



Performance Aviation Boosts R22 Beta Performance

One of the reasons for trading an R22 Beta up to a newer Beta II model is the improved hot and high performance. Matt Bailey of Performance Aviation in Wanaka proposes that fitting one of their exhaust systems will achieve the same gains and more at a fraction of the cost. KiwiFlyer spoke to Matt about his association with PowerFlow and the development of this new product.

What to expect

Matt explains testing of the new Performance Aviation system suggests that owners should save about 5 litres of fuel per hour if they operate at the performance levels they would be accustomed to. Or they can trade that fuel saving for the noticeably increased performance that is available, particularly in hot and high conditions. Carb and cabin heat are also significantly improved thanks to a more efficient collector and shroud design.

Another expectation is not to have to replace the system at 2200 hours as is the case with standard systems. PowerFlow systems in fixed wing aircraft have a life that regularly exceeds 5000 hours. Customers can also expect a 60 day money back guarantee and 1 year 500 hour warranty with their purchase.

PowerFlow and Performance Aviation

Alongside of their helicopter and fixed wing maintenance operations, one of Performance Aviation's goals is to save operators money by introducing better solutions for known problems. This philosophy led to an early partnership with PowerFlow Systems Inc. Several thousand PowerFlow aftermarket exhaust systems are in use around the world including many OEM fitments - for example the new Diamond DA40's arriving for Massey University. There are a great many very satisfied PowerFlow customers - check www.powerflowsystems.com for testimonials and open forum comments.

Since becoming agents for PowerFlow Systems, Performance Aviation have attained Preferred Dealer status in the Pacific Region in a relationship that has progressed to their own development of the R22 system with full support and backing of PowerFlow Systems Inc. The result of this has been a very good system for which a CAA STC is imminent (expected by the end of June). PowerFlow are now themselves entering the FAA STC process using Performance Aviation's data. Performance Aviation will be the sole dealers of the system in Australasia.

Development and Testing

The system started out as the same PowerFlow system used on the Cherokee 140. Performance Aviation then obtained a blank of the heater shroud, fabricating an R22 system that would use the same inlet and outlet hoses already on the aircraft. A much more effective system than standard draws heat from multiple pipes instead of just one and provides for more than 5 deg C greater carb heat from any given setting.



The tidy PowerFlow installation utilises existing hoses.



Matt Bailey at PilotExpo delivering a system to Rod Miller from Rodney Aero Club for their Cessna 172.

During muffler design and carbon monoxide testing, the team found that the location of the tailpipe was quite critical. With forward airspeed there is an area of negative pressure behind the engine which potentially draws exhaust gases back into the cooling fan and air intake. Moving the tailpipe as little as 3" resulted in a CO reading drop from 120 to 12ppm. The standard system operates at 30ppm.

All of the test flying was conducted by Jerry Rowley who operates his own R22 Beta and has logged 1250 hours on type since 2003. Jerry has documented the use of noticeably less power for any given flight configuration, with wider power margins available as well as more economical running. Jerry also says that; "During the test flight programme, which included a lot

of hovering, fuel consumption was 31.4 litres per hour. This is a saving of around 5 litres per hour. Cruising at 22" gave a greater airspeed than with the standard exhaust making it easier to comply with maximum recommended cruise power."

Matt notes that during flight testing on one occasion they got to 8200 feet with -1 degree C outside air temperature and were still climbing at 500fpm with 1" of manifold pressure to spare.

Certification assistance was via Flight Structures Limited in Christchurch and Matt credits Jaap Authier there as being "fantastic to deal with".

Installation and Maintenance

Installation can easily be accomplished in under an hour. With systems delivering 5000 trouble free hours on fixed wing aircraft, maintenance is minimal with only a 300hr/annual lube of the slip joints. In addition, the muffler is ceramic coated which will see it maintain its attractive appearance without changing colour.

Robinson Overhauls and More

Matt suggests making a Performance Aviation System a standard part of any R22 Alpha or Beta overhaul as the small additional cost over a standard system is easily repaid in fuel and replacement savings. Performance Aviation can undertake the entire overhaul process if required and offer a return airfare to Wanaka or free delivery of your helicopter. They have a variety of other improvements they can make to your aircraft as well, including a recently developed mod for engine overspeed prevention on startup.

Performance Aviation are also underway on long term testing of a local mod for R44 exhaust systems. In significant contrast to the standard systems, Matt's version offers even muffler inlet temperatures and a temperature reduction at outlet of 100 deg C. This is expected to dramatically improve the systems longevity and reliability.

For more information

Once the CAA STC is issued for the Performance Aviation R22 system, Matt is planning to host open days in Auckland, Taupo, Christchurch and Wanaka. In an obligation free offer, R22 Alpha and Beta owners are invited to come along and have a system fitted to their own machine. They can then go off flying and assess the benefits for themselves. See advertisement at left for Matt's contact details.