

MODIFIED

# JOY OF SIX

Motor Legends has developed a modern six-speed automatic gearbox conversion for Jaguar's V12 and XK engines that results in a harder and more responsive drive. We experience the transmission in the first car to be fitted with it, a 1971 E-type Series 3 fixedhead coupe

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O CAR is perfect, even – whisper it – the E-type. This is especially true of the Series 3 when it was

fitted with an automatic gearbox, the three-speed BorgWarner transmission that reduced the power, torque and drivability of Jaguar's famed V12. Kent-based classic car specialist Motor Legends was determined to change this, and has developed a six-speed automatic gearbox conversion for the 5.3-litre, fitting it first to a fixedhead coupe it has recently restored. With improved speed and torque, the result should be perfect. ►





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E-TYPE V12 SIX-SPEED AUTO

A Jaguar sports car with an automatic transmission wasn't a new idea at the time the E-type Series 3 was revealed in 1971, having first been offered as an option with the XK 140 from 1956 and then again for the XK 150 drophead and fixedhead coupes. Supplied by the American company BorgWarner, it clearly showed which market Jaguar had in its sights for its automatic transmission cars.

It wasn't until 1966, and the introduction of the 2+2 coupe, that the automatic became an option for the E-type, when the car's longer wheelbase allowed room for the BorgWarner Model 8 transmission. Although it only had three speeds, it suited the 4.2-litre XK engine's torquey character, and didn't hinder performance too much. From the outset, the BorgWarner Model 12 was an option for the Series 3 V12 model, available with both the coupe and, for the first time in the E-type's history, the open car, made possible because the roadster used the same extended chassis as the 2+2.

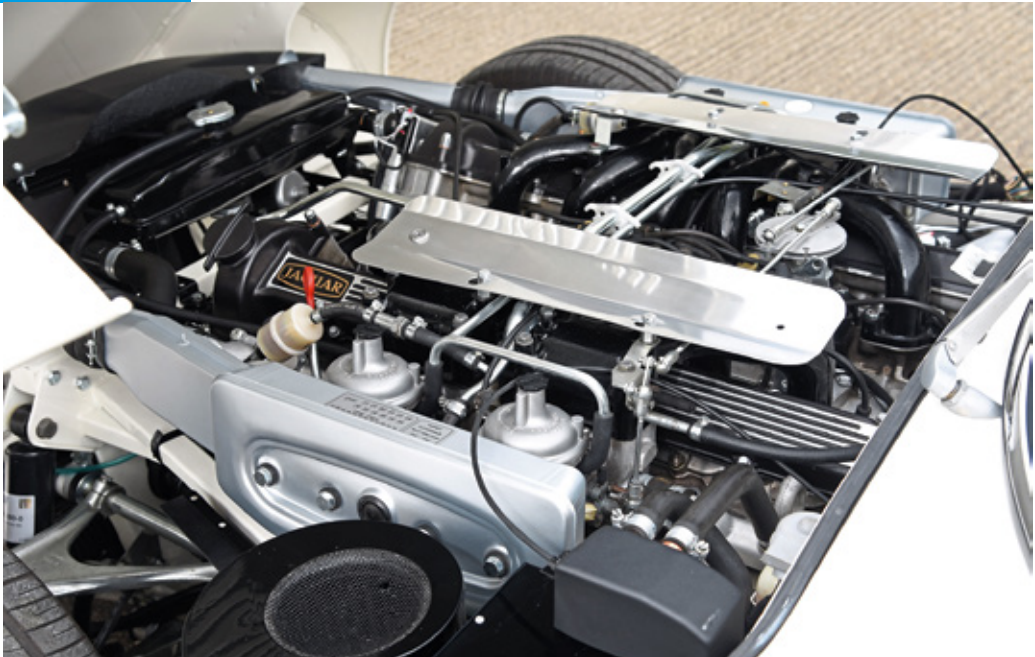
However, due to the slower-revving, lazier nature of the V12 compared to the higher-revving XK unit, the 'box turned the final generation of E-type into more of a grand tourer than the earlier models, a transition that culminated in the luxurious and mainly automatic-only XJ-S in 1975. The E-type V12/BorgWarner combination was never particularly popular – of the 15,292 Series 3 produced, only a handful had the automatic gearbox – and it is still considered by many to be massively underwhelming, including by Keith Perkins.

