

HOW'S YOUR TIRE CARE?

BY TONY BINGELIS

The saying goes, "out of sight, out of mind," and I guess that is quite applicable to the tires on our aircraft. If yours is a typical fixed gear homebuilt it will most likely be sporting a nifty set of close-fitting wheel pants that effectively hide most of the wheel and tire from your view.

For that matter, sometimes wheel pants do a better job of shielding the tires from view than they do in reducing their drag.

I've always considered tires to be one of the most remarkable products of our time and I am constantly amazed how long tires last in spite of all the abuse and wear and tear they take. Even so, as tough and wear resistant as tires are, they still deserve regular inspection and occasional maintenance.

Unfortunately, those nice looking wheel pants really do too good a job of shielding the tires from view. Oh, you can see a two or three inch section of

the tires, but what about the rest of the tire that you can't see? You really can't tell what the over-all condition of that tire is, can you?

In spite of the restricted view of that portion of the tire still visible to you, it can give up a few clues as to its general condition. For example:

1. Does that tire need some air?
2. Is there still plenty of tire tread showing?
3. Is the tire wearing along one side?
4. Is the wear down the middle or along both edges?
5. Is there a worn spot with the fabric showing?
6. Can you see any cuts or damage to the sidewalls?

Isn't it surprising how much you can learn about the tire simply by looking at that small area visible under the wheel pants?

Of course, if your suspicions are aroused that there may be more than meets the eye, you might roll the airplane forward a bit for a more detailed

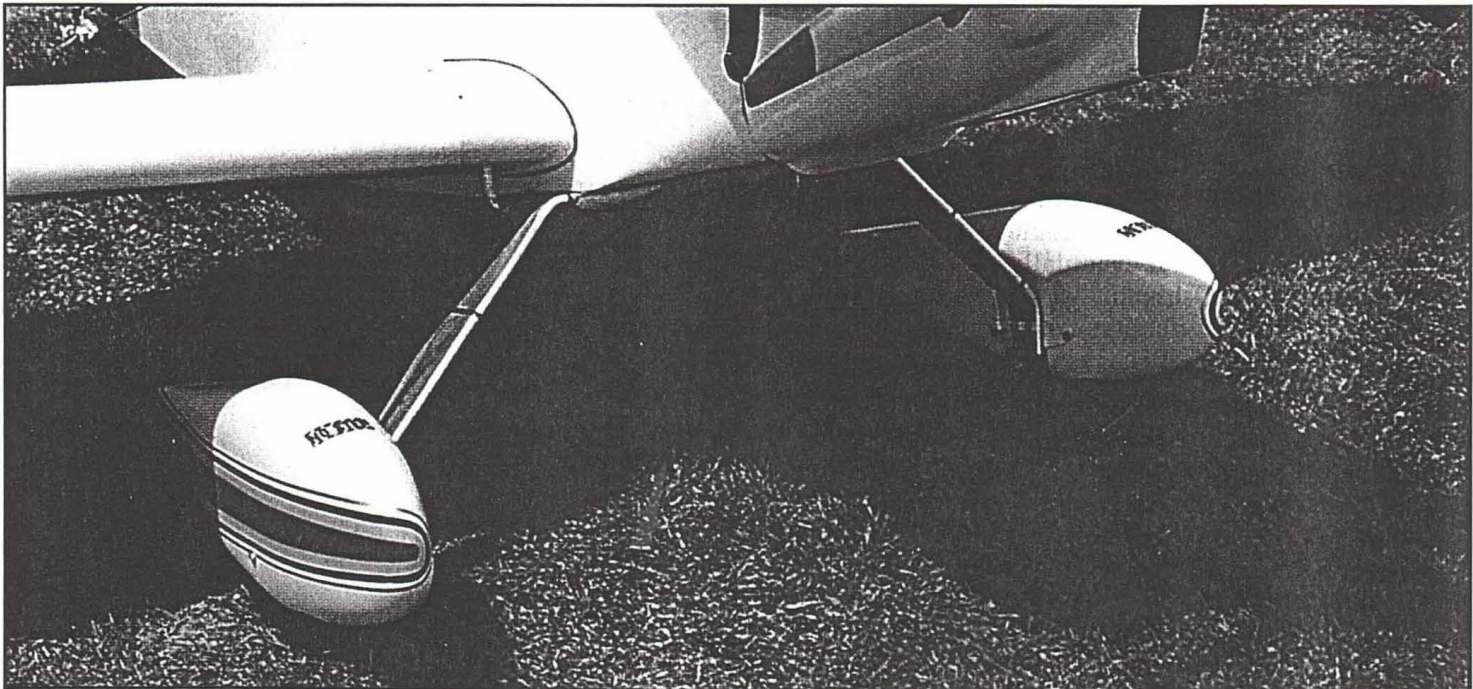
look (without having to take the wheel pants off).

