

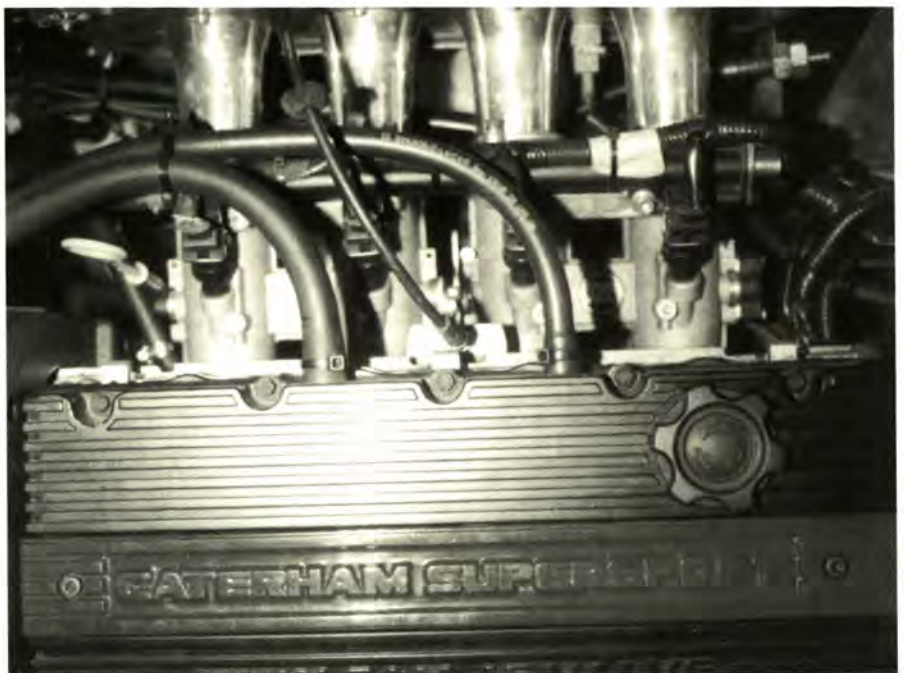


If you are the proud owner of a standard 1.6 / 1.8K engine Caterham and lust after VHPD power but don't want to part company with your pride and joy read on.

One year ago I was introduced to Dave Andrew's website. This true enthusiast has created what some consider a tuning bible for the K series engine. The site details exactly how to modify your standard K series in order to liberate more power up to a staggering 250bhp. Not wishing to duplicate the content of the web site I will keep the technical details of my upgrades to a minimum.

After much head scratching and deliberation I decided that I should go for the 'stage two' upgrade of my 1.6K SS engine. I decided upon this level of tuning because 190bhp at 7800rpm is considered the limit before it is necessary to fit forged pistons and stronger cylinder liners, which would increase the cost of my upgrade considerably.

Stage Two tuning entailed careful cylinder head porting, enlarging the existing valve seat inserts to accommodate 29.5mm inlet and 26mm exhaust valves, sourced from Paul Ivey. The inlet valves are of the flat-backed, waisted stem type. The cams were replaced with Piper 740 profiles, which have 276 degree duration and 11mm of lift. The existing hydraulic followers were converted to



DIY VHPD a winter upgrade project?

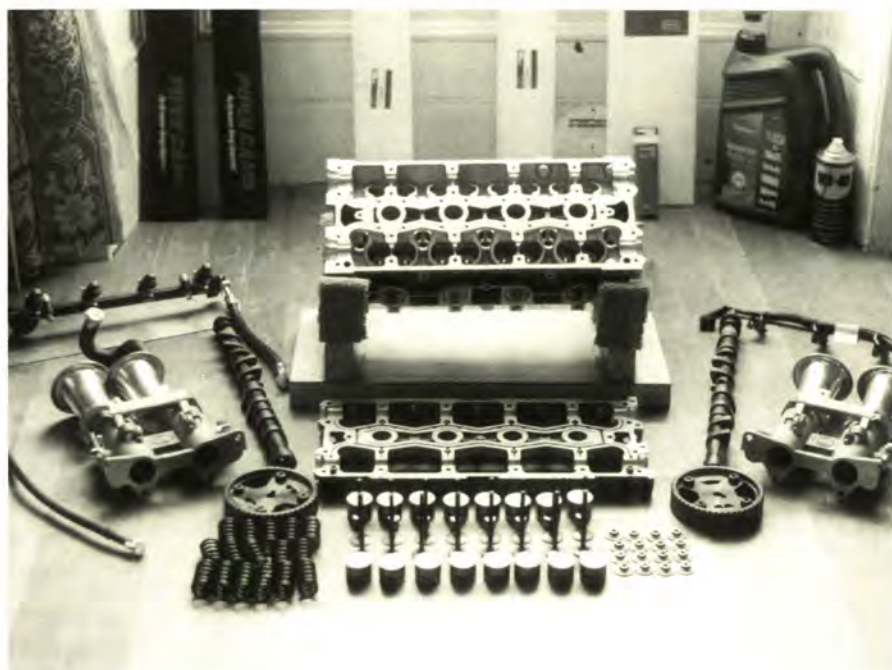
solid items using custom-made shims. The standard induction system was replaced with Jenvey 42mm direct to head throttle bodies, these being specially designed to fit directly to the K head without the need for a manifold and allowing the retention of the standard fuel rail, injectors and pressure regulator. Lastly, the Rover MEMS was replaced with the Emerald M3DK, this is fully K plug compatible and user programmable, the immobiliser and shift light functions are also retained when using this unit.

