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HOT ROD WHERE IT ALL BEGAN

THE JUMBO CRATE MOTOR COMPARO OF DEATH!

One Car. One Dragstrip. Four Days. Eight Crate Engines From GM Performance Parts. We Tested Them and Here Are the Results.

By Bill McGuire
Photography: Wes Allison, Bill McGuire, and Mike Yoksich

THE PLAN

Just where this scheme was first hatched nobody seems to remember, but it has hotel bar written all over it. It must have been after a long, beautiful day on the road on Power Tour® or on top of 14 hours of sensory overload at the SEMA show in Las Vegas. When the HOT ROD staff is spooled up into a state of giddy exhaustion and the second round of beverages has been ordered—only then can a story idea as extreme as this one begin to make sense.

The high concept: Take a truckload of crate engines and race-test them all in the same car, at the same time, on the same dragstrip. Yeah, right. Get real. Such a project would require a track thrash of heroic proportions. The logistics alone are a nightmare. It would demand far more time and budget than one feature could ever justify; meanwhile, any one of a zillion little things could go wrong and crash the whole stupid plan. One would have to be crazy to even suggest such a thing. But now here is the truly weird part: We pitched the idea to the gearheads at General Motors Performance Parts, Lisa Reffett and Dr. Jamie Meyer, and they bought it, the fools. They not only liked the idea, they loved it. Turns out they are as crazy as we are.

As the plan was fine-tuned over the ensuing months, the inventory of engines we proposed to flog was trimmed from more than 20 (insane) to approximately a dozen (a bit redundant) to eight. In the view of GM Performance Parts, that number provided a nice representative cross section of the engines in its catalog. There are two traditional Chevy small-blocks, two hairy big-blocks, and four versions of the engine family that GMPP believes represents the future of enthusiast performance, the LS small-block series. The engines ranged in displacement from 323 to 572 ci and from 327 to 720 hp. So there is something for everyone here, and as they say, everybody likes something. Here's our complete report.

> Mike Copeland is an off-roader and drag racer who cut his teeth at the old Detroit Dragway on his way to becoming a project manager at GM Performance Division.

> Power Tour® veterans will recognize Mario Orlando: He's served as one of the ace wrenches on the GMPD Motor Medic team. Mario also worked on GM's Bonneville program and is a Mopar muscle car enthusiast.

> When engineering technician Tom Seefried is not tied up with GMPD projects, he likes to work on his own '66 Mustang K-code fastback.

> The man with the soul patch is Kevin Schultz. His personal projects include a '73 Camaro with a ZZ4 crate engine and a rare two-door Chevelle wagon.

THE TEAM

The Performance Parts people didn't have to go far in selecting a manager to ramrod this ambitious project. They simply walked across the hall, virtually speaking, to GM Performance Division and tapped Mike Copeland on the shoulder. Mike is no stranger to HOT ROD readers: As project manager, concept and vehicle integration at GMPD, he is responsible for building many of the concept cars, engineering prototypes, and other unique vehicles constructed in-house at GM. The HOT ROD Solstice and the latest makeover of *Popular Hot Rodding*'s Project X are his babies, to name two.

Of course, Mike couldn't take on the mammoth job all by himself. For this project he would need a crack team of elite professionals: welders, fabricators, and machinists. Where to find such a crew? Mike searched the filthiest prisons and scabbiest saloons on earth for the most talented people he could find, offering each one of these desperate men a presidential pardon if, against all odds, they could just pull off this one final, impossible mission . . . wait, wrong movie. Actually, Mike just went out in the shop and put his regular guys on the job. He already has the A Team. Five of them are pictured here, but Mike also wanted to make sure we mentioned Jim Gobart and Jim Holcomb, who were key members of the team but weren't on the road trip to Knoll Gas Motorsports Park in Martin, Michigan, where the testing was conducted. (Until recently, you knew the track as U.S. 131 Dragway.)

NMRA Outlaw 10.5 hero Dan Millen was drafted to drive the test car. When he's not manhandling his badass turbo Mustang down the quarter-mile at 217 mph, Dan is vice president and calibration specialist at Livernois Motorsports in suburban Detroit. "Dan did a super job," Mike says. "He did exactly the same thing every run, like a machine, and he gave total feedback." And while he did not start out as an official member of the team, we would be total dillweeds if we failed to thank Kevin Steele of TCI Automotive. When questions arose about the transmission, he threw two race-prepped Turbo 400s in the back of his van and drove all night from Ashland, Mississippi, to Michigan to make sure we were covered. Actually, it was a false alarm and the spares were never needed, but it just goes to show the level of motivation and commitment required to carry off a project like this. Thank you all—without you this story could never have happened.

