

Tips from Comanche *Flyer* magazines Feb 1973 – Sep 2012

CHAPTER NINE

PROPELLER (GENERAL OPERATIONS, MAINTENANCE)

Table of Contents

Polished Prop Spinner.....	2
Prop Surge	2
Prop Governor Control Cable Lubrication	2
Prop Vernier Control Adjustment.....	3
Parking the Prop.....	4
Prop Failure, Mis-Positioned Shim - 250.....	4
AD 90-04-06, Prop Governor Oil Line PA30/PA39.....	5
Propeller Balance Comanche 180.....	5
Back Plate	5
Twin Prop Feather	5
Propeller Efficiency.....	6
To Install PA30 / PA39 Spinner.....	9
Custom Prop Tool.....	9
From the Tool Box of Maurice Taylor.....	11
McCauley Vibration Problems	12
Protecting Your Propeller	13
Spinners (Nov 2002)	13
Low Pressure in Propeller Dome (Mar 2004).....	14
180 Propellers (Dec 2011)	14
Engine.Out Prop Feathering (May 2012)	14

Polished Prop Spinner

When the spinner on my 260B needed replacement, the new one came only with the factory primer on it. I had toyed with the idea of a chrome spinner, but instead I thought I would take the spinner down to the aluminum and try to polish it. I used a very fine steel wool to remove the primer, which was the most difficult job. After that, I used some buffing compound and a cloth buffer, following it up with aluminum polish.

The spinner looks almost like chrome, and even assists in making the airplane more readily observed when the sun flashes off the spinner. The plane is hangared, so there is not too much oxidation on the spinner. A polishing job every two months or so keeps it looking great.

Prop Surge

Q. A problem developed on our PA24-250, with 700 hours SMOH. The prop would overspeed momentarily and then settle down to normal. We took the governor off and had it checked by the prop shop. Everything checked out OK, but the prop continued to surge. We then pulled the prop and it also checked out OK. On the next cross country, the prop surged and went to flat pitch.

Needless to say we started looking quickly for a place to land. After declaring an emergency, luckily we were able to glide to Ontario Airport and touchdown safely.

After much ado, we decided to purchase a new governor. On the very next flight, the RPM would still not settle down, so we decided to take major action and do a complete investigation. It was finally decided that the prop had some bad seals and would have to be replaced as it would no longer hold pressure. So we sprang for a new prop.

At this point, the Comanche had a new governor and a new prop, and we thought all our problems would be over. Right? Wrong! Another emergency landing was just around the corner. Again fate was on our side, and after a 10 mile glide we set down all in one piece. This time the prop had gone to maximum pitch (low RPM), due to breakage of the governor drive shaft. Since this time, we have heard every kind of diagnostic cause in the entire world: prop seals gone? oil passage in crankshaft blocked? linkage broken? low oil pressure?

My personal feeling is that there was a lack of oil pressure in the governor which caused poor lubrication causing the governor bearings to seize thus breaking the gear driven shaft.

A. You are right. It is almost certain that the problem is due to a loose plug. This plug is aft of the front main bearing on the shaft. It is cup shaped concave forward. Its purpose is to keep oil from going aft. When this plug gets loose so that it can fall over, oil goes aft and pressure decreases. Then there is no propeller control. With no oil in the governor, it can bind and break the shaft. The cure is to take off the propeller, dig out the plug and set it up into place. Hit it with a long rod and hammer to tighten it into place.

If it turns out that this is not the problem, then the trouble would have to be that the front main bearing is bad.

Prop Governor Control Cable Lubrication

Here's an inexpensive tip for those experiencing resistance from the prop control cable when recycling the prop during run-up procedures.

Spray the exterior of the cable housing from the firewall to the prop governor with WD-40 or apply a similar penetrating lubricant to the exterior of the cable housing. This spiral shaped protective cable housing is porous. Whenever degreasing solvent is applied to the powerplant, the lubricants are removed from the cable as well and requires the above treatment to prevent the cable from binding inside of its housing.

I have also found it helpful when installing new cables or vernier controls that applying standard motor oil to the cable when held vertically until it runs out the opposite end prior to installing will ensure ease of operation and longer cable life.

This also combats moisture within the cable housing which freezes during the winter months and in some cases, leads to broken throttle and mixture cables.

Prop Vernier Control Adjustment

I have been having a problem with the prop pitch vernier control creeping toward higher RPM. It just won't stay put where it was set. At a seminar I learned that this is a rather common problem.

Some of the solutions suggested were:

1. Sand down a tooth pick and jam it between the large nut on the panel and the shaft.
2. Put a small wad of clay between the shaft and nut.
3. Stretch a rubber band between the throttle and the prop control shaft.

All of the above cure the symptoms, but don't really solve the problem.

Finally, Bob Weber of Webco Aircraft explained to me what had to be done to solve the problem. The solution is to loosen the nut behind the panel, tighten the nut on the face of the panel a little bit, and then retighten the rear nut.

