

# **OXFORD FLYING CLUB**

## **MEETING MINUTES**

19 March 2013

**Location:** 121 Restaurant, Woodbury, CT

**Attendance:** Regular: 13 Mentored Students: 0 Associates: 1 **Quorum:**<sup>1</sup> Yes X No    

Type		Member	Present
1	Assoc	Aulet, Maximillian	
2	Reg	Baggett, Scudder	
3	Reg	Baker, Matt	X
4	Assoc	Berwick, Kent	
5	Reg	Burmann, Bruce	
6	Assoc	Camejo, Christopher	
7	Reg	Carr, Tim	
8	Reg	Chromczak, Ed	X
9	Assoc (Honorary)	Dasilva, Domingos	
10	Reg	Dobbs, Glen	X
11	Reg	Dobbs, Kristi	X
12	Mentored Stu	Fazio, Mike	
13	Reg	Feeney, Richard	
14	Assoc	Feinman, Phil	
15	Assoc	Goudy, Jim	
16	Reg	Green, Geoffrey	
17	Reg	Heidrich, Don	
18	Med Assoc	Hill, Jeremy	

Type		Member	Present
Reg	Kit, Volodymyr		
Assoc	Kramer, Skyler		
Reg	Kramer, Tom		
Reg	Laine, George		
Mentored Stu	Lampart, Andrew		
Reg	Lyons, Hal		
Reg	Morici, John		
Assoc	Morrow, Bill		
Reg	Mowerman, Illya		
Reg	Nalband, Gary	X	
Reg	Noffke, Karl	X	
Reg	Oloff, Scott	X	
Reg	Osborne, Tom		
Reg	Palmatier, Bruce	X	
Assoc	Piwowarski, David		
Reg	Proulx, Brian	X	
Reg	Pugliese, Jay	X	
Reg	Richardson, Bruce		

Type		Member	Present
Reg	Robinson, Andy		
Reg	Rosen, Stewart	X	
Reg	Rosendahl, Eric		
Assoc	Sabot, Jay	X	
Assoc	Schindler, Leonard		
Reg	Schmecker, Ron	X	
Reg/Stu	Shaker, Ed		
Reg	Stevens, Burt		
Reg	Treanor, Jim		
Reg	Tremallo, Wayne		
Reg	Wilson, Richard	X	
Reg	Zipkin, David		

- **Gary N. called the meeting to order at 7:02 PM**
- **February 2013 minutes accepted unanimously**
- **Guests: Mark Mobilio and his Father John (also see membership report)**

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<sup>1</sup> Per By-Laws, quorum = one-third of regular plus non-mentored student members. In the event a quorum is not achieved, or is subsequently lost, the President will determine if a majority of the board is present. If so, then the meeting will become a Board Meeting.

**Membership Report:** No membership report, Don H. was not able to attend.

Here is a summary from last month effective March 2013:

- Updated attendance sheet to show:
  - Skyler Kramer – Mentored Student to Associate
  - Kent Berwick – Regular Member to Associate
  - Added Wayne Tremallo as Regular Member
- Prospects:
  - Mark & John Mobilio – Attended meeting, both may be interested in learning how to fly. Mark is 24 years old and just completed his undergrad in music so has free time to pursue flying.

**Treasurer's Report:** Presented by Kristi D. and accepted unanimously (see attached)

**MX Report:** Brian P. summarized and provided the following via email (see attached).  
Maintenance report accepted unanimously.

Highlights:

61H – Three unknown expenses were fixed. Muffler, new mag, new door seal.

84F – New trim wheel installed which now correctly holds wider cable. Oil sample had a few shards of metal (see unfinished business). Club also voted to use Reliant for annual.

62Y – Pitot static and transponder certification completed, found broken connector on voltage regulator causing intermittent ALT failure.

61H - Brian also mentioned that if you hear a buzzer noise coming from the tail that means the ELT has armed and you have 60 seconds to reset before it transmits to the satellites and they come looking for you (push button switch on pilots left side).

**Safety:** Jay S. presented. Jay is planning a spring event at Naugatuck Valley Community College around April. Safety report accepted unanimously.

**Abbreviated Long Range Planning Committee Summary, 3/19/2013:** Presented by Ed C. and accepted unanimously.

The planning items are arranged by timeframe and the upgrades of the ELTs will be scheduled during each plane's annual inspection. The costs will vary because of the existing ELT installation arrangements and are based on recent quotes.

