Serial Number 003

With as many Robinson R22 helicopters that are currently in service today, I figured the “Beta II in a box” would have a huge waiting list. To my surprise I was able to purchase and pinpoint the exact delivery time with a lead time pretty much of my choice. The Power Flow System guys seem to cater to guys like me. Private owners that still maintain older helicopters to current standards and fly for the pure fun of it!

I, as do many others, own an R22 that meets the criteria for the installation of an FAA approved tuned exhaust. Basically, a Robby with a 320 cubic inch engine and the correct part number oil cooler in use and you are ready to order! Don’t forget to let the PFS guys know if your ship is equipped with cabin heat. Well, you won’t forget, because they will ask you! I chose to order over the phone instead of by online ordering.

Once the original equipment exhaust system is removed, it is now noticed how ancient in appearance it is compared to the Power Flow System, even during the initial inventory of the new system once it is pulled out of the box.

Being noted as a major airframe change in the instructions, the installation process is still quite easy for the level of experience of a certified technician. Actually, because there are very little, if any, bolt on performance gain accessories that can be performed to R22’s, it’s actually somewhat fun in a gearhead kinda way. Other than the slight confusion in the details, or lack of details, for installing the neoprene strap which is basically flexible hanger for the muffler, reading the installation instructions was of low difficulty. Maybe actual photos of the particular part being installed versus a drawing could be helpful, but that is being very nit picky. One last nit pick would be the part number decals that were inside each of the header tubes. Don’t forget to get those things out! Other than that, all the alignment marks were spot on and the finished job makes the helicopter look quite different. Aesthetically, the new system makes the obviously old design of the R22 look…well, cooler! A claimed performance gain and a more modern appearance, I’ll take that! The installed system is quite striking. The fit and finish is of high quality.

With the new placards on, logbooks updated and weight and balance recalculated, the helicopter was ready for a test flight.

I live in the deep south, where it gets very hot and very humid. So, the allure for me to operate at Beta II limits is very high. In addition to the performance gain, the R22 I own is configured as an HP, which operates at a 1300 pound gross weight compared to the typical 1370 lb. gross weight of the Alpha, Beta and Beta II’s. Additionally, the ship is not equipped with the optional Aux Tank. The claimed performance gain for my specific application at my specific area of operation should be quite noticeable. It is normally equipped with the O320-B2C.

Upon initial engine start, during that first few seconds where before the sound of the blades drown out the sound of the sound of the engine, there is a definite change in the exhaust note from the cabin. It’s

deeper, it's throatier, yet, not at a higher decibel level that is either annoying or more than stock. It sounds…well, cooler!

During run up, noticed are the installed Beta II manifold pressure limits and MAP limits, which were supplied with the new system. I guess we're operating as a Beta II! Once 80% is achieved, the governor takes over and RPM's seem to "jump" to the top of the green. Very unlike the stock 320. Very much like a Beta II would react, as memory would serve.

Raising collective to bring the helicopter to a hover, I am light on the skids at nineteen inches of mercury and flying from one inch off the ground at just about twenty inches of mercury or less. I am trying to keep in mind that I am light with about a half tank of fuel, no passenger and I weigh about 150 pounds. The weather for the day, mild temps with humidity in the low eighties. I hover for about seven minutes with the manifold pressure predominately around twenty inches of mercury with the occasional dip towards nineteen inches of mercury as the wind at field elevation is a light gust. I set down the helicopter and shut down in order for a check of the maintenance performed to be completed.

The next flight would be with the main tank about three quarter's full and with a passenger weighing in at 160 pounds. Upon picking the helicopter up and maintaining a hover, with the same weather conditions, the manifold pressure gauge reads 23 inches of mercury. Moving to runway 18 at 2R4 for a normal takeoff, 23 inches of mercury is noticed with the occasional dip towards 22. At this time, I have a big grin on my face as I normally would easily notice one inch more of mercury if not more. For the HP manifold pressure gauge that would put me right on red line. Typically, flying and HP, I have tighter planning parameters for the right weather conditions, look for a lighter than most average people, passenger, all the time, in comparison to the Beta II or even a Beta for that matter, since the operating manifold pressure Red Line location is higher.

