

# Silver SCREAMER

Not only does Mark Watts' unique 2.2 Astra SRi pack a stunning punch from its Courtenay Sport supercharged engine, it's got an effective chassis to match

Words: Peter Knivett Photos: David Wigmore



Good looking it may be, but Vauxhall's 2.2-litre Astra G SRi probably wouldn't feature high on many people's shopping lists as a stellar performance tool. Partly that's down to a paltry 144bhp power output from its Z22SE engine, which – in a car weighing 1163 kilos – is enough to get anyone's pulse slowing. Ditto the chassis, which is the epitome of a modern dull, safe, understeering front-driver. In short, this Astra lacks any life-affirming sparkle, a fact that Vauxhall partly remedied when the 2.2 SRi was replaced by the 2-litre turbo version with 197bhp, but alas the same forgettable dynamics. So how and why am I enjoying myself so much driving this silver 2.2-litre SRi around Bruntingthorpe's wide expanses?

Step forward Mark Watts. As a long time fan of the Luton-based marque (he also has a VX220), Mark's employed as general manager of top Griffin tuner Courtenay Sport, meaning he's at the cutting edge of Vauxhall modifying on a daily basis. He's also a man who likes a project to keep himself busy and he's got access to a superb workshop with enough technical and diagnostics equipment to shame a Vauxhall dealer. Why keep all the fun for the customers, eh?

Why indeed, and when Mark decided that he wanted a practical everyday car for the run to work, plus the odd track day, a demon plan was hatched. Initially this involved a flirtation with a 1.8 Astra, but this didn't dovetail easily with Courtenay's existing tuning programmes, so a rethink was called for. Mark reckons Courtenay MD Jon Shield suggested a look at the 2.2-litre version of the Astra G, as this offered far greater horsepower potential – because it shares its all-alloy motor with the original VX220, a car that our Norfolk-based tuning friends had plenty of experience tweaking, from mild to wild.

And one of the most popular upgrades that Courtenay offers for the 2.2-litre VX220 is a supercharger conversion. Depending on specification this offers anywhere from 210bhp to 240bhp, potentially offering an Astra the kick in the pants that it needed; so before you knew it, Mark was hunting around for a cheap donor car.

Several enquiries later, he was the proud owner of a clean and tidy 2001 Astra SRi, complete with Irmischer bodykit and 64,000 miles, for just £1,400. There was one slight hitch though, as Mark explains: "The engine had broken a rocker, it was making a horrible noise and had died, so the car was a non-runner. The owner had priced up putting a new engine in it, but decided to sell it instead."

Mark swiftly resurrected the silver beast though, thanks to a replacement powertrain that he'd already earmarked. "We had an engine and a gearbox from a VX220 in the workshop, which also had the water-cooled oil cooler that the Astra and the Vectra 2.2 motor lacked. I had to fiddle around with some of the water pipe work, but apart from that it was a straight fit into the car," he explains. But still, Mark bided his time before picking the moment earlier in the summer of 2007 to upgrade the engine with a Courtenay Sport supercharger install, a conversion that cleverly exploits the popularity of GM's L850 'Ecotec' engine on both sides of the Atlantic.

To explain, near relatives of the Vauxhall Astra are marketed in the States for the 'Sports Compact' market, including the Saturn Ion Redline and the Chevy Cobalt SS. Interestingly both of these cars boast a 2-litre version of the Ecotec engine, developed by Lotus Engineering to deliver extra urge – around 200bhp – via a screw-type supercharger package. What Courtenay Sport realised is that with clever modifications, this supercharger package will suit the larger, all alloy Z22SE engine as well, boasting power up to 240bhp, allied to monster torque gains. As we'll see it's not exactly a bolt-on conversion, but nonetheless Courtenay had fitted several such packages onto VX220s for several customers from the UK, plus as far afield as Norway and Greece, but no one had tried to fit the package onto an Astra. Until Mark decided to have a crack at it...

Internally, the supercharger conversion requires one major change – the 2.2-litre motor's compression ratio needs lowering to 8.5:1,

which Courtenay achieves via means of a laser cut sandwich plate, worked with double head gaskets. That done, new head bolts were fitted, then the US-sourced inlet manifold and supercharger were fitted onto the cylinder head, as Mark explains: "The two prime components do mate to the head nicely and nothing's really cut, but there's lots of relocating and fabrication required, because the underbonnet layout on the American cars is different from the Astra."

The supercharger installation is interesting for several reasons. Firstly, because it's a screw-style blower it delivers boost from tickover upwards as required, peaking at 14psi. Secondly, the blower incorporates an actuator, so that at tickover and on light throttle openings – say during fast cruise – the boost is bled away, to help improve emissions and boost fuel economy. And thirdly, rather than use an intercooler to keep the supercharged engine's air charge temperatures low, Lotus opted to use what's effectively a chargecooled inlet manifold, featuring a 'Laminova' core – effectively an air-to-water heat exchanger. "That's why there's an extra water radiator and a pump that we've had to fit in," Watts comments.

