Important notice

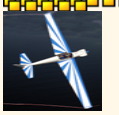
Please remember that people from all over the world read and post on this forum, and that every country has its own rules, regulations and standards. This forum is based in the USA and so much of the information posted here is for the benefit of people who operate aircraft in the experimental/exhibition or experimental/racing categories. Advice given on this forum may be region specific. A person from Europe, for example, may make suggestions perfectly appropriate for a U.S reader, although not acceptable in his home country!

Please take this into account and carefully consult the authorities, standards and approved documentation where you fly.

Taking a 1600VW Turbulent to 21,500 feet

Author	Messages

Bob Grimstead
Captain



Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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Posted Wednesday, July 4, 2012 @ 08:31 AM

STRATOTURB

By Bob Grimstead

"Okay! I'll prove it!"
Rash words: words spoken in the heat of the moment in reply to the scoffing of others when I boasted about my aeroplane's performance.
So often my big mouth has got me into deep trouble.
Then again, how much more often has this sort of spontaneous reply to a challenge resulted in adventure and excitement -- and of course, the odd fright.
So it was to be this time.
Later in the afternoon of my impromptu outburst, wandering around the airfield, I reflected on the practicability of my assertion.
I reckon that my Turbulent goes better than any other. This is mainly because it was a good aeroplane to start with, 25 years ago when Rollasons built it as part of their third batch. It is light, because by then they were experienced and used the lightest of their large stock of spruce, and fast because of the small windscreen, canopy and spats. The aeroplane's excellence has been enhanced over the subsequent years by careful and loving maintenance, first by Rollasons themselves when it was part of the Tiger Club fleet, and latterly by Tony and Jane, Rollason engineers and Club members both, who successively owned it before me.
Finally, I like to think that in my four years of ownership I have improved `RRZ's performance even further. I have designed and made proper engine cowlings, resulting in both less drag and improved cooling. I increased the power of the engine, and as the finishing touch, fitted one of Steve Thompson's superb hand-crafted propellers. Steve, perennial European Formula One air racing champion, makes maximum thrust/ minimum drag propellers, not just for his all-conquering Cassutt, but for most of the other racers too. He made my prop to the same specifications, and it has ensured that I get the full benefit from all the other mods.
Yes, my Turb is a real performer, but how to prove it is best? Speed trials or racing might seem the obvious answer, but with the aircraft's ability to exceed Vne in level flight that would be a bit risky.
Michael Jones eventually provided the solution for me. He is the Secretary of the Tiger Club, renowned son of the famous Norman Jones who originally started both the Club and the UK production of Turbulents.
"Beat the altitude record" he said, emerging from his office at the back of the hangar with a couple of yellowing sheets of paper and a dog-eared graph. It transpired that these relics were the hand-written report of a test flight conducted many years ago to establish the Turbulent's service ceiling. Unsigned, they were really interesting documents, detailing the epic climb of G-ASDB to the giddy height of 13,700 feet, and terminating in a plea to Rollasons to try in future to prevent the alarming apparent shrinkage of the wings as height increased.
"No problem, I could beat that easily". My mouth in runaway mode again.
Upon reflection the whole thing actually tended to look less easy and more hazardous the more I thought about it.
If I was going to go for an altitude record attempt, I was obviously going to have to do things properly. I decided to make my target 20,000 feet.
Twenty thousand feet in a Turbulent? It did not bear thinking about; and it was probably not actually achievable, but if I prepared for that, then I should have covered every eventuality.
Foreseeable problems included the need for oxygen and warm clothing with a minimum weight penalty, possible radio and transponder requirements, and a big enough chunk of easily recognizable airspace in which to perform this feat.
A little serious reading seemed to be in order.
I already knew that the law requires aircrew to use oxygen above 10,000 feet, and I had made a run in a decompression chamber in the Air Cadets many years ago, so I knew some of the dangers of hypoxia. Information Circular 60/1984 (since superseded by 77/1988) filled in some of the gaps in my knowledge. I underlined one paragraph:-
'Breathing air at altitudes above 20.,000 feet results in severe symptoms even in individuals at rest. Metal performance and comprehension decline rapidly and unconsciousness supervenes with little warning'.
For a chap like me whose metal performance and comprehension are not at all that great at sea level, I had better watch out! I should definitely need oxygen, then.
Research and a little calculation of the ISA lapse rate told me that on a standard day the temperature at 20,000 feet would be -25 degrees C, lower on a cold day, and lower still by two degrees for each thousand feet higher. This indicated a need for substantial but lightweight warm clothing.
The fact that the previous pilot stated his personal weight as 150 pounds was also rather sobering. The last time that I

weighed myself I was over twelve stone in my socks alone, so perhaps a little self-sacrifice in that direction would be appropriate.