> A hard-core drag racer, Corey Hansen runs a 9-second Cavalier and is currently building a late-model Camaro with turbo LS1 power.

> The youngest member of the team, Brian Alfonsi is a talented fabricator. "It's rare to find young guys like Brian, so when you find them you grab them," Mike says.

> Dan Millen has no trouble keeping his scary 6-second Mustang between the walls on 10.5-inch tires, so the GMPP people figured he would have no problem handling the Chevelle. They were correct.

> TCI engineer Kevin Steele didn't exactly sign up for this mission; we hijacked him. He drove all night (nearly 700 miles) to offer technical support, and we talked him into hanging around.

THE CAR

The original plan was to take a HOT ROD staff vehicle and run all the crate engines through it. Then Mike Copeland gave our fleet a casual inspection, threw up in his mouth a little, and decided the project deserved a purpose-built car. The GMPP test mule would be designed to hook up and get down the track with maximum consistency and minimum chassis tuning and allow quick and easy engine swaps.

The team started with a '69 Chevelle, a for-real SS 396. Mike scored the car cheap by dealing the engine back to the seller. While the body was basically sound, restoration parts from Year One tidied up the look. According to Mike, one key to the car's consistency is the 10-point rollcage. Starting with your standard generic rollcage kit, they extended the front and rear braces to maximize the structure's torsional rigidity. As you can see in the photos, the car leaves straight with no body twisting or bicycling.

TCI Automotive supplied one of its Pro-X Turbo 400 automatic transmissions, along with six torque converters specifically matched to our eight engines. For quick gear ratio changes, we needed a pumpkin-style rearend with a removable centersection, so a 9-inch from DTS was installed on the A-body four-link rear suspension with Lakewood rear lower control arms and QA1 adjustable shocks. Axle Exchange supplied an aluminum driveshaft to connect the two, and Alumitech provided the radiator to cool all eight engines. There's nothing trick here at all, and as the week's testing proceeded through eight engines ranging from 327 to 720 hp, the only chassis adjustments were to the shock settings and rear tire pressures (12 to 15 psi). While the GMPP crew built in a raft of cool features to make the Chevelle safe to drive and easy to work on, beyond that this is a very simple and straightforward car—so simple it's trick, from our point of view.

> To speed the engine swapping along, the GMPD team preinstalled two complete fuel systems, one for the carbureted engines and another for the fuel-injected applications, using Aeromotive pumps, filters, and hardware. Three ignition systems were also bolted in beforehand, as well as an OEM-style ECM mounting station in the right fenderwell for the LS engines.

> **Below right:** The key rear suspension mod was a pair of Lakewood rear control arms, which lower the trailing pivot location from the top bolt (visible here) to the bottom bolt, relocating the instant center rearward. Adjustable upper control arms allowed the pinion angle to be adjusted to a near-stock 3 degrees down. The rear axlehousing, axles, and third member came from DTS, while the spool is by Auburn Gear. Mike Eaton of Eaton Detroit Spring supplied the rear coils, 145 lb/in left and 165 lb/in on the right. The transmission cooler and fan are mounted on the underside of the trunk floor.

> The hey-look-me-over color on the GMPP Chevelle is '00 Corvette Millennium Yellow. The lift-off fiberglass hood and vacuum-formed plastic front bumper are the only nonsteel body panels. The Chevelle's chassis setup is sweet and simple, allowing the 10.5-inch tires to hook up with nearly every engine/torque converter/gear combination we could throw at it.

> The rear seat and headliner were tossed to make room for a 10-point rollcage. Kirkey racing seats and RJS harnesses round out the safety equipment. The driver's tools include a TCI Outlaw shifter, a full complement of GM Performance Parts gauges by Auto Meter, and a spiffy Evoluzione steering wheel from Flaming River with a built-in button for the transmission brake.

> The GMPD build team fabbed up a slick mounting bracket for the oil tank so the engine and dry-sump system could be removed and replaced as a unit.