As with Courtenay's VX220 conversions, there was tricky detail work to overcome regarding the drive belt, including fitting an auxiliary guide pulley to achieve the correct belt length, plus spacing the alternator and air con compressor out to ensure perfect belt alignment. That done, Mark's attention switched to some fairly major electronic changes. "The factory ECU has to be relocated as it normally lives on top of the inlet manifold, so it's been moved across

**2.2 SRi was never a legend in the world of performance cars but Courtenay's supercharger conversion with chassis mods makes it a belter; looks are understated too, with an Irmischer flavour to the car**



to the right hand side of the engine bay," he says. "In turn that means that most of your loom is the wrong length, so there's a load of wiring that has to be lengthened to suit, some 38 wires in all." Then there's the challenge of managing the Astra's on-boost fuelling requirements, which Courtenay overcomes via a secondary mappable ECU, which lives in the glovebox and fires extra juice into the engine via two additional fuel injectors mounted in the inlet manifold. These are triggered when the secondary ECU receives a signal from an additional MAP sensor that lives on the Astra's inlet manifold, while the original MAP sensor now lives on the supercharger, where it talks to the factory brain to manage the off-boost running.

Then there's the slight issue of battery location, which unfortunately sat right where the supercharger's air intake lives. An obvious (but untidy) way of overcoming this would be to stick the battery in the boot, but Mark opted for a neater solution, which only becomes apparent when you notice something unusual about his Astra's underbonnet appearance – as it sports what appears to be two airboxes. The first is a high flow, heat shielded K&N cone filter that mounts easily onto the supercharger intake, whereas the other is a stock looking item that lives the other side of the engine bay and actually houses a tiny, lightweight Odyssey motorsport battery.

On the exhaust front, clearly the supercharged engine would require a free breathing system, so Mark's chosen a Courtenay Sport 2.5 inch stainless steel downpipe (which removes the pre-catalyst), then dumps the burnt gasses into a 2.5 inch bore stainless steel Milltek system, running an HJS Motorsport cat. In this specification,

Specification	
MARK WATTS' 2.2-LITRE ASTRA SRi	
■ ENGINE	Z22SE, 2198cc 16-valve DOHC all-alloy transverse four cylinder, Courtenay Sport Stage 2 supercharger conversion using Eaton screw-style blower, K&N cone filter, Laminova chargecooler on inlet manifold with pre-radiator, water-cooled oil cooler, additional ECU for on-boost running, two additional injectors mounted in inlet manifold, Courtenay Sport 2.5 inch stainless steel exhaust downpipe with pre-cat removed, 200 CPSI HJS Motorsport catalyst, Milltek stainless steel 2.5 inch exhaust system, Courtenay Sport billet steel lightweight flywheel, bespoke radiator top hose, uprated poly front engine mount
■ MAX POWER	245.6bhp at 5967rpm
■ MAX TORQUE	236.3lb ft at 4472rpm
■ TRANSMISSION	Five-speed F23 Getrag gearbox, Courtenay Sport uprated clutch
■ SUSPENSION	Bilstein B8 sports gas dampers, Eibach Pro-Kit lowering springs, uprated polybushes in front wishbones, front caster adjustment kit, Whiteline adjustable front and rear anti-roll bars, Whiteline rear camber and toe adjustment kit, Whiteline front strut brace
■ BRAKES	308mm 16-groove Courtenay Sport big disc conversion, standard calipers, 8-groove Courtenay Sport rear discs, Mintex Xtreme pads all round
■ WHEELS	7 x 17 inch Astra SRi Turbo alloys
■ TYRES	215/40ZR17 Hankook RS-2 tyres
■ EXTERIOR	Prodrive SRi Turbo front bumper and rear lower skirt, Astra Turbo side skirts, Irmischer front grille, tinted rear lights
■ INTERIOR	Irmischer alloy pedals, Irmischer alloy gearknob and handbrake trim
■ PERFORMANCE	0-60mph: 6.8 seconds*, Vmax: 141.1 mph*
■ PT RATING	■■■■■■■■■■

\* All figures tested with passenger onboard using VBox GPS Performance Box



The 17in wheels (left) are from an SRi Turbo and they conceal huge 308mm Courtenay Sport discs at the front; interior (below left) is largely standard bar some tasty Irmischer detailing



Courtenay Stage 2 conversion affixes an Eaton blower to the Z22SE engine (above left) to boost power to over 240bhp; SRi Turbo front bumper helps to sharpen the Astra's looks (left)

Mark's Astra pumps out a mighty 245bhp at 5967rpm, allied to an impressive 236.2lb ft of torque at 4472rpm, meaning it's a full 100bhp up on the standard figures.

The real secret to Mark's Astra's appeal is the way that the torque is delivered, because a glance at the chart from Courtenay's dyno shows that it churns out over 200lb ft of torque from 2000rpm upwards, which promises massive flexibility. It also gives the Astra F23 Getrag five-speed a thoroughly good workout, hence why Mark's wisely installed an uprated Courtenay clutch, which mates up against a lightweight billet steel flywheel that improves throttle response and allows the engine to rev more freely.

