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The Nineteenth Briefing

EAA Chapter 19 Newsletter

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Prop Strike!

By John Ruley

This article originally appeared in Cessna Owner and Pipers Magazines.

When it happens, it is loud and scary. But prop strikes can range from minor to life-threatening, and your health and pocketbook depend on determining how much inspection and repair is needed.

My wife, Kate, has been taking flying lessons on-and-off for a few years now. She's been taking every opportunity to practice, so was up and out at the airport bright and early one Sunday while yours truly slept in.

When the phone rang, I wasn't really very awake. "Hello," I said, more than half asleep.

"I just did major damage to the plane," a small voice said.

My first concern was to make sure that she was OK and nobody else was hurt. And nobody was. What happened to Kate is one of the most common minor ground problems private pilots encounter: She forgot to take the tow bar off, and when she tried to start the

engine, it interrupted the prop. (See Kate's story on the sidebar below.)

I'm sure most readers have heard about hitting the tow bar. Stories abound of them being flung over hangars, and of airplanes being successfully started and taxied with one attached -- only to hit with a

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Coming Events

Aug. 7	20 th Annual Fly-In Breakfast	Pecos, TX
Aug. 9	EAA Ch. 19 Meeting	Ambassador Room
Sep. 10	EAA Ch. 323 Fly-In Breakfast	Sherman Muni.
Sep. 10-11	Land of Enchantment Fly-In	Moriarity, NM
Sep. 13	EAA Ch. 19 Meeting	
Sep. 16-17	49 th Annual Tulsa Fly-In	Bartlesville, OK
Sep. 23-25	NMPA Annual Mtn. Flying Clinic	Roswell, NM
Sep. 24	FallFet 2005	Enid, OK
Sep. 30-	Albuquerque Ballon Festival	Albuquerque, NM
Oct. 9		
Oct. 1	FINA-CAF Airshow 2005	Midland, TX
Oct. 7-10	EAA Copperstate Regional Fly-In	Maricopa, AZ
Oct. 8-9	Rio Concho Air Show	San Angelo, TX
Oct. 11	EAA Ch. 19 Meeting	

bang when the airplane lands. It's apparently so common that the Civil Air Patrol launched a major program to minimize such incidents. And, of course, the tow bar isn't the only thing the prop may strike: rocks, birds, and the runway (during gear-up landings) all come to mind.

Is That Bad?

So, if the prop strikes something, just how bad is it?

Pretty bad. McCauley Service Bulletin 176D defines a "Blade Strike" as "any impact or suspected impact of the rotating propeller upon

August Meeting

The August meeting for EAA Chapter 19 will be held at 7:30 PM on August 9th in the terminal building at Lubbock International Airport. We will meet in the Ambassador Room upstairs. Passes will be available for free parking.

Wally Moyers will present a program from EAA national on the new Sport pilot certificate.

such items as, but not limited to, the ground, tow bars, landing lights, carts, snow banks, hedges, etc.," and goes on to say that deciding whether or not you've actually had a blade strike is up to you as the aircraft operator.

If you've had one, though, SB 176D doesn't provide much leeway: "Any McCauley propeller experiencing a Blade Strike must be removed from the aircraft *and completely overhauled* by an FAA approved propeller repair station ..." (emphasis mine).

Why? In part -- as SB 176D notes -- because you can have internal damage to a prop (particularly a constant-speed prop) even if there's no visible damage. And it's not a simple matter of dressing or replacing the affected blade(s): SB 176 D goes on to say that the propeller hub itself must be scrapped if any single blade is damaged beyond repair limits.

Senesnich -- which manufactures only fixed-pitch props -- is a little more lenient; its Service Bulletin R-17 says, "Do not fly your aircraft under any circumstance before a thorough inspection by qualified personnel if the propeller has been subjected to impact." It's up to the inspector to decide if the prop must be removed and overhauled.

Do We HAVE To Open The Engine?

Well, that takes care of the propeller -- what about the engine? Up through the mid-1960s, it was common practice *not* to open the crankcase after a simple blade strike. Instead, a dial-indicator test was performed on the crankshaft end (basically, to see if the shaft was bent). This is now considered inadequate. Expensive as pulling the engine and opening the crankcase may be, consider that the alternative could be a catastrophic failure in flight (or during takeoff, when the engine is generating maximum power) at some point down the line ...

For exactly that reason, the engine manufacturers are unanimous: Any damage that requires repairing the prop also requires pulling the engine for inspection and overhaul.

