



MEMORANDUM FOR RECORD

Stephen Stein
Air Safety Investigator
National Transportation Safety Board
Office of Aviation Safety - Eastern Region

NTSB Accident Number: ERA15LA155
Aircraft Registration & Make/Model: N220AF; Rotorway EAB 162F
Accident Location: Indian Lake Estates, Florida
Accident Date: March 14, 2015

Note: The following interviews were documented by the Investigator –In-Charge (IIC), Stephen Stein.

Interview #1 Summary

Bill Jones
Accident Pilot's Certified Flight Instructor

Interview date and time: November 23, 2015; 0939 PST

According to Mr. Jones, he had been instructing the accident pilot in the accident helicopter in early 2015 before the accident. They completed approximately 20 hours of instructional flight in the accident helicopter. Mr. Jones added that he owned a Rotorway helicopter, but was always impressed by how clean and smooth the accident pilot's helicopter was. The instructor stated that Rotorways are inherently rough and require constant adjustments to keep them relatively smooth. Mr. Jones reported that he never experienced any problems when he flew the accident pilot's helicopter. He further noted that he did not observe or feel any anomalies with the cyclic control. The instructor added that the elastomeric bearings tend to go bad quickly as he was on his third set in 150 hours of flight time.



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Interview #1 Summary

Cheryl King
Federal Aviation Administration, Orlando FSDO

E-mail correspondence date and time: March 19, 2015; 1059 ET

According to Ms. King, the cyclic and collective controls were traced from the cockpit to the main rotor blades and did not display any abnormalities barring the damage that resulted from the impact. The swash plate was intact and not damaged. The inspector found previous reports from pilots who complained about an uncommanded cyclic movement, similar to the accident pilot's statement, and later discovered the result was precipitated by bad elastomeric bearings. During the postaccident examination the inspector noted that the bearings did not appear to be new and decided to retain them for further analysis.

The inspector reported that the student pilot had a minimal aviation background and was not a licensed airframe and powerplant mechanic, but constructed the helicopter with some assistance from a mechanic. The pilot accumulated about 51 total flight hours, most of which was in a Robinson R-22. The helicopter hobbs meter showed approximately 36.64 total flight hours.

Interview #2 Summary

Gabriele Rotunda

Federal Aviation Administration, Orlando FSDO

E-mail correspondence date and time: April 21, 2015; 0634 ET

According to Ms. Rotunda's final report, the student pilot accumulated about 54 total flight hours over the previous 8 years. All of his flight time was in helicopters and about 20 hours of which were completed in the accident helicopter about two and a half weeks prior to the accident. During this time the pilot logged approximately 16 flight hours of dual instruction, which was provided to him by a certified flight instructor (CFI) at Cannon Creek Airpark (15FL), Lake City, Florida. The student pilot physically transported the helicopter on a trailer to 15FL in order to receive this flight instruction. The CFI endorsed the student pilot to conduct his first solo flight at 15FL in a Rotorway Talon Helicopter. In addition to his solo flight, the student pilot completed several solo practice flights at his home airport, Winter Haven's Gilbert Airport (GIF), Winter Haven, Florida. He did not receive any flight instruction at GIF or airport/helicopter landing zone between GIF and the accident site. The FAA was unable to locate any cross country training endorsements in the student pilot's logbook.

On November 11, 2014, the FAA issued a special airworthiness certificate with operating limitations under Phase 1 testing, which required the student pilot to remain within 25 nautical miles of Marianna Municipal Airport (MAI), Marianna, Florida when operating the accident helicopter. At the time of the accident flight, the pilot had completed 36 of the required 40 hours required under the operating limitations of the airworthiness certificate.



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Interview #1 Summary

Richard Fuist
N220AF Accident Pilot/Owner/Builder

E-mail correspondence date and time: March 24, 2015; 1630 ET

According to the accident pilot, he completed a 25 hour service and inspection of the helicopter at 27 flight hours on March 2, 2015.

The student pilot stated that he was endorsed by his flight instructor to conduct solo flights in the accident helicopter on March 1, 2015.

Mr. Fuist stated that he logged 55 total flight hours in all aircraft.

The accident pilot stated that he had posted his incident on the Rotorway blog, and had received several responses from pilot/builders who had received similar "cyclic control issues" after making adjustments to the slider ball. Mr. Fuist reported that, prior to his departure on the accident flight, he flew the airport traffic pattern and then landed and shut the helicopter down. The student pilot adjusted the slider ball by tightening the collar with his fingers, then backing it

off one half inch and then tightening the set screws. He did not observe any abnormalities during his subsequent flight in the airport traffic pattern.

In the same e-mail, Mr. Fuist provided a blog post from September 2002,

"Here is the post from Sept 2002 on ROG from a Phase 1 student at Rotorway with a Rotorway instructor:

I was not going to mention this, but since the topic has been broached, I will.

A few weeks ago, I was at RW for Phase 1. On my last scheduled flight on Thursday, I was having trouble holding altitude in pitch. As we got closer to Chandler Airport to practice approaches, I noticed that I was holding almost full right cyclic to keep the ship level. My arm got so tired I had to turn my right hand over and push the left side of the cyclic to the right. Now the cyclic is smashed into my right leg and I'm barely keeping the ship upright.