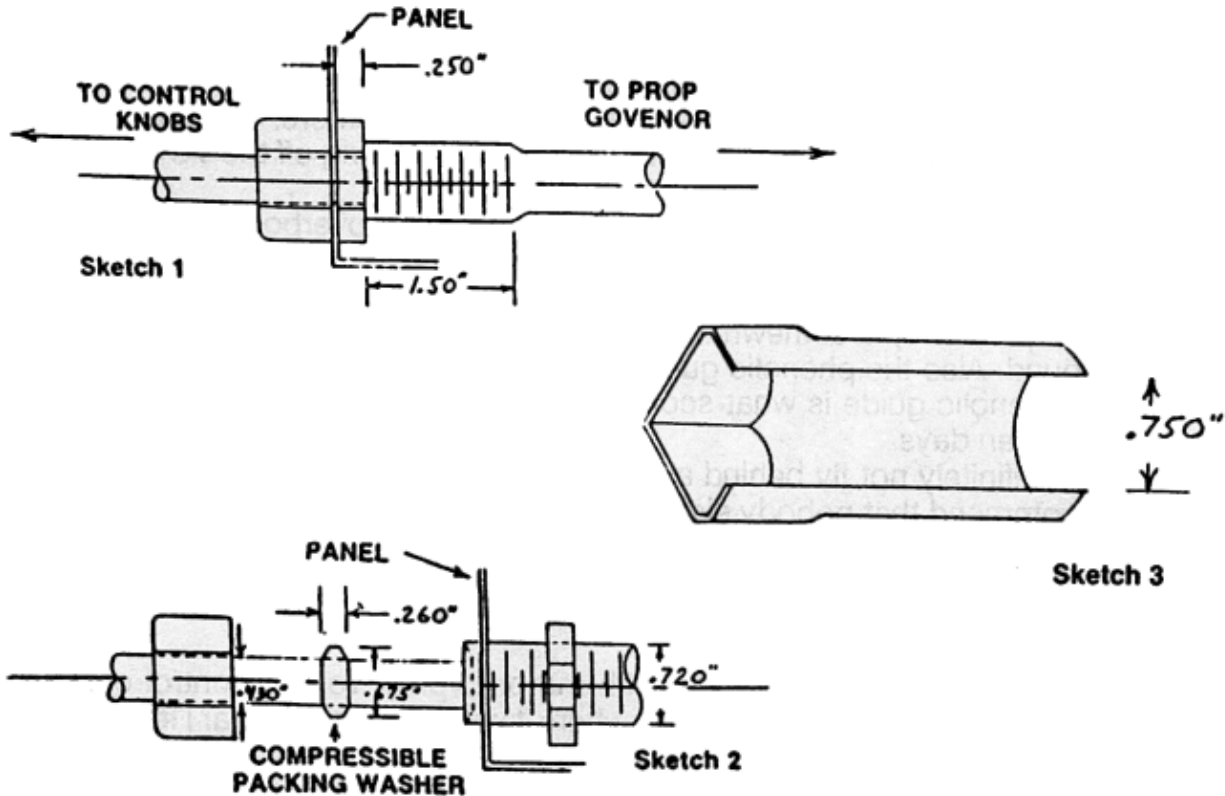
Easier said than done. The lip at the bottom of the panel is wide enough to make it about impossible to loosen the back nut by using any kind of tool that I'm familiar with. If you loosen things up by backing up the panel nut, the "behind the panel" nut can be backed up a bit with your fingers, but by using the front nut to loosen and retighten the system, you will remove paint under the front nut, and who needs a scuffed panel.

Sketch #1 will show roughly how the assembly looks mounted to the panel. Sketch #2 shows detail of the friction mechanism that keeps the vernier system from creeping.

Here is how I solved the problem. Both nuts are 1" across the flats (a 1" wrench fits both nuts). In my junk box, I found one of those cheap spark plug wrenches that are made of rather thin steel tubing with a hex wedged at one end of the tube.

I took this to a friend who has a machine shop and asked if he could remove a section 3/4" wide along the length of the wrench. He took out the section with a grinder that works something like a milling machine (see sketch #3). This gadget works beautifully. The removed section allows this special wrench to drop over the rear part of the vernier assembly and is long enough to clear the lip at the bottom of the panel and grab with slip joint pliers, vice grips, or whatever.

Loosen the back nut. With the same pliers, grab the vernier assembly beyond the threads, tighten the front nut a bit, and retighten the rear nut. CAUTION: there are wiring harnesses in the area and a little care must be exercised when working behind the panel.



Parking the Prop

While lubricating propeller, noticed water coming out exit grease fitting. Smart mechanic says if you park the prop horizontally, rain water will not collect on the hub and work its way in through the seal. Sounds logical.

Prop Failure, Mis-Positioned Shim - 250

There was a very loud bang followed by severe pitch oscillations. Oil covered the windshield. MAYDAY was declared within seconds and the controller informed us the airport was at 9 o'clock and four miles. It quickly became apparent that, powerless and flying into the headwind, we would touch down short of runway 35. Touchdown was approximately 300 yards short of the runway in a grassy field. The airplane came to rest on the fence, approximately 50 feet short of runway 35.