The ADS-B installation sequence may change due to equipment availability and existing equipment in each plane. Perhaps doing one per year may improve our chance of getting them all completed before the avionics shops are overloaded with work. We've selected to start the ADS-

B installations in 2013 with N98819 because the funding will overlap into 2014 and allow sufficient time for payment of the three LRP items for N98819.

61H

Install LED "strobe" beacon [\$700] - WIP @ Reliant; expect compl. 4/5/13; half-cost of rotating beacon.  
(A)

84F (*annual inspection scheduled - May 2013*)

Upgrade ELT. [\$2K] (A)

62Y (*annual inspection scheduled - November 2013*)

Upgrade ELT. [\$2K] (A)

819 (*annual inspection scheduled - December 2013*)

Upgrade ELT. [\$2K] (A)

Install co-pilot seat inertia reel [\$1K] (A)

ADS-B see below

The ADS-B installations listed below are sequenced based on several considerations & are advertized prices parts only:

(1) Technology & product availability are constantly changing, & not all existing ADS-B "out" units are TSO'd for general aviation.

(2) Avionics shops will be overwhelmed with work by the end of 2019 because these installations must be done before 2020.

(3) Several planes have avionics units that should be removed during ADS-B installation (i.e. DME, ADF, Storm Scopes, portable GPS, traffic display)

819: Install ADS-B in/out collision avoidance avionics [\$4.5 K parts + \$2K est. labor = \$6.5K total] - non/WAAS GPS, Mode - C XPDR (A) 2013/4

84F: Install ADS-B in/out collision avoidance avionics [\$4K] Mode - C XPDR (B) 2015

61H: Install ADS-B in/out collision avoidance avionics [\$4K] Garmin GTX 330 Mode - S XPDR (B) 2017

62Y: Install ADS-B in/out collision avoidance avionics [\$4K] Garmin GTX 327 Mode - C XPDR; MX-20 display (C) 2019

### **Unfinished Business:**

- Pinch Hitter plan – Ron S. postponed until next month's meeting.

By-law change – Treasurer and MX compensation – Burt S. emailed the proposed By-Law changes to OFC membership in a timely fashion for consideration but was unable to attend the meeting (enjoying vacation).

The following was graciously provided by Burt after the meeting via email on January 22, 2013.

“To change article V, Section 3d and 3e from three hours to one hour for each plane that the club operates that month. Such compensation shall be a minimum of three hours per month and shall not reduce in the event the club elects to seasonally reduce the hourly rate in any given winter.”

A motion was presented by Ed C. to accept proposal as written and to make this retroactive to January 1, 2013. Proposal was seconded by Matt B. and the club voted unanimously to accept.

- Night landing postponed – Ron S. is rescheduling for first half of April pending availability of instructors.
- 84F oil analysis & engine status, Brian P. presented results of oil sample. A few metal chards were found in the oil filter. This type of metal is suspected coming from either the shoulder pin (holds piston to rod) rubbing on the cylinder wall or can be caused by high RPM on a very cold engine. No mechanical issues or safety concerns to worry about at this time. Will continue to monitor oil samples at 50hr. intervals. (See attached oil report).
- Jones Beach trip, Memorial Day Air show, 2013 – Jay S. is planning Saturday, May 25th for the trip and encourages all members and their family to attend. They had a great time last year and expect the same this year. He will be sending an email with all the details, looking for head count to plan transportation.

### **New Business:**

- April NVCC Safety speaker - Jay S. is planning Thursday, April 25<sup>th</sup> at 7:00 PM to arrange a seminar at NVCC. This would have to be acceptable to Ray Laramie from NVCC. Also trying to get Jims Adams from the FSDO (Flight Standards District Office) to sanction this as a safety meeting.

Included below an excerpt from Jay's email:

Attached is the bio for Larry Anglisano. I spoke to Larry this evening and he has agreed to be our guest speaker at NVCC in April.

Topic would be similar to an educational article that's currently running on AVweb, which initially ran in Aviation Safety magazine, titled "Avionics Gone Wild". Larry said he would follow a similar outline as this article and also touch upon a topic that's currently running in IFR Magazine on recognizing and dealing with EFIS failures.

