

Performance Builder's Guide: Jaguar E-Type Series III V-12



BY MARK J. McCOURT

PHOTOGRAPHY COURTESY STEW JONES RESTORATIONS AND TRACK TIME PHOTOS

Popular wisdom states that of all the E-Type variants built between 1961 and 1974, the first series of lighter, triple-carbureted straight-six cars make the best racers; the V-12-powered E-Types built between 1971 and 1974 were too plush, too heavy, too complex. While the Series III cars, both Open Two Seaters (OTS) and 2+2 Fixed Head Coupes (FHC), may have been larger and less agile than their short-wheelbase predecessors, their 12-cylinder engines featured impressive engineering and a torquey, smooth power delivery, and they still wore aerodynamic bodywork considered by some to be the most beautiful of the era. Although the steel-roofed FHCs are a natural choice for high-speed race cars, OTSs perform admirably with judicious body reinforcements, and both are virtually guaranteed to be the prettiest cars on the track.

The design of this company's road-going 5,343cc, single overhead-cam 60-degree

V-12 was influenced by the 4,994cc V-12 in 1966's stillborn XJ13 Le Mans racer. This aluminum-bodied car's mid-placed engine had an 86.87 x 69.85mm bore and stroke, and its Brico pistons and Dykes piston rings were moved in their cast-iron dry cylinder liners by a nitrided steel seven-main-bearing crankshaft and forged, polished connecting rods. Dual overhead cams actuated the valves, and dry sump lubrication and mechanical Lucas fuel injection circulated the fluids. The final results of the XJ13 engine's tuning were 502hp at 7,600 rpm and 386-lbs.ft. of torque at 6,300 rpm.

Using lessons learned from the XJ13 engine, Jaguar developed the Series III E-Type's V-12 to maintain their customary level of power in the face of ever-stiffer emissions regulations. Smooth and balanced, the aluminum block and head V-12 featured a number of performance-biased components, including high-flow, flat-top

combustion chambers with optimally situated inlet and exhaust valves, seven main bearings and replaceable, cylinder-cooling, cast-iron wet-sleeve cylinder liners. This engine would gain fuel injection and be redesigned twice before V-12 production ceased in 1996, the first time in 1981 when it became the H(igh) E(fficiency) with a redesigned "swirl" combustion chamber design, and the second time in 1994 when the HE was stroked to 6.0 liters of displacement.

Considered by many to be overbuilt, the Jaguar V-12 can withstand significant cylinder boring, notably raised compression and is adaptable to numerous fuel delivery solutions. Although Jaguar may have intended their often air-conditioned, power-assisted Series III cars to be Grand Tourers, as opposed to the pure sports cars of the first E-Type iteration, there are some enthusiasts who feel otherwise. Stew Jones, president of Stew Jones Restorations in



SELECT COMPONENT PRICES

Engine

Rob Beere Racing Fast Road
V-12 cylinder head and camshaft kit \$4,938 (£2,400)
Rob Beere V-12 block conversion for 96mm liners \$850 (£415)
Hayward & Scott stainless steel exhaust system \$1,208 (£587.50)
SNG Barratt V-12 ignition conversion \$594.70 (£289.05)

Drivetrain

Medatronics JT5 5-Speed kit, inc. Borg Warner T5 gearbox, shifter, new driveshaft, clutch disc and hydraulics, hardware and bellhousing \$4,700

Suspension

SNG Barratt uprated torsion bars, pair \$760 (£371)
SPAX adjustable shock absorbers \$129 (£63) each

Safety

Kirkey Intermediate Road Race seat \$725
Simpson five-point pull-down racing harness \$105

SPECIFICATIONS

Engine: 7.3-liter, 450-cubic-inch V-12, alloy block and head, six 44mm Weber IDF carburetors, 11.6:1 compression ratio
Horsepower: 600 @ 6,043 rpm
Torque: 578-lbs.ft. @ 3,922 rpm
Gearbox: Five-speed Getrag 265
Ratios
1st: 3.822:1
2nd: 2.200:1
3rd: 1.398:1
4th: 1.000:1
5th: 0.813:1

DIMENSIONS

Length: 180 inches
Width: 68 inches
Height: 48 inches
Wheelbase: 105 inches
Curb weight: 2,760 pounds with roll hoops and full fuel tank, 50/50 weight distribution

Racer Resumé:

"I believe the E-Type Jaguar is the most beautiful car ever made. I bought my first E-Type, a 1972 V-12 roadster, in 1985, and I had no intention of doing anything to it. I joined the Jaguar Club [of North America], and a few years later, they started a slalom program. I started driving in that program, and began thinking about SCCA events. Stew was maintaining my original car, and we decided that it would be fun to have a car that would do really well in these events. I didn't want to further modify my near-stock car, so we started with a 1973 roadster to make The Beast.

