



Carb Heat

NEWSLETTER

Hot Air and Flying Rumours

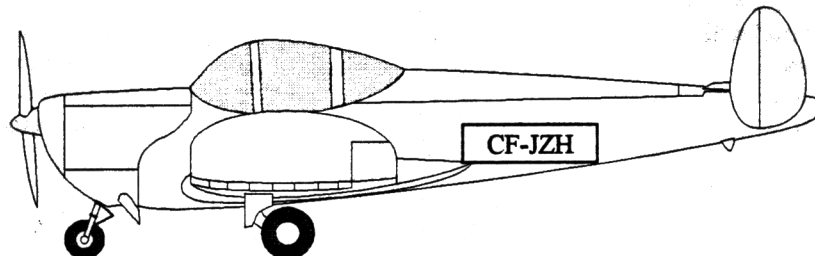
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February 1996

**Next Meeting: Thursday 15th February 2000hrs
Bush Theatre
National Aviation Museum
Rockcliffe**

Program: - Regular monthly business
Guest Speaker: - Dale Lamport DABI (AIRABA) representative will be speaking about Homebuilt aircraft inspection

Inside: Which Oil should I use. by Mike Busch (mbusch@avweb.com)
Special EAA Book and Video offer
NTSB reports on the cause of the Wittman crash.
Chapter Library holdings



Ercoupe

President:	Gary Palmer	596-2172	Aircraft Ops:	Dick Moore	836-5554
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Editor:	Andy Douma	591-7622	Publishing:	Dick Moore	836-5554

President's Corner

As I write this column, our annual January thaw has transformed parts of the airport into a skating rink, but this is unlikely to deter the more resolute of our aviators who continue to get their moneys worth from the snow blower and keep access routes open. The drainage system we installed seems to be doing an excellent job, and the spring thaw should see a relatively short period of inaccessibility.

January Highlights:

Peter Muehleg of Trim Air shared many of the secrets of aircraft upholstery with us, that have made his custom aircraft upholstery business, Trim Air, a success. It was very interesting to hear some of the problems encountered with after market fire-proofing treatments. Particularly cogent was the fact that bromide or chloride salts are used, and over time in the damp environment experienced by aircraft can lead to leaching of the salts, and serious corrosion problems for aluminum aircraft. The best avenue is to get materials that are manufactured to meet aircraft standards from the outset. Peter claims that the incremental cost is small, on the order of 10% for an example quoted in the meeting. I also found the differences between regular, industrial, and "walking foot" sewing machines enlightening. If you are approaching the final stages of construction, check out Peter's services and prices.

Rebel First Flight

The successful first flight of Denis Charbonneau's Murphy Rebel was celebrated the first week of the new year. After a hiatus of a couple of years it is encouraging to see a new home built hatchling take to the sky. From all early

reports, the first flight was a resounding success, and I look forward to a brief status report from Denis at a future meeting.

Carp Airport Status

Despite my earlier stated pessimism, the latest information seems to indicate that the long awaited Carp airport acquisition by the Regional government is near at hand. If my spies are correct, the stubborn individuals in the region that objected to the very reasonable requirements of Transport Canada aimed at ensuring the longer term survival of the airport have moved on to other pursuits. It also appears that despite the "common sense revolution", funding from the regional, provincial, and federal levels of government remains intact for 1996. If all this proves to be correct, we can expect construction on a new runway to be completed sometime this year.

It is still too early to determine the impact this will have on our flight operations, although plans are to use a patched up 04/22 as an interim runway. This should suffice for most of our aircraft, but I will have to find a new home for my Lancair for the construction period.

Steve Whitman NTSB report

The NTSB in the U.S. has released their analysis of the in flight breakup last spring of Steve's O&O special. We have included a precis of the report, courtesy of COPA elsewhere in this issue. I encourage you to read it carefully. If there is one clear message to learn from this unfortunate experience, it is that Aviation is terribly unforgiving of errors. Before you are tempted to use substitute materials, consider carefully materials compatibility.

Follow the recommendations of manufacturer's to the letter. We may never know whether Steve's unfortunate demise was the result of a simple error or deliberate ignorance of installation recommendations for Stits PolyFibre, but only you are responsible for the safe construction of your aircraft. Don't make the same mistake.

