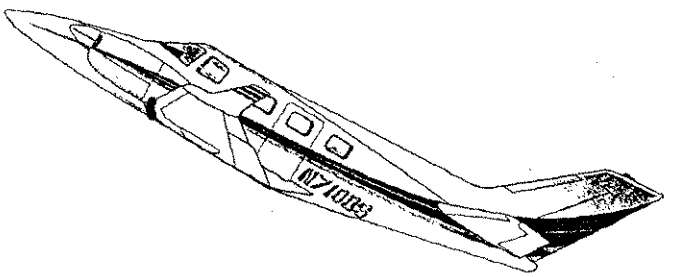

THE BEAUTIFUL Beechcraft DUKE

A COMPENDIUM OF HELPFUL HINTS

EXCLUSIVELY FOR DUKE FLYERS ASSOCIATION MEMBERS

INCLUDING SUGGESTIONS FOR SELF HELP, MAINTENANCE, RECOMMENDED SHOPS, COSTS, OPINIONS, PILOT TRAINING, OPERATION AND OBSERVATIONS

ABSTRACTED FROM THE DUKE ASSOCIATION WEB SITE

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EDITOR: Dane T Scag P594, A&P
Registered Professional Engineer

Issued December 31, 2003

INTRODUCTION

It certainly has been a labor of love preparing this manual. From the simplistic idea of just downloading the messages into my computer, it has become a major task to convert to "Word", decide which and where to delete, which to retain as a useful message, alphabetize, reduce the 1456 full page messages to just two hundred pages and then come up with an index of subjects. I have taken the liberty to correct some atrocious spelling, grammar and punctuations.

It was difficult and I admit, arbitrary where to place each message since they are so interrelated. For example you may be looking for some fuel flow advice. Should it be in "Fuel Flow/Instrument" or "Engine Power Settings" or somewhere else? If you don't readily see the subject of interest, look in some related topic.

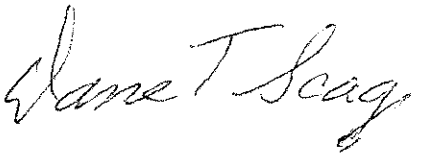
As you all know by now, Lycoming has almost destroyed the utility of our Dukes by their careless outsourcing the manufacture of valve lifters without rigid quality control, somewhere in the mid 1990s. There was a rush of desperate searching, testing, finger pointing at overhaul shops and just poor assumptions of the culprit for the horrendous number of camshaft/valve lifter failures. In retrospect it should have been obvious when reading and absorbing the messages from Gary Bongard, posted on November 2000, Cammack on March 2001, Zannini on December 2001 and Razook on January 2003.

Whether or not you agree on what initiated the multi-million dollar financial and time loss to the Duke owners, the "fix" is available by either the FWF Centri-lubed camshaft, Jerry Burnham's carbide tipped lifters or both. As one of the fellows recently said to me, " I can go to bed now, and sleep peacefully knowing I won't have a catastrophic failure at the next inspection or cross county flight.

I am offering this manual and perhaps a follow up in a year or so, at no cost for labor or time. The anticipated price is just for recovery of printing and shipping costs. My compensation is the renewal of smiles on the faces of happy and proud Duke owners when I see them again at Duke Flyins..

I hope you will find the contents of this manual useful to extend the pleasure of flying your Duke with renewed confidence. If you have any constructive criticism or comments, please fax: 262-544-1418 or e-mail: dane@scag.us.

With Warm regards to fellow Duke owners,



AD 02-10-13

Posted by **Ken Bowdish** on 10/12/03

There were several airplanes at the fly-in that did not have the exterior door operating procedures placard on the main cabin door. Jim Gorman made reference to this at our Saturday meeting as he thought this was an AD and needed to be complied with. I just looked it up and the AD says that within the next 100 hrs time in service after 7/8/02 which is the effective date of the AD or within the next 12 calendar months which ever occurs first the placard must be installed in accordance with Raytheon mandatory service bulletin SB 11-3404 issued June of 2001.
It would be a good idea to get this placard installed if you have not already done so. Some overzealous Fed might just give you a hard time about it

O-rings AD

Posted by **John Awalt** on 09/18/00

Emergency AD 2000-18-53 requires replacement of the o-ring on the oil filter converter plate before 50 hours of use on almost all Lycoming engines, (ours included). There does not seem to be enough o-rings in the distribution system to comply in a timely manner. Engines with more than 50 hours since new, 50 hours since OH or 50 hours since last replacement of the o-ring must have it replaced before further flight.

Gasket AD

Posted by **Jeff Gorman** on 09/19/00

If I am reading this AD correctly, (on the top of page 2), it says this AD is applicable only to engines that were manufactured new, rebuilt, overhauled or had the filter converter plate replaced after April 1, 1999.

AD

Posted by **Bill Unternaehrer** on 09/18/00

I don't have the AD in front of me so can't check the number but the one for the oil filter converter plate is for E series TIO-541s and ONLY for engines delivered since April (?) 1999. The AD from the FAA lists this date on the second page and the one from Lycoming lists the date on the front page.

"O" Rings

Posted by **Frank Singer** on 09/17/00

I am not sure I know what "O" Rings and what emergency AD you are talking about. But, my engine has been "wet" since Lycoming overhauled it a few years ago. During my recent annual I wanted to have the "O" Rings checked around each of the push rods. As it turned out seven out of twenty-four steel washers were missing between the push rod spring and the "O" Ring.
So much for Lycoming quality Control.

Air conditioner

Posted by **Kim Pratt** on 07/23/01

Air works fine on the ground. If turned on in flight the nacelle door starts to close then reopens, this continues as long as the air is on. Freon charge OK, door servo replaced. Anyone had the same problem?

Air conditioner

Posted by **Kim Pratt** on 07/24/01

The door appears to function correctly on the ground. In flight it constantly closes part way and then re opens. I can't use the air in flight as I'm afraid the constant cycling will burn out the motor.

Air Conditioner

Posted by **Shaker Razook** on 07/24/01

Your nacelle door should be open anytime you have selected air, The only difference between ground operation and in-flight is the distance the door comes open. In flight, you should have partial retraction which is controlled by a two position limit switch (as I recall).

Air Conditioner

Posted by **Shaker Razook** on 07/24/01

From what you are saying, it seems to me that your cam operated mechanism inside the rear nacelle is out of adjustment. I had a similar problem and remember the mechanic having a devil of a time adjusting this.

A/C Compressor

Posted by **Rob Terpening** on 07/22/00

My compressor has started to get noisy. It looks like a regular automotive type compressor. Does anyone know if there anything special about it, or will one from the auto parts store work?

AC compressor

Posted by **Tokm Baum** on 07/22/00

The compressor your looking for is a YORK, it was used on some ford's and light trucks. The difference is the hose connections yours are aircraft i.e. 37 degree fittings, the auto has standard 45 degree fittings. If you use your head assembly, you'll have the correct fittings. Since there is no PMA number on the auto compressor this becomes a owner installed part. the aircraft cannot be sold with unapproved parts. But you as the owner/operator can use it in part 91 ops.

Air Conditioner door actuator

Posted by **Al Seither** on 07/25/03

My A/C door actuator on the right engine seems to have a mind of its own. When you turn on the A/C it opens part way on the ground then opens all the way 3-4 mins later (sometimes) Then it closes when it feels like it as well. Has anyone every had this rebuilt like the cowl flap actuator??? Or know where to send it or get it overhauled reasonably. Thanks Al

A/C Door Actuator

Posted by **Robert Hoffman** on 08/03/03

Al: Have you consulted the Duke Series 60 Wiring Diagram Manual? The wiring manual indicates the nacelle scoop actuator is powered through a nacelle scoop retract limit switch, an extend limit switch, and the RH landing gear safety switch. These switches, according to the manual, appear to be more accessible, thus easier to trouble shoot than pulling the actuator. My guess is that at least one of these switches are causing your problem. Regards, Bob Hoffman

Air Conditioner door Actuator

Posted by **Norm Gruczelak** on 11/20/01

The air conditioner door on top of the right hand engine nacelle has begun to stick in the "Ground" large opening mode even when the air conditioner is turned off on the ground or in flight. In flight it will sometimes go into the "flying" small opening mode, at which time it will work properly when the air conditioner is turned on or off. Any ideas or suggestions?

A/C CONVERSION

Posted by **Ralph Cohen** on 05/04/01

While I haven't tried this myself, I have been told that there is a substitute for R-12 called Freeze 12. It sells for about $1.00 per pound. (I paid $800.00 for 25 lbs. of R-12, and was happy to get it!).

An A/C mechanic tells me that you can add Freeze 12 to an r 12 system with no conversion! He said that he personally had never done it. He told me that he always evacuated the system and filled totally with Freeze 12.

If you're interested, I'll get the specifics. I looked into R 134a conversion. I believe it works well, but it requires a lot of work!

a/c conversion

Posted by **steve faber** on 05/04/01

There is a conversion kit (freon r12 to r134a) available from Steinbach & Associates. 817-752-6773, www.texnet.net/steinbach/

Compressor

Posted by **steve faber** on 08/05/00

Beech has part in stock. p/n 60-555041-1 Price under $700.00. Lets keep all Dukes in top shape and don't try to skimp. In the long run the Dukes will continue to have great value.

Ball Bearings for Condenser Blower

Posted by **Ron Donley** on 09/20/03

Can anyone tell me where I can buy replacement bearings (#K271-200SL) for my condenser blower (#60-384006) Thanks!

Bearings

Posted by **Roman Stevens** on 09/20/03

I took my condenser blower to an auto generator repair facility and they replaced the bearings with a sealed unit (unlike Beech) Cost about $180

Weather Strip

Posted by **Mark Allen** on 11/16/03

Greg--- Which cover do you use? The only decent one I have seen is made by Bruces Custom Covers.

Weatherstrip and cover

Posted by **Greg Jellinek** on 11/21/03

That's the one. It covers the cabin from the base of the windscreen back past the last sidewall window. Fastens with a couple of cinch straps under the hull. We keep the plane hangared, but take the cover along when on the road. It is a handful to get on the plane in any kind of wind. Just about impossible in a "solo" situation.

Aircraft Cover

Posted by **Ron Donley** on 11/21/03

I would also give the Bruce's cover a very high recommendation. It's a perfect fit with wide straps and plastic snap closures - quite good looking!

Floor drains

Posted by **Earle Olson** on 11/17/03

The rail above the door makes a big difference. The cover made by Bruce is the biggest help in heavy rain. When you are pressurized the rain stays out but on the ramp it finds it's way in. It is important for the floor drains to be open and since they are rubber they may have become stiff and are not allowing water to get out.

Santa Monica Noise Abatement

Posted by **Ron Donley** on 12/22/03

I had the same experience last year after departing KSMO on an IFR flight plan! After receiving my notice, I called the controlling agency and explained that I was "maintaining runway heading" as instructed by ATC and maintaining takeoff power until reaching a safe altitude. They informed me that a Duke will violate their noise limits every time.

They provided three possible solutions:
1. Fly the recommended VFR noise abatement route no matter what ATC tells you to do. (They cannot publicly suggest this since it violate ATC rules)
2. Reduce power and/or climb at a very steep angle as soon as you break ground. (They cannot publicly recommend this procedure as it violates aircraft manual procedures, common sense, etc. and they would not want the liability.)
They pointed out that both 1 and 2 would increase the distance between the sensors and the aircraft, and therefore keep the recorded noise below the limits.
3. Fly somewhere other than KSMO

#3 was, by far, the recommendation which they seemed to prefer!

I was invited to fly into KSMO again to try whatever method I chose to minimize the recorded noise level. They told me to tell the tower that it was a test run, and that they would tell me immediately of the detected noise levels. HOWEVER, this test run would not be exempted from fines should it exceed the level. Since it would be my second violation, the fine would run into thousands of dollars.(I cannot remember the exact amount)

As a result, I do not plan to fly my Duke to KSMO in the future! I should point out that airliners, and most other large jets, are confronted with this problem daily at most congested area airports, and opt for recommendation #2, but I'm not sure we have the extra power reserve that they do! It seems like a very unsafe maneuver in a Duke!

Santa Monica Airport / Noise

Posted by **Patrick West**

I flew in and out of Santa Monica (KSMO) recently. A week later, I received something rather official looking in the mail from Santa Monica. Turns out I violated the noise ordinance on my departure. They take their noise very seriously in Santa Monica!

My question is does anyone routinely fly their Duke in and out of this airport. If so, what type of noise abatement techniques do you use? I was on an IFR departure and did not fly over the golf course as their VFR noise procedure suggests.

KSMO

Posted by **Bill Black** on 12/23/03

Years ago I gave up on KSMO Duke operation because every time I received a noise violation (but never fined!). KVNY is an excellent alternative option. They have superb FBO's (Petersen, for example), and are only a few minutes farther away by rental car from LA's Westside. Also, KVNY has a full ILS whereas KSMO's instrument approach is a very squirrelly circle-to-land. (Local operators hate it when the weather's at minimums and invariably cheat at CULVE so they can make it straight-in.) The long and the short of this is that Duke operators are far better off in every way at Van Nuys than at Santa Monica. Season's Greetings to one and all!

Sandman air/oil sep

Posted by **Ken Bowdish** on 08/05/03

I talked to Bill Sandman at OSH last week. He gave me a copy of the STC on this air/oil sep that covers the Lyc TIO 541 E1C4 engine. The installation instructions according to Mr. Sandman are "generic in nature", I read enough of the instructions to agree with that statement.
I don't know how you would mount this sep on this engine according to the instruction

Air Oil Separator

Posted by **Rob Terpening** on 01/09/01

Does the Duke have an air oil separator? Is there an STC for one? Any tips for keeping oil in the engine and not on the landing gear.

Air-oil separator

Posted by **Ralph Cohen** on 01/09/01

William Sandman owns a company called m-20, Inc. He markets a separator which he claimed to be STC'd for the Duke. I ordered a pair at the cost of $280.00. This was after personally speaking with him, and being assured the Duke was covered by his STC. When I received the units, they were NOT STC'd for the Duke. I called Sandman and was told to wait a few days and he would get the Duke added. He never got approval. When I returned the units he refused to refund shipping charges, so I was out and he would never return another call. I decided to replace the cylinders on that engine, and now it doesn't blow any oil.

Air/oil sep

Posted by **Ken Bowdish** on 08/06/03

Ralph
You are exactly correct. In addition to the gravity feed the air/oil separator must stand upright to work. The "generic" instructions don't tell you how to do that. Leave's me with lots of questions.

If the engine isn't creating case pressure, and if it is that issue should be corrected anyway, I don't think the engine needs an air/oil separator.

One thing we should all be checking at every annual is the breather drain line. Disconnect the line at the engine and blow shop air thru it making sure that line is open and clear. The hose lays flat enough that sludge can and will accumulate in the line to the point that it will clog up solid. That of course creates back pressure in the engine, which causes all kinds of problems

Sandman

Posted by **Ralph Cohen** on 07/25/03

I bought the separator after being assured by Bill Sandman that it was approved. When I received the STC; It did not apply to the Duke. He promised the STC was coming soon, but it never did. When I returned the separators he charged me freight! I suggest you stay away.

If you still want to try, see if the STC has been upgraded to include a 385 hp engine. The separators require a return to the crankcase. Sandman suggested a return through the valve covers.

Air/oil separator

Posted by **Ken Bowdish** on 07/20/03

I got a card in the mail advertising air/oil separators. I called this guy to see if he had one for the TIO 541 E1C4 engine on the Duke and he said yes. Anybody bought one of these things and had it installed? If so what do you think of it?

The company's name is M-20 Oil Separators LLC 5612 NW 38th Terrace Boca Raton, FLA 33496 Bill Sandman 866 620 2667

Aviation consumer-Re Air Oil Sep

Posted by **Ralph Cohen** on 07/26/03

I'm not sure about today, but I know for certain that the unit was NOT STC'd in Sept 2000 for the Duke. He sold it to me, sent it to me knowing it was for a Duke. When I read the STC it was only approved for engines 200 hp or less.

Air/Oil

Posted by **Dane Scag** on 07/21/03

Got the same ad.

In talking with Gerhard Kendler, P564, he said he always had some oil blow out the breather tube until he dropped the stick level to 7 quarts. The blowout virtually stopped and the landing gear stays much cleaner. When he changes oil, he puts in 8 quarts, one for the oil filter. He noted that the Lycoming manual says the minimum recommended oil level is 4 quarts. This would cause me concern because I would have no buffer volume in case of a problem.

True Air Speed

Posted by **Joe Konicki** on 08/04/03

I currently fly at 30" 2500 RPM (intercooled) indicating 167KTs at 10K for a TAS of roughly 198 Kts. This power setting burns right at 39 GPH with a TIT of 1520 deg F. Using similar pwr settings at 17K, IAS drops a few knots to 164 or so but TAS rises to 220 Kts give or take a knot. TIT bumps up to 1530 and fuel flow is 40 GPH. Now I also fly a 56TC not a Duke so my plane is probably a hair quicker. The speed continues to rise as I go higher up to 237-238 Kts at 25-27K density alt burning 41-42GPH. At 75% power (50GPH) it'll hit the 250 KT TAS mark easily.

True Air Speed

Posted by **Bob Stan** on 08/04/03

Richard: I haven't talked to a Duke Owner yet who has made the "book" numbers. That said, your TAS seems awful low. In my Duke P-404, at 32" and 2500 RPM at FL 210, I true out at 208 to 212 knots depending on weight, temperature, and CG. Obvious items to check are those giving drag, such as cowl flap doors, gear doors, gear itself, retractable step. If your engines are run out or have very low compression, maybe you are loosing power there, but 35 knots seems like a lot. Let us know at the fly in what you find.

Speeds

Posted by **Dean Robert** on 06/28/01

First of all, thank you to all who have responded to my questions. As a new Duke owner, you are a great resource.
My Duke has American intercoolers and Boundary Layer VGs, winglets and aft body strakes. My biggest disappointment so far with this aircraft is it burns more fuel and is slower than any of the book numbers.
Is this normal? I thought these aftermarket items would enhance performance, not detract!
Also, I need to purchase some oxygen masks- any thoughts on a vendor?

Speeds

Posted by John Awalt on 07/03/01

Dean, we have had our B60 for about 3 years now and at first I was disappointed with airspeed also. However, if you check the book, you will notice the test weight is about 6125 lbs. At that weight, we can make book at all altitudes and temps, but the fuel flow is something else. It just won't do it. P533 is intercooled with winglets, strakes and Vgs, and the fuel flow is always much higher than book. Remember, with intercoolers 30" of manifold pressure is the same as 32" book value. Our fuel flow at max gross, FL180, -10C OAT, with 30X2500 power setting and about 200 TAS is 21 gal/side.

Speeds

Posted by Randall Kerns on 06/29/01

I have a Duke with winglets, vg's, spoilers, and intercoolers. I don't compare my true airspeed to the book on every flight, however every time I do I am right on the book regarding airspeed. Regarding fuel I am not close to book numbers at any altitude or power setting. I have installed digital TIT and also have JPI TIT and do not run temperatures hotter than 820 TIT. My fuel flows at 30" 2500 rpm below 12,000 are 20.5-21.5 and will go up from there to above 20,000 at 24-25.
Hope this is of some help.

Alternator conversion

Posted by Wayne Martin on 05/31/01

Had alternator conversion done last year at annual. Have had continuous problem with annunciator lights showing failure since. Alternators are both working but lights indicate failure. Does anyone have any suggestions for cure. Local maintenance shop is stumped.

Alternator conversion

Posted by Joe Konicki on 06/12/01

The problem is likely a result of the alternator not being configured correctly for your electrical system. If your alternator is operating fine but the alt-out light stays illuminated that means you likely have an alternator which is missing the internal relay wire. It is simply a wire which runs from the stator winding to one of the normally unused screw posts. The problem is that Beech uses this screw post connection to power the relay which controls the alt-out light. You also may have a faulty relay which is hung up and won't reset. This was a big lesson learned for me when I had to replace an alternator that went bad. The new alternator had the same part#, and it powered up everything correctly but the alt-out light would stay illuminated. It took a week of phone calls and talks w/technicians that make the alternators to find out what the problem was.

Annual Inspection Ease

Posted by Glenn Adams on 07/11/03

For those who have to travel to bring their Duke in for annual or other maintenance, we now have a loaner Duke to use while your Duke is down. We also have an extensive supply of parts, new and used and are extending our $2200 annual special until the end of the summer. Royal air 318 459-9000

P-471 Annual etc.

Posted by **Roger Storch - N333RG** on 02/24/03

Last Oct. Duke N333RG was taken out of service for, you guessed it, Cam & lifter Problems, and had an engine O/H at FWF. During that time an extensive annual was completed at Stevens Maint. in Lexington, Ky. The tab was in excess of $40,000. This included R&R for the engine, new fuel bladders for the left tanks, wing bolt replacements, new vac system manifold valve, and installation of an alternator conversion kit which took 168 hrs. vs 45 hrs. recommended by FWF. Has anyone else seen this? Also included was the installation of a JPI System which took 100 hrs. to install vs 35 hrs. recommended. Finally, on Jan. 21, N333RG was back in service and flown to Sky Harbour in Canada for new paint & interior. During an NDF/GPS missed approach to Goodrich with blowing snow and 400& about 1/2 mile, the Sandel HSI started to tumble; lucky I had a co-pilot who had a good right panel and was able to get us into a hold as we iced up. After diverting to Michigan for lunch and waiting for weather to clear, we returned to Goodrich only to have my new Left Alternator quit. As of today the Duke is still in Canada due to a 3 week slip in the paint schedule. When it returns it will have a sex change to N7CR. I hope I remember how to fly.

Annual Inspection

Posted by **Jim Gorman** on 06/12/03

We recently took our Duke to Royal Air in Shreveport LA for the annual. Could not be more pleased with the results. For the first time in over two years our prop sync finally works, and they found other items previous inspections had missed. They are very knowledgeable on the airplane. After all, they maintain 10 Dukes. See newsletter 03-1, page 3. Jim

Annual check list

Posted by **Mike McCallum** on 07/22/02

I am a new member looking for a good annual check list if anyone has such a list I would love a copy.Thanks

Annual check list

Posted by **steve faber** on 07/23/02

In the maintenance manual there is a checklist for the annual. It is extensive and thorough.
Being a new Duke owner do not be surprised of all the items that previous owners have not kept up with. It took me about two years to catch up. Once there, you will find that the Duke is not as bad as you might have heard.
Good Luck!

The $32,000 annual inspection

Posted by **Mark Allen** on 03/07/01

Hi Fellow Duke Pilots-
I currently have my ship (P220) in for annual. In addition to a new forward fuel bladder & rod-end issues on control surfaces, I have joined the ranks of those with spalling problems.
The inspector discovered that the right engine has "severe" galling on the cam shaft and lifter damage. Their estimate is that I was less than 10 hours from an in-flight failure. This engine was majored about 20 months ago (220 hours SMOH). Looks like repairs will be north of $22,000. This one hurts, bad!! So, instead of a $10,000 annual I am getting a $32,000 annual, and the worst part is 8-10 weeks down time.

Any advice on dealing with Lycoming on warranty parts? My shop is dealing with them, and so far they have been pretty unresponsive, uncooperative and indifferent.
Sincerely,
"Grounded until further notice"

Annuals

Posted by **Mark Allen** on 02/23/01

Brower Aircraft at Ramona (KRNM) (San Diego) has maintained and annualed my ship (P-220) for some time. Glen Kratz, the Chief of Maintenance, knows Dukes pretty well, although he does not claim to be an expert. They maintain several. They have never screwed me over, are always on time, and have fair rates. Not the biggest shop, but you get personal attention and fair & square dealing. They do a lot of Part 135 heavy maintenance. I would suggest you call Glen (760) 789-3593 and speak to him. Tell him I sent you. I don't think you would be disappointed.
There is also a radio shop right next door who is used to working on Dukes as well who can clear minor radio squawks while Glen does the annual.
If you want to chat with me, I can be reached at (619) 252-3875, anytime.

Inspection

Posted by **Jacobs,John** on 02/21/01

Although they are not in California, Mexia Tx has a strong reputation and will take you to DFW to get home and back. Very fair rates ($42/hr) and a lot of experience with Dukes. They performed ours as well as several other Duke Flyers and did fine jobs. #254-562-2857

Annual Costs

Posted by **Larry O'Connor** on 12/07/00

I've had my annual done at General Aviation Services in October. My understanding is that the Duke Annual Inspection requires 40-41 hours and the rate that I paid was $55/hr. Additional costs are accrued if repairs or replacements are required. It's kind of like getting a tune up on a car. The initial prices includes oil change, plugs, timing, systems check-both airframe and engines, and so on.

N333RG Annual

Posted by **Roger Storch** on 12/05/00

Just completed an annual on N333RG. The Flat Rated hours that Steven's Aviation LEX. Charged this year were 65@$65/hr. for a total of $4,225, compared to 54 Flat Rated last year at $50/hr. for a total of $2,700. Is there a standard Flat Rated number of hours for the Duke, what is that number? Other squawks brought the total annual cost up to $10,000, including a $1,900 rebuilt generator. Also in conjunction with the annual I installed a Garmin Audio Panel, Garmin 530 & 430 GPS's, along with a Sandel Display, and an additional Electric Attitude Indicator. Now I just need to learn how to use all the new toys.

Annuals

Posted by **Larry O'Connor** on 11/06/00

One of the questions on the last Duke Questioneer asked, in essence, what was the cost of your last annual and were you satisfied with your maintenance facility. There were a number of statements of non-satisfaction along with relatively high costing annuals.

The annual on my Duke has just completed. This was the 4th annual that I've had at this shop and I have been totally pleased with the work performed and the overall costs. Fortunately the owner of this shop has flown Dukes for years both personally and also operating under Part 135. In addition he maintains other local Dukes. This means that when I mention a rattle, strange vibration, or something else that defies logic, I don't get the typical blank stare that you tend to get from the many "parts changers" that work on our airplanes. Instead I get the "been there done that" reaction whether the squawk relates to electrical, engine, or general aircraft systems. Case in point--I had a vibration that two local FBOs checked, replaced some parts and did not come close to resolving the problem. I flew the plane up for the annual and within FIVE MINUTES the problem was identified and later corrected.

I don't do commercials, but if you want first class knowledgeable service consider General Aviation Services at the Flying Cloud Airport in the Minneapolis Area. Gary Bongard (612-944-2628) can "talk the talk and walk the walk" when it comes to our Dukes. As an aside, an equally excellent avionics shop is also located field.

C IV Autopilot

Posted by **Eberhard Burghalter** on 04/17/03

Patrick,
for me the C IV is the best they ever did for the Duke. I like this autopilot a lot and would not want to change it. Almost all the features you require can be added.
Altitude preselect: Yes there is a way and it works great. What you need is a servoed encoding altimeter, a King Preselect panel and a little "magic box" which we can make. What it does - in simple terms - is to automatically press alt hold on reaching the dialed in altitude. Since we did not certify it, it can be removed without disturbing the autopilot function in any way. It works great in my plane !

The GPSS functionality can easily be added by installing a Sandel electronic HSI or a KING EFIS. I have the Sandel and that thing really works nice.

What you can't have with the original setup is VSI select which I do not like anyway.

I replaced a CIII with an S-Tec 65

Posted by **JohnTye** on 04/15/03

I replaced the Century III in my Duke with an S-Tec 65 about three years ago. I do not have the GPSS, yet, since it was not available at the time, but have altitude and VS preselect, as well as the yaw damper. It has a few interesting quirks, but as a rate based unit is a great leap forward over the old analog Century units. If you install the yaw damper, have the shop check the vintage of the wiring diagrams, since the original version was backwards (long painful story...). This is about the only game in town for a Duke, but it works great and the price is about as reasonable as anything for an airplane. Give me a call if you want to discuss it further. --John Tye

Autopilot upgrade

Posted by **Dane Scag** on 04/15/03

Hi Pat and Joe:

I've had a variety of autopilots in my aircrafts from Citation Jets to KingAirs to Barons and Dukes. The Century IV is one of the worse. It may randomly command an up-pitch or down-pitch, which can be scary. But after all it is 30 year old technology (all analog).

The S-tec 65 is the very best system for our type of airplane. It will do all of the options you list and more. The only catch is cost. Be prepared for the following:

Discounted System cost $13,500
Installation kit for the Duke $2,000
Labor from 100 to 150 hours $10,000

Please use an avionics shop that has installed several S-tec systems. Then ask owners about their satisfaction with the installation.
There are many shops that will do the job for a lower cost, but I wouldn't let them put air in my tires much less than tamper with my pride and joy. Good Luck
Dane

Autopilot upgrade

Posted by **Patrick West** on 04/14/03

Do any members have a recommendation on an autopilot that has Altitude preselect, VSI select and GPSS?

Currently have the Century IV, and am told that this model does not support the above listed upgrades.

My avionics shop is recommending the S-Tec 65. Any thoughts on this?

S-Tec 65

Posted by **Joe Hosteny (P-507)** on 04/15/03

Patrick -- I am looking at the same thing. Meggitt/S-Tec has a listing of STCs for the Duke. If I am reading it correctly, the 65 is the correct one for the Duke. I will pass on any info I collect, because I am thinking about the same.

Cent. IV Autopilot

Posted by **Lars Lundgren** on 05/20/01

I have had a problem with my autopilot for the last year, and have had no success in finding a solution to the problem.
While flying at any altitude, autopilot on, alt. hold on, nav or heading mode on, suddenly the steering bars drops to max. Deflection and the plane dives following the bars. While flying without the autopilot engaged, but the FD. on, the same thing occurs, the bars drops to max deflection.
This condition is very irregular, ten to twenty hours between occurrences, then it can occur two to three times within thirty minutes.
The "box" has been back to Century several times with No Fault Found.
Would appreciate suggestions how to fix the problem,

Century IV

Posted by **Tom Clements** on 05/23/01

Two quick thoughts, Lars.....First, like Shaker said, try to determine if it ever happens when using Attitude Hold as the vertical mode, not Altitude Hold. If it never occurs except when ALT is engaged, I'd obviously suspect something wrong in the altitude hold system. Second, if it occurs even in ATT, I would suspect a faulty ADI, Attitude Director Indicator. Perhaps it is suddenly "telling" the box an erroneously high pitch attitude, so the bars are diving to try to get back to the "proper" attitude.
Good luck. These things can be frustratingly difficult to pinpoint.

Century IV

Posted by **Shaker Razook** on 05/22/01

Have you tried isolating the altitude hold function by use of the "pitch wheel" and not engaging altitude hold. If no re-occurence, it's obviously in your altitude sensor. The IV uses two different sensors (I believe one is a chamber and the other a diode) depending on year of manufacture. If I'm not mistaken, Bob Power at some time in the past, had that altitude hold modified.....you might check with him. Good luck.

Autopilot

Posted by **Robert Mann** on 07/26/00

Read some of the messages regarding CIV autopilot; why doesn't the KFC 250 function as well. There seems to be significant wing walk at altitudes above 12000 ft. They relate this to decreasing cable tensions with altitude, but the CIV should have the same problem. The KFC 250 also oscillates excessively in turbulence with the oscillations taking a long time to dampen. The autopilot is well maintained. Allied signal even sent one of their specialist to troubleshoot. Basically related it to cable tensions. Does anyone's KFC 250 work at altitude without the wingwalk (rocking motion)?.

Autopilot

Posted by **Tom Comerford** on 07/26/00

I have the same problem and my avionics guy does not know how to fix it. He doesn't seem to have any idea about what to do. This group services very few Dukes, but lots of King Airs, some with KFC 250s, and they don't have this problem.

I hear that the winglets and strakes help and I am thinking about trying them. Any other suggestions?

KFC-250

Posted by **Bill Unternaehrer** on 08/09/00

I believe the wing walk is associated with the autopilot bridle cable tension. Our Duke has a Form 337 done by the King people in Olathe to change the tension from 10 +/- 2 pounds to 2 pounds less than the primary aileron cable as measured before the autopilot bridle is attached. If we keep it up to the correct tension then we do not get wing walk. The pitch oscillation is the same effect. Cable tension seems to be the key.
Here in Arizona the philosophy with Barons was to adjust the cables on the low side of the specification because heating of the aluminum airframe would tighten the steel cables. But with the Duke flying in the higher and colder altitudes the cable tensions need to be set at the high end of the specifications. Would like to hear from others who have had the problem solved in other ways.

Cable tensions

Posted by **Robert Mann** on 08/10/00

Unfortunately when you do that the bridle cable is being used as a tensioner. As the airplane cools with altitude, the aileron cable slackens more than the bridle cable so the bridle cable acts as a tensioner, something it was not really intended for. It does help some though. You can also have the aileron cable tensions set when it is 30 degrees outside this also helps a lot. I am wondering whether the after market strakes would help.

Century IV

Posted by **Bob Stan** on 07/05/00

The autopilot has been great. I had a brief problem, solved by replacing the power supply board. Muncie Aviation in Indiana is really good at working on these.

CIV Alt Preselect retrofit

Posted by **Eberhard Burghalter** on 08/02/00

First a word of caution: this installation is not and will not be certified. Century gives no support
What you need:
A servoed encoding altimeter which gives out baro corrected altitude like KING KEA 346 or similar Colesman (about US $ 7000-8000 OHC)
A KING KAS 297 Alt preselect without the vertical speed function (about US $ 3000 OHC)
A cable
An avionics shop that is creative
Cable goes into the System Coupler Box and performs the same function as you would do pressing the ALT button. Nothing more nothing less.
All extra alert functions of the KAS 297 are available.

Century IV

Posted by **Eberhard Burghalter** on 06/26/00

To my opinion the Century IV is the best choice for the DUKE. It is smooth, reliable, easy to use and compatible with virtually all avionics. Only setback you cannot get an alt preselect certified for it but you CAN retrofit one. Unless the digital KFC 250 it has never let me down, especially not in bumpy weather where you need it most. Nice thing : you hardly see any movement of the steering column like you always do on a KFC 250
The Century IV is not very much used outside the DUKE world so you have to find an avioncs shop that still has the test equipment for it. If you have one and there is a problem it is easily solved because all parts can be bought at RADIO SHACK. No hidden software in Eproms and alike. All printed circuit boards are in real good contact slot rails and not susceptible for corrosion even after long years of operation. Only problem with the printed circuit bards is they did not really know how to contact them through from one side of the board to the other so they used special rivets. On those, corrosion can occur so it is a good idea before you suspect anything has failed to resolder these rivets

Century 4 Go-around

Posted by **John Awalt** on 10/06/03

I've noticed that my Century 4 autopilot go-around function isn't working as it should. I do get an upward deflection of the command bars, but only a slight one. Is this field-adjustable? Anyone else had this problem?

Go-Around

Posted by **Shaker Razook** on 10/11/03

John: I believe you will find a box under the co-pilot's panel, probably up front of the rudder pedals or maybe on the side-wall. This is normally installed with a "pig-tail" harness that allows extension for a technician to make pitch and roll adjustments while the pilot flies the airplane. If memory serves me, you can adjust the deck angle in the go-around mode.

Avionics upgrades completed

Posted by **Patrick West** on 12/22/03

I requested some information regarding avionics upgrades a number of months ago and receive some very good input. I also received fellow Duke Pilots wanting to know how things turned out. Six months later I can report my experience with those interested.

Scope of work: Complete avionics panel re-work and miscellaneous squawks.

Avionics Work Summary: Additional Garmin 530a, S-Tec 65 auto pilot with altitude pre-select and GPSS, new Garmin audio panel, Collins FD112 HSI/Attitude, King Altimeter, Bose X wiring, air data computer, replaced sub panels, Avidyne EX500, Ryan TCAD upgrade, and Satellite radio.

The plane went in the shop the first week of June with a projected completion date by July 4th (I never believed this date). First test flight took place the first week of August. The first flight we had about a dozen squawks and the final squawk was finished two weeks ago. The plane was down for about 3 weeks between Augusts to mid December related to the upgrades. The reason for the down time was primarily due to waiting on replacement parts. I am very satisfied the panel turned out and am glad I did the upgrades. I am equally pleased the work is over.

Some of high-level experiences include the following.

Talk to some one who knows how to FLY the autopilot and all the new features prior to flying. The avionics guys do not read the book any better then I do. We spent about 2 weeks chasing down some Autopilot issues with the initial thought being user error. Turns out there were indeed wiring issues and it was not user error.

The FD112 was the most difficult decision I made and turned out to be the biggest head ache. We went through 3 units (All used) to get one that worked completely. I was also introduced to a component that was required called an inverter. The initial inverters were used with one not being the right size. We installed 2, one as a primary and one as a back up. We were finally able to track down new inverters and installed. I would recommend at least 1 new inverter and save yourself the hassle.

The TCAD existed on the plane prior to purchase. We upgraded to the BX and added to 2 of the three panels. The TCAD took months to get working properly. We finally had to get a tester unit shipped from Ryan. With the tester unit the avionics guys were able to find that the top antenna installed previously had the wires miss-marked and reversed. The unit works great now and targets are NOT jumping around the screen.

Turns out a minor squawk turned into a rather large job. The squawk was to make the sub panel lights work and fix a crack. We found out that all the lights in the sub panel were smashed. If memory serves me, there were as many as 100 bulbs that have to be hand soldered into place. The bulbs were NOT cheap. Unfortunately, we found a potentially better solution after the fact. We also had to make panels for the new audio jack and replaced the smashed lights in the fuel selector panel. We were able to make custom panel for these parts that had the lights molded in the plastic pieces. This worked great for the fuel selector panel. If we would have known this earlier, we would have considered making a new sub panel with the same company who made the other pieces. I am convinced it would have been less expensive and looked as good as the replacement.

I could go on for pages, but just wanted to share a brief amount of my experience. If anyone wants more detail information, please feel free to contact me or post a request.

Posted by **Bob Stan** on 12/22/03

Your panel sounds like a dream for many of us. From previous discussions with others also sounds expensive. What did you end up spending by the time it was all over?

Avionics Upgrade

Posted by **Patrick West** on 12/22/03

I guess the question is cost on which part? For my own reasons, I reviewed the number of lights. There were 100 at 8.42 each plus labor. Trying to focus in on only the panel upgrade, I estimate the equipment cost around $65k and the associate labor 580 hours less 200 hour credit for misc reasons. I would budget about 400 hours for similar work.

Final Avionics Choices

Posted by **Patrick West** on 05/21/03

FYI, Joe Hosteny (P-507), finalized on the S-tec 65. Arrived at the shop this week.

For the final issues to resolve: I was looking into the Sandel EHSI, but have not heard too many positive remarks. This leaves me between a few choices. I would like any input on the following HSI choices. 1) I am told that a King EFIS 40 used goes for about 15K plus 2K for gyro's plus install. This would put a 5" display in the HSI position. This price seems low to me but do not have much experience in the used market. The new unit appears to go for 45K+? 2) The new King EHIS KI 825, about 13K plus install. I cannot find any real world users that have the display. Looks nice, but the size is the question? 3) The final option I am considering is the used FD112V. The used prices are in the 4.5K range plus install. Forgot to mention, I will also need to upgrade flight director to work with S-tec. The FD112 includes this in the price. The final option is more of a sit on the side lines for a few years to see what happens in the digital market, and put up with the backwards heading bug:).

Issue 2: Deciding between the Garmin GMA340 and the PS PMA7000. The price difference is a few hundred dollars less for the Garmin.

Plane goes in next week and hopefully be done by end of June?? I am sure we will have fun working out some of the issues.

Your input on this board has been great and I look forward for your experiences and opinions.

Garmin 540

Posted by **Judd Kessler** on 05/24/03

I just had my King audio panel and separate intercom replaced with the Garmin 540 and I couldn't be happier. Make sure they wire together music 1 and music 2 inputs so you can let passengers listen to music while you are on crew. Also, I like music in the background on the intercom so I had them install a mute cutoff switch too. For music I'm using an Archo 20mb MP3 recorder that I have over 200 cd's on in box the size of a cigarette pack.

Sandel help

Posted by **Mark Allen** on 09/10/03

Ramona Avionics, Inc. - Dave Hainline, is an expert on the Sandel system. He has installed more than any other shop. He is located here in San Diego and provided factory support for Sandel throughout the certification process. Sandel goes to him for help with installation problems.

I would suggest you call him. (760) 788-0546 PST

Bendix/King KLN94 GPS

Posted by **John Cheadle** on 07/25/00

Has anyone installed the (I think) relatively new Bendix-King color IFR GPS? I believe the model designation is KLN94. I had hoped King would come out with a good, color, moving map standalone GPS to compete with the Garmin GPS/nav/com.
Any experiences or comments would be appreciated.

P.S. Thanks to the Gormans for this great web-site. They always seem to be doing something more for this organization.

KLN94B

Posted by **Norm Gruczelak** on 01/24/01

I installed the King KLN94B after waiting almost a year for delivery. I think they had development problems and are just now making deliveries. I replaced a KLN89B and the new unit was a slide in replacement as advertised. I am very happy with the display and new features- particularly the more user friendly approach modes. I would recommend it to anyone who has a KLN89B.

Avidyne

Posted by **Frank Singer** on 09/15/01

This is a pretty late response to your inquiry, but here it is anyway.
I own an avionics shop so I put the latest stuff in my Duke when it is available. I found the Avidyne drove me nuts. While is had a good display pushing all those buttons till something I wanted to work was just too much. I pulled out my Avidyne after a year and replaced it with a King MFD 850 with ground prox. The display is not quite as good but the unit is far easier to use. It also uses one heck of lot less amps. King is working to improve their graphics. Fortunately I still have my Argus, which has better info on a smaller screen than either Avidyne or King.

Flight Situation Displays/radar

Posted by **John E Rice** on 04/06/01

The old original radar in N6033C just crapped out and I am looking at replacements. My local avionics shop suggested either the Avidyne Flightmaster 750 or the BendixKing KMD 850 FSD, which turn out to be only slightly more money than a simple radar by itself. Has anyone else gone through this process, and can give me their experience with either of these or other units?

Radar Indicators

Posted by **Bill Unternaehrer** on 04/07/01

Hopefully you mean your radar "indicator" shot craps. The Avidyne and Bendix/King/Honeywell products are Multifunction displays (MFD) that have the ability to also function as a radar control and display (for some radars). Check and make sure whichever MFD you are looking at will interface with your weather radar. Avidyne used to be ahead of the competition but I believe the King unit is pretty competitive if not ahead in some of the features. I have the avionics consumer magazine that has compared the MFDs available every six months or so and could fax you the articles. MFDs are wonderful and I believe the only way to go. Good Luck

Avidyne

Posted by **Hank Zannini** on 04/06/01

I just had an Avidyne installed in my Duke. It is interfaced to TCAD, Storm Scope, Radar and GPS.
I have no experience with the KING unit but I can say the Avidyne is JUST ABSOLUTELY GREAT.

Avidyne

Posted by **Larry O'Connor** on 04/09/01

Last summer I had the Avidyne installed and interphased to my TCAD and GPS (I kept my Strom Scope separate so if I had an equipment failure I wouldn't loose all weather detection.). The radar image is super imposed upon the moving map and thus gives an excellent graphic of where you are going and what's up ahead. In addition the TCAD feature does the same thing which I find very useful around my small non towered airport.
I have flown in weather with this system and have found it to provide a fantastic visual. You can get a CD from Avidyne that will give you a demonstration of its features. Shortly the system will be able to download real time weather and put it on the moving map.

WX500 Stormscope

Posted by **Randall Kerns** on 11/15/03

I just had a complete avionics upgrade at J.A. Air Center, and had my WX1000+ stormscope removed and replaced with a WX500 and have run into considerable trouble and wondered if anyone has any suggestions or similar experiences. First my 1979 Duke has the alternator conversion. While no interference was ever picked up on the WX1000 I have severe storms with alternators on and under load at the 12 & 6 position. They have tried most everything from external power to the unit, mapped airframe twice, switched processor and antenna. Again the problem only occurs with alternators on & under load. Have checked grounds on airframe, engine etc. Also checked for noise over bus, speakers, headsets etc. Any suggestions?