I was at the point where I just couldn't hold it any longer, so I asked Bill to take it and see if he thought anything was wrong. He did and as soon as he had it and I let go we started to roll left.

He called Chandler tower and asked for a "precautionary" landing on the taxiway. By the time we were about 20 feet above the ground, both of us were pushing the cyclic to the right with as much strength as we had. The stick was now on the left side of center. Bill dumped the collective and we hit on the left skid bounced up, hit the right skid and finally came to a stop perpendicular to the taxiway centerline.

We both thought that something was jammed in the cyclic system. Everything looked OK, but we had to take the blades off and trailer it back to RW.

The end result was the elastomeric bearings were bad. RW says to replace them at 1000 hours. The ship we were in had 982 hours. They said that they had heard a report of similar problem with the cyclic control and it was traced to the elastomeric bearings 'bleeding'."

Interview #2 Summary

Richard Fuist

N220AF Accident Pilot/Owner/Builder

E-mail correspondence date and time: April 21, 2015; 1413 ET

The accident pilot stated that the helicopter kit was manufactured in 2006 and was purchased from a previous owner who sold the original set of elastomeric bearings to another party. The previous owner told the student pilot that he had purchased a new set of bearings from Rotorway, the helicopter manufacturer, in 2013. The student pilot reported that the bearings were in un-sealed plastic bags when he received them. He stored the bearings in his garage for one year before he installed them in his helicopter.

Interview #3 Summary

Richard Fuist

N220AF Accident Pilot/Owner/Builder

E-mail correspondence date and time: April 22, 2015; 1801 ET

The student pilot stated that he did not lubricate the thrust block bearings, but did lubricate the aligner block bearings with Mobil Unirex EP 2 since the blades had been removed for transit.

Interview #4 Summary

Richard Fuist

N220AF Accident Pilot/Owner/Builder

E-mail correspondence date and time: April 24, 2015; 1838 ET

According to the student pilot, he does not remember experiencing any abnormal vibration during the accident flight. Prior to the accident flight, the pilot monitored the rotor blade track and balance in the hover and recalled that the rotor blade performance was smooth during that time. In flight the performance was not smooth, but not different than the helicopter's performance during previous flights. The student pilot experienced a little cyclic pressure to the left towards the end of his flight, which substantially increased as he started his descent to land. The student pilot remarked, "I was giving it everything I had to fly straight."

Interview #5 Summary

Richard Fuist

N220AF Accident Pilot/Owner/Builder

E-mail correspondence date and time: April 25, 2015; 0500 ET

Mr. Fuist stated that the accident flight was normal and uneventful until the cyclic pressure started at the outside boundary of the lake. The student pilot executed a "slight bend/bank" to the right and then turned "straight and level" for a 2-3 mile final approach. He experienced a little cyclic pressure when he initiated the slight right turn, which continued when the helicopter leveled out. The cyclic pressure increased significantly when he began a descent.

Interview #6 Summary

Richard Fuist

N220AF Accident Pilot/Owner/Builder

E-mail correspondence date and time: October 18, 2016; 0625 PT

According to the pilot, at the request of the NTSB investigator-in-charge, he returned to the aircraft wreckage to verify if the set screws on the adjustment collar were tight and to indicate how far the collar had been backed out. After he noted that the set screws were tight, he then marked the position of the adjustment collar with a black pen and loosened the set screws. The pilot subsequently tightened the collar until it was “snug” and marked the collar with a black marker. A measuring tape showed the markings were about one half inch apart.

Interview #7 Summary

Richard Fuist

N220AF Accident Pilot/Owner/Builder

E-mail correspondence date and time: November 16, 2016; 1657 EST

The pilot reported that he flew the helicopter for approximately 15 hours during hover and taxi tests that were not documented in his personal logbook.



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Interview #1 Summary

Darron Braymiller
General Manager, Rotorway Helicopter Manufacturing Company

Interview date and time: November 13, 2015; 0926 PST

According to Mr. Braymiller, the main rotor blades pivot on the hub plate through pitch pins that are mounted to the hub. The aligner block, mounted to the blade, adjusts the lead lag. The thrust blocks are located on the inside of the hub plate and contain the elastomeric bearings, which secure the blade to the hub plate.

Interview #2 Summary

Darron Braymiller
General Manager, Rotorway Helicopter Manufacturing Company

Interview date and time: October 11, 2016; 1246 PDT

Mr. Braymiller stated that he performed a “slider ball collar adjustment” test at their manufacturing facility in Phoenix, Arizona. Prior to the test, he tightened the slider ball collar

until it was snug and tightened the set screws. He then “picked the aircraft up into a hover” and observed that it was hard to control. He felt a significant left pressure through his hand via the cyclic control and when he let go of the cyclic, the control stick would “go to the left.”



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Interview #2 Summary

[REDACTED]

Interview date and time: November 8, 2016; 1541 PST

According to the bearing manufacturer, the functional test results on the accident bearings were consistent with the results of new bearings. He further stated that a blackened appearance of the outer surface resulting from micro-scaled extrusion will show during the first 23 flight hours under normal thrust loads and oscillations, but “has no affect upon function.”