



Winnipeg Area Chapter of RAA Canada

January 2010

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CALENDAR OF EVENTS

January 28, 2010 Annual rust remover. See details inside

February 18, 2010 Still up in the air

March 18, 2010 Still up in the air

April 15, 2010 Still up in the air

COPA Flight 35 CASARA Manitoba RAA Manitoba and Manitoba Aviation Council

The Annual Rust Remover will be held at the ANAVET Hall at 3584 Portage Avenue (same as last year) on **Thursday January 28th at 7:30PM**. Our presenters will be Craig Brown from Nav Canada. Craig will talk about the publications such as maps, Canada Flight Supplements and others that we use on a regular basis when we go flying. There is a lot of information on these publications that we will be brushed up on. Our other presenter will be Pete Firlotte from Transport Canada. Many of us know Pete from past presentations and look forward to what he has to say that is important to us in our daily flying. His topics are always interesting and informative. There will be a \$5.00 admission charge this year as well as door prizes and the COPA Flight 35 Oil Raffle.

At half time there will be a short presentation on the "Manitoba Homecoming 2010 Aviation Tour". \$25 Tour registration package will be available. Join us for a great evening.

Refreshments will be served!



Canadian Propeller tour

Thanks to Maurice Wills, Gerry and Jason for the tour on November 26. The tour lasted three hours and was really interesting for the 24 RAA members and friends that attended. Canadian propeller was founded in 1991 by Maurice. Maurice and his staff specializes in aircraft propeller and governor maintenance and servicing all types of aircraft from Cessna 150's to Beech 1900's.

Maurice talking to the group.

Christmas Pot Luck Dinner

It was another great pot-luck dinner on Saturday December 5, 2009. This was the first pot-luck to be held in the new Lyncrest Flight Centre. Approximately 40+ aviation enthusiasts and their spouses/friends attended. The varied selection of food provided lots of choices for everyone. Nobody went away hungry and the evening was filled with lots of laughing and friendship. Thanks to everyone who helped set-up and clean-up after.

Shock Cords

Know when to change them

Article and Photos by H.G. Frautschy



The Winnsock

Early on in the history of aviation it became clear that a landing gear with some “give” or shock absorption capabilities was desirable. The early Bleriot and other pioneer aircraft used thin tires set on wire-spoked wheels, and while they were great for clearing the humps and bumps of the local pasture, they didn’t soak up the bumps too well, so a second level of shock absorption was added—rubber shock cording.

For decades, woven fabric-covered shock cord (often called bungee cord) was the most common of all shock absorbers. In fact, it was so ubiquitous, used on so many different civilian and military aircraft, that it was even the subject of a military specification, MIL-C-5651D. It’s still commonly used in the military and for civilian use. Double-covered shock cord is Type I; shock rings with a double braided cover are Type II.



A serviceable cord should have a smooth outer covering, with no bumps or disruptions to the woven cover. This one looks good, but age and repeated landing cycles have taken their toll.



No this is not some new exotic pasta dish or an undiscovered sea creature. The outer rubber strands show signs of Environmental aging, as ozone and airborne contaminants (including engine exhaust chemicals) attack the rubber. You can see how the inner strands are less affected. Again, this shock cord didn’t appear to be excessively worn when viewed from the outside; the damage was only obvious once the covering was cut away.



This same cord showed some signs of abrasion damage to the woven covering where the shock cord was in constant contact with the landing gear structure.



This cord shows obvious signs of damage to the outer covering and the rubber strands inside. The bumps and breaks in the covering indicate many broken strands inside the shock cord. This cord must be replaced.



Most normal humans would not be able to pull on a 3/4-inch shock cord and be able to stretch it, but this cord had deteriorated to such an extent that it was possible for me to do so!

The rubber itself is high-grade rubber strip, either natural latex rubber or synthetic rubber, similar to that used when golf balls were made with a wound rubber strip core, only wider. (There are no longer any manufacturers of wound rubber core golf balls in the United States!) While it exhibits great elasticity and durability, the rubber is susceptible to environmental damage. When exposed to air, ozone and other pollutants will quickly deteriorate it. So will exposure to engine oil and other chemicals, such as exhaust residue. Keeping the outer cover clean goes a long way toward keeping the rubber from deteriorating. That's why on a Cub or other similar landing gear systems, leather or vinyl "boots" are used to cover the shock cords.

If you've owned an airplane that is equipped with shock cords as part of the landing gear, you know how important it is to check the cords, to avoid a letdown feeling when one of the cords lets go with a sharp report. But what do you look for? How do you know it's time for a replacement? Do you use the calendar, the appearance of the cord, or the cord's date of manufacture?

The answer is all three! While a cord may look perfectly fine, if it's been sitting unprotected on the shelf in a hot hangar for years, odds are the rubber strip inside has deteriorated to such an extent that a few cycles of stretching will create a lumpy, useless mess. You've probably seen what can happen to a set of shock cords when an airplane has been left sitting out in the open for years. It doesn't seem to take very long for the landing gear to begin to splay outwards, and before you know it, the gear is near collapse.

Do your best to obtain fresh shock cords when it comes time to change out a cord. Each outer layer of the woven cord made to the exacting standards required for the mil spec will contain a pair (or sometimes a trio) of colored treads, which indicate the date of manufacture. The mil spec

defines the meaning of the colored yarn. See the chart included in this article for details. The military requires a shock cord or ring be packaged and delivered no later than six months after manufacture; if stored properly, the cord can last for many years.

During an annual or other periodic inspection, check the shock cord first by standing back and looking at the airplane from the nose. Does it sit high up on its landing gear? Or have you noticed that the wing seems to be a bit lower than it used to be (sometimes evidenced by clonking your forehead when you go to enter the cockpit)? Is the inner portion of each of the tires wearing excessively?

