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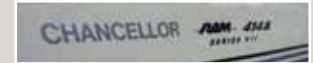
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WHAT DOES IT COST TO OWN A 414?

by Bob Thomason, TTCF Editor



In some ways, the Cessna 414 is the most prized of all the cabin class Twin Cessnas. No doubt 421 owners would disagree, but many people prefer the direct drive engines on the 414 over their geared counterparts on the 421. Moreover, 414s were made in smaller numbers than either 421s or 340s. There are fewer than 1,000 on the U.S. registry today. This desirability and relative scarcity is reflected in high purchase prices.

But purchase prices are only one part of the ownership equation. We recently surveyed our members who own 414s regarding their operating costs. This third installment of our recent survey results details the cost breakdown.

For those who missed the survey details in the last magazine, we provide them again here. We had an excellent response of well over 250 members, all of whom answered the following questions:

1. What year and model Twin Cessna do you own or operate?
2. How many years have you owned your Twin Cessna?
3. How many hours per year do you typically fly your Twin Cessna? (Not including flight time for other airplanes.)
4. Do you typically run your engines lean-of-peak (LOP) or rich-of-peak (ROP) in cruise flight?
5. What is the typical fuel burn of your Twin Cessna in GPH during cruise flight?
6. Do you perform any of your own maintenance? If yes, what percentage?
7. What is the cost of an Annual Inspection on your airplane in an average year? (Not including upgrades.)
8. Not counting the Annual Inspection or upgrades, how much do you spend on additional maintenance in a typical year (engine, airframe, and avionics)?
9. How much is your annual insurance premium?
10. How much is your monthly hangar rent or tie-down fee?
11. Did you spend a significant amount on aircraft upgrades in the past

year?

12. Is there anything else you want to tell us about the ownership costs of your Twin Cessna?

In this survey, we looked at two main variables that impact operating costs: 1) How owners operate their airplane and 2) How they maintain it. Running lean-of-peak (LOP) vs. rich-of-peak (ROP) can lower fuel burn per hour by as much as 20 percent. Additionally, most of our survey respondents perform at least some of their own maintenance.

Although we note in the chart below what percentage of respondents run LOP and what percent do some of their own maintenance, the fuel burns and maintenance costs reported are an average of all responses. Of course fuel costs will be less for those who run LOP, and maintenance costs will be less for those who do some of their own maintenance. Keep this in mind as you apply the results to your own situation. Here are the key findings that you can apply to the average numbers in the summary table:

Notes on Fuel Burn

- 13% of 414 owners report running their engines LOP - up from 9% in 2015. The rest run ROP.
- As a result, average cruise fuel burn dropped from 37.0 GPH in 2015 to 35.9 GPH this year.
- Those running ROP often cited engine operation instructions provide by RAM as the reason.

Notes on Maintenance

Forty percent of respondents report doing at least some of their own maintenance. The average amount of maintenance performed was 64%. These numbers are up from 15% and 52% respectively in 2015. Keep in mind this group includes owners who are A&Ps and do almost all of their maintenance, as well as owners who only do occasional oil changes.

Since the maintenance costs in the Summary Table are an average of these two groups, the costs for those

(continued on page 14)

Cessna 414 Operating Costs					
Survey Data:		Cost to Fly 100 Hrs per Year	Not including taxes, training, or financing costs	Total Cost per Hour w/o OH Reserves	
					\$552
		Variable Costs:		Typical Engine & Prop OH Cost	\$60,306
Hrs/Year	101	Fuel:	\$17,663	TBO	1600
Fuel Burn (GPH) **	35.9	Non-Annual Maintenance	\$7,625	OH Cost Per Hour for both Engines	\$75
Annual Inspection Cost	\$13,950	Total Variable Costs:	\$25,288		
% Who Do Own Maintenance / % Performed	40% / 64%	Fixed Costs:		Total Cost to Fly 100 Hrs/Yr Including Overhaul Reserves	\$62,769
% Who Run LOP	13%	Annual Inspection	\$13,950		
Maintenance Cost Other than Annual	\$7,625	Insurance	\$7,665	Total Cost per Hour including OH Reserves	\$628
Annual Insurance Premium	\$7,665	Hangar/Tie Down	\$8,328		
Monthly Hangar or Tiedown Fee	\$694	Total Fixed Costs	\$29,943		
** Includes both LOP and ROP operations.		Total Cost to Fly 100 Hrs. w/o OH Reserves	\$55,231		
NOTE: Taxes, training costs and financing costs are not included.					
Does not include compliance costs for AD 2005-12-13 (wing spar strap) which applies to some 414As.					