A keen pilot, Keith built up an incredible collection of vintage aircraft, including

two Supermarine Spitfires that form the basis of Aero Legends, the UK's largest vintage aviation passenger flight experience business. He is a keen Jaguar enthusiast also, and in 2017 created a sister company, Motor Legends, to restore, prepare and modify classic cars. And that includes his own.

While visiting New Zealand in 2018, Keith discovered a 1971 E-type fixedhead coupe automatic with 70k miles from new that had suffered from a minor accident 30 years before and had been laid up in a barn ever since. Keith had it brought back to the UK and recommissioned by Motor Legends in 2020 for his personal use. But, says the company's general manager, Andrew Parkinson, a former Lynx man who worked on the Eventer among many others, "It was a lovely car spoilt by a horrible gearbox, especially compared to the smooth eight-speed unit in Keith's XF Sportbrake 2.2." That was the original catalyst for the project.

**The car lunges forward, the V12 feeling even hungrier, revving all the way to 5,800rpm before it changes up in a mere 0.2 of a second (otherwise known as 'blinking speed')**



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"That's when we realised we could improve the car by sorting its weakest point – combining a lovely modern gearbox with the V12," Andrew tells me. Unable to source a modern 'box conversion for the V12, it soon became clear they'd have to develop one themselves. "We looked long and hard, but couldn't find anything suitable."

After investigating several options, Keith and Andrew eventually chose Ford's version of the ZF 6HP, a six-speed transmission found in a variety of vehicles, including the 2.3-litre turbo Mustang. There were several reasons for choosing this. Firstly, the specification of the torque converter suits the torque spread of the V12. "If you look at the power and torque curve of each engine they're actually very similar, meaning we didn't need to mess around using different torque converters."

Secondly, the original ZF-produced 'box has an internal controller that communicates directly with the engine's ECU, which wasn't applicable here since the

V12 obviously didn't have one. With Ford's version (which is made under licence), the controller is separate, allowing Motor Legends to add an ECU to the car uploaded with its own software to govern the six-speed gearbox.

And finally, with the 'box rated to 750bhp, "We could fit it to a supercharged Lister 7.0-litre V12 and still be in the parameters of what the six-speed can handle. We can change the hydraulic pressures to suit the horsepower of any engine," says Andrew.

It would be all for nothing, though, if the 'box didn't physically fit into the E-type. With the engine and standard BorgWarner gearbox removed, together with the front frames that needed replacing anyway, the V12 and six-speed transmission (joined together by a bespoke bell housing adapter plate) slipped surprisingly easily into place. "We kept thinking how big it looked," admits Andrew with a laugh, "yet it's amazing how it almost fitted." Only the gearbox's extra width stopped it from being the perfect installation. ►

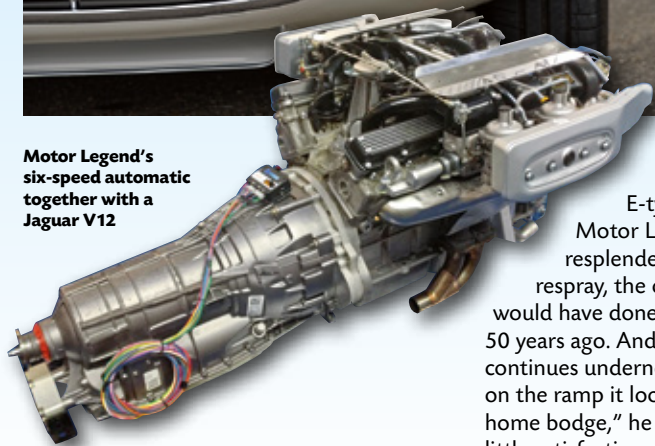


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**Motor Legend's six-speed automatic together with a Jaguar V12**



For the amendments, Gordon Russell, also ex-Lynx and a respected E-type specialist now running the Motor Legends bodyshop, designed and engineered the minimal changes required to the bodyshell.

"My brief was to keep the car looking original inside without disrupting the centre console," he tells me. "Essentially, I had to taper the gearbox tunnel outwards at the back."

Gordon then designed a way to remove the cross member to make way for a new gearbox mounting and then build the strength back into it.

When I see the white E-type coupe parked inside Motor Legend's hanger, looking resplendent thanks to a recent respray, the car appears almost as it would have done when it left Browns Lane 50 years ago. And, according to Keith, that continues underneath. "If you see the car on the ramp it looks factory. It's not some home bodge," he says with more than a little satisfaction about the conversion.

