



Exhaust Side Tuning

Racing Beat and Milltek Sport help our RX-8 exhale.

Up until now, we've focused our attention on improving the grip and handling of our '05 Mazda RX-8, as well as addressing a few of its known weaknesses, including the ignition and fuel system. But the time has finally come to make a little extra jam, and truth be told, the Renesis in stock form really is pretty underwhelming in the horsepower department. Don't misunderstand – we love the way this latest version of the 13b sounds and feels as it revs to 9000 rpm, but the lack of torque and midrange power has left us wanting more.

To get more, we've contemplated everything from a 20b swap to a V-8 swap, but since we want to keep the car eligible for Street Touring class Solo 2 competition, an exotic engine swap is out of the question. With STX class competition in mind, we've therefore set

about freeing up our Renesis' breathing on the exhaust side, where aftermarket headers, high-flow cats and after-cat exhaust systems are permitted.

We started with Racing Beat's exhaust header, a nicely constructed 304 stainless steel unit with individual 1.75-inch OD mandrel-bent tubular primaries that merge into a 3-1 collector. The mounting flange is cast stainless steel and has been carefully designed by the rotary gurus at Racing Beat to allow exhaust gasses to smoothly transition from the engine to the primary tubes. They've also incorporated emissions control air passages in to the flange design so that the factory EGR system can continue to function properly. It's also equipped with an O2 sensor bung so that the primary O2 sensor can be plugged in – again a requirement for retaining proper emissions system functionality.



Swapping in the Racing Beat header is a straightforward affair, one that SG-Motorsports' rotary expert, Joe, handled quickly for us. Since we suspected a clogged cat as the source of our high-rpm power loss, rather than testing the header on its own we decided to install the Racing Beat 3-inch OD resonated race pipe at the same time. This dual resonated midpipe replacement deletes the gigantic OEM catalytic converter, so it's not street legal, but it would be a good way to test our clogged cat theory.

With the RB header and race pipe installed, we bolted the RX-8's rear hubs up to the U2Ndyo.com Dynapack and spun our Renesis up to redline several

These shiny stainless steel goodies from Racing Beat and Milltek Sport represent a serious overhaul on the exhaust side of our RX-8's rotary engine.



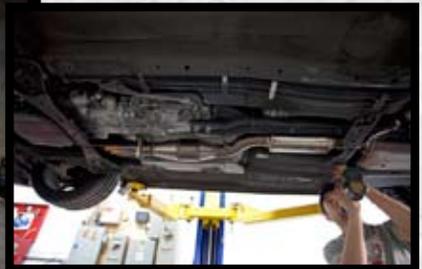
Racing Beat's header features a cast stainless steel flange, mandrel-bent primary tubes and a smooth 3-1 merge.



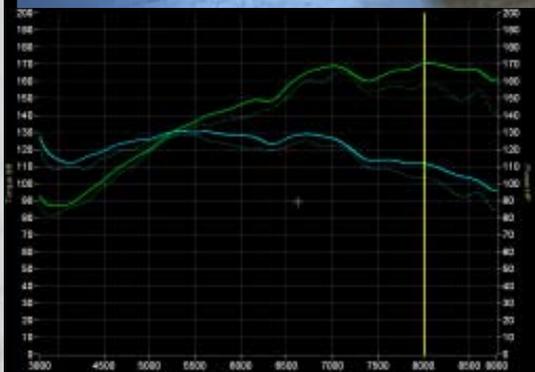
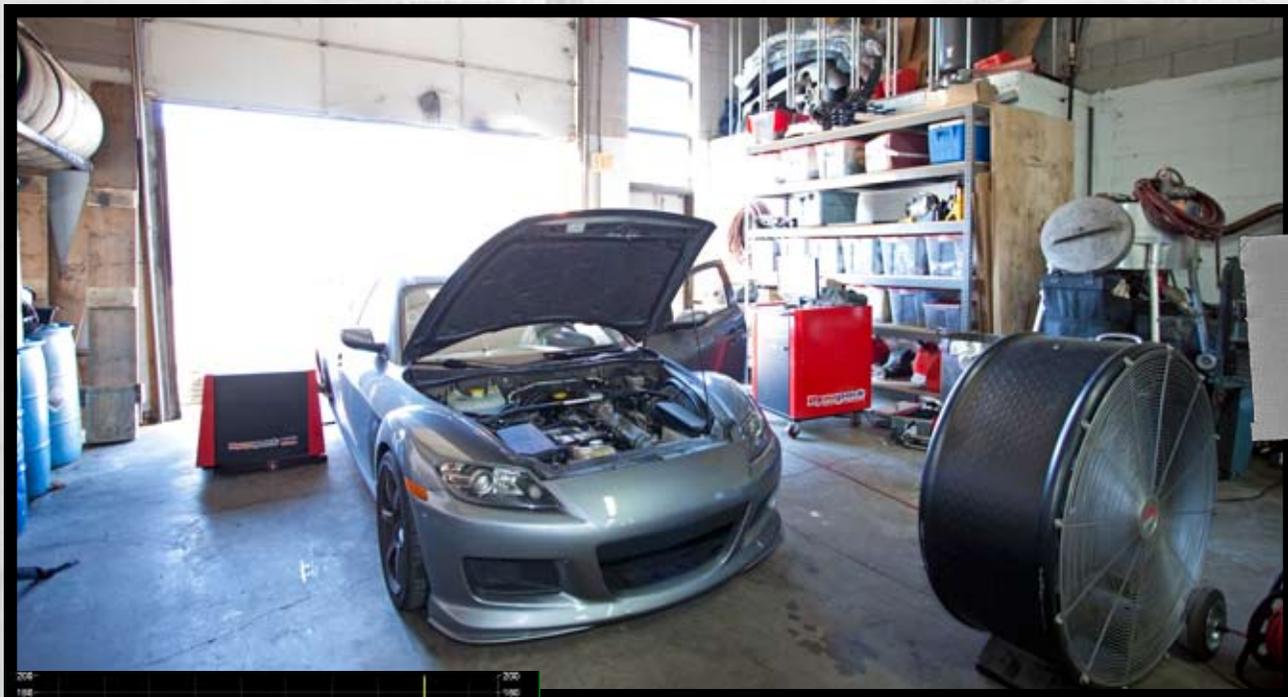
Racing Beat's resonated race pipe deletes the OE cat, but keeps sound level very close to factory quiet thanks to the two large resonators.

