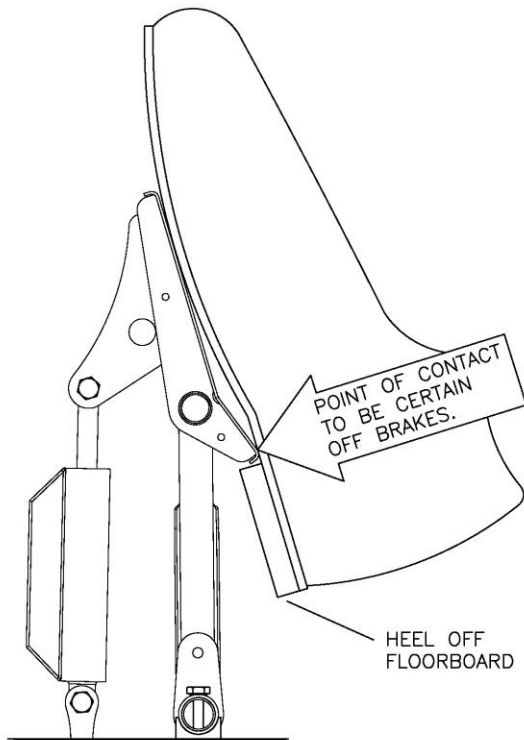


Outbound Progress Report 31

Rudder Pedal Design

I have noticed when giving demos many like to place their heels on the floorboard while operating the rudder pedals. This is totally fine in flight but can be an issue during take-off and landing. The pedal design is not a simple flat surface; instead there are upper and lower surfaces. The lower section angles out to allow the operators foot to move the rudder without brake operation. Just before takeoff or landing the proper method is to move your foot so the aft part of your arch is on the lower ridge. Check out the illustration below.



To properly apply steering without braking rest the front edge of your heel or aft arch on the lower edge of the rudder pedal. This assures no braking is applied until intended. CAUTION: Unintentional braking may cause directional control loss on take-off or landing. The heels of your feet should be off of the floor.

MD2267
REV. - ORIG

RANS S-21 OUTBOUND
STEERING / BRAKING DETAIL

Another neat feature of our rudder pedal system is fore and aft adjustment. The rudder cables have a tang with three holes to allow different tilt settings to move the pedals either forward or aft, offering more or less legroom.

The Advantages of Aluminum Leaf Spring Type Landing Gear Over Shock Strut Landing Gear

There has been some inquiry into if we will ever offer a suspension landing gear featuring shock struts for the S-21. It is wise to never say never....however, we have been very pleased with the stock landing gear for a number of reasons. The S-21 provides good STOL performance and with a set of Alaska Bushwheels it is about as optimum as needed for most back country ops. This is well supported by the number of other planes using similar landing gear designs.

1. Less drag: This can be substantial. As much as 12 MPH has been reported by customers switching out our factory gear for bungee type gear on the S-7S. A similar speed loss would be apparent on the S-21, and with its higher cruising speed the loss could be as much as 16 MPH.
2. Better ground handling in high winds. This is especially important when the terrain is not particularly level. If you have been to our factory in Hays, Kansas and taken a demo, you may have experienced our wandering taxi way. The taxi way runs up hill to the runway. Part of the taxi strip crosses a dam which is effective at channeling the wind under the wings. Many times I have been thankful for the stiffness in the landing gear as the southerly Kansas winds, which can be considerable, have tried lifting a wing.
3. Lower cost to replace. A single piece of heat treated metal is by far lower in cost over an assembly of shocks, bolts, and struts.
4. No chance of leaking shocks.
5. Can still get you home if bent. This is true and I happen to know firsthand, but that is a story for face-to-face hangar flying.



Performance and Prop Settings

It is always fun to experiment with prop settings. The ground adjustable Whirl Wind we provide in the Titan 340 install kit affords an easy opportunity to try different pitch settings. Your ultimate setting will depend on your average density altitude and if you want more STOL or more cruise. We have found a little does a lot. A half or even a quarter of a degree will provide considerable changes in takeoff RPM and cruise. Keep it safe when experimenting with prop settings by staging the tests at an airport with plenty of runway as this affords the option of aborting a takeoff. Watch your engine temps as changing pitch can impact cooling.

Tundra Trike Option:

Continued flight test with the Tundra Trike option shows about a 5 MPH impact on TAS, a slight drop in rate of climb (50' maybe) and a whole lot of fun to take off and land. The nose gear strut does an excellent job of absorbing shock and with dual caliper brakes, steering response is crisp. At around 25 to 30 MPH air rudder is strong enough to drop braking, depending on the crosswind component.



Where you dare to go with this configuration is up to your skill level and budget, and no doubt you will see this trike be a popular option for the level most people are willing to go off-field. The bottom line is the Tundra Trike is a very capable plane that may surprise more than a few tailwheel pilots.

Rib Press Impact

Our effort to improve the process and speed up production is always underway. A few months ago we purchased another press to be used on ribs. This reduced rib making by a third of the previous press time. It is a small impact on the overall time to produce a full kit but, it all adds up. Another CNC mill will be installed in a couple of weeks. This new mill is faster, has a larger bed and a bigger tool carousel. It also will help to reduce part fabrication times and ultimately lead time. Along with the rib press and the mill we have added some great people to our staff. We have the good fortune of hiring quality minded people with a strong work ethic. Our crew is gaining on the lead times but, we won't be bragging on the actual reduction in delivery until it becomes more apparent. But, like the small contribution the new rib press and mill are making, these efforts will pay off. Thank you for the orders and patience.



ROTAX 915

Test flights continue with the 915 powered S-21. Proper cooling with a wide margin to handle moderate to extreme OAT's has been the bulk of the challenge. The process has been slowed due to having to re-shape the cowling and several different cooling elements being placed in various places under the cowling in the hopes of avoiding a re-tooling of the cowling. It is now mandatory to modify the external shape of the cowling to provide the proper cooling for the trike version. This is due to the nose gear strut interfering with placement of radiators and oil coolers. This will not be a dramatic style change, just re-locating the front inlet to allow both rads to be up front.

Performance is exciting: Takeoffs are short, initial rates of climb are well past 1200 FPM, TAS is 145 MPH at 8500, and this is with little experimenting with prop pitch. There may be more MPH to come. The test plane is set up with the Tundra Fork and 22" tundra mains. That has shown to chop off 5 MPH cruise on our prototype. We are expecting to see 150 MPH TAS.

Stay tuned, RJS