The only physical differences are the Gunmetal Grey wire wheels from an Aston Martin DB6 that Keith fitted. Although the same diameter as the standard rims, a slightly wider offset give the normally genteel Series 3 more of an aggressive stance.

Because Andrew was able to keep the Jaguar's original T-bar-topped shifter, the interior is also largely standard. It would take the most critical and eagle-eyed of concours judges to spot the slightly wider, but still perfectly trimmed, gearbox tunnel.

Andrew sits alongside me, his laptop plugged into the car's ECU port (neatly

hidden behind the passenger side front fascia) so he can feed me technical information as we drive. I start the engine, and the big V12 soon settles down to its familiar quiet hum.

After pulling the lever down to drive and squeezing the throttle I can immediately feel the difference. While the kindest way to describe a standard BorgWarner automatic 'box with a mere three gears is 'sluggish' (the space between its gearing being too long and the changes too early to make it a proper sports car), Motor Legends' six-speed gearbox allows the V12 to rev much higher before changing, from its normal 3,600rpm to a hitherto unknown 5,500rpm, resulting in harder, more performance-focused acceleration.

The Ford-sourced 'box is also sharper and more instant than the BorgWarner; according to the telemetry on Andrew's screen, changes take a little under half a second. It's also not as dimwitted as the standard transmission, which can never decide which of its three gears it wants to be in. With double the





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amount, whether it's changing up or kicking down, the Ford transmission always chooses the most appropriate one.

Andrew directs me onto a dual carriageway, where the 'box soon locks into a high gear and stays there. At 70mph, the rpm is reduced from 3,000 to 1,900 so the V12 sounds and feels less strained than an engine mated to the three-speeder, making the Motor Legends' transmission ideal for long-distance touring.

The gearbox has another trick up its virtual sleeve, too: the ECU in Keith's car has a second, sportier setting (or 'map'). As we are now on a faster, swooping road, Andrew engages it with a couple of keyboard taps (he plans for customer cars to have a discreet button sourced from the XJ40 and positioned behind the gearlever) and the car lunges forward, the V12 feeling even hungrier, revving all the way to 5,800rpm before it changes up in a mere 0.2 of a second (otherwise known as 'blinking speed'). It's apparent that the E-type suffers from more jolts when in sport mode, the result of its flimsy frame construction being shaken by the hard and

fast changes, but the way the 'box accesses a bigger amount of the engine's torque more than makes up for it. Besides, this is Andrew's own setting – each of the four maps that the ECU can accommodate will be tailored to the customer's requirements.

Thanks to the surprisingly high-revving nature of the V12 when married to the six-speeder and the time in which the 'box changes in either direction, plus the E-type's perfectly neutral handling – not affected by the new transmission – I'm able to balance the throttle through a corner before giving it the beans, when the 'box kicks instantly down as I exit the bend. It's a very modern experience, despite this car being 50 years old, and I jokingly tell Andrew that all it needs to turn the E-type V12 into even more of a driver's car are steering-wheel-mounted paddles, similar to an F-TYPE's. He replies that with the right software it would be possible, although we both agree a modern wheel would ruin the aesthetics of the car's classic dashboard.

Motor Legend's six-speed transmission has been developed so that it can fit into any

V12 Jaguar (Andrew and Keith are currently road testing an XJ-S version, which I can't wait to try) or any car with the XK straight-six, from the earliest XK 120 to the latest Series 3. Motor Legends can even convert a manual car to the six-speed automatic – although this obviously impacts on the price.

Ah yes, the money. You could buy an entire XKR 4.2-litre and not just its six-speed 'box for the £11,995 (plus VAT) that the basic conversion costs – which includes the reconditioned 'box fitted at Motor Legends' Kent workshop and widening and retrimming the gearbox tunnel – but that misses the point of the project.

Whether you drive any variety of E-type Series 3, XJ-S or XJ12 and want to release more of your car's potential while keeping its looks relatively standard, Motor Legends' six-speed transmission conversion really is, well, perfect. **PW**

**Thanks to: Keith Perkins & Andrew Parkinson of Motor Legends ([www.motorlegends.co.uk/](http://www.motorlegends.co.uk/) +44 (0) 1622 673 404)**