

Yamaha RX1 Bender Stage 3 turbo drag sled NEW DYNOTECHRESEARCH RECORD HOLDER

Frank Jarocki and Chuck Hamrah, some sort of partners on this awful thing.

Terry from Bender Racing called to see if I had time to dyno an RX1 stage 3 turbo RX1 engine he had built for Frank and Chuck. I now have a 400+ HP capable dyno drive shaft, so “bring it on”. It was surely a situation of Bender’s nearly identical SuperFlow sled dyno being tied up with the many turbo projects he’s working on—plus there is some advantage of any sled being dyno’d at DynoTechResearch especially since we have independence and that good ones like this get serious internet exposure on our website.

This open mod drag sled will have to run with a turbo inlet restrictor to be class-legal, but the restrictor we had to test was ill-fitting and wouldn’t stay in the venturi inlet of the oversize Garrett ball bearing turbo compressor—instead during each run it wound up laying in the Superflow airflow meter with the turbo inlet wide open, So this dyno data is with wide open turbo compressor inlet, your results with restrictors may vary.

This run is typical of how the engine performed after 10 fine-tuning dyno runs (timing, boost, jetting) with 80 mph air blasted at the intercooler. After tuning was optimized for 400+ target HP, this engine repeated on our dyno with the last three runs at 414.9, 415.3 and 415.4 HP, showing that this is no fluke, repeating within 1/10th of a percent!

We dyno’d this wild drag engine at a controlled very rapid 600 RPM/ second acceleration rate, meaning that our mechanical fuel flow and airflow meters would lag way more than the instant boost turbo/ engine would, so fuel flow numbers are leaner than actual. The LM1 O2 sensor we were measuring seperately with (O2 sensor with wide band A/F ratio) read actual 12/1 or threabouts at full boost.

The new SuperFlow software that we have ready to install on our dyno uses the LM1 wideband O2 sensor which is much quicker responding than the mechanical gauges we are using now. Sometime in the next few weeks we will install the new software and it will result in more accurate A/F ratio and BSFC during very rapid acceleraton tests like we did here.

Note that one of the unltimate advantages of the four-cycle four cylinder turbo engines is that HP is flat 400-415 from 8700 to the 10,400 rev limiter meaning clutching is way more forgiving than a similarly powerful two-stroke (ie: gonzo stroker with N2O or whatever)..

Bender 1000cc Stage 3 drag turbo

| EngSpd RPM | STPTrq Clb-ft | STPPwr CHp | FulA+B lb/hr | Air1+2 scfm | ManPrs inHg | A/F Ratio | BSFC lb/hph | FUEL-P psig |
|---------------|------------------|---------------|-----------------|----------------|----------------|--------------|----------------|----------------|
| 7500 | 248.3 | 354.6 | 146.2 | 427.7 | 61.2 | 13.39 | 0.434 | 36.9 |
| 7600 | 247.3 | 357.9 | 142.2 | 429.1 | 62.5 | 13.81 | 0.419 | 37.2 |
| 7700 | 249.8 | 366.2 | 136.4 | 434.6 | 64.9 | 14.59 | 0.392 | 36.6 |
| 7800 | 247.7 | 367.9 | 135.2 | 438.8 | 61.3 | 14.86 | 0.387 | 36.7 |

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|-------|-------|-------|-------|-------|------|-------|-------|------|
| 7900 | 247.5 | 372.3 | 137.6 | 446.1 | 63.5 | 14.84 | 0.389 | 37.3 |
| 8000 | 247.5 | 377.1 | 141.2 | 453.5 | 62.8 | 14.71 | 0.394 | 37.5 |
| 8100 | 246.6 | 380.3 | 138.1 | 453.1 | 61.4 | 15.02 | 0.383 | 37.5 |
| 8200 | 246.4 | 384.7 | 135.4 | 461.1 | 63.8 | 15.59 | 0.371 | 37.4 |
| 8300 | 247.7 | 391.5 | 131.5 | 465.3 | 59.3 | 16.21 | 0.354 | 37.1 |
| 8400 | 243.9 | 390.1 | 131.5 | 467.2 | 59.2 | 16.26 | 0.355 | 36.9 |
| 8500 | 242.4 | 392.3 | 134.5 | 472.6 | 58.8 | 16.08 | 0.361 | 36.7 |
| 8600 | 243.2 | 398.3 | 148.4 | 478.7 | 60.1 | 14.77 | 0.392 | 36.8 |
| 8700 | 242.8 | 402.3 | 151.2 | 480.3 | 61.6 | 14.54 | 0.396 | 36.9 |
| 8800 | 240.8 | 403.5 | 153.7 | 487.1 | 57.5 | 14.52 | 0.401 | 36.8 |
| 8900 | 238.5 | 404.2 | 153.1 | 487.9 | 60.7 | 14.51 | 0.398 | 36.8 |
| 9000 | 235.3 | 403.2 | 149.7 | 489.1 | 61.9 | 14.96 | 0.391 | 36.8 |
| 9100 | 232.9 | 403.5 | 150.5 | 488.4 | 62.7 | 14.86 | 0.393 | 36.8 |
| 9200 | 233.3 | 408.7 | 150.3 | 492.9 | 58.1 | 15.01 | 0.387 | 36.8 |
| 9300 | 229.8 | 407.1 | 147.9 | 499.9 | 57.6 | 15.47 | 0.382 | 36.7 |
| 9400 | 232.1 | 415.3 | 144.2 | 500.9 | 56.4 | 15.92 | 0.365 | 36.3 |
| 9500 | 229.6 | 415.2 | 146.7 | 501.1 | 58.7 | 15.64 | 0.372 | 36.2 |
| 9600 | 226.3 | 413.7 | 152.4 | 507.4 | 63.1 | 15.24 | 0.388 | 36.2 |
| 9700 | 222.4 | 410.8 | 156.2 | 506.7 | 63.3 | 14.85 | 0.401 | 36.1 |
| 9800 | 218.2 | 407.1 | 156.7 | 510.3 | 62.6 | 14.91 | 0.406 | 36.1 |
| 9900 | 217.3 | 409.6 | 158.1 | 511.2 | 56.3 | 14.81 | 0.407 | 35.8 |
| 10000 | 214.5 | 408.4 | 156.3 | 514.1 | 58.3 | 15.05 | 0.404 | 35.5 |
| 10100 | 211.5 | 406.6 | 158.7 | 514.4 | 59.1 | 14.84 | 0.412 | 35.3 |
| 10200 | 211.1 | 409.9 | 165.2 | 515.7 | 58.2 | 14.29 | 0.425 | 35.1 |
| 10300 | 207.2 | 406.3 | 166.4 | 513.7 | 59.6 | 14.13 | 0.432 | 35.1 |
| 10400 | 207.2 | 410.3 | 166.4 | 513.7 | 59.6 | 14.13 | 0.428 | 35.1 |