PROVEN

TEXT & PHOTOGRAPHY / *Pablo Mazlumian*

MERCEDES-BENZ S600 RENNTECH DIFFERENTIAL UPGRADE

TAMING THE TORQUE

IN CASE YOU HAVEN'T BEEN FOLLOWING OUR S600 PROJECT, IT SPAWNED FROM A GOLDEN FIND IN SUNSHINE KIDS AND THE COMPANY'S HIGH QUALITY, YET VERY NARROW CHILD SEATS. Instead of needing three-row seating we were able to stuff the entire Mazlumian family of five comfortably in the two rows of the S600. I didn't have to purchase a minivan I'd eventually wear a skirt in.

I wanted performance and with this S600 I got more performance than I bargained for thanks to Renntech,

The Renntech/OS Giken diff was good for a 0.2-second improvement in the quarter. While this may not sound like much, keep in mind at this speed that equates to 35 ft—over two S-class car lengths!

VEHICLE DATA

Engine: 5.5-liter V12 bi-turbo
Mileage: 83,500
Transmission: 5-speed automatic
Curb Weight: 4,500 lb

Modifications: Renntech Monolite wheels, GT GMAX AS-03 all-season tires, Renntech intercooler upgrade, spare wheel/tire removed

ACCELERATION TESTING*	POWER/TORQUE	0-60MPH	0-1/4 MILE
Baseline	472 whp/570 lb-ft	4.4-sec	12.7 @ 114.1 mph
Renntech ECU/TCU/Intake	526 whp/703 lb-ft	4.1-sec	12.2 @ 118.6 mph
Renntech/OS Giken differential	526 whp/703 lb-ft	3.7-sec	12.0 @ 118.9 mph

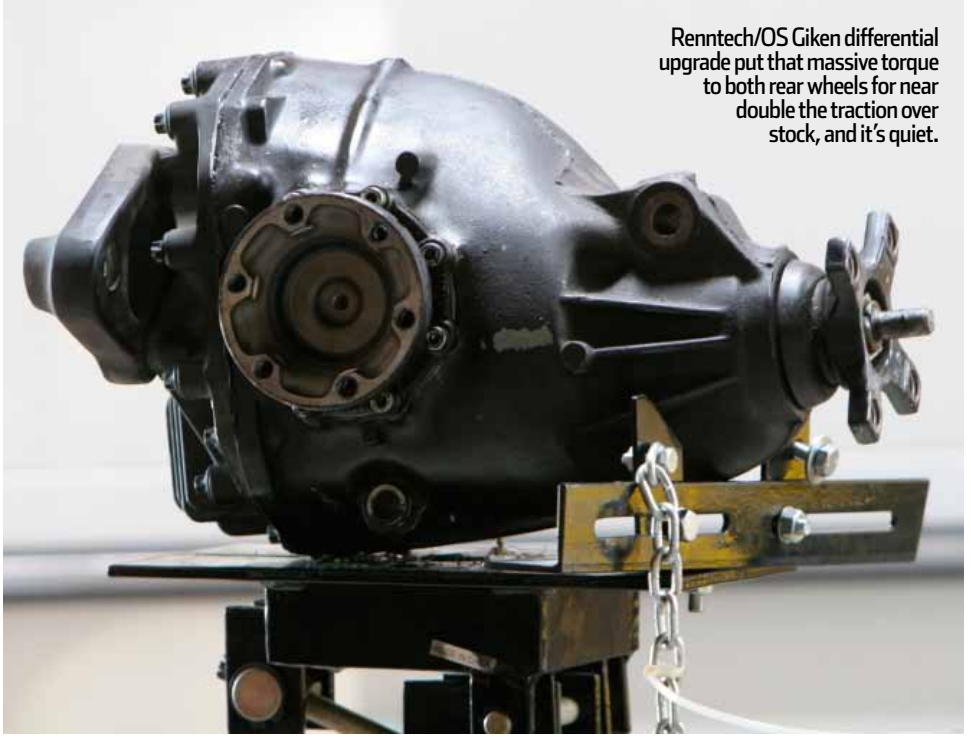
*Performed at 70F ambient, 1000 ft above sea level, no burnout..

2003 MERCEDES BENZ S600

whose Level 3, "650 bhp" upgrade, comprised of engine and transmission ECU upgrades, a carbon-fiber intake and intercooler kit took our stock 5.5-liter V12 powerplant from a crazy stock 472 whp and 570 lb-ft of torque to a laughable 527 whp with 703 lb-ft of torque (Proven, Oct. '11)—yes, to the wheels, and through the automatic trans.

