



## PRODUCT INFORMATION SHEET

### WYNN'S INJECT-A-CLEAN (AEROSOL)

Product Number: 71815 12 x 300 g

WYNN'S INJECT-A-CLEAN (AEROSOL) is a pressurised in-rail fuel injector cleaner, specifically formulated and packaged for use in the Wynn's Inject-A-Clean Kit (Part No. INJ2003), together with Wynn's Inject-A-Clean Bottle (Product No. 71821).

#### Advantages

The formulation of Wynn's Inject-A-Clean provides the following benefits:-

- Cleans fuel injectors of gums and deposits.
- Restores performance, smooth operation, and fuel economy caused by power-robbing deposits.
- Safe for use in leaded and unleaded petrol injected vehicles.
- Safe for use in vehicles equipped with catalytic converters, oxygen sensors, and other new fuel system components.
- Cleans and lubricates fuel injection systems.
- Removes combustion chamber deposits.
- Prevents rust and corrosion of the injection system.
- Convenient aerosol pack for use in the Wynn's Inject-A-Clean Kit.
- Disperses moisture in the rail and injectors.
- Will not damage paintwork if spilled.
- Lasts longer and is less labour intensive than other aerosol brands.

- No need to shake the aerosol can in order to maintain continuous delivery flow.
- Works in one application.
- No pre-mixing with petrol required.
- Ensures optimal combustion.

Wynn's Inject-A-Clean is formulated with the following components to give the above benefits.

- **Alcohols**  
The alcohols absorb condensation water present. These alcohols, completely soluble in petrol, progressively drag the water through the injection system.
- **Corrosion Inhibitors**  
The corrosion inhibitors prevent rust and corrosion, protecting the parts of the system.
- **Lubricants**  
The lubricants ensure an efficient lubrication of the costly parts of the system, such as the injectors, protecting them against wear. These lubricants, specially selected and highly refined, do not form carbon deposits in the combustion chamber.
- **Solvents**  
The solvents keep the injection system clean, especially the injectors, ensuring perfect vaporisation of the petrol. The result is optimal combustion.

### Applications

Fuel injected vehicles are becoming more and more common. Almost all new petrol-powered vehicles are equipped with some form of fuel injector system. A fuel injector delivers a controlled spray of petrol into the intake manifold of the engine, from which it is drawn into the cylinders by the action of the intake valves. The most popular arrangement is the multi-port fuel injector system in which there is one injector for each cylinder. There is also the throttle-body arrangement where a single fuel injector supplies all the cylinders, taking the place of the familiar carburettor. Fuel injector systems provide a more controlled supply of fuel to the engine, thereby improving engine efficiency, performance, and reducing emissions.

Unfortunately, certain types of petrol have been found to create deposits on the tips of fuel injectors. These deposits can reduce the amount of fuel delivered by the injector, and they can also adversely affect the spray pattern from the injector nozzle, which is essential to optimum engine performance. Deposits are particularly troublesome with multi-port fuel injector systems. Usually some of the injectors will plug worse than others, with the result that not all the cylinders will receive the same amount of fuel. The consequences are erratic engine performance, loss of power, stumbling, etc. These problems can occur after only 2400km of driving.

The most profitable and practical way of cleaning and maintaining injectors, is to use Wynn's Inject-A-Clean.

Wynn's Inject-A-Clean can be used with the Wynn's Inject-A-Clean Kit - refer to the Instruction Manual for the complete fuel injector cleaning system procedure.

### Directions

Unlike most aerosol can products, the propellant in this can does not mix with the product and so DO NOT SHAKE CAN prior to equipment preparation.

The aerosol can must be in the upside down (inverted) position prior to tapping the seal.

Attach the aerosol can to the can tap on the regulator, ensuring that the equipment is held in a vertical position.

When the seal in the valve is broken, tighten with the regulator as quickly as possible, but DO NOT OVERTIGHTEN.

Suspend the equipment (still inverted) from under the vehicle's open hood using the can holder, ensuring that the connection hose does not come in contact with the engine fan or moving parts, and is well clear of any exhaust component.

It is imperative that the can remains in an inverted position during the operating procedure.

## Typical Characteristics

Appearance	Clear Thin Liquid
Colour	Pale Yellow
Density @ 15°C	0.750 (ASTM D 4052)
Density @ 15°C	0.800 (Concentrate) ASTM D 4052
Flash Point (°C) Abel Cup	-30 (IP 170)
Boiling Point (°C)	30-200
Propellant	Compressed Air
Volatiles (% Vol)	95.0
Vapour Pressure @ 20°C (kPa)	750

## Fuel Injection

Electronic Fuel Injection was introduced to modern engines to help Automobile Manufacturers comply with exhaust emission laws established in most countries around the world.

Electronic Fuel Injection allows an Engine Management System or On-Board Computer to analyse an engines fuel needs and supply those needs at any given moment.

Sensors located at several points around the engine send information to the computer and then the computer calculates the fuel requirements for the engine and delivers the precise amount of fuel to air ratio, to the fuel injectors.

When a driver opens the Throttle Butterfly by depressing the accelerator pedal, air is sucked into the air intake system.

