PRODUCT INFORMATION SHEET

WYNN'S EXHAUST GAS RECIRCULATION 3 AEROSOL & HIGH PRESSURE 3
Product Number: 23379 12193

Exhaust Gas Recirculation 3 –and High Pressure 3 - Tank treatments

- Instantly cleans the air intake system and inlet valves
- Cleans EGR valve
- Cleans injectors
- Assures good starting properties
- Restores stable idle and acceleration
- Provides optimal power, torque
- Lowers fuel consumption and exhaust emissions

1. INTRODUCTION

a) Why EGR in diesel engines?

Improved fuel systems combined with soot filters and/or catalytic converters reduce CO, HC and soot emissions. The improved fuel systems lead to poor fuel / air mixtures and lower fuel consumption. These mixtures result in higher combustion chamber temperatures and increased NOx emissions.
The EGR (Exhaust Gas Recirculation) system leads exhaust gases to the intake air manifold, enriches the mixture in the combustion chamber and decreases the internal combustion chamber temperature. This results in a reduction of NOx emissions.
Most cars meeting the EURO3/EURO4/EURO5 specifications are equipped with this system. It is used on all types of diesel fuel systems: in-line pumps, rotary pumps, common rail, pump injectors

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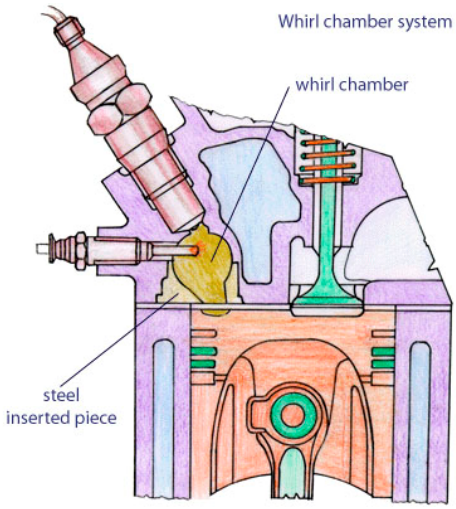
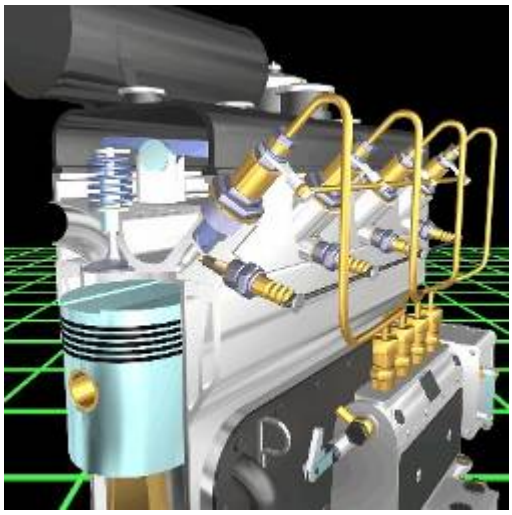
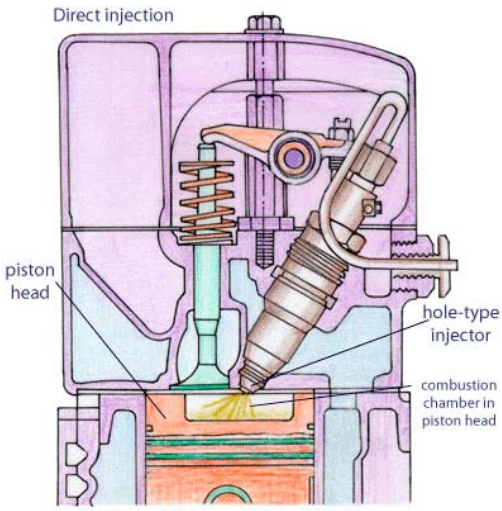
b) Diesel air intake manifold and inlet valves

In diesel engines there are 2 ways of injecting the fuel:
Indirect injection: The fuel is injected in a small pre-chamber. The combustion starts in this pre-chamber en continues in the combustion chamber. This system has a relatively simple construction. Piston heads are mainly flat. Injection timing is less sensitive. Injectors are single hole types. Injection pressure is low.
Due to heat losses in the pre-chamber, combustion is not that efficient. Power and torque are low, fuel consumption is high.
The longer available time for combustion results in lower engine noise.