LS7 7.0L

We kicked off the week with GM's top normally aspirated production car engine, the LS7, which is standard equipment in the Corvette Z06. An all-aluminum piece with a dry-sump oiling system, the LS7 represents the state of the art in pushrod engine technology, with electronic throttle control and other high-tech trickery. To make this engine work in your car, you will need the LS7 wiring harness and controller kit (PN 19166567; $1,150 list) from the GMPP catalog. The kit also includes an electric throttle pedal, a pair of oxygen sensors, and a precalibrated ECM (PN 19166569). The whole deal plugs together like Xmas lights, fires up instantly, and idles like a dream.

It was all almost too easy, in fact. We'd just about nodded off to sleep from relative boredom when Dan did his burnout and lined up the car for the first pass. When he pushed the button, the car stood up nearly on its rear bumper. Whoa, where did that come from? "I guess the chassis is working fairly well," Mike noted with the droll understatement we would come to know well that week. "It's a lot better to start here than to spend the whole test searching for traction." Indeed. The other thing we learned on the first pass: Be sure to remove all blasting media from the car before hitting the strip. When the Chevelle launched, 5 or 10 pounds of sand fell out onto the track's well-manicured starting line.

Once all the sandblasting residue was vacuumed from the rocker panels, Dan made a total of 10 runs with the LS7. The slowest full pass was a 10.90, while fiddling with the shock adjustments and tire pressure produced a best of 10.781 at 120.33 mph. The engine was never touched, proving once again the joys of electronic plug-and-play. Seldom does big horsepower come this easy.

"The LS7 was still pulling at 7,000 rpm."
—Dan Millen

> **Above:** While Moroso solid engine mounts were used for the small-block and big-block combinations, the crew fabricated its own mounts to mate the LS-style small-blocks to the A-body chassis.

> **Right:** On its very first pass, we saw the yellow Chevelle try for the sky—the photographer captured the car just beginning its moon launch. "If it was my car, I'd have stayed in it," Dan said. "But I didn't want to crash the car first time down the track—how would that look?"

> **Above:** The LS7 controller comes precalibrated from GMPP. It can be obtained separately or as part of a complete kit with a wiring harness, a MAF sensor, and a throttle pedal assembly.

> **Left:** One engine down, seven to go.

LS7 7.0L SPECS
Price: $17,495 list
Displacement: 427 ci
Bore x stroke (inches): 4.125 x 4.00
Block: LS7 aluminum
Heads: LS7 CNC-ported
Compression ratio: 11.0:1
Recommended fuel: 91-octane
Rated output: 505 hp at 6,300 rpm; 470 lb-ft at 4,800 rpm
Vehicle weight: 3,420 pounds
Rear axle ratio: 4.44:1
Torque converter: TCI PN 254004

BEST RUN: 10.781 AT 120.33 MPH

LS3 6.2L

GMPP's LS3 crate engine is the very same LS3 powerplant offered as standard equipment in the '08 Corvette but without the Corvette's optional dual-mode exhaust system. So while the Corvette mill is rated at 436 hp, the GMPP unit comes in at 430 hp and 428 lb-ft. And as with the LS7, GMPP offers a wiring harness and controller kit (PN 19201861) that includes a preprogrammed ECM (available separately as PN 10201859). So it's much the same approach as the LS7, but with 75 fewer horsepower. However, the cost is nearly halved: The LS3's street price is around $6,200, versus 13 large for the LS7 crate motor.

As you might expect, the LS3 was just as easy to get down the track as the LS7; easier, if anything. The first run netted an 11.536 e.t. at 113.06 mph, and the second pass was virtually identical at 11.531. With the front shocks loosened up two clicks to provide a little more chassis motion upon launch, the e.t. improved to 11.409. Two more clicks off the front bump and another two clicks off the rear gave us the LS3's best result of the day, 11.333 seconds at 114.23 mph. Not bad. Just to provide a point of reference, the '08 Corvette LS3 tested by our sister mag *Motor Trend* did the quarter in 12.5 seconds, thus raising the obvious question: Who needs a brand-new Corvette when you can be more than a second quicker in a hot yellow '69 Chevelle?

> For the LS3 (*shown here*) and the LS7 engines, Mike selected a molded-plastic air intake tube from a late-model Chevy diesel pickup and adapted it to the Corvette throttle body and MAF sensor.

> TCI provided six different torque converters for the eight engine combinations. The LS3 was matched to an 8-inch Turbo race unit that in this specific application has an approximate stall speed of 5,100 rpm, according to TCI engineer Kevin Steele.

