

XJR remixed

The original 4.0-litre X308 XJR is a rapid car, but when armed with a subtly modified 4.2-litre supercharged engine transplant from a late XKR, just how much faster is it?

Words and pictures: Matt Skelton



For most owners, the X308 XJR – a 4.0-litre supercharged V8, 155mph, four-seater luxury saloon car – is plenty capable enough in standard form. But for some, it's just not quite capable enough.

True, the 1999 example pictured here doesn't look anything out of the ordinary. Close external scrutiny reveals that the lightly smoked indicator and side repeater lenses are the only non-factory items – but when the owner invites us to pop the bonnet, it becomes immediately apparent that all is not as it first seems... In the engine bay sits a 4.2-litre supercharged AJ-V8 engine that would once have called a late model XKR home. This

car is clearly rather special. How special, we're about to find out.

Misfortune and opportunity

Owned by Danny Carpenter of Elite and Performance Jags in Derby, the motivation for the engine transplant came about when the car's original 4.0-litre AJ-V8 engine gave up the ghost. Sadly, that's not an altogether unheard of happening, although in the case of this car it was rather unexpected as all the timing chain tensioners and chains were of the later 4.2-litre type – in fact, it was a failed oil pump that did the dirty deed.

But, rather than scrap the car or fit another 4.0-litre engine, Danny saw his bad luck provided an opportunity to investigate just what could be done to make his X308 XJR a cut above the rest, and the first part of that job was to fit a 4.2-litre supercharged AJ-V8. There were three key reasons why this was a sound idea. Firstly, the 4.2-litre unit suffers from none of the reliability gremlins of the earlier smaller capacity engine, secondly, they are readily available and, thirdly, the swap isn't that complex – provided you source then engine from the right car.

"Getting hold of a 4.2-litre engine is relatively easy," explains Danny. "There are a lot of 4.2-litre



XK/XKR, S-TYPEs and X350 XJRs out there, and a lot get totalled!" To make the installation as easy as possible, though, the engine Danny was after was the 4.2-litre supercharged lump from a late X100 XKR. "Installing a previous generation XKR 4.2-litre engine is relatively straightforward, but with an S-TYPE R or X350 XJR unit there's an awful lot that has to be changed in terms of ancillaries."

In the quest to keep things straightforward and while 4.2-litre XKRs deliver their power through a six-speed ZF gearbox, Danny decided to retain his X308 XJR's standard Mercedes-built five-speeder; it made the electrical side of the job easier (see

This is what a 4.2-litre XKR engine looks like in an X308 engine bay – the use of colour makes it look particularly good. Left is the bay part way through the build – you can clearly see the custom-built aluminium charge-cooling radiator



boxout, 'Engine swapping'), plus there was nothing wrong with it and the belhousing mated up to the newer engine perfectly. Gearbox aside, before the new engine went in there were a few tweaks that Danny wanted to carry out...

The standard 4.2-litre type Eaton Rootes Supercharger was retained, but a larger crank pulley means it's driven at a higher speed for increased boost. To keep the air drawn into the engine via a neat enclosed carbon fibre air intake as cool as possible, an independent charge cooling circuit was installed. This circuit utilises a custom built alloy radiator, and runs its own swirl pot. While this modification doesn't provide any outright performance gain, what it does mean is that in hard use there's no drop off in performance whatsoever as there's no rise in intake temperatures through heat soak.

Completing the mechanical changes, Danny fitted Iridium spark plugs, new catalytic converters with full radius lower sections mated to a bigger bore exhaust system, and then added a separate ECU to take care of fuelling and ignition timing. The XJR was then mapped 'live' on a rolling road – the same one on which Danny tested the car when it had its original engine in stock form. So that means the latest figures for the modified 4.2-litre engine are a direct comparison – and they are most impressive. Peak power and torque gains are 51bhp and 86 lb ft respectively, but

what's more significant are the changes lower down the rev range. At 3,000rpm the 4.2-litre engine puts out 135 lb ft more than the stock 4.0-litre unit, and at 3,250rpm the respective power gain is 80bhp. On top of that, the power hike is at least 60bhp all the way to the red line. In short, the gains are not all at the top end, which should mean a very useable, and very quick engine.

Finishing touches

Before heading out on the road, there are a few other details to note about this car that make it rather different. While the exterior tweaks are minor, you'll have noticed that the underbonnet appearance is particularly smart. Courtesy of satin-red powder coated charge-cooler 'bricks' and a satin-black powder coated supercharger top-plate, this AJ-V8 – in stark contrast to the standard item – is a feast for the eyes. The attention to detail is also apparent. The spark plug covers are picked out in satin silver, and the underbonnet covers (for example, the one hiding the brake fluid reservoir) have been finished in high gloss midnight-black paint. And that's so that they match the dash panels inside...