Tri-Guard De-ice Boot Teatment

Posted by **John Tye** on 10/24/03

I just received a card in the mail from Oxford Aviation/The Proper Aircraft, pitching Tri-Guard treatment for de-ice boots. Based on the way that the card was addressed, I expect that most of you also received one (or soon will). If it works as indicated, and doesn't damage the boots, it would appear to be way ahead of the current messy process, and leave the boots looking dramatically better.
Has anyone used this stuff? Anyone have any informed comments?

Fuel draining from breather tube

Posted by **Robert Mann** on 05/20/01

Recently noted significant (8") spot of fuel with some oil from breather tube. Traced down to fuel drain check valve. Replaced the O-rings in the valve and benchchecked operation. Assuming the check valve is functioning properly why am I all of the sudden having large amounts of drainage from fuel drain check valve? Any suggestions?

Breather tube

Posted by **Robert Mann** on 06/08/01

Checked the fuel pump and it is not coming from the fuel pump. Have identified it as coming from the fuel drain check valve, which is the drain which drains the excess fuel from the cylinder intake valve area. It may be getting too much fuel at idle but don't know why it would start all the sudden i.e. never happened before.

Breather tube

Posted by **Joe Konicki** on 06/08/01

I see now what you're talking about--That's one of the few problems I haven't experienced (so far), so I don't have much I can add to be of help.

My only other thoughts are perhaps some leak-by is occurring inside your fuel injector assy, I'd heard some time ago that there are a number of rubber seals which can start leaking over time and the end result is almost always extra fuel to the cyls. Also, don't know if you've checked your idle mixture adjustment for security. It is a "star" type adjusting knob on the right side of the fuel injector housing/throttle linkage. It should be held in place by a spring--maybe something came off that assy? It'd sure have to move a bunch to be a problem.

Fuel from breather tube

Posted by **Joe Konicki** on 06/04/01

If the "breather tube" you're talking about is the one located on the right side aftermost portion (firewall mounting) of the engine compartment the problem is likely your engine-driven lear-romec (or beechcraft pump if you have an older model Duke) fuel pump seal. When it gets to be a bad leak it'll spray all over the underside of the wing.

If you're talking about the fuel vent lines (also called by some a "breather tube") it could be your tanks relieving internal pressure generated by full tanks and hot climates. I fill the tanks to about 90% (enough to keep the cells moist) when it's going to get really hot and I don't have a problem with leakage or pressure build-up.
Good luck! Joe

Duke Heater

Posted by **Raymond Lewick** on 11/28/03

On Sunday after the Duke convention in San Diego I was headed home over the Rocky Mountains, turned on the heater, and no heat. It was a very cold flight to Chicago. Nevertheless, I had it checked out at Aircraft Systems in Rockford, IL.
As it turned out the wire connection at the rear of the igniter was arching to the housing. Also the feed wire was noticed to be arching, but it was hard to detect unless you cut away some of the wrapping, They replaced the igniter and the feed wire, and the heater works fine. I would highly recommend Aircraft System if you continue to have problems. They are very knowledgeable. Talk to Terry Norris Sr. 815/399-0225.

Heater Problems

Posted by **Mark Allen** on 11/25/03

I have had cabin heater problems for the last 8 months. Two shops have looked at it, twice in one case 3 times in the other to no avail!

What happens: Using manual heat, the unit will start an function as advertised for 3-4 cycles and then will not relight. Back on the ground, the tech finds a small carbon track on the igniter plug that shorts it out. Have it cleaned, then finally replaced it. Ground run is fine, hours at a time. Then fly again and the same thing happens.
What they did so far: New igniter plug, new vibrator, remove and clean nozzle, checked air switch settings, checked fuel pump. Result Nothing, will run max 1/2 hour in flight then .....burrrrrr!
Any ideas, short of a total overhaul? Any yes, the last decay test was fine.

No heat

Posted by **glenn wood** on 11/27/03

I had the same problem with my heater about 2 years ago. It would work all day on the ground, but @ about 3000 feet it would quit. After many frustrating hours and a new heater I narrowed it down by hooking up 3 test lights to R , X ,& W wires (see wiring diagram) at bulkhead connector (#9). At about 2500 feet the X wire H65B18 went open. The diode #33 was failing causing the Heater Safety Relay to open. I replace the diode and the heater hasn't missed a beat. Diode #33 is located just above the pilots left knee on a board with a few other diodes on it.

Heater

Posted by **Frank Shumate** on 11/27/03

I had a heater installed by C&D in Niles MI. phone #269-695-7469. So far no problems, but I have not been in temps -20 or below where my heater was doing the same as yours. This heater also has a higher b.t.u. output.

Heater Combustion Blower Operation

Posted by **Bob Stan** on 07/15/03

When my battery switch is turned on, the heater combustion blower starts, even though the environmental switch in the off position. The problem just started. Any thoughts before my shop starts trouble shooting?

Combustion Blower

Posted by **Tom Clements** on 07/16/03

Save your money, Bob. Don't start the work. You don't have a squawk.

As Greg implies, the heater's combustion blower is supposed to come on automatically if OAT is above about 90 degrees Fahrenheit, and a valve directs its output to the radome for avionics cooling. Look at the environmental schematics (three colored pictures) in the Systems Description section of the POM to see the blue line going to the radome.

BTW, if your Duke, like many others, has exclusively panel-mounted avionics and only has the radar and the glideslope antenna in the radome, then the need for this action is probably nil. (In the real old Dukes, they had some big, heat-producing, black boxes up there.) In other words, doing away with this automatic blower activation probably would be fine, but I also presume it would be "illegal" to disconnect it without proper paperwork.

Combustion blower

Posted by **Ken Bowdish** on 07/17/03

Bob, Power to the cabin heat/vent/ac. mode selector switch is supplied from the left single fed bus and protected by a 10A CB. Cabin temp control located in the lower right sub panel Wired directly from the CB the thermostatically controlled switch will run the blower to cool the avionics in the nose. For your reading pleasure, this can all be found in the wiring manual 21-60-03 page 3 item 11 is the thermostatically controlled switch. (Depending on your a/c s/n you may find this information on a preceding page of the wiring manual I think this is the one that will cover your airplane)

Combustion Blower

Posted by **Dan Bruhl** on 07/17/03

As Tom Clements said, this blower is switched on by a temperature sensor mounted in the radome, which turns the blower on at 90F and automatically resets to off at 75F. The sensor is wired thru the "cabin temp" CB so if you don't have the need for this blower to provide air flow to the radome it can be turned off by pulling this CB. Summer has arrived.

Recessed air inlet heating element

Posted by **Al Seither** on 06/18/03

My 1969 Duke 60 (P105) has an electrical heating element on the leading edge of the air scoop on the right side for heater combustion and the nose radome avionics section cooling. I have been told, and the SIMCOM training manual even states in the general notes section, that early models contain an electric heating element on this scoop, but it was found to be unnecessary and was removed on later models. My question is, if I have it on mine and it is in need of repair do I have to repair it or can I simply remove it and cap the wires without affecting the type certificate for this model. Any guidance would be greatly appreciated.

Heater

Posted by **Chris Larson** on 02/01/03

I just went through some trouble shooting of my heater. I have the new ceramic heater which doesn't require the recurrent inspection under a recent AD. My heater would not heat above 19000 ft. We adjusted fuel pressure up (it was below 6psi) and also adjusted the heat maximum setting. So far so good. I did learn that the vent blower, heater blower need to be checked. My igniter plug showed a lot of carbon early, which makes no sense to me.

Message Body Posted last Fall
I talked to C&D Associates in Michigan. They made my new heater installed in August of 2001. They just finished trouble shooting a Duke with the same problem. They discovered that the fuel pump to the heater, if not delivering 7 psi on the ground, will fail at Flight Levels. So, I am having this checked. I have been flying with the induction knobs out, and cabin differential is 4.4psi.The change in heating capability is dramatic as I descend from FL 230 toFL190.
(7 psi is a correction. 100 psi was a typo)

Contact C&D in Michigan if you need more help. They were very helpful to me.

Interior air Heater Circulation fan

Posted by **Chris Larson**

My heater circulation fan, located behind the pilot, on the interior cabin wall is beginning to develop a low pitch squeal when the heater is on. Is there any maintenance or repair anyone can recommend?

Thermostat fan

Posted by **Bob Stan** on 12/30/03

Chris: I had the same thing four years ago. I removed the thermostat from the aircraft and opened the small motor. The inside had a build up of black carbon looking material. May have been dust too. I cleaned thoroughly with WD-40 and reassembled. Has been running great since! Takes about 30 minutes and is easier if you unsolder the motor wires from the base and reattach when cleaning is done.

Heater & Manifold Pressure Questions

Posted by **Randall Kerns** on 01/31/03

Help! First of all the heater. In the auto mode the heater will not cycle on an off. It is intermittent at best and will usually only work below 8,000 ft. My shop has spent allot of time on it including cleaning my old Barber Coleman thermostat as suggested to finally replacing it.

Second at full power on takeoff and until MP is reduced I am beginning to get a 1-2inch fluctuation in MP for no apparent reason. All instruments and gauges are normal including TIT and 6-cyl EGT & CHT. Any ideas?

Heater; low heater fuel pump pressure

Posted by **Chris Larson** on 12/11/02

I talked to C&D Associates in Michigan. They made my new heater installed in August of 2001. They just finished trouble shooting a Duke with the same problem. They discovered that the fuel pump to the heater, if not delivering >100psi!!!! on the ground, will fail at Flight Levels. So, I am having this checked. I have been flying with the induction knobs out, and cabin differential is 4.4psi. The change in heating capability is dramatic as I descend from FL 230 to FL190.

Heater

Posted by **Joe Hosteny (P507)** on 12/10/02

Chris – In my experience, the heater will keep you warm at any altitude so long as it is working properly. I have had some problems with my heater, but it has never been unable to heat the cabin adequately simply because the outside air temp is too low.

Cabin heat

Posted by **Chris Larson** on 12/09/02

Does anyone know the rule-of-thumb limits for cabin heat? I notice that with a relatively new heater, at flight levels, with outside ambient temperatures of (-)35 degrees cent. at night, without passive solar in the cabin the cabin is cold. I don't feel much heat coming from under the panel. This occurs for me at flight levels where the air is thin, when temperatures are colder that (-) 20 degrees cent. After decent to 15,000-18,000, outside temperatures increase to (-) 20 degrees cent. The cabin is warmed nicely at these ambient temperature at these altitudes. Is this a heater malfunction related to thin air and altitude, or simply the limits of the heater?

Heater

Posted by **glenn wood** on 02/04/02

My heater works great on the ground, but on take-off or very shortly after its inop, even after recycling in auto or manual mode. On taxi back I can recycle again and it fires right up.
Any ideas?

Heater

Posted by **Kim Pratt** on 02/04/02

I've had both problems. ie works on the ground and not in the air as you note and the reverse of working in the air and not on the ground. If you study the way the system is designed, it almost amounts to two systems. If I recall right there is a door that closes when the weight is off the squat switch. If this door fails to close you will have the situation you describe. Have your AP look into it.

Auto Temperature Control Parts

Posted by **Ben Fry** on 03/12/02

just purchased a 77 Duke. It doesn't appear to have the thermostat behind the pilot seat installed. Is it common for Duke owners to pull it out if it quits working? What would it take $$ to purchase and install one? Any recommendations for parts. Thanks for any advice you might have.
The seller said he just adjusted the cabin comfort using manual mode

Heater

Posted by **Ralph Cohen** on 03/12/02

Ben:
See the thread on "Heater" beginning 10-11-00. I wonder what else was removed? You need the thermostat and a heater control board located on the forward (nose) side of the pedestal at the floorboards. Troubleshooting the system is relatively easy if you refer to the wiring diagrams. Good luck. you can call if you need help. I believe the thermostat is common to many airplanes and should be available or repairable.

Heater function

Posted by **Ralph Cohen** on 08/24/02

I had a similar problem. The cause was the motor in the Barber Coleman thermostat (Located on the left side panel, just aft of the pilot's seat, at floor level) heating up due to excessive friction in the motor. The heat generated in the motor "tricked" the heater into thinking the airplane was warm. You can find this discussion earlier on this board.
Good luck! Ralph

Heater Thermostat

Posted by **Bob Stan** on 08/26/02

The Barber Coleman thermostat most often internally heats up when it fills with dust and lint. It is relatively easy to take apart and clean. Open the motor and clean and lubricate the bearings as well. This takes all of 15 minutes or so and saves in replacement costs which are over a grand with a long, long wait.

Heater Mode

Posted by **Randall Kerns** on 08/23/02

My problem only occurs at or above 12-14,000 feet. My heater will operate only in the manual mode and not in the auto mode. At any altitude below that auto mode is perfect.

Would appreciate any help. We are having trouble finding problem.

Heater

Posted by **Shaker Razook** on 12/10/01

One possible problem you may have is a gummed/fouled fuel delivery line into the combustion chamber. This is a problem I had some time ago and corrected it with some plain old "Gumout" or carburetor cleaner purchased at the local Pep Boys (it took several applications letting it soak overnight). Just a thought....

Heater

Posted by **Eberhard Burghalter** on 04/05/01

A lot of the problem is attributed to the little box behind the pilots seat. Sometimes this is mounted way down near the floor. If you are using a refreshment cabinet on top of all heat gets stuck there and the system turns off. May apply to some of you who have good manual but bad auto performance. If that is the case, like in mine just put that regulating sensor up higher and voila´ there you are. If not check the resistor curve in the maintenance manual and see if it meets specs. It is a tricky system but be assured when it works it is one of the best systems in the industry. Here in Europe we sometimes have temperatures of up to minus 50 C and the heater is sill producing enough heat so that you have to turn it down lower
happy hunting

Heater

Posted by **Tom Comerford** on 03/29/01

To achieve more heat, first pull out the white knobs which allows heat from the engines to warm the cabin. Often, this is enough heat, even without turning on the heater. If you need more heat on one side of the cabin than the other, close one white knob, with the other pulled out. You need to have the cabin air knob IN if you want more heat to the pilot or co-pilot. The defroster needs to be in the off position if you want to maximize heat in the cabin.

If you keep charts behind the pilot seat, the bag may interfere with the sniffer which regulates heat. If the heat doesn't come up properly, start with manual and then go to automatic, which usually seems to work. The heater in the Duke is one of the best I've seen, including a number of turboprops. Good luck and keep warm up there.

Automatic Heat Mode

Posted by **Bob Stan** on 03/28/01

My automatic heat setting wasn't working too well, but I had plenty of heat in the manual mode. Another Duke flyer (Ralph) suggested that the thermostat, which is wall mounted behind the pilots seat, was not turning freely, causing the electric motor under the cover to heat up, which in turn fooled the temperature sensor into thinking it was warm enough. Once the sensor is satisfied, the heat doesn't cycle on. To replace is really expensive and takes months. I took the unit off of the wall and opened up the motor. I cleaned the carbon out of the bearings and lubricated so the motor turned freely. I has worked perfectly in the auto mode ever since. This all took about 45 minutes so it is easy to try!

Cabin Heat

Posted by **Frank Singer** on 03/27/01

My experience (S/N 583) is the same as Mark Allen's. The Auto position doesn't work too well but in manual I get as much heat as I want and must turn it off once in a while to keep the cabin from getting too hot.
I also pull all the knobs (except the co-pilot vent) out.

Cabin Heat

Posted by **Bob Stan** on 03/22/01

My Duke heats up well, even when the cabin is cooled way down, and stays nice and warm. Maybe I just am lucky. I fly mainly in the upper mid-west and take a lot of trips to nice warm Minneapolis this time of year. At altitude it's minus 25 degrees C or so which is plenty cold too.
I don't know much about these, but you might 1) check the filter below the floor of the nose compartment to assure it's not reducing air flow, 2)make sure the fan works on high speed versus low, or 3) make sure one of the duct connections hasn't come loose.

Cabin heat?

Posted by **Jeff Cannon** on 03/21/01

The heater in our machine, (P-592), doesn't put out enough heat when we are above 15,000 feet or so in the winter. Closing off the ram air to the intercoolers helps, but it's still too cold. An old King Air I used to fly was the same way. Is this trait endemic to the breed, or am I just lucky?

Auto temperature controller

Posted by **Barry Schwartz** on 10/26/00

Have fun replacing the motor! And wait until you hear the cost that Barber quotes.

The motor is a very tiny 24 volt motor that turns something like 16,000rpm and draws very low amperage. You can send them the motor and they will overhaul it - 16 week delivery and $1000+!

Heater

Posted by Ralph Cohen on 10/12/00

It is possible, even likely, that the motor in the Barber unit is heating up and telling the heater that the entire airplane is hot. I have seen this before. Replacing the motor will solve the problem. Other possible causes could be on the heater control board.

Heater Control Problem

Posted by Bob Stan on 10/11/00

I have a problem with the heater control. If you have had this and know the likely place to look please respond.

When the environmental switch is placed in the automatic heat position, the heater comes on and operates until the thermostat is satisfied. However, after it is satisfied, it never comes back on. The heater still works in the manual mode, so I don't believe it is an internal safety in the heater. Beech wants to replace the wall Barber Colman thermostat, but if that wasn't working, why did the heat come on, and why did it go off when satisfied.
Any ideas??? Thanks for your help.

Foot step arm

Posted by John Rice on 07/09/03

I went to step up and get on my plane the other day and the rod holding the retractable foot step broke, actually snapped in two. It is a piece of cast aluminum with a hollow core, not even critical to flight safety, yet Beech wants about $7000 for this foot long piece. I am wondering if anyone has had this similar problem and would know where I can get one either used or manufactured at a more reasonable price?

Duke Step arm

Posted by Jim Gorman on 07/21/03

Cabin Step assembly Part # 60-430117 is available from Rapid (Raytheon) for $600.00. We just brought one for N 410G.

Duke step arm

Posted by Glenn Adams on 07/11/03

How about 1/10th of that price? Contact Rodney at Royal Air 318-221-3381 or 318-459-9000

Foot step

Posted by Al Seither on 07/09/03

Contact Bob Pinto @ StarAero 856-293-9000 He specializes in Dukes, Navajo's, &Aero Stars' Bob has lots of parts. It's made of magnesium and Bob knows exactly what to do with it. He is also another great source of Duke Info. He maintains 8-10 Dukes yearly. Super people, give him a call

CAMS & LIFTERS: 100+ HOURS AND LOOKING GOOD!

Posted by **Al Uhalt** on 10/24/03

I am at Firewall Forward right now with 107 hours on my engines since installation of their CentriLube camshafts. As I write this, they are "buttoning up" my airplane after changing and checking engine oil, filters and screens and dropping the oil pan to physically check the cams and lifters themselves. Results: NO ferrous material whatever in the oil, filters or screens and the cams and lifters are as smooth at the proverbial "duck's butt" WITH ABOUT 60% OF THE ORIGINAL "SCUFF COAT" TIN PLATING STILL ON THE CAMS -- and, the engines are running smoother than they ever have! (It's amazing what happens when you rub oil against oil instead of metal against metal!)

At this point, I am convinced the FWF CentriLube Camshaft is an answer to the TIO-541 cam-lifter problem. I'll continue to keep you posted each 25 hours. If you have any questions for me, call me at 719-574-1111.

Cam/Lifter Problem

Posted by **George Friedrich** on 10/28/03

It's truly a misfortune that we Duke owners have to spend all this extra money retrofitting the 541 when the problem is germane to Lycoming's vendor selection and QC program. I have a Reman engine with 150 hrs. on it and to date there are no signs of problems. During my annual this winter, I think I'll put new lifters in the engine to try and circumvent the problem.

Does anyone know if Lycoming has made the lifers compatible with the camshaft metal? Seems strange that I ran the engine to 1660 hrs before taking it off and never a cam/lifter problem. I have '91 engine on the right side with a 1000hrs and it's never had a cam/lifter problem either. Granted, the Duke is a fine airplane but w/o Lycoming's support does the airplane have a future? The low prices in the on the King Air E models look REAL appealing right now!

Camshaft/lifter wear etiology per Mark and Tom

Posted by **Maurice Miller** on 03/15/03

You at FWF have spent a small fortune studying the problem and then you engineered a credible fix. Further, your recent out-sourced metallurgy study refutes much of the conjecture/scuttlebutt for us out in the Duke fleet.

So Mark/Tom what is your learned single best theory of causation of recent failures? Is it the previously reviewed changes in oil or gasoline formulation? Please share some of your insight.

FWF cams

Posted by **Robert Mann** on 03/01/03

If you are close to TBO the FWF cam makes a lot of sense since replacing the cam will require an engine teardown, it could be overhauled at the same time. If you are not close to overhaul time other options are to cut the oil filters for inspection every 25 hours and pull the lifters for inspection every 50-100 hours or consider replacing the lifters with lifters from Bongard. Although I don't believe the lifters are FAA-PMA approved, some members have had them installed. Until the Bongard lifters are approved the FWF cam is the only solution that is strictly legal.If Bongard's lifters become FAA-PMA approved then those with low time engines will have that option available. Personally, I would think the Bongard lifters with the FWF cam would be bulletproof insurance against cam lifter failure. If FWF could have used Bongard lifters when they went through the certification process then both solutions would have been available. Putting both together probably would have complicated the STC process however.

Metallurgy of camshaft & lifters

Posted by **mark seader** on 03/05/03

Four months ago, myself and Tom Ehresman decided to investigate the claim of "old production" camshaft/lifters, vs "current production" cam/lifter metal quality. The current thinking was that older production cams/lifters were surviving to TBO, while the current production was inferior by virtue of metal quality or design. We contracted with a Dr. George Krauss, Sc.D., P.E. a professor from the metallurgical department at the Colo School of Mines in Golden Colo. He took on the project to determine if there was a difference between and old cam/lifter set that went beyond TBO (overhauled 11 years ago) and a recent 300 hr cam/lifter set that had failed. We received the report 2-28-03. Both sets of camshaft/lifters were sectioned, polished, metallographically prepared, and inspected using scanning electron microscope to 5000X, and chemical analysis of selected areas of the microstructure performed by energy dispersive spectroscopy. Dr. Krauss sent sections of the camshaft lobes and lifters to Colorado Metallurgical Services, Denver CO., for chemical analysis. I will quote the pertinent sentences from his summary. "The results show that the materials of construction of the two sets of components were very similar, both in chemistry and microstructure" -- This report is very detailed and quite technical (17 pages) with photo's, graphs, chemical analysis etc., --- Tom had asked Dr. Krauss "is there anything you see that would account for the failure in the newer production cam/lifter set? He stated "No. The two alloys are so similar that nothing I've seen would account for the failure" --- bottom line, it's not the metal or construction. Feel free to call if you have any questions. Mark Seader.

Camshaft STC approval

Posted by **Firewall Forward, Int'l** on 02/17/03

CAMSHAFT STC APPROVED!

Firewall Forward is pleased to announce FAA approval of our modified camshaft for the Duke engine.

After years of investigation, analysis and persistence, along with the help of many talented people, we have successfully navigated the mysterious world of "tribology" (the science of friction and lubrication). We have demonstrated that the FWF "Centri-Lube" camshaft modification eliminates premature wear between the cam and lifters. By introducing a continuous oil flow between the sliding surfaces, the "cushion" between the surfaces has been significantly enhanced with the result that friction, temperature and wear are dramatically reduced.

Al & Debbie Uhalt's Duke will be returned from Experimental to Normal Category by Friday of this week and eleven engines are already in the process of having the modified camshaft installed either with or separately from an engine overhaul.

Needless to say, after 5 years of blood sweat & tears, there is much joy in Colorado today!

Camshaft update

Posted by **Mark Seader, Firewall Forward** on 12/31/02

We now have 265 hrs on test engine. Camshaft lobes & lifters still show NO wear, even the anti-scuff on the camshaft, and the Parkerizing on the lifters has not worn off. (Metal to metal contact between cam & lifters is negligible) Engine testing will be completed by Saturday Jan 4th 2003. Al Uhalts plane flew today in preparation for the FAA Test flight set up for Monday 6th (one day in duration) to conduct oil temperature test. STC approval expected by January 15th. Oil used has been Aeroshell 15/50. Firewall Forward engines will now have a 4 year 100% warranty against cam & lifter failure, with unlimited flight hours, or TBO. --- Have a great New Year!!!

Cam Shafts

Posted by **Al Seither** on 11/04/02

I am new to the Duke Flyers organization so only Jim Gorman and Al Uhalt have met me over the phone. I have learned a lot from reading everyone's comments and am very impressed by the knowledge and team work this group has created by working together. I bought P-105 this summer and both engines had 1200hrs SOH Well as luck would have it at 17K the left engine oil pressure went to zero and the engine failed. I won't bore you with the details other than to say that the engine was secured as it was solid below me from 13K down to 500' I traveled 85nm to the nearest suitable airport in poor weather and landed. I was very concerned with the marginal performance of my duke on One engine. Perhaps I was expecting too much.... Anyway the reason for writing is to tell everyone that when the engine shop put my engine back together with factory parts they installed a cam shaft that had tin flashing over the entire shaft. The engine shop stated that this is the old way, and that he had not seen one like this in a long time. Can anyone confirm this? I don't want to have another engine failure in this plane again. Many thanks, and I look forward to meeting all of you.

Cam Shaft

Posted by **Frank Singer** on 03/18/01

I have had excellent response from Lycoming regarding any problem I have ever had. Lycoming did my last overhaul and they stood up to a few problems I encountered, some even after my warranty was over. I do know of a fellow Duke owner who had Firewall Forward do his overhaul. He had cam shaft problems after a few hundred hours. Lycoming did not help him because Firewall Forward uses overhauled cam shafts. Lycoming only uses new cam shafts and cylinders in their overhauls.

Cam Problems

Posted by **Mike Riemann** on 02/05/01

Am interested in joining any action against Lycoming in regards to cam problems.... Both engines are being sent to Firewall Forward as I speak to fix both engine camshafts that are worn down. Firewall Forward said ground the aircraft until fixed. Engines have about 875 hours on them and had shown no problems until last oil change when pieces of iron were found. These engines were overhauled by Firewall Forward in about 1994.

Our Problem

Posted by **John E Rice** on 11/15/00

Tom.....I have only 336 hours on my engines and have just had one totally torn down to find the problem bad lifters and of course a torn up camshaft. Please include my name as one of those ready to get involved in a lawsuit if necessary. 612 707 1521 if you need to call during the day.

Door Leakage of Water

Posted by **Bob Stan** on 11/16/03

Look through your old news letters. I believe the Gormans posted some notes and photos on a door weather strip that helps. I followed their recommendations and installed in my Duke. Cost about $5.00 and took 10 minutes and I have had no water leakage since.

Cabin door

Posted by **Al Seither** on 12/15/02

I have had a problem right after I take off and climbing thru 2500' with the cabin pressurizing around 1.0 psi I get a cabin door open light on the annunciator panel. I replaced the switch but the problem remains. Has anyone had a similar problem or suggestions to correct it? The cabin stays pressurized and the door handle looks secure. Any help would be appreciated...Thanks

Cabin Door lock

Posted by **Robert Mann** on 12/15/02

There is an adjustment to the door latch switches when a new switch is installed. It is covered in chapter 52 of the maintenance manual.

Doorseal

Posted by **Robert Mann** on 01/10/01

RAPID is probably the only distributor of the door seal and it is about $1500, possibly a little more.

Cabin Door seal

Posted by **Rudi Dekkers Press. (Huffman Aviation in Venice Florida)** on 12/29/02

The door seal cost about $ 1650.
What is wrong with yours, my Duke had a bad and torn apart door seal, I put silicone in the seal (on the step in side), this repaired the seal, but still not a good solid and quiet seal. then my mechanics made a this and small alum strip and rivet this in the inside of the fuselage behind the seal, to push the seal against the door when it closes. it worked so well that now i made them same solution for my other duke.(cheap solution)

Door Seal

Posted by **Kim Pratt** on 01/10/01

I purchased one thru Arrell Aircraft 818 727-9343. A bit of a discount from list, about 1400.00

Door seal

Posted by **Scott L. Stipp** on 07/26/00

Has anyone ever repaired a "slit" in a door seal? If so, what product was used. The cut is about 1 inch long.

Door seal

Posted by **Al Konger** on 07/27/00

Had one about 1" long. I squeezed it open, and sparingly filled it with white RTV. It has held for 6 years.

Duke LCD clock/timer

Posted by **Scott L. Stipp** on 12/11/02

The LCD clock timer on your yoke is manufactured by ASTROTECH. The model number is LC-2. Go to astro-tech.com and you will find a repair page to get the phone number to call to return for overhaul at $79. They could sell you a new one also I am sure. There is another option for a yoke clock replacement from another supplier, Davtron. They have a web site also.

Control Locks

Posted by **John Tye** on 01/08/03

I have one of the Beech control locks like Tom was describing ("J" shaped with a sharp point on one end to go into the hole in the column and a red flag). The problem was, when installed and the wind blew, the (metal) red flag banged against the bottom of my Sandel unit, and other parts of the panel. I, too tried to buy the other version from Beech with the rudder lock, but it was "out of stock". I bought a unit from York (they make one that fits a Duke). It's a metal sliding unit that hooks around the rudder pedals and control wheel and holds everything solid. It's obvious and red, so you won't forget it. It's easy to install (you can put it on the copilots controls while sitting in the pilots seat) avoiding the crawl to the floor for the rudder pedals, and it costs about $125.

Gust Lock Address

Posted by **John Tye** on 01/09/03

The website is www.gustlock.com. They have pictures, order forms, etc. The number is 800 927 6275.

Control Locks

Posted by **Tom Clements** on 01/06/03

Al, I can't give you the dimensions! But I presume you don't have one or you wouldn't be asking the question.

So here's two suggestions. First, go order one from Beech. If you can afford a Duke you can sure afford this little gizmo from the manufacturer.

Second, make one yourself. (Which is probably what your question was intended for, correct?) Get a few big nails, bolts, welding rod, whatever, and see what fits best into the control lock hole. Now here's the tricky part. The hole is accessible through the hole in the royalite overlay that covers where the control yoke comes out of the panel. However, notice that there is a much smaller, sturdier hole inside the big one: That's the one for the control lock to go through. The assembly, when finished, should resemble a big "J" shape, with the little end of the J sharpened to a point so as to make it easier to insert/fit into the bottom hole and the hole in the control yoke's shaft. The big end of the J should be long enough to contain a red "Flag" that surrounds that arm of the J and pivots in such a way that it can be rotated over the top of the control yoke shaft, thus locking the assembly into place so that it won't fall out the bottom. Finally, if you really want one like Beech's, you'll include a length of wire rope that goes down to the rudder pedal lock assembly.

You gotta hand it to Beech: This is the most evil, hardest-to-install, device man has ever created! If it were up to me – and it's not – I think I'd just take a big nail with one heckofa bright "Remove Before Flight" streamer attached, insert it from the bottom as designed, hope that friction keeps it in place, and forget the rest, including the rudder lock.

Cowl Flap motor

Posted by **John E Rice** on 08/18/03

Does anyone know a good source for a cowl flap motor? Beech's price of many thousands seems like a bunch for a fairly simple looking motor. Thanks

Cowl Flap Motor

Posted by **Larry O'Connor** on 08/31/22

I suggest you call Gary Bongard at General Aviation--952-944-2628.

Cowl flap

Posted by **Ralph Cohen** on 08/21/03

See previous threads 1-24-01 and 8-9-01 and 10-26-01 on this subject. You can obtain bearings, brushes, etc. from Electro-Mech in ICT. They also stock replacement actuators at a reduced price. I have generally removed actuator and lubed gears annually for preventive maintenance.(I use "lubriplate" white lithium grease. Cleaning the armature and brushes with a high quality electrical cleaner will restore many actuators. Good luck!

Cowl Flap Motor

Posted by **Dane Scag** on 08/25/03

Ralph Cohen suggestions are excellent. If however, you have a badly burned motor, it can be rewound and repaired to like new for about $300 by:

Eurton Electric
800-423-4789
Santa Fe Springs, CA

They have a web site. Good luck,

Warm up

Posted by **Randy Kerns** on 01/07/02

Does anybody do their ground run up with cowl flaps closed in cold weather to reduce the time it takes to get to operating temperature?

Cowl flaps

Posted by **Chris Larson** on 01/09/02

Yes, I warm the engines at 1200-1400 RPM with the cowl flaps closed.

Cowl flap actuators

Posted by **Robert Mann** on 01/24/01

Looking for a source to obtain a cowl flap actuator. Mine is stuck in the retract position on the right engine. Beech wants over $3000.00 and will not have them available until April.

Cowl flap actuator

Posted by **steve** on 10/27/01

Call Russell at Eastway Parts 631-737-2020. He can get it rebuilt or new (not cheap). Really make sure its bad. Mine was just a shorted wire. They are easy to trouble shoot.

Cowl Flap Actuator

Posted by **Shaker Razook** on 01/25/01

Bob: I feel your pain. I have had the same experience twice. In my case, I was lucky....the problem was the limit switch both times (this can be repaired). My suggestion would be to remove the actuator, brace the cowl flap in a trail position (maybe with a piece of tubing) for continued use of your airplane. You might contact the man that helped me out: Ernie Daigle, Cruisaire Aviation, 2428 Montecito Road, Ramona, CA (760) 789-8020. If it's the switch he can help. Good luck.

Limit switches

Posted by **Scott L. Stipp** on 01/25/01

I had the same problem, and it was corrected by lowering the upper limit switch that stops the motor when the jack screw hits it. Mine would travel too far after hitting the limit switch and jam in the retract position. If you need to brace in the trail position (I did this also), go to Lowes, and they have stock aluminum strips about and 1/8" X 1" X 3' that work perfect, easy to cut and drill.

Cowl flap actuators

Posted by **Robert Mann** on 02/01/01

Mine was also jammed in the retract position. Resetting the limit switch and lubrication solved the problem. Thanks

Replacement actuator

Posted by **Ralph Cohen** on 01/27/01

If the problem is not the limit switch, you could get by for a couple of years by just cleaning the motor in your actuator. All the parts, brushes, bearings, armature, etc. are available from electro mech in ICT. Any competent accessory shop can do this. Electro mech also stocks new replacements at a considerable savings.

Intercoolers/cowl flaps/takeoff

Posted by **Stephen Rushmore** on 09/19/00

Flight Safety told me that I can keep my cowl flaps closed during takeoff and while flying because my Duke has intercoolers. Can someone verify that this procedure is correct? Thanks- Steve Rushmore srushmore@hvsinternational.com

Cowl Flaps

Posted by **Tom Clements** on 10/02/00

With or without intercoolers, it is the best way to go until CHT starts creeping up on 200 degrees Celsius. But have them wide open for all ground operation, cold or hot, since you don't have the air flow that will occur in flight, and hence localized hot spots may occur. (Not so much CHT hot spots, but accessories, wires, etc.)

Cowl Flaps

Posted by **Bill Unternaehrer** on 09/19/00

Cowl Flaps closed for takeoff is the way we were taught by Flight Review in the Duke Initial training. The reason is less drag in case of engine failure coupled with the fact that you don't need them open for cooling (even in Arizona). Sometimes passing through 11,000 to 13,000 we need to put them half open (just barely visible) to keep the cylinder heads cool but most of the time they are open only on the ground. We also have intercoolers.

Cylinder head temps

Posted by **Gordy Germany** on 02/22/02

My 74 Duke has a JPI engine monitor gauge by cylinder and my cyl. head. temps range from 180 to 225 on the #3 cyl during climb out to altitude. Once I level off, my temps remain 180's, 190's and #3 is usually in the low 200's. Most of my flying is in the south so oat is higher, but wondered what other pilots are seeing and at what temp you open the cowl flaps?

CHT Temps

Posted by **Frank Singer** on 03/01/02

The number 3 on both sides on my Duke also are the hottest. My right engine #3 is even hotter than yours. I usually don't open the flaps (partial) till the CHT gets near red line. This usually happens when I climb through the mid teens (Summer or Winter). I never had to open the flaps for cooling in level flight regardless of altitude.
An alternate would be to increase fuel flow during climb to cool things down.

CHT

Posted by **Randy Kerns** on 02/23/02

I also have a JPI and my results are as follows:
Out of 12 cylinders my #3 on each engine is the hottest. #3 cylinder on right engine is the only one that runs in excess of 200C during climb or cruise. It will run as high as 220's during climb & 210-220 at high altitude. I have changed probes, checked baffling and everything else I know to do. I monitor compression and see if there are any visible signs of the cylinder running hot, either at cylinder or exhaust. Compression is 78/80. All I know to do is to continue to run it as is.

By the way I do have American Aviation Intercoolers.

CHT

Posted by **Kim Pratt** on 03/06/02

There is a very good 6 part series on turbocharged piston engines on AVweb. Worth reading:
http://www.avweb.com/articles/pelperch/pelp0031.html
http://www.avweb.com/articles/pelperch/pelp0032.html
http://www.avweb.com/articles/pelperch/pelp0033.html
http://www.avweb.com/articles/pelperch/pelp0034.html
http://www.avweb.com/articles/pelperch/pelp0035.html
http://www.avweb.com/articles/pelperch/pelp0036.html

You may want to also look at www.gami.com. There is some good information here also. George Brawley who is quite well versed in aircraft engine operation and has a state of the art engine test cell seems to have pretty good evidence that the cylinders start to go out of round at 425 F. FWIW I operate the engines to keep the hottest cylinder at 400 F or less, EGT at 1550 or less and TIT less than 800C. My hottest cylinder is also the #3 cylinder in front of the oil cooler. The JPI I installed provided this interesting information.

Without the JPI and using the factory instrumentation and running the engines as I was trained there are clearly cylinders running much hotter that 425 F. Perhaps this is why Dukes have gotten the reputation of often not making TBO without a top overhaul.

CHT temps

Posted by **Joe Konicki** on 03/01/02

I think the reason for #3 to be hottest is that the air flow travels a further distance past the cyl before slowing down and also that there is not as much restriction on that side due to the "porous" oil cooler. I find that when I install the oil cooler plate in the winter the #3CHT cools right down. I have thought about connecting a small strip of alum sheet to the top cowling just ahead of #3 to deflect a bit of airflow more downward towards the cyl.

Cylinder Temps

Posted by **Shaker Razook** on 04/23/01

It's brain-picking time. Both engines majored about 30 hours ago. Prior to overhaul cylinder head temps always ran perfectly matched when fuel flow and power settings were the same. After overhaul the right side runs 30/40 degrees hotter than the left. When angle of attack is changed and airflow decreased over engines, the right side increases dramatically indicating it is probably a baffling problem. I've removed the top cowls and compared the baffling on both sides and noticed one side baffle on the right was pinched downward. Corrected this...no change. I have not completely un-cowled the engine yet.Wondering if anyone has run into a similar problem and any suggestions?

High Cyl Temps

Posted by **Joe Konicki** on 04/24/01

Forgive me if I brainstorm online, however I'd check the following:
#1: Baffling, especially the aftermost top baffling which needs to be bent forward when the top cowl is attached. Check the overlap sequence of the aft alum plates between the engine and the turbo area too. Also check that the flexible baffle behind the magnetos is in place. Ensure the alum baffles between the cyls are installed properly. The baffle near the air filter sometimes gets out of whack too. Don't know if you had new baffling strips installed--they could be cut too short.

#2: Wastegate system, if the wastegate is staying closed your throttle butterfly will be fighting against extra hot air trying to feed the intake manifold. This will make the air charge to your cyls very hot with resulting high cyl temps.

#3: Magneto Timing, too far either direction can make your EGT/CHT show high. Without checking a manual, I think adv timing will have the most affect on CHT with retarded timing yielding high EGT.

#4 Fuel system, fuel pump pressure and/or fuel injector settings could be set too lean -or- you could have a leak somewhere and the fuel actually getting to the cyls is less than you think.

#5 Manifold pressure ind, maybe you have a leak in your line and you're setting higher power on the R eng to keep pace w/ the L eng. Then leaning too much to match fuel flows?

Lastly, if you've had one engine installed with oversized cyls verses and engine with orig sized cyls there could be temperature mismatch. Too bad I can't see the plane for myself, I might have a few more ideas! Good Luck--keep those cams lubricated!

Six drain holes on a Duke?

Posted by **Bob Hoffman** on 03/22/03

Dane: Since the COS flyin I have been diligent about checking the aft fuselage drain holes for failed drain seals. I have flown at least thirty different Dukes in the past four years. Each airplane I have inspected has five drains. Well... there is a late (+400 serial number) B60 flying around with six drains. I had to do a second take because I know the far aircraft right fuselage area did not include a drain from the factory. The question is, was this a factory modification, or a savy owner correcting an obvious error? Sure would be interesting to know how many aircraft have six drain holes, and why. See you soon... Bob Hoffman

---

Duke Story in August Private Pilot

Posted by **Bob Stan** on 06/27/03

The August issue has a story on Dukes based on a flight with Lars Lundgren. It also lists the Duke Flyers as a reference source which is good. Thanks to Lars for participating in this.

Three items are iffy as written in my opinion. The story states the Duke is flying at 240 KTAS in the high teens? Unless Lars is flying wide open, I don't get that speed in my cruise flight. Anyone else? The story also said that takeoff was done in the "high 30's" for manifold pressure since full power wasn't needed "at our weight". It may be true that the Duke can fly off at less than full throttle. What do the Duke Instructors have to say about this? I have been taught to use full power on takeoff. Remember the story about runway behind you being of no benefit? Finally, the story implies if the Duke doesn't have the FWF new cam its' value is in question. I don't think there is 100% agreement with this thought.

I would be interested in others thoughts after reading the story. Maybe I am taking the above items wrong.

Private Pilot article

Posted by **Greg Jellinek** on 06/27/03

It's too bad that somebody always has an axe to grind. While FWF cams might be the answer, I would hate to think that the rest of the fleet is consigned for the scrap heap!!! As for TAS of 240, not in either of the Duke's that I have owned. And without fail, every instructor that I have ever trained with has had me push the throttles, props, and mixtures "to the wall" on any takeoff. Guess opinions vary!!!

Duke article/Private Pilot

Posted by **Mark Seader** on 06/30/03

I have just received a faxed copy of the "Duke" article this morning and read it for the first time. I logged on to the Duke website to see if there were any comments and low and behold, news travels fast! Some clarifications are in order:

1) I relayed a story where a Duke was found with bad camshafts during a pre-purchase inspection to the reporter during the phone interview. It did turn out to be the end of the sale. I have also lost several potential buyers on other Dukes when the full disclosure of the camshaft repair, if required, would cost. My statement did not malign all other Dukes without the FWF camshaft currently operating. I stated to the interviewer that it is NOT a guarantee that all cams will fail as I have a fair amount of customers that have reached TBO or are close to it. (That part was not printed) I did state that the number of failures was becoming a warranty nuisance 5 years ago, and that with the exception of the camshaft/lifter problem, the engine is in our opinion, "bullet proof".

2) I am not the owner of Firewall Forward, and have not been in an ownership position for several years. After owning FWF for 17 years, I am quite content to manage sales and product development.

3) The test engine information was not entirely accurate, but the errors are not of any major consequence. I had asked to proof read the article prior to print. So much for phone interviews. These kinds of articles can substantially help the Duke reputation if properly written. It is obvious that proof reading is MUST!! --- As an aside, we have completed 22 engines since Feb 14th 2003, and have 10 in process at this time. I still think the Duke is the best kept secret in GA, and the activity level for Aircraft sales is very active.
Sincerely, Mark Seader, FWF

Private Pilot article

Posted by **Lars Lundgren** on 06/29/03

Sorry about all the confusion the article created.

