

diagnos



S-TYPE D to 'Q' car

While Jaguar's diesel models are far from slow as standard, Diagnos claims that its Autologic diagnostic tool can make them go even quicker still...without lifting the bonnet!

Words and pictures:

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More power, more torque and, in some cases, better fuel economy too. Those are the claims made for the new 'performance tunes' from the Autologic diagnostic tool for Jaguar's four- and six-cylinder turbo-diesel engines. On first hearing, those claims all sound too good to be true, but are they?

We're at Diagnos – the makers of Autologic – at its UK base in Oxfordshire to put an S-TYPE diesel through the 'tune' process and assess for ourselves exactly how effective it is. But first, a bit of background.

After all, how can a car be tuned without even needing to raise the bonnet?

Well, when it comes to performance tuning modern cars with computer controlled engine management systems, there's a surprising amount that can be done without having to make any physical mechanical changes.

'Chipping' is a term that may be familiar, and it refers to physically replacing a computer chip from a particular engine management system with another that's been specifically reprogrammed, typically in

a manner to increase performance. It might, for example, allow a turbo to provide greater boost.

That process of 'chipping' has been around for ages but the game has moved on recently as, since 2002, all engine management systems have been programmable. Whereas, previously, engine management systems were car specific, now they are supplied blank and are then programmed by the manufacturer once in the car they are destined for. And that's where the Autologic tool comes in.



With the Autologic tool plugged in (top), a verification code is first tapped in to access the tuning menu. The tool then checks the car's system before allowing the operator to go ahead. Other than the progress bar, only the flashing dash warning lights (bottom) indicate that anything is happening!



No lift, no spanners and the bonnet is down – not quite what you'd expect in a tuning garage!

Diagnosis – more power!

The Autologic vehicle diagnostic tool has been available since 1999, in the first instance for Land Rovers and, since 2004, for Jaguars (and several other manufacturers too). Today, many independent Jaguar garages use the Autologic tool which communicates with a vehicle's engine management system to enable fault diagnosis.

Clearly, for its diagnostic software to work effectively, the Diagnos engineers that program the Autologic tool have to know Jaguar's engine management systems inside out, and they've now decided to use that knowledge to reprogram, or 'tune' the systems in the marque's diesel engines to provide more power and torque without, they claim, affecting reliability, driveability, or refinement. We're keen to find out if that is true.

Tuning times

Before putting our test S-TYPE through the tuning process, though, we take it on a run of about 15 miles on the roads around Diagnos's base to reacquaint ourselves with the feel of a completely standard car. As it's an automatic, there won't be an opportunity to use a rolling road so our conclusions will be subjective, but if the gains are anywhere near those claimed (see table opposite) the difference between pre- and post-tune should be quite noticeable.

Our route takes in a mixture of dual carriageway (including the inevitable road works) and minor roads. Despite the fact it's teeming down with rain, there is still plenty of opportunity to get a good feel for the car – and it's just as impressive as any other example we've tested. While full-performance testing is impossible, a clear stretch of slightly uphill road presents the opportunity to floor the throttle from a standing start, which results in a clean pull-away without any traction control intervention and acceleration through the gears that is smooth and brisk.

At the end of the run, the trip computer shows an average fuel consumption of 25mpg – not very impressive, but then not entirely unexpected either given the nature of our

test route and the leaden use of the accelerator on occasion.

So now for the tuning process and it's one that, while clearly involving a mind-boggling amount of computer related complexity, appears remarkably simple to the customer! With the S-TYPE parked up, a battery conditioner is first attached to maintain charge during the process (the ignition needs to be on, but the engine off), and then the Autologic diagnostic tool is plugged into the port in the driver's footwell. With connection established, the diagnostic tool checks the car's engine management software and, assuming that all is in order, the operator can then choose to install the 'tune' from a simple menu.

The tuning process actually involves removing all computer programming from the vehicle and re-installing it but, other than a blue progress bar creeping along the screen of the Autologic diagnostic tool, the only outward evidence of the upgrade progressing is the constant flashing on and off of various warning symbols on the car's dash – disconcerting, but quite normal.

Just 25 minutes later, that blue bar has finished its creep across the screen, the warning lights have ceased flashing and, without the bonnet catch having been released, our S-TYPE diesel has been tuned!

Driving proof

Diagnos's own tests on a manual S-TYPE diesel produced dyno-measured maximum power and torque gains of 68bhp and 73 lb ft respectively over the standard figures produced by that specific car, but at 3,750rpm in its tuned-state, the same car was producing 64bhp and 90 lb ft more than before at the same revs. In short, those differences should be big enough to feel on the road without too much difficulty – and on our road test they are.

Instantly, with the gearbox left to its own devices in full-auto mode, acceleration feels more eager, and another standing start test on the same stretch of road as before is markedly different. This time – on soaking wet tarmac remember – the car's traction control system kicks into action as the power comes in (such is the extra amount of grunt available) yet, despite

that, the tuned car is undoubtedly quicker from a standing start. In the dry, with more traction available, the difference would surely be even more apparent.

Gearchanges seem as smooth as they were pre-tune, although when accelerating hard the car is changing up at the red line. Andrew Betteley, senior programme engineer for the Autologic tool, explains that while the gearbox's programming remains unchanged, the fact that it adapts to driving style/power delivery means any previous adaptation is reset by the tuning process. After a few miles, however, it will gradually re-adapt, which means it will then change up earlier to keep the engine bang in its power/torque band.