"This car is clearly pretty potent on the track, and Stew's wife, Karen, has turned the best time ever in a Jag, beating the previous best time by a half-second. Bob Hebert drives for Donovan [Motorcar Service in Lenox, Massachusetts], and he's turned a



58-second lap in The Beast at Lime Rock. He comes back with good feedback for Stew... tweak the torsion bars, lower the tire pressure... and as long as Karen's autocrossing it, Stew trucks it around for me. I can't turn those times at Lime Rock, so it's great to see what the car is able to do at the hands of a good driver. I've hired Bob Hebert as a coach, and I'm planning to continue to do more track driving and probably get my competition license."

—By Jim Roberge



ENGINE

As fitted to a Series III E-Type, the stock 5.3-liter V-12 is only 86 pounds heavier than its 4.2-liter straight-six predecessor, and uses four Zenith-Stromberg 175 CD 2SE carburetors. The engine in The Beast is a highly modified 7.3-liter unit that uses an 84mm Jaguar Racing forged crankshaft, 96mm Cosworth pistons, Carrillo connecting rods and 1.8-inch inlet/1.4-inch exhaust valves with .501 lift. With an 11.6:1 compression ratio and six 44mm Weber IDF carburetors, it makes 600hp and 578-lbs.ft. of torque.

"The Beast is over the top, but there are a lot of cost-effective ways to modify the Series III V-12 for more power," Stew says. "With the short stroke, the 5.3-liter is a durable engine that goes and goes. But instead of trying to get more power from a 5.3, it's easy to increase the cubic inches without giving away low-speed driveability. You can combine the longer crank of the late 6.0-liter engine with 6mm overbore pistons and liners and a mild, streetable cam, and you'll have a 6.8-liter making between 350 and 375hp, which is pretty exciting in a 3,200-pound car. The Stromberg carburetors can be made to work very well, and two-inch SUs are a mid-level upgrade before Webers.

"E-Types are notorious for overheating, and I insist on cooling upgrades on every car I work on, including a Ron Davis aluminum radiator, electric cooling fans, a 165-degree thermostat and an Airpax commercial-level fan switch, which fits in a special housing that I developed. The weak stock ignition system is cured with SNG Barratt's Opus Ignition Replacement HE upgrade."



DRIVELINE

Stew notes that many Series III E-Types were fitted at the factory with three-speed Borg Warner M12 automatic gearboxes—he estimates that half of FHC models and roughly a third of OTS models were so equipped. It is possible to retrofit an automatic V-12 car, as well as an original four-speed manual car, with a modern overdrive five-speed transmission. "The most difficult part is finding a good pedal assembly. Once you get the assembly, everything else is available new," he explains. "Tremec T5s engineered for E-Types by Medatronics are readily available, and T5s are common and relatively inexpensive. The cost for rebuilding a Jaguar four-speed is halfway to a T5 conversion!"

The Beast uses a Euro-spec XJ-5-sourced Getrag five-speed, a three-disc Tilton Engineering carbon/carbon clutch and a 3.78:1 ratio Detroit Locker rear differential. "The Beast is a slalom/autocross/track car that is subjected to severe 80-foot turns, and because of its Detroit Locker, it could chew up output shafts. We use Mark Williams hardened axles, but if you're not building a slalom car, this won't be an issue, and Jaguar's positraction rear is quite sufficient. I like running 3.54 rear gears with a five-speed."



BRAKES

Jaguars were using four-wheel disc brakes, with ventilated 11-inch front rotors, for years before their competition, and Stew feels that, if properly cooled, the stock Series III units are very capable. "The Beast uses 13-inch front discs with six-piston calipers, and the rear brakes are ventilated Porsche discs with four-piston calipers. The only reason I picked the Porsche discs was because of their size and ventilation; Bob Green's BG Developments in England sells cost-effective ventilated rear discs and spacers in the stock diameter," he says. "There's very little room to expand brake size with the inboard suspension cage."