Here is a link to that article:

[http://www.avweb.com/news/avionics/avionics\\_glass\\_panel\\_safety\\_208291-1.html](http://www.avweb.com/news/avionics/avionics_glass_panel_safety_208291-1.html)

- 10 way to improve your flying club – Some ideas discussed.
  - New member mentor program – Assign a club member to each new member to ensure a smooth transition into the club. Brian P. to follow-up.
  - Create a new member checklist – A guide for mentor and student to ensure all members have the same understanding on the way we do things, resources, safety, etc. Club hinted that Bruce P. and Rich W. were meant for this challenge.
- Safety day - head start? – Reminder to start thinking about Safety Day.
- 2013 insurance policy – Burt S. was unable to attend meeting (enjoying vacation).

The following was graciously provided by Burt after the meeting via email on January 22, 2013.

“As for our insurance, we went with the same coverage that we had last year. If we want to increase it to \$1mm smooth, we can do that at any time. We originally discussed having a bifurcated policy – those who wanted \$1mm smooth would be able to pay a premium but when I discussed it with Michelle, she thought it better to get a quote for the entire club which I did. I don’t have the difference before me here but I believe it was \$2k (or about \$50 per person) more.”

Burt will provide exact figures at next months meeting.

- OXC key cards / AC keys
  - Many members having problem getting gate cards. Matt Kelly has been contacted numerous times with him stating the system is down for various reasons.
  - Discussed if the OFC has a responsibility to send notice to Matt Kelly when members leave the club. Brian P. to talk to Matt Kelly to get a list of OFC members he shows in the club. OFC will ensure list is accurate and send Matt the update. No OFC policy changes have been discussed or implemented. Open for more discussions.

The following was graciously provided by Burt after the meeting via email on January 22, 2013.

“Matt Kelly (and more importantly, Pat Cook) get a new membership list every few months sent to them by the treasurer. They know who the new members are and what members have resigned. Historically, Matt has been very lax on requesting the return of any passes. I’ve attached a new list that is current to last week when Kristi was out here in Wyoming.”

- Discussed the policy of distributing AC keys to new members for all our aircraft vs. only keys for those AC used for training or signed off to fly. Club voted 7 to 5 in favor of giving all keys to new members including the hanger key.
- Other items as presented by membership

84F Engine options - Scott O. reviewed the advantages of the new roller tappet design published by Lycoming. (See attached, Lycoming Roller Tappet Technology FAQs)

Details below provided by Scott O via email.

“84F currently has a 1976 model 'A' engine and the model provided by Lycoming as a 0-time rebuilt engine is model 'E', which includes 4 generations of design improvements. Brian P. stated one improvement includes changes to the shoulder pin which he believes is the cause of the very limited aluminum shavings we are now seeing in 84F. This problem previously occurred in 84F whereby much more metal appeared in the oil filter. This ultimately required us to replace all 4 cylinders.”

The goal of the OFC is to have a direction to take in-case we need to proceed with an engine replacement\overhaul. Decision scheduled for next month’s meeting.

The club adjourned at 8:10 PM.

After the meeting Brian P. presented a 15 minute safety tutorial on “**Winter Ops**” to any members that wished to stay. Approx. 8 members took the offer.

Cold Engine Starting Technique:

Hot Engine Starting Technique:

Flooded Engine Starting Technique:

Shut Down Procedure:

Note: Refer to aircraft procedures for details.

Brian reminded all:

- Cranking duration (30 seconds on, 2 minutes off)
- Throttle to 1200 rpm before shutdown – burns off any deposits, prevents from forming
- Ground lean while taxing – prevents fouling plugs

Submitted by,  
Karl Noffke

#### Document History

Version	Date	Change Reference
1.0	23-Mar-2013	Original release
2.0	24-Mar-2013	Under Unfinished Business – Omitted who seconded the motion. <u>Changed from:</u> A motion was presented by Ed C. to accept proposal as written and to make this retroactive to January 1, 2013. The club voted unanimously to accept. <u>Changed to:</u> A motion was presented by Ed C. to accept proposal as written and to make this retroactive to January 1, 2013. Proposal was seconded by Matt B. and the club voted unanimously to accept.