Lycoming 's Mandatory Service Bulletin 533A defines a prop strike as "Any incident, whether or not the engine is operating, that requires repair to the propeller other than minor dressing of the blades ... [or] in which the propeller impacts a solid object which causes a drop in RPM and also requires structural repair of the propeller (incidents requiring only paint touch up are not included) ... [or] A sudden RPM

2005 EAA Chapter 19 Officers

President	Wally Moyers	863-4897	wmstudio@aol.com
V. President	Louie Hillard	687-1070	louieh@headsetsetc.com
Secretary	Jim Schenck	794-8056	jimsch@att.net
Treasurer	Jimmie Mason	792-4401	jmason@nts-online.net
Newsletter Editor	Stan Blanton	799-4664	stanb@door.net
Technical Counselors			
	Rick Liles	687-2923	rliles@indmolding.com
	Lorne Sharp	793-3202	lornesharp@msn.com
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Flight Advisors	Van White	873-3530	snaploopvw@aol.com
	Jim Dickson	441-9887	jim.dickson@att.net

drop while impacting water, tall grass, or similar non-solid medium, where propeller structural damage is not normally incurred ..." It goes on to say that in any of these cases "the safest procedure is to remove and disassemble the engine and completely inspect the reciprocating and rotating parts, including crankshaft gear and dowel parts. *Any decision to operate an engine which was involved in a [prop strike] without such inspection must be the responsibility of the agency returning the aircraft to service.*"

Similarly, TCM 's Service Bulletin SB96-11 defines "propeller strike incidents" in much the same way as Lycoming, and says that "Following any propeller strike a complete engine disassembly and inspection is mandatory and must be accomplished prior to further operation ..." It does include one small out: "For instances where the propeller is damaged by a small foreign object during operation, such as a small stone, inspection and repair must be accomplished in accordance with the propeller manufacturer's published instructions. Any time foreign object damage requires propeller removal for repairs other than minor dressing of the blades, the incident is considered a propeller strike and [requires a complete engine disassembly and inspection]."

I talked to Terry Horton, TCM's supervisor of customer service, about this. "What can happen is that you get a crack, which can lead to a crankshaft failure," he said. "You can also load the front main journal in the case to a condition that leads to a crack because of the load there; and you can get accessory gear damage. We got more strict because we

found a series of situations where a guy has a strike, and checks it out according to the old rules and it looks OK; but we found some people were having problems down the line. We also had people trying to interpret -- what constitutes a prop strike? In essence, unless you have something that only requires a minor dressing of a prop, then you have to tear the engine down and overhaul it -- period. We made it a more comprehensive inspection than in the past, which catches more problems and makes it safer. If it requires you to remove and repair (or replace) a prop or blade, then you need to tear down the engine. It may seem like overkill, but it's not. We see it as a very serious safety issue for our users. We've had instances where the old-style tests were done, and looked fine -- and then, a couple of hundred hours down the line you'd have a crankshaft failure. If our history didn't show this, we'd never have changed our inspection criteria."

John Standiford, a mechanic with Ultimate Engine, agrees: "Anything that requires sending the prop to a prop shop -- finishing, filing, etc. -- is considered a prop strike. I've even seen a situation where someone hit a spinner with a hangar door, and the insurance company wrote it off as a prop strike. If it's up to me, and there's any question about it, I'd do an overhaul. Say you have a minor strike and it passes all the usual tests -- dial indicator, magnaflux, what have you. 300-400 hours later, it could fail after flexing in operation. It's just safer to do the overhaul and be done with it."

Not So Bad This Time

For me, the one small ray of hope in all this was the unanimous opinion of everyone I talked to -- starting with my own local mechanic

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-- that what happened to us didn't really constitute a true prop strike: There was no visible damage to the prop, which indicated that the engine never actually started: The prop was being swung only by the starter motor. But contrast that with the experience of a friend (and Mooney M20K-231 owner) who prefers to remain nameless:

"I made what looked like a normal landing; but something didn't feel right. I was a little long -- and I had some people on board who'd never been in a small plane before -- so I went around, landed, shut down, and went to close my flight plan. When I came out, one of my passengers said, 'Did you see the prop?' I looked -- and both blades were bent back at the tips. I didn't even realize it was damaged.

"I couldn't believe I'd actually flown it with a damaged prop. Suppose I'd had a vibration problem? I could have lost the engine!"

