

RANS S-21 Progress Report

27

Flight Testing Continues with Two Titan-Powered S-21's

With two S-21's both nearly identical, with the exception of the main wheel size, we have been able to get some solid performance data. The numbers we predicted are on target and consistent between the two planes. As stated, the major difference is the wheels size. On N615RD we installed 26" Bushwheels, and they do take a bit more power to push. We are still seeing true airspeeds above 150 MPH with 145 IAS between 6000 and 7000 feet. Economy cruise is just plain fun, running 6.2 GPH and 125 MPH. That is a pinch over the Rotax powered plane and several MPH faster. Speeds of 145 MPH to 150 MPH run 9 plus GPH. Climb rates are strong, at 1800 gross, with 1100 FPM average from 2000 to 12,500.



The prop settings are a half-degree apart, so WOT on N615RD with the 26" wheels Outbound is only 2450 RPM. We will set it back a half-degree and expect even shorter take offs and greater climbs. Cruise will be impacted, and so will GPH, but the bottom line is it will be a fast plane even with the big rubber down under.

Aerobatic testing has shown a very decent roll rates (90 to 100 degrees/second) with entry speeds around 135 IAS, same for loops. Spin recovery is well within $\frac{1}{4}$ to $\frac{1}{2}$ turns. Like all of our planes a hint of relaxed yaw and pitch input usually slows or stops rotation. Deep spin testing (beyond 3 turns) has not been conducted, that may come later in the spring, along with some other interesting flight testing.

Stalls between the two planes are dead on the numbers, break occurs between 38 and 40 MPH IAS. Both have AOA's and work very well to shorten approach speeds (55 to 65MPH) and landing roll out. You can approach under 50 MPH IAS to the tune of the AOA.

The stick pressure in roll is a bit heavier over the Rotax powered plane, and that was expected due to the greater pendulum stability from the heavier engine. The handling is just plain fun and feels very natural.

Empty weights are 940 (low optioned and with out the bushwheels) and fully decked out 1035.

With the 22" Tundra tires the single calipers are adequate and with the low landing speeds you would not need more, unless you want to access critically short strips. The 26" Bushwheels do require a second set of calipers to take full advantage of the STOL end of things.

Both planes were easy to rig hands and feet off ball-centered flight. We cranked in more negative tail incidence in N615RD and are exploring the subtle differences.

Over all I am very pleased with the sameness between the planes, and the Garmin systems. The calibrated airspeeds are within 3 MPH at medium cruise speeds, well within certification limits.

The plan is to have both Titan powered planes at Sun and Fun, plus our Rotax powered prototype set up with the trike gear.

Titan Install Kit and Tech

Now that we have proven the firewall forward package, we are building Titan install kits and getting together the tech. We plan an install video on the next Titan build.



Assembly Alert on Doors

During the flight-testing we do some pretty lousy flying on purpose. Like full throttle climb outs with sideslips; yeah I know, who does that? Well someone will, and it stresses the lexan in the doors. To make sure your windows stay put we are adding 3M VHB to the kits. This is used to bond the lexan more securely to the doorframe. Make up shipments will be happening. VHB stands for Very High Bond. It is double-sided adhesive foam strip. Test bonds show it to be impressive. The brave may be tempted to bond a whole plane together. We like it because it is easy to use and provides light, lasting, and simple bonding in tricky places.

If you have already assembled your doors, it is a simple matter of drilling out the rivets on the mating extrusion, apply the VHB, and re-install. It is highly recommended to add the VHB, otherwise a window panel could separate at the mating seam.

Windshield Skylight

We have successfully flight tested the new install, and will be moving as fast as possible to get the new parts, and tech to everyone. Thanks for bearing with us on this unexpected twist in the plot.

Stay tuned, Sun-n-Fun report will be coming soon...RJS