What is evidenced by any of the above signs can be assumed to be indicative of the overall condition of the rest of the tire, also.

Of course, other potential trouble signs may exist which will require more than a casual look—so off with the wheel pants.

1. Somewhere there may be easily overlooked evidence that the sidewall has been cut or otherwise damaged.
2. There might also be areas where the thread is splitting or beginning to peel.
3. There may even be a nail, or a thorn, stuck in the carcass which, if disturbed or removed, will cause the tire to go flat.

Now that I have you thinking about tires, do you remember when was the last time you took a good look at yours? It should have been during your last preflight. Don't really remember, do you? Let's continue with more embarrassing questions.



Do these tires need air? Are they worn and need to be rotated or replaced? Although wheel pants look good they do make inspection of the tires difficult.

TIRE ROTATION

When was the last time you rotated your tires? That is, jacked up the airplane, removed the wheels, removed the tire from each wheel and turned it around (rotating it 180 degrees) on the wheel.

At that time, did you reinstall the wheels on opposite gear legs to ensure that the future tire wear would tend to equalize? This regular routine, when observed, will help you get more service out of a set of tires.

Unfortunately, many of us don't think about tire rotation until the tread is noticeably worn along one edge of the tire. By then, much of your tire life will have been squandered . . . however, you may still extend the tire life if you rotate them—now.

Tire rotation is actually a very awkward chore and harder on your knees and patience than you might remember from the last time. At any rate, it is a very time consuming job that takes just as long as installing a new set of tires.

If your tires are showing a significant amount of wear or bald spots are in evidence, you might be better off installing a new set of tires instead of rotating the old ones.

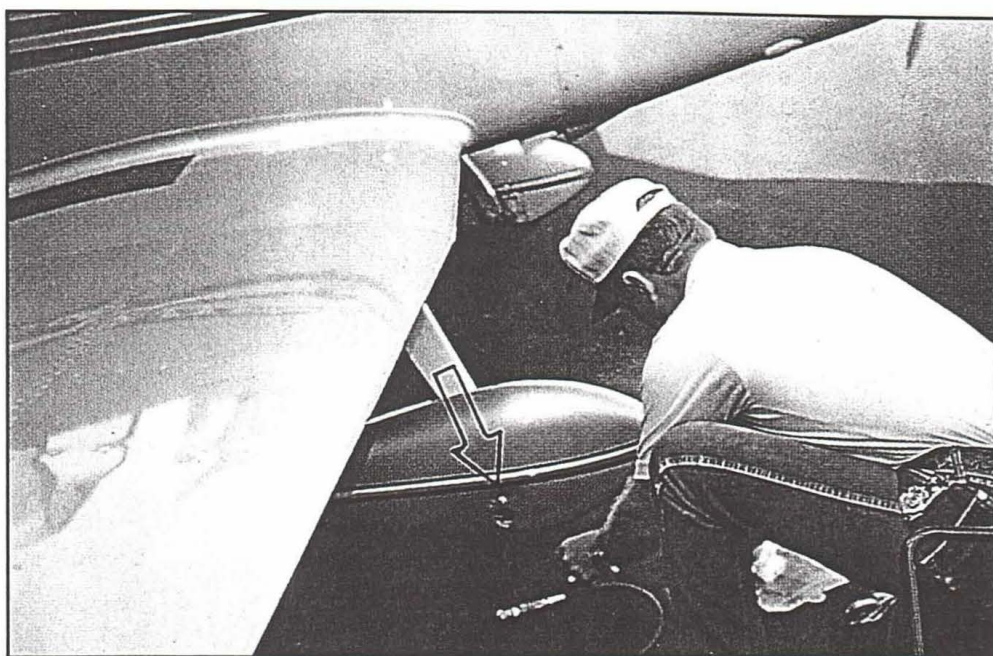
It is a prudent aircraft owner who just happens to have an extra set . . . just in case. If, for some reason, you need to replace a tire, having an extra set on hand will keep you from putting the aircraft out of commission for a week or two while you wait for the newly ordered tire(s) to come in.

