Tundra Tire Rehabilitation

This is not a recommended practice. This was an experiment to see if expensive aircraft tundra tires could be salvaged/repaired suitably for other uses.

I have a set of expensive (> $3000 US) brand name tires that were “checking” and “cracking” after about 12 years of use (yes, that is a lot of time on any tire). They are marked 29x13x6 . They have an extra layer of rubber on the face that the factory recommends as an option for paved and heavy use. These have seen 1/2 their time on a Cessna 206 and the last half on a Super Cub. In use I had kept them at 10 pounds on the Cub (about average factory recommended pressure.) I tried to always land in the grass infield when at CYXY (home). I removed these from use and new tires from the same manufacturer are on order, in the meantime small tires will have to do.

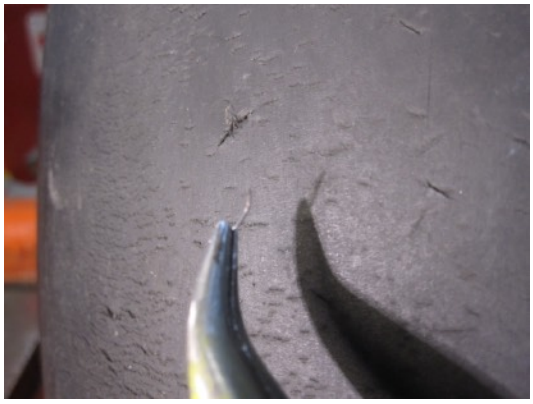
It is interesting to note that the tires I currently have measure 31 inches in diameter despite being marked as 29”. I asked the manufacturer about this and they said this is because “… over a number of years these tires stretch and become larger…”. So, if I want the same size I guess I should order 31” and in a few years I will have 35” s?

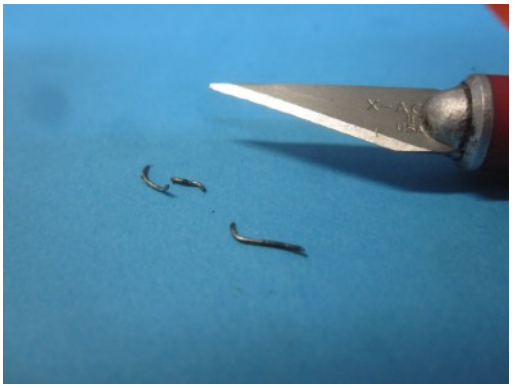
And so, with the Cub in the hanger, now begins this experiment;

I began by cleaning them real well. I assembled them on an old set of 6” Cleveland rims and inflated them to 12 psi. I mounted them on a stand and cleaned them with soapy water, then alcohol. The more I cleaned and examined these tires the worse they appeared.

Now I did a careful inspection. The sidewalls had a lite web of weather checking. (Rubber loses flexibility over time naturally as solvents evaporate from the mixture.) Several places on the rubber travelled surface had a series of cracks that opened laterally (across the tire). Likely this is caused by the tire making sudden contact with the ground on landing, and partly from doing tight turns while taxying. (Witness the twisting distortion of a tundra tire carcass when doing a sharp braking turn.) In one or two small places, about 3 to 4 mm down (1/8”) threads that are possibly the cords can be seen .

Using a magnifying lens I discovered what appeared to be the ends of several tiny pieces of wire protruding from the rubber surface. I removed these with a sharp pick and fine pliers. On removal they turned out to be several pieces of stiff wire that had penetrated far into the contact portion of the tire. A couple of these were more than 1 cm long (> 1/4", see photos.). I am fairly certain these are pieces of the wire bristles from either the Airport sweeper or from other maintenance done on airport equipment. That's because about two springs back I landed a few times in close proximity to the edge of the paved runway 14 at CYXY and immediately afterwards noticed and removed some similar wires (some over 1.5 cm long) sticking out of the tread. After this one tire started losing air. I put 1/2 litre of 'Stans' bicycle tire fluid ($24.00 Can) in each tire and they haven't leaked since. (I stopped landing near the runway edge and didn't see any more wires.)





The tires were pressured to 12 psi. and monitored for several days to make sure the pressure was constant. The tire surface roughened and cleaned with 80 grit sandpaper in a belt sander. The technique is obvious once you try it, don't worry about taking too much off (you can't). The surface was cleaned again with Acetone.

The product most seen used for this on YOUTUBE is Devcon FL-80 (part 159800) and primer (15985). They recommend 3 pounds per tire? I priced that out…..it is $1000.00 Canadian, before shipping and taxes! Not going to happen on these tires!

A local long-time Yukon expert gave me a product called "**Smooth-On URE-BOND II Flexible Urethane Adhesive"** (sold by Stoddards in Anchorage to do this sort of repair). Someone had written the directions on a paper inside the 2 pound carton. They wrote that Kit this was enough to do *"2 sets of 35" tires*". It is a two-part liquid mixed 50:50. It comes out like thin honey. The directions also say; "*Act fast because cure time is 5 minutes….Best to divide tire into 3 sections*." Whats to lose ?

I marked the first tire on each side to guide the area of application. The material was mixed well in small batches (about one ounce of each was mixed at a time). I simply trickled it onto the tire as I rotated it. A body-putty spatula was used to level and spread it. The working time was indeed 5 minutes. A tongue-depresser was used to work it into any larger cracks/defects. (I tried a brush initially but that was a mistake). 1/2 cup did an entire tire (not the sidewalls).

The tire was rotated slowly to cure at about 19 degrees C (65F). Some tiny air bubbles appeared. It turned out very well until I tried to add a second coat to fill bubbles or small hollows. I should have waited a day before trying this. Within not much more than 5 minutes the material was unworkable.

The final result is very shiny and nearly transparent. I didn't realize this until inspection with a flashlight. With a flashlight I could just see into the tire and barely make out some of the defects under the surface. The surface seems tough and well bonded but the real test for adhesion and resistance will come with testing (somewhere).

If you liked this experiment, look for my report on my investigation and tests of modern 'single step' aircraft covering fabric.