All occupants exited immediately through the right cabin door. There were no injuries and no post-crash fire. Only after examining the airplane the next morning was it determined that the propeller had left the engine in flight. It was later located approximately four miles north northwest of the crash site.

The post-crash investigation revealed that forty hours earlier, when the propeller was reinstalled following its overhaul, the shim (Piper part #13-1322) was placed between the engine flange and the starter gear, instead of between the starter gear and the propeller hub (as directed in the installation instructions of the HC-82XL-2C Hartzell propeller). The instructions state in several places that it is absolutely essential that the shim be installed properly as failure to do so may result in failure of the mounting bolts.

AD 90-04-06, Prop Governor Oil Line PA30/PA39

I would like to remind all owners that every AD issued always provides for an alternate method of compliance and on this AD, it is paragraph (d). After checking with more than ten parts suppliers, and thinking about the indefinite waiting period and escalating prices of the line and fittings, I elected to proceed with paragraph (d) of the AD. The first thing anyone pursuing this option should do is phone the New York Aircraft Certification Office. Address and phone are found in the AD itself.

I removed my old line and fittings and on a trip through the Wichita, KS area, I delivered the line to Mr. Jim Ryan of Airight Incorporated located on the airport, phone (316) 943-5752. This establishment is a (CRS) and manufactures several items for Cessna Aircraft. The New York Certification Office checked with Lycoming, who requested that any steel line be manufactured of steel, or stainless of no less than 0.028 wall thickness. Mr. Ryan and I, though standard aircraft suppliers, could only located stainless tubing of .035. The correct ID is AMS 5560F/5567B. A note of interest here, the original external oil line, at least on my PA-24 is a size -5. Dash 5 line aircraft industry wide is an accepted standard for oxygen use. You cannot or should not go to either a bigger or smaller diameter line, as it will affect the C.F.M. oil flow, pressure and volume or all.

Mr. Ryan ordered ten foot of stock and proceeded to bend an exacting shape line made of stainless steel dash 5 and elected to use stainless steel B nuts and fittings to minimize the galvanic action between all parts. The fittings were obtained from Allan Aircraft Supply Co., specialists in stainless steel and exotic alloys, who are located in North Hollywood, CA, phone (213) 877-0941.

Speaking for myself, the flexible line option proposed by Aircraft Certification was not very appealing. The same size ID line in flexible material versus a hard line is going to have a much bigger OD. Routing the line over, around or under the generator, or in my case, the alternator bracket would be very difficult.. Next, any flex line that long and carrying the pressure of 215 PSI +/- 15 will induce whipping and/or flexing. A flexible line should, therefore, be secured by clamps. If possible, the line should not be secured to the engine mount, only to the engine itself as the engine and the mount flex in different directions.

In addition, the original hard line has survived for nearly 30 years. The aft Adel clamp shown in the AD schematic is not applicable to O-360-AIA narrow deck engines (see Lycoming Parts Catalog, Figure 11). You will have to make some sort of bracket alteration to install that clamp.

An important factor to keep in mind is that proper securing and anti-chafing provisions are a must in this installation.

Propeller Balance Comanche 180

Another suggestion to make to your mechanic if the props need to be removed after you have had them dynamically balanced in the past is to mark their position before removal. It is possible to reinstall the prop 180° opposite to its previous position. This may cause noticeable vibration. You would then either have to put the props back on correctly or have the dynamic balance redone to get rid of the vibration.

Back Plate

ED:

The Tip regarding installation of a backplate referring to Hartzell Service Letter SI-118 has been removed because SI-118 is no longer valid.

The proper installation is now included in Hartzell Propeller Owner's Manual 115 N pages 3-28 to 3-31. The latest revision is 13 dated Aug 2006.

Twin Prop Feather

My Twin Comanche flight profile calls for a complete engine shut down and feather during the high altitude part of the flight.

On one plane, we were unable to feather the propeller. The RPM would decrease to approximately 600 / 700 and just stay there. Needless to say, if we had lost the engine on takeoff and not been able to feather it, we would have been in a bit of a pickle.

The other propeller did finally feather, but it took an extremely long time. The indication of this problem is a very slow drop in RPM during the feather check at 1,500 RPM on the pre-takeoff check. The fault is improper adjustment of the governor linkage. Even if all dome pressure is lost, the prop should still feather.

If your feather check gives a slow response, I suggest that you have it investigated.

Propeller Efficiency

Russ Runnels, ICS #05707

The subject of this discussion is prop efficiency. I was wondering about the efficiency of the prop on my '59 '250 Comanche, so I wrote to the Hartzell people and asked if there was any information available about the performance of the prop that's on my airplane. I mentioned that I was particularly interested in determining if there was a "best" set of circumstances for the prop's environment. What is the best RPM (or power setting (MP / RPM)) for the prop? What is the best altitude?