Expect to pay more for hangar space if you own a 414, particularly a 414A which has a wingspan 4.5 feet longer than the straight 414 shown here. A standard 40-foot wide T-hangar will be too small.

owners who don't do any of their own maintenance are likely to be higher than shown, and vice versa for those who do a lot of their own maintenance.

And remember, even if you do all your own maintenance you should take your airplane to a Twin Cessna specialist periodically. This is especially true of an airplane as complex as a 414.

Finally, there are significant operating costs we chose not to include in the survey. Among them are taxes, training, and financing costs. Taxes vary considerably according to location, and the other costs are easily obtainable with a little research.

We do provide our own estimates of prop and overhaul reserves in the accompanying chart. They are based on actual quotes, including removal and installation, from a respected specialty engine overhauler.

Survey Results

We had a good response from 414 owners. About half were 414A owners (1978 and on). This is down from 70% in 2015, which means more tip-tanked owners responded this time. While



414As like this one are subject to a wing spar AD (2005-12-13). Compliance times vary by serial #. See the article on page 16.

the 414As may be more desirable and command higher prices, prospective buyers are discovering that the straight 414s represent one of the best bargains among the cabin-class Twin Cessnas.

Notes:

In the "Cost to Fly 100 Hours per Year" section:

- An average cost per gallon of 100LL of \$4.92 is used vs. \$5.12 a gallon in 2015.
- An average monthly cost for hangar/tiedown of \$694 is used - up from \$607 in 2015.
- Engine and prop overhaul costs based on actual 2020 quotes for a pair of TSIO-520-NBs. They include removal and installation cost, and typical compliance cost for AD 2000-01-16 (exhaust).

Costs omitted include: taxes, training, financing costs, and extraordinary maintenance events.

Cutting to the chase, a 414 will cost you about \$552/hour without reserves and \$628/hour with overhaul reserves according to our survey. These numbers are roughly three percent higher than for the 340. This is due to higher insurance costs (due to higher hull values) and higher hangar fees (to accommodate the longer wings on the 414A). Fuel and maintenance costs are similar between the two models. Here are a few other observations about our 414 results:

- 414 owners fly about 101 hours per year - exactly the same as five years ago. Annual hours flown ranged from a low of 25 to a high of 175.
- Fuel burn is about 36 GPH, on average.
- 414 owners spend, on average, \$21,575 each year on maintenance (both Annual and non-Annual related maintenance). This is up slightly from the \$19,827 figure in 2015, even though more owners report doing some of their own maintenance.
- As mentioned above, insurance and hangar costs are also higher for a 414.

If you are considering purchasing a

414A, be aware that it is subject to AD 2005-12-13, which requires repetitive inspections and a wing spar strap kit to be installed. The cost of complying with this AD is not included in our survey. (See article on page 16.)

The numbers presented in this survey summary are averages. As all long-time aircraft owners know, from a financial standpoint there are good years, bad years and sometimes, very bad years. The first few years of aircraft ownership are often catch-up maintenance years, and costs are likely to be much higher than our survey numbers. Prepare to pay considerably more.

Additionally, the survey results do not reflect upgrades. In order to preserve the value of your aircraft, every so often it has to have paint and interior work. Also, these days it's getting difficult to sell an airplane without at least some glass in the panel. Additionally, avionics are advancing at such a rapid rate that panel upgrades are required with more and more frequency.