Direct injection: The fuel is directly injected in the combustion chamber. This system has a more complicated construction. Piston heads have a special shape to create a poor fuel / air mixture in a short period. Injection timing is very sensitive. Multiple injections per stroke are possible. Injectors are multi-hole type, injection pressures are higher. Combustion is very efficient. Power and torque are high, fuel consumption is low. Engine noise is higher, but can be reduced with multiple injections.



2. PROBLEMS

a) Inlet valve position

Both systems inject in an area, after the inlet valve position. Injected fuel and cleaning products applied through the fuel systems do not reach the intake air manifold and inlet valves. These components cannot be cleaned through tank treatments or products applied through the fuel injection system.

b) EGR in diesel

The exhaust gases returned to the air intake manifold and inlet valves are hot and contain impurities like soot particles. This results in a large accumulation of carbon / tar like deposits in this area.
Leading to insufficient and irregular air flow. The fuel / air mixture is disturbed, which causes problems of engine operation.
The EGR valve also becomes very dirty. The opening distance is reduced and this can even lead to valve sticking.

c) Diesel air intake manifold and inlet valves

In **engines without EGR system** the air intake manifold and inlet valves will mainly dirty up by the oil from the PCV (Positive Crank Ventilation). So even engines without EGR, can have dirty inlet valves and air intake manifold.
In **engines with EGR system** the dirty exhaust gases will increase deposit formation in this area, on top of the fouling due to the PCV.
The fouling of the air intake manifold and inlet valves will lead to disturbance of the air management towards the combustion chamber.

d) The consequences for the driver are:

- Starting problems
- Irregular idle
- Lack in acceleration
- Loss of power
- Increased fuel consumption
- Higher exhaust emissions
- EGR system failure warning

3. SOLUTION

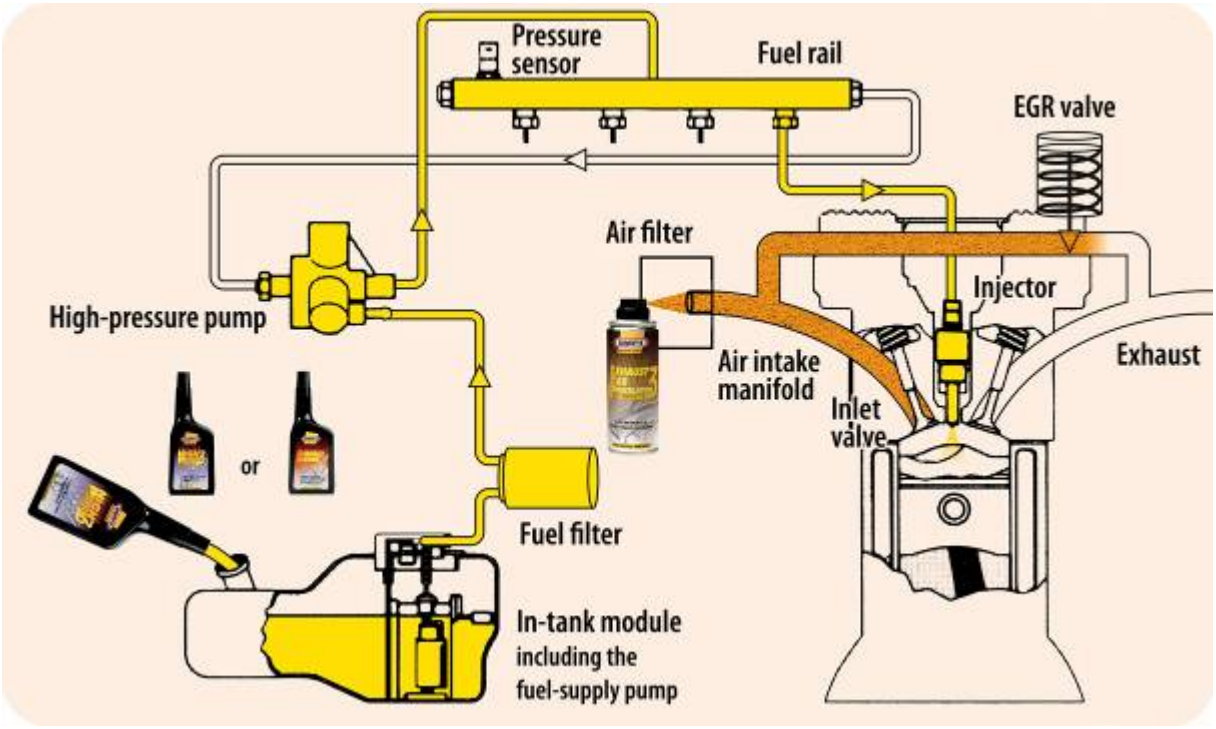
The perfect engine cleaning is a two-fold process for all diesel engines:

- **EGR3 – 200 ml Aerosol Preventive and curative treatment**

>> The EGR3 aerosol (marked orange in the schedule) cleans the "dry part" of the engine: the air intake manifold and the inlet valves. If applied in the right way cleaning of the EGR valve can be obtained as well

- **DP3 – 500 ml Liquid Preventive use or after-treatment for diesel engines with in-line or rotary injection pump**
- **HP3 – 500 ml Liquid Preventive use or after-treatment for diesel engines with common rail or pump injectors**

>> The DP3 and HP3 Liquid Treatments (marked yellow in the schedule) cleans the fuel system, the "wet part" of the engine.



>> HP3-Liquid

Wynn's HP3 is a chemical treatment for diesel engines with direct injection fuel systems, equipped with a common rail system or pump injectors
Recommended for all diesel engines, as well new as used.

PREVENTIVE USE OR AFTER-TREATMENT

Properties

- Inhibits ageing (oxidation) of the diesel fuel caused by high fuel temperatures.
- Prevents clogging of the fuel-feed lines and fouling of the fuel filter.
- Compensates for lack of lubricity in low sulphur fuels and protects stressed metal surfaces in the high-pressure pump and injectors against wear.
- Cleans the fuel pump, the common rail and the injectors.
- Restores the original spray pattern resulting in a better combustion.
- Reduces black exhaust smoke.
- Does not harm catalytic converters or particulate filters.

Directions

- Add to the diesel tank. One bottle of 500 ml treats 50 litres of diesel fuel.
- Repeat the treatment every 10.000 km or together with spray usage for after treatment

>> EGR3 Aerosol –Air intake, Inlet Valve and EGR Cleaner

Wynn's EGR3 is an aerosol, developed for cleaning the intake air system of all diesel engines.

Wynn's EGR3 is recommended to be used at each service interval, to maintain cleanliness of the intake air manifold, inlet valves and EGR valve of diesel engines

PREVENTIVE AND CURATIVE USE

Properties

- Strong solvents provide immediate and strong cleaning of air intake system and inlet valves, EGR valve and connecting tube between EGR valve and air intake manifold.
- Strong power jet spray to support cleaning action.
- Dissolves gum, lacquer, carbon and deposits.
- Easy to use, cleaning is carried out in 5-10 minutes.
- No dismantling of components necessary. (only for direct cleaning EGR valve)
- Restores or maintains the engine performances.
- Eliminates and avoids starting problems.
- Improves acceleration properties.

- Lowers exhaust emissions.

Directions

A. Cleaning of air intake manifold and inlet valves

1. Start the engine and let it warm up. Remove a flexible hose in the air intake system, situated between the turbocharger/ intercooler and the air intake manifold.
2. Let engine run at 2000 rpm.
3. With warm engine, spray the product into the air intake manifold.
4. Spray with short intervals to avoid uncontrolled rise of rpm and diesel knocking.
5. After each pulverisation, wait until original set rpm is regained.
6. If necessary accelerate to avoid engine stalling.
7. Continue until the 200 ml of product in the aerosol are consumed.
8. Let the engine run at idle during a few minutes.
9. After this idling period, accelerate the engine approximately 5 to 10 times. Do not exceed 3000 rpm. Or drive for 5 to 10 km with the car.
10. Before stopping the engine, let it run again for at least 1 minute. Put hose back in place.

B. Cleaning of air intake system before turbocharger and compression part of turbocharger

Act in the same way, but spray the product in before the turbocharger. Remove the air filter to reach this area.