As the air passes an air flow sensor, the air flow sensor measures the volume of this air and sends this information to the computer.

The computer then calculates the amount of fuel required to enrich the air with a mixture of fuel, so that an air fuel ratio of 14.7:1 is achieved. This is 14.7 parts of air to 1 part of fuel.

The metered amount of fuel is then mixed with air via the fuel injector in the intake manifold just behind the intake valve, and then when the valve opens on the intake stroke, this fuel/air mixture is burnt in the combustion chamber thus creating power.

## Oxygen Sensors

Another critical sensor is the oxygen sensor located in the exhaust system. The oxygen sensor measures the amount of unburnt fuel passing its probe and should there be a presence of unburnt fuel the oxygen sensor will immediately notify the computer, which will reduce the amount of fuel delivery from the injectors to the engine, naturally decreasing the amount of unburnt fuel in the exhaust gases, thus reducing the exhaust emissions.

## Catalytic Converters

A catalytic converter looks similar to a muffler or silencer. Internally it looks like honeycomb and is constructed from precious metals. The role of the catalytic converter is to burn off any leftover fuel in the exhaust before it is emitting into the atmosphere.

It works simply like an afterburner; the precious metals absorb heat from the engine exhaust. This heat is retained and as the unburnt fuel passes through the converter the extreme heat burns this leftover fuel.

The introduction of unleaded petrol co-incided with the introduction of catalytic converters. This is because lead in super and regular petrol, is a lubricant for the upper cylinder area of the engine (valves) and adheres to the hot precious metals in the converter, and in a short period of time will destroy the converter. In some respects this also happens to the oxygen sensor.

Therefore it is important that any cleaning agents or fuel additives used should be compatible with oxygen sensors and catalytic converters.

## Fuel Injectors

Firstly, petrol is pumped from the fuel tank at a pressure of 200 kPa (around 32 PSI) to the fuel rail. The fuel rail allows pressurised fuel to accumulate and feed fuel to all the fuel injectors. The fuel passes from the rail to the injectors via a supply tube, then passes through a steel mesh screen, filtering out any particles smaller than 7 microns. The filtered fuel then awaits delivery behind the pintle. The pintle seats on the bottom of the injector acting as a tap. When fuel is required to be sprayed into the intake manifold, an electrical pulse is sent from the computer injectors. This pulse is a "measured" amount as a result of the computers calculations and the injector is electrically opened by a solenoid in the injectors.

As the injector opens, the fuel is released from the seat. The pressurised fuel hits a tapered surface and therefore sprays out of the injector, creating a fine mist of fuel to be mixed with the air.

The amount of fuel delivered is controlled by the duration of the electrical pulse - the more fuel required due to acceleration or higher speeds the longer the pulse will hold the injector open.

This pulse is measured in milliseconds, as this measurement indicates the metering is very accurate.

A fuel pressure regulator is necessary in the fuel system to perform two duties.

- The regulator contains a spring, diaphragm and a needle and seat type valve to release pressure which has been pre-set by the manufacturer at 200 kPa on most vehicles - refer to the Instruction Manual. Therefore should the fuel pressure build up and exceed 200 kPa, the regulator will automatically release the excess pressure through its valve and return the excess fuel to the fuel tank by way of a return line.
- When the engine is decelerating, no fuel is required by the injectors, so the rail is temporarily emptied to starve the injectors of fuel. This is achieved by a manifold vacuum. When an engine is decelerating, the manifold vacuum increases. This vacuum is applied to the diaphragm of the regulator and "sucks" the valve open thus returning all the fuel to the fuel tank.

The major problem with petrol is that it forms solid gum deposits that lodge in the injector filters, thus reducing the area in which petrol can freely flow through to the injector.

This gum settles on injector nozzles and in the presence of heat, the gum hardens. These deposits on the pintle will then cause the spray pattern of the injector to distort. The fuel will then not burn completely, as a distorted spray pattern will produce droplets of fuel too large to be completely burnt.

The oxygen sensor will in turn detect these unburnt particles of fuel and inform the computer that the fuel/air mixture is too rich and the computer will then make the engine run leaner. Of course at this stage a major performance problem has developed, as in theory the engine has been given the correct amount of fuel. This leaning off process has therefore been computed from false information. In other words the computer becomes confused.

As injectors tend to partially clog, fuel flow is reduced, however, not all injectors are effected evenly. A typical set of say four (4) injectors could range in flow from 100% efficient to say 60% efficient. Although the engine may not show any symptoms of this, the overall engine performance and efficiency would be averaged out.

Assume the injectors' flow rates were 100%, 80%, 70% or 60%, which would give an average engine performance and efficiency of 77.5% of maximum or a 22.5% drop in performance. Also the injectors uneven performance will give the engine uneven idling, similar to that of uneven compressions.

Hence injectors must be cleaned and kept that way. The most profitable and practical way of cleaning and maintaining injectors, is to use Wynn's Inject-A-Clean Aerosol in the Wynn's Inject-A-Clean Kit together with Wynn's Inject-A-Clean Bottle.