

PERFORMANCE

VW

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SWEET DADDY

WORLD EXCLUSIVE

UK'S SWEETEST Mk2: SMOOTH BAY, POLISHED 1.8T, RADICAL RETRIM!



BIGGEST UK VW MAGAZINE

CLEAN WORLD'S FIRST R32-POWERED Mk2?



DUBWARS REPORT

CLUB CHARLYS SHOW

JBS AUTODESIGNS AT IT AGAIN!

PLUG & PLAY



FITTED A 1.8T BUT CAN'T GET YOUR HEAD AROUND THE WIRING? THANKFULLY QPE IS HERE TO SAVE YOU TIME, MONEY AND STRESS BY TALKING US THROUGH ITS AMAZING PLUG 'N' PLAY DIY INSTALLATION.

Words: The Infamous Bad Boy Photos: Elliott Roberts, Matt Barnes and CTP

Fed up with seeing the same old techie features? Don't worry, we've teamed up with QPE to bring you the all important one. If you've paid over £6k for a 1.8T swap look away now. This is the conversion most tuners won't want you to see.

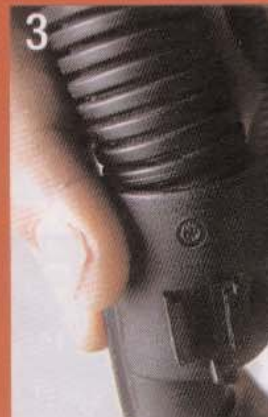
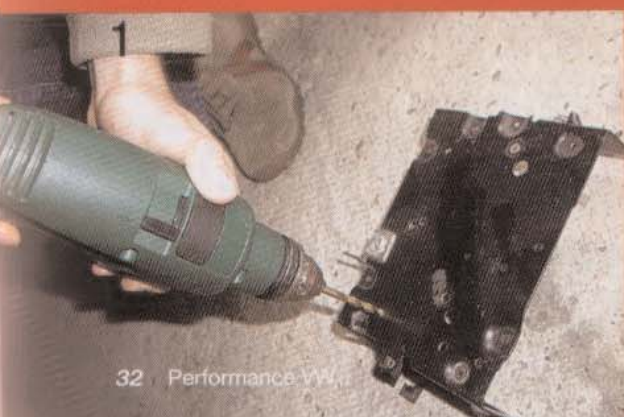
Transplanting engines from late model VWs into those one or more generations removed has, over the last 15 years or so, become a well-trodden path to a quick Dub. Dropping a high-spec engine from a late model into an earlier shell not only provides an easy power hike, but can also breathe new life into your pride and joy's ageing mechanicals. Since VW seems intent on endowing each new generation of GTI with an extra 200 kilos or so to haul about and, as a result, have to fit evermore powerful powerplants as standard, the performance

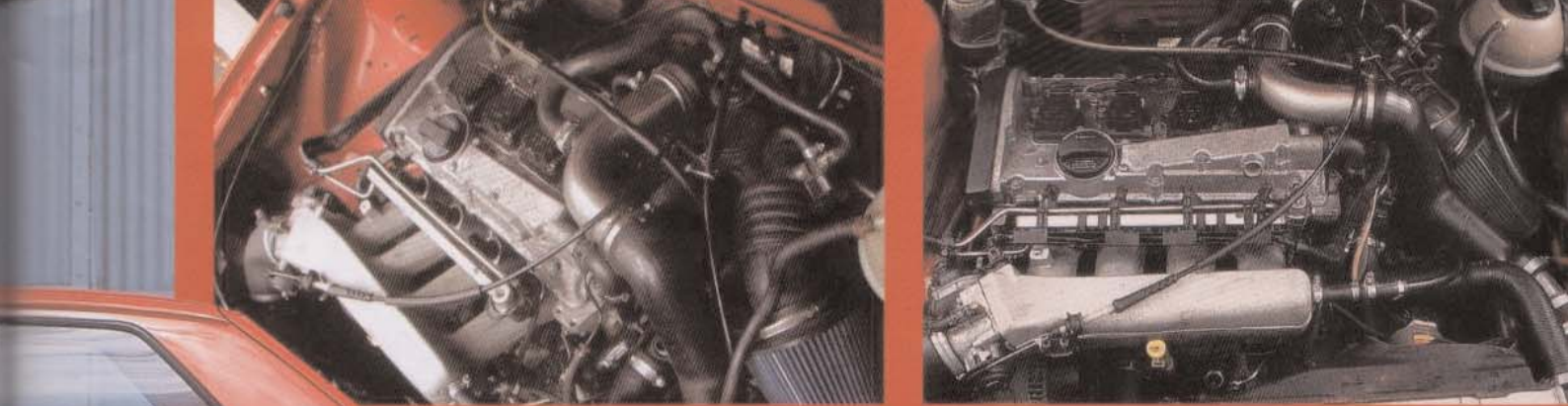
benefits from spanning the generation gap are bigger than ever.

