



In keeping with all the other articles the features in this months Vectra V6 topic are from our experience and the fact we owned one personally.

The system is Bosch 2.8.3 sharing similarities with other GM V6 variants. The vehicle supports excellent serial communication capabilities and Autodiagnos offer software for this purpose. When choosing serial diagnostic equipment I appreciate cost will always be a factor but I suggest you consider complete vehicle access systems.

From our experience the growth in SRS & ABS repairs present a profit centre not to be turned away.

The V6 EM power plant is not a cheap one to maintain. Spark plugs & HT lead replacement is a common occurrence @ approx. £200.00 excluding labour, which may add £75.00 with basic diagnostic checks.

The main problem with HT is corona ringing, which is often quite severe @ low mileage, (15-3,000 mls) oil leakage and spillage do not help.

The EGR valve is easily accessible and we strongly recommend modifying by manufacturing a blank gasket to prevent passage of gasses. This method avoids Mil lamp errors from the lift solenoid and potentiometer if left disconnected.

A noticeable improvement in light and mid range derivability can be expected.

Software modification is another option for increased midrange performance; this can be installed via the serial port.

As with many other vehicles the most common problem is hesitation especially at transient and light throttle.

Check DTCs, but don't omit the preparation to HT first, it's a labour intensive exercise to replace components so fit the OE products first time explaining the benefits to the customer.

Check both Lambda sensors for active switching & frequency. Zirconia sensors should have crossing amplitude of 800 MV with a frequency over 1 Hertz.

Next take a look at the air mass meter, which is a thick film type as opposed to an exposed wire filament.

For a complete evaluation you are going to have to plot the output using a Tektronix TDS 3000 oscilloscope (waveform (1) during a snap throttle test. Pay special attention to the rate of amplitude of the primary peak and secondary peaks. The output is very critical 4.5 volts should be expected, a drop of 200 MV will present significant under fuelling on acceleration, however if the air intake or exhaust are restricted this will directly effect the flow rate of the air intake. Just as incorrect valve timing will. Remember this engine has two cams per bank with 24 valves, they all need to be singing from the same hymnsheet.

It is worthwhile on high mileage vehicles, removing the injectors & testing on a flow bench before servicing. A decrease in injector performance is gradual and often not detected by the customer, together with the attention to HT and Lambda sensors; attention here can transform a lacklustre V6 into a powerful tractable engine.

One of the more intriguing problems with GMs V6 was on an Omega, however the problem was a misfire @ or around 3600 RPM.

The effects (symptoms) were erratic dwell and injector pulse control. Applying the Tektronix TDS 3000 oscilloscope to a break out box (waveform (2) and monitoring the crank angle sensor (CAS) identified a defect in the wave form pattern.

This defect was static within the signal pattern just after the TDC point.

Normally this would signify a phonic wheel problem (run out), however thankfully there was enough access to the phonic wheel through the torque converter housing to measure the run out with a dial test indicator.

Replacing the CAS did result in a cure (waveform (3), it was however interesting to see a foil heat shield around the sensor cable which runs close to the exhaust down pipe.

When assessing exhaust and catalyst performance remember to exclude the possibility of air leaks from the tail pipe sampling.

The use of a carburettor spray whilst monitoring the Lambda sensor response is the most accurate and rapid test, proving discrete air leaks.

An air leak upstream of the O₂ sensor will induce rich of normal mixture due to excess oxygen "seen by the sensor.

This method is especially ideal when searching for leaks in the exhaust system.

Remember a rich mixture is never a fault of the Catalyst, Internal structural failure is almost certainly due to high concentration of unburned fuel.

Misfiring due to HT defects including poor burn time is the prime cause.

#Never replace a Cat without correcting the cause of the problem. We always replace oxygen sensors with new Catalyst.

Exhaust gas analysts demands at least a 4 gas manual test paying attention to oxygen and Co levels. We use a Crypton 290, which offers excellent reliability and flow through the gas bench.