



## Jaguar World – March / April 1995

'S' FOR SURPRISE by Richard Horn

Richard Horn samples a Lynx-built, 300bhp twin turbo 'S' type saloon .



Ask most people which post-war classic saloon Jaguar immediately springs to mind and the elegant Mk 2 will surely be the chosen car. So popular is it in people's affections that several well-known companies have founded their businesses on this one model. Therefore it's all the more surprising - and refreshing - to report on the restoration and extensive modification of the Mk 2's poor relation – the 'S' type Jaguar saloon.

It is certainly a complex project which Lynx Motors International of St Leonards-on-Sea have just completed on behalf of an owner with very definite ideas on what he wanted. The result is a very special, twin-turboed, inter-cooled, superbly-equipped 'Q' car in the very best tradition.

'Q' cars are by far my favourite machines, giving the driver unprecedented fun, especially when encountering unsuspecting and ostensibly "faster" vehicles. The subtler the conversion the better and if the car is a dark, discreet colour then the subterfuge is more successful! Which is why I am glad that this "S" type is finished in metallic Jaguar Solent Blue, drawing attention to itself only by the addition of a discreet under-grille air intake and slightly wider chromed wire wheels.

The anonymous owner certainly gave Lynx a taxing job and it was one they relished. Not since the restoration of the marvellous Ecurie Ecosse transporter had the firm faced such a daunting project, one which was to stretch even this renowned company. The main problem of course was fitting in all the pipework and necessary ancillary items. It was as if they had to hide two 20ft Royal pythons under the bonnet without Customs men finding them! For that was one of the rightful main requirements- the classic twin-cam Jaguar cylinder head had to remain unsullied by extra plumbing wherever possible.

However, before they set to on the main task they had to restore the bodyshell. To what appeared to all intents and purposes a reasonable Swedish, left-hand-drive 'S' type was, in fact, rather worse than it looked. The metal tailors stitched in new panels where required and that was in all the usual places. The stressed sills were replaced inside and out along with a new boot floor and door bottoms. Lead loading was used where necessary as with the spot light shells, one of which had to be dented at its base to accommodate the snaking pipework. Instead of the half rear wheelarch the owner had requested Coombs type lipped round arches to give the car a more sporting appearance and accommodate the wheels which helped give a 2½in wider track. Much rot was also found in this area and new front archlets were let in. Perhaps most important of all were the new front inner wings that had to be made up to squeeze in all the pipework.

Side impact bars were added to the front doors affording some extra safety but Lynx developed an interesting telescopic design. They will collapse in a front impact, reducing the risk of the doors jamming shut which cannot be said of every manufacturer who has retro-fitted crash bars to older models still in production. This neat and simple solution is being patented. A steel sunroof was also on the specification sheet and this proved a nightmare to make as the roof has a double curvature. It took Lynx one week to make this up and 12 weeks in all to prepare the body before shotblasting at Rye. After this it was self-etched primed and at least ten coats of metallic Jaguar Solent Blue acrylic paint were added giving a deep, lustrous finish. Needless to say, the underneath was attended to in the usual manner with rubberised stone chip paint and all hollow sections wax treated. That was the easy part, now Lynx had to sort out everything else.

As you know, the main Achilles heel of any turbo conversion is heat build-up under the bonnet as well as the higher temperatures inside the engine. So the bonnet now has extractor louvres above the turbos a la 'E' types and the new inner wings have vents strategically placed. Two extra cooling fans were fitted, one heat shielded on the right-hand side under the bonnet drawing cold air across on to the twin Garret T25 turbochargers. The other one is mounted high up beside the turbos blowing air directly on to their undersides via ductwork piping. Both of these cooling fans have variable setting temperature sensors located in the aluminium fabricated radiator header tank.

Lynx had an enormous shopping list of items to procure. To start with, the Garret T25 turbochargers are a matched pair, modified with larger compressors giving increased flow. They are also water-

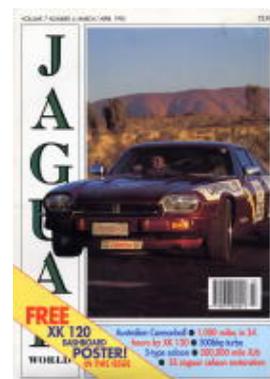


and oil-cooled, protecting the bearings in the best way possible. All that remains of the original 3.8-litre engine is the block which, most importantly, has had added oil cooling jet pipes which go through the block and spray a mist of oil on to the piston crown bottoms. This neat little modification helps reduce the heat build-up and internal turbo temperatures that rightly concerned Lynx at the outset. Otherwise the block has been fully re-machined with non-standard, forged pistons on



Carillo steel con rods giving an 8:1 compression ratio. All moving parts have been dynamically balanced, making for smoother running. To improve cooling further a larger diameter impeller was fitted to the water pump while more secure screw-in brass core plugs replaced the standard steel push-fit items. Drive belt pulleys were ditched in favour of lightweight aluminium versions.

