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SALEEN S7 Twin Turbo

America's Supercar Gets A BIG Boost For 2005

Saleen knows all about power. As in S281 Mustangs, N₂O Focuses and the S7, America's first (and still the only) mid-engine exotic supercar. When it went on sale in 2002, the S7 was the only street-legal car in the U.S. with more than 500 horsepower and 500 lb-ft of torque. The media and S7 owners have raved about the car since it first smoked the rear tires in anger. And it has been recognized by numerous automotive magazines as the fastest production car in the world.

But during the past three years the automobile marketplace has witnessed an explosion of performance with models from manufacturers including Ferrari, Lamborghini, Mercedes-Benz, Porsche and Chevrolet touting power numbers above the once magic 500 level.

Saleen is not an organization content to rest on yesterday's 0-60 mph times or quarter-mile speeds. So for 2005 it's "goodbye S7" and "all hail the S7 Twin Turbo!"

This is the first major change to the S7 since its introduction, and it is a BIG change as in 750 horsepower and 700 lb-ft of torque, numbers the competition will be chasing for a long while we predict.

What's New for 2005

It was pretty obvious to Saleen product planners during the late 1990s that horsepower and torque numbers were trending upwards, especially among the purveyors of supercars. And power figures that looked spectacular at that time might seem quite ordinary a few years down the road. So Saleen engineers have been planning for this day since they drew the first line on a computer screen for the original S7's 7-liter engine.

While there are a number of different roads Saleen's engine designers could have traveled down to achieve those high-altitude horsepower and torque figures, for this second edition of the S7 they decided to think beyond atmospheric. And because this is Saleen, they added a double twist to a tried and true racing technique for boosting power and torque: twin turbos.

Aerodynamics has also come under scrutiny for 2005. Unless you place the new S7 Twin Turbo next to one of the original 2002 models, you probably won't notice that the 2005 version has a different diffuser/rear spoiler package and reshaped front fenders to enhance the S7s already sleek, swoopy and aerodynamic contours.

To complement the Twin Turbo's enhanced straight-line performance envelope The S7 chassis has also undergone a fair amount of tweaking. Virtually every suspension pickup point has been changed, and the suspension geometry has been modified for less squat and dive during acceleration and braking.

Engine & Drivetrain

Designed by Saleen engineers, the S7's engine and drivetrain incorporate the latest in modern racing technology. The new all-aluminum V8 engine casting was engineered and tooled by Saleen to displace seven liters. Redline is 6500 rpm. Space age materials and engineering are used throughout, including stainless steel valves, titanium retainers, beryllium exhaust valve seats, an aluminum throttle body, Saleen-designed aluminum CNC-machined cylinder heads and stainless steel exhaust system.

An exclusive Saleen-designed Front Engine Accessory Drive (FEAD) system results in an extremely compact engine, allowing for better packaging and overall weight distribution. The V8 incorporates a unique Saleen-designed side-mounted water pump, a belt-driven camshaft drive and a Saleen-engineered dry sump oil delivery system.

The engine's mid-chassis placement optimizes weight distribution and center of gravity, making room for an unusually tall engine that allows for a very efficient induction system. Air enters a roof intake, passes through a 90-mm mass air meter and feeds into a carbon fiber plenum. From the plenum the air is routed to the twin ball bearing turbos, is pressurized to 5.5 psi max and then passes through an oval-bore throttle body into an aluminum intake manifold with eight individual runners.

To feed juice to this setup, the injection system includes dual electric fuel pumps and high-capacity, return-less, 52 lb/hr fuel injectors.

Neatly engineered and integrated into the S7's stainless steel, dual, high-flow exhaust system are two, twin-ball-bearing, water-cooled Saleen-Garrett turbos, featuring 44-mm wastegates. The four exhaust pipes from each bank of cylinders merge into a race-car-like high-efficiency collector. In addition, the exhaust incorporates dual catalysts per cylinder bank, EGR and those aforementioned twin wastegates.

And because Saleen believes in power *and* clean air, the emission control system features dual, heated oxygen sensors per cylinder bank and a high-volume evaporative emission system along with those four catalysts. Oh, and for good measure and clean air, the system is OBD-II compliant.

When Saleen's engineers originally laid out the architecture of the S7's 7-liter V8, they purposely over designed all the major components because they knew the car would be raced, and they were also planning ahead for future increased street performance. So one of the few internal changes to the twin-turbo engine is a swap from hydraulic to solid lifters. This change allows the engine to rev higher and "harder." Solid lifters don't "pump up" and "float" like hydraulic lifters can at high rpm, and they also allow more aggressive cam profiles, which results in more horsepower at the top end. As with the previous hydraulic tappets, the valves are actuated by low-friction roller rockers.

As is typical with turbocharged engines, the compression ratio has been lowered. It drops from a very high 12.0:1 in the previous naturally aspirated V8 to a still high 11.0:1. And for increased durability, Saleen engineers also added oil squirters to cool the undersides of the pistons.

A Saleen PowerFlash™ performance computer, recalibrated for 2005, handles engine management. The ignition system is integrated coil-on-plug.