HOW ABOUT RECAPPING AIRCRAFT TIRES?

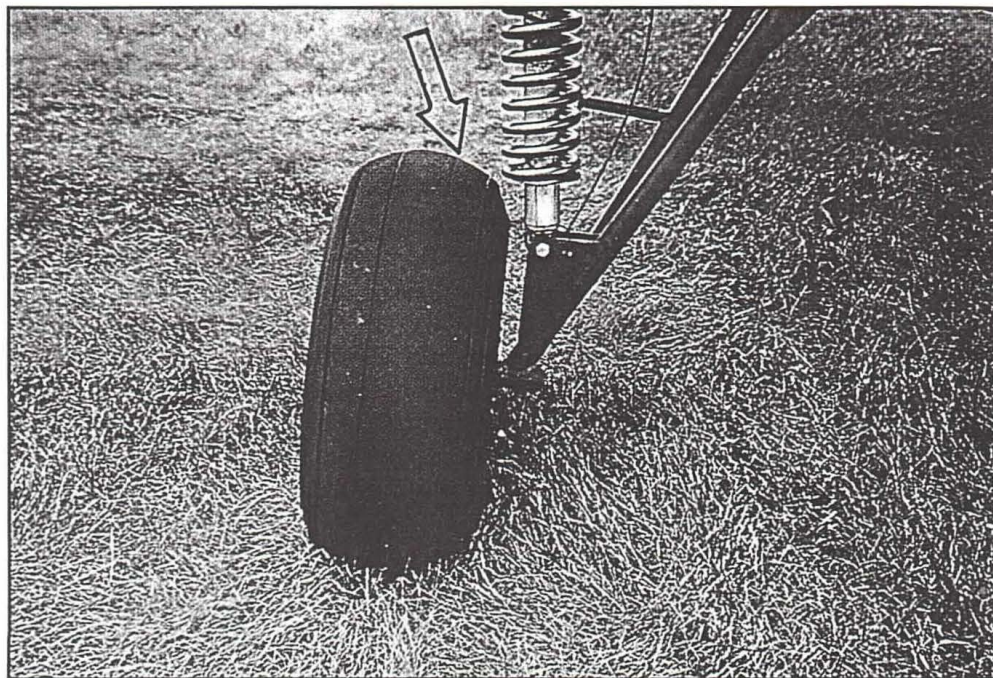
Recapping is the process of reconditioning tires by renewing the tread and maybe one or more of its sidewalls. Some folks swear by it. However, consider this. It will take longer to get your tires recapped than it would be to phone in an order for new ones.

Talk to more than one homebuilder and you will usually get conflicting views as to the merits of recapping aircraft tires. And yet, many of the airlines do it, and so does the U.S. Government and numerous well known flight schools . . . that ought to tell you something.

Recapped tires, today, are far supe-



You can service your tires quickly without removing the wheel pants if you provide easy access to the valve stem as seen here.



Many of us don't think of tire rotation until the tread is noticeably worn along one edge of the tire. However, even then it is not too late to extend the tire life by rotating them . . . now.

rior to the products many oldtimers remember. Today, tires are retreaded using high tech industry materials and methods. These industry standards call for established inspection procedures with the intended purpose of producing an airworthy tire at a considerable saving over that of a new tire purchase. And, as I understand it, the tires are normally balanced before leaving the plant.

Unfortunately, not all old tires can be recapped. For example, if the tire has damaged or cut sidewalls it is beyond repair. On the other hand, even

tires worn to 80% or more of their total tread depth may be recapped if their cord bodies and beads are sound. And that goes, too, for a tire that may have a flat spot which is worn through the breaker layers (but not into the cord) . . . it is still considered to be repairable.