# Oxford Flying Club

## Current Financial Status

### Balance Sheet

03/19/13

#### *Assets*

Cash		\$83,591
Accounts Receivables		\$14,166
	N8261H	\$82,000
	N4384F	\$51,000
	N98819	\$45,000
	N7362Y	\$97,000
Planes - (values based on AOPA Vref figures as of 1/1/2013)		\$275,000

**Total Assets:** \$372,756

#### *Liabilities*

Accounts Payable	-\$329
Bank Time	\$15,690
Loans	\$64,907
Engine & Prop Reserve* includes P&E on 7362Y to date	\$103,081

**Total Liabilities:** \$183,350

**Total Equity:** \$189,406

### Profit & Loss Statement

	February-13	YTD	
<b>Total Income</b>	\$9,290	\$32,675	<<< INPUT This
<b>Expenses</b>			
	Monthly	YTD	
N4384F <i>Annual in 05/12 @ \$8698</i>	\$212	\$6,254	\
N8261H <i>Annual in 03/13 @ 6169, ELT@1552</i>	\$78	\$14,683	> INPUT These
N98819 <i>Annual in 12/12 @ \$?</i>	\$90	\$5,210	/
N7362Y <i>Annual in 12/12 @ \$9498</i>	\$2,097	\$5,027	
Officers Flying Time	\$618	\$1,568	/
Other Expenses	\$1,104	\$1,764	<<< this is calculated
<b>Total Expenses:</b>	\$4,198	\$34,504	<<< this is calculated
<b>Net Income (before extraordinary costs):</b>	\$5,093	(\$1,829)	<<< INPUT This
<b>Net Income:</b>	<b>\$5,093</b>	<b>(\$1,829)</b>	

## **OFC Annual Inspections**

### **N4384F items - Annual 2013**

<b>Open Date</b>	<b>ID #</b>	<b>Issue</b>	<b>Resolution</b>	<b>Status</b>	<b>Assignee</b>
2/4/2013	851	AD 2013-02-13 and is tied to SB1245A	AD applicable to the Stabilator control cable for corrosion and fraying (includes trim wheel cable)	Annual	Reliant Air
2/4/2013	849	SB 1245A	A Technical Publication was sent per publication number SB 1245 - Stabilator Control System Inspection	Annual	Reliant Air
2/4/2013	847	SB 1244	A Technical Publication was sent per publication number SB 1244 - Aft Wing Attach Fitting Inspection Requirement	Annual	Reliant Air
2/4/2013	845	SB 1245A requires signoff	A Technical Publication was sent per publication number SB 1245A - Stabilator Control System Inspection Rev. A	Annual	Reliant Air
12/5/2012	824	Water coming in from door latch area		Annual	Reliant Air
7/28/2012	770	Water dripping from the overhead console	Door seal leaking around upper latch.	Annual	VIP
1/17/2012	703	Addition of ModeS, traffic, and a new GTX-330 Txpndr	We will trade in the current transponder to VIP and use towards the	Annual	VIP



# OFC Maintenance Report

## Active Issues - March 2013

Open Date	ID #	Issue	Resolution	Scheduled for	Status	Assigne
<b><u>N4384F</u></b>						
4/17/2012	733	Corrosion proofing	Process and procedure to be determined once aircraft is returned from		Pending	
<b><u>N7362Y</u></b>						
3/19/2013	862	Pitot static and transponder certification due			Pending	VIP
12/14/2012	826	During tire change, found gouges on inside of rims.	Logbook shows Jay Weiner did repeated tire changes. Rims now need to be replaced, structural integrity is compromised.		Open	Reliant Air
<b><u>N8261H</u></b>						
2/19/2013	854	Overhead Red light Rheostat moving around when turning, not tight and affects the light intensity	tighten rheo, test rheo for operation.		Open	Reliant Air
2/1/2013	841	Install a red beacon on the airplane (belly)	Reliant has ordered the parts in preparation for the annual		Open	Reliant Air
2/1/2013	837	Remove DME from 61H, not needed	Need new W&B.		Open	Reliant Air
4/17/2012	735	Corrosion proofing with CorrosionX or ACF50	Need to complete this		Open	Reliant Air

### **N98819**

<b>Open Date</b>	<b>ID #</b>	<b>Issue</b>	<b>Resolution</b>	<b>Scheduled for</b>	<b>Status</b>	<b>Assigne</b>
1/9/2013	836	Brake pads thin	Not sure why this was not caught at annual...we can make it through the winter months		Open	Club
4/17/2012	734	Corrosion proofing	Process and procedure to be determined once 84F has been completed		Pending	

