Aftermarket Turbo power

Why I dont have 800 or 850 "Aftermarket" turbo clutch kits anymore

I dont have turbo clutch kits for several reasons, mostly of frustration dealing with engine power shape problems. Aftermarket turbo airboxes are fragile and can blow apart. Youll put it together again and again, if it blows apart at least once. A test guy of mine had to put his XXXXXX airbox back together 4 times in one week out in the mountains last season 2020....very annoying.

The next problem I know of is the aftermarket turbo brands have too much internal pipe pressure at engine speeds from idle to around 3600. The existing pipe pressure is high enough that it pushes a dirty exhaust charge air back into the cylinder and makes the bottom end bog, too rich of dirty air and not enough clean intake air. So then have to raise the engagement speed around 3800~4000 to overcome that problem and then guys try to alter with fuel control at low engine speeds...

The engine will run poor below 4200 rpms and be vulnerable to late-winter-season, wet heavy snow, warm air and engine power low then the owner blames the clutching for the engine not running right and the engine speed fluctuation when full throttle.

Next, octane.

Not one turbo brand has published any dyno octane data, its all guessing. I have looked and have seen none. (this is observation as of March 2020, I have not looked for that data after that to today)

If you run too much octane for your cylinder head design then the engine may have low peak rpms because the exhaust pipe will not get to proper operating temperature. The octane will not allow pipe heat.

The clutching is a mirror of maximum engine power. IF your engine is making lower horsepower (the power band is at a lower rpms because of low pipe temperature) THEN you will have to follow the power with the clutch weight. In other words you have to hunt for the engine power rpm with flyweight. Its like playing hide-and-seek. The horsepower is hiding because you hide it with improper fuel octane [too much] and now you have to find the new horsepower peak by re-tuning the clutch. [BUT people blame the clutching when its the owner has changed the power shape of the engine and cant find it due to improper fuel octane]

Next, 5psi.

I would not run a turbo over 5psi because of the complete intake tract material temperature issue. When you go more than 5psi, all the material that makes up the airbox gets HOTTER, MORE HOT and the engine can start to backfire because of charge air being too hot. If the airbox is made of aluminum, it gets hotter with more than 5psi. An engine running at 7 to 8 psi, has an airbox temperature HOTTER than an airbox running at 4 and 5 psi.

...AND, the whole time the owner puts the burden on me [Joey] that what YOU think your turbo engine is running right/correct/competent, but YOU blame the poor performance on my clutching not working.

I deleted the turbo clutch parts off iBackshift, because I am tired of people not knowing what they have and cant tune the engine. And when YOU the turbo owner ask the turbo builder what the problem is, then they [turbo builder] ask you about the clutching. Then the turbo builder[sil/aer/alt/boon, etc...] blames the clutching. The turbo company blames iBackshift.

Then the turbo owner [YOU] changes over to the turbo builder clutching, then the turbo builder clutching does not work, then then owner complains to the builder and the builder says well, it works for us.

And you are on your own....and leave my clutch parts in a path of frustration with a bad name attached to it [Joes clutching didn work] when the reality is the turbo engine isnt calibrated and always runs with dirty charge air below 4000 rpms..

Bottom end power loss as elevation increases

Email #1

Jeff) Hey Joey, I had bought some turbo clutch parts from you last year and recall you had mentioned doing some gears as well! I held off at the time but think I'm gonna try a set before this next season. Just thought I'd see if you had any advice before jumping into it. FYI clutch parts seems great by the way just think I'm leaving something behind by not re-gearing.

Email Reply #1

Jeff) way just think I'm leaving something behind by not re-gearing.

Joe) can you answer this question if I re-phrase your comment?

Re-phrased...

Jeff) just think I'm leaving something behind

Joe) can you explain what you think is lacking? Like say, explain with words that paint a picture for me as-if im there and can feel that sensation of "there's more here, I know it"

What was the "thing done" causing you to think there is more on the table?

...and I don't want to say anything to pre-program your response, rather want to rely on your memory to describe what is happening.

Thanks man, Joey

Email #2

I'm usually riding 8-10k ft. Last year I believe boost was set at around 7.5 psi in the parking lot and automatically increases with elevation. Fuel was pre-mixed, it averaged out to 93.3 octane.

I did have to drop pin weights to 19.4 grams to hit my rpms.

Thinking back one thing coming to mind was i don't think it felt as snappy or grunty as I was expecting off the start or even during a short quick pull. Like it was still missing track speed until it boost fully built up, maybe that's all a engine speed issue from slightly higher octane??

Email Reply #2

Lets say you have 23 grams to get 8000 rpms at X elevation. IF you went higher elevation and you had to lower the pinweight to get 8000 rpms again, THEN the engine power is lower.

its kind of a rule of thumb that for every 1 gram of flyweight you have to add, there is an addition of about the equivalent of 5hp.

This is easily proved, since for every 1000 ft elevation increase, there is 5hp loss. Every 1000 ft increase, an estimated 1 gram must be removed to maintain rated rpms.

Therefore; IF 1 gram = 200 rpms and 1 gram for 1000 feet and 5 hp per 1000 feet, THEN for every 5hp added, you need to add 1 gram.?

5hp loss for every 1000 feet, I got that out of a Rotax 503 fan aircraft shop manual, so they are not my words, they are Rotax's words.?

Example 1
Going from 102 to 108g then that's like there was an addition of 5hp x 6 grams = 30hp increase. Then there is a rule of thumb of for every 30 pounds primary spring end force change, there is a hp change to match it. The calculation is a little bit more complicated because you have to factor the track speed to know what forces are being used by the spring, at-that-track-speed.

Example 2
Lets say you have 23 grams to get 8000 rpms at X elevation

IF you went higher elevation and you had to lower the pinweight to get 8000 rpms again, THEN the engine power is lower.

IF you had to go from 23 grams down to 19.5 grams at a higher elevation, THEN regardless of turbo or not, you've lost 5hp for every 1 gram you had to reduce to get 8000 rpms again.

23g you had "X" Hp at the lower elevation.

22g, you lost 5hp,
21g, another -5hp,
20g, another -5hp,
19.5g, another 2.5hp.

-5hp, -5hp, -5hp, -2.5hp = 17.5hp loss compared to the lower elevation.

I would call David Sebelius here...Turbo knowledge-expert.
https://www.facebook.com/davidsperformanceshop

But you should write out the specs, "what turbo brand", "type of airbox", "fuel octane", "Elevations" then "your problem/observation" and then read it to him over the phone so you will get straight to the point and be efficient with your phone call.

Your bottom end might also be weak because your engine is not getting enough air as the elevation increases. Remember the percentage loss is around 5% for every 1000 feet. The turbo is cranking psi up as you mention, but as the elevation is higher, here is the question - is your engine getting enough air off the bottom end, to say, 4200 rpms at the higher elevation to be able to produce power below the engine's natural powerband?...yes or no? This is something Dave can troubleshoot and might be able to help you with.

...you have an engine calibration problem.

Call Dave and let me know what you find out, thanks, Joey