We also upgraded the factory 18-inch AMG wheels to Renntech's 9x19 Monolite wheels wrapped with General Tire's GMAX AS-03 tires, going up one size in the rear to 275mm. We lost 15 pounds per corner there. We also got rid of the spare wheel and jack—shedding another 60 pounds—with the addition of TyreShield USA's tire puncture protection system to all four of our GT tires, bringing the total weight loss to about 120 pounds.

All told, using our GPS-based PerformanceBox from VBox USA,



Renntech/OS Giken differential upgrade put that massive torque to both rear wheels for near double the traction over stock, and it's quiet.

2003 MERCEDES BENZ S600

our performance went from a respectable 0-to-60 mph in 4.4 seconds with a 12.7-second quarter-mile at 114 mph baseline, to 0-to-60 mph in 4.1 seconds and the quarter-mile in 12.2 seconds at 119 mph. This was at 1,000 feet of altitude, too—subtract a tenth and add 1 mph for sea level correction. The car's the ultimate executive family hauler, yet a total sleeper.

Unfortunately, our S600 was suffering from what many of today's high-performance cars do—not enough grip for the power. So much torque is transferred to the rear wheels at low speeds that it's next to impossible to get a consistently good launch.

High-performance car manufacturers are combating this issue today with sophisticated automatic transmissions and launch control mechanisms to optimize digs from anything under 20 mph (think Ferrari 458 Italia, Porsche 911 Turbo, Lambo LP 560-4), netting easy 3-second blasts to 60 mph consistently, if not quicker. Drag radials would easily get this Benz into the low 3-second range. In fact, Renntech's test car logged 0-to-60 in 3.3 seconds and a mid 11-second quarter-mile at 120 mph at the strip with the same upgrades. However, streetable drag radials aren't desirable in a family car used year-round on the streets in the Midwest. We needed to maximize performance using our all-season tires.

Without launch control, you would think the next best thing is the widest and tallest tire possible, but we're pretty maxed out with our 275s on 19-inch wheels—yet it's still not enough. To put it into perspective, in order to achieve low 4-second blasts with traction control off, we had to part-throttle First gear to 4000 rpm, short shift, and from 3000 rpm ride the torque through Second gear. That's a lot of torque left on the table. Standing on it only caused so much wheelspin that it slowed acceleration times.

Thankfully, Renntech had the answer: a differential upgrade built exclusively for them by none other than OS Giken. In the world of driveline components, these guys are in a league of their own. Because

GENERAL TIRE GMAX AS-03

I HAVE TO KEEP REMINDING MYSELF THE GENERAL TIRE GMAX AS-03 IS A TRUE ALL-SEASON TIRE, NOT BECAUSE IT DOESN'T EXCEED MY EXPECTATIONS BUT BECAUSE I KEEP THINKING I JUST DROVE AN ULTRA-HIGH-PERFORMANCE SUMMER TIRE.

I've been to a few of these tire gigs, and the fact that General invited us to test its new tire at Infineon Raceway in Sonoma, Calif., was a bold statement. The track has myriad blind, bowled and off-camber corners, both uphill and downhill, some you take in Fourth gear. If cars (and drivers) are going to exceed their limits, it's here.

The new AS-03 is General's new ultra-high-performance (UHP) all-season tire designed to perform in almost any condition, from dry to wet and even in light snow. It was a good move since prior to 2008 the summer/all-season tires sales ratio was 60/40, and since then this ratio has reversed.

The V-shape grooves on the GMAX offer optimum water channeling as well as an aggressive visual appeal, while tread block stability and stiffness enhances dry performance. Further in, cleverly placed sipes provide snow traction, packing the snow onto the tire like a snowball builds on itself.

This tire offers incredible new technology that the consumer will notice throughout its lifespan. First, GT's new VAI (Vehicle Alignment Indicator) technology provides sipes on the shoulders of the tires that wear within the first few hundred miles if the car is misaligned, saving the tires from ruin later on.

The GMAX also features General's AMST (Acoustic Modulation Sound Technology) for a quiet ride, even at full tilt, on the dry. General's RCT (Reactive Contact Patch) also comes in handy for today's penny pinchers because during hard braking and acceleration the contact patch increases by 30 percent, leaving you with only the minimum contact patch needed for cruising, thus increasing fuel economy.