A 414 will cost you about \$510/hour without reserves and \$577/hour with overhaul reserves.

Finally, don't forget about inflation. Engine overhaul prices are rising faster than the general rate of inflation. Your overhaul may cost you 20 to 25% more in ten years. If you are accumulating funds in an overhaul account as many owners do, you'll need to factor this into account.

With these caveats, our survey data should be useful to anyone who wants to know the long-term cost of owning a 414.



If you use these numbers for cost estimates and do not plan to perform any of your own maintenance, adjust them upward accordingly.

BUYING YOUR FIRST TWIN CESSNA

by Bob Thomason, TTCF Editor

Every week here at TTCF, we get questions from owners of high performance singles who are thinking about moving up to a twin. Some have “twin fever” and have already made up their minds to upgrade. But most are very cautious and want to know everything possible before making the leap. My hat is off to the latter group, as moving up to a twin is something best done with a well-thought-out plan.

There are several different scenarios we hear:

Scenario 1: The most common is that the owner and his family have outgrown their current airplane - usually a high performance single like a Cirrus. They’ve had another child or the kids have grown larger and they now need a bigger airplane that can haul all the stuff they can fit into their SUV.

Scenario 2: The second scenario is that they have become concerned about flying in a single engine airplane over water, over inhospitable terrain or at night. The idea of a second engine appeals to them from a safety standpoint.

Scenario 3: The final one is they’ve been scanning Controller and Trade-A-Plane and see the prices of light twins and

think “wow, for what my Bonanza/Cirrus/210 is worth, I could buy one of these twins.” This is the scenario that concerns me.

Yes, you can buy the twin, but do you need it from a mission standpoint, and can you afford to maintain it?

(The phone calls I dread most are from Twin Cessna owners who have bought more airplane than they can afford. Consequently, they don’t fly it and the airplane begins to deteriorate as it sits in the corner of a hangar, or even outside.)

With these scenarios in mind, here is what we tell prospective twin owners to consider before they buy.

Consider Your Mission

Most pilots crave speed. If speed is all you want, stick with a single. Some of them are just as fast and do it at less cost. The fastest Twin Cessna is a 340 with a RAM VII conversion. RAM lists a cruise speed of 232 kts at 40.6 gph fuel consumption. The fastest production piston single is the Mooney Acclaim Type S. The Acclaim boasts a top speed of 242 kts with a more typical cruise of 230. But it does this at exactly half the fuel burn of a 340.

If all you want to do is fly yourself and your buddy a couple of hundred miles to play golf at a nice resort, maybe the Mooney or 210 or Bonanza is all you really need. It certainly will cost you a lot less. But if you’re flying two couples, four sets of golf clubs and a week’s worth of luggage, then a twin starts making much more sense.

What is your average flight length and what kind of terrain do you fly over? As a general rule, long trips with mountainous terrain favor turbocharging. Short trips over flatland don’t. There are exceptions, such as flight in icing conditions when the extra climb capability that comes with turbos can be a lifesaver.



If your wife says she doesn’t like flying because it’s too noisy and makes her ears pop, then congratulations, you’ve just received a free pass to start looking for a 340! If you have a family of 6 and like to travel, consider a 421 to use instead of the airlines.

Consider your mission and crunch the numbers. All airplane purchase decisions involve some element of emotion, but if you include data and facts in your decision-making process you’ll be much happier with your airplane in the long run.

Make a Commitment to Training

I won’t get into the single versus twin safety debate here except to say that without a commitment to training, any advantage conferred by a second engine is lost. In fact, a twin pilot that is not proficient in engine-out procedures is likely more at risk than a pilot of a single.

Making a commitment to annual recurrent training in a simulator (RTC, Flight Safety, SimCom) is best. But at minimum we recommend including simulator training as part of a new twin pilot’s initial training. It’s the only way to safely practice engine loss scenarios at low altitude. Then, at the very least, train annually with a competent multi-engine instructor.