The cost of a recapped tire is about 1/3 that of a new one. The downside to consider is that you will have to package and ship the tire as well as pay the shipping costs for its return. With the shipping costs being what they are, the price advantage between a retread and a new tire is considerably eroded.

REMOVING & REPLACING AN AIRCRAFT TIRE

The average homebuilt doesn't weigh much, so jacking is not a problem if reasonable care is exercised.

Builders use a variety of jacks depending on the type of airplane to be jacked. Actually, most builders are clever enough to adapt whatever type jack they happen to own to do the job. The current favorite for jacking my RV-6A is a hydraulic, low profile, automotive floor jack (WalMart's, less than \$30).

After removing the wheel pants, I clamp a stainless steel hose clamp to the landing gear leg just above the bend in the axle. The clamp's projecting screw mechanism or housing provides a small but effective spur or support for the jack pad.

It doesn't take much time or effort to raise one wheel an inch off the ground with the hydraulic floor jack pad wedged under the hose clamp protrusion clamped to the gear leg.

On the other hand, when any type of wing jack is used, the wing must be jacked up rather high before the gear leg unloads and the wheel finally clears the ground. This is also a somewhat



Aren't you glad you don't have to buy, install, and cope with gigantic tires like these installed on the Sherpa bush plane?

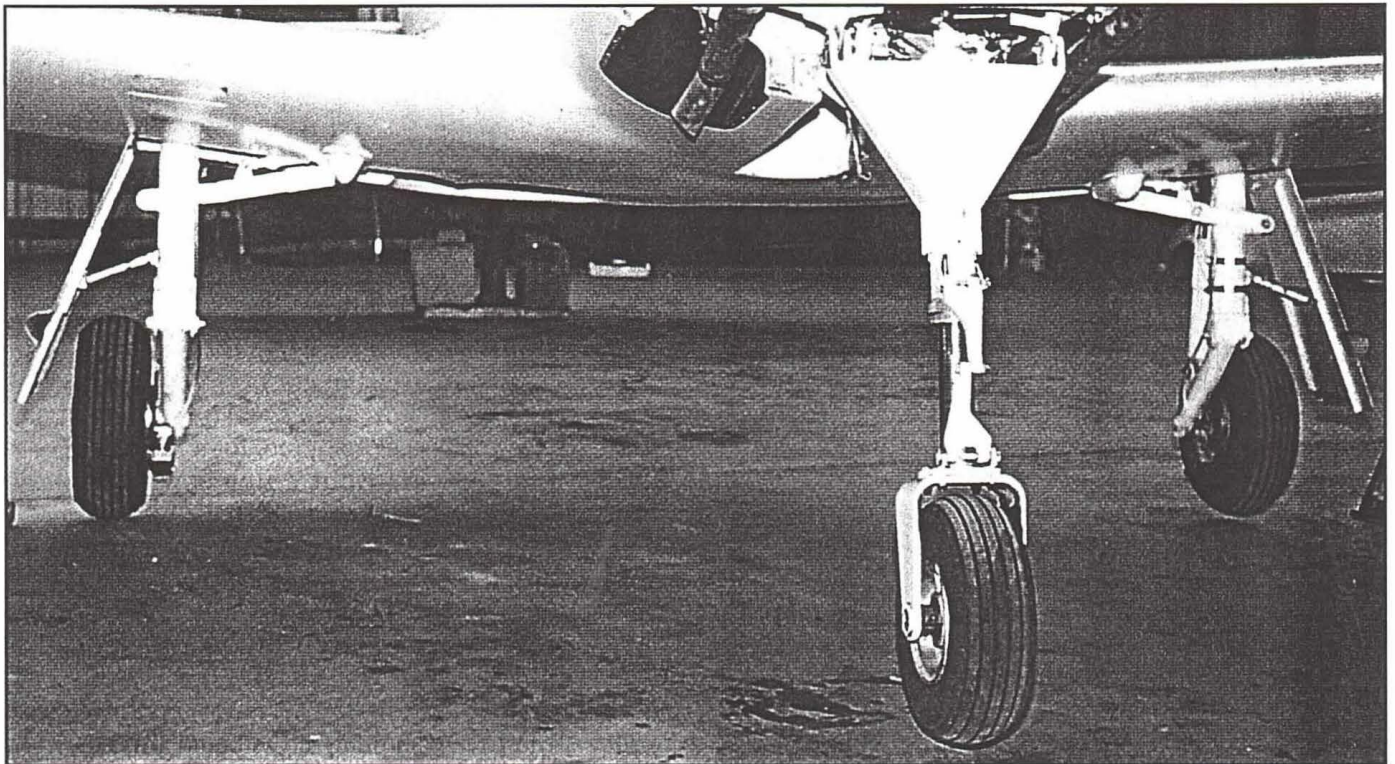
Whether it is worth the time and trouble it takes to have a small aircraft tire (500x5 or 600x6) retreaded depends on what you think. A recapped 500x5 tire will cost about \$28 plus shipping and handling (both ways).