In other words, under what conditions does the prop perform most efficiently? I specified the prop hub model and serial number, the blade design and serial numbers, and the aircraft make, model and serial number.

I wasn't quite prepared for their answer. It came in the form of a cordial letter from the chief engineer and a 5 1/4" computer disk. His letter stated that everything I wanted to know was on that disk. All I needed was a PC so I loaded up the disk and hit the "go" button. The program spits out information in response to a few questions asked of the operator.

To give you an example of what is on this disk, here are the questions asked:

1. Do you want data in English or metric units?
2. What is the altitude?
3. What is the RPM?
4. What is the HP? (-at the specified altitude)
5. Standard atmospheric conditions?
6. What is the indicated airspeed (KTAS or KIAS)?

When you answer the questions, the screen is filled with data items, giving:

1. Flight conditions.
2. Flight Mach number.
3. AIRSPEED
4. Thrust in lbs
5. Blade angle at 0.779 radius.
6. A couple of non-dimensional parameters.
7. Prop efficiency in percent

As I stated earlier, item #7 is the one I was specifically interested in. For this computer run, the data list reflects that I've chosen 8,000' (where I usually fly), KTAS of 165, standard atmosphere conditions at 8,000, -15 degrees F, 188 HP at 8,000", and RPM at 2,400. Here is the data list presentation:

Flight Conditions: 166KTAS @ 8,000'; ISA -15 deg.F; 188 HP @ 2400 RPM.

Flight Mach #	0.263
Tip Mach #	0.799
Cp	0.077
J	1.096
Ct	0.065
Thrust	337
Blade Angle @ 0.779 radius	27.1
Efficiency	0.865

I queried the Chief engineer at Hartzell about what Cp, Ct and J elements of the equation were and he told me the following:

Cp and Ct are 'non-dimensional' parameters whereas J is measurable. Used in the equations:

Cp: is the power coefficient; which is a function of prop diameter, RPM, HP and air density. Ct: is the thrust coefficient; which is a function of prop diameter, RPM and HP.

J: is the advance ratio of the prop; (–the distance the prop moves forward at each revolution).

All this to get at the real question of "what is the efficiency of the prop?"

Obviously the answer to that question is one that is determined by all the other parameters specified and will vary as functions of RPM, power setting, altitude and airspeed, true or indicated.

So I ran a set of "what ifs" that ranged from 3,000' to 10,000', RPM from 2,100 through 2,500 (max RPM allowable), HP setting from 225 @ 3,000' to 173 @ 10,000, (55%, 65% and 75%) and temperature changes @ 3 degrees per thousand feet of altitude.

Much to my amazement, the efficiency of the prop was NEARLY CONSTANT! For example, at 3,000' and 2,100 RPM, the efficiency was 83.5%. At 10,000 and 2,100, efficiency was 86.4%; a difference of 2.9%

At 3,000' and 2,500 RPM, efficiency was 85.5% and at 10,000 and 2,500 RPM, efficiency was 86.8%; a difference of 1.3%.

PROPELLER EFFICIENCY CURVES; HARTZELL 8433

Alt	2100	2200	2300	2400	2500
3,000	0.835	0.842	0.850	0.853	0.855
4,000	0.839	0.845	0.855	0.855	0.857
5,000	0.845	0.848	0.856	0.858	0.859
6,000	0.848	0.851	0.858	0.860	0.861
7,000	0.852	0.854	0.861	0.863	0.863
8,000	0.856	0.857	0.863	0.865	0.865
9,000	0.860	0.862	0.866	0.868	0.866
10,000	0.864	0.866	0.869	0.870	0.868

Look at the chart and you will be able to determine what the prop efficiency will be under the conditions that YOU want to fly. Incidentally, these numbers (0.865, etc) are actually percent figures. (0.865 = 86.5%)

I was really quite surprised at this lack of significant difference in the props' operation. I felt sure that there would be a noticeable difference from 3,000' and 2,100 RPM and 10,000' and 2,500 RPM. But there isn't.

However, if one considers all this, a change of 3.9% at 2,100 RPM could be equated to a decrease in fuel consumption of 3.9%; which is a difference of 0.5 gallons in my 250 at 13 gallons per hour. And at 1.3%, it's only about 0.2 gallons per hour which is not much, by most practical measures.