There’s more. To internalize what you learn during training, you must use it in your regular flying. You must make a commitment to fly more “professionally.” Many singles can be flown by the seat of your pants, so to speak, since they have large margins of error built into their handling characteristics. Most twins do not. They need to be flown by the numbers. It’s



Moving up to a Twin Cessna should not be done on a whim or in a state of “Twin Fever.” Taking your time and doing your homework will lead to a happier ownership experience.

a more challenging type of flying, but it's more rewarding as well. You'll be rewarded by the better performance of a twin versus single, but more importantly, you'll have achieved a higher level of proficiency, competency, and safety.

Alternatively, without this commitment to training and professionalism, you might never be totally comfortable with flying a twin. You'll come to dread your BFRs and IPCs. The airplane may wind up sitting in the hangar, deteriorating, until you decide to sell it someday at a considerable loss. I've heard this story a number of times. Don't let it happen to you.

Go In With Your Eyes Wide Open Regarding Cost and Commit to Good Maintenance

First, check with your insurance agent. How much will it cost to insure your new twin? How much dual will the insurance company require before you can fly solo and will they require recurrent training?

Will your home field tiedown or hangar

fees increase if you upgrade to a twin? You'll certainly be paying twin rates at FBOs when you're out traveling. There may be higher fuel purchase requirements to waive ramp fees. These will be a small fraction of your overall costs, but they will be higher.

"The happiest airplane owners are the ones who "could have" bought the next aircraft up the ladder but didn't in order to afford top-notch maintenance and upgrades."

Now, let's talk about maintenance. Some owners are experts at maintaining an airplane at minimum cost. If something goes wrong, they don't just drop it off at the shop and say, 'fix it.' They find someone who can rebuild the part or they find a replacement part at a salvage yard. Downtime is much less important

to them than minimizing the cost of the repair. I really admire these people. They know their airplanes, sometimes better than their shops do.

Others want to minimize their downtime and are willing to pay for it. Plus, they don't have the time or inclination to source parts, etc.

Personally, I'm in the latter category. I bought my airplane to fly it and I want minimize my down time. I have parts shipped overnight. Whenever I've replaced an engine, I've always done an overhaul exchange in order to get it done quickly. To not be able to fly for days or weeks on end due to my airplane being down for maintenance would be more than I could bear! Needless to say, this type of maintenance is more expensive.

Based on the type of owner you are, consider the following steps:

Step 1: Take an honest look at your finances. What do you have to spend

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BUYING YOUR FIRST TWIN CESSNA

(continued from previous page)

now on the purchase of an airplane? What are you likely to have available on an annual basis for maintenance?

Step 2: Get accurate data on the projected purchase price and cost of ownership of the airplane you want. (TTCF can provide this information for Twin Cessnas).

Step 3: Prepare a conservative budget. We recommend the following:

- Plan on the initial annual costing up to 3 or even 4 times the cost of a “normal” annual. Even the world’s best pre-buy will not catch everything that needs to be done to the airplane. If you don’t get a pre-buy done by a shop that specializes in Twin Cessnas, all bets are off. We’ve seen situations where the cost of the first annual exceeded what the owner paid for the airplane.
- Always be financially prepared to replace an engine at any time.
- In my experience, the happiest airplane owners are the ones who could have bought the next aircraft up the ladder but didn’t in order to afford top-notch maintenance and upgrades. (For example, the 310 owner who could have afforded a 340, or the 421 owner who similarly could have bought a King Air 90, but then wouldn’t have had much of a cushion left over for maintenance.)
- Do not skimp on your maintenance budget, or you will be constantly stressed at best, and grounded at worst.

Make Sure You Buy the Right Airplane

You’ve considered your mission and you know the exact make and model that fits it. Of course, it’s a Twin Cessna! You’ve thought long and hard about the challenges of flying a more complex airplane and you are committed to getting proper training. You’ve prepared a conservative budget that doesn’t “stretch” you and has some cushion in it. Now you are ready to find an airplane and make an offer. I have good news for you, it’s a buyer’s market and good deals abound!

