

Carbureted ZR900 Trail mod by Tom Mango

Tom Mango (tommcat on HCS) and his pal Tom Leonard brought their Arctic Cat sleds (trail mod ZR900 carb and tuned up stock F7 efi) here from Springfield, MA for tuning. Tom M. follows the internet very closely, paying attention to who has done what with ZR900 mods/ parts. The ZR forum on Harcoresledder seems to have more than its share of intelligent technical posts, and Tom used that forum and others to select what modifications to perform to his ZR900.

His ZR900 trail sled is an interesting conglomeration of mods and parts that as the dyno showed, turned out very well. The engine is stock bore, ported by Geno at Racer's Edge Performance, a small shop in West Springfield, MA (413-737-0355). Sometimes we see great engine porting by smaller shops like this. There's no guarantee of getting a great engine job even by some of the larger engine modifiers, and it's refreshing to see a great engine like this from a less well-known modifier. Tom may have told Geno he was coming to DTR, something I suggest to people when getting engine porting etc (even if they're not really planning to dyno), so hopefully the best grinder will get the job.

Besides the REP porting, Tom had Bikeman modify his stock cylinder head, winding up with a pump gas safe but higher compression ratio with .065" squish clearance. V Force3 reed cages replaced the stockers. Interestingly, a SpeedWerx Y pipe was mated with a ceramic coated SLP single pipe and relatively quiet SLP can. Tom also had an SLP cold air kit on his stock airbox, which takes in a greater percentage of outside air (but made measuring airflow CFM impractical). One other nice touch was the removal of the stock electric Exhaust Valve controller, and fitting of Supreme Tool mechanical valve controllers. These nice billet pieces appear to use Bombardier diaphragms/ springs/ covers to adjust the opening time. This seems like a good idea on ZR and F series carbured engines, where valve opening often seems way too late.

Another excellent purchase Tom made on the internet was a spare CDI, programmed with Mountain Cat 1M timing curve. This was the only before and after part of the tuneup, and as the dyno data shows added HP throughout the powerband. Tom began his tests with the 1M cdi, and after tuning his fuel flow to our liking for pump gas, he tried the original stock CDI. Watching the real time graph on the computer, we could see HP was low from bottom to top and I stopped the test at 7700 just as HP began to tail off. But it's easy to see the difference the 1M timing program compared to stock. Remember, this is the 1M ECU on this particular trail mod package, no guarantee that every stock or modded ZR900 will benefit like this. An instrumented dyno should be used tweak timing whenever modifications are done, especially since mods to engine/ combustion chambers will alter mixture turbulence one way or another, requiring a specific timing to be optimal.

Tom also had a Tempaflow float bowl pressure tuning device affixed to his "rifle bored" carbs and airbox. 510m jets were optimal for his riding last season, and the dyno showed optimal here at 80 degrees F. That appears to be such a good setup I'm going to look into trying that Tempaflow system on my stock 98hp XLT600. The test might be January

dyno air, dialed in at .60 then close the door, raise the air temp to 75 and see what we have.

Here's Tom Mango's ZR900 trailmod, first test with stock ECU then second with 1M Mountain Cat ECU. Then I have included a graph of Tom's dyno tuned engine compared to the average of the two dyno certification dyno runs for the 06 stock EFI ZR900 we ran at the 05 Adirondack Shootout, when Am Snow was our Shootout partner. This graphic comparison shows, even more dramatically the overall improvement in the horsepower curve from midrange to top end.

