

J.L. Osborne's TipTank Install N101DH Gets Longer Legs (July 2010)

Dr. Eric W. Kaderbek, MAJ, USAF, MC, MD and
Dr. Laura P. Cebe, MAJ, USAF, MC, MD (wife and real owner),
ICS #16458



The fuel line run on one of the wings

N101DH, my wife's 1960 PA24-250, has performed flawlessly since my last article for the *Comanche Flyer* in May 2008. I have stuck to my plans of visiting friends and family about the Southeast. Since the installation of the GNS 480 WAAS capable GPS, and the approaches it affords, we have been almost unrestricted in our travels. One limitation became clear however. When visiting my father in Butler, Ga. and landing at Butler's municipal airport (6A1), we had no convenient way to refuel for a trip back to Eglin Air Force Base in Florida.

This doesn't pose too much of a problem when VFR. When it is "hard IFR" coming back into Eglin, and with the potential to divert, it became clear that we needed a little extra time in the tanks.

We had been using an airport about 20 miles north of 6A1, KOPN (Thomaston-Upson County) for refuelling prior to our trips back home (there is no avgas available at 6A1) when there was the slightest



possibility of a diversion. That all changed last October with the installation of the J.L. Osborne tip tanks on the Comanche. We wanted to share that installation with the members of the Society in case any other members may be considering the modification, or if others are just interested in how the modification is accomplished on a 250.



The fuel gauge on the panel

Ordering the tip tanks from J.L. Osborne was a bit of a chore. The company wanted a check prior to shipment according to Emerald Coast Aviation (KCEW), and they did not want to ship the tanks until the check cleared. Also, J.L. Osborne would not ship the tanks late in the week which I found odd.

When queried, they stated they had had some problems with the tip tanks being damaged at storage warehouses over the weekend. We would figure that insurance would cover their potential loss, but that was their policy. If you are going to do this modification, plan on a Monday to order their tanks.

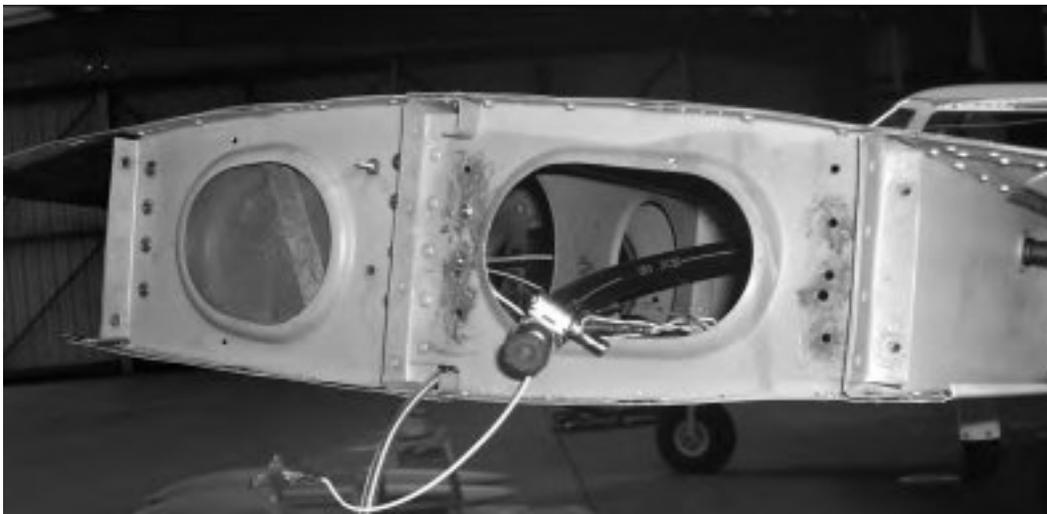
KCEW or Crestview Bob Sikes airport here in the Florida panhandle was the closest place we could find to do the modification. Brad Hall at Emerald Coast Aviation was the A&P mechanic I turned to for this project. He wanted to get the annual done and the tip tanks installed at the same time. Brad was willing to accommodate a set price up front. The tip tanks are not cheap, \$9,850 complete (the negotiated price), but the peace of mind and fuel reserve has already paid big dividends. Our Comanche came "stock" with 30 gallons per side; a total of 56 gallons useable.



The tip tank laid up on one of the wings

The J.L. Osborne tips added 15 gallons per side. Interestingly, the flight manual supplement does not address “useable” fuel in the tips. When researching this modification, it was nice to see that after the mod it increased the gross weight to 3,000 pounds. This modification basically gave us extra fuel without penalizing us significantly on gross weight. The weight and balance prior to installation revealed a useful load of 1,165.21 pounds, and after the modification read 1,341.21 pounds. The tip tanks themselves added 24 pounds. By my calculations, after the mod we could load, with full fuel (now 90 gallons), 801 pounds.

Prior to the modification, with 60 gallons, we could load 805 pounds. VA with the tip tank modification was reduced to 129 mph. Other limitations include using the tip tanks only in straight and level flight since they are gravity fed we suppose. No other airspeed changes are given in the flight manual supplement. We question whether the Comanche is going to stall, fully loaded and clean, at 71 mph or some higher airspeed ($V_a = V_{sn \text{ limit}}$) with a decreased VA.