I was not offered a chance to read the article before it went to print, I would have corrected the errors regarding the 240KTAS and take off with less than full throttle.
We did not take off with less than full throttle, the magazine safety pilot was on the controls in the right seat and "balls were to the wall". Pulled back on power shortly after take off in order to stay with the camera plane.
Regarding the 240KTAS at mid teens, this was a misunderstanding, I guess we talked about max speed at the high 20K's.
Again, sorry about the errors

Private Pilot article

Posted by **Robert Mann** on 06/27/03

Perhaps Mark was misquoted. I think the value of the Duke fleet would be in question if a fix for the camshaft/lifter problem was not available. The value of an individual Duke would vary a little depending on whether it had the new camshaft or not. If the camshaft were not available, the value of the entire fleet of planes would suffer substantially.
I have never seen an article that supports the use of less than full take-off power.
POH has a maximum cruise power KTAS of 232 in the teens at 34/2750 and -37F. I wonder if they meant mph? My IAS is usually 10 knots below book values.

Dane Scag Duke Clinic

Posted by **Maurice H. Miller** on 04/10/03

A definitive compilation of these pearls of wisdom on maintenance of the Duke would greatly benefit our little brotherhood of owners. A Syntopicon with sections similar to J. Norman Colvin's Clinic on the Bonanza/Debonair/Baron, mechanical contributions from Mark Seader, a section on piloting skills from Bob Hoffman, and features from Jim Gorman and fellow Duke owners would benefit all of us.

Let's face it, with only 400+ Dukes in the air, there isn't a big financial market for a book of this type. If half of us would buy a book for, say $75, less than the price of an oil change or about one hour of mechanic's labor, that would gross $15,000--enough to get published. I submit that dissemination of this valuable information would eventually lead to improvement in the overall condition of the fleet---hence higher aircraft values.

I don't know about you other owners, but I am getting less tolerant in paying mechanics' hours on a learning curve to service my Duke. An instructional Duke Clinic text would greatly benefit our needs by keeping service costs low while maintenance quality high.

Maintenance book

Posted by **Ken Bowdish** on 04/11/03

I suggested such a book, or assemblance of notes like this at the Denver fly-in. There didn't seem to be much interest at the time. Glad to see there is an interest now. I think it would save us all a lot of time and money sharing our bits of knowledge. I would agree with Dane that if you don't have the maintenance, parts and wiring manuals, buy them. Also buy the components maintenance manual. In addition for those of us who have basically all the original avionics wiring installed. For a fee you can get these wiring drawings as well. I use them all the time. I have done virtually all of the maintenance on my Duke and have accumulated two full notebooks of "nice things to know" on virtually every system or component in the airplane. I would be glad to share this

Count Me In...

Posted by **Bob Stan** on 04/10/03

I agree with the book idea. Let's all send checks and get going. This would be an excellent topic at the upcoming San Diego meeting.

We have all experienced the learning curve cost of Duke Ownership. Perhaps as part of a survey leading up to the next fly-in, we could all share names of FBO's that know the Duke well, and spend money like it is their own. I know of two right off, in Medina, Ohio and Minneapolis, MN. My local shop has also got a lot better, but it took a few years to get them up to speed.

Finally, as I have learned more about the Duke, from study, experience, and reading this web page, I shorten their trouble shooting time by narrowing the problem. The Duke Flyers has really enhanced my ownership experience.

Some maintenance ideas, experiences and the Duke Fly-in

Posted by **Dane T Scag** on 03/22/03

I applaud Shaker. In times like this we should relish the camaraderie such a fly-in generates. We all share a common love: the nicest twin engine airplane ever made. More than a handful of members should be encouraged to attend.

The relatively new Duke I recently bought (one of the last three made) is getting a face-lift at Elliott. Regarding the cam shaft/valve lifter debate, I have decided to have Bonhard install his carbide surfaced valve lifters. Has anybody had a negative experience with his lifters?

I repeat once again, those of you who have not removed the rear cabin floor plate and checked for missing and broken floor drains may be in for a big surprise. I checked my recent acquisition and found several broken floor drains (certainly causing pressure loss), and corrosion where Beech goofed and never installed one on the right side. There should be six in line there, not five. I have fotos to share.

I look forward to sharing simple maintenance tricks to keep our Dukes flying less expensively. Incidentally, after searching for gust locks at RAPID, they said they were out off production, but could manufacture one for me in 6 months for only $900.00!! So I'm making my own out of stainless steel, which you can buy at an Ace hardware store. Total material cost will be about $25.00 plus some clever labor. I'd be happy to share drawings with anyone (at no cost).

One last recent experience to share: since my plane would be down for some extensive avionics work, I decided to replace all of the brake linings and discs. I bought Rapco parts. Since the runways had patches of ice, I decided to burn-in the linings by a fast taxi run on the very large ramp. It was a very fortunate decision. After 2 or 3 hard stops one brake pedal fell to the floor, and the plane made a hard right turn. I probably would have skidded off the icy runway into soft grass.
I know what you are going to say; I must have gotten air into the brake lines. Not so. I never opened the hydraulic system. After some perplexing further tests where the brake pedal would be either hard or fall to the floor, we jacked up the wheel and looked at the assembly.

I was floored!! The brake discs were very badly scored and the linings had crumbled.

Western Oklahoma State College Lycoming 540 Survey

Posted by **Larry O'Connor** on 02/16/01

According to an AOPA article, the college is disavowing this survey that was sent to many Duke owners. No authorization was given to use the school's letterhead and the Oklahoma Attorney General's office is looking into this matter.

Survey by Dr. Hynes of Western Oklahoma State College

Posted by **Joe Hosteny (P-507)** on 01/30/01

In early January, I received a request from Dr. Hynes of Western Oklahoma State College (Office of Aviation Research) to complete a survey about Duke engines. The content of the letter concerned me that the value of a Duke could be unfairly influenced by the survey.

I asked Dr. Hynes who is sponsoring his study, and who the information will be disseminated to. He has not responded as yet. I recommend not responding to the survey since we do not know how it will be used.

More info on Western Oklahoma/Hynes Survey

Posted by **Joe Hosteny** on 01/31/01

For anyone who is interested, I gave the following information to Dr. Hynes yesterday, and told him I wouldn't respond.

This is a follow-up to my letter to you of January 9. I researched the NTSB database for Duke accidents from 1990 to the present. I found 22 records of accidents or incidents involving Dukes. Of those, only four appeared to involve engine problems. They were:

- N725DJ, June, 1990, engine failure for undetermined reasons, no fatalities;
- N7396D, June 1997, loss of power and failure to feather for unknown reasons, no fatalities;
- N457DA, November 1999, failed rod bolt, no fatalities; and
- N928PT, April 2000, failed rod bolts, no fatalities.

I discounted two because they appeared to involve clearly improper maintenance. Those were:

- N3LP, June 1995, improper materials in a failed turbocharger, three fatalities; and
- N100BL, February 1995, unapproved parts in both turbochargers, no fatalities.

My research therefore indicates that there have been no fatalities associated with engine failures in Dukes since 1990. That causes me to wonder what is the basis of the statement in your letter of January 4, 2001 that "[m]any owners have experienced in-flight engine failure ..." not to mention the comment about "saving lives."

Survey

Posted by **Jim Gorman** on 01/31/01

Our member Jim Foresman did make contact with Dr. Hynes. Statements by the good Doctor were:
1. Sorry he did not review letter before it was sent out.
2. 540 and 541 engines are the same. (which is totally false)
3. Survey was aimed at Malibu Mirage owners.
Some are or planning to sue Lycoming.

I recommend we forget about Dr. Hynes and do not answer his request.

Survey

Posted by **Bob Stan** on 01/31/01

I agree that there is little benefit to completing the survey and sending into unfriendly hands.

Perhaps the Duke Flyers should initiate a survey in the next news letter to more clearly paint a picture of who is having lifter and cam problems. It would also be helpful to know who is not, and the associated circumstances. If there are sufficient numbers, either these pilots as a group, or the Duke Flyers, can pursue action to identify the cause and force the manufacturer to remedy. The survey should be tightly controlled by the group with an understanding that all of the information is confidential and for Duke Flyer members only.

Survey

Posted by **RALPH COHEN** on 01/09/01

I also would like to know who is sponsoring this study and what is the purpose. I urge all Duke owners to reflect very carefully on the impact this may have on the value of our airplanes. I personally have owned many airplanes and could devise a similar survey for all of them. A few individuals may benefit; but all owners stand to lose significant value! Use your own judgment.

Oklahoma University survey

Posted by **Bill Cammack** on 03/02/01

In a recent discussion with Lycoming, they told me that the survey was sent by a person that tries to make a living by finding/creating class action lawsuits. He recently failed to find a problem with another aircraft and has now tried to create a stir with Lycoming. Lycoming has taken him to court and expects to have him out of business shortly, alleging lots of dishonest practices.

ELEVATOR BELLCRANK FRACTURE

Posted by **Dan Bruhl** on 10/04/01

In the process of dismantling the tail section of a B60 for parts, we noticed a complete fracture of one of the attachment arms (part #60-524-044-1) of the elevator bellcrank assembly. This part is a casting and the fracture occurred at the base of one the attachment arms. The fractured part attaches to part #60-624-047. This fracture would appear to be a serious threat to safety of flight as it secures the elevator bellcrank assembly. The part can be inspected by removing the appropriate access plate. There was no evidence of damage to this area that might have caused this fracture.

Induction air

Posted by **bob giebeler** on 05/02/02

Hi Folks Some observations about engine air intake in Dukes; The paper filter on the Duke is way too small...it is a huge restriction...compare it to the square inch surface area you see in the Cessna 400 series circular filters. I found a reasonable alternative was the Bracket oil coated filter, using the coarse insert only.
The worst part of the deal is that in all likelihood, at full power application on takeoff the alternate air door opens to compensate, and you have unfiltered air entering. And even worse, as with my plane occasionally on the ramp, you will note sand/dirt collecting in the intake to the alternate air...how much are new engines???
bob ATP/CFII/A&P/Registered Engineer 20666

Engine breather

Posted by **Ken Bowdish** on 09/16/03

The gang pipe that the engine breather hose connects to has four small stand pipes on the sides of it, looks kind of like a little tree Three of those stand pipes are connected to drain lines, one from the waste gate, one from the cylinder drain lines and the third the fuel pump. The fourth is not used and on the left engine (in my airplane and three others I've looked at) that extra stand pipe has a plastic cap on it. This plastic cap is not on the extra stand pipe on the right engine.

I ran a crank case pressure check on the engine with the cap on and got a little bit of case pressure With the cap off there was no case pressure. Does anybody else have a cap on the extra stand pipe on the left engine and if so why is it there?

Engine breather

Posted by **Firewall forward/Dave Maskell** on 09/17/03

After consulting our technicians believe 4th stand pipe is in case main breather becomes obstructed. Probably needs to be uncapped to allow some air into breather system. dkm

Engine

Posted by **Robert Mann** on 11/05/02

It was a highly modified engine, possibly a 427, produced by Engineair. They had a web site engineair.net until recently. I reviewed the company history on the web and they certainly had numerous setbacks in development. Their engines have been primarily produced for the Lancair market. One of the major stumbling blocks was the reduction gear box. I know Ron had replaced the rudder for corrosion, but I don't think the tail surface was enlarged to handle the higher HP. Also don't know if they had determined a V mc with the higher HP modification. It was a nice installation. Good idea, but I don't know about the reliability of water cooled engines or what engineering changes would have to be made to the airframe to accommodate the higher HP. You can still find some information on the company by searching on the net with search term Engineair.

Engine

Posted by **Earle Olson** on 11/03/02

It was a 427 V-8 built by LCC. It was not derated. The same engine that has been used on the Lancair. Ralph, this was a beautiful installation and tucked into the standard cowling without any protrusions. There were a few compromises made that may have caused problems. Ron had done a marvelous job in a short time with some very talented cooperators. Test data that Ron shared at the fly in showed that they did develop 500 hp and on one engine that can be a problem.

Engine retrofit for BE60's

Posted by **Robert Hoffman** on 04/19/02

It seems every few years we have a discussion about hanging a new motor on the Duke. As I recall from previous discussions, the real limitation for a retrofit STC is finding a 74 inch prop that would be compatible with the airframe and engine. A turbine Duke would be neat, but show me a 74 inch turbine prop.

Heater & Manifold Pressure Questions

Posted by **Randall Kerns** on 01/31/03

Help! First of all the heater. In the auto mode the heater will not cycle on an off. It is intermittent at best and will usually only work below 8,000 ft. My shop has spent allot of time on it including cleaning my old Barber Coleman thermostat as suggested to finally replacing it.

Second at full power on takeoff and until MP is reduced I am beginning to get a 1-2inch fluctuation in MP for no apparent reason. All instruments and gauges are normal including TIT and 6-cyl EGT & CHT. Any ideas?

MP variation

Posted by **Joe Konicki** on 05/09/02

I had close to the same thing happening at 17K and above. It was a combination of something worn (bushings?) on the wastegate--tended to hang up with back pressure/heat on it. And controller actuators that had worn seals, which allowed oil to leak out and air to get into the system.

MP variation

Posted by **Robert Mann** on 05/08/02

I assume that you have switched the Variable Pressure Controller from right to left with no change. I would switch the Bendix fuel injector assembly from right to left and see what you get.

-E1A4 Engines

Posted by **Dane Scag** on 04/08/03

The most knowledgeable people, outside of the Lycoming factory (since they will not admit to anything), are the folks at Firewall Forward, 800-444-0566, ask for Mark Seader or Glen or Tom. They know more than anyone about Dukes, accessories and engines. Tell them I sent you.

Good luck and welcome to the society of Duke passionate lovers.

Engine overhauls

Posted by **Walter Eeds** on 12/17/01

I used Victor 18 months ago and so far their black edition engines are perfect. Approx. 150 hrs. so far. Only complaint was that they were slow. What else is new? However, a big part of their problem was 2 sets of bad cylinders sent them from Lycoming. I'd definitely check them out. I'm in Newport Beach, CA. P536. 949-760-0300. Good luck.

Engine tear down report

Posted by **Mark Allen (N38N)** on 04/09/01

Thanks to those of you expressing sympathy concerning unexpected engine changes. Several of you asked me to post the results of my tear down inspection report. Here is some of it:
All Lycoming factory parts were used in overhaul approximately 230 hours before this problem.
Engine being operated on AeroShell 15-50 oil.
Cam shaft showed abnormal wear on #3 & #5 lobes. Associated push rod assemblies showed abnormal wear also. No other abnormalities found in this engine.
Can anyone shed some light on their communications with Lycoming concerning covering parts and removal labor? What is Lycoming's position / policy. I don't expect blood, but some help would be nice.
I am supposed to be airborne again this week!

Recent engine overhaul

Posted by **Tom Comerford** on 01/03/01

Please see my message under "Firewall Forward" providing some details about my recent experience. When I decided to go with Firewall Forward, I told its President Mark Seader that I planned to give the membership a detailed report of my assessment of his company and the service they provided me. Long short story--I was much more than satisfied. The engines are beautiful to look at and seem to work perfectly well. The service provided by the company was exceptional and prompt.
Please excuse the typos in the longer post!

Overhauls

Posted by **Earle Olson** on 01/28/02

I've been flying Dukes for 20 years. This is my second one. I recently threw a rod bearing at flight level 210 IMC. Larry Rauch was very helpful in getting me a replacement engine in record time. I have purchased 4 Lycoming overhauls and as far as I am concerned no one knows these engines better than Lycoming.

Overhauls

Posted by **Robert Mann** on 01/25/02

I purchased FOH from Airpower in 97 and was very satisfied with factory overhaul and support when I ran into lifter spalling on the engine. They did a complete teardown, replaced case, cam, lifters, turbocharger, oil cooler, and a couple of pistons without charge even though from a date stand point it was somewhat beyond the warranty period. I spoke with the engine rebuilders at the factory regarding FOH and Reman. They did not seem to think there was much different except Reman had new exhaust and a 0 time logbook. Maybe you could talk to Larry Roush at Lycoming regarding the difference. His number is somewhere on this website.

Engines

Posted by **John Awalt** on 01/24/02

FWF does a lot of Duke engines and was able to save some time on my overhauls, Mark had a couple of cy cases on the way in when my engines arrived. He used those for my plane and sent mine in. I would guess it just depends on timing. We have been very happy with our FWF engines. Very smooth and powerful. Nice looking too.

Reputable overhaul shops

Posted by **Chris Larson** on 01/24/02

I'd like input from the membership on reputable overhaul shops willing to do a core exchange on the TIO 541E1C4 engine. I want to be sure that the core I am getting is as good as the one I'm exchanging. Hopefully, I could save significant "down time" with this approach. Also, your thoughts on Factory Reman, vs Overhaul, vs rebuild for this engine would be appreciated.

Overhaul

Posted by **steve faber** on 12/01/01

My recommendation is factory overhaul through Air Power. They make it easy and I have been very happy with the results. Check them out at www.factoryengines.com.

I also recommend that you start right off with Aeroshell 100W plus. I'm sure you have read all the stuff on camshafts.

Firewall Forward

Posted by **Tom Comerford** on 01/03/01

In early November, posted a message indicating that I was considering using Firewall Forward for the overhaul of my Duke's engines. (I had experienced the cam/lifter problem at about 850 hours of operation.)

I have had an excellent experience with Firewall Forward. At the inception of my relationship with the company, I spoke with President Mark Seader and emphasized my expectation that I be kept informed about the progress of work on the engines and that I expected the engines to be completed within the time frame that Mark indicated I could expect. Mark was always available when I called with questions and often called me personally to provide me with an update. The engines were returned to me on schedule. When my local FBO questioned whether it could install the engines within the time frame that I needed for a trip after Christmas, Mark and his chief pilot traveled from Loveland, Colorado to Winston-Salem to assist with the installation of the engines.

Boy, are these guys knowledgeable about their product! Everyone at Piedmont Aviation was amazed at their knowledge of the aircraft and engine. The head of the FBO told me privately that he had never seen engines as close to being ready to go as were these engines.

After the engines were installed Mark and his test pilot flew the aircraft and made the adjustments that were necessary before returning to Colorado. What makes this all the more impressive, insofar as service is concerned, is that this took place just a few days before Christmas when no one really wanted to be away from home.

I have now flown the engines about 14 hours--on a trip to Providenciales in the British West Indies, and the engines performed flawlessly. No oil consumption in 14 hours. (There are a few adjustments that need to be made on the position of the prop levers)
The engines are quiet, smooth and seem more powerful than previously was the case. Time will tell whether I have the same problems that have plagued the cams and lifters--although Firewall Forward believes they have developed a fix for the problem with an STC. What I am sure of is that I have gotten excellent service, timely turnaround and fantastic support so far. Based on my experience to date, I would give strong recommendations to Firewall Forward to anyone who is having engines overhauled for their Duke (or any other aircraft for that matter).

The choice of an overhauler is awfully important given the expense and complexity of these engines. Lycoming really did not seem interested in doing the work when I contacted them. I would be happy to discuss my experience with anyone who has questions (my number is 336.631.8510) and I will let the Association know about any problems that come up that might change the impression I have given in this post. For now, I am a very satisfied customer of Firewall Forward and have every reason to believe that I will stay that way. Happy Flying

FWF

Posted by **John Awalt** on 11/08/00

I had both engines on P533 done by FWF last summer. They were very professional and prompt. The engines are extremely smooooth and quiet running. Don't know yet about the lifter problem. I only have 48 hours on them and they are fine so far. Did have a turbo oil leak and they covered that under warranty 100%. By the way, FWF is now recommending Aeroshell 100 plus (has the additive in it) motor oil. My experience has been good. I recommend them.

TIO-541 engine

Posted by **Mark Seader** on 10/21/03

Several times last week current and potential Duke owners expressed concern to me about rumors that Lycoming will soon stop supporting the Duke engine with regard to overhaul parts and cylinders. I personally talked with Steve Palmatier 10/21/03 (Customer service mgr) at Lycoming, who stated "that simply is not true, we intend to continue our support for the 541 series engine" --- Hope this quells any fears.

Future Support

Posted by **George Friedrich** on 10/28/03

I certainly hope so but I seriously question Lycoming's long term intent on the 541. There aren't that may 541 engines out there and with the present problems with the Cam/Lifter issue, their downside risk will be too high to continue to support all the defective engines and parts. Plus, look at all the recalls on the 540 eng....that is a huge corporate issue. I'm keeping my fingers crossed for a while or until I move to a turbine.

Engine overhaul

Posted by **Ralph Cohen** on 11/08/00

No matter who overhauls your engine, they must use Lycoming parts. I've had all my major engine work done at the factory and have found them to be prompt, courteous, knowledgeable, and fair. In addition, they have all the parts necessary to complete the job. The lifter/cam problem is not limited to any one specific repair center. Lycoming has the resources necessary to step in where necessary. Call Larry Rousch at 570-327-7308 if you want to talk to a real Duke expert.

Descent

Posted by **John Awalt** on 04/16/03

I've been taught to leave power setting at cruise power during descent. Works fine except during the most severe dunks, when I just drop the gear. Reasoning was to keep the engines warm and not disturb the counterweights. I maintain cruise power all the way down to close to pattern altitude or until ATC levels me off at 4-6000 feet. Anyone else doing this?

Descent

Posted by **Bob Stan** on 04/16/03

I agree with John. I keep cruise power all the way down and stay well below the yellow arc at 1000 fpm VSI. I start to reduce power about 2" manifold pressure every minute or so before landing, but no need to reduce power at altitude or anywhere close. With approach flaps and gear down at cruise power you can get over 3000 fpm without power reduction.

Descent

Posted by **Earle Olson** on 04/16/03

John this is the way I have been doing it for 20 years on two Dukes. Not sure why any one needs speed brakes. Only time you may have to very this is in rough air and then watch your maneuvering speed limit.

Engine RPM "sweet spot"

Posted by **Joe Konicki** on 04/29/02

Hi all--was wondering what cruise RPM typically gives you the lowest vibration and/or most comfortable operation.
Mine seems to like indications between 2480 and 2525 RPM at 30" MP (intercooled). Thanks.

TIO 541 pushrods

Posted by **Eberhard Burghalter** on 08/03/01

If you experience higher EGT temps on one or more cylinder after a recent overhaul you can also check if the pushrods the put in your engine are correct. My engine was at LYCOMING last year and was totally disassembled and reassembled. In this process they put ONE WRONG PUSHROD in the engine. Nice job!!
(By the way the intake and exhaust pushrods are not the same length and P/N)

Sparkplug? fouling

Posted by **Joe Konicki** on 01/09/02

Reading your message I think you are experiencing plug fouling.
With the colder air temps your cylinders are not only running cooler but the inlet air and fuel is much cooler so I suspect your plug tips are in turn not achieving high enough temps at your usual idle and mixture setting to burn off the deposits. Your right side fuel distribution also might be just a tad richer than the left too (I see a decent amount of variation in my fuel distribution depending upon power setting).

My recommendation is to lean as aggressively as possible on the ground (if you aren't already doing it) and maybe idle at a little higher power setting to keep the temperature up in the engine. I also don't know what you're doing with cowl flaps (I keep mine closed in descent and on the ground). Hope this helps! Joe

Graphic Engine Monitor

Posted by **Lars Lundgren** on 02/22/01

I am considering installing the Insight Graphic Engine Monitor System, Gemini 1200. Would appreciate any feedback from someone using the system. Installation difficulties? Ease of usage?
Thank you for any response

GEM

Posted by **Kim Pratt** on 02/23/01

I can't comment directly on the GEM. I recently installed a JPI monitor. I went with JPI rather than GEM due to a number of negative comments on Insights customer service on a Beech mail list. The JPI had no install issues and has worked well. It has provided interesting data. I would like to know if other Duke owners see high CHT on the number 3 cylinders. This is routine on both engines. There is good data to suggest that CHTs should not exceed 400 as the cylinders start to go out of round. To stay <400 at altitude requires open cowl flaps and slightly richer mixtures than I ran in the past to keep #3 down. This also raises the question: Is anyone running these engines lean of peak? LOP results in lower temps if the engine will run smoothly. Anyway, either engine monitor will work and in the questions I posed prior to purchase equal good comments about both were made. Again, I opted JPI on the basis of customer service. I feel the data an engine monitor provides is very worthwhile.

Engine Monitors

Posted by **Bill Unternaehrer** on 02/27/01

We have installed the JPI and the installation was not a big deal. I would not fly these (or any other expensive engine) engines without the monitor. The monitor has showed a loose baffle (increased CHT), and a displaced intake tube gasket (decrease in EGT). It is a wonderful device.

Engine Analyzer

Posted by **Frank Singer** on 03/18/01

I installed a GEM in my Duke about five years ago. I would never use a GEM product again. I had a JPI unit in my Bonanza before my Duke and the only reason I installed the GEM was that five years ago JPI did not have a twin engine model. They do now.
The reason I don't like GEM is that my display went out last year. GEM charged me almost $1,000 to replace it. I had a similar problem with my JPI unit about eight years ago and they replaced the display free of charge.

Shadin Digidata

Posted by **Bill Unternaehrer** on 11/23/01

Rob,
We have the Digidata device in our Duke and I believe we were the first to get the device approved as "Primary Fuel Indication". We did this in order to remove the original Beech Fuel flow gauge so that it would open up a hole to install the JPI engine monitor. Let me know if you need a copy of the 337 to help you get yours approved. The Digidata is great. You can read the wind direction / speed during climb so you know when to level off to get the best ground speed. That's probably the most used feature of the "data" half of the device. The fuel flow half of the device is also great as you can interface it to your GPS (at least the KLN-90B) and get all of the fuel flow, fuel used, etc over on the GPS but also get the fuel quantity at the destination.
During a trip you can watch the fuel remaining at destination change as the wind changes and help you make the "stop for gas" decision. In short, it is a great device. We are looking at Turboprops and maybe a Citation Jet and it is the second "black box" that either must be there or we will put it in immediately. The first box is the approach approved GPS.

Preheat

Posted by **Chris Larson** on 09/05/02

Tannis' recommendation was a blanket and continuous heat throughout the winter. Cycling causing cooling and condensation.

Engine Heat - Reply

Posted by **Jim Gorman** on 09/03/02

I hate to disagree with Larry, but the vast majority of Northern Ohio rust problems engines had blankets covering the nacelle. All a blanket does is keep the engine a little warmer for a while when the heater shuts off. This does not stop the internal engine condensation problems caused by the heater starting and stopping.

Engine Preheat

Posted by **Bob McEwen** on 08/31/02

For preheat I use an engine cover and a car warmers and it works just fine. However, I just start the warmers about three hrs before use or sometimes 12 hour before use. Example the night before I keep the plane P528 in an unheated hanger. I also put a warmer in the cabin. I live in Edmonton Alberta but I usually don't fly below -20 Fahrenheit on the ground.

Tannis preheat

Posted by **Chris Larson** on 08/31/02

In response to a December thread about preheating, I had the same conversation with Larry at Lycoming who recommended against continuous heat through-out the winter. Tannis, however, said if the engine nacelle is covered with a blanket, the compartment is equivalent to a heated hanger, and condensation inside the engine should not be a problem

Pre-Heating

Posted by **Greg Jellinek** on 12/24/01

I recall that someone at Lycoming considers a "cold start" as anything below 50°F. We have had the Tannis heaters for years now and I use them whenever the airplane can be plugged in below 50°. I have been leaving the heaters on full time in the winter now. Larry Roush at Lycoming told me that leaving the electric heaters on full time would cause condensation inside the case, but it seems to me that letting the engine cool down would in fact lead to more condensation than simply leaving them warm all the time. Any thoughts???

Tanis Heater Installation

Posted by **Dean Robert** on 08/31/22

I live in Illinois and want to install engine heaters; I am told that because I have JPI digital egt/cht/tit that a Tanis is not an option and there is a simpler/effective alternative to it that fits on the block. What is it and where can I get one? Also need a control lock and sheep skins for pilot/copilot. Who's the best on these?

Engine Heaters

Posted by **Larry O'Connor** on 09/01/22

News to me as J.A. Aviation (DuPage 630-584-3200--ask for Dave in electronics) installed both the Tanis and the JPI unit on my Duke.

Engine heaters/Tanis

Posted by **Robert Mann** on 09/10/01

I was told the same thing when I installed a Gem 1200. Called Tanis and they had combination heater CHT probes for each cylinder.

Engine heaters

Posted by **Randall Kerns** on 09/04/22

You may want to look into Reiff Engine heaters. They are band system that is used on each cylinder & solves the problem with multiple probes such as JPI. Also incorporates case pads also. I have them & they are great, fast & effective.

Engine preheat

Posted by **Bob McEwen** on 09/02/22

I live in near Edmonton Alberta. I have engine covers and three in car warmers one for each engine and one inside the cabin. Because the engine covers are not real easy to put on I have four high density foam inserts for the cooling air intakes . When I use this method for warm up if works real fine. in -20 C temps. Everything is portable and don't have to carry any extra weight in the summer.

Pre-Oiler FBO installation time experience

Posted by **Maurice Miller** on 08/05/

First the good news: I took everyone's advice and had pre-oilers installed...they work great...at about 70 seconds oil comes up to 40 psi.
Now the bad news: fellow Duke owners told me to expect installation hours in the mid to upper teens...well my local FBO (an FAA certified repair station that usually works on Citations, Falcons, and other expensive corporate acft) charged me 65 hours at $67.50/hour. They did a nice installation by anyone's standard. I challenged the bill, and they offered to reduce it, but I need some documentation of the usual and customary installation time experienced by my fellow Duke flyers to back me up.
Thanks, fellow flyers./mm

Oilamatic Pre-Oiler Installation Time

Posted by **Al Uhalt** on 08/14/02

Oilamatic (George McCrillis) says 20 hours to install on a Duke [Ref. DFA News 99-3, p.3].

Pre-oilers

Posted by **John Awalt** on 08/05/02

Mine was 23 hours...

No Metal

Posted by **Greg Jellinek** on 07/27/02

Two years ago we had to replace the lifters and camshaft on our left engine. Last year ditto for the right side. The airplane is in annual now and needless to say I was scared to death. We have been using the 100 plus oil and religiously using the Oil-A-Matic pre oilers on the first flight of each day. We are also pressuring the engines and then using the starter to turn the engine over for 10-15 seconds before priming and starting in an attempt to splash some of the "pressurized" oil around inside the case and around the lifters. All of the lifter faces were found to be smooth and undamaged. There was some very faint scuffing on the side about half way down the shaft of one lifter, rubbing in its tube?? Don't know if this helps, but it is what I have to offer.

High alt start

Posted by **warren Dean** on 08/31/00

Living in Colorado Springs I perform high, hot starts all the time. The key is after a 3-4 second prime and you are cranking, make sure you do not bring the mixture up too soon. Let the engine run through the prime. Also make sure that you have the throttles cracked open.

I have also found that hot starts are most successful when you use the cold start procedure, I just takes a few more prop turns

Engine start

Posted by **Bob McEwen** on 08/24/00

I found that when landing at higher altitudes when I have touched down and no possibility of a go around you need to lean the mixture If you don't your engines my stall at idle because of too rich a mixture. Cold starts are done with fuel pumps on and mixtures full rich for four seconds, then mixtures full cut off . Throttles open about one inch. Was told by Duke operators to leave generators off during start. Crank (I have two new light weight starters) fuel pumps off? Crank engine when it starts slowly advance mixture to about one inch If engine starts and is running rough I usually slowly advance mixture as engine is a little rich. Hot starts generally the same, only fuel pumps stay on and only prime for one second. Just an indication of fuel flow. This works for me however all engines are a little different. When taxing and before take off I lean the mixtures to about just below the start of the full rich indicators on the mixture settings? I tend to be on the lean side for ground work and rich of peak in flight. Hopes this helps/ Glad to converse with you directly if you send your Email address

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TIO541series engine stumble

Posted by **Joe Konicki** on 12/31/02

When I 1st started flying the 56TC I was surprised to find out that when ramping up power for a mag-check or prop check there seemed to be a point between 1300 and 1500 rpm that the engine would "stumble". This would happen whether the elect fuel pumps were on or off, or whether mixtures were rich or lean. It seems more pronounced in hot weather but both engines have done it in cool weather too. It doesn't happen all the time either, I might go some number of flights without it occurring. A friend of mine who has owned 56TCs and a few Dukes told me once this is common to the planes he's ever had.
I will also say that if I land without the electric fuel pumps "on" in warm weather, which I've done a few times just for the heck of it while learning about the airplane (my checklist directs fuel pumps "on" for landing BTW), it is very common for the engines to begin surging during taxi and yes, even quit due to vapor lock. Anytime the weather is warm and the engines are hot they won't stay running unless the elect fuel pumps are on (I lean to normal levels while taxing to avoid fouling plugs). At an intermediate fuel stop despite a warm engine and fuel pumps "on" I still sometimes see that "stumble" during run up. My fuel lines are all fire-sleeved, & all four fuel pumps recently overhauled w/ correct pressures but I've never checked/overhauled the injector manifold (other than cleaning fuel nozzles). Interesting stuff--always something to fiddle with on an airplane!

Engine failure on Takeoff??

Posted by **bob duke master** on 12/30/02

Well, its been a few, but I am taking off a few minutes at year end to share...

I have had N822D for about 8 years now, and a few years ago I was taking off form Vacaville (CA) in the summer (temp 110F), after filing up (gas was cheap), and, well the worst Duke nightmare came true... The Left engine sent soft on me at 200 ft. The place, hill off the end, 200 ft trees to the left, high OAT, lots of fuel.

As flight instructor this also was my worst dream... what do you let your student to do when one falters? Shut it down, or fix it?? The good news is that I was sober... just had a lots of coffee, had 15 flaps down, cowl flaps 1/2...3 degrees bank to the right...etc.

After about 3 (seems like 30) minutes I nursed the sick one back, but what the Hell happened?? Checked out everything we could think of (I am CFII, ATP, A&P, etc), and found some minor things, but nothing too significant.

But one observation; (anyone else seen this??) When I run-up, I frequently see both engines nearly quit (dropping down to 500 rpm and recovering) and everything is then fine (note, unlike Continental (please spare me), there is no fuel return, and any air bubbles can only go through injector.

Any other suggestions, with privates in hand??

Sandel Unit

Posted by **John Tye** on 05/21/03

Patrick:

I have a Sandel unit (as well as an STec 65 auto pilot) and I'll give you a positive comment. It's cheap (relatively–for an electronic unit), fits right into the panel, and works well. Flying with the STec, a Garmin 530, and the Sandel set to auto slew is the slickest thing since sliced bread.

I can't address your thoughts on buying a used King unit, but my experience with buying used mechanical units, is that you're just asking for expensive, painful headaches. The Sandel in my plane replaced a simple mechanical HSI that was about to go in for its third $3000 "overhaul", and the Sandel hasn't missed a beat since.

Good luck and let us know what you decided.

EFIS

Posted by **Robert Mann** on 05/04/03

The problem with most EFIS units is the interface to the autopilot. Meggit has recently developed an interface to the KFC-250 but I'm not sure it is on the market yet. There is a Duke in Germany with a full EFIS system utilizing the King EFIS 40 system. A 337 for this system is probably obtainable without a lot of consternation, however this uses old gyro technology instead of the more reliable solid state AHRS system. Chelton Flight systems and Avidyne are also close to marketing their EFIS systems with AHRS technology, but here again autopilot interface will be a question. If you have to switch to a digital autopilot along with the EFIS system you are probably looking at $120,000- $180,000 by the time it is installed.

Attitude indicator

Posted by **Dean Rbbert** on 04/21/03

On a flight over the weekend, I experienced a tumbling attitude indicator for approx 1-2 minutes. It then regained its "spin" and was accurate on the way home. I was busy stabilizing the plane, in rough turbulence and IMC so did not notice a failed vacuum pump indication at the time. All was fine the rest of the way. Does this sound like the check valve? Can it intermittently interrupt the vacuum? Please advise.

Attitude Indicator

Posted by **Robert Mann** on 04/22/03

It would be unusual but not impossible for the manifold check valve to cause that sort of problem, and if it did then a ground check of the manifold valve would identify it as being faulty. More common would be a problem with the attitude indicator. You were flying in turbulence and if bank angles exceeded the limitation of the gyro then it would cause it to tumble. The better gyros however are good for 360 degrees of roll and assuming you have a high quality gyro you need to consider contamination from the broken vacuum pump, in addition to a worn out gyro.

Attitude indicator

Posted by **Kirk Samuelson** on 04/27/03

I had the same thing happen several times to my co-pilot attitude indicator, (which is probably the original pilot indicator on my 1981 Duke). It would work fine for hours then in some bumps it would tumble even though I hadn't done even a 30 degree bank. After this happening about 5 times in various flights I had it rebuilt and it now works fine 100% of the time.

Meggitt

Posted by **Joe Hosteny (P-507)** on 04/30/03

Steve -- I am curious to know if you ever pursued this. Meggitt says its system has been installed in an A36 Bonanza. I was looking at Meggitt and the King EFIS or EHI. If you have a moment, I'd appreciate your thoughts.

Meggitt

Posted by **Robert Mann** on 09/11/01

I am interested and have looked at the Meggitt system. Would be nice to trade the mechanical instruments to solid state instruments. They claim there is a 20 lb weight advantage also. I was waiting to see what the track record was for the Meggitt system in the Meridian. Also there are autopilot interface concerns. Bendix-King is also in the process of developing an efis system. At Oshkosh, their efis dg (KI-825 I think) is designed to interface with the 102A gyro and subsequently with a minor modification to their AHARS unit when development is complete. They wouldn't give any details in terms of time though. Couple of years is what they said. Maybe you can drag some more info out of Bendix-King. At any rate I

Meggitt

Posted by **Steve Faber** on 07/18/01

Just wondering to see how many of us are crazy.
Please let me know of any interest in upgrading with the Meggitt primary flight display and the navigation display.
To do the STC it would probably require 15 to 20 of us. I will take a guess that the equipment cost, installation, and engineering would run about $80k.

Fuel controller

Posted by **Robert Mann** on 04/19/02

There is usually a small amount of fuel leakage in the idle valve. Lapping the plates in the idle valve will take care of it. Some mechanics will do this but most of the time they will want to send it back to the overhauler. It only takes a half hour to do so should not cost much.

Fuel Burn

Posted by **Frank Singer** on 08/23/03

I run mine pretty much by the book. Here in California. The OAT is almost always on the high end so at 2500/32 I run at 19 gph per side and at 2500/30 17 gph per side. TIT runs close to 930C (1,625F). Never had a problem and I always go beyond TBO. I ran my old turbo charged B36 right at 1,650F and went 1,800 hrs before I overhauled it.
High TIT temps have never bothered me.

Fuel Controller

Posted by **Frank Singer** on 08/08/01

I lost my left engine during take off last week. I was about 200 agl and just entered the overcast when simultaneously the tower told me I was trailing smoke from my left engine and my left engine manifold pressure dropped. I made a quick 180 and landed in the opposite direction on half the runway I just took off from.
The problem was a nut (about 1" across) came off the fuel controller which uncovered a air opening that, in turn, let the fuel controller flood the engine. The engine run-up was normal but as soon as the turbo kicked in the engine flooded. The nut was not safety wired. The nut was re-attached to the controller and the engine ran normally. I checked the other fuel controller and it was safety wired. The engine had about 500 hours on it and it took that long for it to come off.
I will not fly in a Duke unless I first check that nut to see if its safety wired. It can be seen from the left side with the upper cowling open.
Hope this bit of information saves someone's life.

Fuel Flow settings

Posted by **John Awalt** on 07/09/03

Bob, my settings and reasoning are identical to yours, (except I use 30X2500 intercooled). Fuel flow is the same. TIT is the same. Have been wondering the same thing, most people say they have the same results. If I try to lean more, my CHT's get too hot. Opening cowl flaps just slows everything down. As long as the extra gas is not hurting anything, I don't mind. The book values on fuel burn seem to be for advertising purposes.

Fuel Burn

Posted by **George Friedrich** on 07/09/03

Bob, I always run mine at 31/2500 (intercooled) at 825 and my fuel burn for the last several years averages 23gph a side....sometimes higher depending on altitude. I also keep my cowl flaps cracked a coupled of inches during flt.

Fuel is much cheaper than engines or cylinders. I flt. plan mine for 50gph.

Transducer

Posted by **Randall Kerns** on 05/20/03

I have tried cleaning several times. Usually a waste of time and money. When they start sticking they only get worse. Good luck.

Fuel Flow in Cruise

Posted by **Bob Stan** on 01/08/03

On leveling off in cruise, I lean the fuel flow based on TIT. I have a digital TIT and fuel gage so leaning is fairly accurate. I might establish a fuel flow of say 22.0 gallons per hour per side. As cruise flight continues, over a couple hour period, the TIT stays the same, I haven't touched the mixtures, but the indicated fuel flow slowly decreases to say 21 gph per side. Does anybody know why? At cruise at FL 210 temperature is normally -20 to -30 C, so does the fuel density change and thus flow as the tanks cool down? Based on fuel consumed and fuel to top back off the digital fuel gage (Shadin) appears to be very accurate.

Any ideas? This has not been a problem but a point of curiosity.

Fuel pumps & flow

Posted by **Joe Konicki** on 01/03/03

About a year ago I had all four fuel pumps removed and overhauled. Prior to the overhaul I saw the conditions as described (decrease in fuel flow by approx 1.5 GPH when electric pumps were "on"). After the overhaul the conditions remained the same. I also have dissimilar elect fuel pumps on left and right sides, there are two different mfrs/models that fit (one superseded the other)--the difference being slight delta in pressures/fuel flows and elect current draws. Doesn't seem to make a difference to the engines however as each pump still drops fuel flow 1.5 GPH per the Shadin when "on".

My left engine FF indication has always been reading 2-2.5 GPH higher than the right engine at same power settings. In reality however the engines burn the same when it comes time to top off the tanks when I'm flying in the summer. I'm only guessing that the higher Shadin indication on the left engine is maybe there to account for the fuel consumed by the cabin heater, because when I'm running the heater continuously (wintertime) by gosh I do consume an extra 2-2.5 GPH out of the left side fuel system. Maybe the Shadin is just trying to keep me out of trouble.

Fuel Flow

Posted by **Al Seither** on 01/01/03

What's shocking Mike is that after I shut the pumps off and watch the flow increase by 1.5 gals/hr I don't see a reduction in TIT or CHT. Now with the pumps on, if I adjust the mixture by 1.5 gal/hr, I clearly see a change in Temps. Do you have the same occurrence? Thank you for your input.

Fuel Flow

Posted by **Tom Clements** on 01/02/03

Al:
I think your experience is quite common and merely shows that when the engine driven pump is sucking fuel through the fuel flow transducer there is perhaps a slight amount of vaporization occurring that does not occur when the electric pump is pushing the fuel at the same location. Thus, the vanes of the transducer spin a little faster and the indicated FF increases, even though the actual fuel flow changes so little as to be unnoticeable (as shown by your comment that other parameters don't change).

But as to why the big difference before and after your engine change...? Got me!

Fuel flow

Posted by **Mike McCallum** on 01/01/03

My engines have 350 hr since FWF they also show 1.5 gph
at 32-2500,more fuel flow w/pumps off. I just assumed the electric pumps caused a bit of restriction.

Fuel Flow

Posted by **Al Seither** on 01/01/03

What's shocking Mike is that after I shut the pumps off and watch the flow increase by 1.5 gals/hr I don't see a reduction in TIT or CHT. Now with the pumps on, if I adjust the mixture by 1.5 gal/hr, I clearly see a change in Temps. Do you have the same occurrence? Thank you for your input.

Engine Fuel Flow

Posted by **Al Seither** on 01/01/03

I have recently had my left engine overhauled. Prior to the overhaul I had noticed that once I leveled off at a cruise altitude and turned the electric fuel pumps off the Shadin Fuel totalizer would show the fuel burn rate increasing for both engines about 1.5 gals/hr each. With pumps off @ 19K 30" 2500rpm TIT-800 degrees my fuel flow would be around 21.5 gals/hr. when pumps were placed back on the totalizer reads 20.0 gals/hr both sides) Now that I have had the left engine overhauled the fuel burn for that engine is 2.6 gals/hr more than the old one on the right side with the pumps on. When the pumps are turned off the difference in fuel burn is now 4.8 gals/hr. The new engine has about 22hrs on it and the temps have started to settle down. Could both electric fuel pumps need overhaul? Has anyone noticed this same occurrence? Another fellow Duke owner told me that when he levels off and shuts the electric pumps off his fuel flow doesn't change but maybe .2 gals/hr.