A new tire will cost about \$45 and up depending on the brand. As a tempt-

ing inducement some tire outfits will pay shipping costs if a new tube is purchased at the same time.

Here are a couple of companies that specialize in retreaded aircraft tires:

1. Dresser Tire and Rubber Co. Call toll free 1-800/AIR-TIRE (Colorado) or 1-800/247-8473 (Memphis).



One nice thing about retractables—the tires, brakes and linkages are easy to inspect daily because everything is hanging out for easy viewing.

riskier way of jacking an airplane for a tire change or brake inspection.

Before removing the wheel slowly, rotate it and listen for any unusual bearing noise and look for possible damage to the wheel and brake disc.

It will be necessary to remove the two brake cylinder anchor bolts (Cleveland 500x5 and 600x6 wheels) to allow the disc brake assembly to separate for the wheel removal.

Finally, remove the hub nut and cotter pin holding the wheel in place and pull the wheel off. Note that there is a front spacer and a rear spacer on the axle. Don't forget to replace them on installation.

Demounting the tire:

1. Depress the valve stem and let the air out of the tube.

2. Then, using a tire valve tool, screw out the valve stem and place it out of harm's way. **Do not risk removing the valve stem before letting the air out . . .** that valve stem can shoot out like a bullet and it is capable of doing bodily harm!

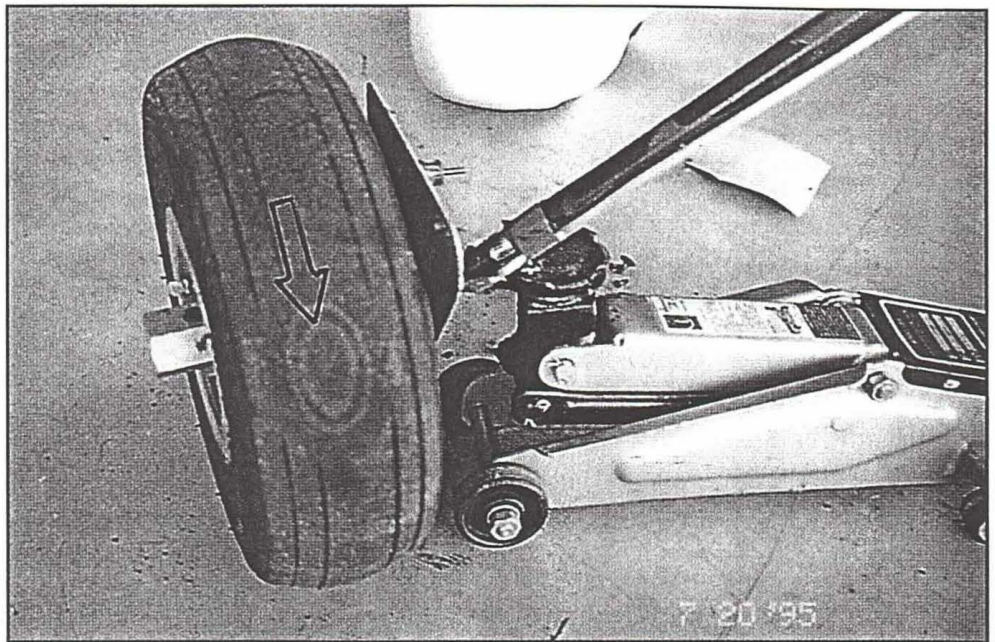
3. Next, separate the wheel halves. A thin-wall socket with a short extension works well. On the opposite side of the wheel the nut can be held from turning with an ordinary wrench wedged against it. The clearance may not be enough to get a socket in as a back-up.