[Edit by Bob Grimstead on Thursday, July 5, 2012 @ 06:48 AM]

Bob Grimstead
Captain

Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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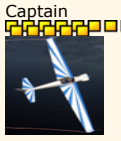
Posted Wednesday, July 4, 2012 @ 08:33 AM

More reading did not reveal any need for either a radio or a transponder provided that I stayed out of controlled airspace. This was just as well, as a Turbulent has no electrical system.
My airstrip is deep beneath the shadow of the great invisible overcast of the London TMA, so I was going to have to make the actual flight from somewhere less restricted. Jim Espin's strip at Popham immediately came to mind. Popham is to the south-east of a long corridor of unrestricted airspace approximately paralleling the A4 and the river Kennet -- and it would be a good place to fill the fuel tank with 100LL too. I usually use four-star motor fuel, but one of the conditions of its use in aircraft is that such aircraft do not fly above 6,000 feet.
In fact I had once unthinkingly climbed to 8,000 feet the previous summer in a fit of post-display exuberance, and it was not the fuel system that had given trouble but the altimeter, which had ruptured its capsule with the excitement. I now had a new one, so that should not be a problem this time.
Since it became apparent that minimum weight was paramount, it seemed that everything that was not absolutely necessary would have to be stripped from the aeroplane.
Because it was obviously going to take a while to do all this, and a day with minimum temperature and maximum pressure would be best for the engine's performance, I decided to make the attempt the next February or March, on one of those calm clear crisp high-pressure days we often get then.
That gave me six months.
Lightening the airframe turned out to be the easiest job, simply because there is not much surplus to remove from a Turb. The g-meter went, the VSI, the map pocket, the luggage locker lid and the seat cushions. Finishing off with a thorough Hoover out, that was it. I just left the Permit, insurance certificate, a half-mill chart and a two-inch pencil stub. My kneepad would be a postcard taped to my leg.
During the winter a brake shoe had cracked, so I removed brakes and spats completely while I waited for a spare. The total weight reduction from all this probably did not amount to more than fifteen pounds, but it made me feel that I had done something.
The longest and most difficult job of the whole operation was getting my own weight down, I was determined not to `go on a diet', but simply to eat a little less -- after all, like most of us, I eat and drink far more than I need anyway, and I only had to lose twenty pounds to equal my predecessor. Sadly, Christmas intervened, and my very best efforts resulted in a loss of only ten pounds, to 162 pounds.
By choosing the lightest of my winter and skiing clothes I was able to keep my total clothed weight to the standard 170 pounds, but only after discarding shoes and substituting two pairs of woollen socks covered in polythene bags.
Another time-consuming task was finding the oxygen. After following a number of leads I was eventually able to borrow a medical 120 litre portable oxygen bottle through Alan James of the Walter Kidde Co. It weighed less than four pounds complete, and should last an hour at high enough flow for 20,000 feet. Perfect.
By now it was early March and everything was ready, apart from the weather. I was keen to try to make the flight on the 9th, because that would be the twenty-fifth anniversary of `RRZ's first flight. In the event that day turned out to be murky and unpleasant, the aftermath of just such a settled high pressure weather system as I had hoped for, and I was only able to complete an extended circuit to commemorate my little red pal's birthday. The high pressure stayed, and on the following day I realised that with a slight clearance forecast, the 11th was likely to be the very best day that I would get.
In final preparation I did an engine oil change, emptied and flushed the fuel tank, and refilled it with carefully filtered 100LL brought in a Jerry can for the purpose. As a token gesture to aerodynamic efficiency I washed `RRZ and taped up the cowlings like the air racers do, and then I had an early night.
Sure enough, the following morning dawned foggy, but the forecast was optimistic, so I ate the lightest possible breakfast and drove to the strip. I loaded my thickest clothes in the locker and flew gently to Popham. The weather was hazy, certainly, but not dreadful and there was not a cloud in the sky. With a temperature of seven degrees it was cold though.