EAA Book Sale

There is a special sale of EAA how to books and videos being made to EAA chapter members. We will be placing a single large order for all chapter members in early April. With savings of approximately 40% over EAA's normal low prices, this is an excellent opportunity to stock your library with home-building classics such as Tony Bingelis's series of how to books. I consider Tony's books to be mandatory for anyone building their own aircraft.

Feb. 15th Meeting. at NAM:

Our next meeting is being held Thursday Feb. 15th at our normal **National Aviation Museum** location in the Bush Theatre at 8:00 PM sharp. Our feature speaker is **Dale Lamport** who is the DABI (AIRABA) representative in our area. Dale will be covering the do's and don'ts of the amateur built inspection process. Follow Dale's recommendations and you will hopefully have a snag free inspection. I hope to see you there.

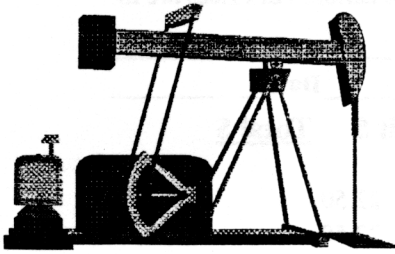
Gary

EAA Book & Video Sale

The following is a limited time offer for EAA chapter members to purchase EAA books and Videos. To take advantage of this offer which provides savings of 45% on books and 50% on videos, as well as lower shipping costs, just fill out the following order form indicating the quantity required for each item and forward with a check for the full amount no later than March 31st to George Elliott. All Prices are in Canadian dollars. We expect to receive our order sometime in June.

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Qty	Item #	Description	Unit \$	Total \$
Books		Tony Bingelis series: A must have		
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	21-14029	Magnificent Desolation Apollo Astronauts	18.50	
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	21-35798	The Steal Revealed -Oshkosh 90	12.00	
		Grand Total		

Which Oil Should I Use?



There's a whole lot more to choosing the best oil for your Continental or Lycoming powerplant than most aircraft owners realize. You can't necessarily believe everything you read in the oil company ads. Here are some of our recommendations concerning aircraft engine oil. You just might be surprised.

This originally appeared in Cessna Pilots Association magazine. by Mike Busch (mbusch@avweb.com)

Oil is the lifeblood of your engine. To achieve maximum engine life, it is crucial to choose the correct oil and to change it regularly at the correct intervals using the correct procedures.

If you were flying behind a turbine engine, the choice of oil would be easy. You'd simply choose the slipperiest, longest lasting lubricant you could find, and that would be a 100%

synthetic oil. End of story. But when it comes to the piston engines that power our airplanes, the issues are much more complex. That's because the oil in a piston engine is called upon to do a lot more than simply lubricate. The oil must also serve as a coolant, a cleanser, an acid neutralizer, a sealant, a hydraulic fluid, and a preservative. Finding an oil that performs all of these functions adequately well can be a tricky business.

Single-Grade Oil

Straight mineral oil such as Aeroshell 100 (red can or blue plastic bottle) is a petroleum-base oil without the usual cleansing agents or additive package. It is commonly used as break-in oil for new steel or chrome cylinders. Its "claim to fame" is that it isn't particularly good at either lubricating or cleansing! The resulting high levels of friction may speed up the break-in process, but this oil isn't approved for long-term use in your engine. If you use this stuff for break-in, you should plan to drain it within 10-25 hours (the sooner the better) and replace it with a high-quality ashless dispersant (AD) oil.

Single-grade AD oil such as Aeroshell W 100 (SAE 50) or W 80 (SAE 40) is a straight-weight petroleum-base oil with an additive package of ashless dispersant cleansers, lead scavenging agents, and acid neutralizers. It offers good

lubrication and good cleansing action. Single-grade oil is especially good at protecting engines against internal corrosion, because it is very thick at ordinary room temperature and sticks to engine parts without stripping off as readily as multi-grade oils. However, single-grade oil is not recommended for non-preheated cold weather operation. When starting in sub-freezing temperatures, single-grade oil may be too thick to provide adequate lubrication in the first minute or two of engine operation.

Multi-Grade Oil

Multi-viscosity petroleum-base oil such as Phillips X/C 20W-50 is similar to single-grade AD oil, but has a viscosity index ("VI") enhancer which causes the oil to maintain a more constant viscosity over a wide range of temperatures. This oil remains much thinner and more easily pourable at room temperature than single-grade oil. This is a distinct advantage for cold weather starting if a preheat (or heated hangar) is not available. On the other hand, multi-vis oil will strip off engine parts much more readily during periods of disuse, so it doesn't provide nearly as good corrosion protection as single-grade oil does.