Needless to say, the cylinder head also received attention. First in the firing line were the inlet and exhaust manifolds which were gas flowed to maximise the overall performance of the larger, Nitrided inlet valves. The increased stemmed exhaust valves were fitted with oversize cam





follower buckets improving heat dissipation and sealing against high specification valve seats. The chosen camshaft was a standard XJ6 Series 3 item acting on lightweight followers. Other cylinder head modifications include nitrogen- pressurised "Wills" steel O-rings locating into grooves in the cylinder head. These contain the cylinder compression which is obviously important in a turbo engine. Race variety Champion C57c spark plugs are fitted with the standard coil backed up, however, by a Lucas power amplifier. Added to this are the twin turbos in parallel, fitted to give far quicker response and greater torque at lower speeds. A single turbo would take too long to wind-up. Lag is further reduced by using smaller pipes which maintain gas velocity. A custom-made inter- cooler of all aluminium composition was fitted below the front bumper, connected by twin aluminium ducts. Using the same type of ducting Lynx hid the air filter in the left-hand front wheelarch.

The fuel injection which replaces the two SU carburettors is electrically- operated and controlled by the main ECU. The plenum chamber is also from an XJ6 Series 3 modified with a double throttle body and a halved plenum chamber giving greater control of the air/fuel mixture. The fuel supply passes through a new high-efficiency filter unit, while the fuel pumps are now of a high capacity and pressure. A constant fuel- to-air pressure differential is maintained by a pressure control valve with a variable turbo boost setting.

The engine is presently set to deliver 300bhp and can be increased to produce 425bhp should the owner desire. All of this tremendous power is handled by the standard all-synchro four-speed gearbox with overdrive. To ensure that it can cope with the much higher torque figures special attention has been paid to the electrically- operated overdrive unit. Uprated cones and springs are fitted. The 3.77:1 limited slip differential is standard, apparently able to cope with 800bhp! The power is fed through a high performance, semi-competition clutch and Lynx have added a removable bellhousing/transmission tunnel, eschewing the need to take out the engine every time.

The exhaust manifolds had to be machined specially by Lynx to accept the turbos, being of the three into one variety of a cast iron material. The 23 metres of TIG welded turbocharger pipework which twists and turns every few inches is made from 16 gauge stainless steel as is the exhaust system, mimicking the original rear pipes. Around the turbocharger flanges and just under the passenger floor can be found much heat shielding which not only reduces under-bonnet temperatures but also maintains exhaust gas velocity.

With the obvious high temperatures created, a fully synthetic Castrol RS oil is used, negating the need to add extra additives. The only way that Lynx were able to install everything under the bonnet was to fit the block in first and then add the turbos and all the necessary plumbing. Janspeed of Salisbury were consultants, choosing appropriate turbos and greatly short- circuiting development time. It is still amazing that everything fitted because, besides the air conditioning pump, there was also added an oil cooler, negative earth, high output alternator, new aluminium cored radiator with integral header tank and Kenlowe electric fan.

Nobody in their right mind contemplates up-rating an automobile on the engine side alone and Lynx have modified the 'S' type to cope with the performance gains. To start with, the brakes have been replaced all round, with full 4 pot AP aluminium racing calipers allied to hugh 14" diameter vented discs of dinner plate proportions.

A Lockheed remote vacuum- operated servo with increased capacity master cylinder was included to reduce pedal pressure. Standard rubber brake pipes gave way to Aeroquip items. Next in line was the suspension. Koni shock absorbers and uprated new springs were added, giving the 'S' type a sportier ride while retaining the compliant feel of the original car. The standard rubber bushing remained but a slightly stiffer anti-roll bar went in to help the car's cornering behaviour.

Now the spotlight fell on the steering. As the original Varimatic power steering was not wanted the manual system was kept and just overhauled. Wheels and tyres grew in width to 6in rim wires sporting Dunlop SP Sport D7 covers of 215/70ZR15 size. This combination maintained the traditional appearance and improved grip, response and power transmission at the same time. The 2½in increased rear track now matched the front and also helps handling. This was accommodated by fitting modified XJS wishbones and drive shafts. All the suspension parts were self-etched Kefos-coated for longevity.



By now the owner had visited Lynx twice to see the progress of his 'Q' car. A total of 18 months' labouring would elapse before this discreet machine was finished. He requested a CD player on top of the Sony radio/cassette that was already going in. So Lynx just had the electrics to sort out and the trimming of the interior.



