

**“Oil the News That’s Fit to Print!”**



**Spotlight on...**

## **Old Man Winter**

**(Or, Baby It’s Cold Out There!)**

**By Jim Stark**

Those of us in the cold winter climates have to deal with a little more discomfort and inconvenience to fly in the winter months than our friends in the south. But it’s worth it to skim aloft the white frozen landscape, seeing beautiful terrain that cannot look the same at any other time. Wings and engines work better, and some planes (at least the one I’m flying) climb faster in the cold of a winter day’s air. You can fly for hours in silky-soft air, as if riding a magic carpet.

If you can get the engine started.

Oil is as contrary to work with in the cold as numb fingers. SAE 50W oil flows like molasses. Its resistance to flow increases resistance of the engine’s parts to move, which is further sapped by a cold-weakened battery. Just when you thought you would be settling in to enjoy the manifold heater’s instant blast of warm air, the starter’s feeble efforts can no longer turn the prop and you are faced with dismounting back into the frigid air. Darn!

Engine preheat is a wonderful thing. So are heated hangars. Even without these conveniences, pilots determined to operate piston aircraft engines in extreme cold have found a way to do it. During WWII those big radials used on fighters and bombers used SAE 60W oil. Since they had to start in the unprotected cold, someone developed a gas injection system. Before shutdown, gas was injected into the oil sump and left to agitate for a short while before shutdown. Presto! Thin oil upon startup. The gas would cook back out of the oil as it agitated at operating temperature. Oils were simple straight-weights back then, and oil change intervals were short. While gas contamination of the oil is undesirable

## **The End of Carpal Tunnel**

As you probably know, we ask for all kinds of information on the oil slip that you send in with your sample. But how much of it is necessary? Do you really need to fill out all those blanks every time you send a sample in?



A good rule of thumb to remember is to let us know anything that changes from sample to sample. If you’ve already given us your engine serial number, aircraft and engine make and model, contact info, email address, and credit card number, you don’t need to fill that information in again. On the other hand, we do need your registration (N) number, hours on the engine and oil, make-up oil used, and any recent changes such as an overhaul or a problem you’ve encountered. The more information we have, the better-- so if in doubt, go ahead and write it down!

because, like any contaminant, it causes rapid oil oxidation, that system worked and helped save the world from Axis domination.

I've read about pilots who park in the extreme cold draining their engine oil into a bucket and carrying it inside with them for the night. Hardy souls, if you ask me, but pilots often are.

Most of us don't have to deal with such extremes. Multi-grade oil was a wonderful invention. 15W/50 and 20W/50 oils have the properties of SAE 15W and 20W oil when cold, yet still maintain a viscosity of a 50W oil at operating temperature. These oils work well in winter and aid greatly in starting a cold piston aircraft engine.



The other approach is to switch to a lighter straight-weight oil when old man winter comes to call. The flight schools we work with have too many aircraft to park indoors and yet they have to be available for operation regardless of the cold. These fleets typically switch to W65 (SAE 30W) oil in the winter. I can't tell you why — only that it works for them and they believe that method serves them best.

You might think the lighter straight-weight grades W80 and W65 wouldn't serve the engine's needs as well as W100 when cruising with oil temperatures in the green arc. The truth is, we find no difference in wear regardless of the oil grade in use. Lighter grade oil doesn't shorten an engine's life. It just makes the engine easier to start in the cold.

Coming soon to your own frozen piece of the planet, a beautiful personal view out the windscreen. Don't miss a minute of it! If she doesn't fire off the first time you try, you can always jump-start the ornery critter — assuming, of course, the plugs haven't frosted over.

## Report of the Month

**What's wrong with this Lycoming O-320 engine? See the caption below for an explanation. Don't look right away -- take a good look at the report first.**

(To learn where the various elements might be coming from, [click here.](#))

MI/HR ON OIL	46	UNIT/ LOCATION AVERAGES	45	32	26	29	UNIVERSAL AVERAGES
MI/HR ON UNIT	3,967		3,921	3,876	3,844	3,818	
SAMPLE DATE	12/30/04		9/25/04	7/21/04	4/6/04	1/3/04	
ALUMINUM	8	7	<b>10</b>	8	5	7	7
CHROMIUM	4	4	5	4	2	4	4
IRON	16	15	<b>16</b>	<b>13</b>	<b>11</b>	14	17
COPPER	1	1	1	1	1	1	2
LEAD	4649	3377	<b>4162</b>	<b>3412</b>	<b>2778</b>	3385	3608
TIN	1	1	2	1	1	1	1
MOLYBDENUM	0	0	0	0	0	0	0
NICKEL	2	1	2	1	1	1	1

Elements in Parts Per Million	POTASSIUM	0	0	0	0	0	0	0
	BORON	0	0	0	0	0	0	0
	SILICON	3	4	3	4	5	5	6
	SODIUM	0	1	1	0	1	0	1
	CALCIUM	0	1	0	0	0	0	2
	MAGNESIUM	0	0	0	0	0	0	0
	PHOSPHORUS	993	1165	848	995	1026	1071	1015
	ZINC	0	2	2	1	2	2	3
	BARIUM	0	0	0	0	0	0	0

Properties	TEST	cST VISCOSITY @ 40 C	SUS VISCOSITY@ 100 C	cST VISCOSITY@ 100 C	SUS VISCOSITY @ 210 F	FLASHPOINT IN F	FUEL %	ANTI- FREEZE %	WATER %	INSOLUBLES %
	VALUES SHOULD BE				86-105	>460	<1.0	-	0.0	<0.6
	TESTED VALUES WERE				91.2	440	1.0	-	0.0	0.5

**The engine itself looks fine -- it's the physical condition of the oil that bears attention. Old man winter strikes again -- it's common to find fuel in aircraft oil during the winter months, because it takes extra priming to get the engine started. That extra priming shows up as fuel in the oil, and it's not really a problem. You can get rid of fuel buildup by flying the pattern a few times prior to sampling. The heat and agitation of operation burn out any fuel and moisture that have accumulated in the oil.**

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