Bob Grimstead
Captain



Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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Posted Wednesday, July 4, 2012 @ 08:36 AM

At Popham I filled the fuel tank to the brim and organised the oxygen bottle in the locker where I could get at it, with the red/green flow indicator looped through the empty holes in the instrument panel so I could see it clearly. I put my anorak, skiing gloves, top sweater, balaclava and bobble hat on top of it and emptied my pockets. The latter caused some amusement, but not as much as removing my shoes did, so I had to explain what I was trying to achieve. My statement was received politely, if a little incredulously, and I felt eyes following me as I taxied to the threshold.
To compare my climb with that of my predecessor, I intended to time the flight from start to take-off, although the figures for the first few thousand feet would not give a direct comparison because I was going to climb at a higher speed than optimum to keep the engine cool. I intended flying and writing on my kneepad with my right hand and reading the stopwatch on my wristwatch, changing hands on the stick for the writing bit.
When I opened the throotle we leaped forward, lifted off at 55 knots and as I glanced at the flickering digits I saw tat my 0-60(mph) time was 7.5 seconds. Wow, that was almost as good as my old Lotus Seven!
I very rarely take off and climb at full power, partly because most of my departures are in formation, and the rest of the time to treat my engine gently, so this came as something of a surprise -- as indeed did the first few thousand feet. Five thousand feet came up in as many minutes, and I knew there and then that I was riding a winner! The temperature was dropping rapidly, so I struggled in the confines of the cockpit to don sweater, hat and mittens. The precision of my flying suffered but I did not care, it was all so exhilarating. Passing 7,000 feet I broke through the haze layer like a minnow jumping up out of a muddy lake. Visibility up here was unlimited, and the sky was a hemisphere of powder blue. There was not another aeroplane in sight, not a moving thing in the heavens, but way way down under me a dark Lynx-shaped slug crawled slowly across the surface of Salisbury Plain.
My heart was pounding, the adrenalin was flowing, and I broke out into a sweat. Quick, hat and gloves off again.
Through 10,000 feet in twelve minutes and I could see snow below on Watership Down. England was spread beneath me, and with the winter sun low in the sky, every fold and ripple was highlighted. Those scattered bumps must be barrows. Everything was tinged with a rosy glow; what a beautiful country we live in!
Time to put on the anorak. Now this was more difficult -- the cockpit is cramped normally, and today, bundled in clothes as

I was, I filled even more of it than normal. Also the anorak was less elastic than my sweater, so it was a real struggle. It took me a couple of minutes to get it on comfortably, and by then I was exhausted and breathing like a steam train.
There was a clue here somewhere!
I turned on the oxygen. I noted the time at thirteen and a quarter minutes, and as I wrote it on my kneepad, realised that was what I wrote for 11,000 feet, and we were now through twelve. Damn! Did I knock the stopwatch off while fighting with the anorak, or was I sufficiently befuddled by hypoxia to have instinctively stopped it when I took the last reading? Rats! I shall never know, but it is odd that the times were the same.

[Edit by Bob Grimstead on Thursday, July 5, 2012 @ 07:12 AM]

Bob Grimstead
Captain

Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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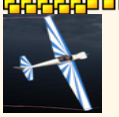
Posted Wednesday, July 4, 2012 @ 08:38 AM