times. Power improved across the board and the problematic top 2500 rpm smoothed out and improved considerably, but still isn't peaking as high as it should (at least 10 whp higher than the second "hump" on the horsepower line is typical of a healthy Renesis). So although the Racing Beat header and race pipe combo proved a potent horsepower liberator, it hasn't turned out to be the magic top-end tonic we were hoping for. The OEM cat would appear to have been contributing to the weak top end, but there's still something holding our Renesis back above 7000 rpm.

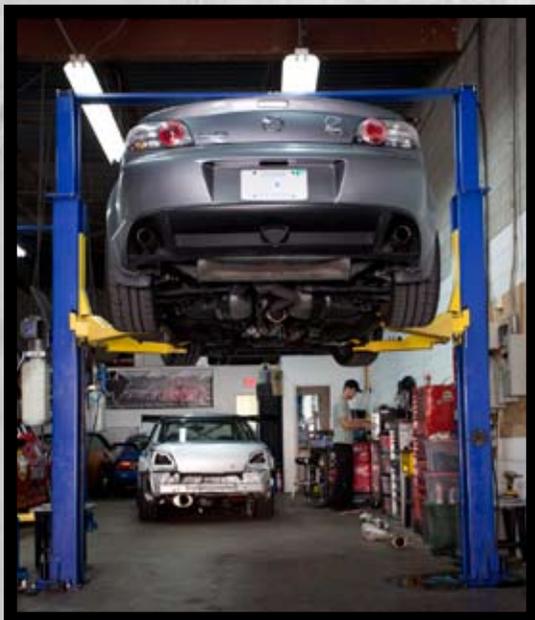
Now it was time to make our RX-8 STX class legal, if not street legal in some states (check your local regulations to determine if high-flow cats are permitted). As per the STX rules, we'd need to install a catalytic converter within 6 inches of the OEM location. But what cat to use? Having stumbled across a thread on RX8club.com, where a hardcore STU class autocrosser was using a HJS Motorsports cat normally used on WRC, WTCC and DTM race cars in Europe (where they have much stricter emissions laws for racing than we have), our interest was piqued. If this cat can survive the kind of anti-lag



The HJS Motorsports cat was positioned in the OE cat location for quick light up and STX rules compliance.



As you can see from the dyno graph, our Renesis has gained hp and torque across the board thanks to the exhaust side upgrades, with peak gains in the top 2500-rpm range of 5-18 whp.



punishment and sky high turbocharged exhaust gas temps produced by a WRC engine, it would no doubt withstand the heat produced by a mildly tuned Renesis engine with ease.

Since there's no U.S. distributor for HJS Motorsports catalytic converters, we turned to Charlie Orpen at Milltek Sport Ltd in the UK. Milltek stocks HJS cats designed for modified road cars and full-blown race cars, and as we learned firsthand Milltek ships quickly and affordably. Since we wanted the big dog WRC spec motorsports cat, Charlie shipped us one with a 3-inch OD and 13.25-inch length, which just so happens to make it a perfect replacement for the forward-most resonator on the RB race pipe. This puts the HJS cat in the OEM location, meaning it'll light up quickly for proper emissions control and make use of the factory heat shield that protects the center tunnel from excessive heat buildup.

We were more than a little curious to see what sort of restriction this top-of-the-line motorsports catalyzer might be, but to our amazement power output actually increased slightly compared to the catless race pipe and sound was very close to OE since we've kept the stock muffler section for now. The small improvement in power output was likely the result of slightly lower engine temps during the dyno runs and/or a reset ECU, but it's still remarkable to see a cat that doesn't throw a CEL and robs

no power whatsoever.

We were also surprised and impressed by how quiet the exhaust continues to be with the Racing Beat header, resonated midpipe and HJS-cat in place, cruising decibels and sound quality being virtually indistinguishable from the factory setup. There is, however, a new and pleasingly menacing snarl when stomping on the loud pedal, a noise that is distinctly Renesis and one that puts a grin on our faces every time we let it rip to redline.

Next month we're going to install a COBB AccessPORT so that we can datalog a wide variety of engine health parameters. With any luck this will help us get to the bottom of the flat top end, particularly since we're teaming up with Jeff from MazdaManiac.com who's going to provide us with his custom remote tuning service. With Jeff's help, we're confident we'll maximum engine output while either solving or at least identifying the source of the high-rpm woes. ■

SOURCEBOX

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