This happened during the return from a group flight to Mexico on a medical mission. I remember how pale the pilot quoted here looked when we caught up with him (my plane's a bit slower than his). Even his story, though, turned out to have a silver lining:

"I called my insurance company, USAIG. They asked who I wanted to do the repair. I really didn't know, but asked a mechanic at my home airport to do it. He got a ferry permit, dialed the crankshaft, installed a spare propeller, picked up the airplane, and brought it home. Then he pulled the engine and did a major overhaul, and replaced the prop. I traded up to a three-blade and had to pay the difference between that and a new two-blade out of pocket. *Everything else was covered by my insurance*, and my rates didn't go up. The airplane was in the shop for about one month total."

Now that's got to be the single best reason to carry hull insurance

I can think of.

As for my own story -- we got lucky because the engine hadn't actually started when the prop contacted the tow bar; only the starter motor was operating, and it expended most of its energy pushing the nose wheel to the side. Our mechanic looked it over, and his verdict was two words: "Fly it."

My brother, an aeronautical engineer for the U.S. Air Force, suggested that we get an oil analysis done soon (I do one at every oil change) to see if any metal might turn up in the oil; but as I write this, it looks like we got off lightly.

EAA CHAPTER 19

Chapter Meeting Minutes

July 12, 2005

The regular monthly member meeting was held at the Rick Liles residence, 7313 80th St., Lubbock. The members toured the large workshop at rear of the residence and also viewed Jim Dixon's plane in the back yard, which is almost ready to fly- except for a minor item—the wings. The paint job and graphics look great.

Discussion Items:

President Wally Moyers opened the outdoor meeting with requests for plane pictures and interesting information from members for our new website, which is www.eaa19.org/

The newspaper article on Van White's lifetime flying activities and development of Biggin Hill was very interesting and thanks to Van for the great picnic and activities on Saturday July 9th. It was good weather for the fly-bys and a great day.

Wally urged all members to turn out at the fly-in coming up on Sept. 10th at the LBB airport. Steve Moffett will be arranging for volunteers for the Young Eagles flights

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The British glider project at the Silent Wings Museum is in need of a person from our EAA to schedule and co-ordinate the construction of the Horsa glider. The exchange glider program is about ready to get going and we need a volunteer to help keep track of the various phases of the project. We have many builders who have volunteered to assist the actual fabricating.

Reports presented:

Mark Piercy reported on the general aviation luncheon held today at the airport. Attending also was Jimmie Mason. The annexation of the various general aviation areas is a major concern due to higher taxes on all services, fuel, repairs, etc. Piercy and Mason are forming a study committee and input is needed from all members on any concerns.

\$22 million is scheduled to be spent on the LBB airport and general aviation needs your support and attendance at these meetings.

John Schmitz reported that Abilene airport will host a fly-in and airfest on Sept 24. It is being organized by locals with help from their EAA chapter. A Saturday night cookout is planned.

Builders reports were presented by chapter members.

The meeting was adjourned and members continued to tour the Liles workshop and view the two Van's RV planes under construction.

Jim Schenck, Secretary

Handyman

One of the most unique fighter interceptions of WW2 took place over Okinawa. Marine Division Leader Ken Reusser [Ruby 6] was on patrol with Bob Klingman and a couple of other 'Checkerboarders'. The flight was climbing to altitude . . about to proceed on a routine patrol, when Air Defense Control [Handyman] called them up: " Ruby 6, this is Handyman. Over."

"Handyman, Ruby 6. Go ahead."

" Ruby 6. We have a 'bogey' approaching on course one eight zero at Angels 25 . Climb to angels 25 . . steer 270 . . BUSTER [at full speed] ! OVER ! "

"Handyman . . Roger. Course 270. Angels 25. Out."

The flight dropped their belly tanks, test fired their guns, put their

props in full low pitch, and firewalled their throttles. Klingman remembered, " We could see the vapor trails as the " bogey " made two complete circles over our harbor."

The Marines had a good idea about the purpose of the aircraft they were pursuing. Over the past few days, their squadron and others had taken turns trying to intercept a plane following a similar track. Intelligence believed it was a Japanese aircraft involved in photo reconnaissance of the Navy's ships, for the purpose of planning future kamikaze attacks.

Previous intercepts had failed because the intruder was able to climb away as it was retreating for home. And with an initial altitude advantage, the Japanese reconnaissance aircraft easily outran them. This time, the pursuing Marine pilots would attempt to intercept the ' bogie ' over a greater distance, while proceeding at their Corsair's optimum climb speed.

Reusser : " We were turning inside [his turn] to try and join up, but we were so far below that we had little chance of reaching him. So, I just pulled the nose up and held my trigger down . . with no aim and no accuracy. Just trying to " loop it up there ". I saw a couple of "glints", but I didn't think anything of it at the time. [The ' bogie ' then] leveled off headed back toward Japan." The division kept climbing and remained on the " bogey's " tail even though it didn't seem possible to overhaul him.