# OFC Maintenance Report

## Closed Issues - March 2013

Open Date	ID #	Issue	Resolution	Status	Assigned	Closed Date
<b><u>N4384F</u></b>						
3/15/2013	860	new tail beacon light installed		Closed	Club	3/15/2013
3/3/2013	858	36hr oil change.	found a few strands of metal in the oil filter. Will continue to watch	Closed	Club	3/3/2013
3/5/2013	857	Trim wheel unspun again.	This time we replaced the trim wheel with a new Piper issued wheel. This appears to be the GOLDEN fix.	Closed	Reliant Air	3/8/2013
2/3/2013	843	Trim wheel cable	Identified that the new trim cable is thicker than the original causing it to overrun when making the last loop (full nose down). Piper states that this is normal...we may elect to use a cable meeting tighter tolerances.	Closed	Reliant Air	3/7/2013
1/7/2013	831	VSI showing -500ft decent on cold mornings. Once warmed up the Instrument is fine	Adjusted	Closed	Club	3/10/2013
<b><u>N7362Y</u></b>						
3/12/2013	859	50hr oil change	some flakes of metal in filter. Waiting on oil analysis	Closed	Club	3/12/2013

Open Date	ID #	Issue	Resolution	Status	Assigned	Clos e Date
2/28/2013	855	Mag problems and right brake pedal went to the floor	determined that the brake caliper o-rings were melted and the brake pads were gone. Just replaced the pads in December. Should get at least 1-yr out of pads. Someone is riding the brakes bad...	Closed	Reliant Air	3/1/2013
2/19/2013	852	Co-pilot side door will not open from the exterior		Closed	Club	2/26/2013
11/20/201	812	Pilot side fiberglass wingtip (underneath) has a crack and needs to be stop drilled	done	Closed	Club	3/10/2013
<b><u>N8261H</u></b>						
3/18/2013	861	Alternator issue (ALT flashing, showing a discharge)	loose connector on voltage regulator	Closed	Reliant Air	3/18/2013
3/4/2013	856	DG failed...tumbled several times in flight.	Overhauled existing DG at VIP	Closed	VIP	3/8/2013
2/19/2013	853	Overhead white light INOP	Replace bulb?	Closed	Reliant Air	3/1/2013
2/4/2013	850	AD 2013-02-13 and is tied to SB1245A	AD applicable to the Stabilator control cable for corrosion and fraying (includes trim wheel cable)	Closed	Reliant Air	3/1/2013
2/4/2013	848	SB 1245A	A Technical Publication was sent per publication number SB 1245 - Stabilator Control System Inspection	Closed	Reliant Air	3/1/2013

<b>Open Date</b>	<b>ID #</b>	<b>Issue</b>	<b>Resolution</b>	<b>Status</b>	<b>Assigned</b>	<b>Closure Date</b>
2/4/2013	846	SB 1244	A Technical Publication was sent per publication number SB 1244 - Aft Wing Attach Fitting Inspection Requirement	Closed	Reliant Air	3/1/2013
2/4/2013	844	SB 1245A requires signoff	A Technical Publication was sent per publication number SB 1245A - Stabilator Control System Inspection Rev. A	Closed	Reliant Air	3/1/2013
2/1/2013	842	Need new R/H magneto	Current mag is an original from 2007. Inspected 3x at 500hr intervals and guts replaced several times.	Closed	Reliant Air	3/1/2013
2/1/2013	839	Dark sooting on bottom cowl co-pilot side near muffler	Possible exhaust leak?	Closed	Reliant Air	3/1/2013
2/1/2013	838	Install new Airtex 406 ELT	Needs new W&B	Closed	Reliant Air	3/1/2013
1/7/2013	830	Door seal peeling off and damaged. Need new door seal	new seal installed	Closed	Reliant Air	3/1/2013

**March 18, 2013**

				Eng. TT	3771.00		
				TTAF	3771.00		
Annual Insp & hours to date	3416.54	354.46		SMOH	1718.13		
Tachometer Reading	3771.0	50hr Oil Due	34.00	TBO	281.87	prop	281.87
Engine Overhaul (11/30)	2052.87	oil samples	1/24/2013	Hobbs (calc)	4438.47		

