

Hardcore Hook

PREPPING A FACTORY 8.8-INCH REAREND FOR DRAGSTRIP DURABILITY AND TRACK TRACTION

Text and Photos by Paul Rosner



Our grassroots project will focus on skipping a couple levels of evolution by upgrading the rear suspension far beyond our immediate needs with Team Z Motorsports new Strip Series 1 complete rear suspension kit with relocation brackets. The kit includes the Strip Series adjustable upper control arms with relocation bracket, spherical bushings, single- or double-adjustable lower control arms, and antiroll bar, all made from premium 4130 chrome-moly steel. This kit can be found on some of the quickest and fastest stock suspension race steeds in the country, everything from 7-second Drag Radial racers, to the quickest bumper-draggin' Real Street racers, to street sleepers like yours. In addition, we chose Team Z Motorsports for our build because they have and continue to build cars for some of the most successful racers in heads-up competition of all types and performance levels.

Gradually evolving performance is something that can make or break one's budget. Replacing items several times can be expensive and frustrating—first adding a gearset, then breaking an axle, followed by the differential—whereas if we had done it right the first time, it would have been cheaper in the long run. It's important to plan ahead and make sure your expectations are realistic.

A rearend is difficult because it impacts the brakes, wheels, and tire size, in addition to axles and differentials. A properly set-up rear will retain the same tire clearance

both during launch and sitting still. We have already made the decision that our car will be mostly dedicated for the strip, and choosing to build a bulletproof rear-end with a killer suspension was our goal.

Most builders will agree that the most intelligent approach to our project is to choose the rear tire we're planning to run. When you know what rubber will hit

the road, then you build up the rear and suspension from there. Our project car is an '01 GT with a 600hp ProCharged Two-Valve mod-motor with a Ram twin-disc clutch and a Tremec TKO-600 transmission. We would like to run a 275-60 drag radial or 28x10.5-inch e.t. street tire, so that cast the die for a complete revamp of our rear-end, which brings us to the story at hand.

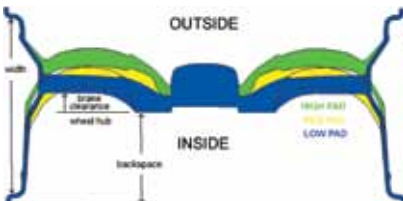
HORSE SENSE: It's easy to get more aggressive with your older Mustang projects when you have a newer 'Stang in the driveway. For the Rosners, it was the addition of a spanking-new '11 GT. That makes Paul the first contributor to own a Coyote-powered 'Stang, but he certainly won't be the last.



Building go-fast goodies for over 40 years, Strange Engineering offers products for everything from Top Fuelers to your mom's new '11 Mustang GT. We're upgrading to Strange's new Pro Race 35-spline axles with shear-proof, NHRA-required, 5/8-inch threaded, 1/16-inch studs; spool; lightweight four-piston drag brakes; and lightweight slotted rotors.



The SN-95 wheelwells are easily one of the biggest of any vehicle. We ousted the usual 17x10.5-inch wheels with 315/45-17 drag radials in favor of Weld Racing's newly designed RT-S series S-71 style 10.25x15-inch mid-pad-height wheel, tailored to a perfect fit with 4.5-inch backspace and 28x10-inch drag radials. The idea was to get a bit more serious at the dragstrip with the bigger sidewall of the 28-inch-tall tire on 15-inch rims for some real 60-foot times with the cool offset look of 17x5.5-inch front-runners. The rear wheels exceed the SFI 15.1 drive-wheel requirements and accept the larger 1/16-inch-shank, typical-drag-style racing studs, all at a great new low price via the new welded, forged-aluminum design, manufactured for more than 43 years in Kansas City.



Most of today's drag-style wheels feature thin spokes designed strictly for straight-line performance and do not work with aftermarket big brake systems. Through customer demand, Weld's new RTS Series is a robust design with thick, durable spokes suitable for anything from a 1,200hp dragster to a tiger-clawed road-course ripper. The key feature is the variable pad height, and endless offset and width choices for whatever brake and suspension combination you have chosen. They are available in low, medium, and high pad height in literally hundreds of 15-, 17-, and 18-inch width and offset combinations for those six-piston, 14-inch rotor brake systems, or the cool 15-inch-rear, 17-inch-front wheel look to enhance the size of the big rear meats as we choose.



Team Z removed the rearend, disassembled it, had it hot-tank boiled, cut the end off both sides of the housing, and re-installed it in the car for mock-up. The tires of choice were mounted on the new RT-S Series S-71 style wheels and fitted in the wheelwells, measuring 57 inches between the wheel mounting surfaces, perfectly nestled in the wheelwells. The stock '01 axle housing measures 62 inches between the wheels, which required shortening the rear 2.5 inches per side, while Fox rears measure 59.125 inches and '94-'98 measure 60.625 inches, if you were wondering. A special alignment bar is bolted in the housing via the carrier mounting caps, so the new ends can be welded perfectly aligned.