> Another trick piece imagineered by the Performance Division technicians was this accelerator pedal assembly that can handle cable and electronic throttle bodies.

> All four LSX-family engines in our test used the same set of Hooker ceramic-coated headers, which are tailor-made for the '66 to '72 GM A-body swap (Hooker PN 2289-1HKR).

> With a 2.40:1 First gear in the Turbo 400 and a 4.44:1 ring-and-pinion, the LS3 had no trouble pulling the front wheels and running 1.53-second 60-foot times.

LS3 6.2L SPECS
Price: $8,428 list
Displacement: 376 ci
Bore x stroke (inches): 4.06 x 3.62
Block: LS aluminum
Heads: aluminum rectangular-port
Compression ratio: 10.7:1
Recommended fuel: 92-octane
Rated output: 430 hp at 5,800 rpm; 424 lb-ft at 4,600 rpm
Vehicle weight: 3,334 pounds
Rear axle ratio: 4.44:1
Torque converter: TCI PN 254013

BEST RUN: 11.333 AT 114.23 MPH

LS327/327

We will call this one the little engine that could. Going into the session, the LS327 crate engine was a bit of a head-scratcher. Name aside, this is essentially the same iron-block 5.3L V-8 installed in zillions of late-model GM pickups and SUVs. It's a truck motor. And at only 323 cubes, it is the smallest V-8 crate offering in the Performance Parts catalog. GMPP spruced it up with a set of Grafal-coated, hypereutectic pistons and a new cam with 0.467/0.479 lift and 196/201 duration. Ours was kitted out with a single-plane aluminum intake manifold (PN 88958675) and a Holley 770-cfm four-barrel (PN 19170093). In this form, GMPP rates the engine at 327 hp and 347 lb-ft, but to be honest, it was hard to know quite what to expect as the Chevelle pulled up through the staging beams.

Surprise: The first pass was good for a nice little wheelie and a 1.719-second short time, followed by a 12.392 at 105.17 mph. Encouraged by the impressive performance, the team tried swapping springs in the Holley's secondary air valve diaphragm, but it didn't help, so we ended up back where we started. The LS327's best run was a 12.354 at 105.67 mph early in the session. That's pretty stout for a truck motor, a dinky one at that. Added benefits: GM recommends cheapo 87-octane fuel for this one, and with only 323 cubes, it shouldn't drink all that much of it. We hear the LS327/327 can be had for as little as $3,200, so if you enjoy stretching a dollar, this could be the engine for you.

> At 5.3 liters, the LS327 was the smallest engine in the program, but it had heart. Lots and lots of heart.

> Carbureted Gen IV engines running without a distributor require an ignition controller like this Edelbrock MSD unit to translate the 58-tooth crank reluctor signal. GM's version is PN 19171130, which lists for $458.

LS327/327 SPECS
Price: $4,382 list
Displacement: 323 ci
Bore x stroke (inches): 3.78 x 3.62
Block: cast iron
Heads: aluminum cathedral-port
Compression ratio: 9.5:1
Recommended fuel: 87-octane
Rated output: 327 hp at 5,500 rpm; 347 lb-ft at 4,600 rpm
Vehicle weight: 3,386 pounds
Rear axle ratio: 4.44:1
Torque converter: TCI PN 254012

BEST RUN: 12.354 AT 105.67 MPH

> Here's an idea found in NASCAR we can all use: a car chief's checklist. Which gear ratio? Is there oil in the engine? Taped directly to the car where everyone can see it, the sheet allows the crewmembers to keep track of exactly what has been done so there can be no mix-ups.

> We ran the same pair of Mickey Thompson 28.0x10.5 slicks almost all week, making more than 100 runs. M/T also supplied the 28x4.5-15 front tires and all four forged-aluminum wheels.

> At this point, the cherry picker was just getting warmed up. The man in the blue jacket looking on is Jack Day, president of Rockett Brand Racing Fuel, which supplied the gasoline. Folks dropped in to see us all week—perhaps to wish us well, or maybe to see if we were really this crazy.

> The ZZ4 350 is a traditional old-school small-block Chevy with 58cc aluminum heads and 90-degree (pre-LT1 style) intake manifold fasteners. Ours was equipped with a Holley 4160 carb (PN 19170093).

> Engine swaps took from one to two hours, with the six-man crew working quickly but deliberately.