Hoskins Fuel Flow Approval ?

Posted by **Dan Bruhl** on 06/15/02

Does any one on the list have an approval from their local FAA office to use the Hoskins FF to replace the Beech FF gauge? I would like to get a copy to aid us in doing the same.
Thanks.

Hoskins vs. Shadin

Posted by **Bill Unternaehrer** on 06/18/02

If you haven't already bought the Hoskins, we have approval for the Shadin Digi-Data to replace the Beech Fuel Flow gauge. I think it's hard to beat the Shadin.

Hoskins fuel flow computer

Posted by **John Awalt** on 06/13/02

Am getting a "low batt" message on my Hoskins under-panel unit (still working). Anyone know if the battery is user replaceable and what type it is?

Hoskins

Posted by **Shaker Razook** on 06/14/02

One more thing....when replacing the battery at the rear of the unit, be sure to leave the aircraft battery power on. This will retain the "fillup" figure, which has been programmed into the unit. John is right. The battery is a "camera" type battery which can be purchased at the local drug store.

Hoskins Batteries

Posted by **Robert Mann** on 06/13/02

They are replaceable. When I had a Hoskins I replaced mine once and they were watch type batteries. If my memory serves me right, there is access to the batteries from the rear of the unit, so you must remove the unit to replace the batteries. I don't remember the battery # , but I bought them at the drug store. It was a straight forward procedure to replace them.

Fuel Controller

Posted by **Frank Singer** on 04/17/02

My right engine idles very rich to the point that starting it is very tricky. It is also hard to keep running without the fuel pump on on a hot day especially at high elevation airports.
I had the fuel controller rebuilt 18 months ago ($1,200) and it worked fine for a while but now runs rich again. Take-off and cruise fuel flow are fine, its just RPM below 1,500 that gives me trouble. My mechanic has played with the idle adjustments to no avail.
Any one out there with any suggestions?

Fuel flow-prop sync?

Posted by **John Awalt** on 10/05/01

On a recent flight I noticed that intermittently my Beech fuel flow indicators would drop to zero and at the same time the prop sync would stop working. Later they would be OK. Any ideas? P533...

Fuel Flow

Posted by **Bill Unternaehrer** on 07/03/01

We did a Field Approval for the Shadin DigiData instrument to replace the Beech Fuel Flow. At the time we did it the Shadin DigiFlow had an STC for the B-60 but the DigiData did not. We did provide our data to Shadin. We wanted to get rid of the fuel flow indicator to open up a hole for the JPI engine monitor. The Shadin is a very good device giving you air data information (like wind) at all times. You can monitor the winds as you climb up and level off were appropriate. The JPI is absolutely irreplaceable and I would not operate an expensive engine without something like it. Good luck.

Fuel Flow & Prop Sync - Intermittent Operation

Posted by **Bob Hoffman** on 10/07/01

John: I don't have a ready answer to your problem, however, I consulted the Duke wiring diagram manual page 60-20-01 for prop sync operation and 70-30-02 for FF operation and found both ff and prop sync are wired through the respective fuselage connectors mid wing in the fuselage. Knowing you are based in warm and humid Texas, moisture in the connectors may be the key to this anomaly. It is my suspicion that these connectors are the problem in that no CB's were open. The first thing I would do is make darn sure your cabin is good and dry before chasing electronic gremlins at $$$ per hr. A dehumidifier and some of those drying packets may do the trick. A trip to Scottsdale where the cabin door is open for a few days will probably cure the problem also. If you don't have a wiring manual I'll fax the pages to you. Give me a call before Monday morning the 8th, (859-282-0474) as I'm flying for the next five days.
Fly safe, Bob Hoffman

Fuel Vent Line vs Control Cable

Posted by **Larry O'Connor** on 10/08/01

While inspecting the right wheel well, it was discovered that a control line was rubbing against the fuel vent line. The cable had cut into this line to where only a paper's width was left--if line is cut there is no shutoff. Cable is not supposed to be that close to fuel line but stuff happens.

Beech fuel flow indicators

Posted by **John Awalt** on 09/29/00

My factory analog fuel flow indicators don't operate sometimes. Sometimes one, sometimes both. Doesn't seem to be any pattern. The digital indicator always works fine. Anyone else had this problem? Any Ideas where to look for the problem?

Fuel flow indicator

Posted by **Bill Unternaehrer** on 09/29/00

The solution is to throw it away and make the Shadin Digi-Flow or Digi-Data the Primary Fuel flow. The Digi-Flow is STC'd for that and we got a Field Approval for the Digi-Data. That also opens up a hole to put the most important thing you can buy for your Duke - an engine monitor. We installed the JPI. Good Luck!

Left fuel boost pump

Posted by **Bob McEwen** on 10/16/03

My left boost fuel pump is unserviceable and I replaced it with a used one. However I would like to get the old one repaired or rebuilt any suggestions? I believe the electric motor is still good, Then I will have a spare and one that could be loaned or exchanged.

Fuel Boost Pump

Posted by **Ron Donley** on 10/17/03

Try Aeromotors, LLC in Wisconsin. Telephone 608-325-7741

Fuel Boost Pump

Posted by **Ralph Cohen** on 10/26/03

I had a similar failure of the left boost pump about 14 months ago. I located an overhauled pump from Professional Aviation in Atlanta. The pump supplied by Professional had been overhauled by Fleet Support, the Rapco people of overhauled vacuum pump fame. The new pump lasted about 1 month. It failed and Professional supplied a replacement. I paid labor and fuel costs. That pump failed 13 months later. I called the chief inspector for Fleet, and he agreed to supply a third pump free of charge. I gave them a credit card to secure core return. They are now refusing to credit the $867.00 on my card. I have called all parties involved, but no luck.

I recommend we avoid doing business with either Professional Aviation or Fleet Support Services.

Boost Pump

Posted by **Ron Donley** on 10/29/03

For comparison, Aeromotors charged me $400.00 for a replacement overhauled pump. That was in July 2003. The unit runs perfectly! Fedex charges were additional!

Fuel Pumps

Posted by **Jim Gorman** on 01/31/01

Try Aircraft Systems listed on first page of Newsletter

Extra Fuel Tanks

Posted by **Al Uhalt** on 09/02/02

Bob Desroche at Boundary Layer Research, Inc. in Everett, WA has been working on exactly what you described for some time now. Progress has come to a stop because of both limited interest by the Duke community and other business priorities. I'm not sure how far along he is, but, there's a lot to it including determination of the "plumbing" from the nacelle tanks into the main system; also, how to refuel them. An STC will be required. Give him a call at 800-257-4847 or 206-353-6591. I'm sure he'd be happy to talk to you about it.

Locking caps

Posted by **Jim Gorman** on 01/20/03

Aircraft Spruce offers locking caps. Page 159 of their 2002 catalog 877-477-7823

Leaking tip tanks

Posted by **Scott L. Stipp** on 02/07/03

P-525, I am experiencing fuel seepage on top of the wing tip tanks through the rivets. It appears as though the rivets have rusted, and are allowing fuel to come through at a slow rate. Has anyone determined the proper fix?

Leaking tip tanks

Posted by **Ken Bowdish** on 02/08/03

Scott,
No guarantee to this, but if the leak is minor I have had success using (a fresh bottle) of Loctite 290 applied to the leaking rivet head. Loctite 290 is a wicking type of sealant. It will work it's way down around the rivet and stop the leak. An Aerostar pilot passed that little trick on to me. Their tanks are all wet and they are notorious for leaking. If it is a big leak this won't work. It is important to use a new bottle of Loctite, there products all have expiration dates on them

CAUTION - New heated fuel vent

Posted by **Eberhard Burghalter** on 10/19/03

It happens that the heated fuel vent (60-381002) needs replacement because the heating does not work. So you order one from Raytheon and get it with 8130. The thing is manufactured by Electrofilm Mfg Co. What it is: a 90 deg bent aluminum tube with a heating wire element on the outside. Very straight forward with nothing really to it. So you look at it from all sides, looks good. But now comes the catch.

Out of sheer childish urge to play I blow into one side and TA TA !!!!!!!! IT IS BLOCKED !!! After a lot of probing and poking I find out that someone has put a neat fabricated CORK in place exactly where the bent is! Invisible with no hint to it and no reason that it has to be there. Please imagine what happens when you replace your vent with something like that! You can nicely test your abilities to fly the Duke single engine after Take Off. Remenber : this comes right out of a sealed Rapid bag with 8130 included !!!!

Fuel Venting during Fueling

Posted by **Larry O'Connor** on 07/17/01

Since I purchased my Duke I've had the persistent problem of fuel venting, from the overflow, when I top off the right tip tank. What a feeling when someone is admiring the plane during fueling and it starts to flow fuel out the vent. At the various flyins that I've attended I've heard a number of solutions. They ranged from rocking the wing, hand thumping the tip area, fuel slowly, to using a plastic tube to blow into the vent. In addition early in the game Raytheon replaced some kind of solenoid--waste of money. Well I finally decided to "bite the bullet" and have the access panel removed over the overflow check valve. If you have a nice paint job it requires removing the painted in screws--thus you need to have a very good paint type guy standing by. In any event General Aviation Services at Flying Cloud did the work. Low and behold they discovered that it appears that the factory installed the float valve upside down. Now when I top her off, the only flow is downward into the tank.

Fuel Venting

Posted by **Shaker Razook** on 07/29/01

My problem is when I attempt to top off fueling the outboard tanks, my right wing tip begins to leak out the very end of the wing. This occurs after I have topped-off the inboard filler (just over 110 gallons), then after adding approximately 3 gallons to the tip filler, it starts to leak. Will somebody please describe in detail the procedure for blowing out the vent line so that I might try this as a remedy. Thanks.

Fuel Venting

Posted by **Bob McEwen** on 07/17/01

Seems there is more than one cause for this problem. I too blew the vent many times however my problem was of a different variety. The fuel vent in the wing tip tank goes through the wing tip tank internally exits on the inboard side of the tank where it is submersed in fuel when the wing tip tank is full. there was a small crack in this vent line just before exiting the tank an thus allowing fuel to seem into the vent line and exit the vent. Discovered this by small pressure on the vent line and could hear the escaping air. Fix was with some PRC.

Right wing fuel vent drip

Posted by **Bob McEwen** on 09/18/00

My aircraft engineer found the trouble with the fuel drip. He discovered that there was a pinhole in the vent line just before it exits the wet wing tip and enters the wing. What was happening was the fuel would leak out the small hole in the vent line. It appears it is sealed with PRC and he managed to reseal it with PRC

Right wing overflow fuel vent

Posted by **Bob McEwen** on 08/08/00

When I top the right wing with fuel both inboard and out board tanks, I get a steady drip out of the fuel vent. At the last Duke Flyers get together some one suggested blowing backward on the vent I have done this to no avail? How much do I blow back obviously with fuel caps open Or do I need to do some repair?

Fuel Vent

Posted by **Bill Unternaehrer** on 08/09/00

I'd be a little careful with that much pressure on the fuel vent. Typically the little vent flapper is "re seated" as you indicated by just blowing in the vent (3 or 4 pounds). 60 psi sounds like an awful lot - but who can argue with success. The little flapper disk may need to be removed and sanded to give it a rougher surface. They tend to get glazed over and not make a good seal after a few years. Also, if the blowing doesn't do it then the leak may not be in the valve. I just posted a reply on where our vent leak is and it's not a pretty picture.

Fuel vent heaters

Posted by **Randall Kern** on 12/10/02

Does anyone know a test procedure for these. It would appear as if mine are not working on the ground. I have been told by some, they should operate on the ground. I've been told by others they are temperature sensitive and will not operate until below 5C. I have not been able to find this in writing.

In addition when checking prices they appear to be around $900 ea. Any ideas?

Fuel Vent heat

Posted by **Tom Clements** on 12/10/02

They should work at any time, regardless of OAT or ground/air. The ground test is merely to turn on the battery and the fuel vent heat switches (might as well check pitot heat at the same time, so turn them on too)and then go outside and see if they get warm (pitot gets HOT) to the touch. Turn everything off when you're done.

They are simple resistance heating elements and the most likely cause of lack of heat is a broken wire or other loose connection. Check all that out carefully before ordering deciding you need new ones.

Courtesy lights

Posted by **Rob Terpening** on 05/26/02

My baggage compartment light and cabin entry light are both inop. Does any know where the fuse is located?

Courtesy/baggage light fuse

Posted by **Ken Bowdish** on 05/26/02

Ron- In my airplane those fuses are located in the battery compartment on the inboard side.

Hot-wired fuse

Posted by **Tom Clements** on 05/27/02

Yes, like Ken said, that's where it is. But be aware that on the later models the mounting bracket is installed upside down, making the fuse hard to see. (Follow the wire.) I was told this mounting position helps in keeping the fuse and fuse holder moisture-free.

Duke Heater glass fuses (2).

Posted by **Jean-Pierre Paquette** on 12/08/01

We are having problems with our heater in both manual and in automatic modes, no heat what so ever.

We have it down to finding the two glass fuses which control the fuel to the heater. The fan works fine, just no heat. We suspect the fuses are in the left panel on the pilots side, behind the oxygen control and gauge. Before taking all that wall apart, please, anybody, confirm that they are indeed there. Our Duke is serial number P-261.

Heater Fuses

Posted by **RMann** on 12/08/01

Fuses are located under the instrument panel just above the rudder pedals. Take a flashlight squirm under the instrument panel, look up, and there should be 2 fuses on a little circuit board. The same circuit board that was the subject of a mandatory SB for adding diodes. The fuses are easy to change, once you are under the instrument panel.

Fuse location

Posted by **Bill Unternaehrer** on 11/29/01

On S/N P-594 the fuse is located above the co-pilots right rudder and within about one inch of the fuselage skin. The fuseholder and the stall warning horn are mounted on the structural member and the fuse is facing towards the aircraft skin (making it VERY nice to replace). The holder has a spot for a spare fuse and the fuse that is being used. Being 3 foot tall helps with this job.

Gear Box and other tips

Posted by **Dane Scag** on 04/08/03

I phoned the Beechcraft Tech Support (800-429-5372) after looking up the landing gear actuator part number (they always ask you for a part number and/or the reference page in the parts manual. The only new part available is 60-81003-5 and it is rated at 4000 hours. My former Duke had over 3000 hours with still the same actuator. I surely don't think it is worth paying 4 times the price for double the projected life. Just wait until you have to replace the gear box

Wow! Stevens makes a lot of money at $22,000 in labor. A proficient mechanic should be able to remove and replace the entire actuator assembly in about 4 hours. Then take about 4 hours to set the limit switches and check the landing gear rig. Give double this time for not hustling and it still is only about 16 hours. I'd check with another shop.

Incidentally, the best thing you can do to enhance the life of your gear box is to check the oil level at least annually, unless you see oil leaks on the floor under the copilot seat. I know that this is quite difficult to get at and check. So the first thing I did with my new Duke was to drill a 1 1/2 inch diameter hole in the skin right above the dip stick. Then anybody can check the level with ease. If you want more dimensions about locating the new hole, just let me know.

I know a lot of Duke owners look for advice on this Webb site hoping for a cheaper way to maintain their Duke. This is commendable. However, I've always asked for the tech support at the Beech factory. They are extremely knowledgeable and always helpful. They usually ask for your aircraft serial number and for you to identify the part number.

One of the cheapest thing you and other owners can do, even if you are not an A&P and don't intend to do your own work, is to buy the maintenance manuals. They have a lot of valuable information, and you can save a lot of money and time by walking into an FBO and smugly say "What's the cost for R&R such and such a part number". They will know you have done your homework. The total cost for three manuals, 60-590001-25 and -35C and -29B/ is only $568. This is very cheap knowledge, especially at annual inspections.

Gear Box

Posted by **Roger Storch** on 04/08/03

My Duke N7CR, P-471 has what Stevens Aviation refers to as an "Old Style Gear Box" which they say is good for 2,000 hrs. The "New Style" is suppose to be rated for 5,000 hrs. I currently have 2,100 hrs. on my Gear Assy. My motor has approx. 400 hrs. Is it mandatory and/or recommended to replace my Gear Box? A new one costs $22,000 and an O.H./Exchange is $5,133 plus 48 hrs. labor. Any advise?

Gear motor

Posted by **steve faber** on 12/20/01

Remember Dukes are 20 years old. The gear motors have brushes and commutators. I would recommend that you change the motor. Its not expensive and you will have peace of mind. I have changed all the motors in my Duke. Each one had worn brushes etc. You may want to examine your log books and see if any have been changed. Other important motors to check are the heater combustion, heater fuel pump, cabin air, and flap.

Gearbox

Posted by **Mark Seader** on 04/09/03

Roger, the operation and construction of the gearbox is quite simple. I have had only one gearbox go bad that had to be sent out for major repair/overhaul, and that due to the manual lever being engaged during normal operation which damaged the manual engage shaft. Under part 135 operation you would be required to deal with yours now due to time limit. Under part 91 there are no mandatory requirements. Having said that, I would recommend a minor overhaul within the next 200 hours. This involves disassemble, clean, inspect, magnaflux, new seals, bushings, bearings & gaskets. This should cost $475.00 in labor and $200.00 in parts. If the worm gear is worn, which is critical, you can add another $400. The 2000 hr gearbox is painted gray or green, the 4000 hr gearbox (not 5000) is painted epoxy white. You cannot make a 2000 hr gearbox a 4000 gearbox. (The upgrades include gears & actuator arms) The motor technically should be overhauled during the gearbox overhaul, so if you send it to most other shops, they will be compelled to include the electric motor, thus more $$. Brushes & commutator can be easily inspected on the motor during annual. Fluid level in the gearbox is critical. Any leaking fluid from this assembly should be dealt with asap. Sincerely, Mark Seader.

Landing Gear Time

Posted by **John E Rice** on 01/02/02

For those of you relatively newer Duke owners and pilots, having the gear motor rebuilt makes a HUGE difference in time if you notice the gear starting to sound like it is straining or taking longer. Turns out a rebuilt gear motor that used to take 8 second retraction time now makes it 3 seconds!
Thanks everyone for your replies and assistance!

Gear transition time - gear motor?

Posted by **John E Rice** on 12/20/01

Lately, it seems as though my landing gear seems to be taking longer to retract, and the sound of the gear seems weak. Could be my imagination, but the thought of having my gear motor or other component freeze up in any other position but down and locked bothers me. My mechanic checked it and says it's fine but he isn't the one flying it. Is there a documented transit time for the gear up or down, or does anyone have any suggestions?

Landing Gear time?

Posted by **Mark Allen --- (N38N)** on 12/27/01

I flew a trip this morning and checked it out after seeing your post.

I don't know what "the book" says, but I cycled the gear twice this morning on my trip (take-off & landing) and both times it was 4-5 seconds start to finish. (S/N P220)

Gear Transit time

Posted by **Robert Mann** on 12/20/01

I believe the Duke video says 4 minutes, but I would check with Beech technical support. They recommend overhauling the gear motor every 2000 hours and checking or changing the brushes every 500 hours. If a high resistance develops in the circuit it will be slow to retract. I would check the voltage at the motor during retract when the plane is up on jacks. If you have good voltage at the motor then perhaps one of the brushes is not making good contact.

From: DTScag@aol.com
To: terpening@dakotacom.net
Sent: Thursday, April 10, 2003 10:07 AM
Subject: Gear Box

Hi Rob:

On page 12-20-00, page 216, Chart 204 you will see a reference to the gear box and lub. Required is Mobile GG, which I supect is ordinary 90EP grease. But I'm checking with Beechcraft now on the grease.

There is no inspection hole now in your airplane, but there is a dip stick. Remove the copilot seat and carpeting around the front wing spar covering and if you look down the large hole with a mirror, you can see the dip stick cap. I drilled (with a hole saw) a 1 1/2 inch diameter hole right over the dip stick location. Then in the future it is easy to check. Note that the oil level check should be done every 300 hours. If you need the exact location of the hole, I'll measure mine and send you a drawing or reference dimensions. Please send me your fax number.

After you properly add grease, watch the oil level. You may need an overhaul job. See Mark Seader memo on the Duke webb site.

Belt Supersession

Posted by **John Awalt** on 12/10/03

Several years ago Gates consolidated some of their belt numbers. All the 8000 (8373) belts were superceded by 7000 and 9000 numbers. The belt that replaced the 8373, an extremely popular GM alternator belt, is the 7445. Specs are 25/64 -45 1/8. Do you suppose that Gates continued to make some 8373 belts for aircraft use? I am speaking from knowledge in the automotive field, have owned a NAPA auto parts store for many years. Anyway, this probably accounts for the confusion and delays in getting the belts.

More on Generator Belts

Posted by **Jim Gorman** on 12/15/03

John Awalt is correct, new Gates part number is 7445 at your local NAPA store. About $18.00 each. Only difference 7445 is a notched belt. Compared it with old 8373 and they appear identical in size

Generator belts

Posted by **John Awalt** on 12/18/03

As stated earlier, I have owned a NAPA auto parts store for many years. Can sell and ship a pair of premium quality 7445 belts to anyone who might be interested. $20.00 will cover both (2) belts and shipping. A brief note on "matched sets", gates stopped doing that several years ago, and claims their manufacturing tolerances are so close now that it is no longer necessary. These are automotive belts, no mention of aircraft usage. The retail price on this belt is about 18 bucks. If you are interested, just email me directly... Fly Fast...

Generator Belts

Posted by **Jim Gorrman** on 12/08/03

There is a lot of good information in the DFA newsletters. As an example, the index prepared yearly by Al Uhalt lists: Generator Belts, 97-1 page 4. If you refer to this page you will find the following: Other items you might wish to carry on your airplane are spare generator belts. Most FBO's do not stock them. Gates part number 8373 should be installed as a matched pair. Specs are 45 5/8 x 3/8 x 38 degrees. Might save yourself some money. We care a set with us at all times. Jim Gorman

Generator belts

Posted by **Ken Bowdish** on 12/05/03

When I overhauled my props I decided to replace the generator belts as well. Had all kinds of trouble finding them. The part number in the parts book is 8373 which has been superceded to 8114-2737.which has been superceded to 8136-3775. The first two part numbers are for single belts. The last part number 8136-3775 is for one set of matched belts. Matched belts mean they were produced from the same mold and they are exactly the same. It is important to use matched belts with these generators. The problem is that the computer at Rapid shows this last part number as a single belt.

The 8136-3775 part number consisting of two matched belts was given to be by the tech center at Raytheon, Rapid didn't know this number consisted of two matched belts They thought this was a number for a single belt. maybe they do now, but they didn't two years ago However once I asked for the right part number the matched set of belts were located and I was on my way.

It would be a good idea to have a couple of sets of these belts in our inventory of spares at DFA

Generator Rebuild Costs

Posted by **Hank Zannini** on 01/16/01

I have reviewed the messages posted here as well as the past 10+ years of Duke News Letters.

Over and Over again - I have seen the recommendation to Overhaul the generators before 500 hours.
The advice says overhaul after 500 hours will be 3 times higher.
During this year's annual - with the generators around 400 hour - I decided to overhaul both of them.

Does anyone have feedback on what overhauls at these low times should have cost?
Thanks

Generator Overhauls

Posted by **Frank Singer** on 03/18/01

I overhauled mine at 350 hours during my annual. It cost me about $1,400 in parts and labor (brushes and bearings). Both generators worked perfectly before the overhaul. After re-installation it took about four months and much agony to get them working again including the purchase of a new voltage regulator. I am not so sure I will do this again.
About four years ago one of my generators went south after 1,500 hours. It cost less than $2,000 to repair.

Generator Overhauls

Posted by **Ron Comeault** on 02/04/01

$850.00 CDN flat rate. Excellent workmanship and turnaround time. Condor Aircraft Accessories (1996) Inc.
620A McTavish Road N.E. Hangar No. 5 CALGARY, Alberta T2E 7G6 Canada
Tel: (403) 250-3032 Fax: (403) 291-9439
Email: viki@condorac.com
Ask for Viki Reeves, Operations Manager

Generator overhaul

Posted by **ralph cohen** on 01/17/01

I have a spare generator plus the two installed on the airplane. Raytheon had an overhaul facility in Atlanta that was run by a friend of mine. He would install brushes and bearings for about 300.00. The FAA came down on this reputable shop for using "unapproved" bearings in the Prestolite 100 amp alternator. Raytheon was forced to recall hundreds of alternators and replace the bearings with identical bearings supplied by the same manufacturer. As a result, they closed the accessory shop.
I sent my last generator to the gentleman in Rockford, Illinois recommended in the newsletter. He charged me over 1800.00 for the same work. (He claimed the armature was "out of spec" Advanced Armature in Wichita had rebuilt armatures for me in the past for less than $200.00)

Generator Costs

Posted by **Bill Unternaehrer** on 01/17/01

Two years ago the cost from Rockford for basically bearing and brush replacement (including armature checks for out of round) for two generators with about 300 hours since overhaul was $2300. The next year (about 100 more hours) the cost was about $150 each for a basic bench check. Good Luck

Gen O/H

Posted by **Roger Storch** on 01/18/01

I just had a Gen. O/H last Nov. by Aircraft Systems in Rockford. The Gen. had approx. 900 hours on it and it cost me $1,931.75.

Gen o/haul recommendation

Posted by **pete edwards** on 01/18/01

Try Thunderbird Aviation 'Will Rogers' airport, OK. Overhauled, 'ran in' and mods done for $500.

Generator Paralleling

Posted by **Richard Probert** on 08/19/00

Does anyone have a procedure?? Also who makes the Alternator Kit?

Generator Paralleling

Posted by **Ken Bowdish** on 09/05/00

Firewall Forward has the STC for the alternator kit I note that someone has given you the name and address Mark Seeder is the guy.

Your generators can be paralleled according to the beech maintenance manual the procedure is spelled out in chapter 24-30-00, page 202 thru 204. Not hard to do If the carbon pile voltage regulators have not been overhauled this might be the first place to start. Terry Norris at Aircraft Systems can do that job very well Good luck. Hope this helps

Duke Flyers with interest in Ham Radio

Posted by **Maurice H. Miller** on 10/23/02

In the November 2002 issue of QST there is an interesting disclosure that thousands of pilots are also hams. The shared common interest in honing a skill to achieve a worthy goal, enjoyment of learning, keeping up with technology, and comradeship was a focus of this piece. (Available for the price of two gallons of AVGAS at a magazine stand near you!)

Querry:
1. Who are the other Duke flyers with a Ham license?
2. Have any of you mounted an external HF 20M antenna and have had good results?
3. How are you getting the heavy duty 12V DC source?
4. What FAA regs/approval are needed? (Or is this one of those "don't ask//don't tell" modifications?)

73's WA9NBB

Valuable HAM info from Mark Allen

Posted by **Maurice H. Miller** on 10/26/02

Thank you very much for the detailed response, especially since it is based on a "been there... done that" premise. $7500 price tag is a out of my range, for sure. Where did you power the Wilmore converter, from the main buss or a dedicated line to the battery? Could you also comment a little more on that converter ($/ source, power limit, etc) I was contemplating using high amp solid state paralleled voltage regulators on a fan-cooled heat sink for either my TS-50 or my SGC xcvr/ant system. Also, any worthwhile contacts/QSO's?

Amateur Radio in Dukes

Posted by **Mark Allen (N38N)** on 10/24/02

My call sign is W6PC. I fly S/N P220.

I have a Northern Airborne VHF (2 meters & business band) radio installed in my stack. (Legal, it's TSO'd & installed on a Form 337). I did experiment in my last aircraft, a C421 with an HF antenna from wing tip to wing tip via the vertical stabilizer. Tuner mounted in the tail area. I also did that on a Form 337. I don't suggest any illegal installations, since a.- its against the regs & b.- if there is a problem your insurance company will smile as they deny your claim.....
With reference to the 12 vdc question, I used a converter made by Wilmore Electronics to get from 28 to 13 vdc. Used a Kenwood TS-50. It worked fine. My 337 form had a limitation against IFR operations when on HF.
Hope that helps.
PS- never thought about HF in the Duke, because I usually am busy with flying & the novelty wore off from my previous experience. The fact it cost me about $7500 for install work is also a factor.

ANR?

Posted by **John Awalt** on 03/15/02

Does everyone use ANR headsets? I quit using mine when I traded in my Baron. I use the small Sony walkman-type set. Very light and comfortable, and I have no trouble hearing at all (except at the dinner table when my wife is talking to me). I had an intercom installed when I bought the Duke, but no one in the back ever uses it unless they want to listen to ATC. We carry on front to back conversations in almost normal tones. When we reach altitude, I usually switch to the speaker and use the boom mike. Noise is just not a problem.

ANR Bose vs Lightspeed

Posted by **Kim Pratt** on 03/15/02

I have both the Bose X and the Lightspeeds. Both are good products. The sound (for music) is a bit better on the Bose, but not by much. For radio communication, there is little difference. I usually use the Bose and give the Lightspeeds to my wife, but after a number of hours flying in a day the Lightspeeds actually seem a comfortable change. It could be just changing to another headset gives pressure points a rest. Headsets are very much a personal preference item so opinions will vary. The Bose are good, but I'm not sure they are worth twice the price of the Lightspeeds.

Headsets

Posted by **George Friedrich** on 03/15/02

I have all three headsets in different planes and I prefer the Bose which are in my Duke.
They are more comfortable and quieter and the customer service is outstanding. I can't remember what I paid for the Bose but they are definitely worth the $$$.

ANR Headsets

Posted by **Bill Unternaehrer** on 03/15/02

Obviously from the comments the Bose seems to be preferred choice. We also have Bose up front. However, I also have a Sennsheiser in the back and have used it some. This is the one without the earcup. It has a foam cushion that sets "on" the ear - not encapsulating it with an earcup. It's a whole lot lighter and almost as good as the Bose. It does use two AA batteries. British Airways uses them as their standard issue. The other one to consider is the Lightspeed QFR Crosscountry. I tested the "normal" Lightspeed and the QFR. They filter different frequencies. For my biplane I preferred the QFR. There is a difference in the frequencies filtered and the size/weight of the unit on your head. A lot of individual preferences here so try them all.

Headsets

Posted by **John Rice** on 03/14/02

I went ahead and put out the extra for the Bose two years ago and couldn't be happier. I have had a volume control knob come loose one time and I lost it, but Bose replaced it immediately, no questions and no cost. Lifetime warranty. Not that I wouldn't have accepted something of similar quality at lower cost, as I have never tried other brands. But I love my Bose, and considering the amount of hours I fly I probably wouldn't have anything else for myself. Now, for my passengers.....

Headsets

Posted by **Ben Fry** on 03/14/02

I own the Bose X headsets for the pilot and copilot. They are the best and you can pay for them in 12 monthly payments if ordered from Bose. No interest. Mine are hardwired. I highly recommend it. Should be able to install for approximately $500.

Bose ANR Headsets

Posted by **Chris Larson** on 03/14/02

I have had the Bose ANR since they were introduced in 1989. Bose continues to give great support, even for these old headsets. I sent one of the pair I own to Bose last Fall, because of static. They tightened connections, fixed the problem at no charge. They offered to send their new model for me to try, but said that a 30 trial is recommended before purchase for owners of the first generation sets. Many of their current customers prefer the old larger first generation model, but this may have more to do with the ambient noise you get accustomed to and sounds we recognize as normal during flight. The silicone gel ear-cups do need to be replaced every 2 or 3 years. (I think Bose recommends more frequent replacement than that)

ANR Headsets

Posted by **Tom Clements** on 03/14/02

If you can afford the price, the Bose-X are really something: comfortable, great sound quality, excellent ANR, and with the permanent installation, no batteries to replace. The latest version even has a smaller control until in the cord, which is nice.

For a less expensive option, I really think the Lightspeed 20XL is superb. Although much bulkier than the Bose-X and somewhat odd looking, it too is very comfortable and gives great performance. I use this as my "travel" set, taking it with me to fly other airplanes, whereas the Bose-X are installed in my own plane. The 20XL's batteries seem to last a surprisingly long time and the unit has a clever automatic shutoff feature so the batteries won't run down when you leave the airplane and forget to turn the headset off.

Ice plates

Posted by **Ken Bowdish** on 03/15/02

Last winter my project was to design and install Kevlar ice plates on the nose hull of my Duke. I developed a proposal and presented it to the FAA as this does take a 337 and a field approval. It involved special structural adhesives, vacuum bagging the Kevlar to the nose anti-static coating to dissipate static charge etc. They approved it as submitted and I got busy. Worked out great they look nice and weigh less than 3 lbs. Half the weight of the aluminum ones. (And they are bullet proof) If you're interested I would be happy to give you more information.

In addition to having the heat turned on the props another little trick I have been doing now for about four years is to coat the entire length of each prop blade with a silicone lubricant made by Dow Corning called High Vacuum grease. It is actually a clear silicone product that is used in lubricating glass stopcocks and glass and rubber joints. It doesn't dissolve easily in water therefore it does a pretty good job of shedding the ice in small enough piece that they don't chip or dent the nose during the non heated cycle of the prop de-icing system. Put it on thin as it will make a bit of a mess. All of this in addition to trying to stay out of the ice as much as possible has at least for me proven to be quite successful.

Ice plates

Posted by **John Awalt** on 03/12/02

I added mine during a paint job last fall. Nose was dented at the time, and I didn't want my new paint job ruined. Sky Harbour has an STC for them and it was an easy choice. Welcome to the club, you will enjoy your new plane, and this organization is an invaluable asset.

Insurance renewal quote (AIG)

Posted by **John Tye** on 08/01/02

I just got a renewal quote (thru AOPA) from AIG. The premium increased a modest amount, BUT, the liability coverage had been changed to a $100,000 per passenger sub limit (from the combined single limit that it has been for years). The agent says that AIG tells her that they have decided they won't write Dukes with a combined single limit any more.
Anybody else run into this? Anybody found any solutions, yet?

Insurance

Posted by **Ron Comeault** on 07/17/02

I was with US Specialty and got a 11.5% increase this year in May. However, I just cancelled and went with US AIG for approximately $100.00 more per annum because of US Specialty's stringent and inflexible recurrent training requirements.

Duke Insurance

Posted by **Bob Stan** on 07/16/02

I just received renewal quotes for insurance on my Duke. The premium increased by 25%. There was no increase in hull coverage, no accidents etc. Companies quoting to my agent were U. S. Specialty, W. Brown, and USAIG.
Are others seeing this type of increase? Any recommendations on other companies to pursue for more competitive quotes?

Insurance

Posted by **Robert Mann** on 05/10/02

I have been with Avemco for 18 years without an accident. I recently called for a quote on a Twin Beech and was told they would not write a policy for that aircraft. I was suspicious so called for a quote on a King Air and was told they do not insure turboprops. I then asked if they would insure me in a Duke if this was a new policy and they said no. (I have had my Duke insured through Avemco for 5 years so was grandfathered in.) I then asked them for a quote on a new Bonanza and they said they could not write a policy for that either. Apparently they are limited to writing policies for aircraft with hull values less than $300,000. I am wondering about the financial stability of Avemco.

Cheap insurance

Posted by **bob giebeler** on 05/02/02

Just a note for the cost-sensitive in the group; my insurance came due in September...not a good time. Fortunately I had gotten a quote from an alternative company, as the one I was with was based in NYC. I really wanted just liability, as I own the airplane out-right. And I do not want to be restricted by bullshit "simulator factory approved annual recurrent training"

So AVEMCO came through for $700 per year; god bless their soles.
bob N822D ATP/CFII/A&P

Insurance

Posted by **Frank Singer** on 08/08/01

I wonder if anyone else is having the same "new" insurance requirement. I have had my Duke for about eight years and my insurance company has for the first time required recurrent training. They said that starting this year all pilots flying cabin class twins will need training on an annual basis. In the past it was a choice. I would get $2,000 off my insurance if I took training. Now the choice was taken away (they did drop my rates by $2,000).
I took my training from a Jack Nyce. He was very thorough (he is a 50,000 plus hour pilot) and of course, I learned something during the three day ordeal. If any one wants more info on my experience with the training feel free to contact me. I am sure all of you are going to run into this.

Inverter

Posted by **Jean-Pierre Paquette** on 04/25/02

My Duke inverter is blowing fuses rendering my heated windshield unserviceable. I understand that there are two inverters in Dukes P-261. One small one feeding A.C. to the avionics having as back up standby feed from the big (windshield) inverter. The small one is functioning O.K.
Please inform me of either an inverter for sale and where one can find a reputable shop that repairs these.
Thank you for any help provided.

Inverter

Posted by **bob giebeler** on 05/02/02

Hi Jean.....I have one out of my Duke. I am testing a lighter new technology alternative I will attempt to get an STC on. The original design is very heavy, and like a bird, lighter is better, so out it went.
Where are you located? I have no idea what its worth.

Inverter

Posted by **Eberhard Burghalter** on 04/27/02

The big (standby) inverter was manufactured by a company called OECO Corporation 4607 S.E. International Way, Milwaukie, Oregon 97222 Phone (503) 659-5999. It is a 600 VA, 400HZ unit which gives out 26,115, 230 and 240 Volts AC.
Unfortunately they do not make it anymore and I think provide no more service for the unit. But they are very helpful and send blueprints. So if you have a good electronics shop they might do something. Apart from that a different inverter with the same specifications will fit but it is very hard to find one that lets out 230 Volts

Inverter

Posted by **Dear Eberhard** on 05/11/02

Thank you for your message. I have contacted the manufacturer and he did mail us the blueprints.
We are now (our electronic shop) attempting to repair our instrument. We will keep you posted and again thank you for the info.

Jack Pads

Posted by **Dane T Scag** on 11/10/02

New replacements cost almost $100 each. Get a local machine shop to make you about 6 (for spares). They don't have to be so fancy. Just be sure the threads match those on the airplane.

NOSE GEAR UPLOCK BOLT IMPORTANT ! PLEASE READ

Posted by **Eberhard Burghalter** on 08/03/01

When I entered my maintenance facility for my annual the mechanics started to tow the ac and stopped immediately because of some "funny feeling". The funny feeling proved right : the nose gear uplock pin had broken in half (one piece inside the hangar, the other outside on the runway).
If you now think well its only the uplock pin so what the heck!!! YOU ARE WRONG !!! This pin or better bolt is especially hardened steel that attaches the retract mechanism to the nose wheel. Without this bolt the nose wheel collapses when taxiing or screws up the system after take off. So the damage is that of a nose down landing (two engines two props nose section!!!!!)
The findings were as follows: The nose wheel brace did not accommodate a bushing. The bolt was just put through the cast alloy. With time and no accommodation for lubrication the channel started to corrode giving the bolt space to move. This in turn weakened its structure, it got bent and finally broke! That has nothing to do with hard landings or so...we found no other damage on the nose gear that led to believe that there was some sort of impact. It just worked on the bolt until it finally cracked.
We will file an incident report with the German FAA because here life and property are at stake.
I must say I was so extremely lucky that the damage happened where and when it happened because on the next flight I would have had an almost total LOSS !!!
SO PLEASE ALL WHO READ THIS CHECK YOUR NOSE GEAR UPLOCK PIN BY REMOVING IT WHEN THE AIRCRAFT IS ON JACKS: PLEASE DO IT NOW: WHEN YOU FIND NO BUSHING IN THAT CHANNEL GET IT FROM RAYTHEON OR HAVE ONE MADE.
THIS IS REALLY SERIOUS !

Recognition Lights

Posted by **Bob Stan** on 10/14/03

At the San Diego Fly-in I noticed several Dukes with the wing tip recognition lights. I own P-404, a 1977 Duke. On my lighting switch panel I have a switch position for "BCN & RECOG", but do not have the lights in the wing tips. Does anyone know if there is a kit or parts available to add these? Is the wiring in place to the wing tips? This seems like a great safety measure to add.

Lights

Posted by **Shaker Razook** on 10/14/03

Bob: I had these lights installed many, many years ago by the Beech dealer at VNY. As I recall, they had to get the kit from Beech and run the wiring. In your case, with the switch already in place, it is probably pre-wired for the lights.

Cabin Door Light

Posted by **Bob Stan** on 12/16/02

I had the problem until last week. Only a half turn was required to adjust. Call Gary Bongard at GAS (Duke Flyer member) to see how the adjustment was made or Gary can do it for you if your are in the Minneapolis area.

Magneto

Posted by **John E RIce** on 01/09/02

After almost every flight now, my right magneto carbons up, clearing after a higher RPM runup and lean out process. The left side seldom does this. The right side problem just began a few months ago. Any suggestions as to what may be the problem? Could it simply be too rich a mixture at idle?

MAPCO Unit & Auto Temp Control Sensor Needed

Posted by **Ben Fry** on 03/20/02

My MAPCO refreshment center needs refurbishing. Any ideas who does good work? Looking for the auto temp control sensor unit that mounts behind the pilot's seat.

Mapco Center

Posted by **Jim Gorman** on 03/29/02

The Mapco unit is made here in Mansfield, Ohio Call 419 -522-2231 ask for Dick Baker. Don't know about the auto temp control sensor.

Shops

Posted by **Mark S. Allen (N38N)** on 05/26/03

Patrick-

San Diego Airmotive has maintained my former Duke and now my current one as well for last 9 years. I am going in for annual next month with them.

Glen Kratz has a great deal of experience with Dukes and most Beech twins. They are honest and quick. Current shop rate is $65/hour. I would strongly suggest you talk with him. Thier number is (760) 489-3593. E-mail = gkratz@sdairmotive.com. Web site: www.sdairmotive.com.

This company was formerly Brower Air and changed their name last year, but all the same folks are there.

West Coast Shops

Posted by **Tom Clements** on 05/17/03

Although I agree that CAT in San Jose is a good place, don't overlook Loyd's Aviation in Bakersfield. It is a smaller shop but with a bazillion years of Beechcraft experience and has maintained numerous Dukes for many years. Steve Loyd is the owner and Mark Jensen and Mark ???? are in the shop. Great folks! Talk to Steve at 661-330-1321.

Western Skyways Service or lack there of

Posted by **jim tate** on 11/23/02

I had my right engine (number 2) rebuilt by Western Skyways about a year ago. When it was first delivered it would quit on rollout. This is not good when you're landing at a busy airport. I had to take it back to Montrose CO where it took them almost a week to find the problem. After only 70 hours the engine went down because of the lifter/cam problem. Even though the repairs are covered by Lycoming they still charged me $5600.00. Beware of them!!!!!!

Engine/Avionics Shops

Posted by **Greg Jellinek** on 05/07/03

The shop that you are looking for is Corporate Air Technology, located at San Jose Jet Center. Phone # is 408.977.0990. Contact is Steve Frost.

These guys really know these airplanes. I have had both my Dukes serviced at CAT for over 20 years now. Very knowledgeable.

The avionics shop, LAC Avionics, is located in the same hanger at the jet center. Phone # is 408.295.4144 Excellent shop, but pricey.

West Coast Shop

Posted by **Joe Hosteny (P-507)** on 05/06/03

Pat – The former owner of my airplane used San Jose Jet Center, 408 297-7552, so you might consider that shop. I believe they have worked on more than one Duke; ask them to be sure.

My son lived there for a while, and had some work done on his avionics (in an updated Travel Air) by LAC Avionics, 408 295-4144. I had them do a minor repair and liked them.

General aviation services

Posted by **steve Faber** on 11/07/00

Great Place. I lost an engine climbing out of MSP and went to GSA. They put a new cylinder on and I was out of there in 24 hours.

I can only imagine the service if I was a regular.

FWF engines

Posted by **warren dean** on 08/31/00

Shaker, I spoke with you about a year ago regarding winglets. Thanks for your help. I have FWF engines and have torn down the right one twice. The first time we had the previously mentioned problem with disintegration of the lifters and the damage to the cam. FWF performed the work under partial warranty and it was a battle to get that. When FWF put the engine together the second time There was a slight pinch of the crank by the bearings. Again we tore it down and this time FWF only supplied some labor and parts. Again it took a lot of arm twisting.