Where the tip tank and fuel line connect

The Installation

The installation manual from J.L. Osborne is 11 pages front to back. It would be difficult to describe all the procedures involved in the install, but we wanted to let those interested know of the basic procedure. Obviously fuel is drained from the main tanks. Then the ailerons and flaps are removed from the aircraft. The removal of these structures gives access to the very forward areas under the ailerons and flaps to install the fuel line that runs from the tips into the cockpit. The line runs under the forward edge of the ailerons and flaps along the majority of the aft wing until it runs forward into the main cabin just aft of the spar. Holes are drilled into the spar and doublers are installed. Once inside the cabin, the line runs forward through holes in the spar towards the existing fuel valve area. The fuel valve is replaced by two valves; one for each side. The wing tips are removed, and the new tip tanks accommodate most existing nav lights and strobes. On our aircraft the strobe power supplies had to be removed and repositioned inside the wing mounted on the back side of the first rib.

Stiffeners are attached to the now exposed wing tip structure to support the additional weight. In the cabin, two new fuel valves (one for the right, and one for the left) are installed with the positions being "Off", "Main" and "Tip". The mod comes with a new tip tank fuel quantity indicator that is mounted into the panel. There is a small switch positioned next to the indicator to allow you to select which tank's fuel quantity is to be displayed.

Interestingly, there is a modification to the install for 1962 Comanches that routes the fuel line run in the wing instead of outside the wing under the flap well and ailerons.

After the Modification

Since the modification, we have made several trips without any problems. We have inadvertently flight tested the half-full tip tanks in a couple of 500-700 FPM descents without the need to run any Emergency Procedure checklists for fuel starvation (thankfully).

We have even had the opportunity to land the Comanche on the tips without incident. We have since modified my checklist to comply with the old adage "On the mains, fuel in the mains, boost pump on". The point being that even with a simple modification such as this installation that changes the routine for descent and landing, one must be continuously vigilant about their operation.

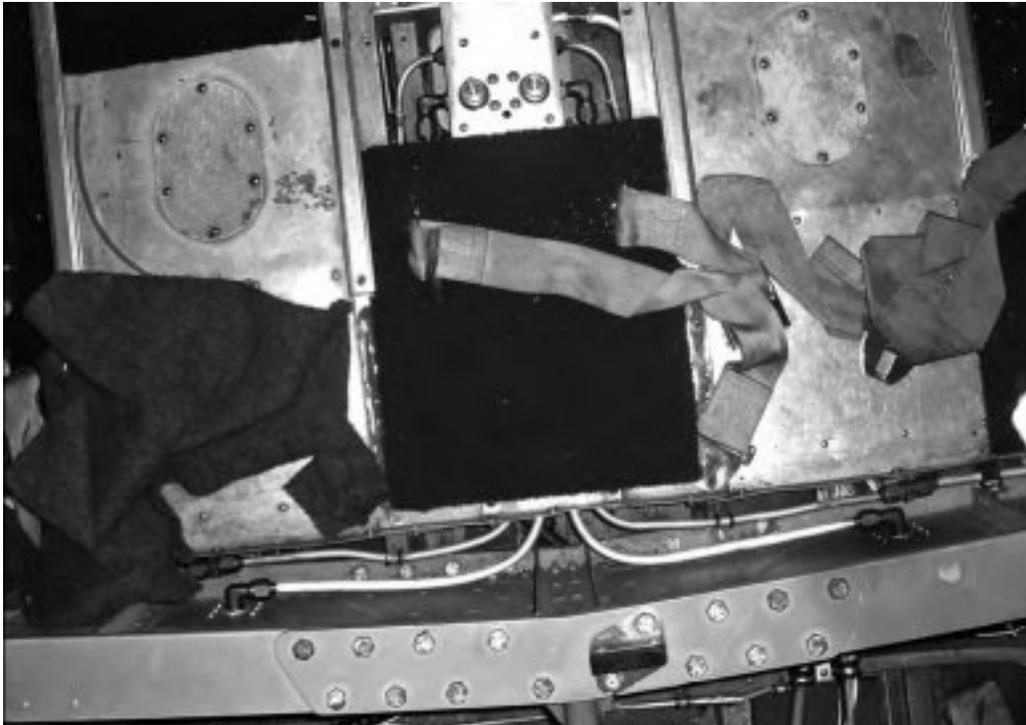
Improving on perfection is hard to do. However, this modification does just that. It is nice to know that the Comanche can now easily outlast our bladders or need for a good leg stretch.

For those in the Southeast interested in this modification, we highly recommend the use of Emerald Coast Aviation (www.emeraldcoastaviation.com).

Their blend of attention to detail and professionalism is unsurpassed here in the Southeast. If anyone has any questions, we can be reached at kaderbekew@gmail.com



The forward view of the tip tank



Inside the cabin where the fuel line runs to valves