Maintenance Overview									
1977 Piper Archer II - N4384F (28-7790026)									
March 18, 2013									
					Eng. TT	5298.20			
					TTAF	6673.20			
Annual Insp & hours to date	2172.6	273.40			SMOH	713.90			
Tachometer Reading	2446.0		50hr Oil Due	40.00	TBO	-88.90	prop	773.20	
Tach at Replacement	4042.00		oil samples	3/3/2013	Hobbs (calc)	7980.48			
					Estimated Engine replacement	Dec-2012			
					Expect to go 250 beyond TBO with new lycoming cylinders installed 8/2010	Oct-2013			

**March 18, 2013**

Annual Insp & hours to date	6730.90	41.10	TTAF	6772.00		
Tachometer Reading	6772.00		SMOH	1455.00		
Engine Overhaul	5317.00		TBO	545.00	prop	1295.3
			Hobbs (calc)	0.00		

Maintenance Overview							
1977 Cessna R182 - N7362Y (R18200127)							
March 18, 2013							
Annual Insp & hours to date	4477.00	93.00			TTAF	4570.00	4397.00 OFC in service
Tachometer Reading	4570.0		50hr Oil Due	40.0	SMOH	145.50	3237.50 overhauled engine hrs
Engine Overhaul (11/30)	3677.10		oil samples	3/12/2013	TBO	1107.10	3383.00 time on engine
					Hobbs (calc)	5378.89	
					Prop TBO	1385.00	or 8/2017
Estimated Engine replacement						Aug-2017	



# OIL REPORT

LAB NUMBER: F45094  
REPORT DATE: 3/12/2013  
CODE: 20/34

UNIT ID: N4384F  
CLIENT ID: 38450  
PAYMENT: CC: AmEx (Bulk)

UNIT	MAKE/MODEL:	Lycoming O-360-A4M	OIL TYPE & GRADE:	Aeroshell 15W/50
	FUEL TYPE:	Gasoline (Leaded)	OIL USE INTERVAL:	32 Hours
	ADDITIONAL INFO:	Piper PA-28 181 "Archer", Engine S/N L-22130-36A		

CLIENT	BRIAN PROULX	PHONE: (203) 558-5214
	15 MIDWAY DRIVE	FAX:
	MIDDLEBURY, CT 06762	ALT PHONE:
		EMAIL: flyn4fun@snet.net

COMMENTS	BRIAN: You marked "don't know" on the oil slip for the cylinder type, but if these are Lycoming factory cylinders, then they're steel. That agrees with what we're finding here, since chrome and nickel are both reading nice and low. Iron and copper both came down a little this time, thanks to the shorter oil run. Iron is from steel parts, and it typically tracks with time on the oil, so we expect it to read lower with less hours. Copper, as we've mentioned in the past, is due to the use of Aeroshell 15W/50, so it's not a problem, even though it's still above average. Nice report!
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	MI/HR on Oil	32	UNIT / LOCATION AVERAGES	50	49	50	50	42	UNIVERSAL AVERAGES
	MI/HR on Unit	705		2,403	625	528	483	229	
	Sample Date	03/03/13		12/16/12	11/08/12	07/12/12	06/07/12	07/26/11	
	Make Up Oil Added	2 qts		4 qts	3 qts	3 qts	3 qts	3 qts	
ELEMENTS IN PARTS PER MILLION	ALUMINUM	4	5	4	2	2	3	2	5
	CHROMIUM	2	5	2	2	2	2	2	4
	IRON	23	30	28	19	22	22	14	27
	COPPER	12	17	16	11	18	14	24	6
	LEAD	5129	4800	5858	4504	4125	3963	3197	4206
	TIN	0	1	0	1	0	2	1	1
	MOLYBDENUM	1	0	0	0	0	0	0	0
	NICKEL	1	2	1	0	1	1	1	2
	MANGANESE	0	0	0	0	0	0	0	0
	SILVER	0	0	0	0	0	0	0	0
	TITANIUM	0	0	0	0	0	0	0	0
	POTASSIUM	0	0	0	0	0	1	1	0
	BORON	7	1	1	1	1	0	0	0
	SILICON	3	6	3	2	4	4	6	5
	SODIUM	2	1	2	2	0	3	0	1
	CALCIUM	2	1	1	1	1	1	1	8
	MAGNESIUM	0	1	0	0	0	0	0	1
	PHOSPHORUS	1375	1127	1386	1223	1170	1092	1118	673
	ZINC	7	8	12	6	15	12	11	7
	BARIUM	0	0	0	0	0	0	0	0