4. To separate the wheel halves from the tire it may be necessary to jump up and down on the tire to loosen the tire bead from the rim. A more dignified way, however, would be to use a tire iron, or a large screwdriver, to pry the tire bead away from the wheel rim. Be very careful that you don't gouge and damage the wheel.

5. The tight fitting rubber grommet that protects the valve stem from abrading against the wheel opening may give you trouble when you try to separate the tube from the wheel. Work it out carefully so that you don't damage the valve stem.

If you are installing a new tire it might be a good idea to also replace the old tube. However, in my estimation, the tube need not be replaced until the second tire change . . . unless your tire changes are years apart.

From what I have been able to determine, a set of tires should last at least 200 hours or so . . . unless, of course, your flights are usually short ones or you have a mania for seeing



This worn flat spot remained undetected because the wheel never stopped where it was visible under the wheel pants. For this reason it is a good idea to periodically remove wheel pants for a closer tire inspection.

how many landings you can make from one approach.

Naturally, given the same amount of flying time, the tires using grass landing

strips will last longer than those subjected to pavement operations. That greater tire longevity is also typical of light home-builts with slow landing speeds.



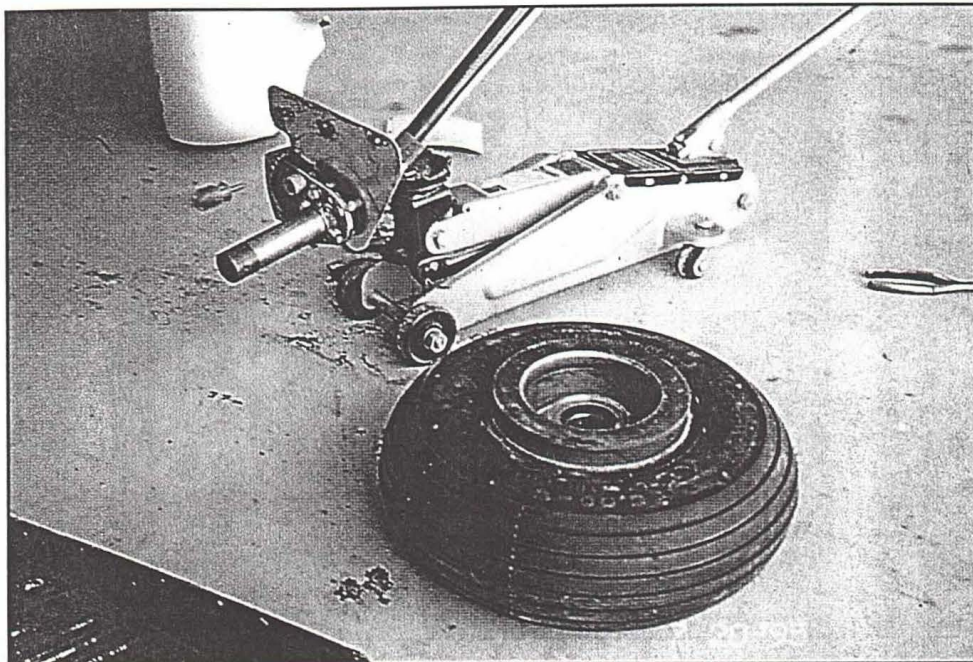
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A low profile automotive floor jack can be adapted to work with almost any landing gear and should be safer to use than a typical wing jack setup.

Mounting the tire:

1. Prior to installing a new tire, inspect it inside and out for defects. Make sure no foreign matter is inside the tire or stuck to the tube.

2. Before inserting the tube, screw the valve stem back in and inflate the tube until it is firmly rounded . . . then inspect it, too, for defects.

3. Generously dust the tube and inside of the tire with tire talc or talcum powder to prevent the tube from sticking to the inside of the tire. The talc will also help the tube slip and maintain its correct shape inside the tire during inflation. This should likewise lessen the chance of wrinkling or pinching the tube during the wheel assembly.

