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**WORDS** / Ren Bergerholtz as  
told to Jonathan Wong  
**SHOTS** / Steve Demmitt for MotiveLife.com







# THE PERFECTIONISTS

INNOVATION IS THE NAME OF THE GAME IN DRIFT RACING'S GAME, AND THEY PLAY IT VERY WELL.

**T**he Bergenholtz Brothers - Ron and Ed - have made quite a name for themselves over the years. From the early days of Ed street racing with his infamous CR-X that the two eventually turned into a FWD single-dipfl speedster (which was also introduced into the NHRA Museum this past winter), then campaigning a Mazda 6, it's safe to say they know a thing or two about living life one quarter mile at a time. They not only learned how to get down the track quickly, but they figured out how to do it right: by designing the FWD wheelie bar, the invention that put

them on the map and is still employed by drag racers today. Ron, known particularly for his attention to extreme detail, used to dominate the show circuit with a cleaner-than-clean DA Integra back when hiding wires and the word "JDM" was virtually unknown; now he's turned his obsessive car building technique to a new direction, drifting and time attack, and what he's thought up for their new Mazda RX-8 could very well set the wheels in motion for yet another innovative way to build race cars in a totally different light. Let's see what madness Ron has brewing in his head now.

## THE PERFECTIONISTS


Bergholtz Racing has always been a fan of drifting since the very beginnings of its introduction at the Irwindale Speedway. We always enjoyed the entertainment value and had the utmost respect for the skill of the drivers. We knew we wanted to get involved somehow, and we knew we wanted to do it in a big way. In 2007, we were able to get involved with our long-time sponsor, APEX. We were able to engineer a great program right from the start using their Mazda RX-7 and were also able to enlist the professional services of 2004 D1 Champion Ryan Miki. We learned so much in '07 and '08 about drifting from both an driver perspective as well as an engineering car setup perspective. Sooner or later we knew we'd have to build our own Bergholtz drift car and build something that would make a major impact in the way it's constructed as well as having great visual/audible impact - you know, built something crazy that nobody in the drift community has ever seen. In those two years of using the APEX RX-7, we knew improvements could be made on a performance level and service level for the mechanics. We decided our research could be put to use by building the latest in Mazda's RX series, the RX-8.

All Bergholtz racecars we have built in the past always had the best and we weren't about to stop here with our own Mazda RX-8. Every step of the process required a lot of engineering and we wanted to make sure we produced a drift car that was perfect in every way possible. If we took time to think through every meticulous part on the car, we would never have to redo the car. It was a nightmare. I was facing time constraints and at the same time making sure we did a good job. The saying goes: "There's always time to do the job twice but never enough time to do it right the first time." There wasn't one day that went by where I wanted to take a short cut in doing something and ended up taking the long road to do it right. On top of that I wanted every piece to look cool. If it looked like I took a shortcut, I knew there'd be people who'd talk shit. We performed most of the work at Stern Chassis with the help of Gary Stern, who's just as obsessed as I am in doing an excellent job because this RX-8 would represent our work. Both of us agreed that we do not produce shit for work. We both went nuts. We decided to start at the rear of the car and work our way towards the front.

The biggest problem with drifting is that we know the car is prone to damage at any given time, especially

the rear. My experience with the APEX FD resulted in pulling quarter panels at almost every event. Bash upon bash. There had to be a cleaner solution to address this ongoing problem. On top of that, judges promoted the drivers in scraping the walls. After studying several drift videos, I realized that in drift, the driver would lightly scrape the wall for joints. If the driver were to push the drift further into the wall, he would run the risk of disrupting the drift. The quarter panel can only absorb so much impact before there would be no give at all, roughly two inches (at most) of travel into the wall with a stock car. If the drift would go further than the two inches, the impact would force the front end to go into the wall, especially on banks. Another saying goes: "With every action there is a direct proportional reaction." Much like the metal built suspended by fishing wire on everyone's desk. You invert the ball to the side and let go so it results in the opposing ball being launched up. The wall has now become the road below the car but turned sideways. That's how we saw it. I have a lot of prizes for the vehicles Bergholtz Racing produces and it hurts me to see any of them get damaged in any way. We had to come up with a solution, so Gary Stern and I came up with the spring/hook-loaded bash bar. Instead of scraping the paint and ruining the body we engineered a bar that would scrape the wall and help absorb the impact. We wanted to absorb ricing the wall. I spent countless hours drawing at night how I wanted to construct this absorber drifting concoction. Nevertheless, Gary and I came up with a solid design and started fabricating away. The invention is able to absorb roughly three inches of wall before scrubbing point. If the driver wants to move in a little further there is another 2.5 inches of travel available. All of this travel will absorb impact without disturbing drift. The quarter panels as well as bumper are allowed to flex. Nothing is rigidly mounted. This was going to be our "wheelie bar invention" but for drifting. Bergholtz Racing has always prided itself as an innovator and this invention was going to do just that.