The era of the GTI engine swap began in the late '80s, when folks began dropping the then newly introduced 1.8 16v from the Mk2, into the Mk1 shell. Although regarded as an awfully big deal at the time, things moved on and the next big task faced by those pioneering modifiers was the holy grail of the G60 conversion. Still with its fans today, it's here that transplanting culture really took off. With 160bhp out of the box that was easily improved upon with a smaller 'charger pulley and remapped ECU, the unit was capable of giving stunning performance to a Mk1 or 2 GTI that was impossible, or at least very expensive, to achieve via conventional tuning. In the mid-'90s the introduction of the VR6 to the Mk3 Golf and Corrado ranges predictably prompted a craze to retrofit the rumbling

gas-guzzler to the previous generations of Golf. While fitting the unit into a Mk2 was relatively painless experience (unless it happened to fall on you!) the Mk1 was a whole different bucket of spanners, requiring major chassis surgery.

And even though the electrical side of these conversions could be tackled by a competent home mechanic with the eye for an odd wiring diagram or two, VW's latest performance unit, the 1.8 20v turbo, as fitted to the Mk4 GTi and many others, has proved much more of a headache. While the mechanical side of things is straightforward enough, (certainly simpler than a Mk2 VR), integration of the sophisticated engine management system into the earlier cars is fraught with problems. If at first you can fight your way through the bundles of superfluous wiring, the next stumbling block is that the





QPEng's Ben Leach (below) used his 4x4 Mk1 20vT (left) as a test bed for the new kit. The brief? To develop a package allowing easy integration of engine management and the AGU 1.8T into any digifant Mk2 or Corrado



ECU's integral immobiliser system requires the original ignition switch barrel and transponder key to be used, requiring big time, dash out, steering column surgery. Perhaps even more of a pain is that the instrument set from the donor car must also be used if the engine is to run correctly.

The most popular method of overcoming these problems is to employ a standalone programmable engine management system (EMS). However, even these have their problems, not least in that they require a wiring loom to be manufactured, or at least modified. In addition, the engine's original sensors and coil packs, etc, are often incompatible with the new system and have to be replaced, leading to extra expense, hassle and the loss of that 'there from factory' look to the conversion. Also, unless the EMS supplier has previously performed

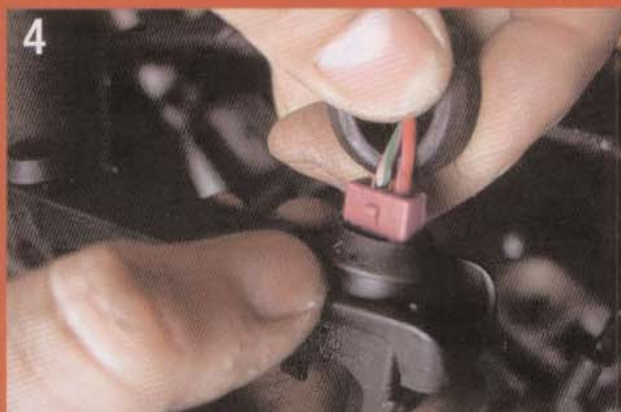
an identical conversion and can supply a suitable map, the system will require a full calibration, needing many hours of rolling road or engine dyno time that can, in many cases, end up costing as much as the system itself.