Clearly, Mark's car now has thrust aplenty, but our man also placed chassis improvements high up his agenda too. "In fact, I did the chassis modifications first," says Mark, "fitting the B8 Bilsteins and the Eibach springs which drop it about 10mm, so it's still nice to drive even on B-roads."

From here Mark moved onto improving the Astra's handling balance, to produce a car that was more satisfying to steer both on road and track. "I wanted to take some of the FWD understeer characteristic away," he says.

Here he's been helped enormously by the fact that the Astra is also sold into the Australian market, so it's nicely catered for by Aussie suspension supplier Whiteline, which markets all manner of

affordable chassis goodies for it. As such, Mark's fitted Whiteline polybushed front arms, which produce an extra half a degree of front caster to help turn in and steering feel, allied to an adjustable anti-roll bar that's fixed on its softest setting. At the blunt end Whiteline camber and toe adjustment plates have been fitted behind the Astra's hubs, to encourage the rear of the car to be more mobile during cornering. Allied to a Whiteline anti-roll bar set on its medium position it's a neat set-up that hasn't broken the bank and still remains compliant enough for everyday driving.

**Mark's Astra pumps out a mighty 245bhp at 5967rpm, allied to 236.2lb ft of torque**

Rim-wise, Mark's Astra's been treated to a set of 17 inch Astra SRi Turbo wheels, which are shod in Hankook RS2 trackday tyres – something of a bargain at £75 per corner. Nestling

behind these are a set of larger 16-groove Courtenay Sport 308mm front discs, while the stock calipers are repositioned using special brackets and are fitted with Mintex Xtreme pads. As the rear stoppers don't endure such a hard time, Mark's uprated these with standard-sized 8-groove Courtenay discs, again with Mintex pads.

Finally, Mark's treated his now not so humble Astra to a subtle, yet effective visual nip and tuck, fitting an Irmischer front grille and a later SRi Turbo (Prodrive styled) bumper to sharpen the nose. This is matched by an SRi Turbo rear lower skirt (again Prodrive) and Astra

**Neat conversion leaves the SRi with 245bhp and 236lb ft of torque, creating a 141mph raver with 0-60mph dealt with in a scant 6.8 secs**

Turbo sideskirts, while a set of smoked rear lights and a personal plate complete the job. Which begs the question: how does it drive?

Very nicely, in short. It's been ages since I last pedalled an Astra, yet Mark's car felt instantly welcoming. Twist the key and it settles into a smooth, steady tickover with a purposeful throb from the exhaust, but once you're underway it's clear that there's some serious squirt on tap. Pick any gear and a prod of the throttle sees the Astra respond instantly, as a wall of torque is unleashed. It easily lights up the front Hankooks in the lower ratios if you're brutal on the throttle, accompanied by a shrill, electrifying scream from the 'charger that makes the hairs on the back of your neck stand on end.

Despite this prodigious grunt it's refined and well behaved on part throttle, with no shunting, fluffing or pinking. It willingly revs hard to the 6500rpm redline, at which point the whistling scream from the supercharger is, er, intrusive – but perfectly judged to put the smile on any petrolhead's face. You don't have to work it hard though, as there's ample power available from very low in the rev range and such is the blown engine's sharp response it feels akin to driving a 3-litre NA car. It's quick too. Two up, Mark clocked a 0-60mph of 6.8 seconds (8.2 standard) combined with a Vmax of 141.1mph (133mph) at which point the Astra was clipping the rev limiter in fifth.

Pleasingly, Mark's chassis modifications are as effective as his engine tuning, for here is an Astra that boasts a biddable, exploitable chassis that actually gives you handling options beyond chronic

understeer. Turn-in is keen and the Astra's tiller is alive with feedback from the Hankooks which hang gamely on, being a sticky track day compound. Ultimately it'll understeer when pushed, but a mere lift of the throttle mid-bend sees the sliding tail come round in a nicely controllable way, or turn in on the brakes and there's oversteer available on demand, which can be swiftly caught with a prod of the throttle. Happily, this dynamic finesse includes a comfortable, composed ride, with more than enough suspension travel to absorb the worst lumps and bumps, while the anti-roll bars mean Mark's SRi exhibits a nice, neutral stance even during spirited cornering. It's staggeringly good fun and offers plenty of appeal, especially when you consider the lowly handling abilities of the base model...

I've been scratching my head a bit with this car, wondering whether I'm getting carried away with my praise, but I don't think I am. Yes, the engine conversion is quite expensive – around £5950 fitted for the supercharger, which represents good value, considering the work involved. But with Astra SRis on the secondhand market for anything from a couple of grand upwards, even when you add the chassis upgrades it isn't an expensive car. Or if you can't stretch to the 'charger conversion, the good news is that there's an affordable, effective Astra G chassis upgrade package that really works.

Mark's SRi is very different, very capable and very quick. I'm so impressed that in sheer cause and effect terms, I don't remember driving a more enjoyable and well sorted modified Vauxhall – period. **PT**

**Mark Watts (below left) gets to work on tuning Vauxhalls day in, day out, so who better to have a modified Astra SRi?; VXS badge (below) is a neat touch; exhaust (bottom pic) is a Milltek 2.5 inch stainless system**



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