



MEMORANDUM FOR RECORD

Brian C. Rayner
Senior Air Safety Investigator
Eastern Region

Date: March 10, 2025

Person Contacted: Inspector Michael Torrent – Wreckage and Records Examinations
NTSB Accident Number: ERA23LA283 Macclenny, FL

Narrative:

Mr. Torrent conducted a series of examinations and records reviews. He consulted subject matter experts, manufacturers publications, and Federal Aviation Administration rules and guidance. His direct notes, and a collection of other notes and his concurrence with them were extracted from lengthy email strings and attached below.

Contained within the notes are performance estimates, weight and balance estimates, and damage/condition estimates.

Good Afternoon Brian,

I conducted a review of the records you sent over as well as the notes from our previous examination.

I concur with the notes and findings you provided.

I will add one note on the maintenance performed on 1 JAN 2022, they noted "in accordance with Part 43 Appendix D". This is a common mistake; Appendix D is not a checklist but rather a list of items to be included in the checklist you develop based on installed equipment and manufacturer's recommendations. A checklist must still be developed for each aircraft.

Take care,

*Michael H. Torrent | Aviation Safety Inspector -Airworthiness
U.S. Dept. of Transportation - Federal Aviation Administration
South Florida Flight Standards District Office (SO19) – Miramar, FL*

Notes and Observations

1. Macclenny FL

- a. elevation is 131 ft SL.**
- b. Temperature reported to be 35°C dew point 22°C. 95°F/71.6°F**
- c. Density Altitude is approx. 2500 ft.**

2. N9WZ

- a. manufactured in 2005 as Serial number S1882**

- i. equipped with 35 gal fuel tank.
- ii. From video appears equipped with upstack exhaust.
- iii. Max GW certified is 2050 lbs
- iv. FAA approved rotorcraft flight manual is sections II, III, IV, and V.
- b. Required placards
 - i. 600 pounds max cabin weight POH section 2-3
 - ii. Limit Manifold Pressure POH section 2-3 (based on altitude and OAT)
- c. Manifold Pressure gauge, yellow arc and red line (27.2 in Hg) depicted in Fig. 2-3 sheet 4.
- d. Empty weight CG is not known but similar aircraft weigh in between 1150 and 1200 lbs with similar moment arm of approx. 100 inches.
- e. Assuming 1170 lbs empty weight, 592 lbs pilot and PAX, and ½ hour flight time burned off of a full tank leaving fuel at 28 gals 168 lbs.
- f. Estimated Gross weight at take off 1931 lbs. Longitudinal CG, using figure 6-4 Sample W&B worksheet, is 95.8 inches, Forward Limit is 95 inches. Lateral CG calculated to be 2.0 RH, Limit is 3 inches at full forward Longitudinal CG (95 inch)

3. POH charts and limits based on estimated GW

- a. CG Envelope in fig. 6-1
- b. Performance data is in section V. fig 5-2 is HV diagram. Fig 5-3 is recommended GW and DA to maintain fig 5-2 conditions. At 2500 ft DA recommendation is 1890 lbs.
- c. Fig 5-5 in ground effect hover ceiling vs GW 3200 RPM and 80% humidity indicates aircraft (at 1930lbs) should be able to hover up to approx. 3700 ft PA

4. Notes and comments

- a. 100 hour / Inspections require visual inspection Elastomeric MR dampers for cracking and separation, also at 600 hours there is a stretch check required with a limit of .048 inch extension requiring replacement. Inspect in accordance with Section 8-20 and 8-21e.
Was the stretch check recorded? There have been reports that low flight hour dampers with significant age will not pass the check. Also there have been reports that hot weather has some negative impact on damper life. Are these the original dampers, 19 years old? Manufacturing dates are on the data tag on the damper.
- b. 100-hour inspection requires a visual and physical inspection dimensional check of landing gear dampers. Was this done in accordance with HMI section 12-14? Was it recorded?
- c. Depending on the intensity of the engine stall on engagement the MR dampers may be out of phase. If MR dampers were marginal or exceeded stretch limits they may have started to separate. Were all three dampers elastomers pulled out of the cans? Examine the inside of the can, the cap end, for impact damage from the center sleeve of the elastomer. Ground resonance usually is indicated by multiple contact rings on inside of cap.
- d. The video shows several interesting things.
 - i. The rotor/engine noise droop is NOT typical. It may Indicates poor throttle control or loose/worn throttle cable connections. Or potential engine power issues.
 - ii. End of the video does look like Ground Resonance.
 - iii. Damage to transmission mounting is consistent with GR.
 - iv. Rapid collective reduction and rapid throttle off will make the rotor blades lead and will aggravate any MR damper problems

