



“Serving to Serve Again”

### **New C182 310 HP Conversion**

Jack Johnson – Texas Skyways, Inc. – It probably started off basically at the request of customers. They wanted a better, more powerful engine in order to have a shorter take off distance, better climb and better cruise. We had customers coming to us that had (Lycoming) engines in their 182 S & T models. The Lycoming engine has an AD note on the crankshaft and they knew that by a certain time they’re gonna have to replace the crankshaft which means basically a major overhaul. They asked us if we could put in a continental engine of greater horsepower. They know our background of increased horsepower, our background of building engine mounts that we have in the early model airplanes. We talked to some other aircraft companies about the project, they seemed to think it was good, we talked to Teledyne Continental, they were very much in favor of it because they sell engines and especially if they can replace a Lycoming engine. So we got a Cessna 182S and put in the 310 horse engine.

1998 Cessna 182 S

Engine: Continental IO-550-N- Fuel injected – Tuned Top Induction  
310 HP @ 2700 RPM

Propeller: Hartzell Three Blade “Buccaneer” – Blade Diameter 82”

Gross Weight: 3100 LB

Performance Based on Initial Flight Tests

Top Speed: 179 KTAS 206 MPH

Take Off Distance Ground Roll: 400’

Rate of Climb: 1800 FPM

Fuel Consumption at 8500’: 15 GPH

Jack: Tom, this is your new engine that came in.

Tom: Well I had this phone call from Mickey and she says that the engine was in so I’m anxious to get over here and see it and I’d like to unwrap it.

Jack: Okay, Let you unwrap it okay

Tom: Okay

Jack: Tom is the gentleman that’s been flying the slow airplane for us while we’ve been flying the airplane with another 550 engine

Tom: So if I can get Kevin to install this in my airplane I won’t have to put up with you passing me everyday

Jack: (laughing) that’s right, that’s right



“Serving to Serve Again”

Kevin Miller – Texas Skyways, Inc. – The reason we decided to put this particular engine in here was the airplane in our opinion was vastly underpowered. The Lycoming IO-540 engine basically is a 230 Horse engine at this point. By putting the IO-550 Continental engine in here, we only gained ten cubic inches but in actuality probably gained 70 horsepower. And in conjunction with the Hartzell three-blade prop we gained a great amount of speed as well as climb.

This is the Lycoming IO-540 engine that we’ve taken out of the 182S model. We replaced it with the Continental 310 horse IO-550 engine. Basic differences are the intake system on this one is on the bottom as well as the fuel inlets and on the Continental the tuned intake system is on the top allowing cooler air to get into the engine thus creating more horsepower.

Jack: and this is the top induction, the air comes in from the top. The air on the top of the engine is cooler because the cool air comes in from the front of the cowling comes up here so it keeps your induction air cooler which gives you more horsepower than if the induction air was hot.

Tom: Jack can you tell me something about the differential in weight in this engine versus my current engine?

Jack: This engine weighs about 40 pounds more than your current engine however we’ve set the engine back towards the firewall seven and a half inches. This engine sits to the rear seven and a half inches which of course reduces the engine overhang load that’s on the firewall. The center of gravity will move forward just a little bit, maybe three quarter of an inch.

Kevin: This is the Continental IO-550 top induction engine because you notice the induction tubes are on the top giving us cool air going into the engine and thus creating a little more horsepower.

Jack: When we first started off with this one of the big things that we had to do was to create an engine mount, if you see this is the mount here and Kevin tell us about that engine mount.

Kevin: we had the mount engineered and manufactured for us at this point and it was the major component in making everything of this project come together. This particular engine mount was created and made with larger diameter tubing and thicker wall tubing as well.

Jack: What’s this about a six point isolation system?



“Serving to Serve Again”

Kevin: Yes, this mount has a six point vibration isolation system on it to help us reduce vibration from the engine and propeller itself, it gives us a much smoother flight, smoother ride.

Jack: Why's this engine sitting so much further back from the propeller, it seems that there's quite a bit of difference between the engine and the propeller, what's that?

Kevin: what we attempted to do when installing the engine with the new mount was actually move the engine back towards the firewall to create less overhang weight as the engine sits on the firewall, we use a propeller with an extended hub on it to be able to do this.

Jack: I see there's a little difference in the oil check door up here, what's the deal on the oil check door?

Kevin: We had to actually increase the size of the door to facilitate getting in and actually being able to check your oil easily just because of the positioning of the Continental dipstick itself

Jack: Kevin, you told us some interesting things about the Lycoming engine you took out, the Continental engine you put in so let's put the cowling on, button the thing up and let's go fly, I think we've got some interesting flying to do.

Kevin: very good.

1998 Cessna 182 S

Engine: IO-550-N

310 HP @ 2700 RPM

2002 Cessna 182 T

Engine: IO-540

230 HP @ 2700 RPM

Jack: Even I was impressed, I've been flying this airplane for several months now and I know that it is fast we've seen speeds in excess of 200 miles an hour straight level but I had no idea how much difference it would be between the airplane with the 310 horse engine and Tom's airplane with the 230 horse engine. I knew it would be great, but I didn't know it would be this great. We lined up side by side on the runway and started off of course with the bare acceleration of the 310 horse engine, I never saw Tom, I was out ahead of him from the time we released the breaks and it was just gone, I think that's gonna show up in the film some. But I was impressed with how fast we could leave Tom.



“Serving to Serve Again”

Then we did some flybys in the air and it was impressive to see just how fast, how much more speed this Airplane has than the standard 182.

Another thing very impressive about it is we passed Tom, with Tom going straight and level, we passed Tom in a climb and so it would out accelerate, out climb, out cruise Tom in every way that we tried. Airplane's just fantastic in performance plus with this big heavy engine mount that Kevin told us about the airplane is extremely smooth, very smooth and also very quiet. When you're riding in an airplane, if you think about it, you're riding inside an aluminum drum and any vibration that you have is gonna make that drum sound off and this airplane is very smooth and very quiet. We've had several people talk about how quiet it really is. The way we compare the airplanes is Tom is running full power in his airplane, I was running full power in this airplane when we'd run pass Tom, we'd have to slow down and let Tom catch up and go back and do it again. But the pictures that you see both airplanes are running at full power, all we can do with both airplanes.

This propeller is one of we hope to be many choices of propellers. We have on order from Hartzell a composite propeller we want to get that STC for it. From what we are told from Hartzell and other people the aluminum propeller is better performing. But we do want to get a composite propeller approved for this for those who want composite propellers; the composite of course is a little bit lighter. We went for the performance also the price of this propeller is several thousand dollars less than the Hartzell composite prop. This prop is what we call the Hartzell Buccaneer propeller, some people call this propeller the Scimitar, it no way resembles the original Hartzell Scimitar propeller that was a propeller that had a lot of vibration with it. This propeller is extremely smooth, fast and reasonably quiet.

Kevin: Well the airplane is definitely quicker, it has a quicker, faster take off roll and definitely better climb mile? We have to feel that most of that is due to the heavy duty Texas Skyways mount that we put on there. The six point mount system greatly reduces vibration in the aircraft and it flies very smoothly. This particular engine has a great reputation; it is also used in Bonanzas and Cyrus aircraft. The combination of installing this particular engine with the 182 airframe is cheaper than buying a Cyrus or Bonanza and it's almost as fast.

Continental IO-550-N  
Fuel Injected  
Tuned Top Induction  
310 HP @ 2700 RPM  
Top Speed 179 KTAS 206 MPH