Open the door and those midnight-black painted dash panels, door inserts and console surround look smart, but not the slightest bit ostentatious. The steering wheel also matches,

and there's a neat boost gauge situated by the driver's side A-pillar. Alloy instrument rings and pedals complement one another too, but nothing is over the top – except, perhaps, for the entertainment installation! The details of this are far too long to mention in full, but the Alpine based system includes a multimedia touchscreen where the original radio would have sat, plus DVD screens in both rear headrests which can be used with wireless headphones. There's an iPod interface in the centre console and a full surround-sound amplifier powers the system, which feeds a full complement of surround-sound speakers and a 12in subwoofer.

In total, there's almost £3,000 worth of audio equipment installed and while Danny admits that he may have got a tiny bit carried away, the fact that the end result still looks like a factory fit – despite there being an additional 280-metres of cabling hidden away – is credit to the care with which the job was completed!

Driving proof

Sat behind the wheel for the first time, this XJR feels no different to a standard car – although twisting the key to prompt the engine into life does deliver a deeper exhaust burble which promises a little of what is to come. The first job, though, is to drive the car slowly. After all, a key characteristic of any XJR is its ability to combine



The media install includes front multi-media screen (there are screens in each of the rear headrests too), and an iPod interface in the centre console. The amplifiers that power the system, along with a 12in subwoofer, are mounted in a custom-built boot enclosure. Like the rest of the modifications, it looks like a factory finished job



The interior features midnight-blake painted trim and a neat boost gauge – to name just a few of the tweaks...

refinement at slow speeds with searing pace when necessary. So, have those modifications compromised refinement?

The simple answer, immediately apparent after just a mile's drive, is no. With the J-gate in Drive, this car is as refined as any standard XJR and, no matter how we try to trick it, gearchanges are super-slick too. In fact, it simply drives as you would expect a well-maintained standard example to – there are no bumps, thumps or knocks over road imperfections, and the standard wheel/tyre combination means a slow-speed ride that is cossetting too. So, with the grace question answered, what about the pace? Does an extra 200cc coupled with the other modifications we've mentioned really make a noticeable difference? Oh yes...

Cruising at 50mph and with the gearbox still left in Drive, pressing a little harder on the throttle results in serious push in the back acceleration without the 'box even dropping a gear. Repeating the exercise with the gearlever flicked across the J-gate and up to third results in a very serious push in the back – and flooring the throttle in the same gear necessitates some serious concentration. As the needle in the boost gauge dances around its dial, the push in the back becomes a kick in the pants. It's the same story

in any gear. This is an exceptionally rapid car, and one that's testament to the standard design too.

Missing from the list of modifications are any changes to the suspension, steering, or brakes for the simple reason that Danny didn't feel they were necessary. And we'd have to agree. Despite its ability to travel considerably faster than the already fast standard XJR, this car feels totally composed in any situation we are able to throw at it. The only caveat I'd add to that is that, personally, I'd prefer a little more feel through the brake pedal, but that preference is one that's true in the standard car too – there's nothing wrong with the braking system's stopping ability.

A sensible move?

Disregarding the additional modifications that Danny has made to the engine, does the basic concept of a 4.0-litre to 4.2-litre engine swap make any sense? Well, I wouldn't suggest that if your 4.0-litre X308 is running like a dream that you go out and junk a perfectly good engine. But, if you're unfortunate enough for that engine to go bang and don't want to scrap the car, then replacing it with a 4.2-litre unit, even in standard guise, is a route well worth considering. The end result, just like this car, could be something really rather special.

XJR: from 4.0- to 4.2-litres

If your 4.0-litre X308 XJR has a blown engine and you decide to go down the 4.2-litre route then remember that it is important that you source the larger unit from an XKR to make the swap as easy as possible. The top price for a low-mileage 4.2-litre supercharged XKR engine is around £4,000. Once you've sourced the engine, Elite and Performance Jags would typically charge between £1,500 and £2,000 for the installation. If that sounds like a big total bill, remember that a new replacement 4.0-litre engine from Jaguar will be in excess of £7,000...

The reason for the range in the installation charge is that fitting the 4.2-litre engine to pre-2000 XJRs is a little more involved than it is with later cars. Though it's always been called the AJ-V8 for consumers, Jaguar's V8 engine has been through numerous iterations as it has been developed. The very first version was internally coded the AJ-26, and in supercharged form it was in production until the 2000 Model Year when enhancements to the electrical system saw it upgraded to AJ-27 specification (the naturally aspirated engine having been upgraded the year before). That means that there are both AJ-26 and AJ-27 engined X308s. Mating a 4.2-litre engine's electrical system to an AJ-27 car is easier than it is to an AJ-26 example – but it's not impossible, and Danny's car is the proof as it is an AJ-26 machine.

Two final points. One: if you own a naturally-aspirated 4.0-litre X308 and the engine goes bang, then going the 4.2-litre route won't be as simple because the five-speed ZF isn't as tough as the Mercedes version in the XKR and changing to the later six-speed is a non-starter due to the electronics. Two: exactly the same applies to 4.0-litre XK8s/Rs – so converting a 4.0-litre XKR to a 4.2-litre R power is feasible, doing the same with an XK8 is, sadly, not going to be as straightforward.