Wait a minute, the manifold pressure gauge I installed has the same Red Line location I had before, which is at 24.1. A Beta would have a higher Red Line location, which is at 25.2. the difference I notice is that, due to the increased efficiency of the exhaust, the engine is operating much less than the maximum output and I am noticing this effect not only "seat of the pants" wise but also at the manifold pressure gauge. This helicopter truly is performing as a Beta II.

Once I check for traffic, I take the active 18 and begin my normal takeoff. At 45 knots, I pitch it up, power it up and trim it up. Duplicating the same climb out I would perform, using the same airspeed for climb out and at the same rate of climb that I would normally perform, manifold pressure is now about two inches of mercury less. Once straight and level I notice about 20 inches of mercury pulled, very similar to a Beta II. Not at all like an HP.

During my approach I am operating below eighteen inches of mercury with full carb heat. No noticeable difference in this procedure. But, adding collective coming to a hover, the manifold pressure gauge reads between one and half to two inches of mercury less compared to what I would normally experience.

The next flight, a solo, with the new Power Flow System will again provide more support to the “Beta II in a box” claim. Two to almost three inches of mercury less during all phases of flight were noticed! Straight and level flight, solo, the manifold pressure gauge was close to nineteen with the occasional dip towards eighteen inches of mercury. This was never experienced before in this helicopter! This is at 70 KIAS. It’s….well, cool!

Overall, the Power Flow System was exactly what I was looking for. Increase safety through increased performance. Modernizing what would be considered aging, performance wise and increasing the aesthetic overall mechanical appearance, which in turn, in my opinion, increases value.

I recommend one accessory with the addition of the Power Flow Exhaust system. Due to the up swept, wide mouth muffler I added a remove before flight item: An exhaust plug. During storage, even while in the hanger, peace of mind that no dirt, bugs (we have a huge spider problem at this airport, huge meaning both numerous and in size) or potential FOD, through the introduction of an exhaust plug, seemed within reason, as the muffler seemed to be somewhat of a spittoon of some kind, in appearance. It looked like it was begging for things to be thrown into it. I robbed one off my dirt bike and it fit perfectly. I just attached a remove before flight flag on it. I later found that there are muffler plugs sold already with remove before flight flags already attached. One should be at my doorstep today!

Scheduled, is normal flight activity. Cross country trips to local airports in the region. Through these flights, I am hoping to confirm the lower fuel burn claims. But, I don’t see why this claim would not be supported. I am hoping to conduct my cross country impressions of the exhaust system and a long term impression in the next few days.

I performed my tests using consistent numbers to compare that are familiar to me. Numbers such as maintaining a 70 KIAS straight and level flight and noticing the manifold pressure gauge reading, versus maintaining a manifold pressure reading that would normally be experience at 70 KIAS and noticing the change in KIAS. This manner of validation supported the claims that Power Flow Systems made, but in a way that made sense to me as a private owner/operator that flies helicopters as an enthusiast and hobby.

In my honest opinion, for my particular application, the cost is justified. Additionally, the replacement time is on condition and replacement parts, such as the tailpipe insert, or baffle, are available so that performance can be restored.

Finally, I am in no way affiliated with Power Flow Systems and this impression is purely voluntary. I do give permission to Power Flow Systems to use the information and pictures in a way that is of positive influence to others with R22’s or with Power Flow Systems in general. I believe product delivers what it claims to.

To Darren and everyone at Power Flow Systems, thanks for making available, to guys like me, serial number 003 which is the awesome performance exhaust system made specifically for my helicopter. I

plan on purchasing a second Power Flow System for my other R22 which is Beta and is currently undergoing a twelve year inspection.

Thanks again!!

Frankie Lapina