration

Near complete combustion means better fuel economy with less carbon built-up and less pollution.

With Max~Zone connected across the battery, decarbonization process is a perpetual process when vehicle is beginning drive, carbon deposits are exhausted at each cylinder exhaust cycle – engine chambers are always clean.

Max~Zone wishes every MZ member's engine will be like this;



Happy Motoring

November 1, 2011