As mentioned earlier, the dynamo was junked in favour of a high output alternator. An electrical isolator switch located in the boot was included as found on every new Bentley or Rolls- Royce. It also acts as a quick servicing kill switch. Because space was at a premium Lynx mounted the battery in the boot along with the air conditioning refrigeration unit, the multiple CD charger and the 2½kg halon gas fire extinguisher. This last item is powered by a separate internal battery but all the aforementioned live in a new rear bulkhead for neatness and strength even if it robs some boot space. The fire extinguisher has two under-bonnet nozzles, one aimed at the turbos and the other directed at the fuel distribution/inlet manifold. A red danger switch in the best James Bond tradition is mounted on the parcel shelf below the dashboard, to prevent any raging inferno taking hold.

Another electrical item hiding under the dashboard parcel shelf is the Zyteck ECU, which controls fuel pump operation, duration and timing of the fuel injector operation and timing of the ignition HT voltage. It has been programmed especially for the car. All windows are electric as one would expect, closing automatically when the Philips alarm is set. However, the electric sunroof will not close automatically. Another expected extra is central locking operated from the remote alarm if so desired or the driver's door key or internal door knobs. I have already mentioned that the car has a suitable radio/cassette and CD system fitted and all is connected to an eight way speaker system with 'period' chrome electric aerial in the right-hand front wing.

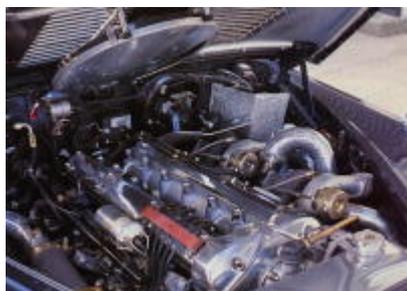


Front seats have been changed to XJ40 'chairs' with all the usual electrical adjustment mounted in a panel in the centre console. Lumber support adjustment is manual however. Fixed seat belts have gone in favour of inertia-reel versions and the rear seats are now fitted with three-point fixed belts. With regard to trimming, top quality magnolia Connolly hide has been used. It covers seats (contrastingly piped in dark blue), door panels, rear parcel shelf and other little trim items to provide a welcome contrast to the blue exterior paintwork. Roof headlining is magnolia England cloth, while the parts that might get muddy are dark blue Wilton with magnolia edge bindings. To trim up one door panel involved one week's work, so you can imagine what it took to do the rest. All woodwork was carefully re-varnished and a woodrim steering wheel substituted for the thin original.



#### ON THE ROAD

Before driving this 'S' type I followed in one of Lynx's XJS Eventer estates and could not help noticing how the back of them 'S' type reminded me of a baby Bentley of a similar period. The new round rear wheelarches really complemented this elegant car, which wears its blue coat admirably. As I was climbing into the driver's seat, I was informed that Lynx took the car to Goodwood for shakedown tests and the ex-BRM Formula 1 Peter Gethin found the car very complete and together and well up to modern cars in every aspect.



The main requirement from the owner was for plenty of torque in all gears. He was not concerned by great horsepower figures, though they are available if the wick is turned up. I found that refinement was the main attribute to this gentleman's express. It is as smooth as a Jaguar V12 with no lag from the twin Garrets. Set at a maximum boost of 0.7 bar the car picks up from 1,500rpm in top gear without a murmur and comes on boost at around 2,000rpm when the horizon begins to shrink rapidly. By about 4,500rpm you have had your lot and it is time to change up and hit the overdrive switch. A very sedate 50mph equates to 2,000rpm in overdrive top and of course there is no need to change down to dispatch a few 'slow coaches' ahead of you. Very fast cars can be so safe in the right hands and in the right conditions. I certainly found that there was plenty of torque

and the car was very tractable, which cannot be said of some Italian exotica of a similar age. Plug fouling in town? I don't think so. This behaviour all adds to the fun that is on offer from the Lynx 'S' type. The owner must have a wicked sense of humour because Bentley Turbo R owners might be humbled by this machine.

The brakes were magnificent in bringing this swift projectile into line with no tramlining from the 215 section tyres. The good damping and lack of roll also contributed to the overall feeling of security, while despite the surge of power in any gear, rear-end steering was entirely absent. The steering I found neatly direct and not shoulder wrenching; nor was its left-hand position a handicap on British roads as I could keep well tucked in on corners and use the power to slingshot past when necessary.

Obviously Lynx could have extracted similar horsepower from one of their conventional 'D' type spec. engines; but not the incredible torque that this twin turbo engine gives - some 365 lb ft at just 2,500rpm. To put this into perspective, that's actually 231 lb ft more than Jaguar's very latest 6.0 litre V12 pushes out, and at 1,750rpm lower too! So you can begin to appreciate just what this 'S' type feels like when you put your foot down.

Lynx have done a remarkable job and like Peter Gethin, I could find no fault or hidden vices. The owner might have bought an Aston Martin DB7, but then why follow the herd? This 'S'-type is the most surprising Jaguar I have ever driven and surely the ultimate 'Q' car.