Reaching Marlborough, the western end of my self-appointed climb lane, I turned gently on to a reciprocal heading. And blow me down, but there was the moon! It was a little above the nose, and slightly to the left of track. It looked incandescent in the sky ahead. Unable to resist the temptation, I aimed straight at her for a moment and asked for her benediction. As I did so, we sailed serenely up through 13,700 feet, the record I was out to break. The engine was humming like a little turbine, temperatures and pressures in the green, the aeroplane tight, vibrant, the air utterly still, and the record ours.
But we were still climbing like a rocket. It was only 17 1/2 minutes from start of take-off, the fuel gauge still read full, and there was nearly an hour of oxygen left. Perhaps 20,000 feet was a practical proposition after all!
At 15,000 feet I was starting to feel a little chilly. The gloves and balaclava went back on -- not without a little problem with the oxygen mask, though. I forced the face aperture wider and it all fitted. At 17,000 feet I was now higher than I had ever been before in an unpressurised aircraft, and the memory of another calm clear day rushed back. That time I had been over the Isle of Wight in a white Cherokee, and without oxygen. I could not do that now. I was too old and unfit, and there are airways there now where there once used to be nice clear airspace.
Greenham Common ahead and below; time to turn west again.
Doing so, I looked to my right and saw the only other aeroplane I would see that day. It was an airliner, contrailing westward above me to my right, America-bound on Green One. For a ridiculous moment I wondered if they might be able to see me; they were only a little higher after all -- but perhaps not.
It took a while to reach 18,000, so I had time to look down again. I could see that big strip near Hungerford, and the M4 stood out clearly. Away in the distance to the right were the Malvern hills; closer at hand on the left `Smokey Joe', the white-smoking chimney at the western end of Salisbury Plain, was doing its stuff. As I crossed Marlborough again I could make out Fred Butcher's strip at Draycott Farm where the other red Turb lives. Continuing westwards, I suddenly realised that the regular feature I was looking at was Avebury stone circle, impressively obliquely lit by the winter sun.
So I should be able to see Silbury then. Yes, there it was. That 130 foot high Bronze Age memorial was once the highest thing I knew of. I had climbed it with my father and both grandfathers and have a photo of the event somewhere. It is 4,000 years old, and is reckoned to have taken 500 men ten years to build; and here was I, mocking it while yet respecting it from nearly four miles above, a height achieved in little over half an hour, and using 25-year old technology at that.

Bob Grimstead
Captain



Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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Posted Wednesday, July 4, 2012 @ 08:43 AM

Back over Lyneham it was time to start a gentle turn again. A check on the oxygen gauge showed over half left. I had started using it at fifteen minutes; 45 had elapsed now, so I was safe for another half hour. By golly it was getting cold!
We passed the magic 20,000 feet somewhere over the Vale of Evesham, and although the rate of climb had dropped right off we were still going up. The enormity of what we had achieved was starting to dawn on me now. Four miles up! In a mere Turbulent! My goodness, it felt lonely! No, not lonely, just isolated, `RRZ and me up here, and everybody else in the world on the ground. I could see the town in which friends live down there, but not their homes, and certainly not them. I wondered idly if any of them, looking up, could see me? Probably not, not at four miles, not unless we were contrailing -- now there was a thought!
It was really bitterly cold now. I had already put the chart and aircraft documents under me to try to insulate me a bit from the cold, cushionless seat, without much effect, but my feet were freezing -- literally: there was frozen condensation on the inside of the canopy, and cold sweat inside my vest. What the hell was I doing up here?
I concentrated on flying accurately at sixty knots, ball in the middle, to get the most out of the aeroplane, but my heart was no longer completely in it. To tell the truth I had never been so cold, and I was not a little scared. I could die of exposure up here, and no-one would know.
Frankly, I suspect that not all the flatulence I was so uncomfortably suffering from was due to the equalisation of internal and external pressures. No, John Gillespie Magee had it all wrong: high flight can be bloody frightening.
My feet were in agony. They were the only part of me actually touching the skin of the airframe, and they were burning with the dry-ice cold. I lifted them off the floor one at a time in an attempt to get some relief. I no longer gave a damn about the weight; I just wished I had some shoes, or better, boots.
At 21,000 feet, 56 minutes had elapsed, and as we approached Newbury I determined to turn west for the last time. The turn, in this thin air, with barely fifteen degrees of bank applied, was a real piece of precision control. I managed to get around it without actually losing any height, and absolutely forced myself to ignore the pain in my feet and concentrate on the flying.
I leaned forward to see the ball and the ASI more clearly, pegged the ball in the middle, and coaxed the altimeter upwards. It took forever to gain another 500 feet, but the cold in my toes was becoming less noticeable. I concentrated harder on the speed; it was down to 45 knots now, and the stick was well back as I eased the nose higher and higher. I leaned further forward to focus better on the instruments and coax the little aircraft higher still. Forty three knots, 21,510 feet, 42 knots, 41...
Then instantly, it was all over. The stick nibbled and snatched with the only stall warning that a Turb ever gives, so I instinctively thrust it positively forward. I could certainly do without stalling all this way up here!
The sudden fright made me realise that I didn't feel too good. I was hunched over, starting fixedly at the ASI, with my face only a foot from it, yet my brain was not absorbing its message. My ears were roaring, my hands and arms felt odd, heavy, and my chest was heaving. My goodness, I was hypoxic!
I dragged my half-blind gaze the few inches from the ASI to the oxygen flow indicator and saw that it was red!
I must get down fast!
The nose was already pointing well down from my over-enthusiastic stall recovery, so I left it there. I had enough sense

