



TECHNICAL BULLETIN

Valve Seat Recession

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What is Valve Seat Recession?

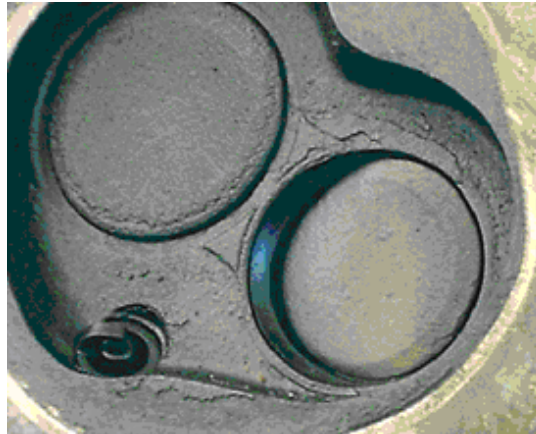
If you drive a pre-1986 vehicle, you have to know about VSR or **Valve Seat Recession**. Valve Seat Recession is when the valves from an internal combustion engine embed themselves into the cylinder head. This is generally due to a lack of lubrication between the valve and the cylinder head.

What causes VSR?

The lead in petrol pre 1987, greatly improved combustion and increased octane levels. This high-octane fuel enabled cars to run higher compression ratios than cars of today. In addition, the lead oxides that formed during combustion would settle on the valve seats and act as a cushion, protecting the seats from erosion.

When leaded fuel was phased out, car manufacturers lowered compression ratios and started using hardened valve seats that did not require the lubricating properties of lead.

Consequently, when cars designed to run on leaded fuels were run on unleaded fuels, they run the risk of suffering valve seat recession.



Valve seat recession generally affect the exhaust valve in the head. This is because this is the valve that opens to expel the burnt combustion gas. Inlet valves are lubricated by the petrol fuel mixture or only have air passing by them and hence are closed during and after combustion. Exhaust valve recessed into the cylinder head

What are the symptoms of VSR?

As the valve sinks deeper into the seat, the engines "breathing capabilities" are reduced. This is because the valve does not open as far and therefore restricts the movement of combusted exhaust from the cylinder following the firing stroke. resulting in loss of power and fuel economy. If allowed to continue, tappet or valve stem clearance will be reduced leading to burnt, broken or bent valves that can lead to major engine failure. This causes loss of compression, resulting in misfiring, hard starting and substantial loss of power.

How does LPG affect valves and valve seats?

LPG once vaporised is a pure vapour and has no lubricating properties at all, this then passes through the inlet valves and into the cylinder where it is ignited by the spark plugs, combustion takes place and the hot spent gasses exit through the exhaust valves.

These gasses are very hot and contain no lubricants or additives. They very slowly start to burn the valve face and valve seat of the exhaust valve away, this process is called recession. Over time the valve begins to recede in to its seat, subsequently reducing the valve or tappet clearance to zero. Once this has happened it is only a matter of time before the valve head starts to disintegrate causing loss of compression and misfire.



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What can I use to protect my engine from VSR?

Penrite have introduced a new version of **Valveshield** that replaces the original Valveshield with a new and improved version that also replaces **Upper Cylinder and LPG Lubricant**.

The new version is available in 1 Litre and 250ml bottles and can be used for any of the purposes that the previous two products were used.

Valve Seat Protection

Valveshield acts as a lead replacement additive in unleaded petrol protecting the engine from VSR in those that have not had hardened valves and seats installed post original manufacture.

Upper Cylinder Lubricant

New Valveshield acts as an Upper Cylinder Lubricant and is especially suited for use where vehicles are running on LPG. It can also be used in the "Dripper" systems fitted to some LPG vehicles.

Other Benefits

The new Valveshield will assist in keeping the fuel system clean and protected against corrosion whilst extending the life of fuel pumps and injector systems. It is harmless to emission control devices such as catalytic converters and oxygen sensors ..

For best results:

- Add **Valveshield** prior to filling fuel tank
- 50 ml treats 50 litres of unleaded petrol for prevention of VSR and upper cylinder lubrication
- For added cleaning benefits use 100 ml per 50 litres of petrol
- Use at each fuel fill if protecting a vehicle designed to run on leaded petrol from VSR

Product Benefits

- Protects against Valve Seat Recession
- Cleans and protects fuel system components
- Provides a lubricant into the fuel system which is absent with the "dry" LPG
- Prevents power loss by lowering intake deposits on valves
- Will not harm catalytic converters or oxygen sensors
- Maintains optimum compression by preventing cylinder head damage
- Extends the life of fuel pumps and injection systems
- Protects against rust corrosion and wear
- Suitable for late model vehicles



To find out more about this product and Penrite extensive range of lubricants visit penriteoil.com or call the 7 – day – a – week technical line on 1300736748. You can find your local stockist by entering your postcode in the store locator on the product page.

Penrite recommend **"The Right Oil for the Right Application"**

[Click Here](#) to visit the Penrite Recommendation Guide, which will ensure you receive the correct oil for your application

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