Values  
Should Be\*

PROPERTIES	SUS Viscosity @ 210°F	87.6	82-105	90.7	91.5	89.4	91.5	94.0
	cSt Viscosity @ 100°C	17.40	16.0-21.8	18.16	18.35	17.84	18.35	18.94
	Flashpoint in °F	455	>440	480	475	465	470	490
	Fuel %	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5
	Antifreeze %	-	-	-	-	-	-	-
	Water %	0.0	<0.1	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.3	<0.6	0.4	0.4	0.4	0.4	0.3
	TBN							
	TAN							
	ISO Code							

\* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 www.blackstone-labs.com

Lycoming makes engine model specific kits. Please be sure of your engine model when ordering Lycoming cylinder kits.

#### ***Do Lycoming cylinders efficiently dissipate heat?***

Unlike other smooth surface cylinders, Lycoming cylinders have a rough surface that actually cools better by the effects of turbulence. By disturbing the cooling air, Lycoming factory cylinders actually dissipate heat more efficiently.

#### ***Are Lycoming cylinders hard?***

Some would have you believe that through hardening makes metal harder than Nitriding. This is incorrect. During manufacture, the nitride process creates a .025" thick armor of protection that outlives through hardening by a wide margin. All Lycoming cylinders are nitrided with choke bore except the O-235-C, which has straight bore cylinder walls.

#### ***Are Lycoming cylinders designed for high horsepower / high compression engines?***

Lycoming is the only manufacturer in the market today who has designed, manufactured and certified cylinders for the entire line of Lycoming engines. Higher compression and turbo-charging requires cylinder barrels and heads that can withstand higher pressures and temperatures. With thousands of these engines flying millions of miles every year, Lycoming cylinders' track record speaks for itself.

#### ***What warranties are provided with Lycoming cylinders?***

Lycoming offers a comprehensive 24 month (from the date of operation) warranty on all cylinders for engines other than the O-235 Series.

#### ***Why should I purchase Lycoming cylinders?***

Lycoming designed and built the cylinders and incorporated them into the engine as an entire system. Using anything but factory-engineered parts could compromise the long-term efficiency of the entire engine.

With 75 plus years of experience, a very competitive price and after-sale support worldwide, why would you purchase anything else?

#### ***Where are Lycoming distributors located?***

Lycoming has a well-established distribution network around the world. To find a distributor nearest you please visit the Lycoming web site at: [www.lycoming.textron.com](http://www.lycoming.textron.com)

## **Lycoming Roller Tappet Technology FAQs**

#### ***What are the benefits of roller tappets?***

The roller tappet eliminates the sliding motion between the cam and tappet, reducing wear and allowing the introduction of more advanced materials. Adding to its durability, the tappet's body and crankcase are designed to maintain proper alignment assuring the roller tappet cannot loosen or turn during engine use.

#### ***How do I get roller tappets in my engine?***

Roller tappets were introduced into the Lycoming aftermarket engine product line in July 2005. This was a phased introduction as Lycoming gradually changes over all applicable engine models. Please contact your local distributor for more information.

#### ***Can I get rollers in my NEW aircraft?***

Lycoming began installing roller tappets in OEM engines in June 2005. Ask your OEM dealer or salesperson if Lycoming roller tappets are in your aircraft of choice.

#### ***Are Lycoming roller tappets offered in every engine?***

Roller tappets were designed to replace the principle tappet of our four current tappet versions. This makes them available in the vast majority of our engine models. The balance of our engine models, which make up a small percentage of current production, will continue to use their current flat tappets.

#### ***Will roller tappets extend my TBO?***

The major factors limiting an engine's TBO are the wearing surfaces throughout the engine. While roller tappets make significant improvements in an engine's durability and reliability, they are only one factor in the formula to determine an engine's TBO and therefore will not extend TBO by themselves.

#### ***Will roller tappets affect my engines horsepower rating?***

No, roller tappets were designed as an enhancement to current engine models. In order to maintain current engine certification, roller tappets were not allowed to increase engine horsepower or performance.