The Strange Engineering Late Big Ford 9-inch ends, used on later-model trucks, are the first choice when upgrading any rearend housing. It utilizes the largest diameter bearing and uses bolt-in-style, 9-inch axles.



The axle tubes were welded 360 degrees; all bracing must be welded on before adding the alignment bar and welding on the new bearing ends. Team Z Motorsports fabs everything in-house, so only the best TIG-welding equipment is used. When customers expect to exceed 200 mph, there is no room for faulty welds.



The new 35-spline S/T are induction-hardened; the case of the SAE 1550 (Modified) shaft is hardened to 58-62Rc, and the core is left soft to absorb shock, or you can specify the Pro Race Hy-Tuff, which are made from an ultra-strong alloy hardened to 46-48 throughout for those cars that will never see street usage. Our aftermarket C-clip 31-spline axle measured 1.324 inches in diameter, while the new Strange Engineering 35-spline is 1.5 inches in diameter. Since the new axles were over 4 inches shorter, they were only 2 pounds heavier, 20 versus 18.

The 9-inch, bolt-in-style axles satisfy the C-clip eliminator/aftermarket axles rule, per NHRA rulebook section 2:11 for cars



10.99 and quicker, or any car equipped with a spool regardless of class or e.t., and come with the required 5/8-inch wheel-stud minimum. The caliper mounting backing is added; then the bearing is pressed on, followed by an additional pressed-on bushing for added insurance. Make sure the open end of the bearing faces as shown so gear lube can get to the bearings. We shed the ABS rings and all the ABS components, going with a complete Strange braking system with a manual brakes master cylinder. This allowed us to also oust the power-steering components since we no longer needed the hydraulast for the brakes, losing over 100 pounds!



Ratech (www.ratechmfg.com) specializes in small parts for your 7.5-, 8.8-, or 9-inch rearend rebuild or ring-and-pinion swap. We used the company's 8.8-inch Installation Kit, complete with carrier bearings, race and shim pack, pinion bearings, pinion seal, pinion nut, marking compound, and new ring bolts. Ratech pioneered a trick new crush sleeve—dubbed "smart sleeve"—for your street application, while the drag guys will use a solid piece and shim to get the required bearing preload. If you have access to a press and can set your own gears, they also make a trick and inexpensive pinion-setting tool you should have.

8.8 BUILDUP



We used what we thought were the best parts in this build, with the goal of putting all the rearend woes out of the equation. The Strange Engineering spool performed flawlessly. Unfortunately, we overlooked the ring and pinion. We thought all ring and pinion sets were equal—they are all about the same price, and if you're an educated shopper, you get what you pay for. Drag racers with 9-inch rears have been installing Pro Gears for centuries. They are not made from the typical 8620 steel that is heat-treated for longevity. They are made from a much softer 9310 material, allowing the teeth to actually bend and absorb the violent shock of the launch instead of snapping off the teeth, as in our case. Many people will run about 0.002-inch less backlash to lessen the shock, especially on stick-shift cars. Keep in mind, Pro Gears are strictly for drag racing and are not resilient enough for long trips, since they are softer. In addition, the typical 4.10 gear set for an 8.8-inch has 41 teeth on the ring and 10 teeth on the pinion. Richmond's Pro Gear has a 37-tooth ring and a 9-tooth pinion, allowing much larger teeth for added strength. Let's just say we found the weak link, and Richmond Gear (www.richmondgear.com) fixed it. The company is the only manufacturer to make an 8.8-inch Pro Gear.



The first step to installing our Team Z Motorsports Strip Series 1 is removing the stock upper control-arm bushing in the housing. Use a cartridge roll or piece of sandpaper taped around a drill bit to open up the holes to accept the solid bushings that are welded to the stout upper control-arm assembly.



Add a generous amount of antiseize compound to both the solid bushing and the housing bore. The solid upper bushings stick out through the plates about 1/8-inch and are TIG-welded 360 degrees, so have a bit of patience. They are at an angle and have to be rotated just so to fit. It is a bit tricky getting both sides installed, but a tight fit will keep them from moving in the bores, and improve the performance of the kit.



Use the supplied Grade 8 hardware, install the inner relocation plates and just snug the bolts. All bolts must be tightened after all parts are installed. And don't worry—you can't put the lock nut on backward as shown. The threads won't start. Just checking to see if you're paying attention!



Next, add the upper control arms, making sure to screw both rod ends in all the way. Use the hex to extend the rod ends until they have equal thread engagement. One end has a LH thread and the other RH, so they can be adjusted without removing the arms. To avoid confusion later, install them so they both adjust the same direction by turning the hex the same direction, and don't forget the rod-end spacers on both ends of the arms.



The pinion support straps are not the same, the right side is a bit longer with a bend in the center and the 90-degree cut ends attach to the control arms. All pieces come with a rugged powdercoat finish. Due to time constraints we were not able to powdercoat the housing. That will be a great winter project.



One side of the upper control arm connector has a welded-in solid bar, and it's a snug fit in the receiving tube side. You may have to use an alignment punch or large screwdriver to aid in aligning the hole and adding the bolt; now that everything is assembled, all the hardware can be tightened.