ZZ4 350

Like many of the crate engines in the GMPP catalog, the ZZ4 350 is offered in every level of completion: from partial engine (what we used to call a short-block) to base engine, which includes heads, an intake, a cam, and a distributor, but minus a carburetor. You can even get a turnkey version, which includes a carb, an air cleaner, and a complete serpentine drive with a power steering pump and a GM R4 radial A/C compressor. Additionally, by starting with a partial engine and mixing and matching cams, heads, and intakes from the catalog, you can assemble six different GMPP-validated packages that make up to 406 hp.

Our ZZ4 was the base version, with L98-style aluminum heads with 58cc chambers and D-shaped exhaust ports. Rated at 355 hp, the ZZ4 ran so well that were we the NHRA, we might be inclined to ask for a teardown. Once on the track, it became known as the happy motor, jerking the Chevelle's front wheels with authority and running mid-12s. Shifting at 5,800 rpm, drivin' Dan made nine runs, the slowest a 12.69 and the quickest a 12.447 at 105.67 mph. All this doesn't seem right somehow. We can remember when it was darned difficult to put a small-block Chevelle deep into the 12s in real street tune. Now all you need to do is open the catalog and make your selection.

> The ZZ4 proved to be a happy little motor in the Chevelle, popping neat wheelies and zipping to 12.40s at more than 105 mph. "This would make the perfect street rod engine," Dan said.

> When the ZZ4 small-block was swapped in, the 4.44:1 rear gear used for the LS7 and LS3 engines was exchanged for a 4.30:1.

> On the LS and small-block engines, these 9-inch exhaust collector extensions were usually good for around a half a tenth. A little longer (like 12 inches) would probably be even better, but the crossmember was in the way and there was insufficient time to develop a workaround.

ZZ4 350 SPECS
Price: $6,692 list
Displacement: 350 ci
Bore x stroke(inches): 4.00 x 3.48
Block: iron small-block
Heads: aluminum L98-style
Compression ratio: 10.0:1
Recommended fuel: 92-octane
Rated output: 355 hp at 5,400 rpm; 418 lb-ft at 3,600 rpm
Vehicle weight: 3,360 pounds
Rear axle ratio: 4.30:1
Torque converter: TCI PN 241002

BEST RUN: 12.447 AT 105.67 MPH

> **Above:** The ZZ383 sits at the top of GMPP's 383 crate motor lineup, which also includes the iron-head HT383. > **Right:** To avoid plumbing and drivebelt hassles during the frequent engine swaps, the small-block and LS small-block engines were equipped with Proform electric water pumps from the GMPP catalog. Simplifying things even further, all the engines ran without an alternator. The lack of a charging system caught us out only once—with the ZZ383 as luck would have it.

ZZ383

The ZZ383 is a small-block stroker motor but with a slight twist on the classic hot rod 383 format. Instead of a 4.030-inch bore and 3.75-inch stroke, the ZZ employs a standard 4.00-inch bore and a slightly longer 3.80-inch stroke. Other key elements of the GMPP-style 383 include a 4340 forged crank, powdered rods, and four-bolt main caps. The cylinder heads are Vortec Fast Burn aluminum castings with 23-degree valves and 62cc chambers, while the cam is a GMPP hydraulic roller grind (PN 12378046) with 0.509/0.528 valve lift, 222/230 degrees duration at 0.050-inch lift, and a lobe-separation angle of 112 degrees. With a single-plane aluminum intake (PN 12496822) and a 770-cfm Holley carb (PN 19170093), GMPP rates its stroker at 425 hp at 5,400 rpm. However, our test engine was equipped with a dual-plane intake (PN 12366573), which makes a little less peak power, according to GMPP.

The first run down the track netted an 11.825 at 107.71 mph into a stiff headwind. Though the weather was quite stable all week, with temperatures hovering between 50 and 60 degrees, the mornings tended to be a bit breezy until the sun came out. As the haze burned off and the wind calmed down, the ZZ383's mph began to pick up. The seventh run was the quickest and fastest: 11.705 at 111.71 mph, with a 60-foot time of 1.564 seconds. But on the eighth pass, the engine picked up a misfire that was immediately diagnosed as low battery voltage. After a quick recharge, the ZZ383 settled in to run a series of 11.70s in the 111-mph bracket. That's a solid performance for a hydraulic-cam small-block that likes pump gasoline.

