

MASTER TUNER

Victor Harman looks at tuning specialists Bromley's.

WHY TUNE IT?

The mass-produced diesel car engine generally has a number of shortcomings that are the result of the necessity to meet a wide variety of service conditions and realities, such as variations in manufacturing tolerances, fuel quality variations, climatic conditions, and inferior maintenance. As a result, the off-the-shelf characteristics of a standard power unit offer significant scope for improvement and, as has been shown by power and torque curves obtained from dynamometer tests, poor low speed response and mid-range "flat-spots" can often be eliminated, with a resulting improvement in overall performance – which doesn't just mean going faster. So "tuning" is not all about raising power and torque output, (although this is usually also a pleasant end result!) but equally about optimising the efficiency of the engine.

One of the reasons why the diesel engine has great advantages over its petrol counterpart in terms of response to tuning is the key factor of "excess air". Try to tune any petrol engine by offering it more fuel and it soon becomes breathless, as it runs out of oxygen with which to burn the extra fuel. The only way to overcome this is to persuade the engine to burn more petrol at higher engine speeds, where more air/oxygen can be ingested. So generally a tuned petrol engine has to rotate more quickly to produce extra torque and power, and in the process becomes a more temperamental and frenetic performer. But most diesel engines – and we are inevitably talking today of turbo-diesels – are able to ingest far more air than is needed to burn the injected fuel. So they respond eagerly to the offering of carefully chosen modest amounts of extra fuel by intelligent re-programming – and in the process usually actually operate at higher efficiencies!

The ready availability of excess air at all engine speeds means that



Tuning specialist Mike Bromley with one of his most popular products.

the tuned diesel engine usually produces its extra performance throughout the speed range and, as a result, the response is improved in all driving conditions – not just when maximum power is demanded. So a tuned diesel becomes an even friendlier and more willing beast, often becoming smoother and more flexible – so it will pull a higher gear, and often deliver better fuel economy than a standard engine – because it's actually more efficient!

HOW DOES IT WORK?

The operation of today's electronic injection diesel engines is masterminded by the engine's ECU which, according to requirements, sends constantly varying signals to the fuel injection unit, as instructions to deliver a certain amount of fuel at any instant. Electronic tuning uses any one of a number of different systems to modify this signal in such a way that, throughout the engine speed range and according to power demands, the fuel injection volume is beneficially enhanced. But it's particularly useful if there's potential to actually adjust these modified instructions according to individual needs – and particularly if an engine is being tuned to an owner's specific requirements.

WHY TUNIT® – BY BROMLEYS?

Diesel runs through Lancastrian Mike Bromley's veins – he came up

the hard way through the ranks, and still isn't afraid to get his hands dirty. Bromleys is a friendly family concern, started nearly 20 years back, and it's now grown into a highly-focused "hands-on" business specialising in high-tech diesel engine tuning, but retaining the important personal touch.

TECHNOLOGY AND RESEARCH.

Bromley's Tunit® module is the result of complex and continuing research, aided by the first UK-installed sophisticated TAT rolling road dynamometer recently commissioned at the Chorley, Lancashire headquarters. Links with manufacturers and other technical organisations ensure that up-to-the-minute data on engine specifications is always to hand, and Tunits® are often developed for engines in advance of their launch in UK RHD form. Bromleys are currently advancing into more advanced performance-oriented tuning, with a developing programme of "Project X" ultimate conversions, offering the full benefits of up-rated intercoolers, turbochargers, injectors, and exhaust systems.

FLEXIBILITY

A vital feature of the Tunit® system is the simple adjustability of each and every unit, enabling tuning to individual requirements, which is highly recommended for the optimum benefits. Perhaps even

more dramatic is the optional "Laptop Tune" feature where Mike, or Chief Technician Eric, can take your car out on the open road and adjust its response to your individual requirements whilst you are actually driving!

PORTABILITY

The Tunit® system features modification of the fuel injection programme by linking in a small, fully removable, sealed unit. All Tunit® modules thus have the potential for easy de-activation or removal as and when required during your ownership, or on the sale of your car.