When you rock the wings with your hands while on the ground, does the landing gear seem excessively soft?

Even when the cords have been well protected, the interior of the shock cords will deteriorate over time and will need replacement. Evidence of that wear is most often seen in the form of surface irregularities in the covering.

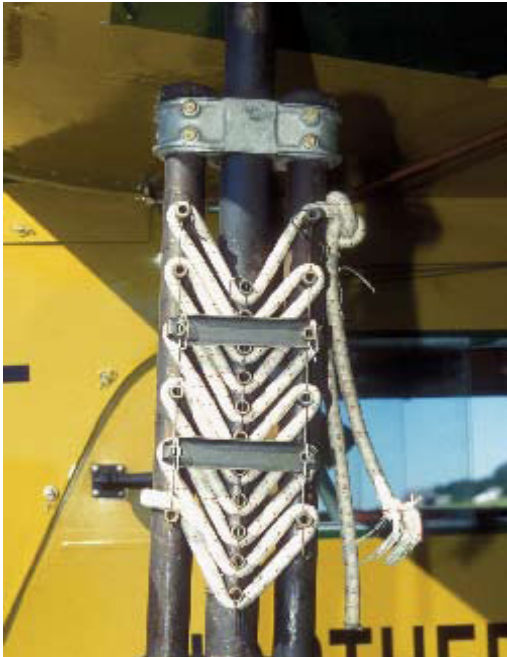
Bumps, tears, or other disruptions in the smooth woven cover tell you something's amiss under that cotton wrap. Is there discoloration on the cover, indicating possible exposure to chemicals or oil, or is it dirt and grime from a lifetime of living on the belly of an airplane?

Take a look at the photos in this article. These shock cords had been in service for 14 years on an Aeronca Sedan. A pair of rings is used on each side, for a total of four shock cord rings. I'd noticed that the gear seemed rather soft when the wings were rocked up and down, and the gear seemed splayed out more than normal. Also knowing that the age of the cords was at least 14 years, I made plans to change the cords during the annual inspection. While one cord looked pretty good, the other, manufactured four years earlier evidenced by different color-code cords in the woven covering) had obvious defects.

Once the decision has been made to replace the cords, caution must be exercised to prevent injury. These shock cords can recoil with tremendous force once stretched.

For the Piper Cub and its brethren, a few enterprising companies have made special tools for stretching and installing the cords. In other cases, a special tool is not needed, but do avoid the use of sharp or pointed tools to lever or pry the shock rings in place. Disrupting the covering not only exposes the rubber to the environment, but also can cause a change in the cord's modulus in a small area, weakening the cord and leading to premature failure.

Once the cords have been replaced, go out and enjoy that "new landing gear feeling." But be careful—you'll be amazed at how stiff the landing gear has become, and you may need to adjust your landing technique. But even if you "sproing" a few of those first landings, you'll have the peace of mind knowing your bungee cords are up to soaking up anything you can throw at them!



Some aircraft use multiple shock cords. This is the upper end of the landing gear of a Fokker Super Universal. A similar herring-Bone arrangement was used on the Ryan NYP, Spirit of St. Louis.

MIL C-5651D

Shock Cord Dating System

The color code repeats on a five-year cycle.

First color stripe:

1997—Red

1998—Blue

1999—Yellow

2000—Black

2001—Green

2002—Red

2003—Blue

2004—Yellow

2005—Black

2006—Green

2007—Red

The second stripe indicates the quarter of manufacture:

January-March—Red

April-June—Blue

July-September—Green

October-December—Yellow

Some manufacturers add a third color stripe not required by MIL-C-5651D.

This article was copied from the following website:

<http://www.vintageaircraft.org/featured/2006%20-%20Vol.%2034,%20No.%2008%20-%20Shock%20Cords.pdf>

aviation clichés

Aviate, Navigate, Communicate.

Truly superior pilots are those who use their superior judgment to avoid those situations where they might have to use their superior skills.

Rule one: No matter what else happens, fly the airplane.

Flying is hours of boredom, punctuated by moments of stark terror.

Fly it until the last piece stops moving.

It's better to be down here wishing you were up there, than up there wishing you were down here.

An airplane will probably fly a little bit overgross but it sure won't fly without fuel.

Believe your instruments.

Think ahead of your airplane.

The propeller is just a big fan in the front of the plane to keep the pilot cool. Want proof? Make it stop; then watch the pilot break out into a sweat.

Always remember you fly an airplane with your head, not your hands.

2010 Membership Form

Winnipeg Area Chapter RAA

Trial (\$25)

Student(\$25)

Full (\$50)

Required Information

Name		OFFICE USE ONLY	
Mailing Address		Renewal Date	
Phone(s)		Chq. Other	Cash
E-mail		Initials	
Are you an RAA national member? ⁽¹⁾		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Do you give permission for your information to be made available to other Winnipeg RAA members?		<input type="checkbox"/> Yes	<input type="checkbox"/> No

Optional Information

Do you own an aircraft?	<input type="checkbox"/> Yes <input type="checkbox"/> No Make/model: Registration:	Are you a member of other aviation groups?	EAA: <input type="checkbox"/> COPA: <input type="checkbox"/> Others:
Are you building or restoring an aircraft?	<input type="checkbox"/> Yes <input type="checkbox"/> No Make and model of project(s):	What Pilots licences and ratings do you hold?	

Please make cheques payable to: RAA - Winnipeg Chapter
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Notes:

- 1) RAA Winnipeg contributes \$15 per member towards the insurance program maintained by RAA national. This program provides liability insurance to cover local chapter events. The \$15 does not provide membership in RAAC.**