Fully synthetic oil such as Mobil AV-1 (no longer available) is a multi-vis synthetic oil with an AD additive package similar to

other AD oils. Synthetic oil has better lubricity (or slipperiness) than petroleum-based oil, as well as several other advantages. Unlike petroleum products, a fully synthetic oil does not carbonize (or "coke") under high heat, nor does it lose its viscosity with prolonged use. On the other hand, synthetic oil strips off parts readily (because of its low viscosity at room temperature and its extreme slipperiness). It also is poor at cleansing, because its molecules are too slippery to hold scavenged lead, carbon, and other particulates in suspension very well. It is this poor cleansing action (particularly with regard to lead) that was responsible for Mobil AV-1 being withdrawn from the market recently. For years, we have warned against the use of fully synthetic oil in most owner-flown airplanes.

Semi-synthetic oil such as Aeroshell 15W-50 is a blend of multi-vis petroleum-based oil with fully-synthetic oil (in the case of the Aeroshell product, it's a 50-50 mix). Such a blend is an attempt to combine the excellent lubricating properties of a synthetic oil with the excellent cleansing properties of a petroleum oil. For the most part, it achieves these goals. Aeroshell 15W-50 is an excellent oil which does almost everything well. However, like all multi-weight oils, it remains quite

thin at room temperatures, and so strips off engine parts readily and leaves them vulnerable to corrosion during periods of disuse. About a year ago, Shell started adding a new corrosion inhibitor to the additive package of Aeroshell 15W-50 in an attempt to remedy this problem. However, we feel that it's too early to tell just how effective this new additive is.

So Which Oil Should I Use?

It all depends on where you fly, and how often. If your airplane flies at least once a week, or if you operate in a low-corrosion environment such as the desert or the mountains, you probably don't have to worry too much about corrosion. This is especially true if the airplane is also hangared. In this case, we recommend that you use a multi-weight oil such as Phillips 20W-50 or Aeroshell 15W-50. The Aeroshell semi-synthetic is a slightly better lubricant, while the Phillips X/C is slightly better at cleansing. Both are excellent choices. On the other hand, if you are based in a corrosive environment--within 100 miles of the coast, the Gulf, the Great Lakes, or a major metropolitan area with its industrial pollution--and if your airplane sometimes goes for two weeks or more at a time without being flown, internal corrosion should be a major concern. This is especially true if the aircraft is not hangared. If

you fall into this category, we strongly suggest that you use a single-weight AD oil such as Aeroshell W 100 to provide the best possible protection against corrosion during periods of disuse. If you operate in a temperate climate (such as is found in much of California), you can use single-weight oil all year around. However, if you operate in sub-freezing winter temperatures, then we recommend that you switch to a multi-weight oil during the cold-weather months, and then return to single-weight oil during the remainder of the year. (If your mechanic tells you that it's bad to switch from one type of oil to another, he's misinformed.)

Change Oil Regularly It's impossible to overstate the importance of regular oil changes. During engine operation, the oil becomes contaminated with nitric and sulfuric acids, water, lead salts, carbon, metal, and other contaminants. It is essential to flush these out of the engine on a regular basis. In addition, the cleansers and acid neutralizers in the oil's additive package wear out, and must be replenished by changing the oil. If your engine is equipped with a full-flow oil filter, you should change your oil and filter every 50 hours or less. If you have only an oil screen, you should change every 25 hours. In any case, you should change your oil every four months even if you've flown only a few

hours during that time; the oil may still look clean, but the additive package is probably shot. Whenever you change your oil, fly the airplane first in order to bring the oil up to full operating temperature and to agitate any contaminants that may have settled out back into suspension. Drain the oil as quickly as possible after the completion of this warm-up flight in order to ensure that you drain out all the nasty stuff. Catch an oil sample about halfway through the draining process and send it to a lab for spectrographic oil analysis. (The author uses Engine Oil Analysis in Tulsa, Oklahoma.) If you have an oil filter, be sure to change it at every oil change. It is especially important to cut open the old filter and inspect the element for metal. If you ever spot an uncut oil filter in the trash can at your maintenance shop, find yourself another shop!