DISTRIBUTOR NETWORK

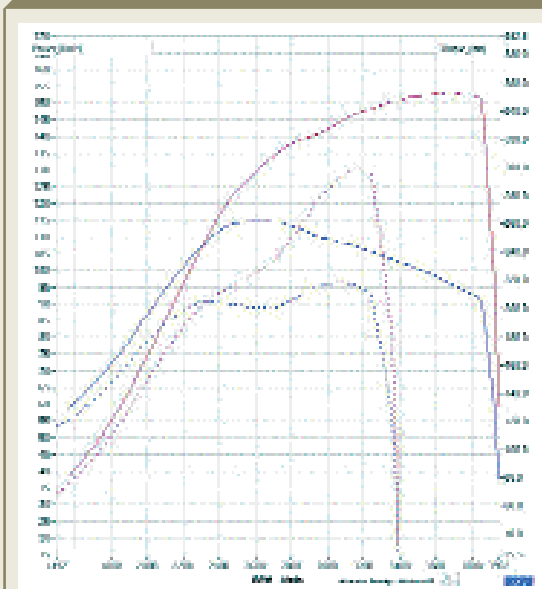
The Bromley H.Q. at Chorley is the centre of network of fully approved distributors, each of which has been carefully vetted by Mike Bromley for its facilities, diesel expertise, and commitment to meeting the Bromley standards of sales and service. Tunits® can be supplied on a "try-before-you-buy" basis by any of the nationwide distributors or – as many certainly have been, with great success – for self-fitting, by mail order.

AFTER-SALES SERVICE

Bromleys recognise that many owners approach electronic tuning with some small doubts and reservations. You'll never find it too difficult to get advice on tuning, either from Mike Bromley himself or one of his qualified staff. They naturally back up all their work with a full 3-year warranty on the Tunit®, and their wealth of knowledge means that they often diagnose and rectify minor engine problems in the course of fitting a Tunit®. They can also offer helpful advice on insurance matters.

But most importantly, as many customers will confirm, they back all of this up with a continued interest and guarantee of satisfaction, long after they've taken your money!

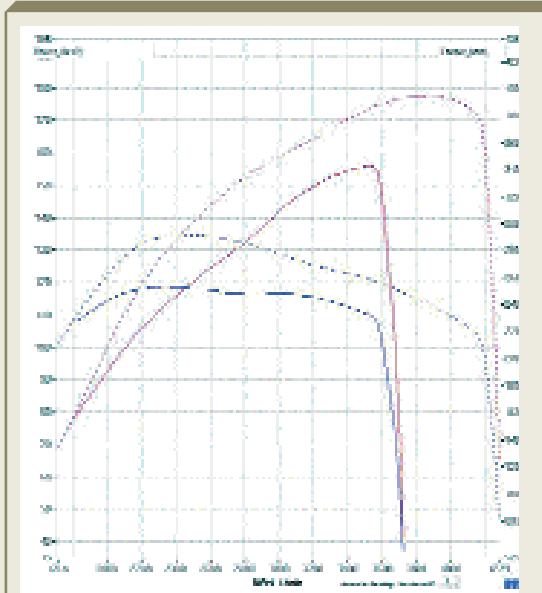
Tunit® conversion of
ALFA ROMEO 156 2.4 JTD (136BHP)



Tunit® conversion of Alfa Romeo 156 2.4 JTD (136bhp)

Illustrates the massive potential of the standard engine, which has now been factory uprated to 150bhp, and will soon, with the aid of a 20valve cylinder head and Multijet technology, be increased to 175bhp. The mid-range torque has been boosted by over 35%, and a flat-spot, shown by the dip in the standard torque curve, is eliminated.

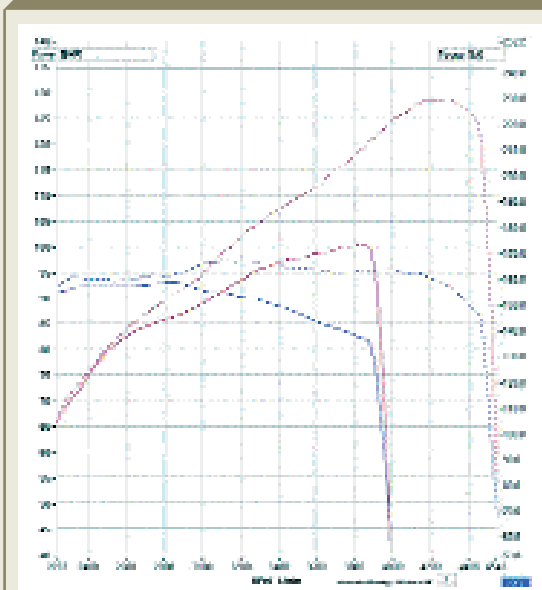
Tunit® conversion of
AUDI A6



Tunit® conversion of Audi A6

Shows a healthy boost of torque at 2,000rpm, continued throughout the speed range, plus a beneficial extension at the top end that extends useful power, giving safer overtaking, from 3,600rpm to over 4,200rpm.

Tunit® conversion of
MAZDA B2500 (MAZDA PICK-UP & FORD RANGER)



Tunit® conversion of Mazda B2500 (Mazda Pick-up & Ford Ranger)

Conversion maintains a flat torque curve from 3,000rpm to 4,000rpm and beyond, eliminating the falling torque of the standard engine. A 30% plus power gain significantly boosts performance in the upper engine speed range.