#### ***How do I know an engine has roller tappets?***

Roller tappet-equipped engines are identified with an "E" suffix after the s/n dash number (Example – L-\*\*\*\*\*-48E). Furthermore, the ENPLs contain RT in front of the number (Example – ENPL-RT10052).

#### ***What parts are affected?***

- Roller Tappet
- Crankcase
- Pushrod
- Shroudtube
- Shroudtube Seals
- Camshaft



**What materials are the roller tappets made of?**

Traditional flat tappets are made of cast iron. The new roller tappets are created from a high carbon, wear-resistant steel that has been proven very successful in power plant applications.

**What mechanism is used to prevent improper rotation?**

Unlike other roller tappet designs, Lycoming's utilizes a more robust system to "square the case" that entails precisely machining the crankcase to accept the tappet body. This design eliminates improper rotation of the roller tappet.

**Are the hydraulics and/or oil mechanism different from traditional tappets systems?**

No, the roller tappet system utilizes the same hydraulic and oil system as existing engines.

**Can roller tappets be retrofitted into my current engine?**

No, large populations of existing engines do not possess a crankcase that has sufficient material in the tappet body area to allow the required machining to accept the new roller tappet. There is currently no Lycoming approved process to retrofit roller tappets in the field.

However, if you purchase a Lycoming Factory Overhaul, engine roller tappets are standard equipment with no additional charge.

**What makes Lycoming's roller tappets unique?**

Lycoming's roller tappets were the result of many hours of world-class engineering research and design efforts. Lycoming's partnership with a world-renowned roller tappet supplier also provided technical expertise in manufacturing processes.

**What type of testing did Lycoming do on the roller tappets?**

Lycoming documented over 15,000 hours of test cell time during the FAA certification testing of the roller tappet design. These tests included dynamometer, motoring and extreme condition cold-start tests.

Lycoming was also the leader in introducing roller tappets to the market. In the 2003 Reno Air Races, Jon Sharp's and Mike Jone's engines were equipped with roller tappets.

**What is the AEIO / IO-390 engine?**

The AEIO / IO-390 is Lycoming's largest normally aspirated 4 cylinder engine producing 210 horsepower. This 387 cubic inch engine is horizontally opposed, fuel injected and equipped with a counterweighted crankshaft for optimal performance.

The AEIO engine comes equipped with an aerobatic kit that is required for power aerobatics.

**What is the footprint of this engine versus the IO-360 (180hp)?**

The AEIO / IO-390 is 19.4" x 34.3" x 31" and weighs approximately 308 lbs. In comparison, an IO-360-B Series engine is 20.3" x 33.4" x 32.8" and weighs approximately 275 lbs. Different accessories may affect weight and size estimates.

**What is the footprint of this engine versus the IO-360 (200hp)?**

The AEIO / IO-390 is 19.4" x 34.3" x 31" and weighs approximately 308 lbs. In comparison, an IO-360-A Series engine is 19.4" x 34.3" x 31" and weighs approximately 308 lbs. When comparing these two engine families, the 390 Series provides an additional 10 horsepower with no additional weight or size. Different accessories may affect weight and size estimates.

**What is the footprint of this engine versus the IO-540 (235hp)?**

The AEIO / IO-390 is 19.4" x 34.3" x 31" and weighs approximately 308 lbs. In comparison, an IO-540-W Series engine is also 19.4" x 33.4" x 38.9" and weighs approximately 400 lbs. Different accessories may affect weight and size estimates.

**Where do the extra 30 cubic inches in an IO-390 come from versus an IO-360?**

The additional 30 cubic inches of displacement are derived from a larger cylinder bore. Several years ago, Lycoming developed the 580 Series engine, which incorporated a new, larger displacement cylinder. The 390 Series engine is a 4 cylinder version of the larger 580 Series.

**Why did Lycoming develop this engine family?**

The AEIO / IO-390 was developed and introduced into the non-certified market as a kit engine. Aircraft owners and pilots are always on the search for more power with less weight. Lycoming was able to deliver more horsepower with the same weight as the similar 200 horsepower, IO-360 Engines.

The first engine, an AEIO-390, was built and flown in an Extra aircraft with impressive results. The additional horsepower and torque were evident when performing aerobatic maneuvers.