remaining to leave the throttle open to retain some warmth in the engine (I did not want to damage the heads by cooling them too much, too soon) and I let the speed build up to Vne. A laborious glance at the altimeter showed it unwinding through 20,000 feet as I reduced the power setting a little to increase the rate of descent and added a touch of sideslip.
I was definitely suffering from tunnel vision, because I had to make a deliberate effort to move my eyes from outside to ASI to altimeter. Then I spent a long time pondering why, although the altimeter's big hand was unwinding nicely, the littlest hand was still pointing steadily at the 2. At first I though I had broken it by taking it too high, and then I saw that the needle was moving slightly, and remembered its true function: indicating tens of thousands of feet.

Bob Grimstead
Captain

Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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Posted Wednesday, July 4, 2012 @ 08:48 AM

Somewhere about 15,000 feet I reduced power further, and began to feel better, generally brighter, and (thank goodness) warmer too. I pulled the oxygen bottle over my shoulder, and sure enough the little needle pointed at the E -- yet I should have had ten minutes remaining. Well, it was too late to worry now. I was pretty well gone, back up there, but not yet unconscious, and I still had the presence of mind to note the time and height as I started down (1:07:19) and treat the engine gently.
Within five minutes we were back down to 10,000 feet, and I had time to collect my thoughts. I wondered how long I had been without oxygen. I had completed the difficult turn over Newbury successfully, so the flow must have stopped during the straight westward flight that followed. Perhaps due to a gradually dwindling oxygen flow I had been drifting off for several minutes. Certainly I cannot have had much 'useful consciousness' left.
Throughout the flight I had had a loop of string around my left wrist and over the magneto switches, so that the onset of oblivion would automatically turn them off and initiate a descent; but I had not expected to get quite so close to using this crude 'dead man's handle' without at least some warning. It just goes to show what a frighteningly insidious thing hypoxia can be.
The remainder of the flight was uneventful, a gradual descent through increasingly warm layers of air to Popham, and a gentle touchdown one hour 25 minutes after take-off. Inspection of my diminutive aeroplane revealed no ill-effects from its prodigious feat -- although, to my annoyance, I found that the fuel tank was still over half full, which meant that we had dragged a good twenty pounds of unnecessary weight up to the edge of the stratosphere and back.
The following day I was able to check the temperatures at altitude. The freezing level had been 3,500 feet; at 16,000 feet it had dropped to -20 degrees C (deep freeze temperature); and at 21,500 feet it was -35 degrees C. No wonder I had felt cold!
So there we are: `RRZ and I have broken the unofficial Turbulent altitude record by the surprising margin of 57 percent – and, given more oxygen, we could probably have done better. As far as I know we had also gone higher than any other ultralight aircraft, and had certainly bettered Bob Calvert's then current 20,000 feet British microlight record set in February 1986.
Four miles up on Beetle-power -- amazing! So there is still adventure to be had, and frontiers to push back.

That was in 1988, and I'm certain any RF3 or RF4 could do better today.
I just haven't gotten around to experiemnting.

Yours, Bob

SteveBeaver
General

Gender: Male
Location: Columbus, Ohio - USA
Registered: Jan 2007
Status: Offline
Posts: 371

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Posted Wednesday, July 4, 2012 @ 09:32 AM

What a treat. Thanks for posting Bob. A very enjoyable read.

Steve

Bob Grimstead
Captain

Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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Posted Thursday, July 5, 2012 @ 07:03 AM

Thanks Steve,

I couple of things I didn't mention in my article, becuase they were illegal.
I'm guessing/hoping that the Statute of Limitaitons has by now expired.

My Turbulent had the 1600cc Rollason engine, with standard pistons, compression ratio etc (8.2 to 1 from memory) but it had no mixture control. I wanted as much power as possible above 10,000 feet, and my own, improved carburetor heat system gave not only good heat, but a significant rpm drop due to enrichment of the mixture. So I bought a smaller main jet for the 1200cc engine from Frank Hounslow of Rollason, and substituted that for the standard jet. Then I flew with carb heat selected at all times below 10,000 feet, changing to cold air above that to get a leaner mixture.