At the end of our test route, there's another surprise – the trip is showing 30mpg. While far too short a test to be sure, Andrew explains that he would expect gains in fuel economy (if the car is driven in the same manner as it was pre-tune!) of up to 12%. That's simply because in the tuned car the greater torque available means the same rate of acceleration can be achieved with a lesser throttle opening than is necessary in a standard car.

While that gain in economy is something we can't endorse for certain after our test, an additional few miles on the motorway do demonstrate just how much torque is available.

Cruising at 65mph in top gear, slotting the gear selector to the manual side of the J-gate to select fifth raises revs right into the fat part of the engine's torque/power bands – and a prod on the throttle results in acceleration that is astonishingly assured.

Win a diesel tune!

We've got one Autologic diesel 'tune' to give away – and entry is open to anyone with a diesel engined X-TYPE, S-TYPE or XJ. Simply write your answer to the question below on a postcard and send it with your name and address to:

Jaguar World Monthly Autologic competition, Kelsey Publishing Ltd, PO Box 13, Westerham, Kent, TN16 3WT. The closing date for entries is Friday 1 December – the 'tune' will be redeemable at any Autologic equipped garage.

Q: What's the claimed max torque output for an Autologic-tuned S-TYPE diesel?



A quick comparison shows why. Jaguar quotes a torque figure for the formidable S-TYPE R of 408 lb ft – but Autologic's dyno figure of 387 lb ft for its tuned diesel mean it's not far behind!

The cost...and any catches?

As mentioned at the beginning of this piece, the Autologic 'tunes' are available for both Jaguar's V6 and four-cylinder turbo diesel engines. The claimed gains are the biggest for the V6 engine, although those for the X-TYPE engines are significant too compared to the test cars (see the table below).

Regardless of engine, though, the tunes will cost between £500-£600, the final price being determined by the Autologic-equipped garage that's carrying out the work – so it will certainly be worth phoning around to get the best quote. Other than the financial outlay, there are two other factors to consider: emissions and warranty.

Andrew freely admits that Autologic's tunes do raise emissions levels, although they are still well within permissible MoT limits. As for the warranty situation, to the strict letter of the small print, a dealer could say that a tuned car is not covered. However, Diagnos clearly works closely with many garages and dealers and claims never to have had warranty work refused. And, if necessary, as each 'tune' comes with a coded receipt, a car can be put back to standard by any Autologic garage and then re-tuned (for no cost) at a later date.

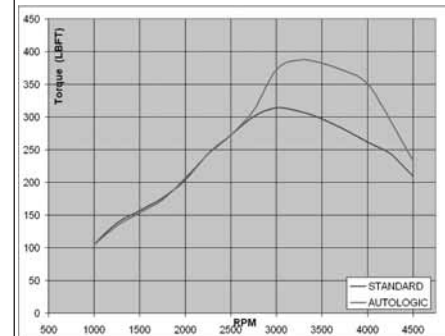
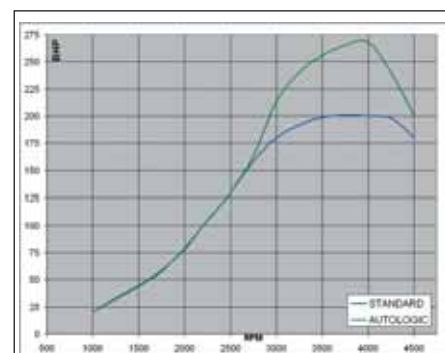
A worthwhile upgrade?

The relative brevity of our S-TYPE test means it's only really possible to present initial impressions of how effective the upgrade is, but those initial impressions are undoubtedly positive, and we'd expect as much from a system with such a good reputation in the trade as Autologic.

So, while a far longer back-to-back test between a standard and tuned S-TYPE diesel would be necessary to reach a fuller conclusion, if we ran such a car everyday, we'd certainly be very tempted indeed.



It's the fact that Jaguar's diesel engines use turbo chargers that make them so tuneable – and the S-TYPE has two!



The above graphs show the power and torque curves produced by Autologic's manual S-TYPE test car pre and post-tune

X-TYPE 2.0D	Max power (bhp@rpm)	Max torque (lb ft@rpm)
Jaguar's quoted figures	128@3,800	244@1,800
Autologic dyno-results standard car*	139@3,750	212@3,150
Autologic dyno-results tuned car	163@3,900	235@3,150
X-TYPE 2.2D	Max power (bhp@rpm)	Max torque (lb ft@rpm)
Jaguar's quoted figures	152@3,500	270@1,800
Autologic test car standard*	152@3,600	246@2,500
Autologic test car tuned	185@3,800	283@2,800
S-TYPE 2.7D	Max power (bhp@rpm)	Max torque (lb ft@rpm)
Jaguar's quoted figures	206@4,000	320@1,900
Autologic test car standard*	200@3,750	314@3,000
Autologic test car tuned	268@3,900	387@3,300

*It only takes a quick glance at the figures for all three 'standard' cars to see that their torque/power outputs vary from those quoted by Jaguar; in some cases they better Jaguar's figures, and in others they are lower. Diagnos was keen to stress that for maximum credibility it chose to present its 'raw' figures – that is, the actual figures produced by the vehicles it tested. The larger variations between Jaguar's quoted and Diagnos's 'test car standard' figures (most notably in the case of the X-TYPEs) were unexpected, but the gains between the 'test car standard' and 'test car tuned' figures are clear. If you'd like to receive a pdf of the power/torque curves for the X-TYPEs, simply email jwm.questions@kelsey.co.uk with the subject 'Autologic'.