Stew enhanced The Beast's braking ventilation by rerouting the original passenger compartment air ducts to feed air to the front brakes. "Jaguar designed bolt-on ducts that stuck out below the car, ahead of the rear wheels," he says. "On most E-Types, these are long gone, either smashed flat or possibly never installed by the dealer. I added exit plenums that pull air from above the rear discs and send it through hoses that exit where the license plate lamp used to be."





CHASSIS

While a rigid, aerodynamic coupe is the obvious base for an E-Type racer, an issue of helmet clearance pushed the 6-foot-4 Jim to choose a roadster as The Beast's starting point. With the structural stresses of autocrossing in mind, Stew's crew heavily trussed and reinforced the car using original Jaguar specification tubing, spending 2,000 hours in the process. "Once we got started, there was no point in doing 'some,' because everything ties together," he says. "If a car is making 350 or 400 horsepower, you can leave the chassis alone, but with 600hp, all of that braking and cornering stress starts to twist the body."

A number of suspension upgrades can bring a V-12 E-Type into the 21st century, and those include stiffer 7/8-inch torsion bars, Harvey Bailey Engineering anti-roll bars and adjustable Koni shock absorbers. "Urethane bushings are the buzz word in racing," Stew explains, "but Jaguar's stock upper A-arm bushings are beautiful, and I never alter them. I do use urethane in the lower A-arms, although I remake the inside steel shell. I run really fast cars with the OE rubber Jaguar bushings without issue. The Beast uses Heim-jointed radius arms and Spax shocks, and while its bonnet and rear quarters look stock, they were modified to allow fitting 18 x 11.5-inch BBS wheels and 315/30-18 Hoosier slicks, but we have a second set of wheels and tires for the street. We've installed Jaguar-sourced steering rack travel limiters to stop the front wheels from interfering with the suspension."

Winsted, Connecticut, is one of them.

A Jaguar restoration specialist since 1977, he enjoys bringing out the Series III's inherent sports car character with vehicles like our feature car, "The Beast," the Jaguar Club of North America slalom record holder and track racer that his team built for Lincoln, Massachusetts, resident Jim Roberge. Like many, Stew was a fan of the early models, but working on a customer's



SAFETY

Jim wanted his purpose-built autocrosser to be streetable, and in that, not one that drew undue "official" attention to itself. With this brief, Stew and his team designed tall roll hoops that would clear Jim's helmet and bolt into the car's heavily reinforced underbody structure, but are removable for street use. The snug-fitting Kirkey racing seats can be converted to accommodate Jim or Karen Jones, who is Stew's wife and the expert driver who piloted The Beast in 2006 to capture the all-time JCNA slalom record of 38.390 seconds. Those seats are complemented by securely mounted five-point Simpson racing harnesses, and a low-high interior rear-view mirror offers a glimpse at everything that The Beast leaves behind. The Exide Orbital O6 gel battery rests behind the passenger seat.

Its capacity selected with running the Lime Rock race track in mind, The Beast's trunk-mounted "Fuel Safe" fuel cell holds 22 gallons of racing gasoline. This unit was also chosen for its low-profile design, which maintains the car's low center of gravity.

V-12 car opened his eyes to its possibilities. "I believe in the twelves," he says. "There is a lot of competition in the Jaguar world between six- and 12-cylinder cars, and they're an untapped source because they've been overshadowed by the sixes for so long. They have a lot of potential and respond nicely to modifications, and as the old saying goes, there's no substitute for cubic inches!" 🏎️

RESOURCES

Stew Jones Restorations
860-379-1534
www.jaguarv12etype.com

SNG Barratt
800-452-4787
www.sngbarratt.com

Rob Beere Racing
+44-0-24-7647-3311
www.rob-beere-racing.co.uk

Hayward & Scott
+44-0-12-6872-7256
www.haywardandscott.com

BG Developments
+44-0-15-2787-3716
www.bgdevelopments.co.uk

Classic Jaguar
512-288-8800
www.classicjaguar.com

Medatronics Corporation
561-743-5600
www.5speeds.com/jag.htm

Fuel Safe Racing Cells
541-923-6005
www.fuelsafe.com

Tilton Engineering
805-688-2353
www.tiltonracing.com

Mark Williams Enterprises
800-525-1963
www.markwilliams.com

Ron Davis Racing Products
623-877-5000
www.rondavisradiators.com

Harvey Bailey Engineering Ltd.
+44-0-13-3534-3018
www.jagweb.com/hbe/

Cosworth Pistons
310-534-1390
www.cosworth.com

Simpson Race Products
800-654-7223
www.simpsonraceproducts.com