Call me if you would like to discuss in detail as I have strong opinions about how I was treated 719-630-0066

Firewall Forward Overhauls

Posted By **Dane Scag** on 12/31/03

I am compelled to speak up with my experiences. Mark Seader and his company FWF have delivered exceptionally high quality workmanship, with costs quotes and time schedules totally satisfactory. They have done two jobs for me and I am pleased. I have no reservations to recommend their shop for engine overhauls and their clever mods.

It is unfortunate that blame has been placed on other overhaul shops, as well as FWF, for premature failures of valve lifters and cams, when it was not their fault at all. The mass of evidence and the current record of successful solutions have proven their position.

Mexico

Posted by **Frank Singer** on 03/18/01

I have a home in Mexico and fly for the Flying Samaritans and therefore fly to Mexico quite often. The rules are simple even though they change every now and then. You can file an international border cross flight plan and land at any Mexican airport of entry. The "closest airport" requirement is only a US thing that requires you to land at the nearest airport of arrival in the US upon your return.

I usually take off from John Wayne Airport in California with my first stop either Loreto (500 miles) or La Paz (650 miles)

Fees are fairly high however. There is about a $40 entry fee, a $28 landing fee, and a $18 per passenger tourist card fee. If you pay for your fuel via a credit card there is an extra $.40 per gallon radio transmission charge.

Mexico

Posted by **Bill Unternaehrer** on 03/13/01

We went down two weeks ago with the Baja Bush Pilots to pet the whales. We actually went with a friend in his Baron and a Mooney (our Mexico expert) was with us. We went directly from Phoenix to Loretto where we did the in processing. On the way back we cleared out of Mexico at Hermisillo and back into the US at Nogales. Nogales was our most pleasant experience. While no expert, I would be happy to discuss our trip and experiences with you. The old rule was to clear at the first opportunity but I believe that never was applicable for twins and is no longer applicable for anyone.

Mexico flying

Posted by **Greg Meadows** on 03/13/01

I have had the Duke to Baja several times. Each trip I learn more and it get's easier as you learn the 'tricks.'
You will file a border-crossing flight plan with the US. Your first landing needs to be an airport of entry (AOE). If you can go the distance, go for it ... as long as it's an AOE.

You will then file a flight plan with Mexican authorities to you next destination. Or, if you are planning multiple stops at un-staffed locations ... destinations. Be sure to keep ALL your mass of paperwork together.

Your last stop in-country will be to turn in your paperwork and file a flight plan to your US arrival airport -- one with customs. Be sure to notify customs yourself and not rely on that information being passed on by the folks in Mexico. This can be done with a phone call or a relayed radio message. I once had to relay via an Alaska Airlines flight since I couldn't raise anyone else.

If possible, get your current customs sticker ahead of time and some blank arrival forms. Have the form filled out when you arrive -- and you're golden! I don't know about mainland Mexico, but everyone in Baja seems to appreciate the couple of dollars I give for their services. One official fell in love with my logo golf ball my passenger was playing around with. He was all smiles as we left it with him!

All in all, be patient and you'll do fine. Don't forget your normal required documents for the airplane, passport or birth certificate for all aboard AND Mexican insurance!

Trip to Mexico

Posted by **John Awalt** on 03/12/01

Last time we flew into Mexico, we stopped just across the border in Reynosa to enter the country. We were with a group, VFR and were told that you had to make that first stop in a border town and could not simply overfly the border to your destination airport of entry. That doesn't make sense to me.. I would like to fly direct from my home in Texas, 2TA6, to Leon, MMLO(an airport of entry near San Miguel de Allende. Why can't I simply file an International IFR flight plan and cross the border at FL240. Doing it the other way turns a 4 hour trip into an all-day experience. Any suggestions?? Surely some of you have done this.

Jepp entry requirment

Posted by **Duane Moorer** on 03/14/01

If you use Jepps they have the "entry requirements" for Mexico in your manuals. You will need the insurance. You should not have any problems with anyone there in Mexico. But when you come back to the USA make sure you dot all the i's. I don't think you can overfly any airports in the great USA.

Nose cone leakage

Posted by **Jeff Gorman** on 04/03/03

Two Dukes have recently experienced avionics and radar failures due to high moisture and / or leaking nose cones. If your aircraft is subject to sitting out in rain on occasion, it might be worthwhile to have the cone seal checked at your next inspection.

Oil analysis

Posted by **Robert Mann** on 05/09/02

Lycoming has said the principle benefit is silicon levels which indicate dirt in the system from an air filter problem. I suppose if you spun a bearing something might show up in oil analysis. It doesn't pickup many of the problems but it may pick up a few. That's why I continue to do it.

Oil Analysis

Posted by **Frank Singer** on 05/08/02

I don't know why I keep doing an oil analysis because it is next to useless. I have had engines with excellent oil analysis go South and an engine with very poor oil analysis go to 1,800 hours with absolutely no problems. Even Lycoming told me that oil analysis is questionable at best and that cutting up the oil filter is by far the best way of judging engine condition.

Oil Analysis/fine metal particles

Posted by **Maurice Miller** on 05/05/02

Lars et al, it is my understanding in reading the Sky Ranch Engineering Manual by John Schwaner (2d ed.) that the fine metal particles from wear are often not detected in spectrometer oil analysis of the samples we submit. Particles 10 microns and larger are filtered by Champion oil filters. The "harmful particle size range lies between 15 and 35 microns...metal level reaches an equilibrium between generation by wear and removal by filtration. Oil hours, particle size and oil filtration influence Spectrometer oil analysis levels" (p 105) Hence our "normal" reports.
Schwaner recommends proper oil filter analysis. From my personal experience this benchtop chopping open the filter always lacks the precision and accuracy mandated by a standard comprehensive protocol. Never the less, one will always be presented with an opinion; however its validity is truly questionable. Kinda like the drivel voiced by an ex-wife...and both are submitted to us for a price---a very high price!

Aluminum in oil

Posted by **Dean Robert** on 07/31/01

I just completed my second oil analysis on FWF 300 hour rebuilds and had a 10 fold increase in the aluminum readings!! I had 38 hours on the oil, which was Exxon Elite. Any thoughts as to what I might have??

High aluminum count

Posted by **Scott L. Stipp** on 09/03/22

I had a similar problem that has corrected itself after I cut back on the amount of priming I did upon engine start. Too much fuel at start causes piston scuffing.

Oil Analysis

Posted by **Bill Unternaehrer** on 08/01/01

It may depend on what the absolute numbers are. A ten fold increase from 1 would be OK. Our oil analysis has consistently showed 10 to 16 PPM (Parts per million) of aluminum once we started using straight 50 weight Aeroshell. It got up to 43 with 15W50 multigrade Aeroshell. I can send you an Excel spreadsheet and graph of our oil analysis over the last 500 hours if you wish.

Engine oils

Posted by **Mark Seader** on 04/04/03

Bob Stan, over the years we have heard differing stories about customers experience with different brands and weight of oil used. We currently recommend Aeroshell 100 PLUS. Aeroshell also makes a 100 detergent labeled simply "100" The plus brand of Aeroshell 100 contains the camshaft additive. It does not necessarily provide better lubrication, but the additive give the oil better retention (oil does not drip dry off of the parts during periods of non-use) I have had customers go TBO with virtually every major brand of oil. I have also had many customers go TBO & beyond changing oil every 50 hrs. (+ - 5 hrs) As probably everybody knows, there are no straight mineral oils approved for the Duke engine, so do not let your FBO use this type for any type of engine or cylinder break-in. --- We used Aeroshell 15/50 in our Duke test engine as we wanted to use the oil that was most common to engines suffering from camshaft failure. It is our opinion that any major brand used with the self oiling camshaft will be satisfactory and not void our warranty. For cold weather operation we recommend the Aeroshell 15/50 if need be. While I would prefer the 100 weight at all times (given the advantage of engine pre heat systems and heated hangars in some cases) I do not like the high pressures induced on the oil cooler on start up, given the age of most coolers. This, as you know by experience is a subject that requires some attention. Our tests revealed that the oil cooler "grows" .060" (1/16") at 100 psi. Mark

Oil

Posted by **Ken Bowdish** on 04/04/03

I definitely agree with Mark's posting on oil. The single grade oil in the winter time for those of us in the cold climates, no matter how long you warm up the engines produce oil pressures way over red line not good for the oil cooler, the hoses, crankshaft nose seal gaskets and other stuff Best thing to do during that time period is use the multi-grade.

I would add that not only does the Aeroshell 100 w plus contain the equivalent Lycoming additive but it also contains an anti-rusting agent that is not in the Aeroshell straight weight 100 w AD oil.

Phillips 20w50 doesn't contain the equivalent Lycoming additive or the anti-rusting agent but it is a petroleum based lubricant, where-as- the shell products are basically a synthetic oil. Exxon elite is also a synthetic based oil

If you read our survey you will note that we had every kind of oil used with no clear indication that one is better or worse than the other. Also note that several members changed their oil at 35 - 50 hour intervals Some going to TBO some not. Basically the same thing Mark is saying in his posting

Lycoming Oil Additive

Posted by **Maurice Miller** on 12/19/03

Review of our news letters 01-1 and 01-3 touches on the subject of LW-16701/2 and Aeroshell W 100 Plus, but many questions come to mind: a) How much should we add to plain oil? b) Is there benefit to add it to W-100 plus (the belt-AND-suspender theory)? c) What is its actual chemical IUPAC name, physical property and mechanism of action in our engines...perhaps an aromatic-aliphatic hydrocarbon/arena of 13-17 carbons? d) Where can you buy the additive? e) Does our Prof. Seader/FWF have any non-proprietary info from his engineering cam/lifter studies? f) How does it show up on commercial spectro analysis (NMR, CMR, ESR spectrum)? I asked info from our friends at Shell and Lycoming and from each received a complex answer combining "proprietary-info-I-dunno-fer-shure" with a deer-in-the-headlights type of delivery. At about fifty thousand bucks to overhaul each of our 541's, a little more information to stretch out TBO's would certainly be appreciated.

Engine oils

Posted by **Joe Konicki** on 04/04/03

I continue to use shell W100 plus. In my previous posts I related my experience w/ Shell 15w50 (which wasn't good)--ended up giving my spare cases of oil away to other airport folks & going back to W100 plus.

To mitigate the thick oil in winter issue I preheat any time I'm below 40 deg F. I also attach the oil cooler blockage plates if I preheat, which I keep in the plane (takes less than 5 mins per engine), then go flying.

I've been reading recently about the use of automotive STP in aircraft engines--some sources indicate it has the same type of high pressure additive found in W100 plus, but who knows what else may harm an aluminum engine. Anyhow, the information seems interesting.

Oil & Nuvite

Posted by **Ken Bowdish** on 04/02/03

I wish that the survey really uncovered a "smoking gun" to help solve our engine problems, but I didn't and I didn't expect would.

Still, I think the results were interesting and I feel they substantiate some of the things we keep saying to each other in our meetings. I had a 4 hour meeting with Paul Mcbride reviewing the master spread sheet with all the data from our survey. We both agree there is a definite pattern to this problem. I also know that Lycoming assigned an engineer to review our survey, haven't heard anything back yet.

Lycoming now recommends the single grade oil over the multi-viscosity oils. For those of us in the colder climates, I agree, a mult-visc. oil is necessary during the coldest winter months. Personally I use the Aeroshell 100 w plus as long as I can and Exxon Elite 20w50 for the winter. I agree, our survey says we can use any approved oil we want. Be sure to put the additive in if necessary.

I can't speak for either Lycoming or FWF but I will bet they both would like to see us change our oil and filter's at 25 hour intervals.

The news letter gives Nuvites address but their phone number is 800 394-8351. When you do the door frame use masking tape to protect the interior . Another little tip After you use the nuvite put a coat of Glass Wax on the spinners and door frame. Makes the shine last longer. Glass Wax is an old product, available in most hardware stores.

Which Oil is Best?

Posted by **Bob Stan** on 04/02/03

The fine information put together by Ken on the engine survey raises an interesting question - which oil is best? Since FWF did my engines last May, I have used Aeroshell 100 plus. Even with winter hanger heating, this oil is pretty heavy for winter use.

Ken's survey results seem to say the oil doesn't matter. Results seem about equal for 15W50, 100 Plus, Exxon Elite etc.

For Mark Seader - many of us have engines done by your fine shop. What oil meets you warranty requirements, and after your untold hours of cam testing, what oil(s) do you recommend?

There are also varying numbers of hours between oil changes. To get the most out of our engines, what frequency of hours is recommended by FWF?

Exxon testing on Lycoming TIO-540-J2BD

Posted by **Ron Donley** on 09/08/02

Test results, published by Exxon, seem to suggest that the problem that we are having with followers and cam lobes is due, at least in part, to our choice of oil. The test results can be viewed on their web site - www.exxonelite.com I would assume that this is an honest presentation of the test findings (not necessarily a complete presentation), and that using Exxon Elite is probably a better choice than the other lubricants mentioned in the test. I do wonder if they also tested natural single grade oils, and if so, with what results.

My last aircraft was a 1997 B36 Bonanza with a Continental TSIO 520-UB engine. At 500 hours total time, my lifters looked like the example on the top in the Exxon test, pretty sad. A number of my friends with the same engine had the same problem. We were all using a 15W-50 oil. I can attest to the fact that some Continental engines share the same affliction that we have with our Lycomings.

I read the posting concerning the variation in hardness of 5% and 15% between lifters, but could not put those numbers in context. Is there an industry standard of acceptability for these measurements to which we can compare. Also mentioned was an STC being worked on to provide new lifters. Does anyone have testing results that show unacceptable metallurgical composition of our present lifters, and testing results for the proposed new ones?

Please excuse me if this is something that you've covered in the past. I'm a new Duke owner, and I'm trying to get up to speed on this subject!

AeroShell recall

Posted by **Jeff Gorman** on 12/02/01

Here is some info on a recall of Aeroshell Oil:

Subject: Aeroshell Recall
Equilon Lubricants L.L.C is the producer of Aeroshell, the world's best selling aviation piston engine oil. We take seriously the level of confidence placed on Aeroshell products by the aviation community and individual customers like you.

In this spirit, we are acting quickly to voluntarily recall specified batches of products that fall below our quality standards and replace them, at no cost to you, with Aeroshell products that do meet our quality requirements.

Aeroshell is manufactured to exceed industry specifications, and has enjoyed years of proven performance. However, a recent batch of Aeroshell product may not have met our stringent requirements. A mechanical problem in our blend plant equipment may have allowed some debris to be carried from the blend tank to our packaging equipment. While the problem has since been corrected and measures put in place to preclude this from happening in the future, the debris that did get to the packaging equipment may have allowed some Aeroshell products to fall under the desired level of internal quality control. Therefore, we are recalling specified batches of products and replacing them with Aeroshell products that do meet our quality requirements.

These measures are necessary because of the high standards we have for the Aeroshell product line and our commitment to the aviation community.

Exxon Elite

Posted by **Ron Comeault** on 09/13/01

I have been using this oil since 08/00 and have had great results. The only thing I recommend is that you turn down the oil pressure adjustments on each engine. You will notice increased oil pressure with this oil and if you don't turn down the pressure adjustments you will experience oil leaks, i.e pushrod seals and main seal.

Oil

Posted by **Alfred Konger** on 07/14/01

I've owned my b60 Duke for 15 years. Used to fly 100 hrs. per year, Somewhat less now. Engines are 1982 factory new, 1300 hrs. When I bought it I put in Aeroshell syn, saw a decrease in oil pressure, some prop surging switched to Phillips 20w50 until Mobil 1 came on the market, and used it until it left. Went back to Phillips 20w50 + 2 bottles of Lyc snake oil per 30 hr. oil change. Keep oil level @ 13 qts. It may seem that the oil level drops fast, but if you fly at flight levels, it's the long high power that eats up the oil. Remember, the oil is a big part of the cooling. Have a lifter check every annual and they look like new.

Oil

Posted by **Bill Unternaehrer** on 05/24/01

Further down in the messages you can find several messages on the subject of oils. Aeroshell 15W50 is a synthetic. In the colder climates synthetics have some advantages. And if you run the engines once a week, sythetics should not be a problem. If you look at the messages on the lifter problems, 100% (less the one in Germany) have had Aeroshell 15W50 oil. Exxon Elite is some percentage of synthetic - it seems to be impossible to determine the percent. I don't think it has been in use long enough to establish a track record. Phillips X-C multigrade is not a synthetic. A straight weight oil like Aeroshell 100 is not a synthetic. I can show you a graph of the metal content in the oil from oil analysis on our Duke when we purchased it 3 years ago. The first three oil changes (with Aeroshell 15W50) had the aluminum, iron and copper climbing. After talking with Lycoming I switched to straight weight oil (I wanted to use straight weight oil in the first place but did not think it was approved by Lycoming). The metal percentages in the oil analysis immediately started back down and have remained at nominal levels. At the recent annual inspection we pulled the lifters for two cylinders on each engine and found everything very good. We operate about 120 hours per year but the engines are not necessarily run once a week. I know straight weight oil can be a pain in the winter but so can an engine rebuild. If I really wanted a multi-grade oil I would choose a non-synthetic if I was not running the engines once a week.
I don't know much about the pre-oilers as it relates to the lifter problem but it seems I remember some of the lifter problems were on engines with pre-oilers.

Oil

Posted by **Robert Mann** on 05/24/01

Congratulations on the purchase. A lot of people are considering the Exxon Elite oil. Their advertisements certainly are appealing. I used Aero-Shell 15w-50 and had spalling at 180 hours on a foh. Also have pre-oilers which do not address the problem. They do not lubricate the cam lobes. I switched to AS 100w+ and will probably switch to Exxon Elite in the fall. However, it seems to me that this is a defect in the manufacture of the lifter. Engines o/h prior to 1996 seem to have less potential for developing the spalling than those oh in 97 and later. I wouldn't hang my hat on the oil preventing the problem. It almost seems prudent to pull the lifters at each annual and look at them.

EXXON ELITE

Posted by **Randall Kerns (s/n516)** on 05/24/01

My engines only lasted 100 hrs SMOH, when both had to be torn down for cam lifter problems. I don't know what role oil plays, however to date I don't know of one confirmed problem using something other than Aeroshel 15/50. I now have 50 hrs SMOH & have been using Exxon Elite only because of the different climates I have to fly in. I would prefer to use straight weight.
By the way I also had pre-oilers.

Exxon Elite

Posted by **Dean Robert** on 05/23/01

I recently traded my A36 for a 77 Duke, P-430. So far so good-she's a beauty. The previous owner highly recommended Exxon Elite oil and my local shop in Springfield, Il recommends Shell 15/50. I obviously am anxious to avoid the cam and lifter problems I have read about. My plane has 250 hours on FWF rebuilts, with the preoilers.
Any input?

Engine oil testing by Aviation Consumer

Posted by **Joe Konicki** on 03/22/01

Aviation Consumer recently did a test of oils re: how well do they withstand corrosion?

The results gave the Exxon a resounding thumbs up. Sounds like Exxon may have a winner here.
My only hesitation in switching products is that I personally prefer heavy straight weight oil (shell 100+) with a bottle of the Lyc engine oil additive, even in the winter months (I preheat and use oil cooler baffles). Sure, I know 100W+ & 15W50 is supposed to have the same level of protection as the Lyc additive, but I still like to know I have adequate "snake oil" in the sump. There are also enough questions in my mind that shell 15W50 may not be a very good match for our particular engines--so I avoid it altogether.
Maybe at some point I'll try the Exxon product just for a comparison.

Oil

Posted by **Frank Singer** on 03/18/01

This is an update of my December message in which I described my experience with the new Exon oil. I have now gone through two oil changes (35 hours each). The engines run about ten degrees cooler and my oil usage has been cut in half. The left engine usually uses six quarts between changes which is now down to three. The right engine used to use three quarts between changes and this time I added nothing. Oil analysis is also slightly better. Unless something drastic happens I am sold on Exon. (I used to use Phillps)

Oil

Posted by **Bill Unternaehrer** on 12/21/00

The new Exon Elite oil is a partial synthetic as is the Aeroshell 15W50. We also had high amounts of iron, copper and aluminum using Aeroshell multigrade oil. On the advice of Lycoming we switched to Aeroshell straight 50 Weight oil and the metal content came down and in three oil changes was normal. I have this plotted out if you would like to see the dramatic difference. All of the engines with lifter / cam problems have been using Aeroshell 15W50. Synthetics may not be good for this engine. One supposition is that the synthetic runs off metal parts quicker than straight weight oils - especially if the engine is not run every couple of days.

Oil

Posted by **Frank Singer** on 12/20/00

I recently switched to the new Exxon oil. My engines have 300 and 500 hours on them. Previously I have been using multigrade Phillips.
Both engines run at least ten degrees cooler with the Exxon oil. Oil consumption has remained the same. Between 35 hour oil changes one engine uses three quarts and the other six quarts. So far the only thing that has changed with the Exxon oil cooler running engines.

As a sidebar.
My 500 hour engine's oil analysis always comes out perfect even though that is the engine that uses six quarts between changes. The oil is always black as ink. Here is the anomaly. The 300 hour engine uses half the oil and is very clean even after 35 hours. The oil analysis however is terrible (high usage of Iron, Aluminum and Copper). Lycoming says not to worry as long as the filters show no metal (they don't).

Now you ask why has one engine 200 more hours on it? After 200 hours a cylinder came off the engine after a Lycoming overhaul (at 17,000' over Mexico). It turned out that the cylinder heads were over-torqued. Both engines were overhauled at the same time but the other engine has given me no problem.

Oil change

Posted by **RF Mann** on 11/04/01

I change my own oil, but 16 hours is a bit excessive for just an oil change, even if the mechanic works at a snails pace. You don't have to uncowl the engine to do an oil change unless you are doing an overall inspection or are looking for an oil leak. If you just remove the cowl flap you have access to the drain plug and oil screen. It usually takes me about four hours to change the oil and filter along with checking the screen and cutting open the filter for inspection along with the paperwork for an oil analysis. It costs me about $180 to do it myself. Oil, filter, Lycoming additive, and oil analysis kit. It may take longer with intercoolers however, and they must have done some other inspections to come up with 16 hours.

Oil Change$$$

Posted by **Bob Stan** on 10/29/01

Steve: That sounds really steep. Perhaps your shop hasn't seen a Duke before and had a learning curve. I checked my records for the last couple of years and the greatest number of manhours was 6.0. This included washing things down after they were done, run-up leak check, new filters, and cutting open the used filters to check for metal, as well as taking an oil sample. And believe me, my mechanics don't move with the speed of light! Good luck.

Oil Change

Posted by **STEPHEN RUSHMORE** on 10/19/01

What does it cost to have the oil changed with new oil filters for both engines of a Duke? I was charged $1,600 last week which included 16 hours of labor. Can that be correct?

Oil Change $$$$$

Posted by **Mark Allen N38N** on 10/19/01

Stephen- I had my oil and filters changed this week. Serviced with AeroShell 100W. Total labor was 4.5 hours, including my customary added inspection of exhaust system and so forth when the cowls are off. Total bill (including oil disposal fee) was $577.40. This is pretty normal for me. I had work done in the San Diego area.

Spare Oil Coolers

Posted by **Larry O'Connor** on 11/25/02

Oil coolers (new) are one of the items our Association is carrying as part of the spare parts inventory. Gary Bongard at General Aviation Services is stocking the coolers.

Oil Cooler Problems

Posted by **Bob Stan** on 11/22/02

I had FWF complete both engines in May. On the right engine at 30 hours the oil cooler failed. FWF sent a replacement, which on run up after the repairs failed. Replacement number two was shipped and worked, for a while. At about 60 hours, last week, the replacement failed and stuck me in Pittsburgh. I then found out the previous three oil coolers were rebuilts from Pacific. A NEW cooler was then provided.

It appears that either this was a heck of a coincidence, or that Pacific has a quality control problem. I recommend caution to all of you, and perhaps replacement with new when required. There is the Beech price for new, and the OEM price from Gary Bongard which is a lot less. Thank goodness the result wasn't more than a lot of lost time and expense from being stuck.

Oil cooler function

Posted by **Joe Konicki** on 01/16/02

Robert,
I'll say up front that I do not know exactly what the bypass valve looks like internally in a TIO-541 however I can tell you what it looks like in a TSIO-360. The 360-series valve does not completely shut off the flow through the cooler it only minimizes the flow by opening a path from the oil cooler line to bypass the cooler. I was told once that there is an aircraft design requirement for our coolers to be non-congealing, therefore some heated oil must always be allowed to flow through it to keep it warm (hence cooling the oil). In my earlier post I talked about the problems I had getting the oil temp to stay hot enough with a fully open cooler. If the oil flow through the cooler was completely bypassed by the valve in question, then my addition of winterization plates would have no effect on oil temperature. In actual use, the plates do raise my oil temperature significantly.

Oil Dip Sticks

Posted by **Bob Stan** on 01/04/01

I suspect at past annuals or oil changes that my dip sticks may have been switched. Does anyone know the proper length of the left and right, or if the length is the same, are the markings a different distance from the end?

Dip sticks

Posted by **Jeff Gorman** on 01/04/01

Hi Bob: I sure think the dip stick lengths are the same both. I will measure next time I'm out. Our old engines had individual left and right sticks. The new ones have markings for both left and right on the same stick. We put a mark on the top of each caps so we are sure to be looking at the correct side of the stick.

Dipsticks

Posted by **Ralph Cohen** on 01/17/01

I checked and my dipsticks are labeled "left engine" and "right engine". I had two right engine dipsticks installed. When I replaced the left with the correct dipstick, the actual level was 1/2 quart higher than indicated on the wrong right stick.

Oil Filter-good eyes

Posted by **bob giebeler** on 05/05/02

Yes Maurice is right, the best calibrated and sharpest eyeball in the open sunlight works well, but is very subjective. It would be more scientific to flush the material from the filter with a solvent and analyze that. I will stick with the eyeball technique.

Oil leak/breather line/fuel pump

Posted by **Chris Larson** on 12/24/02

Replacing the Gar-loc spline seal for the fuel pump spline did not improve the leak. Lycoming is recommending changing the internal metal plug for the gear spline. It is accessible through the sump.

Excess oil from breather/fuel pump

Posted by **Chris Larson** on 11/27/02

I am trouble shooting a significant oil leak, (1 qt per hour) which seems to be coming from the fuel pump to the breather and exiting all over the underside of the wing. We pulled the "capped" rubber hose from one of the leads, (something suggested to relieve the siphon break problem) but found significant oil coming from the rubber hose from the fuel pump. The seal was replace but oil was visible in the spline. The breather tube lead comes from the pump itself and not from the spline. Any thoughts on whether this is a failed pump or why oil would come from the fuel pump itself.

Oil Quick Drains

Posted by **Bill Unternaehrer** on 08/29/22

I have been working with AVI for more than 2 years on getting an oil quick drain that will fit the Duke engines with Intercoolers. AVI has received PMA approval on this device and now are taking orders. I have 6 people who have ordered enough drains for 8 aircraft (16 drains). The cost is $100 per engine. I am supposed to have them available by the San Diego fly-in in mid Sept. If anyone else wants to make their oil changes a lot easier they should contact me as soon as possible.

Installed Quick Drains

Posted by **Ron Comeault** on 10/14/01

Installed these quick drains on my aircraft last weekend and I'm very pleased with the workmanship and quality of these. Since I change the oil every 25 hours, they will allow me to drain the oil warm after returning from a flight no matter what time of day or night, save time and above all keep everything nice and clean.
Your efforts are much appreciated Bill. Thank you very much.

Oil Quick Drain Valve for Dukes

Posted by **Bill Unternaehrer** on 10/31/00

For the last two years I have been trying to get a quick drain manufacturer to make an oil quick drain that will work on the Duke. It appears that I am within a week of making a deal with AutoValve. AutoValve makes quick drains for various aircraft but until now would only sell exclusively to the aircraft manufacturers. They make a two part valve for Piper and Beech that is very low profile and has a "probe" that clips on the valve to release the valve and drain the oil. The only problem is that the valve they currently make for Piper and Beech has the wrong size threads on the valve.

I have prototyped the valve by making an adapter to compensate for the thread size. It works great and has plenty of clearance from the cowl flap. Our Duke has Intercoolers and I think this is the worst case. AutoValve will make the quick drain with the correct threads and I have agreed to get the Field Approval. I will be ordering 12 sets (quick drain and actuating probe)at $100 each set. Obviously I only need two sets for our plane.

I am looking for buyers for the other 10 sets. Of course they will accept an order for more than 12 if the demand is there. I will be happy to provide a copy of the approved Form 337 for others to get their approval. Please e-mail me at bill.unternaehrer@honeywell.com if you are interested.

Oil usage, etc.

Posted by **Tom Clements** on 12/11/03

I'm often the one to offer an answer or two, but now the shoe is on the other foot and I need the groups' help.

I have been happy to do some flying with my good friend, Bob Cannon, new DFA member and owner of P-430. The left engine blows copious quantities of oil out the breather tube, getting the flaps and gear dripping wet, unless the level drops to under 7 quarts, then it seems to stabilize rather well. I tend to think we are pressurizing the crankcase. Could a bad prop seal be a likely culprit here? Also (he has the EDM 760 system) the #3 cylinder on the left side shows over 100 degrees F cooler EGT and marginally hotter CHT than the other five. Could that be related?

On another but possibly-related topic, I observe that this LH engine has the air-conditioning drive pulley installed, although, of course, not used. Is this standard? Can it be removed, because it is cracked clear through such that the spokes are all now disconnected from the rim (but the rim still turns with the hub since the cracked spokes still retain significant contact).

Any advice from you maintenance aces will be greatly appreciated!

Oil consumption

Posted by **Mark Seader** on 12/12/03

Tom, the oil appears to be due to crankcase pressurization. The case can be pressurized by several methods. 1) Piston ring blow-by 2) Oil filler neck seal bad 3) Crankshaft nose seal -- In your case I would perform a compression check (paying particular attention to the low EGT cylinder), and also inspect spark plugs and bore interior for heavy residual oil. I would perform the compression check at top dead center, and also at the bottom of the piston travel. If the rings are annealed you will have high oil consumption, high CHT, and lower EGT. Also the case outlet tube under the engine can be improperly positioned to cause a low pressure area particularly when the flaps are down. --- You might also inspect the exhaust slip joints at the low EGT cylinder for burned oil residue. If this is the case, you have an exhaust guide leaking oil into the exhaust. This could account for the temp differences and high oil consumption. Many times these kinds of problems can be multiple and overlapping.
The pulley is always installed even though it is not running a compressor. The defects you noted are serious, change the pulley. (You can buy them used for 50% of the new part price) Hope this helps.

Excessive Oil

Posted by **Dane T Scag** on 10/02/02

Have you solved your oil consumption problem? I had this problem with oil pouring out from the prop seal years ago. But it had nothing to do with the prop seal. It turned out to be a plugged oil breather tube, where the inner rubber liner delaminated and acted like a flapper valve.
PS Thanks for the photos. The paint style is exactly what I'm looking for. You missed a darn good meeting last week at the Duke fly-in in Canada.

Oil Useage

Posted by **Frank Singer** on 06/20/02

I posted a question to do with excessive oil usage a few weeks ago. My crankcase was getting pressurized and throwing oil out of the breather. The problem was not a broken ring, but annealed rings. Apparently the engine got hot once and caused this problem.
I monitor my temps during climb out and cruise, and have never let the TIT get over 1,600 degrees, but according to Mark Seader at Firewall Forward this can happen any time even by excessive idling on a hot day. My right engine runs fine so I am a bit baffled why one engine can overheat and not the other. Firewall Forward honed the cylinders and put in oversized rings and hopefully next week I'll know if the problem is fixed. Incidentally, my engines are mid time, have great compression and always excellent oil analysis. I think oil analysis is a waste. Cutting the filter gives more real info.

Excessive Oil Useage

Posted by **Frank Singer** on 05/21/02

About ten hours ago my right engine started to throw a lot of oil out of the breather tube. I changed prop seals (like I did five years ago which solved a similar problem then) but the oil keeps leaving the engine (about a quart/hr). The engine has about 700 hours, great oil analysis, and very good compression in all cylinders. During ground run-up the engine stays dry, but fly it around the pattern and there is oil all over the wheels. I will have the cylinders boroscoped to see if there is a cracked ring, because something is pressurizing the crank case while in flight. Anyone have any suggestions? Help!

Excessive oil

Posted by **Earle Olson** on 05/22/02

I have had this problem and thought that compression of 70 was ok. But after checking everything else out I finally told our shop to pull two cylinders that showed 70 and have them rebuilt. One had a broken oil ring. The other had a stuck oil ring. Engine time approximately 350 hrs. Stopped the oil consumption. I don't think a boroscope will show a broken ring unless it has scored the cylinder wall.

Oil Burn

Posted by **Ty Jenkins** on 02/02/02

I am a new owner of a 1974 Duke 900 hours on each side, we have been burning about 1 quart per hour per side this seem excessive, we use Areoshell 15/50 and run the engines at 30/25 and TIT at 1550. We did a compression check and all over 80 except #2 on right engine it was about 50 what should I expect on oil burn? And if this is high what are my options thanks

Oil usage

Posted by **Joe Konicki** on 02/05/02

I use about 1 qt in 4-5 hours in each engine also--very consistent over 3 years. One engine has 1400 hours the other at 600 hours. I have some minor oil leaks around some of the pushrod seals and the vent tube blows a little out as well. I only use AS100+ and preheat below 45 deg F. I don't exceed 1525 F TIT.

Oil Usage

Posted by **Bill Unternaehrer** on 02/05/02

I would try and determine how much is being "burned" and how much is leaking. About the only way to do that is to clean the engine real good and then go fly for an hour and see where the oil is coming from. Good bets are push rod tube seals and crank shaft seal. Good compressions tell you that the compression rings and valves are tight. There is not much way to tell if the oil ring is good other than the rate of oil burn. Also make sure the crankcase breather tube is clear and not causing excessive crankcase pressure. One quart an hour is a lot. A near leak free engine in good shape will burn a quart in 6 to 7 hours of operation.

Oil Burn

Posted by **Kim Pratt** on 02/04/02

I use about a quart per 4 or 5 hours. I would RUN not walk from the Aeroshell 15-50. This oil is suggested as a contributing factor to the cam and lifter problems owners have been seeing. I would suggest going to a straight weight oil such as Aeroshell 100 Plus which is 100 weight with the Lycoming additive. You may find a straight weight oil reduces your consumption.

Smell in cockpit

Posted by **Judd Kessler** on 04/11/03

I'm noticing an odor of oil or combustion on my clothes after flying my Duke. The shop has checked the sonic nozzles and found nothing. Any suggestions on where to look, or how to ensure only fresh air enters the cockpit?

Odor in cockpit

Posted by **mseader** on 04/11/03

Judd, have your mechanic check your induction system check valve. It is a one way check valve assy located on the right side of the induction air manifold next to the Bendix fuel servo. You can find it easily by following the stainless steel air line that runs from the right front corner of the air plenum (the housing that routes air to the 6 induction pipes) back to the check valve. The purpose of this check valve is to prevent induction/fuel odor from entering the cabin via the sonic venturi/cabin pressurization system during naturally aspirated engine operation, and to allow manifold pressure to pressurize the fuel injection nozzles during boost operation. The part number is LW-12745. Do not let them sell you a new one as they are $396.00 list price. It can be taken apart and for the cost of a few special o-rings, can be resealed. It sometimes can give you a smoother idle on your engine also. Sincerely, Mark Seader.

Oxygen Masks

Posted by **Joe Konicki** on 06/29/01

Masks: I've bought them online and via phone from the Airport Shoppe and from Aircraft Spruce. They carry most of the same products. You can go with the inexpensive medical-type masks for about $6 each, I think they're only good to 22K however. The high end scott masks are good to something like 34K but cost $95 each unless you want one with a mic, which is the same mask but with the mic installed then it runs about $300 and up. Don't forget the connectors too (if you don't already have a mask(s) you're replacing. Connectors run $30-$45 each.

Duke Painting Recommendation

Posted by **Bob Stan** on 06/25/01

I just returned from aircraft painting and offer a very positive recommendation for Sky Harbour in Goderich, Canada. I had a concern about finding a qualified, detail oriented shop who knew how to handle the Duke's magnesium surfaces. Sky Harbour fit the bill.

Several items were very positive. First, they do award winning work. We all prize our Dukes and this was important. Second, they know what they are doing. The mag surfaces concerned me. Third, they post daily pictures on a web site dedicated to the customer's plane, so you can watch daily progress. Next, they keep a draft invoice posted for review so you know where they are on cost. When items arise, they contact you to discuss cost implication. Finally, they are just plain nice people to deal with. John, the paint shop foreman, is super. Shirley, who handles customer service is great. They even have a nice little place to eat.
If you need painting this is a great place to go!

Paint

Posted by **Jeff Gorman** on 07/26/00

Bob:
I just picked up P-596 from a total paint job at Stevens in Dayton. I think they did a pretty good job. I can't really can't find too much to complain about at this point. You are certainly welcome to pop up to Mansfield anytime and take a look for yourself.

Paint

Posted by **Robert F. Mann** on 07/20/00

I had my Duke painted recently at Sky Harbor Refinishers in Goderich, Ont. They did a good job at a reasonable price. Also on time in terms of delivery date. Should be just a short drive from Ohio.

Duke parts

Posted by **Glenn Adams** on 06/24/03

We have three part-out Dukes in, several with all parts available. The serial numbers are P202, 69, 103. We also have a 1974 with 1360TT for sale for $90,000. Also available is a factory overhaul still in the crate for $45700/exchange

Controls

Posted by **pete edwards** on 04/17/01

If no luck try Crossroads Aviation - Addison, Texas. They stock B60 flaps/ailerons....very reasonably priced.

Turbo Parts

Posted by **Bill Unternaehrer** on 08/03/00

I have used Arizona Aircraft Accessories at Falcon Field in Mesa AZ to bench check, calibrate and overhaul Turbo parts. The only part I know of that they replaced was a butterfly plate in the wastegate. The Y Pipe is really hard to find and I'll buy one if you can find it. Az Aircraft Accessories phone number is 480 833 5812.

Damaged drink/ash tray holders

Posted by **Dane Scag** on 03/25/03

If you are referring to the plastic side panels with the arm rests, they get a lot of abuse. Mine were badly cracked and repaired by Elliott at Moline during refurbishing interior. I know it involves reinforcing the back side with fiberglass cloth, then filling, sanding exterior and painting.
If you want procedure, just e-mail me and I'll get the specs.

Cup holder

Posted by **Kirk Samuelson** on 03/31/03

I had the fold out cup holder on my 1981 model replaced by Hill Aero in Lincoln NE while they were doing some other work. I believe he said it was a standard product used on RV's.

Solvent

Posted by **Bob Stan** on 11/28/00

John: I used WD-40 to remove the mess. Use a terry cloth rag, WD-40, and a little elbow grease and the mess is gone. I tried all kinds of solvents first and WD-40 was the one that worked.

Old adhesive

Posted by **John Awalt** on 11/15/00

What is good to clean old adhesive residue that is left on plastic (royalite) trim around the inside of my front windows? "The dark brown stuff left from old velcro adhesive strips"

Hypersensitive pitch.....

Posted by **Mark Allen** on 11/15/03

I just completed a long road trip and the last two days the airplane sat outside in San Francisco in a hard steady rain on and off for the entire time. Normally I keep the airplane hangared, and this is probably the hardest rain I have had the airplane in, while on the ground. I found the carpets wet in the door area as well as the carpet runner. I looked for a source of ingress, but nothing was obvious. It had to have seeped around the door seal.

I did not think much about it and departed with 3 people on board. We climbed to FL230 with an uneventful flight for 2 hours or so. At that point, the autopilot tripped offline and I found the aircraft "hypersensitive" in the pitch axis. I reduced speed with little noticeable effect. I reengaged the autopilot, but it tended to over correct, so disengaged and hand flew the balance of the trip. Once in the pattern, with full flaps extended as usual, the pitch remained hypersensitive making for an interesting, but safe landing.

After parking, I checked the elevator by hand for anything obvious, but all seemed normal. With 30 minutes considerable water begin to drain from the "weep" holes located under the fuselage, just forward of the door area. I estimate at least a gallon drained. I am assuming ice formed at altitude somewhere affecting the pitch axis control. Has anyone had a similar experience? Is there some remedy for keeping Mother Nature out of my cabin while on the ground? This is S/N P220. It has no rain gutter around the door as I have seen on some aircraft.

Hypersensitive pitch

Posted by **Greg Jellinek** on 11/16/03

No question but that you had water under the floor and that it probably froze at 230. I recall some discussion about control cables becoming impaired by this phenomenon in an earlier discussion. Cannot remember if there was a fix. We had problems with water around the door and did install the rain gutter which has helped. A fuselage cover has also seemed to make a difference when the plane is parked outside.

Source for polish

Posted by **Bob Stan** on 04/03/03

See page 2 of the newsletter, call them at 1-800-394-8351, or order from their web site at www.nuvitechemical.com. There are also directions for applying on the web site.

News Letter - Polish for Spinners

Posted by **Bob Stan** on 04/02/03

I just read Ken Bowdish's note about using NuShine Grade S polish to shine the spinner. I just happened to use this two nights ago for the first time. WOW what a shine!! I also bought the Grade C prep material to prepare the surface.

I have polished my spinners for years with other products, but this worked better than any to date, was fast (less than 45 minutes total including getting things out and clean up), and oh what a shine. Good price too, only about $20 per bottle.

Nuvite

Posted by **Ken Bowdish** on 04/02/03

The news letter gives Nuvites address but their phone number is 800 394-8351. When you do the door frame use masking tape to protect the interior . Another little tip After you use the nuvite put a coat of Glass Wax on the spinners and door frame. Makes the shine last longer. Glass Wax is an old product, available in most hardware stores.

Pre-purchase inspection

Posted by **Greg Meadows** on 08/09/02

Lawrence -- The best I can do is in San Jose, California . . . Corporate Air Technology (CAT) at the San Jose Jet Center . . . 408.977.0990. Lots of Duke experience . . .

Pre-Buy

Posted by **Ron Comeault** on 02/19/01

Had my pre-buy done in 1997 in Phoenix by a Rick Lundquist of Arapahoe Aero located in Englewood, Colorado. Telephone number is (303) 799-8386. He was very familiar with the Duke and new exactly what to be looking for in the pre-purchase.
Price was right as well and everything was done 1 workday.

Pre-Buy

Posted by **Larry O'Connor** on 02/08/01

If you are anywhere in the St Paul, MN area I would highly recommend General Aviation Services 952-944-2628.

Pre Buy Inspection

Posted by **Jim Gorman** on 02/08/01

Suggest Stevens Aviation in Dayton OH. They maintain 7 or 8 Dukes. Contact Mick Walsh @ 888-872-1587

Pre-buy

Posted by **Robert Mann** on 02/08/01

ADI in Pontiac, MI has considerable experience with Dukes. There are other places also. Depends on what you want and where you want to do it. Where is the airplane and where are you?

Mid West Pre-Buy

Posted by **Hank Zannini** on 02/07/01

Hi Dean: It all depends on your definition of mid-west but I just went through what you need and I would HIGHLY recommend Dave Guzman [Southwest Aviation Specialties] .

http://www.swaviation.net They are in Tulsa - Tulsa might not meet your definition of mid-west.

Different Pressurization problem

Posted by **Kirk Samuelson** on 04/16/03

I am having a different pressurization problem than the previous writer. I had new avionics put in and the instrument air manifold replaced, (so was down for 4 weeks). When I got the plane back it is consistently only pressurizing to 4.1 psi now. The system works exactly as it should in climb and descent until the differential pressure reaches 4.1 psi and then it climbs with the plane, (ie I set the cabin to 7000 feet altitude, it climbs to that altitude and holds it, until it reaches 4.1 psi then it begins to climb with the plane.) I was sure they had a leak from the new avionics work but after 3 checks no leaks are found. We just replaced the solenoid valve on the dump valve vacuum line system and all the static lines on both the out flow/dump flow valves, but still the system works only to 4.1 psi. The shop feels it is the out flow valve which I'm guessing is very expensive. Does any one have any other thoughts or ideas on an out flow valve?
Thanks for your help, Kirk

Your Problem

Posted by **Earle Olson** on 04/21/03

You do not have a vacuum system it is a pressure system. Had one of your flappers in the pressure manifold broken off it would have blocked the pressure to all your pressure instruments and it would not have corrected it self until you shut your engines off. Then the loose flapper would drop off the line to your instruments. The next time you started your engines the flapper may not block the line to your instruments until it got sucked up and then it would. If your pressure manifold is ten years old or more you must replace it because there is a mandatory AD on it.