4. Deflate the tube until it is barely rounded. Then insert the tube so the heavy point of the tube (valve stem) is in line with the balance mark (light point on the tire).

5. Inflate the tire/tube to its correct pressure. Next, and this is important, **deflate it completely.**

6. Once again, reinflate the tire before reinstalling the wheel on the gear.

This procedure will help prevent pinching the tube, and will also help expel any air that might be trapped between the inner tube and the tire.

Don't be surprised if you find the tire pressure of your newly installed tire to be a bit low the next time you go out to fly. The reason may be as pointed out above—the bleeding off of trapped

air between the tube and tire . . . a rather common occurrence.

On the other hand, you could have a leaky valve. You did put some spit on your finger and rubbed it across the valve stem to see if air was bubbling out, didn't you? And you did install a valve cap to protect the valve from damage and to keep dirt out of the valve stem, didn't you?

TIRE BALANCE

The majority of builders don't concern themselves with tire balance unless, and until, they are faced with the problem. If you have the problem you will know it. Unbalanced tires can cause severe vibration, and nose wheel shimmy (if your airplane is so endowed) during takeoff and landings . . . sometimes so much so that the instruments in the panel become difficult to read.

Needless to say, such an unbalance condition results in an accelerated and uneven wear of the tire tread—so much so that an early tire replacement often becomes inevitable.

After takeoff, an unbalanced tire will have a tendency to stop rotating with the heavy part of the tire at the bottom of the wheel.

During landing when the tire strikes the runway, this heavy side impacts first and results in severe localized wear in that one area of the tire.

You'd think that eventually the

heavy side would wear away and the tire would become more or less balanced. Maybe so, but by then you will have probably developed flat spots and uneven wear.

Sometimes balance marks are painted on some aircraft tubes to identify the heavy portion of the tube. When you insert the tube in the tire this balance mark should be positioned at the balance mark on the tire.

When there is no balance mark on the tube, you are supposed to position the valve at the balance mark painted on the tire. That's the rule, and it works most of the time.

However, I had a recent experience where I noticed that the "correctly assembled" tire installation caused the wheel to rotate of its own weight on the axle. Disassembling the wheel again, I ignored the "rule" and relocated the tube valve 180 degrees away from the tire mark. The wheel then appeared to be in balance without any further tendency for it to rotate from whatever position I placed it. A flight test proved the installation to be O.K.

How come? "Rules" are fine but don't be lulled into thinking that they work in all cases.

AIRCRAFT WHEEL BALANCERS

In checking around, I found that aircraft wheel balancers are scarce, or unheard of, at most of the small airports I frequent. The common static type auto tire balancers are expensive (even at J.C. Whitney's) and may not work with small aircraft wheels/tires anyway.

However, all is not lost because the EAA once again can come to the rescue. A simple-to-make balancer, based on the automotive type designs, is described by Ron Scott, renowned builder of Ol' Ironsides, in the April 1979 issue of *Sport Aviation* on page 20. (A copy may be ordered from EAA.)

No tire balancer? And you don't feel like building one? Try this:

1. Remove the offending out-of-balance wheel.

2. Remove the bearings and wash them and the hub with a solvent.

3. Oil the bearings lightly with a light machine oil (engine oil is too heavy) and reinstall the wheels torquing the hub nut lightly . . . you

want the wheel to spin easily.

5. The heavy side of an unbalanced tire will rotate to the bottom. Tape a small lead weight to the top inside of the wheel. If you guessed the correct amount of lead needed, the wheel should not turn no matter what o'clock position you rotate the wheel to. Glue the lead weight to the inside of the wheel with contact cement (some automotive speed shops may have self-adhesive wheel weights).