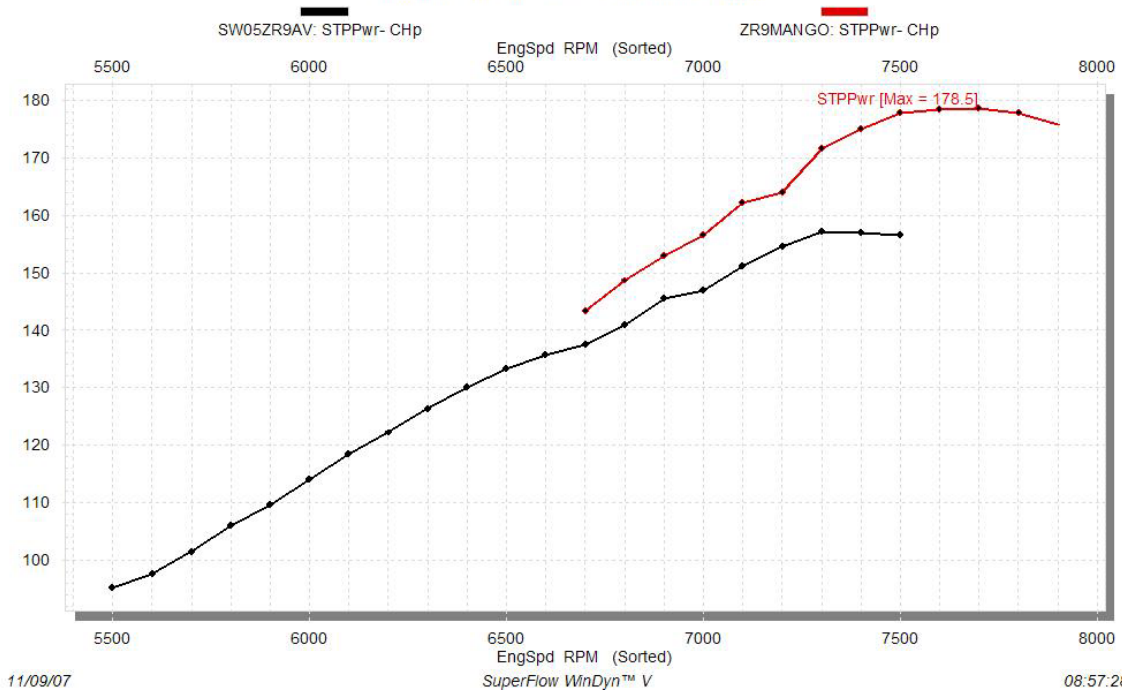
Tom's trail mod ZR900, tuned safely for pump gas, stock ECU

| EngSpd | STPTRq | STPPwr | BSFC B | Fuel B | TsTim2 | WtrOut | AirTmp |
|--------|--------|--------|--------|--------|--------|--------|--------|
| RPM | Clb-ft | CHp | lb/hph | lb/hr | second | degF | DegF |
| 6900 | 110.3 | 144.9 | 0.640 | 86.8 | 4.1 | 81 | 66 |
| 7000 | 112.5 | 149.9 | 0.648 | 90.8 | 4.7 | 81 | 66 |
| 7100 | 112.1 | 151.6 | 0.644 | 91.3 | 5.0 | 80 | 66 |
| 7200 | 112.5 | 154.2 | 0.667 | 96.2 | 5.5 | 80 | 66 |
| 7300 | 112.3 | 156.1 | 0.658 | 96.0 | 5.6 | 80 | 66 |
| 7400 | 112.8 | 159.0 | 0.638 | 94.9 | 5.7 | 80 | 66 |
| 7500 | 119.2 | 170.3 | 0.656 | 104.8 | 6.1 | 79 | 63 |
| 7600 | 119.7 | 173.2 | 0.639 | 103.5 | 6.7 | 79 | 65 |
| 7700 | 118.1 | 173.1 | 0.643 | 104.1 | 7.1 | 79 | 65 |

Tom's trail mod ZR900, tuned safely for pump gas, Mountain Cat 1M ECU

| EngSpd | STPTRq | STPPwr | BSFC B | Fuel B | TsTim2 | WtrOut | AirTmp |
|--------|--------|--------|--------|--------|--------|--------|--------|
| RPM | Clb-ft | CHp | lb/hph | lb/hr | second | degF | DegF |
| 6700 | 112.3 | 143.3 | 0.635 | 85.1 | 0 | 81 | 67 |
| 6800 | 114.8 | 148.6 | 0.641 | 89.0 | 0.7 | 81 | 67 |
| 6900 | 116.4 | 152.9 | 0.640 | 91.6 | 1.6 | 80 | 66 |
| 7000 | 117.4 | 156.5 | 0.636 | 93.1 | 2.0 | 79 | 66 |
| 7100 | 120.0 | 162.2 | 0.636 | 96.8 | 2.6 | 78 | 64 |
| 7200 | 119.6 | 164.0 | 0.636 | 97.9 | 3.5 | 77 | 64 |
| 7300 | 123.4 | 171.5 | 0.639 | 102.6 | 4.3 | 76 | 65 |
| 7400 | 124.1 | 174.9 | 0.632 | 103.6 | 4.7 | 76 | 65 |
| 7500 | 124.5 | 177.8 | 0.631 | 104.9 | 5.4 | 76 | 66 |
| 7600 | 123.2 | 178.3 | 0.618 | 103.1 | 6.5 | 76 | 66 |
| 7700 | 121.8 | 178.5 | 0.610 | 101.8 | 7.1 | 76 | 66 |
| 7800 | 119.7 | 177.7 | 0.608 | 101.1 | 7.5 | 76 | 66 |
| 7900 | 116.9 | 175.8 | 0.614 | 101.0 | 8.1 | 77 | 65 |

Tom Mango's Pump Gas trail mod ZR900 compared to stock 06 ZR900 from Adirondack Shootout



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SuperFlow WinDyn™ V

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