ZZ383 SPECS
Price: $6,995 list
Displacement: 383 ci
Bore x stroke (inches): 4.00 x 3.80
Block: iron small-block
Heads: aluminum Fast Burn
Compression ratio: 9.6:1
Recommended fuel: 92-octane
Rated output: 425 hp at 5,400 rpm; 449 lb-ft at 4,500 rpm
Vehicle weight: 3,360 pounds
Rear axle ratio: 4.30:1
Torque converter: TCI PN 241002

BEST RUN: 11.705 AT 111.71 MPH

> Both small-block V-8s, the ZZ4 and the ZZ383, ran these Hooker headers with $1^{3}/_{4}$-inch x 31-inch primary tubes and 3-inch collectors (Hooker PN 2116-1HKR).

> Mike (*left*) and Mario demonstrate how running without inner fender panels makes engine compartment access a lot easier.

ZZ427/430

Here's an engine aimed right at the big-block neotraditionalists out there: the ZZ427/430. The displacement and power rating are a callback to the L88 Chevy V-8 of the late '60s, but where that engine was a fire-breathing monster that could run only on Sunoco 260 (102 RON, leaded), this new unit is completely housebroken. The L88 had a 12.5:1 compression ratio, but the ZZ427's is just 10.1:1, allowing it to run on 92-octane unleaded. And the ZZ427 runs a hydraulic roller cam, so there's no need for valve adjustments, ever. Isn't technology wonderful? For the street-oriented rodder with a Tri-Five Chevy or first-gen Camaro who wants the big-block look and sound under the hood, your crate engine has arrived.

For the strip tests, the 4.30:1 ring-and-pinion installed for the small-blocks was swapped out for a 4.11:1 gear, and the 10-inch TCI Street Fighter converter was replaced with an 8-inch unit with a stall speed of approximately 4,800 rpm. The first thing we discovered: With the added front end weight of the big-block, there would be no more cool wheelies. The Chevelle's nose was now stuck to the ground. With its new, more horizontal attitude, the car went a total of six passes with the ZZ427. The best run was the last: 11.351 at 115.94 mph.

> **Above:** Brand-new to the GMPP crate motor lineup this year, the ZZ427 is essentially an iron-block version of the all-aluminum Anniversary 427 due in spring 2009. Valve covers are cast aluminum, while the carb is an 850-cfm Holley with mechanical secondaries and electric choke.

> **Right:** How to make A-body engine changes loads easier, especially with a big-block: Whack out that gigantic stamped crossmember and replace it with compact square tubing. Oil pan clearance is increased by a mile. The tow hook is a nice touch, too.

> **Opposite top:** Mario fires the ZZ427 for the first time. After testing four straight small-blocks, the crew was ready for some big-block rumble.

> **Opposite bottom:** "Doing burnouts with the 427 was effortless," Dan said. "When the timeslip came back, I didn't think it was that fast. That was rather surprising."

ZZ427/430 SPECS
Price: to be announced
Displacement: 427 ci
Bore x stroke (inches): 4.25 x 3.76
Block: iron big-block
Heads: aluminum oval-port
Compression ratio: 10.1:1
Recommended fuel: 92-octane
Rated output: 430 hp at 5,800 rpm; 444 lb-ft at 3,800 rpm
Vehicle weight: 3,520 pounds
Rear axle ratio: 4.30:1
Torque converter: TCI PN 254062

BEST RUN: 11.351 AT 115.94 MPH

THE FINE PRINT

Since these engines are offered in a wide variety of completion and tune, we've done our best to describe each one accurately and whenever possible, to point out any additional parts required to make them run in your ride. However, applications vary, the details can be endless, and as they say, prices and specifications are subject to change. Before you make your purchase, be sure to review the GM Performance Parts catalog and consult your GM Performance Parts dealer if you have any questions.

"I have no idea what you people are trying to prove here, but it looks like a lot of fun."
—Confused onlooker

ZZ572/720R

Here is the bruiser of our ensemble: the ZZ572/720R, a big-block rated at 720 hp. Some of you people skipped right over all the other engines to read about this one first—you know who you are. This is the crate engine with the Frankenstein parts: a solid roller cam with 0.714/0.714 lift and 266/274 duration; a 12:1 compression ratio; a raised-deck iron block; and the key feature, 572 ci. The catalog calls it the ZZ572, but just to be on the safe side we addressed it as *Mister* ZZ572.