A new-generation six-speed transaxle, with a unique Saleen bell housing, transfers power to the wheels. The clutch is an organic/metallic 8.0-inch, twin-plate unit with hydraulic actuation.

And if you need any more proof of how Saleen engineers sweat the details, the stroke of the already short-stroke shifter has been furthered shortened for improved shifting feel. Say that five times fast, once for each gear change!

Chassis, Suspension & Brakes

The S7 chassis and suspension incorporate decades of Saleen's experience in racing, racecar construction and high-performance road car manufacturing. The Saleen S7 architecture begins with a space frame chassis to which honeycomb composite reinforcing is grafted. The body is structural, aerospace-quality, autoclave carbon fiber.

Suspension is via fully independent unequal-length double wishbones with coil-over springs, lightweight aluminum dampers (shock absorbers) and stabilizer (anti-roll) bars front and rear. The uprights at each corner are CNC machined billet aluminum, flow-through designs that use air to help cool the bearings.

A major improvement in ride is achieved for 2005 with the use of coil springs that are a dual-stage design. The first spring has a lower rate than the single springs fitted to the current S7, resulting in softer ride during normal street driving. But if you remember your history, you know that the S7 is a flat-bottom, downforce car. The faster you go, the more downforce the S7 develops. In the case of the S7's new dual-stage springs, the second stiffer spring starts coming into play at around 100 mph when the car begins to develop serious downforce.

Chassis tuning also includes revised shock valving front and rear.

Saleen-engineered Brembo-supplied lightweight aluminum six-piston mono-block calipers are fitted front and rear. The brakes are among the largest of any production car with 15-inch vented discs up front and 14-inch vented discs at the rear.

The Saleen-designed forged alloy wheels feature center locking wheel nuts with automatic safety locks. Sizes are 19 x 9.5 inches up front and 20 x 12 inches at the rear.

Geometry changes, along with new tires, result in about a 30 percent increase in mechanical grip . . . which is substantial. In a seeming contradiction to current performance tire practice, the 2005 S7 Twin Turbo is fitted with "taller" tires, 275/35R19s up front and 335/30R20s at the rear, replacing the 275/30R19s and 345/25R20s fitted to the normally aspirated S7. While the Michelin Pilot Sport PS2 tires have higher aspect ratios, they also lay tire patches that are nearly an inch wider up front and almost 1.5 inches wider at the rear.

Body Design

The S7's beautiful shape was "designed" by the wind. Optimal aerodynamics and top speed performance objectives were achieved with extensive wind tunnel work. Targets included a low coefficient of drag, optimum drag-to-lift ratio, and extreme down force. The S7 has "full tray" body sculpting underneath.

Longtime Saleen design consultant, Phil Frank, and Steve Saleen then personalized and refined the aesthetics of the S7 to reflect modern supercar thinking. The gill-like ducting is, of course, fully functional. The autoclaved carbon fiber body panels incorporate advanced aerodynamics and include integrated split-channel airflow throughout the car, full underside air management, and advanced front tray and side skirt designs and an integrated full-body rear spoiler, replacing the wing used previously.

For the 2005 S7 Twin Turbo, the redesigned front and rear diffusers, along with the new rear spoiler, result in a 40 percent reduction in aero drag and a 60 percent increase in down force. Those of you who know anything about aero forces recognize the significance of that last statement. Typically, you would have to trade down force to reduce aero drag.

The mid-engine Saleen S7 has front and rear trunks and comes with Mulholland Brothers® custom-made, 3-piece, fitted luggage. In true supercar style, the doors open up and away from the body.

"When seen in person, the S7 has an amazing overall presence," says Steve Saleen, founder and president of Saleen, Inc. "It's quite long and wide, yet only 41.0 inches high, adding to its exotic appearance. We wanted to maintain a 'form-follows-function' look, but one that was esthetically beautiful as well. I really feel we've achieved both."

Interior

As much care has been given to the creature comforts of the Saleen S7 as to its performance. Great attention was given to seating position. The car features asymmetrical seating, with the driver position moved slightly more to the center than the passenger. This improves the driver's ergonomics and the side-to-side weight distribution. Because the S7 features a custom fitted driver seating position with

adjustable pedals and a tilt and telescoping steering wheel, it comfortably accommodates tall drivers. While Shaquille O'Neal would have a tough time fitting behind the wheel of an S7, drivers as tall as 6 feet 6 inches can enjoy the S7 driving experience.

To further improve driving comfort and ergonomics, the S7 Twin Turbo incorporates a revised pedal box. The clutch and throttle lever ratios pedals have been changed for lighter pedal efforts. In addition, the three pedals have been spaced farther apart without impinging upon the dead pedal.

Seats and other interior surfaces are covered in elegant leather and suede. Air conditioning, power windows, power door locks with remote keyless opening for the doors and both trunks, an electric-headed front windshield, variable intermittent windshield wipers, a leather-wrapped steering wheel and an AM/FM/CD/DVD/TV system are all standard. The Saleen S7 also has one unique interior feature: a video "rearview mirror" — there is a small video camera inconspicuously mounted in the rear of the car.

A navigation system and polished wheels are among the few available features.