RAM Recommends

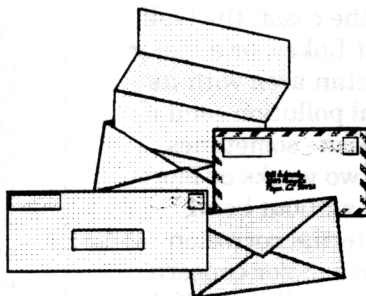
Aeroshell W100 RAM Aircraft Corporation of Waco, Texas, is perhaps the premier overhaul shop for big-bore Continental engines. On June 1, 1994, RAM revised its recommendation for selection of oils to be used in RAM-overhauled TCM IO-520, TSIO-520, GTSIO-520, and TSIOL-550 engines. Here is an excerpt of what RAM now recommends to its customers: "First choice: Aeroshell W 100 or equivalent SAE 50 ashless

dispersant aircraft engine oil. Use should be limited to climates with typical ground level engine starting temperatures of not less than 30 F.

"Second choice: Aeroshell W 80 or equivalent SAE 40 ashless dispersant aircraft engine oil. Use should be limited to climates with typical ground level engine starting temperatures of not less than 10 F, nor more than 90 F.

"Third choice: Anti-wear formulation Aeroshell 15W-50. Use may be indicated by typical flight operations to and from climate extremes such as southern USA to Canada or Alaska where winter ground level engine starting temperatures would be below 10 F. "RAM does not approve the use of Mobil AV-1 aircraft engine oil

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NTSB says improper covering installation led to Wittman crash

-By MICHAEL SWEENEY

The crash that killed Steve Wittman and his wife happened because the pioneer aviator improperly applied the fabric covering on his homebuilt aircraft, the National Transportation Safety Board (NTSB) has ruled.

Wittman, 91, and his wife, Paula, died April 27 when their "O and O Special" broke apart in flight near Stevenson, Alabama, while the couple were returning to Oshkosh from their winter home in Ocala, Florida.

According to the NTSB probable cause report, Wittman's airplane broke up as the result of "aileron-wing flutter induced by separation at the trailing edge of an unbonded portion of wing fabric at an aileron wing station."

The NTSB further concluded that "the debonding of the wing fabric was a result of improper installation."

Ray Stits, a friend of Wittman's who tested a section of the O and O's wing as part of the NTSB investigations determined that Wittman had applied Poly-Fiber fabric to the plywood wings of his plane using nitrate dope.

Stits, who invented the Poly-Fiber coating system before selling the company, said the wing sections he tested showed a "high quality" of craftsmanship and no evidence of fabric debonding.

Nevertheless, Stits said Wittman had clearly mixed two different, and incompatible, aircraft covering systems: Ceconite and PolyFiber. The instructions for using Ceconite call for the use of dope when covering plywood with Ceconite fabric, while the instruction manual for the Poly-Fiber system warns users not to use dope with Poly-Fiber fabric.

"If you use dope, you need to stay with Ceconite. or with a dope system," Stits said.

The Poly-Fiber instruction manual warns, in bold-faced type, that "Nitrate dope applied to the (Poly-Fiber) fabric first will interfere with the adhesion."

The manual further advises that "PolyBrush provides approximately twice the adhesion of nitrate dope on polyester fabric."

(Poly-Brush is a proprietary product developed by Stits to replace the nitrate and butyrate dopes that have been widely used since the earliest days of aviation to seal and tighten the fabric covering of airplanes.)

The Poly-Fiber manual also warns that "Finishing tapes applied with nitrate dope over a first coat of Poly-Brush . . . will eventually peel off in-flight."

"Here at Poly-Fiber we suggest that builders start with one covering system and stay with that system until completion," said PolyFiber Vice President Jon Goldenbaum.

"Mixing systems or substitutions almost always brings on problems."

Goldenbaum said Stits coatings have been flying on certified and Experimental aircraft for more than 30 years "with no problems when builders stay with the system.

"To quote Ray Stits," Goldenbaum said, "Read the manual and don't substitute materials."

Paul Poberezny, EAA founder and longtime Wittman friend, figures that during his long career as an airplane builder, Wittman probably covered or recovered 25 or 30 airplanes, most of them with cotton fabric and dope. "It's the way we used to do it," said Poberezny. "But you shouldn't mix dope with Poly-Fiber."

Poberezny, who is building a memorial at his home in Oshkosh to honor Wittman's contributions and inspiration, said the crash that killed his old friend should send a clear

message to other homebuilders.

"If you are going to use a product, and put your faith in it, then follow their process," he said.