Checkerboarder Jim Cox's plane kept dropping back until he was roughly a 1,000 feet below the others; he wasn't able to coax another knot of speed out of his battle-weary Corsair. Reusser ordered Cox and the other pilot to return and orbit near their base, while he and Klingman continued in their pursuit.

At Angels 38, he and Klingman reached their Corsairs' service ceiling, but the " bogey " was still about a mile ahead. At this point, due to the thin air and reduced power from their engines, their elevator and aileron adjustments amounted to gentle and small changes.

Klingman : "As we got closer, Ken was firing, while the " bogey's " [rear gunner] was firing back at us. I [was taking] a few small bullet holes. My plane had no gun heaters and my guns were frozen [and inoperative]. But I was still pretty eager to get me a Jap plane, so because] my plane was new and a bit faster . . I went on ahead."

" I closed on the " bogey " until I was 20 or 30 feet behind him. I couldn't get any closer due to his prop wash. But it held me back - and kept me from running into him. I slowly climbed above, then nosed over and ran into his tail with my prop. I only had enough extra speed to chew off some of his rudder and elevator before being blown away [by the "Nick's" prop wash]. He was still flying, so I climbed above him for a second run. I nosed down (again) but pulled out too soon and I only got some of his rudder - and part of the top of the rear canopy. I remember seeing the rear seat gunner

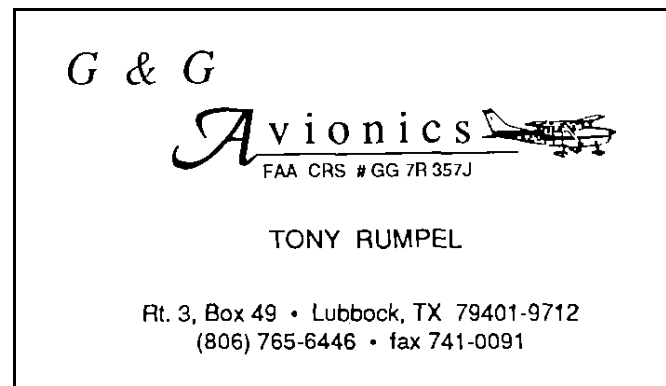
frantically looking round . . trying to use his machine gun."


" I climbed above for my third run then I chopped the right side of his elevator. [That hit] did most of the damage to my plane and we both went into spins. After losing only about 1,000 feet, I recovered. The enemy plane continued in the spin . . both its wings coming off at about 15,000 feet."

Reusser : " The Japanese gunner pounded [with his fist on the action of] his machine gun to free it up. But it was frozen . . as was mine. When Bob came down on the [Japanese aircraft's] canopy with his prop . . it tore the machine gun away from its mount and (also) hit the gunner." By then, Reusser's own aircraft had been hit numerous times with bullets from the " Nick's" rear gunner.

Klingman didn't have a 'shoot down' . . but he definitely had a ' knock-down'. Now they swapped their recent experience for another set of problems. They were hundreds of miles from home . . with one airplane now shaking so hard that its control stick was leaping around ' the cockpit. Later, when they drove closer to their airstrip and passing through 10M, Klingman ran out of gasoline. Others radioed him to " go over the side . " But Klingman thought he had a fair chance to glide toward their strip, then ' dead stick' it in.

Alerted by radio, other pilots and crew members stood quietly next to the runway and watched Klingman finesse his wounded Corsair toward them. With no engine roar . . and his propeller windmilling silently . . Klingman approached them in a " no-go- around "glide. Almost prayerfully the observers were loudly talking to themselves" D-o-n-t s-t-r-e-t-c-h the glide ! DON'T BE S-H-O-R-T ! "





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August Meeting

7:30 PM — August 9th
Main Terminal Bldg. - Upstairs
Lubbock Int'l. Airport

At the last split second, Klingman raised the Corsair's nose. His plane pounded down on the dirt overrun - bouncing a handful of yards onto the airstrip. The pilots and flight crews were astonished as they ran over to examine the aircraft's condition. All three blades of Klingman's propellers were bullet-pierced ; their furthest segments jutted outward - with six inches missing - from each of their tips. The Corsair's wings were pierced with large holes. And chunks of the 'Nick' were found lying deep within its cowling.

After surprisingly moderate repairs and a new propeller, the Corsair was returned to combat status. And for removing the threat of the enemy's knowing the precise location of Navy's ships, both Bob Klingman and Ken Reusser earned the Navy Cross.

Abridged from the Leatherneck, May 1995, Ray Schanamann VMF 312

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