The flexible quarter panels were just the start. Troy Samitomo was able to create these fiberglass quarter-panels from the existing stock RX-8 units. He even widened them an additional inch to provide some clearance for wider Nitto NT05 rubber. The car is extremely modular and much like a big "Snap-Tite Model Kit". It makes it extremely easy to work on and most of all makes all the panels replaceable. With the nature of drifting this was a must. I did not want to constantly put layer upon layer of Bondo over the quarter-panel for repairs. If it's broke simply replace the panel. All exterior panels are removable



including the roof. Once it is completely apart, the car feels very much like a dove huggy. The quarter panels and body kit were all made by Troy Samitomo of Five Axis, all the doors and trunk lid were provided by Seibon Fiberglass.

In addition to the bumper bars, we had to construct mounts for the custom APR wing. Most wings are mounted to the trunk via bracket. We felt that the trunk had too much flex in it to provide any downforce so we felt the best way to connect the wing was to the chassis. Again, it had to look cool considering the wing not only provided performance value but had to look really cold. We opted to use streamline tubing. The tubing looks just as aerodynamic as the wing and is attached directly to the chassis right at the rear-most part of the crossmember. The amount of direct down force to the chassis is second to none.

With the engineering on the rear end, it was time to address the front end of the Mazda RX-8. Bergholtz Racing has been known for drag racing and horsepower. No matter what we were looking for, we wanted mass amounts of power. It was in our nature for God's sake. We noticed competitors in Formula Drift were opting for V8 powerplants. Horsepower seems to be the name of the game and apparently made the drift cars more reliable, plus having torque on hand at a moment's notice for the drivers was a must. We opted for a Mazda 3-rotor and turbocharged it because the stupendous amounts of power with turbo reliability. We enlisted the services of Kyle Midan of Mandatrix to fully build the engine complete with street porting. Mandatrix did an amazing job and insisted us in consulting of the proper components to surround the Mazda 3-rotor.

The intake manifold for the Mazda 3-rotor appears to be





stock but a couple inches of aluminum was implemented into it. The factory manifold has a large amount of runners without it and this takes up plenty of volume. The manifold appears to look like a plenum but is far from it and based on my experience I did not like this design. I proceeded to cut the manifold in half and port all the runners out. I wanted to create a manifold design that was a true plenum. The plenum would act as a reservoir of air for all the runners to feed from. The runners feeding the plenum were quite long so I didn't worry too much about losing torque. In addition, I opted-out from using the factory 3-valve throttle-body and we implemented a 90mm GM unit that uses a "throttle-by-wire" design. The MoTeC M800 is more than capable of controlling it. We also relocated the throttle-body further downstream on the manifold to deter any effect of creating turbulence in the plenum. This design would make sure that all runners would be receiving equal amounts of air as well as equal delivery. In the end, the manifold and throttle-body is extremely simple and functional but a pain in the ass to build.

With the intake manifold area completed, the turbo side needed to be addressed. We employed the expertise of Tod Kaneke from Mudspeed's Research and Development team. He recommended a TIAL dual ball-bearing unit GT40XSP1 that had good characteristics in the lower RPM as well as great horsepower at higher RPMs. Simply it is a bad-ass turbo. We mated the turbo to a Burns stainless Inconel manifold. Steen Chassis did all the fabrication on it with recommendations for runner length from Burns and Tod Kaneke. With the manifold being fabricated from Inconel, the sucker was damn expensive but bulletproof enough to handle the 1500 degree plus temperatures in the exhaust manifold.