Cabin pressure

Posted by **Chris Larson** on 04/17/03

This sounds like a large leak. I had a leak at the fire-wall shut off that gave a musical note once psi got to 4.1. I could not detect it using Dane's vacuum cleaner check. I had to travel to an FBO who could check it with a pressure cart. Keep in mind that some seals, (ie door seal) are passive and don't close completely until cabin pressure really starts to climb. For me, I needed 3.0 psi before I could find some of the leaks. I was unable to achieve this level with the vacuum cleaner check.

Cabin Altitude Controller

Posted by Ron Donley on 06/10/03

When I first bought my Duke, we chased a problem with the same symptoms. After swapping almost all of the components, we found that the problem was a loose setscrew on the knob. When we were turning the control knob, that was all we were turning. The unit was set for -1000', and it went there on take-off and stayed there as long as it could during the climb, after which it acted normally. But during the first part of the flight, our ears caught hell as we went below sea level in the cabin. A couple of turns with an

Instrument Air Check Valve

Posted by Jim Gorman on 01/25/03

Dan Buhl Discovered one of the new HE-7007-5 Check Valves was defective

Before you install the valve if purchased from Rapid, perform a simple check to make sure yours is ok:

1) Cover both large center tubes tightly with duct tape to block the airflow from them.

2) Place your finger over the small tube and blow gently into that end. No air flow should result.

3) Repeat #2 at the other end.

Rapid (Beech) have reduced the price from $1400. to $647 at our request. Details in the next newsletter. The Association still has 10 vales at $595, and tested before shipment. See newsletter 02-3, Page 2

Pressurization system

Posted by Dean Robert on 08/02/02

My P430 pressurizes the cabin to max diff. directly after takeoff, regardless of where the controller is set. At annual, the vacuum system was checked and found to be sound. I had the controller overhauled in 1998 and recently sent off to the rebuilder in Reno and he said it bench tested fine. Any other ideas on where to look??

Outflow valve

Posted by steve faber on 08/03/02

Clean the outflow valve on the rear bulkhead. They can clog especially if people smoke in the plane. Good luck

Vacuum

Posted by Bud Allen on 08/03/02

Dean, Although my Duke has the older controller and system I had the same problem and it was a lack of vacuum at the outflow valve. In our case the aluminum tube that goes to the wing boot from the "suck down valve" that holds the boots down in flight had gotten moisture in it and had frozen and split. We had no idea the problems (boots inflating in flight) and the pressurization could be connected but both need vacuum to operate properly. Expensive lesson. Hope you find it soon or you are going to need a good ear, nose, and throat doctor!

Cabin Pressurization w.r.t. manifold pressure setting

Posted by **Maurice H. Miller** on 04/15/03

GIVEN: turbocharger output is reduced by a sonic nozzle then it flows through an intercooler, check valves, conditioning plenum, and finally the cabin. To maintain pressurization, two engine operation requires about 21" m.p., single engine op requires 26" m.p.
PROBLEM: On descent (2 eng) I start losing cabin pressurization with around 25-27" m.p. instead of 21". Pressure is promptly restored with 30" m.p.
(Related info: There has been a recent replacement of the outflow control valve and the safety valve checks out well. Pressure vessel leak tests, after a lot of sealant and seal replacements, measures circa 50-54 CFM.--normal is <30 CFM-- FYI these descent cabin pressure problems occurred prior to and after the recent service.)
SOLUTION: (?)

Pressurization

Posted by **Tom Clements** on 04/16/03

In addition to Dane's right-on idea about the leaks, check carefully all of the lines from the sonic nozzle into the pressure vessel, especially the tubing in the wing's leading edges and the connections to/from the heat exchangers. Either too much is getting out or not enough is getting in.

Cabin Pressurization

Posted by **Dane Scag** on 04/16/03

You've got a huge leak someplace!!!

Check the landing gear actuator tubes pressure boots. Check the floor drain valves. It's unfortunate that most guys don't have my simple vacuum cleaner cabin leak tester for a do-it-yourself leak detector. See Duke Flyers News letter no.99-2 for the procedure. Or give me a call:
262-544-4090

Cabin Altitude Controller

Posted by **Maurice Miller** on 06/10/03

PROBLEM: despite setting the unit at desired cabin altitude or at cruising alt. +500, at take-off, the cabin pressurizes to about 1000' below sea level and then gradually corrects to flight level, several ear pops later. The rate knob is set to lowest or 500 fpm during these tests with little performance difference.

The outflow control valve is about 10 hours since overhaul and the safety valve works well. I can get about 4.7 differential, e.g. at 24,000', cabin alt. is about 10,000'. Cabin leak test is in the low 50's cfm, normal being in the high 30's. With Dane Scag's cabin pressure tester technique (shop vac exhaust pumped through the little round pilot's window, but I use an electric leaf blower) I get an honest one inch of pressurization. A little side question: with "hell hole" access open, is it normal to feel a slight breeze coming out of the controller valve itself when acft is pressurized this way? Or could this freshly overhauled valve still be defective? (The fore/aft line between the alt. controller and valve has no leaks.)
SOLUTION?

Pressurization

Posted by **Robert Mann** on 08/04/02

There are primarily two sources for pressurization to go max diff on take-off. Either an abnormality in the vacuum source or a defective controller. I don't have my maintenance manual today, but I think you could disconnect the vacuum source from the rear of the controller, run the engines up to 2000 rpm and place the pressurization switch in the test mode. Attach a vacuum gauge to the vacuum line which goes to the controller. If there is no vacuum then it is a vacuum source problem. If there is, then the controller maybe the problem.

Pressure controller

Posted by **John Tye** on 08/05/02

I had this happen on a mtse. flight. The shop was trying to find the reason I could not get anywhere near the 4.6 pressure delta. The mechanic had had the pressure controller out to check it and forgot to reattach the vacuum line to it when it was reinstalled. As soon as the airplane came off the squat switch the cabin pressure went to max differential (it happens really fast at full throttle--as you probably know well). The mechanic (who was on the flight with me) immediately realized the problem, crawled under the panel and reattached the line. At that point the cabin began to go back up at about the same speed to the controller setting.

It sounds like you may have a problem with the vacuum line that goes from the controller to the outflow valve--not connected, a leak, pinched line, broken line etc.
Good luck, and don't test it with a head cold.

Pressurization

Posted by **Ken Bowdish** on 08/08/02

If you refer to your maintenance manual chapter 36 pages 201 thru 205 you will find a procedure there to adjust the ejector pressure (vacuum) the runs the controller. It also would be a good check to disconnect the line between the controller and the outflow valve and plug one end and connect a hand automotive vacuum pump to the other end and pull a little vacuum to see if the line is secure If it doesn't hold the vacuum you have a hole in the line Any good NAPA store will have the hand vacuum pump Also chapter 21 21-30-00 page 7 shows a schematic for airplanes serial no 308 and later If the connections to the controller or the filter in the back of the controller is dirty or the line to the auxiliary volume tank is not the right length you can also have problems Maybe it is just a loose line to the controller. good luck

Cabin Pressure

Posted by **Robert Mann** on 07/04/02

The leaks you mention don't seem enough to cause that high leak rate. Did they check in the baggage compartment for leaks or the air conditioning drain hole. If you close both firewall shut-off valves with the cabin pressurized you should see a leak rate of less than 5500 fpm. If your leak rate is less than 5500 fpm Then you may have an inflow problem such as bad seals in the firewall shut-off. If it is much greater than 5500 fpm then you probably have other leaks to find in addition to those you have mentioned.

Pressurization leaks/ Retract rod boots

Posted by **Dan Bruhl** on 02/04/02

Is anyone aware of a product that can be applied to intact but thinning retract boots which would prolong useful life, provide a better pressure-seal, and thus avoid having to replace the boot.

Retract boots

Posted by **Robert Mann** on 02/06/02

You can use PR-1425 B2 adhesive/sealant until a proper repair can be done.

Pressurization

Posted by **Ken Bowdish** on 11/27/01

Hank
My controller needed to be repaired and these guys did a good job at a fair price.

Air Marine Accessories Inc
4373 South St.
Titusville, Fla. 32780
407 268 3694

Pressurization Leak Check

Posted by **Bill Unternaehrer** on 02/09/01

Does anyone have a reasonable way to pump up the cabin (on the ground with the engines off) to look for pressurization leaks? Has anyone used infrared or other methods other than pressure?

Pressurization

Posted by **Robert Mann** on 02/09/01

You can pressurize on the ground by pulling the pressurization circuit breaker and disconnecting the air line from the controller at the outflow valve. The engines have to be running at almost full power to reach max diff if there are any leaks. I have done this in the past and would strongly discourage you from attempting this. It is not necessary. You should use the technique that Jim Gorman has cited to look for leaks. To grade how you have done in terms of identifying the leaks, fly the airplane and pull both shut-off valves off and check the rate of cabin descent. Mine reads 3700 ft/min and I think they allow up to 5500 ft/min.

Vacuum manifold

Posted by **Chris Larson** on 05/30/01

I'm noticing a drop in pressure (pilot instrument vacuum only) I'd like to get my mechanic to check the regulator. Where is it located?

Vacuum regulator

Posted by **Ralph Cohen** on 06/01/01

I believe the regulator you are looking for is located under the co-pilot's floorboards.

Vacuum Pressure Manifold

Posted by **Randall E. Kerns** on 04/21/01

HELP! Looking for Pressure Manifold Beech P/N 1H24-6 New P/N HE7007-5.
Would appreciate any suggestions.

Problem: When operating on ground and up to around 11-12000 feet all indications normal. After that right ball pops out indicating pump failure on right engine. Have verified both pumps functioning normally on ground. Shop has diagnosed pressure manifold to be the problem. I am open to suggestions.

Red Source Failure Button

Posted by **Tom Clements** on 04/21/01

I could be totally wrong -- I often am! -- but just because the pump checks out OK on the ground is no guarantee it is going to work well in the rarified air up high. How old is the pump? If it has more than 400 hours on it, it may well be suspect. You might want to swap pumps side-to-side and do another flight or two up high and see if the red button still pops out on the same side or the other side before you replace the manifold. I'd put my money on it still being a weak pump.

Also, try this, before you swap pumps: On the ground, start at about 1500 RPM and then slowly reduce power, one side at a time. When do the red buttons appear, if they appear at all? If one side beats the other by a lot, I'd surely suspect a weak pump.
Good luck!

Vacuum pump

Posted by **RALPH COHEN** on 04/21/01

I totally agree with Tom. The pump would be the first thing I checked. Maybe the shop has already, but the first indication of a weak or worn pump is its inability to keep up at higher altitudes.

Pumps o'haul

Posted by **pete edwards** on 04/17/01

B&S Engineering in Wichita also stock these items.

Firewall shutoff valve

Posted by **Robert Mann** on 10/03/00

I had a similar experience with a bad seal in the shutoff valve. Someone had glued the seal to the valve with an un approved glue and it came off leading to an inflow problem. You can check the leak rate by pulling both firewall shut off valves and noting the rate of descent. I have about a 3000 ft/min rate of descent; I think 5500 ft/ min is acceptable. Once you have determined the leak rate push in each firewall valve individually to see the rate that each turbo repressurizes the cabin they should be equal.

Pressure Leaks

Posted by **Kim Pratt** on 10/03/00

Went thru this a few months ago. Actually found a number of problems. We started with the less expensive items and worked up. Various seals as mentioned were bad. In addition, found a leaking outflow valve. Each item improved, but did not cure, the problem.

After extensive frustration and tweaking of this and that and multiple test flights the major problem was discovered. The left pressurization control (the red control under the copilot's yoke) was in the normal position. The control had broken inside the flexible housing allowing the control end in the nacelle to move independent of the control end in the cabin, the control valve in the nacelle opened slightly with less than full pressure being sent to the cabin. What appeared to be a leak at first turned out to be mostly an inflow rather than an outflow problem. Because we did find some outflow problems at first we were misled from the inflow problem which we defined on a test flight by reducing power on each engine one at a time. The cabin altitude held when the left engine was brought to idle, but climbed rapidly when the right engine was brought down. This led to some concern that perhaps the left turbocharger was weak until the broken cable was found.

Pressure Leaks

Posted by **John Tye** on 10/05/00

Bob:.....I had the same problem. About 2 psi differential was all I could get. Tried (and fixed) all the easy items first--new drain seals, check heater housing, windows, etc. The major problems were cracked outflow valve (very difficult to find) and new boots needed on the landing gear rods (like one of the other responses to your question, mine were vintage and had deteriorated). After all that, I can now get about 4.5 psi differential. This all took a "bunch" of shop visits, test flights, etc.

Prop overhauls

Posted by **Dean Robert** on 10/23/02

I currently have my props in for overhaul and got word that one of the hubs is corroded. Bottom line is $4000 for new hub-$6500 total on left side and $2100 for base o/h. Any other options you can think of for the hub? Any good used ones out there?

PROP HUB

Posted by **Glenn Adams** on 10/26/02

I have several in stock

Prop deice low voltage/Outer inner malfunction

Posted by **Chris Larson** on 09/03/02

While function testing prop deice, I noticed a "low voltage indication" with 7 volts indicated for the outer boots, right side. Trouble shooting showed that on the right, with all three prop deice boot wires hooked up to the brush rings, the outer and inner boots heat simultaneously during the right outer cycle, and at the same time, I show a low voltage indication. If I test one prop and disconnect wires of the other two, I get the proper sequence of outer then inner heat, without the voltage drop.
Our next step is to try a different timer, guessing that the problem is a combined poor contact in the timer for the outer prop heat on the right, with an electrical short causing the outer and inner prop boots to heat at the same time.
I appreciate any thoughts on this subject.

Prop Deice

Posted by **Tom Clements** on 09/05/02

Chris, I am confused by your posted information. First, you must mean 7 amps, not volts, since the propeller deice ammeter reads amperes, and should run between 14 and 18 amps, as I recall. Second, how did you know it was the right outer having the problem? Was this found by a hands-on test feeling for heat? And am I correct in my understanding that if you remove ANY ONE of the three right propeller blade heating element wires from the slip rings that the problem goes away?

I would be very surprised if the problem is in the timer, but stranger things do happen, don't they? Make sure the brushes are all making good and proper contact with the slip rings. Good luck!

Prop Deice

Posted by **Chris Larson** on 09/16/02

This turned out to be a broken Brush on the Outer Ring.

ISO Prop Heat Help...

Posted by **Jack Webster** on 11/16/00

Hello Fellow Duke Flyers! Checking the prop heat during the last annual, we discovered one segment with low voltage and another off completely... has any one been through the prop heat system that would care to offer any trouble shooting tips?
I've inspected all leads and they appear tight. Brush blocks are not adrift, but I've not pulled them off yet. Is there some continuity test that can be made on the individual circuits? Can corrosion at the contact points at the prop hub/bulkhead cause these kinds of problems.

I'm hoping it's just a big cleaning job, but one opinion I have is that the controller may be kaput!? Comments welcome!!

Prop heat

Posted by **Ralph Cohen** on 11/22/00

The Prop boots each have two electrical segments, inboard and outboard. There are four timer cycles, one for right inboard, one for right outboard, one for left inboard, and one for left outboard. Each boot segment draws 5 amps. If you see 5 amps during a cycle, then that segment is only heating one of three boots. If you see zero, then you are heating no segments.

There are two types of boots used, one has replaceable leads and one without. You must locate the open segments using an ohm meter or simply turning on the heat and feeling the boots. Then replace the defective boot or lead. (you say you've already tested the brush block assembly).

This can be accomplished with the prop installed on the airplane!

Model 60 & A60 propeller linkage

Posted by **Hunter Bennett** on 02/04/03

I have owned P-115 for 19 years now. Through all that time I have been deviled by the fact that the propeller control throw is not long enough to move the governor arm through its full travel. The adjustment to get full takeoff rpm and still let the propeller feather is very critical. This problem was corrected on B60 models by a new propeller control lever. I have control levers out of a B60 but no one will put them in for me because they have no part nos. on them. Has anyone ever gotten approval or a 337 form for this?

Prop feather after shutdown

Posted by **Bob McEwen** on 03/10/01

I was having a problem with the right prop feathering after shutdown. After we removed the props and de slugged both props The right one doesn't feather anymore after shutdown.

Right prop feather

Posted by **Bob McEwen** on 09/20/00

I am wondering if anyone has had a problem with a prop feathering after engine shutdown on the ground. Tthis happens only periodically . And it is only the right prop that does this.

Prop feathering on the ground

Posted by **Tom Clements** on 10/02/00

This is not all that uncommon. Here are a few suggestions. First, don't idle at too low an RPM right before pulling the mixtures. About 1,000 is great, but 700 may not allow the prop governor oil pump to supply enough pressure to keep the blade angle on the "flat" side of the "anti-feathering stops." Second, perhaps it is time for a governor overhaul if it happens even when idling at 1,000. Third, oil viscosity plays a role. You may want to give the new Aeroshell 100 Plus a try if you are now using 15W-50. Good luck!

Prop feather

Posted by **Phil Sykes** on 09/18/00

We just came out of our Duke's first Annual, done by the Beech people (oh, my God!). Since we bought the airplane, the right engine would feather nicely during the pre-takeoff check, but the left engine wouldn't budge when asked to during the check. Our local mechanics hummed, hawwed, and fiddled with it to no avail. The Beech folks fiddled with it, also to no avail.

We are still left wondering if the left engine will feather when we really need it.

Feathering

Posted by **Tom Clements** on 10/02/00

This isn't good, obviously, and I would consider it a grounding item until fixed!

Since it is the left side, perhaps the prop sync motor has run the actuator to the full increase RPM travel position and stuck there. Is there a prop knob split in the cockpit with the left one behind the right one to get the same cruise RPM? That usually also shows up it the sync actuator is at the limit. Is there "cushion" when you pull the left prop lever back, or is it bottoming out against the panel before it has really pulled the governor shaft all the way back to the feather position? If none of these suggestions work, swap governors side to side. Now will the other side not feather? If so, get a new governor!

Left prop feather

Posted by **Ken Bowdish** on 09/18/00

Phill .....I had the same problem with my Duke. It's all in the rigging of the prop governor and the prop sync cable. If you are going to be at Rockford this weekend ask me about it there. I'll tell you what I did to solve the problem

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Prop sync test box

Posted by **steve faber** on 10/22/01

I have a test box that you insert between the Jones plugs in the cabin. the test box allows you to monitor the drive signals to the motor and monitor the governor pickups. The box is equal to Woodward p/n wt-46192. I also have the Woodward trouble shooting guide. With this you can tell if the pickups are ok, or if the computer is ok. If your shop doesn't have this then you're waisting money.

If the components checkout it gets down to a bad plug in the left nacelle which connects to the stepping motor.

I will loan out the test box. Just let me know and pay fedex both ways.

Prop Synch

Posted by **Shaker Razook** on 10/18/01

One more possible source of your problem may be lack of lubrication in the flexible shaft and trimmer on the left (slave) engine. There is a Woodward Governor published procedure for this. Any prop shop or Woodward should be able to help on this.

Prop Synch

Posted by **Ron Comeault** on 10/20/01

Went to the Fly-In Rockford last year with a squawk list for the local FBO. One of them was Prop Synch Inop. They took the aircraft to Terry Norris at Aircraft Systems and the problem was found to be the canon plug inside the left engine cowling. They replaced it and readjusted the system. It has worked well ever since.
I agree with Ken Bowdish entirely...Terry Norris and Aircraft Systems are good but not cheap!

Prop Sync Check Procedure

Posted by **Tom Clements** on 10/16/01

This is really in response to Chris Larson's question of a few posts ago. Here is how I recommend checking if prop sync is working.

In cruise, manually sync the props carefully at your usual RPM, probably 2,500, and turn on prop sync. Now take the right prop lever, the master side, and make a small increase in RPM, just enough to hear (and see, if you have the optional sync scope in your tachometer's face) that the props go out of sync. In a moment, the left side should catch up to the right and re-establish sync. Now decrease RPM a touch on the right side and watch for a like result in the other direction.

One of the more common faults with sync is that the actuator motor runs to one extreme and sticks there. If, to get the props synced, it requires quite a stagger of the prop knobs and the sync in inop, it is probably stuck.

Prop Sync

Posted by **steve faber** on 03/31/01

I have been struggling with a problem for months and finally got it fixed. First, the connector on the stepper motor was a ms3106a-14-2s. This connector has a plastic insert which deteriorates over the years. The pins look fine but do not seat correctly when screwed in. The right connector is ms3106e. In addition the Jones plug (aircraft side)is not a quality connector. Over time the female contacts loose tension and become intermittent. I change both and everything works great.

I built a Woodward test box WT-46192 which makes checking out the system easier. i will loan it out along with the Woodward trouble shooting guide. Happy flying

Prop sync

Posted by **steve faber** on 10/20/00

Jeff, My prop sync bit the dust. Turned out to be a bad box. I now have the service instructions and drawing of a simple test fixture to check out the entire system. Let me know if you want it.

Prop sync

Posted by **steve faber** on 08/05/00

I thought my prop sync was defective and everything checked out ok. Problem turned out to be the prop governor adjustment. They have to be real close. You can verify this by watching the drop on run up. They should be identical. Good Luck

Me too (Rudder Bellcrank)

Posted by **bob giebeler** on 01/26/03

Note my message on this awhile back. Mine broke completely while on the ground. We need to send parts to Beech, as this could be a killer

Cracked housing on rudder bellcrank

Posted by **Bob McEwen** on 01/21/03

During a recent rudder removal for painting the mechanic discovered a cracked housing on the rudder bellcrank assembly. I am in need of a part number 60-630042-1 which is an upgrade or 60-630011-109 Also has anyone else had this problem The housing that is cracked is the part that attaches the rudder shaft to the bell crank assembly

Rudder bell-crank failure

Posted by **bob giebeler** on 05/02/02

Just a cautionary note; My duke was on the ramp at SJC intl and I noticed rudder-damage; over-limits and torn metal. Upon investigation, the rudder bellcrank had fractured. I figured it was jet-blast. But when it was repaired it became obvious there was severe corrosion internal to the lower bellcrank magnesium casting. This airplane has been in a hanger most of its life, and there is no evidence of corrosion otherwise. Then we realized that there was no drain-hole to allow moisture of any kind to drain out that collects in the torque-tube. I am happy it happened on the ground; still kissing the ground! Good thing to check at your next annual.

Small cracks in the spinners

Posted by **Bob McEwen** on 02/12/02

During my annual the AME has discovered small hairline cracks extending from the attach holes of the spinner. Just wondering if anyone else has had this happen and if there is a repair or a better fix. The props are Hartzel approximately 2200 hrs.

Spinners

Posted by **Larry O'Connor** on 02/18/02

I had a similar situation. After checking into various fixes I decided to just replace both units. I don't remember what they cost but Gary at General Aviation Services Flying Cloud, MN got me a good deal on the replacement set.

Why Spoilers?

Posted by **Bob Stan** on 02/03/03

I have had my Duke for almost 6 years now and haven't had a single requirement for spoilers. Any day you can get 1000 fpm on the way down without touching the throttle. To drop at 4000 fpm, simply lower approach flaps and gear and she'll come down like a rock! Try it sometime and you'll see.

Spoilers

Posted by **Kirk Samuelson** on 02/02/03

I just bought N88Gk (P 574) and joined the Duke Flyers association. The plane has the spoilers already on it. I flew a 1992 Baron for 4 1/2 years always negotiating altitudes with ATC. I know the Duke has higher gear/flap speeds but boy is it really nice when I need to descend at 1200+ fpm like this past weekend Chicago held me high and gave me 30 miles to descend 13000 ft into South Bend In. No changes in power or air speed just hit the button and minor trim changes.

Spoilers

Posted by **Randall Kemp** on 01/10/03

Thanks Robert. With the name of the company I finally found their website:
http://www.harbornet.com/spoilers/

The website also shows the phone numbers you provided, so they must still be correct.
I appreciate your help. You have saved me lots of time.

Power-Pac Spoilers

Posted by **Robert Hoffman** on 01/10/03

Randall: I have a large information package on POWER-PAC Spoilers that I picked up from one of the owners association meetings several years ago. The company name is/was Spoilers, Inc. 1724-26th Avenue N.W., Gig Harbor, WA 98335 (206) 851-1769 - (800)544-0169. I was unable to confirm the 800 number due to the early hour on the left coast. To my knowledge the company is in business as I have several clients with Power-Pac spoilers installed. If the number does not work I will be happy to give you the name of a client that has this recently installed this system. Regards, Bob Hoffman

Struts

Posted by **Bud Allen** on 09/17/03

I give up. I cannot get the main gear struts to the same height. They do not leak down but invariably one winds up higher than the other. After I bleed that one the next time I land it is too low. I would appreciate any ideas.

Struts

Posted by **Ken Bowdish** on 09/17/03

Obviously you are trying to do just what the maintenance manual tells you to do 12-20-00 page 202 or chapter 32-10-00 page 201. I agree the way this is written getting the struts even is almost impossible. They want you to inflate the strut with the airplane on the ground rather than while it is on jacks because any sudden surge of nitrogen in the strut will drive it to the extended position like a bullet. I'm sure you can see that this would very likely cause serious damage to the strut assembly.

Here's what I do and I know several other mechanics that do the same thing. With the airplane on jacks with the strut serviced at the proper level with 5606 hydro fluid and the strut fully compressed, connect the hose from the nitrogen bottle to the valve on the top of the strut. Make sure that both valves on the nitrogen bottle are closed. Crack open the valve on the top of the nitrogen bottle then immediately shut if off. I stress this, as it is important. All you have done is put a very small charge of nitrogen into the filler system. Keep the valve connected to the nitrogen bottle closed, and slowly open the other valve. That will release this small charge of nitrogen into the strut. Open the valve very slowly and you will watch the strut extend. Now you can service the strut with higher pressure.

I don't have the chart handy but as I recall if you service the strut with about 500 psi of nitrogen when you let the airplane down off the jacks you will have the 3" strut extension the book calls for. Just remember to service both struts to the same pressure. Again, you must be careful that you do not drive the strut to its full extension with any force. This procedure works best for me. If you have never done this before it would be my advice to do this a mechanic that is familiar with the procedure.

Strut inflation

Posted by **Ralph Cohen** on 09/26/03

I do this exactly as Ken has described, except I use a strut gauge between the bottle and the strut. A gauge allows you to accurately monitor the precise nitrogen pressure in the strut. I fill to 375psi for the mains and 90 psi for the nose. By the way, to fill with fluid, i connect a flexible rubber hose to the opened strut valve; the other end submerged in 5606. I then "stroke" the strut about three or four times until all air is expelled.

Stabilizer Service Alert

Posted by **Bob Stan** on 03/01/01

I found the following in "Plane and Pilot News", January 2001. This is an Ohio publication.
Printed under the heading of "ALERTS" they had the following:
Beech; Model B60; Duke; Horizontal Stabilizer Security; ATA 5510

During an annual inspection, the technician discovered the horizontal stabilizer made a "creaking" sound when he applied hand pressure at the tip. Investigating further, the technician noticed movement at the aft attachment fitting on both sides of the horizontal stabilizer. He removed the bolts (P/N AN176-7A), which were not tight, from the close tolerance holes in the fitting and discovered they were too short for the installation. The manufacturer's technical data, as well as the measured hole depth, indicates these bolts should have been four sizes longer (P/N AN176-11A). It appeared these bolts were installed as original equipment when the aircraft was manufactured. Since this condition presents a potential serious safety problem, the submitter suggested all operators of like aircraft check for proper horizontal stabilizer attachment hardware at the next opportunity. Part total time 1,629 hours.

I have not seen a service bulletin or AD on this. Everyone might give it the hand test, or have your maintenance staff take a look.

15 degree take offs

Posted by **Bob McEwen** on 11/17/03

With the Boundary Layer Research Vortex Generation Kit the Vmc drops to 77 knots and Lift off is generally around 82 Knots so with the Kit there is a huge margin of safety built in, because you are Usually above Vmc before lift off . And I usually stay in ground effect until Blue line

15 degree Flaps Takeoffs

Posted by **Bob McEwen** on 11/13/03

Hi Bud--- I normally takeoff with 15 degree flaps and I know the reason It is not recommended. I have the vortex kit and I find that the plane is much more stable on lift-off and uses much shorter fields even though that is usually not a problem. Would like your evaluation of the procedure. Thanks Bob McEwen P528 CFRKJ

15° flaps

Posted by **Greg Jellinek** on 11/14/03

I too use approach flaps to get out of my home runway, but the pavement is only 3100' long and trying to get this old sled up to 92 or 93 knots would leave me with not much more than a couple hundred feet of runway. You have to be very mindful of the blue line as rotation with 15° of flaps will get you in the air at 80 knots and it is a long way to blue line from there. I just accellerate in ground effect and as soon as I reach the blue line they come up. Scary, but it works.

Flaps

Posted by **George Friedrich** on 11/15/03

A friend of mine used approach flaps for 12 years and I couldn't convince him otherwise. Then, he went to Simcom in Scottsdale where they told him not to use flaps on T/O. I take off on a lot of short runways w/o flaps except when I'm at San Carlos where the runway is 2600'. However, I have VG's and they really make a big difference. What scares me is to loose an engine with flaps while below blue line on T/O.

TIT leaning

Posted by A.Konger on 10/21/03

There is a well kept secret in the Lycoming service letters. Lycoming has a fixture that syncs the relationship of the throttle position to the position of the turbo controller cam. You must use this fixture. Without it you may end up with the throttle plate in say the 50% position and the turbo cam at say 70%. This throws the mixture out of whack. Use the fixture and you will find that you are dead on to the power tables. Can't think of the service letter #.

TIT Temperatures during leaning

Posted by Bob Stan on 07/08/03

I have been conservative in leaning my TIT temperatures to no more than 825 degrees C. At 32" and 2500 RPM this gives roughly 21 gph per engine at FL200. Any thoughts on leaning above this TIT? I go by the theory that fuel is the cheapest part of operating my Duke and another gph or so makes little difference, but others tell me too much fuel flow can also hurt power. The original Beechcraft Horsepower and Fuel Flow computer suggests this fuel flow is high. Any thoughts or recommendations from the experts?

TIT Temperatures During Leaning

Posted by Joe Hosteny (P-507) on 07/08/03

Bob – I tend to run about 850C. I used to go a bit higher since (as I recall) the book says 900C or the charted fuel flow, whichever is reached first. I do think I get a bit of sparkplug fouling now and then. My fuel flows are not much different from yours, perhaps a bit lower.

TIT/Fuel Flow

Posted by Shaker Razook on 05/21/03

Bob: The transducer price is from Sandia Aerospace in New Mexico who owns the rights to the old Hoskins totalizer. The transducer is a "Floscan" Model 201. Incidentally, I had done exactly as you recommended i.e., swapped both transducers and probes. I will let you know the results after flying. Thanks for the input.

TIT/Fuel Flow

Posted by Robert Mann on 05/20/03

Could be a worn probe or probe is in a slightly different part of the exhaust stream. Assuming they are calibrated might want to consider replacing the probes. In regards to the fuel flow I would switch left to right the plugs on the back of the fuel flow gauge before buying a new transducer. alternatively, you could switch the left and right fuel flow transducers to make sure it is the transducer and not the Hoskins unit. By the way $489 seems low for the transducer, last time I checked with Beech they were $1400 and not in stock. Where did you find them?

TITs

Posted by Joe Konicki on 06/17/02

At 35-36 GPH I see about 1310-1340 deg F depending on outside air temp, and I have intercoolers installed. If I lean it out a bit to say 1400 deg F my CHTs still stay below 375 deg F and I see fuel flows around 31-32 GPH per side.

TIT

Posted by **Jay Hamilton** on 05/08/03

Actually, the left is 50C to 70C lower but it only occurs at full power or near it. Once I pull the power back and lean the mixtures I get nearly the same fuel flow and TIT indications. The most notable occurrence happens at take-off power, where the right TIT indication rises immediately about 50C to 70C above the left and the left begin to indicate TIT temps until I start to lean then it begins to rise. It seems the right engine would be running leaner in one of the cylinders but I have cleaned the injectors, and replaced an intake gasket on the right #1 cylinder. I expected this to fix the problem and it seemed to semi-fix it where the TIT doesn't rise as much at full power, but still rises on the gauge by 50C to 70C.

TIT's

Posted by **John E Rice** on 06/13/02

Can I get a few reference points from our members,please. On climb out, at the recommended 200 pph fuel per side, 35.5 mp and 2750 rpm, what do you show for TIT's?
My fuel flow numbers are inaccurate, and I am considering trying to work towards the proper TIT's backwards.

TITs

Posted by **Greg Jellinek** on 06/14/02

This is my second Duke. The first one flew with everything squared; balanced fuel flows, balanced CHTs, Oil Temps and TITs. This airplane has always had (now more than 1200 hours in it) a split between the TITs with the fuel flows balanced or a split in the fuel flows (both analog and digital) if the TITs were married. After a lot of thought and some 'back & forth' with Larry Roush, we flew it for a while with the TITs married and then again with the fuel flows married. Turns out that with the fuel flows married, the fuel burn was just about on, with respect to the right and left engines. And with the TITs married, the plane was burning about 1 lb. per hour more on the left than the right? Had the TIT probes calibrated about 6 different times over the past decade and they consistently show hotter on the right. Maybe that engine is just set up a little different. I don't think that I would go dialing the gauge back down just to make it look symmetrical!

TITs

Posted by **Tom Clements** on 06/13/02

My experience indicates that 750 to 800 degrees C is typically seen under the cruise climb conditions you indicated.

TIT UNIT

Posted by **JIM GORMAN** on 03/29/02

Rob Forget about the Beech TIT unit. They will be out of calibrator 10 hours after reworked. Suggest replacing with Electronics International T-2P unit. Ours has been flawless for 4 years. See Duke Newsletter 99-3 page 3

TIT Alcor

Posted by **Robert Mann** on 03/28/02

Alcor I believe will lend their unit if you can find the person who knows what it is. I met him at the Alcor booth at the Oshkosh fly-in, and he said they will loan it out for free. I think you may need to pay shipping. You could also try a Raytheon service center, I know the one in Rockford has one. Or you could buy one I heard they are somewhere around $2000. I would hazard a guess that Alcor makes them.

TIT Gauge

Posted by **Bill Unternaehrer** on 08/03/00

We put an Electronics International engine monitor in a B-55 Baron. I found it worked very well and the factory had excellent technical support. Their web site is www.Buy-EI.com and a phone number is 503 439 8484. We have now installed the JPI engine monitor in P-594 and it is truly an amazing device. It has caught a loose baffling causing slightly higher CHT on one cylinder and an induction leak caused by an induction tube o-ring that partially blew out causing that cylinder EGT to be about 50 degrees cooler than normal. I recommend the JPI for the Duke. You get the EGT and CHT and all of the other monitors for cooling and electrical bus voltage monitoring which can catch a problem early. Good Luck.

TIT gauge

Posted by **Robert Mann** on 07/21/00

I put a Gemini 1200 from Insight in my Duke and it works well. Also put a JPI engine analyzer in a Sierra, and I like that a lot more. Has more options available in terms of monitoring, such as oil pressure, voltage, inlet and outlet temperatures and others. Also can install a warning light that will light anytime a value falls outside specified parameters. I would recommend the JPI unit.

TIT

Posted by **Al Konger** on 07/24/00

I had one installed, and had it removed and put the original gage with new probes back in. Could not read it, even had it rewired for full time back lighting. Not enough contrast, and Mfg. was no help.

Recurrent Training

Posted by **Norm Gruczelak** on 05/27/03

I just finished my insurance mandated annual recurrent training with Don Cordier. He is based at Van Nuys in Southern California, and came to my airport at Camarillo, CA. I understand his program is approved by many insurance companies, but I would check with your broker to be sure.

I have been to Flite Safety and Simcom for initial and recurrent training. Don is very experienced in Dukes and does a great job reviewing the Duke systems, and gives a great workout in your aircraft while being very careful not to over cool your precious engines. I highly recommend him. You can find Don at (805) 527-7731, or DonCordier@earthlink.net

Recurrent Training

Posted by **R. M. Bud Allen** on 11/09/03

Praise where praise is due. I have gone to the big schools (Simcom, RTC, etc.) for insurance mandated recurrent training for the last several years. This year I trained with Robert "Bob" Hoffman. It was by far the best training I have ever gotten. Bob was extremely organized in his approach. He told me every thing we were going to do and then we flew it. Virtually every minute of every flight was either a new learning experience or an excellent review. Bob's knowledge of the plane's systems and his "traveling tips" alone were worth the cost. Speaking of which his fees were less than I have paid anywhere else - even with the fuel cost. Although, I worried some about abusing my plane I have the downloads form my engine analyzers to prove we placed no more thermodynamic loads on the engines than normal operations.

There is just no substitute (especially a generic instrument simulator) for some of the training we were able to do in the plane. Balked landings, no flap landings, Flaps 15 takeoffs, partial panel unusual attitude recoveries, rejected takeoffs just can't be experienced any other way.

Finally, I must admit to some intrepidation about going but I convinced myself that I would rather be a little uncomfortable now and be more prepared if on some dark stormy night something really bad happens. But Bob put me at easy with comments like "that was neat"! It definitely was the training I was looking for. I would encourage anyone who is looking for recurrent training or who has never had real initial in the Duke to talk to Bob. His website is dukepilot.com.

Training - I agree

Posted by **earle olson** on 04/02/03

John..... I flew with Bob today and also had a wonderful experience. Bob is very good with the Duke and has prepared alot of printed material to support the flight training syllabus. Bob has the knowledge and patience. I hope more owners will take the opportunity to master their Dukes with his tutelage.

Winter Flying: ICE STRATEGIES FOR DUKE PILOTS

Posted by **Robert L. Hoffman** on 11/24/02

In preparation for the winter flying season I have discovered two very good training videos produced by NASA, FAA, AOPA, and distributed by SPORTYS. The first video, Icing for General Aviation Pilots is relevant to the Duke pilot and our operating environment. I have to admit that I picked up a couple of pearls from this one. The second, Tailplane Ice covers a subject that needs more discussion and awareness among Duke pilots. Both videos may be purchased through Sportys for $5.00 each. What a deal!!!. Next, I recommend logging on to aopa.org and going to the Air Safety Foundation page and check out the site on aircraft icing. Having reviewed both videos, and the AOPA aircraft icing page the Duke pilot needs to remember the following: 1.) Do not operate the Duke in sustained icing conditions below 140KIAS. 2.) Do not use flaps for approach or landing with any amount of ice adhering to the wings. 3.) Finally, if you do nothing else this winter season, review the FAA APPROVED FLIGHT MANUAL SUPPEMENT for KNOW ICING in Section V of the AFM. The current supplement was revised September 1998. P/N 60-590001-17. If you do not have a copy of this supplement I will be happy to send you one. Fly safe and have a great holiday. Regards to all, Bob Hoffman

Training

Posted by Norm Gruczelak on 11/10/02

I attended the Beechcraft Society training last April in Fresno, CA. Although my insurance Co. W. Brown Assoc. approved it, a friend of mine was denied approval by USAIG. I think approval is very much on a case by case basis. I suggest you call your broker

Bob Hoffman recurrent training: worthwhile

Posted by Maurice H. Miller on 10/26/02

Bob has been working with me for quite a few years and does a great job, especially in emergency procedures. I recall doing some failed-engine IFR work in wintry conditions. Unfortunately my new Sky-Tec starter was dead and a restart was unsuccessful. With Bob's calming guidance ("Look, we've been flying on just the right engine for an hour. So don't worry, declare an emergency and tell the bureaucrats down there just the legal minimum, pretend you have a cup of coffee and relax, plan our ILS and land. Above all, you're the captain in command so deal with this problem!") I've gone through several other real emergencies with renewed confidence. No one has needed my dental records yet! It's the valuable practical info not in the books that Bob brings to the training that sets him apart from some of my other instructors.
The only bad thing I can say is that as he gets more regular students it is becoming harder to schedule with him!

Recurrent training

Posted by Randy Kerns on 10/24/02

Just finished recurrent training with R.L. Hoffman Aviation Services, Inc. and wanted to let all know Bob does a great job. He will challenge you and is a great source on Duke systems.

Aviation Safety Training (Upset Training)

Posted by Joe Hosteny, P-507 on 06/04/02

If any of you have thought about upset training, I highly recommend Don Wylie and Aviation Safety Training in Houston, Texas. They do a wonderful job in the classroom and flying concerning recovering from usual attitudes, review of aerodynamics, spatial disorientation, runaway trim recovery, and a good deal more. The training is excellent and fun, too.
My instructor, Rick Gillenwaters, is a retired USAF F-15 instructor. I recommend you check out www.aviationsafetytraining.com.

BPPP Duke Training

Posted by **Larry Bridgman** on 04/29/02

I just finished the BPPP Duke training and found it to be an excellent program. I attended the SIMCOM program two years ago and I much prefer BPPP. The instruction is in your own plane verses a flight simulator and every conceivable malfunction was thrown at you. The ground instruction was well prepared and presented. There was a dinner for the Duke owners the first night and dinner for the whole group the next night. You don't just meet in class and go back to your hotel room... you see each other at breakfast, lunch and cocktail hour. This makes for a total eat, live and breathe airplane experience.

Beechcraft Pilot Proficiency Program

Posted by **Bob Stan** on 04/04/02

I received a flyer yesterday from the Beechcraft Pilot Proficiency Program, a wholly owned subsidiary of the American Bonanza Society Air Safety Foundation. Has anyone heard of this before? What do you know about their Duke training? Who flys as instructor for the flight sessions for their Duke Owners? Any feedback about good or bad and whether or not approved by insurance companies for recurrent training?

Great Recurrent Training Instructor: Bob Hoffman

Posted by **Maurice Miller** on 02/05/02

I share this strong recommendation with some hesitation, for increased demand will make it harder for me to schedule...

Robert Hoffman captains for Northwest as his day job, but his heart is in Duke initial and recurrent training. On my last insurance policy shopping tour I was quoted the lowest rates on the broker's pilot profile form in which I had him personally listed. He charges more than minimum wage ($1200 for a full two day session at my own airport) but I really feel that those few discretionary disposable income dollars that my Ex and her fee-churning lawyer don't bleed off me are well spent on Bob's training.

Bob has a proper instructional syllabus, plenty of Duke air-time, and familiarity with the BE-60 technical/maintenance issues. Eg, he found several squawk items after my fresh, very comprehensive, and expensive annual inspection.

Captain Hoffman can be reached 859.282.0474, or cell 859.653.2149. He lives in Florence, KY. The interested reader should not hesitate to contact me.

Training

Posted by **Walter Eeds** on 12/17/01

Just got through with 3 days of recurrent Duke training with Simcom in SDL. Excellent training and instructors[ask for Bill Gant-great guy].Nobody is Tom Clements, but it's his old company. And they are worth the $.The C421 Sim is ok and gets the job done. SDL is great in the winter!

Simcom training

Posted by **John Tye** on 10/26/01

I went to SIMCOM in Scottsdale last time and plan to go back in a couple of months. Instructor was Bill Gant (as Mark noted). The sim is a C-421, so there is some difference (but I used to have a 421, so I probably feel more at home than most here).

In my opinion, nobody knows more about Dukes than Tom Clements and the old Flight Review gang, but SIMCOM/Scottsdale is a good group that worked hard to make it a worthwhile experience. As I noted above, I'm going back.