This will probably come as no shock to many, but with the 572 we finally arrived at the limits of what the Chevelle and its 10.5x28 tires could handle. The first pass was a 10.79 at 125 mph, and while the 60-foot time was not totally horrible at 1.569, the car was making an immediate move to the right, jumping out of the groove. "We've just got too much motor for not enough tire," Mike noted. With tire pressure and damper adjustments, the Chevelle ran a best of 10.217 at 128.14 mph, which easily stood as low elapsed time and top speed of the four-day test. However, we couldn't help thinking something was left on the table. Should you decide to step up to the king of the crate motors, you will need plenty of tire and car to fully exploit it.

> Dwarfing mortal men, the ZZ572 is GMPP's most powerful crate engine. This is a serious piece of equipment: It runs a big mechanical roller cam and requires 110-octane race fuel.

> Mister ZZ572 was the only one of our carbureted engines to request a jet change. The plug readings looked a little fat, so the No. 98 primary and No. 97 secondary jets were changed to 93 square. While our 572 was equipped with a Demon carb, production ZZ572 crate engines now ship with 1,090-cfm Holley Dominators.

ZZ572/720R SPECS
Price: $19,568 list
Displacement: 572 ci
Bore x stroke (inches): 4.560 x 4.375
Block: iron tall-deck big-block
Heads: aluminum rectangular-port
Compression ratio: 12:1
Recommended fuel: 110-octane
Rated output: 720 hp at 6,250 rpm; 685 lb-ft at 4,500 rpm
Vehicle weight: 3,560 pounds
Rear axle ratio: 4.11:1
Torque converter: TCI PN 2251803

BEST RUN: 10.217 AT 128.98 MPH

> With 720 hp on tap, Dan was able to produce entire walls of tire smoke with the tall- block motor.

> Dan employs universal driver sign language to describe the difficulty of getting the big ZZ572 to leave straight.

> To help launch the big-block torque monster, an MSD two-stage programmable ignition box was used, with the low step set at 4,500 rpm.

> The eighth and final engine was the LSX, actually a prototype for a new crate engine that will be available in the first quarter of next year. At 454 ci, this is the biggest LS-based crate engine yet.

LSX 454 SPECS
Price: to be announced
Displacement: 454 ci
Bore x stroke (inches): 4.185 x 4.125
Block: iron LSX
Heads: aluminum prototype LSX
Compression ratio: 12:1
Recommended fuel: 110-octane
Rated output: 640 hp at 6,100 rpm; 576 lb-ft at 5,400 rpm
Vehicle weight: 3,448 pounds
Rear axle ratio: 4.11:1
Torque converter: TCI PN 2251803

BEST RUN: 10.754 AT 120.33 MPH

> **Below left:** Like the LS7 and LS3, the LSX mule engine uses EFI and electronic throttle control. However, we now hear the production crate engine will be set up for a single four-barrel carburetor, at least for its introductory version.

> **Below:** Unlike all our other engines in the test, this wasn't a new unit straight out of the crate. As the photo shows, this one had been around the block a few times—it did the '07 Power Tour®.

LSX 454

The LSX was the final engine in our four-day test and the first and only one to give us any real trouble. To be honest, HOT ROD must share some of the blame: To accommodate the photo schedule, we changed Mike's carefully planned engine-swapping order (just one of the high-maintenance demands we made during the week), which meant less time for sorting the setup as we came to the end of the four-day track rental. And now there was no time to swap rear gears, so the LSX would have to race with a 4.11 instead of the 4.44 screws Mike originally calculated for the combination.

The engine had issues, too. This wasn't a production crate engine like you can buy. This was the dyno mule for the 454 LSX crate engine that will go on sale in early 2009. Assembled mainly from prototype pieces, this motor had done the '07 Power Tour® and also had a zillion dyno pulls on it performing calibration work. It may have been a mite tired. But the main problem was a weird, wandering misfire under load as the engine banged and sputtered to a 12.62 on its first pass. Mike quickly diagnosed the trouble as an incompatibility between the prototype fuel-injection harness and the Chevelle's wiring, and the crew went to work swapping in the entire electrical package from the LS3 crate engine. With the misfire repaired but time running short, the car was rapidly dialed in, running a best of 10.754 at 120.33 mph—not representative of what the engine can really do but presentable, and everyone was satisfied enough to call it a day. There are two lessons here, we suppose: When you have a tough problem to diagnose, it's good to have Mike Copeland and crew on the job, and don't let HOT ROD mess with your schedule.