That system worked very well, and indeed I was still climbing pretty well when I ran out of oxygen.

The other illegality? transponders were even then required for all aircraft above 20,000 feet in Britain, regardless of circumstances.
But I figured that, in a wooden aeroplanewith only a primary radar return, if I stayed out of the airways anybody watching me on radar would assume I was a helicopter (slow-moving, poor return) operating below 3,000 feet!

Yours, Bob

Bob Grimstead
Captain

Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

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Posted Thursday, July 5, 2012 @ 07:22 AM

Also, I didn't mention in the article about the frozen oxygen regulator, because the guy at Walter Kidde had so generously provided me with the bottle free in return for a mention in the magazine (Pilot, UK).
He had warned me it was medical oxygen not aviation oxygen, but didn't elaborate.
When I took back the bottle, I asked the difference, and he explained.

Although I say in the article it was nearly empty, it actually wasn't. It was still half full, but the bottle's neck, valve etc were all white with furry ice when I looked over my shoulder after starting the descent.

So.... be warned.

Yours, Bob

---

jb92563
Second Lieutenant

Gender: Male
Location: Lake Elsinore, CA, USA
Registered: Mar 2007
Status: Offline
Posts: 582

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Posted Thursday, July 5, 2012 @ 06:01 PM

Great story and drives home the point.

I have climbed my RF4D to 13500 to make sure it could cope with any terrain around the Sierras on the Minden trip next week and although the climb was quite slow at that height, perhaps 250fpm with my Aerocarb leaned some, it was still climbing.

It occurred to me that the limiting factor seems to be increasing richness with altitude, which the Aerocarb can be adjusted for and oxygen percentage in the thinner air.
Perhaps if feeding the pilot oxygen is good then you could likewise feed the engine additional oxygen just as well?

I suppose in lieu of a turbocharger it could work. However blending high concentration oxygen into the carb needs to be done carefully to prevent any fire hazard potential.

Just thinking out loud, not that I have any need to do this as my 4 can clear any terrain I might think of flying around in my area.

Ray
RF4D #4057 N-1771 Rectimo 1400cc
http://picasaweb.google.com/jb92563/FournierRF4D
http://www.touringmotorgliders.org

eugenio
First Sergeant

Gender: Male
Location: Str. Val S. Martino inferiore 133/7 I - 10131 Torino ITALY
Registered: Oct 2006
Status: Offline
Posts: 288

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Posted Friday, July 6, 2012 @ 02:37 PM

Somebody did that on cars, but it's not a very sound idea. First of all you have to take with you the bottle that is quite heavy (the engine sucks more oxigen than you), second it is quite dangerous, there's risk of explosion, third the engine is not enough strong to whithstand the extra power. The oxigen will work like a turbocharger, but the tiny VW is not thought for that.
A friend of mine did that modification on a Renault 5 that after the mod was running like a missile, but after a couple of runs the engine blow out.

Eugenio

jb92563
Second Lieutenant

Gender: Male
Location: Lake Elsinore, CA, USA
Registered: Mar 2007
Status: Offline
Posts: 582

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Posted Friday, July 6, 2012 @ 03:16 PM

Now that I think of it, perhaps Bob G's "Ram Air" carb tube would work nicely without pushing the engine past what it is already capable of.

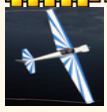
Its certainly simple and lightweight and not so much for increasing performance but for maintaining it in the thinner air at altitude.

I agree injecting great volumes of Nitrous Oxide like they do for cars is not at all suitable for the tiny Rectimo.

That must lean the mixture something fierce and probably just melts a hole in the top of your pistons.

Ray
RF4D #4057 N-1771 Rectimo 1400cc
http://picasaweb.google.com/jb92563/FournierRF4D
http://www.touringmotorgliders.org

Bob Grimstead
Captain



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Posted Thursday, November 22, 2018 @ 06:48 AM

Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

Bob Grimstead
Captain

Gender: Male
Location: Perth, Western Australia or West Sussex, England
Registered: Dec 2006
Status: Offline
Posts: 1775

profile www email pm find edit quote

Posted Thursday, November 22, 2018 @ 06:51 AM

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