If I were shopping for a Twin Cessna today, here is how I’d go about it:

1. I’d **join the Twin Cessna Flyer** and start taking advantage of all the information on our website. I’d log onto the online member Forum and start asking big picture questions. What Twin Cessna model best fits my mission? What does it really cost to own a Twin Cessna?
2. I’d immediately **sign up for one of the TTCF Systems and Engine seminars**. This is the very best thing a prospective owner can do to prepare for Twin Cessna ownership. I attended one prior to purchasing my first Twin Cessna, a T310R in 1999, and it saved me at least thousands, and more likely tens of thousands of dollars. I got a great airplane at a fair price and was very happy with it for many years. There were no surprises and it performed reliably and as advertised.
3. I would also **call a shop that specializes in Twin Cessnas** like TAS Aviation, DFW Aeromechanix, or Tom’s Aircraft. I’d tell them which model aircraft I was looking for and see if any of the ones they maintain might be for sale. Buying an aircraft maintained by one of these shops or another Twin Cessna specialist would considerably reduce the risk of unexpected maintenance

surprises. Frankly, I’d pay a significant premium for one of these.

4. I’d **contact Jerry Temple** and see what he had in inventory. Unlike many other brokers, Jerry goes over the aircraft he represents with a fine-tooth-comb. No one in aircraft sales knows more about the Twin Cessnas market than Jerry. He has been working with these airplanes since they came off the assembly line in Wichita. His reputation for honesty is impeccable.
5. Once I found the aircraft I wanted, I’d **have the prebuy done by TAS Aviation, DFW Aeromechanix, Tom’s Aircraft, or another Twin Cessna specialist**. I would spare no expense here even if I had to fly one of their mechanics to the airplane. Money spent on a top-notch prebuy is the best investment you’ll make in your new twin.
6. I’d **buy the airplane** and have the time of my life flying it!

If you follow the above advice, you’ll love owning your Twin Cessna. Buying it will be some of the best money you’ve ever spend!





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The 414 first flew in 1968 and was certified in 1969. It was a derivative of the 421. Cessna wanted a more cost competitive cabin class aircraft and it was able to achieve this by utilizing parts from the existing 400 series models.

There are two broad categories of 414's: the early, tip-tanked 414's and the later model 414A Chancellor's which had wet wing fuel tanks and other modifications including hydraulically operated landing gear. This landing gear upgrade replaced the electro-mechanical gear in the original model. In addition, the longer nose section, vertical stabilizer and rudder of the 421 were added. The 414 not only lost the tip tanks, but 30 sq. feet of wing area was added. Maximum takeoff weight increased by 400 lbs. and useful load by about 200 lbs. From 1970 to 1977, 508 original 414's were produced. 739 414A's were produced from 1978 to 1985.

The original 414's were powered by TCM TSIO 520-J's, producing 310 HP. In 1976, the engine was changed to the "N" model and then to the "N" model in 1979. The switch to the NB model was a significant improvement in that this engine had a much improved crankshaft. The TBO was 1,400 hours on the J and N models but was boosted to 1,600 on the NB models.

RAM offers several desirable conversions that boost HP to 335 HP per side. At one time, a liquid-cooled TCM 550 option was offered. Some of these airplanes are still flying. RAM still supports them, but most are slowly being converted back to conventional engines as the liquid cooled engines don't offer any significant advantages.

Real world speeds depend on engine configuration, but owners typically report 200 kts at about 38 gph in the upper teens. 414's will typically haul 5 people plus bags and full fuel.

As with all Twin Cessna's, the landing gear and exhaust systems must be maintained properly. In addition, there is an AD (2005-12-13) on the 414 wing that requires a spar strap at 9,000 hours TT for aircraft with serial # 200 and lower. Serial numbers above 200 have a compliance time of 15,000 hours.



The Cessna 414 is truly one of the best values in the pressurized piston twin market today. Anyone looking to step up from an unpressurized twin or even a high performance single, should give the 414 a serious look.