Before you all become too depressed and give up on that 1.8T conversion forever, perhaps we should introduce Quantum Performance Engineering and its 'plug and play' 20vt EMS kit. Armed with this box of tricks it is possible for any reasonably confident DIYer to drive a 200bhp Mk2 Golf out of their garage after a weekend of reasonably hard graft.

The concept of the plug and play kit was dreamt up by Ben Leach, who, along with Jonathan Saunders, formed Quantum Performance Engineering (QPEng to those in the know) about a year ago. After spending a

large chunk of time fitting and programming an EMS to his 4x4 20vt Mk1 (PWV 8/03), Ben decided that there must be a market for a complete kit that could slash the time, skill and cash needed to complete, what was likely to become, a very popular conversion. The original brief was to develop a package that allowed the easy integration, in terms of engine management, of the Mk4 GTI 'AGU' engine into any Digifant Mk2 Golf or Corrado, as they guessed this would be the most common conversion folk would take on. With the kit aimed at the DIYer as well as the professional market, simple, fast fitment was deemed essential, as well as OEM levels of fit and finish.

The first job was to select an ECU and, after much research and deliberation, they plumped for the brand new 982 unit from MBE (3), who also happen to supply TVR and Noble. After acquiring a suitable engine and adapting its



DIY PLUG 'N' PLAY

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wiring loom to the MBE ECU, the whole lot was rigged into an engine dyno test cell for mapping. Once they were happy with the engine's performance it was fitted into Ben's daily driver (his mum's old Mk2 8v – see previous page), which had already been earmarked as a test bed for the project. Development then continued as the ECU maps were tweaked to give the best driveability and good starting. The closed loop boost control, mappable against engine speed and throttle position, also received a lot of attention to ensure a smooth, but still aggressive drive.

With the ECU calibration out of the way, attention turned to setting the wiring loom up for production, with much emphasis being placed on neatness and ease of fitment without excessive cost. Whilst a bespoke harness was considered, the relative ease of modifying the original item, coupled with the superior factory fit and finish it offered, persuaded them to go the VW route. Each loom begins life as a brand new Mk4 GTI engine harness direct from VW, before it is modified to allow total integration between Mk2 body and Mk4 engines without changes to either. It is then added to the pre-programmed ECU, MAP (Manifold Absolute Pressure) sensor and fitting kit to form the complete plug and play package.

In order to show what a doddle the kit is to fit, Ben gave us a 'while you wait' demo. The car was a Mk2 GTi that already had its 1.8T engine fitted and plumbed in, but was waiting for electronic side of things to be sorted. With both the Digifant engine harness and the original 20v loom already removed, the first job was to feed the new loom through the hole in the scuttle tray vacated by the original wiring (5). To avoid enlarging the hole, Ben began by removing the covers from the three largest junctions in the corrugated loom sheathing (3). He also had to unclip the plastic

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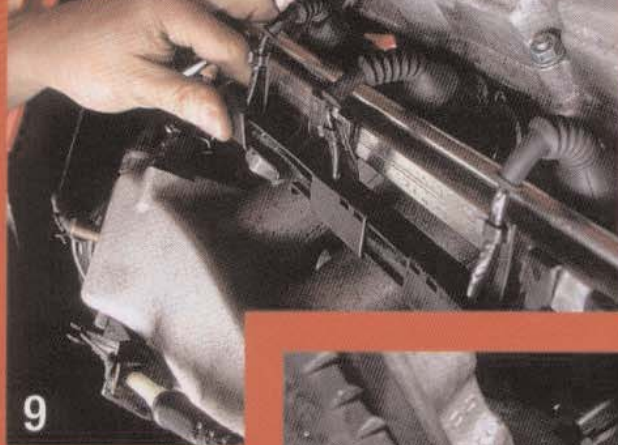


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parts that secure the injector plugs to the fuel rail (4), allowing the loom to be eased through and the grommet to be pushed into place (6). Once fed to the front of the engine, the previously removed parts were refitted and the connections to the injectors, coil packs, boost control valve, coolant temperature, intake air temperature, throttle and crank sensor made as normal (see relevant photos). The only extra connections required were to the tachometer (via the original ignition coil plug) and to the coolant temperate gauge (again through the original Mk2 loom).