## THE PERFECTIONISTS

To make matters even worse, we had to package a whomp'ir Mishimoto radiator, a big whomp'ir HKS intercooler and that TiAL turbo into the front of the car. All of these components wanted fresh cool air to go through them. It took me two days to mock-photoshop all these items into the front of the mouth of the RX-8 front bumper. It's like having three kids yelling at you that they all want fresh air. Cooling is key in drifting because the cars are traveling sideways at full throttle and not much air is travelling to the front of the car. We had to corralle all the components together in a box to help channel what air was available. Luckily everything worked out and looks dope. To assist further in cooling we also implemented a water sprayer system to cool temperatures even further. We used a Honda Civic windshield tank and pump combo routed to a spray mister I jacked from my backyard misters. The combination works great and cools temperatures an additional 10 degrees. In addition, we had to channel air out of the intercooler out of the hood. Considering everything was custom (this makes it a pain in the ass), we had to get a custom hood as well. We used the factory lightweight aluminum hood and started hacking away. We didn't want to simply just cut a square out of the hood. If we did it that way it would look really stupid so we decided to implement the factory rotary indentation on the hood with the design. The overall fabrication creates what was once a two-dimensional rotor on the hood to a three-dimensional rotor on the hood. In fact, the apex of the rotor overlaps right over the intercooler. The split in the middle of the hood looks aesthetically pleasing as well. At first glance, it looks like a thin sheet of aluminum that splits the opening of the intercooler. We simply put a small diameter aluminum tube underneath it that is hard to see to strengthen it up. The results look really cool and helps promote the theme of the rotary. Really cool!

Engineering underneath the hood was just the start. To add more anarchy to the buildup, a custom front suspension had to be engineered. The RX-8 comes stock with a great double wishbone set-up. The handling of the stock double wishbone is second to none and the typical design is even being used in Formula 1. Unfortunately, a double wishbone setup is not very good for drifting. A lot of drift cars that have the most angle run a MacPherson setup. There is one less wishbone for the suspension to hit when turning. We wanted to give Justin a very large window for turning to avoid the chances





of spinning out. The hubs are stock RX-8 units but all upper and lower wishbone arms are custom engineered by Gary Steen. It was a tall order but Gary pulled it off. Before we started, we agreed to attempt to produce a glorified forklift, so to speak. The wishbones are extremely adjustable for a wide-range of settings. They are very strong and were built very similar to trophy truck standards. The results produce mad angle and performance. People in the drifting community can't believe we are able to get that much angle from a double wishbone setup. KW dual canister shocks handle suspension duties on all four corners and are completely adjustable.

Now let's address the interior. We wanted to produce an interior that was comfortable and pleasing to the eye. Keep it nice and simple, if not stock looking. I think it is extremely important to keep the driver comfortable in the car and create a no stress environment. Justin has enough to worry about drifting next to some crazy driver. We actually positioned Justin's Sparco seat in what I like to call the lazy, cruising the boulevard mode. I've done this before with the Mazda 6 drag car and most drivers feel comfortable in the driving position. Again, the comfortability theme has come to play. To make things feel more at home for Justin, I measured the pedals-brake/steering wheel heights and distances from his seat in his old Mazda RX-7 to match that of the RX-8. The Sparco seats, steering wheel and belts are identical between his two cars. The only thing I did not bring into play from his former car was the "fishbowl" shifter. Nevertheless, Justin would enjoy the shifting performances of a HKS full sequential transmission. From Justin's feedback he does not mind missing the "fishbowl" shift knob mated to a stock RX-7 tranny. Even though it's a completely different car, we wanted Justin to feel at home with the RX-8. All Tilton pedal assemblies, e-brake handles, Sparco steering wheel tilt or heights are fully-adjustable. I might even want to take it out for a spin. In addition, Justin had requested an old school Wink mirror. I had surveyed the market for one and most of them had come up as the cheap Chinese plastic black mirror that you would find at Pep Boys. I was able to acquire a great billet Wink mirror from an off-road shop. The dash is very simple, removable and stock looking. Overall, it is clean and comfortable but striking enough so that Justin does not fall asleep.

We have implemented in all of our cars MoTeC engine management. It is by far the best engine computer in the world. We run a MoTeC M800, a

MoTeC full enabled dash, complete with dual CDI-8 ignition boxes. To add more painful expenses to the mix, we also implemented MoTeC's new PDM module (Laka Power Distribution Module). All I know about this expensive gadget is that the car no longer requires fuses; everything is run from this module. It helps decrease any chances of shorts and on top of that is hooked up to the MoTeC M800 to do all kinds of tasks. Nathan Tasakon of MoTeC engineered the complete system. To make matters even crazier, Ed was able to hook up all the MoTeC hardware to another computer for telemetry. Ed is a computer geek by trade and mating the computer geekiness with Nathan's expertise makes for a very serious setup. We are able to have live data from the car anywhere on the track. Ed is able to monitor any of the RX-8's conditions on the track. No wires are required to connect a laptop to see what the car is going through. I must admit it's really tricky. A lot of the engineering is used in higher forms of racing such as Grand AM, American LeMans and IRL. The whole MoTeC setup is really expensive and reliable, but worth every penny.