The porting of the cylinder I undertook myself, this is not as difficult a task as many people would have you believe, although I must confess I did seek some guidance from Dave Andrews before starting. All the equipment you really need is an electric drill that will deliver 3000 rpm or more, some carbide cutting burs, a selection of abrasive rolls and mandrel and some emery cloth for hand finishing. After careful porting of the head the engine was reassembled using all the new parts. On completion of the assembly and to my relief the engine started with little effort using the base map supplied by Emerald. I was now starting to get excited, the

engine sounded gorgeous with much improved throttle response and induction roar. After some basic checks it was then necessary to get the car down to Emerald and have the cars ignition and fuelling mapped on their rolling road.

This next stage of the project proved to be the most nerve racking, negotiating central London in rush hour with my Seven in tow. Luckily I had fellow Severer, Tony Thorp riding shotgun and acting as another set of eyes. I took the precaution of transporting the car down to Emerald who live in the heart of Brixton as the base map appeared to be producing an over rich mixture. Emerald is run by Dave Walker of CCC fame and Karl Paton. I felt particularly confident in entrusting the mapping to Emerald as they are the manufacturers of the M3DK ems and have mapped many similar specification K series engines, they are also nice guys to deal with. Their experience gives them the advantage of starting from a map that is close to being right without subjecting the car to a prolonged period on the rolling road. This also saves time and money.

With the mapping completed it was



now time for the acid test; the power runs. I have to tell you it is dramatic to see and hear you car being taken up to its maximum revs whilst stationary inside a small building. You will note from the plots that the engine delivered a very satisfying 186bhp @ 7862rpm and 130lb ft @ 6445rpm, also a very useful 95lb ft on tap at a mere 3000rpm. At this stage things were looking very good, the engine delivering very similar power output to the Caterham 1.8K VHPD (measured on the same rolling road) and reasonable torque showing itself at a very usable 3000rpm, I left Emerald a very happy bunny.

Living with the car over the past year has been a joy I have covered over 4000 fun packed miles. The car has been 100% reliable and has returned an average 30mpg. I have found the engine tractable around town and in traffic, it does not overheat or complain on long high speed cruising either and when full revs are used goes like a scalded cat. Never on public roads, Officer.

You will have no doubt deduced from my ranting that this stage two power upgrade has much to recommend it. From the technical

viewpoint the upgrade uses direct to head throttle bodies, as stated previously these do not require a manifold and their port spacing match the inlet ports almost perfectly. In contrast the factory built VHPD engine uses throttle bodies from the Rover KV6, that need to be connected to the inlet ports by a dogleg manifold. Stage two 1800cc engines have produced in excess of 200bhp @ 7800rpm as compared to the VHPD which produces 190Bhp@7500rpm.

So what does all this performance cost ?

Retail prices including VAT are:

	£
1 pair of Cams	315-00
Up-rated Valve Springs	91-00
Valves.	202-82
Throttle Bodies	385-50
Trumpets	60-00
Air Filter	80-00
M3DK ems	600-00
Mapping	150-00
Gaskets, Shims, misc	100-00
Head re-surface	25-00
Tools& Abrasives	50-00
	£2,058-50

I think the cost comparison with the VHPD is also an interesting one. However we must not forget that no labour costs are included in my figures as you will be doing all the hard work yourself.

Useful contacts, info and thanks to the following:

Dave Andrews Web Site

www.members.aol.com

sevens list

www.se7ens.net

Emerald	020 7737 7114
QED	01509 412317
Jenvey Dynamics	01746 768810
Piper Cams	01233 500200
REC (Paul Ivey)	01902 373770
ITG	01203 305386

Lastly and most important do not forget to advise your insurance company in writing of your modifications and get their approval before driving your car on public roads.

Rob Walker

Bristol & Bath Area.