CONCLUSION

So. What have we learned? What's our takeaway from this hilariously overreaching scheme? First, we know we didn't extract the full potential from any of these crate engines, but that was never the goal. We had eight engines and four days—two engines per day—which is not nearly enough time to dial them in completely, let alone look for more speed. We have no doubt there are more tenths to be found in all these engines, while the ZZ572 could run in the 9s with the right setup. And a whole host of circumstances conspired against the LSX 454 showing what it could do. We plan to revisit the production version when the planets align for a fairer demonstration.

Anyway, with the exception of the ZZ572/720R, none of these powerplants is a full-on race engine; that's not their purpose. These are primarily street engines. If you are going to choose one of these crate engines for your rod strictly by its e.t. and mph, you are missing the point. When we shop for crate engines, we generally have a whole list of needs to meet—and yet performance is always on our radar. "Let's face it," Mike said, "when we look at these engines, somewhere we are always thinking, *What would this one run in my car? What'll it do?*"

Here's what we accomplished: By testing all these engines in the same car, at the same track, under the same conditions, we were able to lay down a yardstick and see where each engine measures up in comparison with the others. For example, how does the ZZ4 stack up against the ZZ383? The LS7 versus the LS3? We got that done, with useful accuracy if not full scientific rigor. But more important: With this test we discovered a new, informative, and fun context for talking about all these engines—what's behind them, what they are really like. You know, the personalities of these eight engines. Yes, we at HOT ROD are twisted enough to believe engines have personalities, and we like to think we captured them here.

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HOT ROD would like to thank all our fellow lunatics, err, product suppliers for their assistance in making this project happen. They include:

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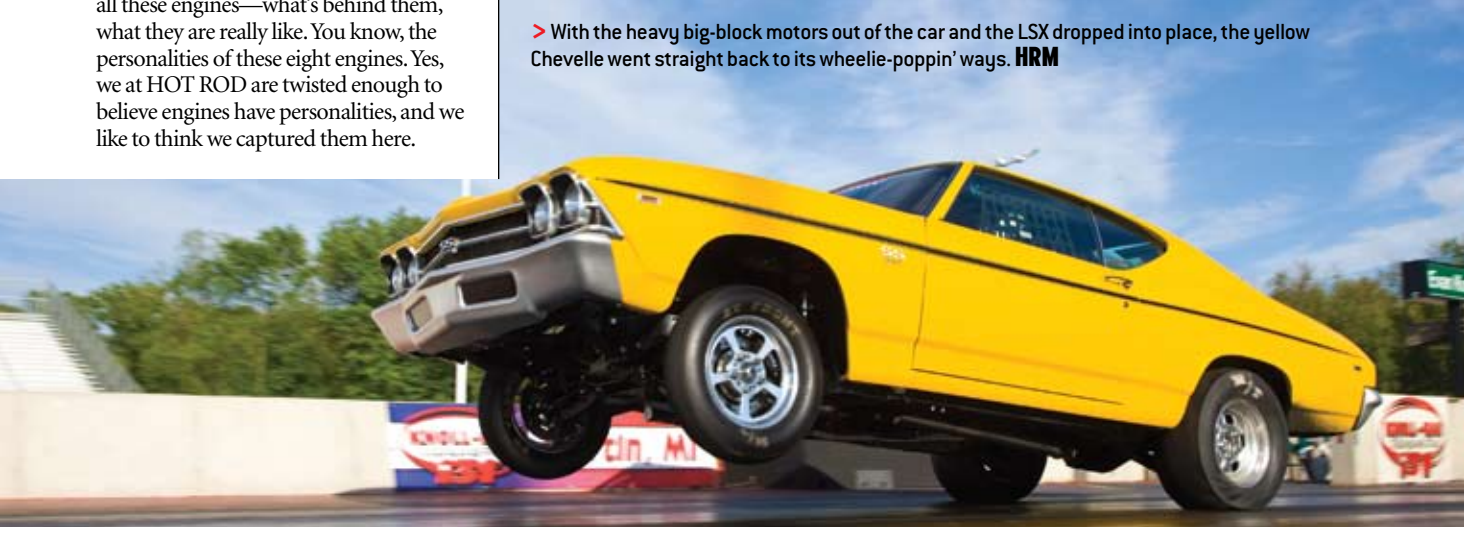

> With the heavy big-block motors out of the car and the LSX dropped into place, the yellow Chevelle went straight back to its wheelie-poppin' ways. **HRM**