I can't forget the tires either. This is extremely crucial because all this work could get nullified if we don't put a kick-ass set of tires on the Mazda. With all the custom work done to the Mazda RX-8, the only thing planted to the ground is ultimately the tires. Tires are key to making all this hard work succeed. Nitto's new NT05 was the ultimate choice for our build because the tire delivers superior performance in grip and is very predictable on track. Justin has no problems telling the RX-8 what to precisely do on the Nitto NT05. He has tried other tire brands and by far loves the performance of the NT05. If we're going to put nothing but the best components as well as the best fabrication on this Mazda we might as well put the best tires on the sucker.

In conclusion, this painful build came out damn sexy. The car performs like no other and creates the maddest angle anyone has ever seen in drift. There is a boatload of power currently and yet still more available. Justin loves every single moment in the car and gives us nothing but positive feedback on its performance. The Mazda has only been out for a short time and has no problem qualifying at the top seats. We are still adding new tricks to it and competitors are already sweating it. It is only the beginning and to us the Mazda still could be improved in our eyes. Just wait until Ed starts taking it out for Super Lap Battle. You ain't seen nothing yet. Still more gixgita things to do. 🙌



## TUNING MENU

### 2009 Mazda RX-8 R3

**OWNER** BERGENHOLTZ RACING  
**DRIVERS** JUSTIN PAWLAK (DRIFT); ED BERGENHOLTZ (TIME ATTACK)

**CREW** Brian Benson, Kurt Gasper,

Rommel Figueroa

**ENGINE** Mazda 3-rotor; engineered and assembly by Kyle Mohan at Mazdatric; Star Mazda three-stage dry sump setup with Peterson three-gallon sump tank and Baker Precision bearings; 600cc stage one/1,000 cc stage two injectors; custom Steen Chassis intake manifold with GM Z06 90mm throttle-body and Burns Stainless turbo manifold; NGK spark plugs and wires; TIAL 674KSP; turbo (configured by Tod Kaneo); blow-off valve and 10mm wastegate; HKS intercooler; Mishimoto radiator and oil coolers; AEM air filter; Product Engineering fuel pump; Aeromotive fuel regulator; Stewart water pump and recovery tanks; Baker Precision ultralite plumbing lines

**TRANSMISSION** HKS 6-speed sequential transmission; OS 616m twin-plate clutch and 1.5-way LSD; Driveshaft Shop driveshaft and 1,000rpm custom axles with hubs

**ENGINE MANAGEMENT** MoTeC M800, dual CDI-8, Power Distribution Module (PDM) and full wiring; tuning by Eric Hsu at KS Engineering

**POWER** 600 hp with M80 1b-ft. at 3k lbs of boost.

#### SUSPENSION & CHASSIS

Chassis work by Ron Bergholtz and Steen Chassis; 3-way competition adjustable KW coilovers and rear sway bar; Speed Source front sway bar and custom adjustable rear arms; Steen Chassis rollcage, custom upper and lower arms

**WHEELS & TIRES** 5x4 55F 18x9.5 and 19x10 wheels; Nitto NT05 ZVS/3R129 and ZVS/3SR129 tires

**BRAKES** Brembo brakes

**EXTERIOR** Aurora Blue Mica paint by Sam's Auto Land, Gardena, CA; APR GRC-500 wing with Steen Chassis mounts; Selbon Fiberglass doors and trunk lid; custom door sills and quarter panels by Troy Sumitomo at SAric; custom Steen Chassis hood

**INTERIOR** Sparco EVO seats, seatbelts and Champion steering wheel; McKenzie's wink mirror; MoTeC ADL instrument cluster; ATI 10 gallon fuel cell

**PROPS** Jim Jordan, Steve Sanders, Tod Kaneo and Derek Tge at Mazda USA; Tomo Mizutani, Gloria Hiyamoto and Terrence Ng at Nitto Tires; Troy Sumitomo at SAric; Scott, Kanemura and Rommel Figueroa of SAC; Nathan Tasakon and Jim Munn at MoTeC Electronics; Warren at Sparco USA; Ryo at Selbon Mike at Mishimoto; Gary and Jason at Steen Chassis; Jon at RC Engineering; Chris at KW Suspension; Sean at OS 616m; Chris and Danni at Brembo; Greg at TIAL Sport; Eric and Max at Garage Graphics; Darlene and Hung at Baker Precision Bearings; Izumi at WPC Coatings; Kyle Mohan and crew at Mazdatric; Frank at Driveshaft Shop; Eric Hsu at KS Engineering; Jack at Burns Stainless; Mike Morton at Peterson Fluid Systems; Christopher at NGK; Ryan Nufelle at HKS USA; Chuck and Masaki at KPEDI Enterprises; Jim Uaw and Dirty Panda at Formula C; everyone else we possibly forgot because we're getting old and forgetful

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