C. Preventive cleaning of EGR valve

C1. If the valve is close to the injection point of the product, act the same way as in A

C2. If the valve is at remote distance to the injection point of the product, use an extension tube (available in option) to get closer to the valve, then act the same way as in A

D. Curative cleaning of very dirty EGR valve

1. Dismantle the EGR valve (housing).
2. Spray the product directly on the valve, housing and other components, until these parts are very wet.
3. Let the product act a few minutes.
4. Spray again on the parts until all the dirt has been removed.
5. It can help to remove the dirt with a piece of cloth or paper tissue.
6. Dry the parts with compressed air, cloth or paper tissue.

Usage

Method A, B and C

- Every maintenance (15 000-20 000 km)

Method D

- At initial first treatment on car with high mileage

Note: For direct and strong cleaning of the fuel system of diesel engines, the **Wynn's FuelServe** with **Diesel System Purge** liquid can also be used.
Due to the fuel system technology, this will only clean injectors and combustion chamber.

4. TEST RESULTS

Clean up test VW Bora 1.9 TDI at the Belgian Technology Institute De Nayer (method A)

	before	after	change
engine power in HP	115,4	118,7	3,3
engine torque in Nm	271,9	276,6	4,7

Clean up test VW Vento 1.9 TD at Technology Institute De Nayer (method A)

Before treatment

After treatment

Clean up test Citroën C5 HDI at Wynn's (method A)

	before	after	change in %	one week after treatment	change in %
soot in m^{-1}	2,89	0,88	-69,6	0,92	-68,2

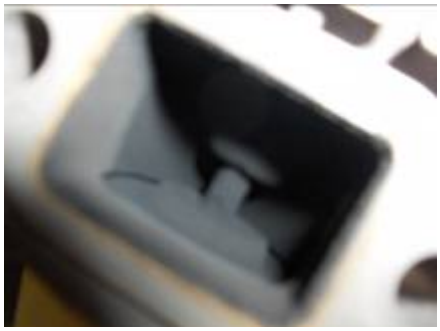
Clean up test Hyundai Elantra at Hyundai Belgium (method A)

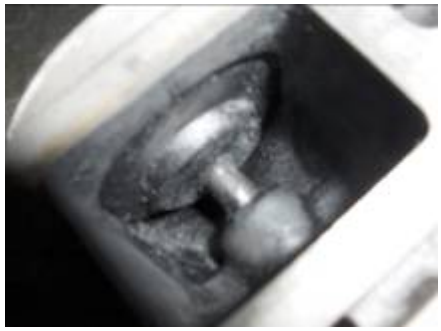
Before treatment After treatment

	before	after	change in %
soot in m-1	4,15	2,30	-44,6

Clean up test Mitsubishi Pajero 3.2 TDI (method D) at Wynn's

Direct EGR cleaning:





Before treatment After treatment

Clean up test Nissan Micra 1.5 dCi – 68 HP (method C) at Nissan workshop

Before treatment After treatment

Clean up test Nissan Micra 1.5 dCi – 68 HP (method D) at Nissan workshop

Before treatment After treatment

	before	after	change in % after C	one week after treatment	change in % after D
soot in m^{-1}	9,50	3,50	-63,2	2,50	-73,7

Clean up test Nissan Patrol 3.0 TD (method D) at Nissan workshop

Before treatment After treatment

Clean up test Opel Zafira 2.0 Turbo DI 16V (method A) in Italy

	before	after	change in % after C
soot in m^{-1}	3,46	1,13	-67,34

5. CONCLUSION

1. Wynn's Exhaust Gas Recirculation 3 can de used to clean the air intake system of ALL diesel engines:

- Indirect injection
- Direct injection
- In-line injection pumps
- Rotary injection pumps
- Mechanical or electronic steering
- Common rail
- Pump injectors

2. It cleans and keeps clean the "dry part" of the diesel fuel system without dismantling.

3. It can be used to clean dismantled parts thoroughly such as EGR valve and turbo-charger.

4. In combination with Diesel Power 3 or High Pressure 3 it provides a complete cleaning of the diesel fuel system.

5. The treatment preserves a good operation of the fuel system with

- Stable idle
- Good accelerations
- High power and torque
- Low fuel consumption
- Low exhaust emissions

6. An additional spray nozzle helps to reach parts to be cleaned.