Background

The Saleen S7, America's first true supercar, has captured the imagination of the automotive world since its introduction in August 2000 at the prestigious Monterey Historic vintage car races. Designed to compete with the fastest, quickest, best handling and most exotic sports cars, the S7 provides a distinctly American driving experience for the fortunate few who will own one. It also reflects Saleen's more than two decades of performance and engineering excellence in manufacturing fully certified high-performance automobiles.

The exotic S7 is designed, engineered, manufactured and marketed by Saleen, Inc., a high-performance vehicle manufacturer headquartered in Irvine, Calif. Working with some of the world's most respected and technologically advanced automotive suppliers, the Saleen S7 went from prototype to first customer deliveries in less than two years.

Dual Personality

The Saleen S7 Twin Turbo was conceived to combine the performance of a track-only racecar with the driving pleasure of a road car. As a result, while the S7 would be at home on any racetrack, it is also a car that can be driven with pleasure on highways, Autobahnen and back roads.

“With the improvements made in engine performance, chassis tuning and aero, the S7 is not only easier to drive at ‘normal’ around town speeds, but also it’s faster and more fun,” says Steve Saleen.

But don’t expect less of the Saleen ‘attitude.’ The S7, like every Saleen, is a product of Saleen’s strong racing heritage.

“We wouldn’t feel we’d accomplished our mission if you didn’t come away from a drive around the block thinking the S7 felt like ‘a race car for the street,’” Saleen continued. “We designed it that way.”

Racing Successes

Unlike most exotic supercars, the racing version, the S7R, has already proven itself on the international motorsports stage. During the past three years, the racing version has won more than 50 poles, set fastest race lap over 50 times and has been victorious well over 40 times, winning seven GT Championships. This incredible record includes winning the prestigious 12 Hours of Sebring and setting a new track record at the famed 24 Hours of Le Mans.

Last September, the S7R scored one of its most memorable wins, taking the victory in round eight of the 2004 FIA GT Championship. The S7R has won a number of FIA GT races so that victory stands as one among many. What was more significant is that the race took place at Imola, Italy, home track of Ferrari and Maserati, and the big story that weekend was supposed to have been the heralded debut of the Maserati MC 12s. Instead, Saleen S7Rs dominated qualifying, placing 5 cars in the top 10 and added insult to injury when the Vitaphone S7R finished the race with a 43-second advantage over the second-place Maserati. It was not a happy day for Ferrari-Maserati management or any of the Ferrari, Maserati and Lamborghini racing teams.

Best-in-Practice Design

While the S7 is an American supercar, the vehicle itself reflects a “best-in-practice” philosophy, where Saleen has incorporated superior components from around the globe in order to manufacture the best vehicle possible. For example, the Saleen S7 uses Saleen-engineered/ Brembo-supplied brakes from Italy as well as numerous high technology pieces from companies located in the Midlands area of the United Kingdom, a region that is to motorsports what the Silicon Valley is to computers. Initial wind tunnel testing was conducted at the University of Glasgow in Scotland.

Marketing

None of the S7’s major supercar competitors, such as the Ferrari Enzo, the McLaren F1 and the Maserati MC12, are a match for the S7 Twin Turbo’s prodigious horsepower and torque figures: All are at least 100 bhp and more than 200 lb-ft in arrears of the S7. Chalk up another victory for good old American V8 engine ingenuity.

It’s also no contest when it comes to price. The Manufacturer’s Suggested Retail Price (MSRP) for the 2005 S7 Twin Turbo is \$555,000. That’s \$100,000 less than an Enzo (which is out of production and escalating in price) and nearly \$300,000 fewer dollars than the Maserati. And you could have Her and His S7s for the price of the McLaren F1!

When it comes to performance AND value, nothing on his planet can come close to matching the S7 Twin Turbo.

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Designed and built at Saleen's Irvine, Calif. manufacturing facility, the S7 is sold through a global network of Saleen-certified dealers specializing in exotic automobiles.

The Saleen S7 went on sale at its introduction at the famed Monterey Historic Races on August 19, 2000, and the first production version was delivered in June 2002.

The 2005 Saleen S7 is a proof-of-concept for what Saleen, Inc. has been building for two decades. Since the company’s inception in 1984, Saleen has produced over 9,000 complete and EPA certified vehicles, more than any other specialty manufacturer. In addition, Saleen has equipped more than 500,000 vehicles worldwide with Saleen products to improve a vehicle’s ability to stop, go, slice-through-the-wind and turn—both corners and heads.

An seven-time Manufacturers' Champion in GT sports car racing, Saleen's corporate facilities include research, design, engineering and manufacturing capabilities, as well as the coating/paint division. Saleen also has manufacturing facilities in Troy, Michigan and in Canada.

Besides the S7 Twin Turbo, the company's line of products and services includes the Saleen S281 3-Valve, S281 Supercharged and the S281 Extreme sports cars, plus the Saleen N₂O Focus, Saleen Competition, Saleen Composites, Saleen Performance Parts, and Saleen Engineering and Certification Service. Contact Saleen at 949-597-4900 or for more information about Saleen – its people and products – visit the web site at www.Saleen.com.