Lastly, General's RTM Technology has "Replacement Tire Monitor" imprinted on the rib of the tire so that when it gets down to 3/32-inch tread it transforms to read "Replace Tire." But with a treadwear rating of 480 AA and a 4-year/40,000 mile warranty, we doubt you'll be seeing those words anytime soon.

At Infineon we were thrown through a barrage of tests, including wet- and dry-handling autocross courses, as well as some lapping around Infineon's full racetrack in vehicles ranging from Audi S5s and TTSs, to Mitsubishi Evo Xs and Mustang GTs and Camaro SSs. In the short dry and wet tracks, the GMAX performed surprisingly well against some major competitors. In fact, it seemed to blow the competition away in the wet.

On the racetrack, both editor Bidrawn and I were floored at the performance of the cars equipped with these tires. Under fairly hard braking the GMAX wasn't actuating the cars' ABS systems, meaning it was holding up to the braking system and weight of the cars, lap after lap. Under cornering we were able to exceed 1.1g around turns on which we felt we were barely 90 percent, and the overall response was superb. Impressive but not surprising, given General Tire is owned by performance giant Continental Tire (those German guys with that 220 mph-rated tire that comes as original equipment on some exotics). Despite the technically complex track, the tires kept us unusually comfortable, even with the broad range of high-powered cars—several of which we'd never driven. And you can drive these in the snow... Did you already forget?

SOURCE

General Tire
generaltire.com

General Tire's new GMAX was our choice for year-round performance on this S600 in Kansas City. It helped lay down a 0-60 mph blast in 3.7 seconds, and it can be driven in light snow.

2003 MERCEDES BENZ S600

of their costly raw materials and patented designs, OS Giken is able to stuff up to twice as many plates—in the case of the S600, 20—inside the pumpkin. This not only achieves the smoothest transition between running nothing to 100 percent full lock, it's also able to withstand an exorbitant amount of torque. They're also extremely reliable, many times outlasting the lifetime of the cars they go in, and to this day OS Giken reports zero failures from its U.S. customers.

If there is one slight drawback, it's the added weight. With so many plates, our diff shipped out a hefty 119 pounds and returned to us a whopping 19 pounds heavier. It was a fun install (make sure you've got a friend to help).

The diff operates so smoothly and quietly, I have to try hard to get any chatter—like in a U-turn at part-throttle—yet it's still fairly unobtrusive. With the stock diff, I'd gotten used to expecting so much useless torque that, with the traction control off, I'd take up two lanes when the tires broke loose. It was like driving in the rain. With the TC on, the car would hesitate annoyingly while trying to find traction in the first two gears. It was like being the passenger to a driver who gets on and off the throttle repeatedly.

Renntech supplies the diff with the special blend OS Giken lubricant. We made sure not to spill any since it takes exactly 2 quarts and the stuff's expensive.

With the Renntech/OS Giken diff installed, it's an entirely different story. While you don't hear it, you'll feel the improvement. Given the massive 700 lb-ft of torque, leaving the TC on during a First-gear launch is still the way to go. But the acceleration is so brutal, it's as if the diff and tires have married themselves harmoniously with the ECU's commands, allowing maybe 10 percent wheel slippage, and keeping the car catapulting forward through First gear with much less hesitation. The improvement tells the story, and a 0-to-60 mph rip at 3.7 seconds with a 12.0-second quarter-mile says it boldly.

Some have told me it feels like a roller coaster; other unsuspecting passengers become quiet from the literal loss of breath, similar to when I throw my 2-year-old Alexa up in the air and don't forget to catch her.

With the newfound grip and progressive locking feature in the differential, the performance is much more repeatable. It will be interesting to see how this new upgrade changes the car's behavior in light snow expected in the upcoming months here in the Midwest.

In high-speed turns, the diff performs smooth as silk, so much so that one has to wonder why Mercedes didn't use OS Giken rearends for all of its twin-turbo V12s. With a $4,000 price tag, it's probably no more than a $2-3k difference over the factory pumpkin. Given the compromise-free performance improvement, that 2 percent price hike over the total package of a V12 Biturbo Benz would be nothing to me if I had that kind of coin lying around for a new one today. But I don't.

At least I saved enough to pony up the 9-year depreciated amount. And thanks to this upgrade, I'm now even gladder I did.

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