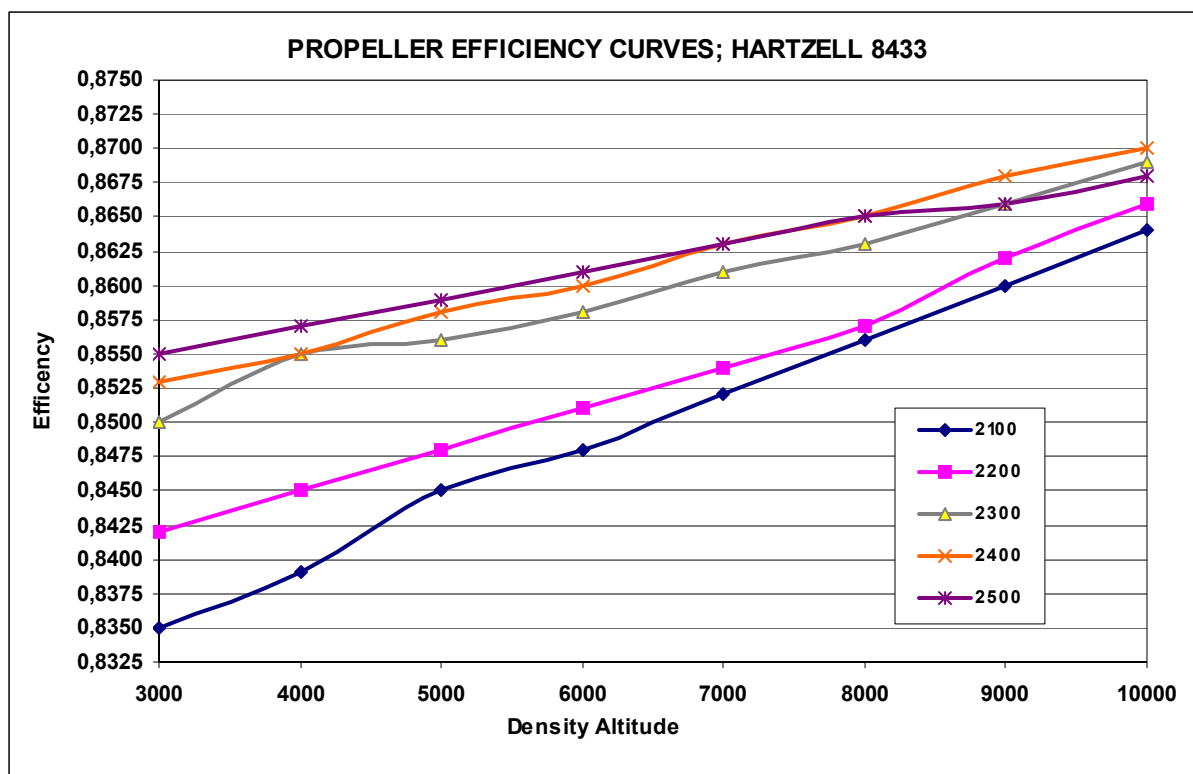
Well, anyway, there you have it; a measure of the prop's efficiency for a PA24-250.

Oh, yes – there is one question still unanswered: what is the airfoil of this prop? It would make a difference, you know. The chief engineers' answer to that question was that many years ago, there was a man that worked for Hartzell that developed all the prop airfoils that Hartzell uses and he (the chief engineer) knows of nobody that knows what they are!

All this is a summary of what I've been able to determine from the computer runs. If you wish a copy of the data runs, (there are 12 – 8 x 11.5" sheets), contact the ICS HQ, for copies. Bear in mind that this data is for my 1959 '250. If you have a 180, 260 or 400, the data is going to be different. The computer disk I have is for the specific prop on my 1959 '250. But I'll bet the differences will be small for the other aircraft

ED:

This article is quite old but generally still informative. I have added a graph showing the data of the table above:



To Install PA30 / PA39 Spinner

ED:

The Tip regarding installation of a Spinner referring to Hartzell Service Letter SI-118 has been removed because SI-118 is no longer valid.

The proper installation of spinners is now included in Hartzell Propeller Owner's Manual 115 N pages 3-28 to 3-31. The latest revision is 13 dated Aug06.

It is important to install the spinner with a pre-load, which is defined in the 115N-manual.

Custom Prop Tool

A. H. Bieck, ICS #02171

When we installed the McCauley C412 propeller on our Comanche 250, neither the propeller shop nor the maintenance shop at our airport had a suitable adapter for torquing. I tried several tool suppliers to no avail. Therefore, I decided to make my own tool.

I cut a 3/4" open-end wrench and ground the cut to fit the contour of a 1/2" drive socket which I had ground down so that only the 1/2" drive portion remained. I then had it welded to the wrench. The distance from the center of the 3/4" open-end to the centre of the 1/2" drive is 3 1/2" (picture #1). This allows the tool to fit inside the spinner bulkhead, (picture #2). The torque wrench can be used directly, (picture #3).