RTC

Posted by **steve faber** on 10/23/01

i feel compelled to comment on the negative words about RTC. I have been to Simcom, Flight Safety and RTC. I have to say overall RTC has made me a safer pilot.
Simcom which uses a P-Baron simulator has great visuals, auto pilot etc. However their training scenarios were not great. A lot of glitz but not substance.
At flight safety I flew the 414 black and white visual full motion. it was good training but not high value.
I agree RTC does not have fancy simulators. I agree that there facility has poor amenities and i agree that some of their instructors are not duke specific knowledgeable. However hands down RTC has the best training scenarios anywhere. Anyone who has attended should remember Colorado Springs and all that we forget with ifr rules, or Albuquerque to Santa Fe with equipment failures, bad weather etc. RTC has never oed having great sims but they stress instrument proficiency to high standards. i always feel a safer pilot after leaving RTC. They always find a way to challenge me more.
For me I feel comfortable flying the Duke as I'm sure most of us do. What I like is training to challenge my judgments and improve my decision making. These are the things that are going to get us in trouble. Just read all the cfit accident reports. They have nothing to do with type specific training.

Last RTC is approved by insurance companies. They must be doing something right. Yes i will go back for a fifth time. If anyone has concerns speak to John or Randy.

RTC

Posted by **Randy Kerns** on 10/23/01

I just came back from RTC & would have to agree with Steve. If you go with an open mind & can stand the culture shock when you walk through the door, you will be challenged & walk away a better pilot. Also you have to keep in mind RTC's training comes from a whole different standpoint. They truly are not type specific as SIMCOM, however you will learn how to fly IFR in the system.

Training

Posted by **Mark Allen N38N** on 10/17/01

I have taken my recurrent at SIMCOM in Scottsdale. I have found the instructors knowledgeable and the simulator while not exactly like the Duke, it is close enough. Very nice facility.

The last instructor I had there was Bill Gant. He is a past Duke owner/operator and was excellent. I learned a lot of new tricks. The manager there is Jim Hill and he will bend over backwards to accommodate you. Tel # 800-293-3055.

I felt that I & my company got their money's worth. What else can I say?

Recurrent Training and RTC

Posted by **Bob Stan** on 10/16/01

My insurance requires annual recurrent training. I have attended Flight Safety initial and recurrent, and they are good and equipment specific. I just attended the RTC recurrent. RTC was a real disappointment. It was great generic Sim IFR refresher, but I knew more about the Dukes than any of the staff did. Their Sims didn't handle like the Duke, couldn't be programmed to the Dukes airspeeds, and in general offered only basic recurrent training. Their Sims didn't offer GPS's so approaches couldn't be practiced, nor flight directors. In general they looked like a shabby outfit with worn out equipment. Don't be enticed by the low price like I was.

Does anybody know about SIMCOM in Orlando? How is their Duke Advanced Course? Any other recommendations?

Training

Posted by **Kim Pratt** on 06/12/01

Talk to Bob Hoffman, he is listed on the vendor page of this website. I needed 25 hours in the plane when I purchased it. Bob really knows Dukes and will give you good training. We did a weekend from MI to SD to MT to WY to CO and back. Covered a good bit of the 25 hours and the long distance flying was a great way to get comfortable in the plane flying it the way you will most likely use it. Bob is a great guy to fly with by the way.

Training

Posted by **Ken Bowdish** on 06/08/01

Call Jim Bauer At Advance Aviation Training. He is excellent. Knows the airplane and its systems really well Good guy to fly with I'm sure you'll like him.
address is 5260 Hilldale Road Leaf River, Il 61047-9989 phone 815 738 2489

Outstanding Training

Posted by **Bob Stan** on 10/20/00

I completed recurrent training with Bob Hoffman this past weekend. The training was a combination of flying and in depth discussions on the ground regarding everything from technique to decision making. The flying portion was done cross country and allowed a review of skills in "the system" rather than just circling the patch. His experience in "flying the line" was apparent compared to past instructors from Flight Safety.

Bob is an excellent instructor and I highly recommend his program. He is approved by most of the insurance companies for recurrent training. He is listed in the Vendors section of the web site, but note his area code is now 859.

Turbo Anomaly

Posted by **JOhn Rice** on 06/25/02

I just wanted to let everyone that responded to me know, that the problem did turn out to be the controller. After all the discussion, I had it replaced and the engine runs steady as a rock, just like new. Thanks everyone that took the time to comment.

Turbo Anomaly

Posted by **John E Rice** on 05/07/02

Ok Duke flyers, I have a problem that I would like your perspective on.
At higher altitudes over 19000, I get a slight and occasional fluctuation on my left engine manifold pressure. Flying along, the left side will (on it's own) increase about a half pound, and may or may not decrease back over a few minutes time. Since my prop sync doesn't work, it gets annoying if I do not manually decrease it. For a few minutes it will run just fine, and then it will adjust itself back, or it may increase back to a half pound over the right side setting. As soon as I put the down for initial descent, the left side MP begins a steady increase with descent that continues all the way to about 3000 feet. I have to continually adjust the throttle for that side to keep the engines at the same MP, and by the time I am at 3000 the left throttle is retarded an inch or two lower than the right side, with MP the same and RPMS the same. Then, after a bit more descent, something lets go, and the left side decreases down to where it should be at about 700 pounds lower than the right. Once I adjust it forward, both throttles are the same and all is well until the next flight.

The problem does not occur at all under 17000 feet. My mechanic says it is not a sticking waste gate, as he has cleaned it thoroughly and after these occurrences. The turbo controller has been checked and found good, and we have switched the controllers and waste gates without the problem leaving the left side. One other clue. Today while at 22,000, I advanced the prop levers to full just to see what would happen. The right MP stayed at 32 inches, the left increased all the way to full MP even though the throttle was not moved. When I put the RPM's back to 2500, the left MP was very slow to go back to 32 inches.

Ok, anyone got answers for me? I have not swapped the turbo's as that is quite a job, and I am at annual. I would appreciate anyone's suggestions. Thanks

Turbo

Posted by **R. M. Bud Allen** on 06/17/02

I own P-39. We recently had a cracked wastegate actuator housing that could not be repaired. After much searching I wound up having to buy a new turbo, stacks, exhaust, etc. (almost $10,000 since the new wastegates only mate with the new turbos. I sold the old turbo charger to the guys in Louisiana that are running the charter service - it only had about 150 hours on it. If you want to call them I can give you the number but you may be better of to bite the bullet and convert to the new style.

Turbocharger failure modes

Posted by **Norm Gruczelak** on 02/26/01

I recently had a turbocharger type failure which you may find of interest.
I lost partial boost in the right engine at 17000 ft. The manifold pressure varied between 32 and 28 in. for a few minutes and then would only make 28in. The turbo was visually inspected from the induction side and looked and felt fine. The waste gate was inspected and lubricated and a subsequent runup showed even with the wastegate fully closed the engine would only make atmospheric pressure.
(no boost)
The culprit was finally found to be a large hole in the exhaust manifold on the rearmost left side. I have the American intercooler installation and a large pipe from the intercooler is located right under this exhaust manifold, sometimes touching. It took my mechanic a long time to find this leak since the intercooler pipe completely blocks any view of the underside of the exhaust pipe. The way we found it was that the hot exhaust from the manifold hole finally burned a hole in the intercooler pipe putting exhaust gas into the induction side shutting down the engine.
I STRONGLY suggest anyone with American intercoolers insist on an inspection of the exhaust manifolds any time their engines are worked on.

Turbochargers

Posted by **Tom Comerford** on 02/02/01

The current thinking at Firewall Forward is that turbos should be spooled down for three minutes at 1000 rpm. The most important part of this recommendation is the 1000 rpm, because they believe that there is inadequate lubrication when idled at 700 rpm or so, which I was initially taught to do with the Duke. Whether cooling down three or four minutes, the important thing is to go right back to idle cutoff from 1000 rpm to assure good lubrication.

Cool Down Time

Posted by **Bob Stan** on 01/18/01

Mr. Clements comments make it sound like four minutes is wrong, and he even suggests that if I think four minutes should be used, why not five or ten. He should understand that I fly and operate my Duke by the numbers. The four minutes was not from an old wives tale or a seat of the pants guess. I train at Flight Safety International which I consider to be knowledgeable and outstanding. FSI provides Duke Owners a Pilot Checklist. The "After Landing and Clear of the Runway" checklist has as item 1 "Time...Four-Minute Turbo Charger Cooldown". If FSI says four minutes, I use four minutes, and actually time this after each landing.

I pay all of my maintenance bills, and if cooling down for four minutes saves just one turbo charger over the years, then I have come out way ahead.

Cool down time

Posted by **Robert Mann** on 01/18/01

It would seem that as power is reduced for descent that turbocharger cooldown has started. The TIT certainly are reduced while the oil flow through the bearings is about at maximum. It would seem that further cool down on the ground would be appropriate. The cool down time however would seem to be somewhat arbitrary. Lycoming in their Operators Manual suggests "it must be idled long enough to reduce temperatures". I was not able to find a time in the POH. Where does four minutes come from? FSI and where did they receive their recommendation from. Tom Clements was one of the Beech factory instructors for years. Perhaps he knows.

Turbocharger failure modes

Posted by **Joe Konicki** on 01/12/01

Greetings everyone, I am a new member of the organization who flies a 56TC out of Warrenton VA. I've been impressed by the wealth of knowledge available in the group.
The question I have is there a fairly common mode in which the typical TIO541 series turbocharger tends to fail? Is it any of the below: oil starvation, leaking seals, cracked turbine housing, rotor scrapping housing, compressor/turbine failure...etc.? At my last annual I had to replace the left engine turbo at 1300 hrs due to a cracked housing.

Turbo Cool-down

Posted by **Tom Clements** on 01/13/01

Let me offer a couple of comments about the turbocharger cooldown time. First, I believe the POM states two minutes, and we at Flight Review have for many years taught three minutes, with the clock started when at taxi speed, or leaving the runway. I see no harm at all in four, but...where will it stop? Maybe we should go to five? Do I hear ten? Second, I think that about 1,000 RPM is the ideal power to use while this time is recorded. Usually the airplane taxis fine at this power. Striving for the truly minimum RPM of about 700? I don't feel good about it. Even though a digital TIT gauge shows a reduction as compared to 1,000, think about the reduced oil flow out of a pump that is now turning 30% slower. Back in the old days before the digital gauges, TIT was on the bottom peg at any reasonable idle speed.

Turbocharger Failure

Posted by **Bob Stan** on 01/12/01

I previously flew a B36-TC Turbo Bonanza, and have now had a Duke for over three years. It is really important to allow the turbocharger to wind down at least four minutes before shutting down the engines. Oil starvation to the turbocharger is what I understand to be the leading cause of failure as the bearings coke up, and lots of bad things happen including cracking. I also understand that running the TIT too high can contribute to cracking.

If you aren't doing this four minute cool down religiously, by all means start now.

Turbo Prop

Posted by **Roman Stevens** on 05/21/03

A friend of mine is installing a Williams turbo prop (Czech made) in a Lancair kit (pressurized). He plans on keeping the aircraft @ his private strip and using filtered kero which will be stored at his hangar. The old soviet block fuel requirements are not as stringent as the west. Anyway a buck a gallon for fuel is a lot cheaper than the $2.50 plus the Duke will weigh much less. $2.50+ vs $1.00 & you go & climb a lot faster. I still think a good diesel should replace our heavy 541$$$$. cheers

TURBO PROP USEFUL LOAD

Posted by **JOE HOSTENY** on 05/19/03

ALTHOUGH YOU MIGHT NEED MORE FUEL FOR A TURBO PROP LET'S LOOK AT SOME NUMBERS.ENGINE WEIGHT FOR A DUKE IS 616 POUNDS EACH FOR A E1C4. THE WEIGHT FOR AN ALLISON 250 B17 IS ABOUT 175 POUNDS EACH. THE WEIGHT DIFERENCE IS 882 POUNDS FOR THE TWO. THAT COULD GIVE YOU YOUR 100 GAL. OF JET A AND GIVE YOU AN EXTRA 207 POUNDS OF USEFUL LOAD. A B17C ALLISON IS RATED AT ABOUT 404 SHP. CRUISE IS ABOUT 370 SHP. AT 75% POWER, YOU WOULD BE PUTTING OUT 303 SHP @19.5 GPH. PER ENGINE. I WOULD THINK YOU MIGHT WANT ANOTHER 50 GAL OF FUEL BUT NOT 100 GAL MORE. THAT 50 GAL OR 25 GAL PER SIDE COULD BE PUT BETWEEN THE ENGINE AND THE FIREWALL AS IN THE KING AIR. THE OTHER 50 GAL WOULD THEN TURN INTO 335 POUNDS OF USEFUL LOAD OR A TOTAL OF 542 POUNDS MORE OF USEFUL LOAD. THE DUKE WOULD THEN BECOME A FILL THE FUEL AND FILL THE SEAT AIRPLANE.

Turboprop duke

Posted by **Ken Bowdish** on 05/19/03

I kept a letter dated July 28, 1983 from Mike Smith of Mike Smith Aero, the guy that did all the mods to the bonanza. Subject of his letter was Project 19. Which was to hang a pair of PT6-A21 engines on the Duke Max speed was to be 280 knots at 25,000 ft. Max zero wind range of 1537 nm. Fuel capacity was 300 gal. Twin engine rate of climb 2500 ft/min Total cost of the conversion was $297,000.00 Financing was available.

This is a different conversion than the Galaxy 300 Duke with the Allison Engines newsletter 91-2 tells more about that one

I'll send a copy of the Mike Smith letter to Jim, maybe we can include it in our next newsletter just for grins

TURBOPROP DUKE

Posted by **JOE HOSTENY** on 05/15/03

IN 1993 GALAXY GROUP OF VAN NUYS CALIF. WAS DEVELOPING A TURBOPROP CONVERSION FOR THE BARON 58P. THE CEO OF GALAXY GROUP WAS GORDEN COOPER FORMER NASA ASTRONAUT. THE ALLISON CONVERSION WAS TO GIVE THE 58P A SINGLE-ENGINE CLIMB PERFORMANCE FROM 270' FPM FOR THE PISTON MODEL TO ALMOST 1000'FPM FOR THE ALLISON MODEL. SINGLE-ENGINE SERVICE CEILING WENT FROM 13,000' FOR THE PISTON MODEL TO 19,000'FOR THE ALLISON MODEL. TAKEOFF DISTANCE AND TIME-TO-CLIMB WERE BOTH REDUCED WITH THE ALLISON CONVERSION WITH RANGE TO STAY ABOUT THE SAME. THE DUKE WAS TO BE THE NEXT AIRPLANE FOR CONVERSION. BY THE WAY, THE COST OF THE 58P ALLISON CONVERSION WAS TO BE 700,000.00 IN 1993 DOLLARS.

Valve Lifters/Camshaft Alert Bulletin

Posted by Dane T Scag on 12/10/03

Many of you are aware that I have volunteered to download, edit and catalog the useful technical information posted on the Duke Flyers Web site. The main purpose of this "Bulletin" is that when working with all of the messages in a short period of time, I am appalled at the vast number of Duke owners with valve lifters/cam problems that are crying for help. I get the feeling that about half of the Dukes are doomed to this engine problem. It has become pretty clear and obvious to me (and I'm sure to many others) that the horrendous number of lifter failures started with engines overhauled after about 1995, either by the Lycoming factory or other engine shops. Clearly something has changed in the sourcing and metallurgy of these lifters by Lycoming.

All of the witchcraft concerning brands of oil, single vs multiple viscosity, synthetics, pre-oilers, etc etc are not really the permanent solution. My opinion of what is the best solution or solutions, after reviewing the hundreds of messages discussing valve lifters/cam problems is:

* Run, don't walk, to your nearest shop and have them remove and inspect every valve lifter for spalling.
* Schedule this inspection every 100 hours.
* Help and urge Jerry Burnham to get the STC for his carbide surface lifters for the 541 Lycoming engine.
* Install the FWF Centri-lubed camshafts.
* Convince Mark Seader to sell his patented camshaft to any shop overhauling your Duke engines.

If you catch minor spalling early, it is an inexpensive fix. Costs for the FWF replacement parts, tear down and engine installation is about $28,000 for both engines with a fantastic warranty by FWF. The Burnham valve lifters are about $7,000 for a set for both engines. This may not seem cheap, but compared to about $100,000 for two overhauled engine jobs, which still will not yield a permanent solution.

I recently purchased Duke P594 with two new factory overhauled engines. I took my own advice and "ran" to FWF for the new gizmos. They found that after only 40 hours, 3 of my lifters were starting to spall. I just saved myself about $100,000, for another worthless engine rebuild.

I'm sure some of you will disagree with my assessment. But that privilege is democracy for you. I'll be glad to chat with any of you about the above subject anytime. Just phone 262-544-4090. We still may want to consider the threat of some class action law suit against Lycoming to get them to share in the expense for their callous goof in denying any responsibilty.

Subj:	**Re: Nose ice shields/Carbide lifters**
Date:	12/14/2003 11:27:03 AM Central Standard Time
From:	Cllarsonmd
To:	DTScag

Thanks for the tips on nose ice shields. I will talk to Jerry Bailey about an oversize version of his shields.

I did put the carbide lifters on about 140 hours ago, and things are running well. I had one inspection at about 80 hours with no visible lifter wear at that time. I had used straight weight Aeroshell 100plus but have switched to 15w50 for the winter.

Jerry Burnham's process is a slow one indeed, for getting an STC. He is doing everything himself which may explain why it is taking so long. I understand that Pen Yan and maybe one other overhaul shop are looking into using the carbide lifters even before the STC approval. The problem is huge. Your comments about erratic lifter rotation pattern were the first I have heard. I'm sure it speaks to the very poor quality control that Lycoming has adopted as a company policy for outsourced parts. Eberhardt and I talked two years ago about the poor quality of chilled steel in the Lycoming lifter, and his independent metallurgy which showed how junky the Lycoming lifters are. Porosity and hardness index measurements across the face of the lifters were done and photographed.

Subj: **Lifter Spauling**
Date: 7/23/2003 10:16:24 PM Central Daylight Time
From: information@plastic-surgeon.com
To: Dane@scag.us
Sent from the Internet (Details)

Dear Dane,

Read your comment on the oil separator and the spauling problem. While I cannot prove it, using the oil-a-matic pre-oilers for the last couple of years has abated the spauling for us (at least the lifters have been smooth for those last couple of years.) We lost the camshafts on both engines, one in 2000 and the other in 2001 and I got all over Lycoming and they agreed to replace the lifters every year for three years for examination. The last two years - clean.

I pressurize the engines to 50 psi with those pre-oilers and then I use starter to turn the engine over through perhaps 25 blades without priming. I figure that with the engine pressurized, that spinning the engine probably extends the lifters and splashes some oil around, perhaps (hopefully) up onto the cam lobes. Then I prime and start the engine.

I am probably going to go back to FWF the next time around and have the new camshafts installed, but I think that I will stay with my technique with the pre-oilers and starter. If the pre-oilers will push oil into the shaft of the camshaft, then those lobes should be really juicy when the engine starts generating power.

Carbide Lifters

Posted by **Dane Scag** on 08/29/03

After waiting for a whole year hearing the same story that more paper work was required for the Lycoming engine STC, I gave up.

A few weeks ago I had both camshafts replaced with the FWF STC system. Mark Seader could not install the new camshaft with the unapproved valve lifters for fear of liability. I agree with him. I'm very pleased with the careful work FWF did when removing and replacing my engines.

With only 50 hours on my factory overhauled engines we found three lifters with chips at the edges and very erratic rotation patterns. Decided to replace all lifters with new factory units.

More on this at the San Diego flyin. FWF will have samples to show.

Incidentally, I'm still waiting for a refund of my deposit for the lifters I ordered last year. Anybody want my set? Jerry Burnham has them.

Cams & Lifters

Posted by **Al Uhalt** on 04/28/03

Dane,

I have no experience with the hardened lifters, so cannot really provide much guidance in that area. What I can attest to is that, so far, the Firewall Forward CentriLube camshafts appear to be standing up beautifully!

Inasmuch as I grounded my own airplane (for a year and 17 days!) when it was "making" so much metal, I tried to pay close attention to the two primary "fixes" in the offing. I watched the development of the CentriLube camshaft very closely for two reasons: 1) FWF overhauled my engines and were trying to correct the problem for me, and 2) FWF is a lot closer to Colorado Springs than North Dakota.

As you probably know, new camshafts are delivered with a very thin layer of tin coating the faces of the cams. On the FWF ground test engine run continuously (except for 50-hr oil changes) at 45" MP and 3200 rpm for 300 hours, the tin coating was still in evidence on the cams! It's amazing what happens when you run oil on oil and not metal on metal.

If the cams can stand up to the hardened lifters, I reckon they may work also. It seems, however, that they do not really solve the basic problem: metal on metal with inadequate lubrication. I'd like to have both, however, for now, the internally lubricating camshaft seems to be doing the job.

One final consideration: the FWF CentriLube camshaft is fully STC'd; as far as I know, the hardened lifters are not. I have reservations about insurance and "legalisms" which may eventually rear their heads.

50 HOURS AND GOING STRONG!

Posted by **Al Uhalt** on 04/22/03

25 hours after installing the Firewall Forward "CentriLube" camshafts and new lifters in my engines, we pulled the filters and changed the oil. Findings: CLEAN FILTERS with no ferrous material! My bird just crossed 50 hours since modification. We are buttoning up the engines after a 50-hour inspection with oil and filter change as I write this. Same results. Sure makes me feel great after "making" enough metal shards on the end of a magnet each "look-see" before modification to look like an "afro" hairdo. NO KIDDING – I have pictures!

For now, I really think Firewall Forward has the answer to our camshaft-lifter problem. I'll be going through this exercise each 25 hours until we hit 200 hours since modification and we post results – whatever they are – here each time.

Lifter hardness

Posted by **Mark Seader** on 03/10/03

Chris, the hardness was measured across the total wear surface, the chill zone and the sub-chill zone. Microhardness tranverses from the hardened surface of the camshaft and lifters were made on the Vickers hardness scale with a 1000 g load. In addition, a light micrograph of the chilled surface zone and the graphitic zone below the chill zone was accomplished. The hardness was measured through these zones and graphed as a function of distance from the surface of the chilled end of the lifter. The highest hardness, at the chilled surface was HV 740 (HRC 62), and the hardness drops to about HV 300 (HRC 30)-- Both "old" and "new" lifters measured the same. Let me know if I can provide any additional information. Sincerely, Mark Seader. FWF

Spalling

Posted by **Joe Lemanski** on 02/15/03

A couple years ago, I started to fly a Duke with a GEM 1200 that showed noticeably lower (200 degrees F) EGT and CHT temps on takeoff and high power climb for the middle two cylinders along with a reduced fuel flow indication for that engine - about 39 GPH vs. a more appropriate 46 GPH on the other side. Manifold pressure was redline at our 600 MSL airport elevation. The aircraft tended to pull right on initial brake release and the suspect engine was on the RH side. I personally thought the aircraft was more anemic in takeoff and climb than my previous Duke experience. In cruise, things seemed reasonable and no other signs of distress where noted. The plane's previous pilot suggested bad probes, thought it ran fine and nothing had been noted during routine maintenance. The engines had about 700 SMOH with factory overhauled fuel injector units. Compressions were found to be excellent; the fuel nozzles for those cylinders were clear and properly sealed at their bases.

Discussions with Lycoming and the manufacturer of the fuel injector system affirmed that the fuel injector units are mass flow driven and a worn lifter could reduce cylinder mass flow enough to show on fuel flow gages. The turbo will take care of low altitude manifold pressure shortages. Lycoming also stated the oil pan could easily be removed to examine the cam/lifter system.

Investigation revealed that the engine's LH and RH middle cylinders use the same intake lobe. Valve lift was viewed thru a spark plug hole, then measured by removing two adjacent rocker covers to reveal almost 5/8" lift on a "normal" cylinder lobe, but 3/8" on the suspect lobe. Nothing of significance was found in the oil filter. Logbook records showed a recertified cam had been used at overhaul in the mid-90's. I believe it had all new lifters installed.

When this engine was repaired, the other engine's lifters were inspected. Several lifters were replaced due to slight spalling, but the cam still appeared to be in good shape.

In summary, yes, a cam problem can be spotted late in the game using fuel flow and EGT/CHT performance under high power on an otherwise fine running engine. As a pair of cylinders stop breathing, this fuel system reduces the quantity of fuel delivered to the system. Climb rate for a given load and hi-altitude performance should also deteriorate as the lobe wears, but this is obviously way too late to save the cam.

Valve Lifters - My Experience

Posted by **John Rice** on 02/12/03

Dean
I had the same problem two years ago after 330 hours. Lycoming initially wouldn't cover anything but after a bit of threatening got them to cover all the parts, and the labor for the engine work but nothing for the removal and reinstallation of the engines. One engine's cams and lifters were shot, the other was just starting and I had both done at the same time. Best of luck.

Lifters

Posted by **Shaker Razook** on 01/15/03

There is an interesting "letter to the editor" piece in the January/February issue of WORLD BEECHCRAFT relating to the lifter/camshaft problem. According to the submitter, the problem has been narrowed to all TCM and Lycoming lifters made by a company called EATON since 1995. The root of the problem has been determined to be the alloy procured by EATON from Russia. He goes on to say that the NY FAA is preparing an AD which will probably require removal, cutting open the filter and examination for metal every 25 hours until such time as a 'suitable' replacement is available. Phone # for World Beechcraft Society is 866/732-3927. Website is worldbeechcraft.com.

Lifters

Posted by **Joe Buzzetta** on 10/26/02

My Duke is just out of annual. Had all my lifters pulled and no spalling, All look normal. They were replaced 180 hours ago after we found two at early stages of spalling, engines at that time had 100 hour on factory remans. According to Gary Seabert at Island Aviation the lifters he received from his supplier were the old type and a different metallurgy, and I was lucky to have received them.

Cams & lifters data point

Posted by **Joe Konicki** on 10/02/02

I'm flying a 56TC and I currently have almost 1600 hours on the left engine, 700 hrs on the right. L eng overhaul was done in the mid 1970s (Shenk?), R eng done in the late 80's by Carter. There have been a number of different owners since that time (about 6 or 7 per the log book history I have pieced together). NO cam/lifter problems to date. Don't know what oil was run early on, but engines were run on 15W50 during all of the early 90's, and up until I bought the plane around late 98 when I switched to W100+ or W100 w/Lyc additive. Prior to my ownership the plane has alternated between flying 150 hours a year, and even sitting "out of annual" in a hangar for up to two years at a time during two different periods. No pre-oilers installed, and it did get intercoolers added around '1995/96. Seems almost odd engines are still running strong doesn't it?

Lifters and Cam Shaft

Posted by **Dane T Scag** on 10/02/02

Al Uhalt will probably be the best person to put all the info together since he is vitally interested.
In the meantime, here's my opinion:
Discussions about type of oil, gasoline corrosion, preoilers, cam splash lub versus forced surface lub and hours flown per month have no statistical value in facts. The only thing that makes sense to me, since engines overhauled prior to about 5 years ago have had no problems, is that Lycoming has quality control issues with their overseas supplier.

Visiting with Jerry, the guy from South Dakota was very impressive and reveling. He has cut away lifters from Lycoming from several years ago, and some from newer production. There is clearly a visible change in structure just below the surface.
Jerry has had no failures with his lifters with over 3000 hours of operation in Continentals.
As I have indicated earlier, I'm getting a set installed as soon as I get my Duke, and will post any experience on the Duke web site.

More on Valve Lifters

Posted by **Dane T Scag** on 10/01/02

I have concluded from all of the comments at the recent Fly-in, that most of the opinions have no true basis and cover up the real problem.
Those of you who took the time to visit with the guy from South Dakota, would have seen that indeed, Lycoming has changed their lifter metallurgy. I saw a microscopic cut of an older Lycom lifter and a new one. There is a definite change in structure visible about .020 below the top surface.
The SD lifters have been successfully installed in several Continental engines and have experienced up to 1000 hours with no failures.
I have ordered a set to be installed in my Duke as soon as I get it, and will keep the members informed of my experience.

Lifters

Posted by **Robert Mann** on 09/20/02

From what I understand Lycoming did not recognize there was a problem in the past. If they are considering it now then it has been since the class action lawsuit. Unless Lycoming is compelled to fix the problem I doubt if they will. They have been aware of it since at least 1999. I have had an engine teardown for lifters and think the service difficulty report is a good idea. It is my understanding that this is usually filled out by a maintenance facility although owners are free to do so. That being the case, why hasn't FWF filed these forms when they have an engine for teardown with spalled lifters? They have certainly seen a lot of them and it would help their cause in STC approval.

Immediate Action Needed on our Cam/Lifter Problem: EVERYONE AFFECTED, PLEASE HELP ON THIS!

Posted by **Al Uhalt** on 09/18/02

We have TODAY (18 Sep 02) been informed that the FAA finally recognizes we MAY have a problem with the cams and/or lifters in our engines and is beginning an investigation into same. They have a procedural problem in proceeding, however. As of now, they have received NO Malfunction or Defect Reports (FAA Form 8010-4) on the cam/lifter erosion we have been experiencing in our engines over the last five years. (NOTE: Several of us have recently sent in reports, but they have not yet surfaced in the FAA data base.)

Please take pen in hand right now and fill out an M or D Report -- one for each affected engine for each incident -- and mail them to your local area FSDO. I'm quite serious about this: please; right now; today! The report is quite short (it's a postage-paid, mail-in post card) and, if you do not have the information requested, just leave that particular area blank. The Feds need to know the number of episodes we have had and the severity of each. This is the means they use to prioritize their actions. Either you or your maintenance shop can do it. We must get this data to the Feds or we will continue to get little or no attention from them.

If you do not have or cannot obtain a Form 8010-4 from your local maintenance or avionics shop, call your area FSDO and they'll mail you some. Or, call me at 719-574-1111, FAX me at 719-574-6864 or e-mail me at cobd@earthlink.net and I'll FAX or mail you one right away. If you get one from the FAA, it'll be a light cardboard postal card; the type I have is a single bond sheet that you fold in half, tape and drop in the mail. If I can ever figure out how to get a copy on our Message Board here, I'll do so. And, I'll have a stack of 'em with me at Sault St. Marie.

This action on our part is really important; it will contribute materially toward getting this problem behind us and our airplanes back in the air. If you've been affected by cam and/or lifter problems, please do this today! If you haven't been affected yet, you will be -- shortly after you have your engines overhauled -- unless we fix it now.

A Few Late Thoughts on Cams and Lifters

Posted by **Al Uhalt** on 09/19/02

There's certainly been no shortage of opinions lately on what we should or should not do about our growing cam and/or lifter problem. I've read them all (website, letters and FAXs both to me and to others who have shared them with me) and all have been food for thought. For what it's worth, I'd like to share with you some late topics I'm sure we'll be discussing at Sault St. Marie. I am not an expert on any of this. Please consider what I've written here as only one member's opinion and position -- however, a member with a very sick Duke. I truly hope we can arrive at a unified position that will be more or less beneficial to all of us and help get those of us already grounded back into the air.

One message posted here on the website stated, "The TIO541 (sic) engine is unique to the Duke." This is not altogether true. While it is used predominantly on the Duke, the Lycoming TIO-541 engine is used also on the 56TC Baron and the pressurized "P" Navajo, both models of which have experienced the same problem as the Duke. Although none of these three aircraft are currently in production, the TIO-541 engine continues to be produced. As stated in the message noted, it is indeed supported by Lycoming with both parts and factory overhauls -- as well as new engines and "zero-time" factory rebuilds.

Contrary to some recent thinking and surmise, current events indicate Lycoming is increasingly "backing" their engine and wants to solve the cam/lifter problem as much as do any of us. I really do not think we are "pressuring" them at all. A class-action lawsuit was being prepared. That action is currently in abeyance awaiting the outcome and conclusions reached at our forthcoming convention/fly-in. Short of going out of business, I really do not think Lycoming will stop their support of the engine. That really WOULD invite litigation far beyond any currently contemplated. I am certainly looking forward to getting their perspective on this at the convention.

Some of us are very wary of what we are doing to awaken the FAA to our problem. The effort to get the FAA involved is NOT directed at Lycoming, but rather, at the FAA itself to move them to accelerate the STC evaluation and certification of at least one proposed solution to our problem. The process got so bound up in bureaucratic red tape and delay that the developers got discouraged and, at one time, considered abandoning the project altogether. They did not though, and things finally seem to be moving again, albeit ever so slowly. This is what we are trying to speed up.

Another possible solution exists, however, I've been told that that developer did give up on the STC process and is now looking into the possibility of installing his "fix" in our engines under some other FAR. (I don't know what that is, however. Perhaps we will find out at the convention.)

At the moment, these are the only possibilities in sight and we must not allow them to "die" else we really WILL be grounded -- PERMANENTLY -- without a functional engine.

I agree with those who say that getting the FAA involved may get our airplanes grounded. I personally think that possibility is remote, but yes, it is certainly a possibility. For the record, my airplane has been grounded due to this specific problem since February 4th of this year. And there are others similarly grounded. When the problem appeared in BOTH my engines, 70 hours after overhaul, we replaced the camshafts and lifters only to have the problem reappear 35 hours later. Although I agree with some that flying this type of airplane is expensive, I have neither the dollars nor the time to have my camshafts and lifters replaced every 35 hours -- at $15,000 per engine! I don't think anyone else does either.

What is more likely is that, from empirical data now available, the FAA investigation will find that only engines manufactured, rebuilt or overhauled during a specific time period (1997 to the present?) are affected and perhaps these airplanes SHOULD be grounded. Mine is certainly one of them. As indicated, two possible solutions are at hand and at least one of these is nearing STC approval. Lycoming may well come up with a third and perhaps we may employ two or all three in the long run. In the meantime, should we fear grounding? I think not. We have been lucky (or very skillful) so far with turbocharger and waste gate failures, feathered props, oil pump failures, engine stoppages, etc., all traced back to shards of metal in our oil systems. Sooner or later, one of us is not going to be so lucky (or skillful). Let's get the problem solved before that day arrives.

AN OPEN RESPONSE TO EARLE OLSON'S ITEM ON "MISPLACE BLAME"

Posted by **Al Uhalt** on 09/16/02

Dear Earle:
Regarding our current cam/lifter engine problem, your basic premise in your Message Board item of 09/05/02 is flawed. No one afflicted or actively engaged in working to solve the problem is trying to "BLAME DFA founders or any of the volunteer officers FOR THIS PROBLEM" [emphasis added]. Much of what has been said and written of late stems from frustration in our collective (individual, DFA, Lycoming, etc.) inability to cure the problem which is getting worse and daily affecting more and more of us. Some of our members do "blame" the DFA for not taking a more aggressive role in seeking a solution to the problem, but they are certainly not blaming the DFA "FOR this problem."

While your proposal to do metallurgical tests (which, by the way, are currently being set up here) may disclose the root of the problem, it will not give us a near-term solution. You are trying to find fault. While this may eventually be warranted, we are not, at this point, trying to do that; rather, we are working day and night to find a solution we can implement immediately to get our birds back in the air. Both Gary Bongard and Mark Seader are to be commended for their efforts. I'd sure like to see Lycoming and, if need be, the FAA in that elite group.

You state your concern that getting the FAA involved could get all Dukes grounded. Mine is already grounded and has been for over eight months now -- as are a number of others. More are joining us daily. We want our airplanes back in the air -- safely. If you are not now already afflicted with the problem, you certainly will be as soon as you have your engines overhauled. About 35 to 50 hours later, all of a sudden, one's outlook changes. It may well be that the powers that be find that those Dukes, P-Navajos and 56TC Barons that have had their engines overhauled within the past five years SHOULD be grounded until the problem is solved. If so, so be it. Let the chips fall where they may. I'm sure you do not propose us continuing to fly around with a time-bomb ticking in our nacelles.

Earle, we cannot cure this problem ourselves. We need help. Only two people, Gary and Mark, have put their money where their mouth is. And, it appears they need help also in getting their proposals tested and approved (or disapproved). They are encountering, at best, bureaucratic delay after delay in the pursuits or, at worst, complete disregard of not only their efforts, but of the basic problem itself. Lycoming, which makes the engine, and/or the FAA, which is charged with overseeing and ensuring the operability and safety of the products we use, MUST join us. I, for one, am pressing the FAA to give this problem the attention it deserves immediately which, one way or another, will result in solving the problem for us all. You and everyone else can help in this effort by filling out and mailing to your local FSDO an FAA Form 8010-4, MALFUNCTION OR DEFECT REPORT, for EACH incident on each engine "making metal" and falling victim to this problem. That's the best way to get their attention.

Please note again that I am NOT trying to affix blame for what has occurred. What we need is a cure, not finger-pointing. Spending time assigning blame at this point is time poorly spent where, for many of us whose airplanes are already grounded or showing signs of the problem, time is of the essence. Let's all join hands in our common effort and get on with this now before someone gets hurt -- or worse.
Most sincerely, AL UHALT

Misplaced blame

Posted by **Earle Olson** on 09/05/02

I think it is folly to try and blame DFA founders or any of the volunteer officers for this problem . They didn't create it but have tried to have an open forum for all of us to discuss it. No one seems to have found out what is the problem. Is the hardness of the lifters or the tolerances that you mention any different than they were before this problem came to light? What might be useful is to find some old lifters that have not been used and compare them to those that are supplied now. It also would be helpful if we could find out what specifications are called for these lifters. Do they spell out the metallurgical composition of the lifter metal or do they just call for a specific hardness reading and what tolerances are acceptable.

If anyone has any old lifters (used or new) it would be worth getting them analyzed. I do not feel that getting the FAA involved is the way to solve the problem .The FAA is not going to solve it but they could order all Dukes grounded. This problem has not caused any engine failures that I have heard about. I doubt seriously that any one has even noticed any loss in performance before they have replaced the lifters. Yes I have experienced the problem and have replaced or rebuilt three engines but I'm not going to try to blame fellow DFA members for the problem.

Reply to Bob Stan: "Lifters/Cam"

Posted by **Al Uhalt** on 09/04/02

The answer to all three of your questions, Bob, is: SUBMIT MALFUNCTION OR DEFECT REPORTS.

Before I wrote my tome, I checked the status of FAA action on this "at-least-five-year-old-problem." Guess what: OFFICIALLY, they didn't even know about it. With all that has happened, how could that be? Answer: not one single M or D Report on the TIO-541 cam/lifter problem has ever been submitted! So, as Pogo once observed, "We have met the enemy and he is us."

The Malfunction or Defect Report is short, simple and straightforward; the FAA even pays the postage. It is what they use to establish that a problem exists and how widespread and/or severe it is. Every pilot and mechanic should have a pad of them in his/her flight bag or tool box and use them at every opportunity. (I do now.) This is how we get product improvement AND STC ACTION.

Some may misunderstand my motive here. Simply put, I just want to get my airplane back into the air -- safely. It is obvious by now that the FAA has to become involved in this and the way for us to get them involved is by submitting an M or D Report on every failure we have ever had. I am not "pushing" anything; let the chips fall where they may. I just want the "powers that be" (Lycoming, FAA, Bongard, FWF or whomever) to get ON with it! We've been dancing around this problem far too long. Sooner or later, someone is going to get hurt. Let's get it fixed before that happens.

EVERYONE please send in your M or D Reports today! It'll get the ball that's just been sitting around for years finally rolling.

Cam & lifters

Posted by **Eberhard Burghalter** on 09/04/02

Thank you Al for finally doing something that will help all of us.

Although I am from Germany and have no real influence on the FAA I am happy that someone finally IS taking some action. It should be the Association first and foremost target to help it's members fly and maintain their aircraft properly and with a problem like that only an organized effort can lead to something productive.
We know and Lycoming knows that there is a problem related to poor quality control, craftsmanship, greediness or whatever. I have experienced that failure, you did and many more of us have. I read the discussion in the bulletin board and I read the newsletter and the invitation to the meeting. What I don't see is a comment of our elected President or of the "founding fathers" of the association saying something like "We are going to coordinate the effort and step forward with the authority of app 350 members owning about 600 engines affected with the disease"

Instead we read in the Newsletter:
-our average flight time is only 136 hours per year
-Install Pre-Oiler
-Switch to Shell Oil
-Use the Additive
and
-Don't start over 650RPM

Now this really helps! If this would be the reason for the problem then where are all those Cessna 4 series drivers with their damaged engines, or Navahos, Aztecs and those big twin Bonanzas? It looks as they are smarter, better trained and much more conscious. And they fly 500h each per year!
But I give you another hint: The metallurgical analysis by BMW I had done on one full set (12) of UNDAMAGED lifters revealed that the hardness between the single lifters differed by up to 15 % AND within the lifter surface of one single lifter differed up to 5 % from inside to outside.
Since I announced that I was going to have the lifter analyzed I have been approached by many members asking about the results. And I am happy to share the findings.
Why had the Association not long ago done the same thing? Gathering hard evidence to substantiate a discussion ? Is it money? No! Had there been an appeal to the members for let's say a hundred dollars each for funding the research do you really think that would have been turned down?
And I read the invitation to the Duke Meeting. Last year Lycoming was invited and agreed to send responsible members of the staff. Unfortunately the event did not take place. We all know why. This year it was obviously "forgotten" And only after someone posted something on the board, some invitations went out. How can the single most serious problem be forgotten by the DFA ????

And one last thing: have you looked at the "blue book" recently and seen what your airplane is worth? The Dukes that are out on the market are pretty cheap. Guess why!
I have just returned from the US where I had spent five weeks of flying in my Duke and made 2 more Atlantic crossings without operational problems. Next week we will see in the 100h inspection how my engines are. I hate this tension until I know I am good for another 100h or if "the act of god" has struck again.

The Duke is such a great airplane and we have to do everything that it gets it's quality reputation back. I wish you the best of luck, Al, with your actions and most of all I wish you, finally the awakening and the support of the DFA "board of Chairmen"

OF CAMS AND LIFTERS: PLEASE READ THIS AND ACT!

Posted by **Al Uhalt** on 09/02/02

Many of us are experiencing significant problems with the cams and lifters in our TIO-541 engines. Witness the numerous entries and comments here on our DFA web page, not to mention all the "cross-talk" amongst us all. Our engines are "making metal" and, as a confirmed result, have experienced waste gate and controller malfunctions, turbocharger shaft damage and outright failures, oil pressure drops, reduced power output, uncommanded prop feathering, etc., etc. In truth, it has been only the capability, skill and expertise of all of us, pilots and mechanics alike, that we have not had an accident directly attributable to these events, now numbering in the hundreds.

Over the last few years in particular, the incidence of these events has been climbing steadily to the point that many of us (including me) have grounded our airplanes until a "cure" is found. Some of us (including me) have had the camshafts and/or lifters in our engines replaced with factory-new units only to have the problem reappear in only a few hours' operation -- an expensive and, perhaps, risky way to go to say the least. Until recently, the engine manufacturer (Lycoming) has pointed its finger back at us as the cause of the problem and the FAA has yet to take note that there even is a problem. What can we do about it?

The following article will appear in the next issue of our "Duke Flyers Association News." The subject will certainly be high on the agenda and a hot discussion item at our imminent Convention/ Fly-In at Sault St. Marie, Ontario. I've repro- duced it here because we really need to "get in gear" and send "M or D Reports" on all these incidents and failures to the FAA. (See the article below and you'll see what I'm referring to.) Even with all the problems we've been having, not one single Malfunction or Defect Report has been submitted by anyone -- including me until last week! We have really been remiss in this area. We need to get the attention of the FAA. This is the way to do it. Please take just the five minutes it takes to do it now. If you don't have all the information at hand, never mind; send in what you have. When the volume of paperwork reaches a critical mass, we'll get some action!

A CALL TO ACTION

The title above is not hollow; it is real and it is urgent! If what follows has not yet affected you, it inevitably will if you keep your airplane through an engine overhaul. Please read the following and help spread the word about what is happening and what we need to do.