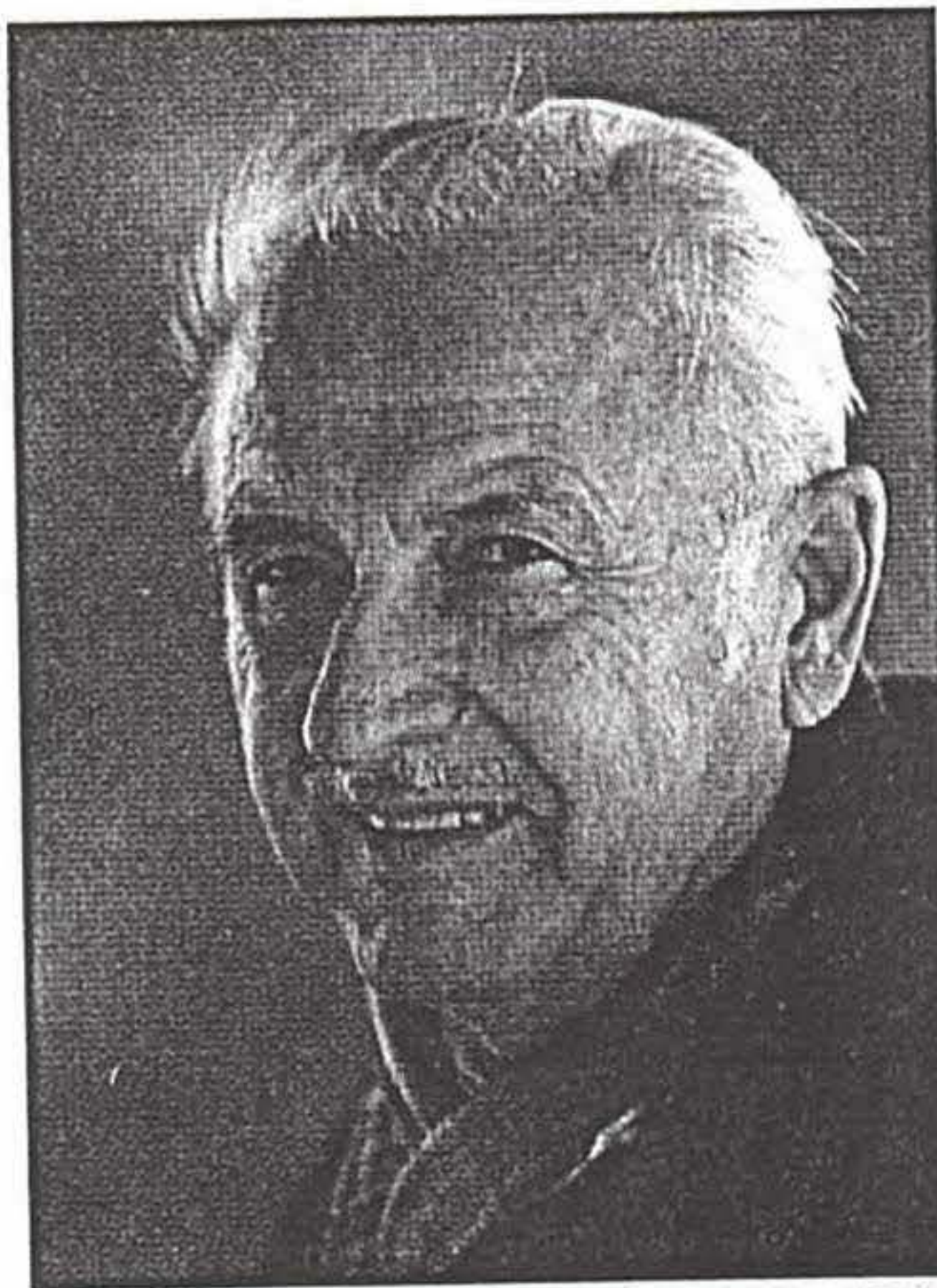
A little tweaking with the lead weight will get you the balance results you want (don't forget to re-grease the bearings when the exercise is over).

TIRE TRIVIA

Here is a revelation that might surprise you.

It is claimed that more tires fail during takeoffs, usually with dire consequences, than do during landings . . . at least that is what the BFGoodrich folks seem to have concluded.

How about that? ♦



If you wish to contact the author of this column for additional information, please send a SASE to:

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BOOKS BY TONY

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Aviation Foundation, EAA Aviation Center, Box 3086, Oshkosh, WI 54903-3086, 1-800-843-3612. Major credit cards accepted.

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