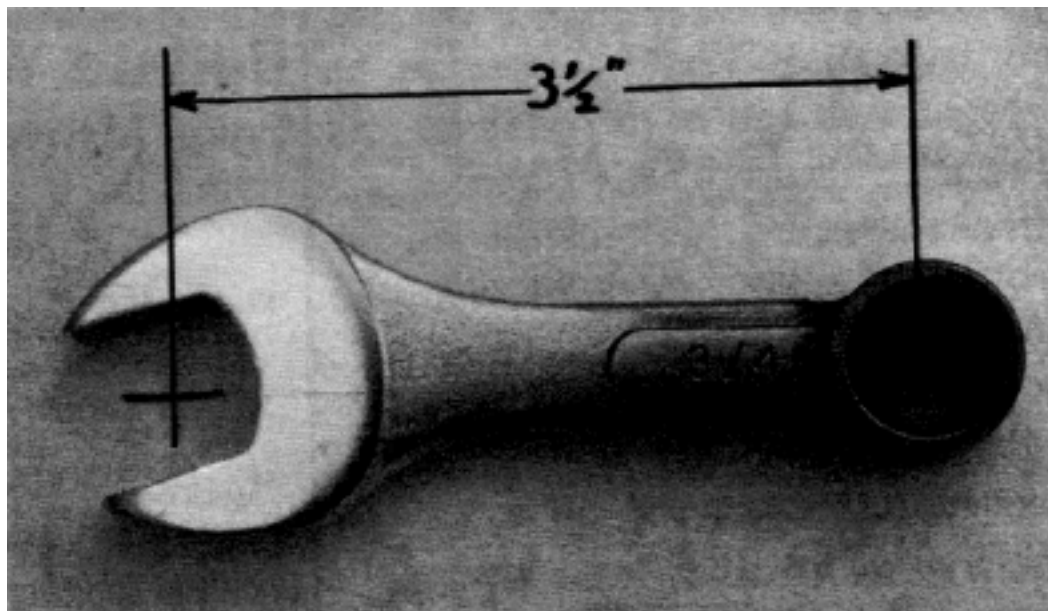
Of course, as with all adapters that change the effective length of the torque wrench, to achieve the correct torque value, the following formula has to be used:

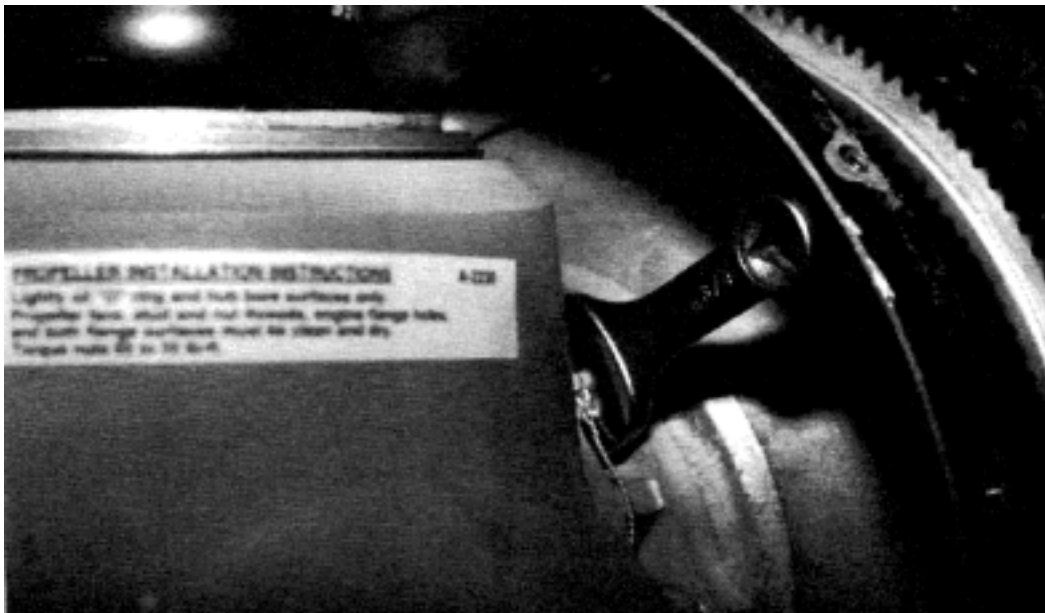
$$(L/(L+E)) \times T(E) = T(W)$$

Length of torque wrench E Length of extension (adapter) T(E) Torque to be applied by adapter T(W) Setting on torque wrench

Example:

$$(17/(17+3.5)) \times 60 \text{ ft.lbs.} = 49.75 \text{ ft. lbs.}$$







From the Tool Box of Maurice Taylor

I want to be sure that all members know that you can have your HARTZELL HC-A2 propeller modified to the MV shank (see HARTZELL S/B-61-232). This then makes the propeller not subject to AD 97-18-02. If you plan to go this route see the shops we have now listed, that are approved to make this modification. If you have an HC-82 it's my understanding that the hub on this propeller cannot be modified to the MV shank.

I want to thank Ken Rivard ICS #13465 for calling me about this. I guess I thought that this was common knowledge for the 250 owners. I see no reason for panic but do beware that the time is getting shorter. If you think that I can help please call.