Although the problem has really been with us since "year one," the incidence of internal camshaft-valve lifter mutual destruction in our Lycoming TIO-541 engines began to increase in rate of occurrence about five years ago, usually shortly after an engine overhaul, rebuild and even original manufacture. The problem has now reached pandemic proportions with a steadily escalating number of failed, seriously degraded or questionable engines, in-flight and ground emergencies, damaged turbochargers and oil pumps and malfunctioning VAPCs and propeller governors due to ferrous particles and slivers appearing in our engine oil. Many, including me, have grounded their Dukes, 56TC Barons and P-Navajos rather than risk loss due to these shards of metal circulating through our engines wreaking who knows what damage.

There are at least two efforts currently under way to solve the problem, however, neither Lycoming nor the FAA "officially" recognizes there even is a problem. Why not? Because, in spite of literally hundreds of our engines being affected and scores of our airplanes being down with much cross-talk among the owners, operators, pilots and mechanics (see the DFA web pages) and, in some cases, expensive replacement and repair, absolutely no one has used "the system" to report the problem to the FAA. And, therein lies the root cause of the "fix" coming at such a snail's pace.

Supplemental Type Certificate (STC) approval action to alleviate the problem has been working for at least 3 1/2 years, however, it has little or no priority within the FAA and, as a result, has suffered setback after setback. In the case of the Firewall Forward modified camshaft, there have been five changes of supervising inspectors and one change of responsible FAA office. Each change resulted in essentially beginning the STC approval process all over again. We must get this issue on the "front burner" before someone gets hurt! A fatal accident or two will generate the priority we need, but, for heaven's sake, who needs that? How do we go about getting the attention we need? Answer: USE THE SYSTEM!

(Continued)

Attached hereto is a copy of FAA Form 8010-4, MALFUNCTION OR DEFECT REPORT. If you have had any kind of aircraft, engine or appliance problem (especially this one), please fill it out immediately, fold and tape it in half and mail it to your local Flight Standards District Office (FSDO). We must literally inundate the FAA with these to get the priority we need to get our airplanes back in the air safely. You and I know we have a real crisis here, both economically and in flight safety, but, we've got to let "them" know it too! The "cure" is at hand. You can do yourself and your fellow Duke (and 56TC Baron and P-Navajo) flyers an inestimable service by taking just a few minutes to execute this form and put it in the mail. Let's give them "the message" the way they want it and get our favorite flying machine back in the air!
One way or another, please take the time to do this. Many, many thanks! --Al

Lifters

Posted by **Greg Jellinek** on 06/12/02

There is an airplane in our local shop for a pre-sale inspection with 200 hours on a pair of engines on FWF replaced camshaft and lifters. Severe damage found on both sides. Interesting that the contributors to this thread who have lifters older than the mid-90's are not having this problem.

Lifters

Posted by **George Friedrich** on 05/03/02

A few months ago I pulled my left engine off at 1680 hrs. The engine was a factory. reman in 1987. Western Skyways who rebuilt the engine said the lifters and cam showed no excessive wear. After reading all the horror stories on spalling, I wish that I would have put the old lifters and cam back in instead of all new. We had the same problem with Cummins back in the 80's when Cummins switched cam vendors. The difference in metal hardness caused the cams to wear down to the point where the lifters would pop off the rocker arms. We complained like hell but Cummins, like Lycoming, declined to admit and guilt. So, most of us switched to Cat engines.....Cummins almost went broke because of lack of business. Unfortunately, we don't have
the option to switch engine manufacturers.

Lifters

Posted by **Lars Lundgren** on 05/02/02

Hi Bob, Do not believe in the oil analysis to detect lifter-camshaft problem. I had my oil tested by the lab, result, EVERYTHING APPEARS NORMAL. Before next flight I pulled the lifters and found two badly pitted and the lobe worn down. Camshaft and all lifters replaced, 800 hours on the engine.

Lifter/cam

Posted by **Ralph Cohen** on 02/12/02

I had a 1984 overhaul fail at 500 hours due to spalling! I say there is a lot more to the story than Oil and hours flown/ inactivity. The engine delivered on the left side of my airplane (1977) made it past TBO (1850hours) and thirteen years. The engine delivered on the right side was overhauled at 200 hours due to catastrophic piston failure in 1980. It was overhauled twice more in the next ten years due to cam failures. Same pilot, same oil, same amount of inactivity.

Lifter Spalling

Posted by **Norm Gruczelak** on 03/07/02

Sorry to say you can add my name to the long, long list! My RH engine was overhauled by Lycoming in March 1995, and the previous owner used Shell 100W with the LW16702 additive for the first 450 hours. When I purchased the plane in May 1999 I switched to Aeroshell 50 weight 100 Plus. I have changed oil every 50 hours and have had oil analysis with no indication of high iron content. At 700 hours inspection of the filters showed magnetic metal. Removal of the lifters showed HEAVY spalling on two of the lifters, and of course the cam was badly damaged. So much for the 15W50 theory.

When are we going to sue these Lycoming guys? I don't think we have to worry about the value of our planes. Has anyone looked at the prices of used Dukes lately? Trade a Plane is full of ads advertising Dukes for 50K to 80K less than Vref or Blue Book.
Any comments?

Lifter problems

Posted by **Randy Taylorr** on 03/09/02

I have owned two Dukes, the first one in 1983 developed spalling and metal with engine failure at about 650 hours. Despite warranty being out I was able to convince Lycoming that they had a problem and I got a factory new engine for $13,000. The opposite engine ran fine for about 950 hours at which time the aircraft was sold.

My present Duke was purchased in 98 and about 750 hours was found to have spalling and metal. You know the rest of the story. I am holding my breath on the other one now.

I really believe we should stop spending all these thousands of dollars on rebuilds and seek help from the source of the problem which I believe is Lycoming. If Mr Lafferty has knowledge of a class action suit with substance we club members should unite and use our considerable pooled resources to get this problem resolved.

There's just too much smoke for their not to be a fire. There is no way that the piloting techniques could be to blame with all these failures. There is no way oil could be the cause of these failures. Let's wake up and pursue this. I am amazed that no serious accidents have been precipitated by this. One of my engines failed in flight and required flying about 170 miles on the other engine to reach safety. I am sure many of you can recant similar stories.

Lifter Problems-Thanks

Posted by **Mark Allen --- (N38N)** on 12/27/01

Thanks for the information. This is the most logical explanation I have seen to date. I showed your e-mail to my IA, who claims to be an engine expert, and he said this makes "perfect sense." If your information is indeed correct, we are all in for more problems down the road. I don't know about you, but unscheduled engine overhauls put a crimp in the ol' budget.

Your comments concerning the engine manufacturer are right on! I have been talking with them for a year (almost) about my cam/lifter replacement with absolutely no result. Some days I wish I were a lawyer, as that might be the only way to get their attention.

Lifter Problem Feedback

Posted by Hank Zannini on 12/26/01

I attended the AOPA conference in Ft. Lauderdale in November and I tried to talk to Lycoming about the problem.
That was a WASTE of TIME. They HAVE NO PROBLEM.
However - I did talk to one of the oil companies about the problem. There was an engineer in the Exxon booth that knew the details to the Nth degree. He had done metallurgical analysis of the Cams and the Lifters. His research leads him to believe the problem is not the cams, not any oil problem - but a lifter problem. He said the lifters are built by Eaton in Germany - under contract for Lycoming. He has analyzed the metal composition from lifters over the various years - before the problem started and after the problem started.
He told me what year he saw a change in the metal. I don't remember the EXACT year but it was somewhere around the mid 90's. He said at that time - Eaton switched their supplier of metal to RUSSIA. He said since that time the Russian metal going into the lifters at Eaton has shown a much higher porosity than before the problem. He believes it is this high porosity metal that is TOO ABRASIVE on the Cam Lobes causing the problems.
I know - you are all going to KILL ME because I didn't get his business card. As an expert in the field he didn't think Lycoming or Eaton was going to do anything about the problem anyway.

BOTTOM LINE - I was convinced it didn't matter what oil we used and whether we BABIED the engines or not - we where all going to get STRUCK by this problem eventually.That was the engineer's opinion also.
I was whacked with the problem last year. It will probably be another year or so before I get whacked again.
Besides doing all the PREVENTIVE recommendations on the Duke web site here - I am doing one more thing to try and stop the Lifter problem from getting me AGAIN.
http://www.microlon.com/

Cam or Lifters?

Posted by Greg Jellinek on 12/24/01

P425 (1977). Both engines were overhauled and zeroed in 1995. At 825 hours metal was found i screens on the left engine and disassembly showed spalling of the camshaft and lifters. Replace Firewall Forward. One year later with only an additional 75 hours on the airframe (the airplane w down for almost 5 months) the camshaft and lifter set failed on the right engine.

It is my understanding that a substantially large percentage of engines rebuilt after 1995 have experienced this problem, premature failure of either the camshaft or lifters. Reportedly this perc is way up as compared to engines built or rebuilt prior to 1995!

This is my second Duke. I ran the first airplane from 1982 to 1990 and when I sold it the engines way past TBO. No problems with the cams or lifters. I don't fly the current Duke any differently th did the last one, although with more than 1400 hours in type, I have learned more and more abo of the TIO541's and if anything I am much more careful with the engines now than I was 19 year when I really did not know "squat" about these powerplants.

I am of the (humble) opinion that something has changed with the components of the camshaft-li interface since 1995. As recently as today, my shop informed me that they have another Duke in store with failure of both camshaft-lifter sets with something like 250 hours on each!

I think that this is something that our association needs to pay careful attention to.

1. Is there a different failure rate now as compared to 10 years ago?
2. Are the aircraft being operated differently now than 10 years ago as Jim (Gorman) is suggesting? In my case a definite "no!"
3. Did something change at Lycoming? I am told (at least third hand) that Lycoming "out-sourced" camshaft production somewhere in the mid 90's and is now considering bringing the manufacture of the camshafts back "in house."

Lifter problem

Posted by **Bill Cammack** on 03/02/01

In a recent discussion with Lycoming, they acknowledged a problem with lifter failures and are actively working on the problem. Their current line of thought is that maybe the new high-tech plating/surface treatment isn't as good as the "old reliable" and the R&D dept is considering going back to prior procedures. The time frame was undetermined but I got the impression that they hope to have answers in a few months.

Action against Lycoming

Posted by **Tom Comerford** on 01/03/01

John, I have been so preoccupied with getting my engines fixed that I have not been able to give much thought to pursuit of Lycoming. I have written them, received a non-committal response, and played telephone tag with their legal department. I would be very interested in pursuing some constructive solution with Lycoming--or legal action if necessary.

I would like to get the details of the cam/lifter problems experienced by Duke owners. This includes hours on engines, overhaul or reman, age of engines, lubrication used, how the problem manifested itself etc. Look forward to hearing from you and anyone else that is interested. I have begun to compile files from everyone that I have heard from so far.

Lifters

Posted by **Robert Mann** on 12/24/00

This really is disturbing. So many recently overhauled engines are having cam/lifter problems that it seems necessary to pull the lifters every 50 hours or less if you want to be safe.

Lifter action

Posted by **John Rice** on 12/18/00

Tom..... You mentioned in this email that you would be willing to discuss representation in a suit against Lycoming. I would be willing to join you in this. Let me know if you are still interested or if you would prefer having someone else initiate.
Thanks

Cams and lifters

Posted by **John Rice** on 12/12/00

Jim.... I have spent the last two months waiting for engine number one with 332 hours since reman on it to be returned to me after having new lifters and a camshaft. On a hunch, we used a bore scope and dropped the pan on the other engine and sure enough the other engine has the same problem.
I am waiting for Lycoming to reply to my request for labor coverage for the first engine, they offered parts only. Supposedly their legal counsel is drafting their response, which doesn't sound very promising.
My serial number is P491. Any help?
Thanks

Duke Lifters

Posted by **Gary Bongard** on 11/20/00

We have the cure for your lifter ailments. I'm not here to debate what does or does not contribute to the lifter spalling problem, but one thing is for certain, there is a severe lack of quality control as it relates to lifter material and/or material surface treatments.

Jerry Burnham of C&B Aviation (Sturgis, South Dakota) has been in the aircraft maintenance business for over 33 years and holds numerous STC.'s for lifters, cams, and roller-rocker arm assemblies. He identified this same lifter problem (in Continental engines) nearly 10 years ago. Much of his business revolves around maintaining and rebuilding engines on turbo-charged agricultural aircraft. These Continental-powered sprayers were shelling lifters every 200-500 hours, many times destroying the cam shaft in the process. These ag planes became the test bed for the "new" lifters. By their operational design, these aircraft engines are subjected to very severe operating conditions, flying heavy and slow at maximum manifold pressure and rpm. Because of poor quality materials, the lifter surfaces begin to degrade. These abraded surfaces, in direct contact with the cam shaft, act as a milling machine and if not caught in time, destroy the cam lobes. A simple 50-hour visual inspection of the cut oil filter will not reveal what is happening, as the spalled material is too fine to produce visual metal chips. You must solvent-wash the filter and magnetically drag the residue to find the metal debris. By the time there is visual evidence in the filter, it is too late and the cam lobes are probably gone.

Jerry developed a process to fuse a carbide surface onto the face of the lifter, thereby eliminating the source of the lifter problem. These lifters have been in service for over 3300 hours (two overhaul cycles) and show no evidence of wear. On January 6, 1995, the FAA issued Jerry an S.T.C. (SE-00113SE) authorizing the replacement of the factory lifters on Continental engines with his lifter bodies. Because the Duke lifters are of similar design, we will be petitioning the FAA to allow us to piggy-back these lifters onto the existing Teldyne-Continental STC. Now, this can go several ways: (1) After revising the engineering documents along with the existing failure information, the FAA could allow these lifters to fall under the existing S.T.C. (best case scenario), in which case we could have approval in 90-120 days; or,(2)the FAA rejects this proposal and requires us to demonstrate proof of concept. We will then need to set up a test stand and run the lifters in an operating engine for 400 hours at prescribed power settings. This would delay the certification process by approximately 6 months, as the data would need to be verified and accepted by the FAA. Obviously, this would result in a cost increase. We know the similarly-designed lifters work in the Continental engines. Along with this history, we will provide the FAA with documentation of lifter problems provided by Duke Flyers Association members. We hope this documentation will satisfy the requirements of formal Material Deficiency Reports (MDRs).

Now for the particulars. As we all know this takes ongoing funding, so the first 25 ship-set customers will be allowed to purchase the new lifters for $250 each, or $6000 per ship set. A 50% deposit will be required at the time the order is placed, with the remaining balance due at time of installation. After the first 25 ship-set slots are sold, the lifter price will increase to $300 each, or $7200 per ship set. In addition, you will need to factor in these related costs:

Cam inspection and oil sump R/R (8 hours labor, $440)
Lifter R/R (24 hours labor, $1320)
Oil/Filters/Avblend additive ($220)
Gaskets/Seals ($380)
Downtime: Approximately 4 days

As you can see, this is no small investment, but look at the alternatives. If you have any questions, you can contact Jerry Burnham at C&B Aviation, 605-347-3356, or Gary Bongard at General Aviation Services, 952-944-2628.

Make checks payable to C&B Aviation at the following address: C&B Aviation, Sturgis Municipal Airport, Sturgis, SD, 57785

Cams/Lifters

Posted by **John E Rice** on 11/15/00

If anyone needs a next case I will be happy to be a volunteer. I just received a call from my engine shop, advising after 336 hours the lifters are shot, and the engine is so torn up the shop has never seen anything like it. Only 2 of the lifters are undamaged - the inside of the engine is totally torn up, and I am told there is no question it was bad parts.
I always treat my engines with the greatest respect - have used Avblend since I owned the airplane, and there is absolutely no reason for this. I have been driven to even consider moving to another airplane to get rid of the hassle, until finding out how many others have been affected.

I need to speak with Lycoming about this problem, and hope to get some satisfaction, but I agree we need to speak as a unified group, a class action situation. The FAA definitely needs to get involved. I will speak to my attorney who is a member of a rather large group in Minneapolis, and if I find a partner who specializes in this type of law I would be happy to begin the process, unless someone else has already begun.

Lifters : Survey and Action

Posted by **Eberhard A. Burghalter** On 11/06/00

I can only say: Larry and all the others you are right. There is no sudden widespread disease of mistreating engines after years of troublefree operation. There is no act of God but act of Lycoming involved ! I propose the following :

The Association represents the vast majority of DUKE owners worldwide. Only the Association has access to that database. So why don't we make use of it and include in the next newsletter a survey questionaire asking the members about all aspects of the problem. We would have to emphasize the necessity of reply. I have no doubt that the majority would reply judging by the response outcome of the last survey. Why not ask members also if they are willing to contribute towards a funds if worst comes to worst ?
With this survey information at hand why not take the next solid case of lifter/camshaft failure to Lycoming and try to fix a deal for the whole community.

If no solution can be reached there then is a way on from this point. Civil legal action would be an issue as well as bringing the problem to the attention of the authorities like FAA and NTSB. I think there are enough qualified lawyers members of the association to take care of the problem.

I think we have to do something because this camshaft/lifter problem is THE one single problem that can really spoil your fun flying a DUKE. Everyone by now gets a sort of bad feeling when sitting in the DUKE and flying heavy IFR. Up to now there were no fatal accidents because of that problem. We should make sure that it stays that way.
To get this problem out of our way is in everyone's best self interest. Not only safety and fun is at stake but also commercial interests like resale value are in question. We really have to do something

Cams/lifters

Posted by **Tom Comerford** on 11/02/00

I am in the process of sending my engines off for overhaul after finding metal during the annual inspection. Clearly, there is a pervasive problem with these parts. I would be happy to discuss joint representation of engine owners who have had similar problems. I am a trial lawyer and have some background with litigation against Lycoming. I have seen in other cases how they stick their heads in the sand and simply refuse to address problems like this.

Firewall Forward claims to have a fix to the problem that involves better lubrication to the affected parts. They may also have different recommendations on engine oil.

The question I have is why is the problem occurring now? My first set off engines went over 1700 hours without being touched. These overhauls (from Lycoming) have gone about 850 hours, during which they have been perfect. Then, all of a sudden, the cams and lifters are digesting themselves.

At Firewall Forward, the suggestion was made that low idle operation may be a problem. Many of us have been trained to allow the engines to spool down after landing (and, of course, some spool down is required). The thought expressed was that low idle spooldown, below 1000 rpm, may expose the cams and lifters to poor lubrication.

I would be happy to assess the various situations in which Duke owners have experienced this problem and then determine whether a claim might be in order.

Lifters--Lycoming/(?Firestone)

Posted by **Larry O'Connor** on 11/01/00

As host of this year's Flyin I had an opportunity to come into contact with many Duke owners throughout the year. One thing that struck me was the number of engines that had lifter/cam problems.

Evidence continues to grow that indicates that there are major problems with the lifters that we are getting from Lycoming. Many engines with a relatively short number of hours are developing serious cam/lifter maintenance problems. I can personally attest to this as I was recently notified that 2 lifters, on one of my new 230hr engines, are showing early signs of spalling. I might add that as part of my 100hr annual I requested that these parts be inspected. Normally this kind of inspection is not part of the annual. Usually when metal is found in the oil filter the lifter are checked--I'm told that when metal is detected it is often too late.

Pilots that have been involved with flying the Duke for over 10 years have told me that lifter/cam problems were a non issue until the last several years and relate to replaced engines. When my engines were replaced, and Aeroshell 15w/50 was the oil of choice in the original engines, it was noted that the cam/lifters were in excellent condition with no signs of spalling.

One did not have to be a tire expert to conclude that with certain Firestone Tires there were serious problems where the "rubber meets the road". Yet it took quite awhile before the manufacture was ready to admit that there was a problem. I think that the same analogy holds true for Lycoming. While there is mounting evidence of sub-performance regarding certain of their products, they are "stone walling" us regarding spalling where the "lifter meets the cam".

This website should be able to provide us with a forum to find some of the following answers:
A. When Duke operators replace their engines do they suddenly have brain failure and forget how to take care of their engines?
B. Is there a problem with Lycoming Parts?
C. If there is a problem, how do we get the attention of Lycoming?

Lifter spalling / Oil Type

Posted by **Bill Unternaehrer** on 10/19/00

I believe that the 15W50 oil contributes to the problem. Several articles and seminars have brought up the fact that the 15W50 oil (partial synthetic) does not stay on the engine parts as long as the straight weight oils when the engine is not running. This agrees with the Lycoming recommendation to run the engine often. Straight weight oils cling to the metal parts longer and do provide ever so slight of a film during that first engine turnover during starting. It's possible the 15W50 does not provide this thin film protection and the wear is taking place when the engine is first turned over. 15W50 will flow from the pump to the surfaces quicker than straight weight oils during starting. When we were using 15W50 and the metal content of oil analysis was increasing, the Lycoming rep told me to try straight weight oil. We did and the metal content went down.

My personal feeling is that 15W50 oil should not be used in this engine.

There MUST be an end to this story !

Posted by **Eberhard Burghalter** on 10/18/00

After reading the whole thread and having a lot of discussions at the excellent fly-in it should dawn to everybody that there must be something really wrong with lifters and cams in an otherwise quite good engine. A lot may be pilots fault in how we treat our engines but with this problem the case is different. It seems to be Lycomings problem.
Here in Germany in 1996 we had 8 ! engines at the same time with the same problem: between 90 and 800 h lifters and cams failed without obvious reason. At the end of the day most of the costs were covered by Lycoming.

Since I knew of that problem right from the time I got reman engines from Lycoming in 1996 I thought it could never happen to me. Fly the aircraft minimum 100h per year start it up slowly let it cool down before shutting it off making oil analyses at every oil change. All in all try to treat your engine properly.

When we replaced some gaskets at a 100 hour inspection I had my maintenance people pull some lifters just out of curiosity and guess what : on my left 330h after reman engine the two intake lifters Cyl 5 and 6 were heavily damaged, all others were good. The cam lobe which was actuating the two lifters was worn down. Now I was really mad. There had been no indication of the problem whatsoever. I use a Gemini 1200 and it showed no anomalies. I had the oil analyses made : nada. So I contacted Lycoming in a quite demanding fashion and at the end of the day they repaired the engine - also it was out of warranty - at no charge. At least this was a success. I asked what guarantee I would get on the new camshaft and lifter ? Answer : NONE

What is with the other engine being remanufactured at Lycoming at the same time as the other ? No answer.
There remains a bad feeling about my engines. Some of you have met me at the flyin in Rockford and yes we have made it back well to Germany. My DICKY is just undergoing a 100h inspection and you bet I had the lifters of # 5 and #6 cylinder on both engines pulled. Good news for now they are ok. But this is not the way it should go !!! We all pay around 45.000 US$ for a reman engine which has a certified TBO of 1600h. That is what may justify the money. And this TBO should be reached on average without preoiler, fancy new development camshafts and lifter, but with the stuff Lycoming is putting in there.

Lycoming denies that there is a significant increase in lifter spalling in the 90', but ask any long time standing maintenance facility with a reputation of working on DUKE engines. They will tell a different story. So what is to do? I think the association should just remind Lycoming of the standards in quality control they used to apply in the past so that we get the quality back that we deserve for our dollar.

If that problem occurs to me again I will be on their doormat again. I hope the engines will hold up

Lifter spalling

Posted by **Warren Dean** on 10/14/00

I am now annualing my plane and have 16 lifters that have signs of spalling and am replacing them. Ten of them were replaced 400 hrs ago When I had to replace the cam for the same reason. My mechanic, Bob Brungard of Boulder, who is one of the original Beech factory mx employees, has worked on Dukes since they started production and specializes in Duke and other Beech maintenance, says that almost every plane he annuals shows the spalling problem. In fact he "jokes" that you should change the lifters with each oil change. He also points out that this is a problem he sees in almost every plane now.

The lifters can be pulled and inspected on this engine. At the same time you can inspect the cam. If a spalling lifter is not caught early, it wears the cam into a mushroom shape and the problem is then much bigger and expensive. Of my lifters this time several had deteriorated badly and were about to work on the cam and others had almost microscopic pits which then start to expand. Bob recommends a thorough inspection of the oil filter after each changer using a srong magnet to see any fine particles can be picked up. They start extremely fine and you need to go into each pleat as you inspect it. Any metal means you should inspect the lifters themselves.

Due to the widespread nature of the problem, I think we ought to consider some sort of contact with Lycoming as a group.

Losing Weight

Posted by **Rudi Dekkers** on 10/09/02

Anybody out there who can tell me how to make the Duke less heavy, I bought P 293 from Gordy. This plane weights 4734 pound, vortecs nothing more. Then I bought last week P301, this plane is equipped with everything (wingtip, intercoolers, vortecs) and weights 5145 pounds. This plane is equipped with all Collins old stuff. I will replace this for new, this saves about 50 pounds. The king 56 color radar will go out too, save 45 pound, change the starters to the Skytec starters, this save 36 pounds. Butt the plane will still weight 5014 pounds, If anybody needs anything from the radios I will replace, or the radar, contact me.

Saving Weight

Posted by **Al Uhalt** on 10/09/02

Replacing your generators and big carbon pile regulators, reverse current relays, etc. with alternators and solid state control system will save you about 45 pounds -- and it's a lot more reliable and less expensive to maintain. (A NEW alternator is less than $1K.) Contact Tom Ehresman at Firewall Forward, Inc., 800-444-0556.

Saving weight

Posted by **Dane T Scag** on 10/10/02

In addition to the suggestion by Uhalt to knock out some serious weight with the new alternators, you might consider the intercoolers. They add about 70 pounds. However, in spite of what the other Duke Assoc. members have said that the intercoolers are a waste of money, and add drag, I will keep mine as a safety margin. The one time when I might have an engine-out on take off, I want all of the engine power I can get. The intercoolers might save my life.

If you want to save more weight, take out the mid-passenger seat just to the left of the cabin door. We all know that our beautiful Duke is a lousy 6 passenger airplane. Suddenly, you will have cabin room like an airline. Nice space for books, mags and lunch. If you do this, don't forget to make a new weight and balance form, to avoid some gaff at a ramp check.

Finally, after you remove all of the excess junk, weigh the airplane. You will be surprised that the data will probably not agree with the calculated empty weight.

Windshield

Posted by **ralph cohen** on 01/24/03

Installation was straight forward. New windshield fit perfectly. We used new screws. Also used 2 hour sealant. Replaced control box at the same time

Sierracin (Windshields)

Posted by **ralph cohen** on 01/17/03

I recently purchased both windshields from Jim Romano at Sierracin. Service and delivery were excellent. Windshield is pricey, especially considering that mine was less than 5 years old and seemingly undamaged, except no heat! Jim was sympathetic, but unable to warranty. However I received the w/s next day, AOG.

Windshields

Posted by **Steve Strauss** on 10/10/02

Recently I was looking for a replacement windshield for another airplane and contacted a company called Sierracin. As is turns out, this company makes the Duke windshields for Beech (or at least they claim to). So, for anyone interested, here is the contact info and prices that I was quoted:

Sierracin/Sylmar Corporation
12780 San Fernando Road
Sylmar, CA 91342
Tel: 818/741-1630
Fax: 818/362-7801
Contact: Jim Romano (818/741-1538)

LH Heated W/S P/N 60384009-3 -- List Price $9,250
RH Non-Heat W/S P/N 60284008-02-List Price $2,645

I would not call these bargain prices but they are better than the factory prices. The Beech dealer I called quoted $11,591 for the pilot side and $2,965 for the co-pilot side.

Windshield Heat

Posted by **Robert Mann** on 04/09/02

With temperatures below 70 degrees, and the engine running, if you turn on the windshield heat it should feel warm to your hand in the heated portion of the windshield. If it doesn't there is probably something wrong. Inverter needs to be on for windshield to heat. When the windshield heats up to 90-110 degrees F it shuts off the inverter until the temperature drops below 90F. Sounds like either your inverter output is low or the temperature control box is defective.

Windshield Deice - P556 and after w/o temp control box.

Posted by **Robert Hoffman** on 04/01/02

Chris: The windshields on all Dukes are DC powered through a built in windshield heat inverter that converts 28VDC to 240VAC to power the heated windshield. On P459 and after a windshield voltage indicator is incorporated to monitor the AC voltage output to the heater. Normal AC voltage with the function SW selected to L WSHLD should be 220 VAC, or the left side of the green arc on the gage. With the SW ON the windshield should heat and indicate at least 220 VAC on the gage if the temperature is below 90F. Your system is a bit less complex than P556 and earlier because the temperature control box was replaced by two varistors. I'm not an electrician, but I suspect the varistors essentially keep the windshield between 90F and 110F. For more information checkout the maintenance manual page 30-40-00 and wiring manual 30-40-03. Hope this helps.
I'll fax the pages to you if you like. Regards, Bob Hoffman

Windshield Deice

Posted by **Chris Larson** on 04/01/02

My windshield deice does not indicate in the green unless temperatures are well below zero C. I haven't been in a situation where this would be a problem, but should I be able to perform a ground check at freezing or above to check that it's operational? Also, I thought the inverter needed to be turned on for Windshield deice use. Is this true?

Windshield heat

Posted by **steve faber** on 10/22/01

I am catching up on the latest postings and have something to add.

The heated windshield is for anti-icing and has limited de-ice capacity. in addition the defroster must be operational for it to be effective. That means heater on and defrost control out. Also earlier dukes use "ac" for windshield heat and run off inverter 1 only. The later Dukes, i think '81 and '82 use "dc". On my duke P458 I can feel the difference in heat above and below the heated portion.

Remember 140 knots minimum when in icing conditions.

Windshield heat

Posted by **Mark Allen N38N** on 10/17/01

I operate s/n P-220. My experience is that the windshield sheds ice pretty well. I have found the secret is to get ahead of it, by turning on the windshield plenty early. My opinion is that it works much better as an anti-ice device.

By the way, although I am not sure exactly what Beech recommends, my rule of thumb is that once I turn on the windshield I do not turn it off until landing. I know on a turbojet that I fly, there is a specific caution about shock cooling the windshield after operation in icing or cold soaking at altitude.

We are very careful about operating in icing conditions in a Duke piston aircraft. The worst I have personally encountered is what is generally termed "moderate" icing, the windshield did keep up.

Since the windshield is an important part of the anti / deice system, I strongly recommend a competent service technician looks at your complaint, before you have to count on it.

Heated Windshield

Posted by **Bob Stan** on 10/16/01

I have had this problem two times in the past, and both times it was the controller board. This part is relatively inexpensive at about $300. Both times this solved my problem, but of course I can't be sure it will solve yours. I have had very good results in shedding ice with my equipment.

Wing bolts

Posted by **Robert Mann** on 07/31/02

Airplane is in for annual and the 5 year wing bolt inspection is due. The mechanic suggested that by replacing the bolts with Inconel bolts the 5 year inspections would be eliminated. Does any one know where these bolts can be purchased?

See the Wing bolt discussion at 9-11-2000 below

Posted by **john tye** on 08/01/02

See the discussion thread from 9-11-2000. I, too, have been told that the Incon9el bolts are not approved for use on the Beech piston line.

Wing Bolts

Posted by **Bill Unternaehrer** on 08/01/02

I was told by a Beech dealer that they were not available for the Duke.

Wing Bolt Bathtub Cover Security: Ideas?

Posted by **Maurice Miller** on 02/05/02

Dear Colleagues: Do you have any good ideas for securing those covers other than a blob of RTV? There is an aluminum trail from the ILS 29 middle marker to the threshold at my home airport paved with my blown-away covers. Mrs. Beech's engineers must have been smokin' sumthin other than Camels when they designed those flimsy spring retainers for the covers! Someone out there must certainly have an esthetic idea...

Wing Bolt covers

Posted by **Bill Unternaehrer** on 02/05/02

Cut a nice piece of aluminum the same shape as the $100 version from Beech and put the "blob" of RTV on the bottom. Actually put a thin bead of RTV on the bottom and stick it on. Forget the little spring clips. If you need to put RTV on the top use a paintable silicon caulk and use your touch up paint to paint the cover AND the caulk. It looks better than the $100 Beech part. The caulk/RTV comes off easily for inspection.

Wing bolts

Posted by **Ken Bowdish** on 09/12/00

To the best of my knowledge the inconel bolts are not a replacement option for the Be-60. We have to live with the Ad

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Flap transition board

Posted by **Dean Robert** on 02/25/03

In annual at FWF, they found the flap transition board to be defective and unrepairable. New cost is over $900. Anyone have any ideas on where to find a rebuilt or used one?

Transition board

Posted by **Ralph Cohen** on 02/25/03

I assume you are speaking of the board inside that drives the 3 lights. Try Hank at precision electronics, inc. in Atlanta, Ga. If he doesn't have a replacement, he probably can repair yours.

Heavy Wing

Posted by **R. M. Bud Allen** on 05/14/02

Our recently acquired Duke is very right wing heavy. We have rerigged the ailerons, and adjusted the flaps to no avail. We believe the only thing left is to adjust the wing incidence. Can anyone tell me how difficult, time consuming, and/or expensive this is. Is it something that my mechanic and I can handle - the manual seems straight forward. Finally does anyone have anything else we should check before trying this. The plane will not fly straight without considerable left aileron trim which must be cost us lots of knots.

Wing heaviness

Posted by **Tom Clements** on 05/17/02

Wow! Big Topic! Let me try to tell you what we did to check this condition when I worked for Beechcraft in the 70s.

Amazingly enough, even though you may have massive amounts of aileron trim input, your plane may not be wing heavy at all! Here's how to check, as I recall. First, as you said, make sure that the aileron rigging is 100% correct. Get out the protractor-like travel boards and make sure that both left and right up and down aileron travel limits are set and adjusted correctly. Now go fly to a typical altitude with typical cruise power. Trim out control wheel and rudder forces as necessary.
Now look out at both wings. Where are the aileron trailing edges relative to the flap trailing edges? Are they the same? That is, is each aileron perhaps about a half inch above each adjacent flap? If so, then you have no wing heaviness. However, if you have significant aileron trim applied, you now need to land and, using a trial-and-error approach, bend the fixed aileron trim tabs by hand until their new position will offset the requirement for aileron trim displacement. (For example, if you are using right-wing-down aileron trim, then bend the left tab up and the right tab down.)
On the other hand, when you check the wings, let's say that the left aileron is an inch above its flap while the right aileron is an inch below its adjacent flap. (This is an exaggeration, but will serve the purpose.) Rotate the control wheel to align both flaps equally. That is, rotate the wheel to the right to lower the left and raise the right aileron until they are in equal positions relative the their respective flaps. Doing so causes the airplane to roll to the right, eh? Okay, now you have correctly identified a right-wing-heavy airplane. The trick now is to (in order of preference) (1) raise the left flap, (2) lower the right flap, or (3) rotate a wing.
To raise or lower a flap, the actuator is disconnected from the flap and then turned a half-round before being reconnected. Turn the actuator end clockwise to raise the flap or counterclockwise to lower it...like a screw. Right to screw in; left to screw out. However, remember that the limit switches are on the left flap. Thus when you raise the left flap a half round it will still stop in the same position as before but now the right flap will hang a half-round lower than before. Since lowered flaps add drag and reduce speed, that is why we want to raise a flap before lowering its opposite member. If it appears that the limit switch can be adjusted for a more up position without causing a binding problem in the flap/wing junction, then do so. As a last resort, lower the other flap a half round and repeat the flight test.
If it becomes apparent that the flaps are fairly out of whack and yet the airplane is still wing heavy (that is, it rolls when the ailerons and flaps trailing edges are equally matched), then it is time to "rotate a wing." This involves, on a trail-and-error basis, loosening the wing bolts and pivoting the wing about the lower forward wing bolt and then re-torquing the nuts and bolts against the crush washers to set the wing into the new position.
Finally, if and when you reach a position such that the airplane flies level when flaps and ailerons are aligned evenly, now go and bed the fixed aileron tabs until the aileron trim wheel can be positioned to zero.

Kinda complicated, huh! Good luck!

Heavy Wing

Posted by **R, M. Bud Allen** on 05/17/02

Tom, Thank you so much for your information. I thought Baron people were helpful people but they are nothing compared to Duke people. The right wing is the heavy one and even though on the ground when the ailerons are set the same relative to the outboard, in flight, the left rides up perhaps 5/8 inch and the right stays close to neutral or maybe slightly down but no more than a 1/4. I checked the tensions in a very cursory manner and they seemed close and I didn't go further down that road because that seems like the effect of this problem and not the cause. I have adjusted the flaps and I think they are okay. If this last clue doesn't add anything to your thoughts we will probably rotate the wing - which sounds like fun.

Thank you again for all your time and input.

Winterization Kit

Posted by **Eberhard Burghalter** on 09/16/03

As I said in an earlier posting, I feel that the Raytheon Kit is too large. We made one set ourselves and it works perfect. If you want to have pictures, please e-mail me. I have to take them still so please do not expect them at once.

I don't like the ides of duct tape on that spot because I don't know what the heat is doing to the glue on the tape or the tape itself.

Winterization Kit

Posted by **Robert Mann** on 09/12/03

I just purchased one from RAPID so they may have them in stock. I had to wait 6 months for them to produce them, but perhaps they made more than one.

Winterization Kit

Posted by **Al Seither** on 09/11/03

I know this has been talked about in previous postings. But does anyone have a drawing or picture to produce the baffle for the oil cooler for winter ops they would be willing to share?

Baffles

Posted by **Gerhard Kendler** on 09/12/03

Al, did you ever hear of "DUCT TAPE" works just like your Baffles. I fly The Mid-west, Chicago and upper Michigan, stay Weekends up North -10 below and have had no Problems so far. In the winter I cover the oil cooler half way with "DUCT TAPE" just dont forget to remove when temperatures increase. My Oil year-round is EXXON 20-W50, 25 hour oil change.
See you in San Diego.
Best wishes, Gerhard.

Winterization kit

Posted by **Robert Mann** on 01/12/02

The concept of maintaining the oil temp within acceptable limits is easy to understand. The concept of blocking air flow through the oil cooler which does not have oil circulating through it to cool the oil is what I have a hard time grasping. If the thermostatic bypass valve works, why do you need to block the cooler?

Winterization kit

Posted by **Robert Mann** on 01/10/02

I've looked in the POH for that statement and can't find it. Where is this located. There is a statement in the POH 1-1 that says oil cooler baffles are to be removed when OAT exceeds 20 deg C. I was unable to find a recommendation for a temperature under which they should be installed. There is a temperature controlled oil cooler bypass valve in the system also, which reduces flow to the oil cooler in cold temperatures. So if there is little oil flow to the cooler, how much effect is there to reducing the air flow to a cooler that does not have much oil flowing through it?

Winterization kit

Posted by **Joe Konicki** on 01/09/02

Whenever the OAT falls below 45 degrees F I start using preheat -and- I fly with the oil cooler plates installed.

In the past, whenever I've flown without the plates installed I cannot get the oil temp to stay above 65C. In addition to worries surrounding the boil-off of moisture from the oil, I specifically have trouble with the propellers remaining in synch during cruise and ramping up smoothly to full RPM at takeoff. When the oil is hotter (80C) I never have any problems with the props being sluggish.

I do have intercoolers, but don't know if they have much effect on oil temp being cool.

Winterization Kit

Posted by **Greg Jellinek** on 01/07/02

I recall being told by a very knowledgeable instructor that the POH stated that the "winterization kit should be removed for flights in temps above 20° F, but did not say anything about putting them back on, for a reason and that is that they are not necessary.

Having flown two of these airplanes now since 1982, and for more than 1400 hours, all without the kit; I can never recall the oil temps being below the bottom of the green arc if the engines are properly warmed and run up before flight. And I do not understand how the winterization kit will help anything once the engines are shut down or before they are started.

I do have the Tannis kits on the airplane and religiously use them from the early fall through the late spring. When the master is turned on, it is nice to see the oil temps squarely in the green before hitting the starter!

Winterization kit, key reprints, operator's manual

Posted by **Eberhard A. Burghalter**, 01/11/02

A lot of comment on that one.
I feel that when the POH says the oil cooler baffles have to be removed when OAT exceeds 20deg C. they are at least allowed below that temperature. Seems logic. Thermostatic bypass valve or not some of the engines just don't heat up enough to my feeling for healthy operation. I certainly cannot agree with the opinion that once the oil temp is in the green arc everything is fine. The green arc starts at 38ded C (about 100deg F)and that is certainly way too low for cont. operation.

I just want to point you to some excerpts from "Lycoming Flyer" Key Reprints and to the limit section of the Operation Manual TIO 541 engine. They are attached here:

Particularly during cold weather operation low power operation allow both the oil and cylinder head temperatures to fall below the normal range. This is detrimental to good engine health. Oil temperature in particular should be maintained
between 165°F and 220°F to achieve maximum service life. At lower temperatures, the moisture which gathers as a result of combustion will not vaporize and be expelled. This can cause dilution of the oil which detracts from its lubricating properties.

Flyer Key Reprints p.44

Engine operating temperature is another item that is not usually given enough consideration in cold weather. We usually are very cautious about high oil temperature which we know is detrimental to good engine health, while a low oil temperature is easier to accept. The desired oil temperature range for Lycoming engines is from 165 degrees to 220 degrees F. If the aircraft has a winterization
kit, it should be installed when operating in outside air temperatures (OAT) that are below the 40 to 45 degree F. range. If no winterization kit is supplied and the engine is not equipped with a thermostatic bypass valve, it may be necessary to improvise a means of blocking off a portion of the air flow to the oil cooler. Keeping the oil temperature above the minimum recommended temperature is a factor in engine longevity. Low operating temperatures do not vaporize the moisture that collects in the oil as the engine breathes damp air for normal combustion. When minimum recommended oil temperatures are not maintained, oil should be changed more frequently than the normally recommended 50 hour change cycle. This is necessary in order to eliminate the moisture that collects and contaminates the oil.

Flyer Key Reprints p.48 "Cold Weather Operations"

Some operators are running the engines on the ground in an attempt to prevent rust between infrequent flights. This may harm rather than help the engine if the oil temperature is not brought up to approximately 165 ° F, because water and acids from combustion will accumulate in the engine oil. The one best way to get oil temperature to 165 ° F is fly the aircraft. During flight the oil normally gets hot enough to vaporize the water and most acids and eliminate them from the oil. If the engine is merely ground run, the water
accumulated in the oil will gradually turn to acid, which is also undesirable.

Flyer Key Reprints p.65 "Frequency of Flight"
Operator's Manual TIO 541 3-7

Average Ambient Air Temperature	Desired	Maximum
Above 30° F.	180°F	245°F.
0 ° to 70°F.	170°F.	225 F.
Below 10°F.	160°F.	210 F.

** - Engine oil temperature should not be below 140°F. (60°C.) during continuous operation

Winterization kit

Posted by **Eberhard A. Burghalter** on 01/05/02

Please look into your POH and see what they say : use winterization kit below 20deg C !!!!!!
For me it is an absolute MUST to put them on. Reason: water condensed and trapped in oil needs a minimum temperature of 82 deg C to evaporate. If you don't get this temperature it will seriously degrade the health of your engine due to corrosion and a change in viscosity of the oil. Here also start lifter and camshaft problems.
For my taste the original kit that comes from Beechcraft is too large for temperatures between 0 and 15 deg C. and should only be used below this temp. So I recommend having a second set handmade (not difficult) that shades about 30%-40% of the oil cooler. This will be sufficient for most operation

Oil cooler covers

Posted by **steve faber** on 01/01/02

After six years of Duke ownership and being based in the northeast I will give my observation.

In cold weather (30's) it takes forever for the engines to warm up. I like to take off with a minimum temp of 50 degrees C. Also if the oil temp is too cold then you will redline oil pressure on take off.
Coming home last night from the Caribbean (baffles not installed) at 21,000 it was -25 and the oil temp was around 70 and pressure at red line.
Both of these examples warrant the use of the baffles. Since the oil pressure has an adjustment you can try to find a better spot. My attempts have not yielded better results. I carry a speed wrench and find that I can install or remove the baffles in less than ten minutes. Even at a fuel stop the oil cooler location is not too hot.

Winterize Plates

Posted by **Fred B. Hunt** on 12/26/01

Wonder how member feel about installing winterization plates. I have gotten a couple of different opinions and thought I would ask the members.