With the engine end of the loom sorted, attention was turned to the ECU. For extra neatness and reduced hassle, the new ECU, and accompanying MAP sensor, were both fitted to the original ECU holder after drilling four mounting holes (1).

Since the MAP sensor requires a pressure signal from the intake manifold, it was connected into the fuel pressure regulator line using the T-piece provided (15). The pressure line (also part of the kit) was then routed to the MAP sensor, passing through one of the holes given up by the original ignition coil. After connecting the ECU and MAP sensor and securing them in place, all that remained was to connect the new loom

into the Mk2's 5-pin Digifant power connector (13) and fit the earth eyelet under one of the wiper mounting bolts (18).

So there you have it, a non-worky to worky 20vt Mk2 in under an hour, with not a pair of wire cutters or bottle of Valium in sight.

At present the kit is only available (as a true 'plug and play setup' at least) for fitting the AGU (Mk4 Golf/A3 with throttle cable) engine into any Digifant Mk2 Golf or Corrado, Rallye or G60. However, there are plans to introduce more engine/chassis combinations according to demand, so if you're after something else then let the lads know. If you can't wait that long then they also suggest that with minor loom mods, mainly to the power plug area, the kit will fit other platforms such as Mk1, earlier Mk2 and Mk3 GTis, Corrados and Ibizas.

Another major advantage of this kit,

compared to the OE management route, is that the ECU comes with an upgraded map that delivers 200bhp as standard, negating the need to spend £500+ on having the original unit reprogrammed. If you subsequently wish to upgrade the engine, (and, let's face it, with 300bhp+ available from just a bigger turbo and injectors who wouldn't), then ECU reprogramming, by QPEng or any MBE dealer, will be necessary. However, none of the hardware supplied in the kit need be replaced. Job done.

PRICE

Complete kit (including 200bhp upgrade map) £900 plus VAT

CONTACT

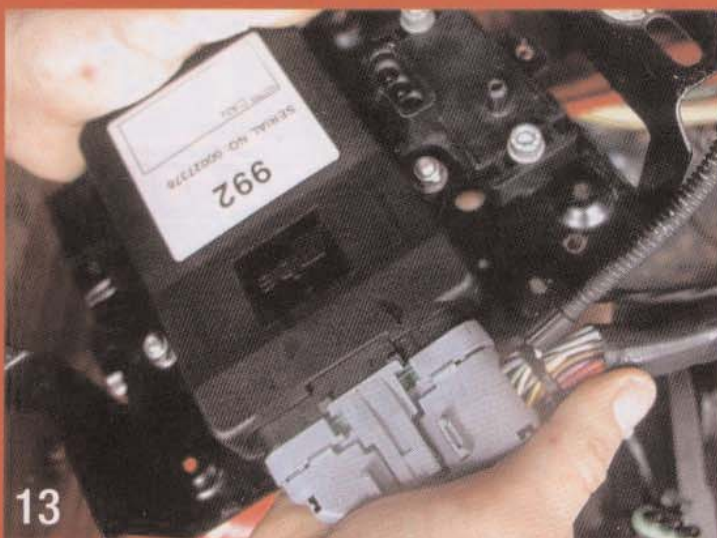
QPE (07980 983095, 07952 288003 or info@qpeng.co.uk)

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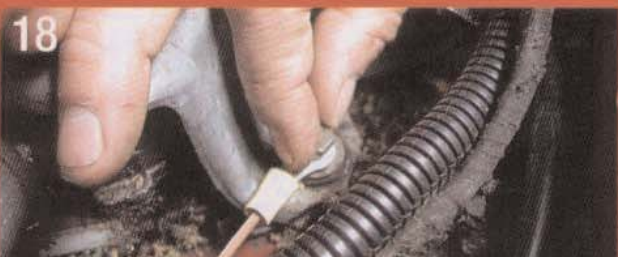
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