The following propeller shops are approved to upgrade propeller blades to the now "MV" design in accordance with Hartzell Service Letter HC-SL-61-182. This list is current as of 7/21/99:

Aircraft Accessory Services

P.O. Box 745 Sallsbury, South Australia, Australia 5108 Attn: Tony Brennand Phone: 61-8-8258-3033 Fax: 61.8.8258-5083

Aviation Propeller, Inc. 12970 Port Said Road Opa Locka, FL 33054 Attn: Tim Galther Phone: 305-688-9439 / 305-688-6030 Fax: 305-681-4236

Byam Propeller Services 4001 N. Main (hangar 7 south, Meacham Field) Ft. Worth, TX 76106 Attn: Karl Byam Phone: 817-625-0161 Fax: 817-625-0009

Hartzell Service Center Piqua Airport 5465 West State Route 185 Piqua, OH 45366 Attn: Jeff Slattery Phone: 937-778-4201 Fax: 937-778-4202

Hope Aero Propeller & Components 2283 Ansom Drive Mississauga, Ontario, Canada L5G 1G0 Attn: Harry Hope Phone: 905-677-8747 / 800-268-9900 Fax: 905-677-5935

Jordan Propeller Service, Inc. 103 East Rhapsody San Antonio, TX 78216 Attn: Gary Jordan Phone: 210-344-3064 Fax: 210-344-9433

Maxwell Aircraft Service Crystal Airport Minneapolis, MN 65429 Attn: Butch Maxwell Phone: 612-533-8611 Fax: 612-533-3219

Northwest Propeller Inc. 16709 Meridian St. East Puyallup, WA 98373 Attn: Dick Jacob Phone: 206-770-7400 Fax: 206-770-7550

Ottosen Propeller & Accessory 105 South 28th St. Phoenix, AZ 85034 Attn: Don Ottosen Phone: 602-275-8514 / 800-528-7551 Fax: 602-275-8594

Palm Beach Aircraft Propeller 2633 Lantana Rd. Suite 23, Bldg. 1501 Lantana, FL 33462 Attn: Larry Harris Phone: 561-965-7767 Fax: 561-965-7933

Western Propeller Co. Ltd. 7940 Yellowhead Trail Edmonton, Alberta, Canada T5B 1G3 Attn: Bob Spak Phone: 403-477-3501 / 800-681-9948 Fax: 403-477-0131

I had a call from a member that was having a 3 blade #412 McCauley propeller installed on his PA24-250. They called him to ask if the shim that is used on all the 250 & 400 Comanches that have a Hartzell propeller should be removed. The answer to that is yes. McCauley in the instructions doesn't show this shim at all, meaning that it is NOT to be used. I talked with Terry Brernor of McCauley. He indicated that they would add a note to the instructions that will clear up any misunderstanding.

Back in April of 1998, we were advised by George White (ICS #07870) that he had found cracks in his control wheels. We put an article in the FLYER at that time. Now I'm asking for your help on this. Please take a good look at your control wheels. George found his cracks just ahead of where the roll pin goes through. You can use a dentist's mirror to check the aluminum casting for any cracks. We are not talking about the plastic covering; cracks in the aluminum casting is what we are hunting for.

If any are found, please let me know. I will need your aircraft model and serial #. Thank you for your time and effort on this. Also, thanks again, George for advising us about this.

McCauley Vibration Problems

Ken Rivard, ICS #13465

Another chapter in the ongoing saga of the McCauley C-412 prop on Comanches.

I have a customer that had a C-412 (three bladed prop) with new Barry Lord mounts installed on his PA-24-250 in January, 1998. Some time in the fall of 1998 I flew with him and noticed an abnormal amount of vibration. We discussed this through the spring of 1999. I suggested he pursue getting the vibration problem resolved, so we made two trips to West Palm Beach Aircraft Propeller in Florida, 800-965-7767. The first trip the propeller was dynamically balanced and the prop was rotated 180 degrees. On the second trip McCauley shipped a new set of blades to West Palm Beach Aircraft Propeller.

In between the first and second trip there was a Comanche Fly In at Fort Pierce. I had an opportunity to discuss these vibration problems with Dave Pratt of Aviation Performance Products in Melbourne, FL, 407-725-5578. Mr. Pratt has installed approximately twenty five C-412 propellers on PA-24 aircraft and strongly believes that you cannot use the Barry mounts on the PA24 and he puts the #1 blade pointing upward and #1 cylinder on the compression stroke.

I then called and talked to Suzanne Snyder in the engineering department at McCauley, 800-621-7767 ext. #566. We discussed the vibration problems at length. I then called the Lord Mounts Company, 800-458-0581 ext. #6611, and talked to Paul Snyder.

He explained the different composition of the Barry mounts and the ones manufactured by the Lord Mounts Company. The Barry mounts are made of Butyl rubber and Lord makes theirs from natural rubber, which means they are softer. The

final result to the story is the three new blades helped the vibration somewhat. Also, we installed the prop on compression #1 cylinder with #1 blade straight up. We then installed a new set of Lord mounts and all the vibration was gone.

In conclusion we want to thank the McCauley Company for their wholehearted cooperation and assistance with the propeller vibration problems. It would seem the mounts on the engine have to be from Lord Mount Company, and putting the #1 blade up with #1 cylinder on compression does not hurt.