"Sometime. "If you mix what you think is good enough because you've always done it that way, you could be mistaken."

The two-seat O and O Special had a fabric covered steel tube fuselage and fabric-covered plywood wings. Completed in 1986, it was powered by a 230-horsepower Continental O470 and had just over 200 hours on the airframe at the time it went down.

Poberezny, who also participated in the NTSB crash investigation, said the plane was capable of 230 knots, but was only cruising at about 130 knots when the accident happened.

In a matter of seconds, he said, the plane lost both wings and most of its tail, with the right wing departing first, hitting the vertical fin and then the left stabilizer, shearing a bolt.

The wreckage was scattered over a mile.

Although neither aileron was ever found, the NTSB determined that "damage and structural deformation was indicative of aileron/wing flutter."

The NTSB noted that wing fabric dope "was distressed or missing on the aft inboard portion of the left wing upper surface, and

along the entire length of the top of the main spar." At the same time, the NTSB noted, "large areas of dope were also missing from the left wing undersurface (and) the entire fabric covering on the upper and lower surfaces of the right wing had delaminated from the wing plywood skin.

"The doped finish was severely distressed and mottled," the NTSB reported. "The fabric covering had not been installed in accordance with the Poly-Fiber covering and paint manual; the plywood was bare and was not treated with the Poly-Brush compound."

The Poly-Fiber instruction manual calls for new plywood surfaces to be sealed with two coats of Poly-Brush before fabric is applied.

The Poly-Fiber system has an FAA supplementary type certificate (STC), which requires that instructions for its use be followed exactly when used on a type-certificated aircraft.

Like other homebuilt aircraft, however, Wittman's O and O Special was licensed in the Experimental category: and its builder was free to experiment.

In a career dating to the 1920s, Wittman had logged nearly 17,000 hours as a pilot. He built and piloted a number of air racers and other homebuilts, helped

develop the Formula V racing class, served for 38 years as manager of the Oshkosh airport, and was an early member and longtime director of the EAA.

A number of his airplanes, including the racers Chief Oshkosh and Bonzo, are on display at the EAA's Air Adventure Museum in Oshkosh. They will be housed in a new hangar being built in Wittman's honor on EAA's Pioneer Airport.

**PLEASE NOTE:
ADS DEADLINE IS THE
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PLACE YOUR ADS BY
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Classifieds Editor**

CLASSIFIEDS
05 February 96

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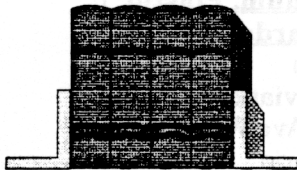
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1 February 1996

Airworthiness Manuals: -

- Airworthiness Manual Chapter 549
 Amateur built Aircraft, Transport Canada
- Airworthiness Manual Chapter 571
 Maintenance of Aeronautical products
 Transport Canada.

- Aircraft Operating Instructions - General, 1970, MoT.
- Amateur Built Aircraft Flight Testing
 Handbook, FAA Circular AC-90-89.

Reference Books:

- Amateur Built Aircraft Reference Manual 1990 (Revised),

Wm. E. Laundry, Canadian Aerosport Technical Committee.

- Choosing Your Homebuilt, The one you'll finish and Fly, 1991, by Ken Armstrong.

Catalogues:

- Aircraft Spruce and Specialty 1992-93.
- Univair
- Grass Roots Aviation, Oshawa
- Starrett Tools #28

- EAA Designee Newsletters, loose leaf binder
- EAA Building Tips, loose leaf binder, collected articles from 1974 to 1991.
- Formation Flying, chapter excerpted from CF flight training manual.

Technical Manuals:

- Continental C-Series Engine Overhaul
- Carburetor information and overhaul
- Magneto information and overhaul

Miscellaneous books & pocket books:

- Firefox, 1978, Craig Thomas
- Johnathon Livingston Seagull, 1973, Richard Bach
- Space Liner, 1981, Report on the Columbia's Voyage
- World of Aircraft, 1978, David Monday
- Zero to Airtime, 1974, Patrick Watson
- Weatherways, 1968, DoT

Video Tapes:

- Basic Aircraft Welding and Woodworking 1990 donated by Garry Fancy EAA 245
- Information on Zenair CH701 & CH600
- Kitfox
- EAA Fly-in

The Above Books, Manuals, Tapes may be borrowed by phoning — Andy Douma at 591-7622.