The Team-Z Strip Series kit relocates the upper control arm pivot point and the angle at which it can apply lift to the front of the car. Imagine your rear axle as the center of a wheel and the distance to the front tire defines the diameter of the wheel. Now draw an imaginary line through the upper and lower control arms individually, making a triangle (instant center), this is your prybar to get the wheel rolling, representing launching your car. If the triangle goes far beyond the diameter of the wheel (your front tire), it would take much more time to initiate movement at the front tire since movement starts far out in front of the car. However, the closer you could get the triangle to the perimeter of the circle or the front tire (shorter instant center), the quicker the front end will lift and transfer weight with much less power. Bottom line, the Team Z suspension kit shortens the instant center, improving the launch of the car.



The lower control arms are chrome-moly steel and feature replaceable wear sleeves in the rear. Our set included the double-adjustable option, so their length can be adjusted while they are bolted in place. All the suspension's rod ends are 4130 chrome-moly with self-lubricating, Kevlar-reinforced nylon races. They have a 38,000-pound ultimate radial static load rating.



Strange Engineering makes one of the lightest-weight four-piston brake systems for your drag steed. They are pretty much the industry standard on all 200-mph professional door-slammer cars. However, the S-series drag brakes with lightweight slotted rotors are for drag racing only, designed for unparalleled instant stopping force, followed by a rest to cool down. The rotors are solid steel, not cast iron, and have no axial cooling slots between brake surfaces and so can't handle repeated braking as encountered on the street. However, if you want to drop some serious weight from your drag steed, this is definitely the fast track. Strange offers Baer and Wilwood brake kits for the more street-minded.

8.8 BUILDUP



The new brake system is not compatible with the stock brake lines as Strange utilizes SAE fittings. Racecraft makes a trick, inexpensive custom-braided brake line kit made especially for Mustangs switching to Strange Engineering brake systems. The company also has trick 2-inch-drop front Fox spindles, which you will need so you can get the good four-piston front brakes from Strange to complete your new brake system.



We let the pros set up the gearset. Team Z contracts to one of the best guys in the business for the task, who sets up gears for many of the NHRA Pro Stock teams. Slide the axle assembly into the housing, gently rotate to line up the splines, don't hammer it. Bolt the backing plate to the housing with the brake mounts in the rear; make sure to use the small diameter lock nuts or they won't clear the rotors.



Insert the metallic brake shoes into the four-piston calipers and secure them with the supplied bolt, sleeve, and lock nut. Make sure they slide freely on the sleeve. Notice all four pistons have separate bleeder screws, so you will need to bleed all of them accordingly and test drive the vehicle. Don't make your first trip down the 1,320 your test drive for the brakes.



Add the rotors to the axle. They are directional—notice the arrow of rotation at the bottom. Slide the caliper assembly on the rotor, and always use Loctite on the bolts.



The Team Z Motorsports' antiroll bar is designed to transfer force from the right side to the left and always keep the axle housing parallel to the chassis, keeping the engine torque from twisting the body while launching. The unit is assembled in place and mig-welded to the frame directly above the rearend housing, on both sides.



The antiroll bar features oil light, self-lubricating bronze bushings and comes in regular, X-treme, and tailpipe-clearing configurations.



The antiroll bar tabs must be welded to the rearend last, with the car at finished ride height, and at the weight it will be traveling down the track. Try to stitch-weld and allow the weld to cool. You don't want to induce any excess heat or warpage in the housing.

SOURCE

TEAM Z MOTORSPORTS
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When fully installed in the car, our 8.8 assembly with the Team Z Motorsports Strip Series suspension should easily be as stout as any 9-inch on the market. It is considerably lighter, less expensive, and boasts a lighter rotating assembly than most 9-inches, unless you spend the big bucks for an aluminum third-member and gun-drilled axles.



Team Z Motorsports owner Dave Zimmerman has mentored a great crew of racers to fabricate streetcars into racecars. They are constantly perfecting the design, fit, and functionality of all the parts they manufacture: Adam Zimmerman, Frank Lamborghini, Nick Gregg (top row); Dave Zimmerman, Kevin Gluski, David Zimmerman Jr. (bottom row), and Willie Bush (in the cage) cause he always gets into his work!



We finished the car days before the end of racing season, so we only got a couple of shots at the racetrack. To complicate matters further, we had a full rollcage added to our car before starting the rearend build, and it was instantly apparent that it's not an easy transition tuning the chassis on a rigid full-cage racecar with a fully adjustable suspension when you're used to twisting, stock-body cars. The ultra-stiff new chassis hit the tires too hard, resulting in a lot of tire spin. Tuning the new chassis is going to require patience, some clutch savvy, and more patience! Our best e.t. was a 10.86 at 131 mph with 1.48 60-foot times and lots of tire spin. We should see low 10s, hopefully a 9-second run by year's end, with low 1.3 60-foot times. See ya' at the track! **5.0**