I believe anyone having vibration problems should look at the above steps first. Until I spoke with Dave Pratt, I was not looking at the engine mounts because they were brand new.

Protecting Your Propeller

Cecil Wachsman, ICS #02041

After spending \$6,300 on a new propeller for my PA24-250, and getting a chip of paint removed in the first month, I thought it would sure be nice if I could protect the prop in some way. Well, being an airport BUM, I saw a fellow with a Cessna 175, 180 hp and constant speed prop preparing for a trip to Alaska. He had a product called Prop Guard on his propeller. Upon his return, I inspected his propeller and found there were no nicks or abrasions on the blades. He informed me he had landed and camped mostly on unimproved landing strips! I got the name and phone number for this Prop Guard and ordered a Kit.

Prop Guard is a thin strip of clear polyurethane tape, 2 inches wide, to cover about 1 inch of propeller, front and back, on the leading edge of each blade. With normal use, this product should last 5 to 6 years.

The installation instructions are simple and must be followed to the "T" in order to achieve a good bond. The entire installation takes about 20 to 30 minutes of your time. One important step is to be sure there are no nicks, scratches or abrasions of any kind on the blade before installing the tape. All nicks, scratches, or abrasions must be removed per AC 43,13-16, Chapter 8, Section 4 & 5, by a qualified A&P mechanic.

The installation of Prop Guard is a minor alteration and requires a log book entry, also by an A&P mechanic.

In preparation, I used a 320 grit sandpaper to feather the edges of any chipped paint to eliminate possible air bubbles from forming when I applied the polyurethane tape to the blades. I then wiped down the blades with lacquer thinner. Then, I also wiped the blades again with isopropyl alcohol to ensure freedom of lint, dirt or oils on the blade. I applied the adhesion accelerator to the painted surface of the propeller letting it set for 15 minutes to dry. The adhesion accelerator is to be applied only in the area the tape will cover. On applying the tape, it is extremely important to follow instruction #3-f to eliminate air bubbles.

I firmly believe this Prop Guard Kit, installed per instructions, will protect the leading edge of your propeller from abrasions through normal use for years to come.

For more information you can contact: Prop Guard Laminate for Metal Propellers, WebSite: www.propguard.com, or (888) PROP GUARD ((888) 776-7482)).

Spinners (Nov 2002)

Mike Rohrer ICS #13392

Have you every tried to put your nice shiny spinner back on your "new" three blade propeller and it puts scratches on the blade shank? Here is a tip. With the help of a friend grab a blade and twist. This will turn the blade to the stop and the spinner will go on with ease.

Low Pressure in Propeller Dome (Mar 2004)

Q When I want to change the propeller pitch in my twin to a lower rpm while in the descent, the rpm does not change at all. I can recover that situation by reducing power to almost idle and then increasing power again. What is wrong?

A Most probably there is too little pressure in the propeller dome. The reason may be a faulty valve. The gas pressure inside the dome supports the blades to move into the feathered position. To detect low pressure early, the best is to cycle the prop controls simultaneously at 1500 rpm. In the case of low pressure, there is a delay in changing pitch of one of the propellers.

180 Propellers (Dec 2011)

Q I have a Comanche 180 and I am trying to get a list of propellers that are approved for this aircraft.

A: That's not difficult. Call Hartzell or McCauley, or go to their websites. Look at PA24s and the engine series in your particular aircraft. McCauley has the only approved three-bladed prop for your airplane.

Pat Barry

A There are four types of props approved for your airplane:

The OEM, Hartzell; the OEM, McCauley (two blade); the Hartzell Top Prop (two blade); and the McCauley Black Mac (three blade) which is available with either the old style straight blades or the new style scimitar blades.

Zachary Grant

Engine.Out Prop Feathering (May 2012)

Q The HC-A3VK-4/V8433-7 prop on the 400 is a nonfeathering prop. For engineout training in the 400, can the prop be brought back to full coarse to extend the glide and then pitched up to fully fine for a full power overshoot? In a real engine-out situation, could the prop be juggled between coarse and fine to squeeze into a tight landing spot? When this was put to Hartzell, they said it was a matter for the POH, which, of course, says nothing. One situation I can attest to is that with an engine-out on short final with gear and flaps down, pitch fine, the 400 goes down like an aerodynamic brick.

A Yes, as long as you have oil pressure, an operable governor, and engine rotation, you should have control of your prop; and certainly pulling the prop to low RPM/ coarse pitch will extend your glide by a significant distance. You can also push the prop to high RPM just before landing for normal drag. For training, you can pull the prop all the way to coarse, pick your landing spot, and then reverse the whole situation, add power and return to normal flight.

Yes, compared to the other single Comanches, the 400 has the highest wing loading, the largest prop disk area, and largest displacement engine, all resulting in truly amazing abilities to fall out of the sky at great rates of descent. However, with flaps/gear up, and prop pulled to low rpm, the glide ratio is over 13:1, the same as all other Comanches!

Zach Grant