To: Brian Rayner NTSB
11-10-2024

Examination Notes – N9WZ ERA23LA284 #2

Per your request I attended a virtual inspection of N9WZ, a 2005 SCHWEIZER 269C, S/N S1882 at Florida Air Recovery in Jacksonville, FL on Thursday 11 APR 2024, with Inspector Michael H. Torrent (FAA). We were on the phone and face timed to observe wreckage. I had several photos Michael sent me from his initial exam on the 10th.

The airframe, notably the Main Rotor Mast and transmission supports were damaged in a manner to indicate a ground resonance event occurred.

All three Main Rotor elastomeric dampers were damaged, this is typical in a ground resonance event. But the interior of the two that pulled out and the elastomer at the tears indicate the dampers were likely deteriorated prior to the event. This would reduce the damping available during the lift off and sudden landing from hover.

The manufacturers 100 hour / Inspections require visual inspection of Elastomeric MR dampers for cracking and separation of the elastomer, also at 600 hours there is a stretch check required with a limit of .048 inch extension requiring replacement. Inspect in accordance with Section 8-20 and 8-21e of the Manufacturers Handbook of Maintenance Instructions. Was the stretch check recorded? There have been reports that low flight hour dampers with significant age will not pass the check. Also there have been reports that hot weather has some negative impact on damper life. Are these the original dampers, 19 years old? Manufacturing dates are on the data tag on the damper.

Right Rear Oleo Strut- no travel was noted on piston with weight applied. The Left Front Oleo Strut approximately 1 inch of piston travel noted with light weight applied. The Left Rear Oleo Strut approximately 1 inch of piston travel noted with light weight applied. The Right Front Oleo Strut protective rubber covering was removed for inspection of the chrome piston. The Piston was found extended. The Strut was found to move easily several inches in travel with minimal force applied. There was dried but no fresh liquid hydraulic fluid. This indicates the damper was flat or extremely under charged prior to the event.

The forward dampers are charged on assembly to 350psi, which requires approximately 400# of load to compress the piston one inch. The rear dampers are charged on assembly to 750psi, which requires approximately 650# of load to compress piston 1 inch. The Manufacturers 100 hour inspection, requires a visual and physical inspection, a dimensional check of landing gear dampers. Was this done in accordance with HMI section 12-14? Was it recorded?

This examination indicates a ground resonance event occurred. Several maintenance deficiencies allowed the vibrations to increase in intensity resulting in destruction of the aircraft.

11-24-2024

Comments on review of maintenance records provided by NTSB inspector Raynor. For aircraft serial number S1882, built in 2005.

Log book entries dated: 2 Dec 2020, 1 Jan 2022, 7 Feb 2023.

Latest entry 7 Feb 2023, includes wording stating an Annual Inspection was performed using mfg's checklist. Inspections performed are Daily, 25 hr, 50 Hr, 100 Hr and 12 month Annual. A checklist was attached. The checklist date is 20 May 1993 copied from CSP-C-2 (current CSP-C- 2 is version dated 30 Nov 2016). This is outdated by several years. This is also NOT the correct checklist or maintenance manual as a later version manual (CSP-C-10) was issued to cover aircraft SN S1809 and subsequent, (this aircraft is S1882). The most recent version of CSP-C-10 I reviewed is 3 Oct 2003 revised 30 Nov 2015, this is also the current version according to the Schweizer RSG website Publication index CSP-P-1, dated 23 Jn 2020. Also detailed in the record write up is "All 4 landing dampers have same extension and were recently serviced to proper psi."

NOTE CSP is "customer service publication" and can be considered the part number of the document and is the FAA approved/accepted document for maintenance instructions. Entry dated 1 Jan 2022 includes wording to effect that an "annual inspection was done in accordance with Part 43 appendix D and Part 43.15 referencing the TDCS and manufacturers maintenance manuals." No manufacturers manuals version number or dates were referenced, no checksheets were attached.

The log record has a number of details of work performed including "REMOVED, INSPECTED, RECHARGED WITH NITROGEN, AND REINSTALLED AFT LANDING GEAR DAMPERS. And REMOVED, INSPECTED, RECHARGED, AND REINSTALLED BOTH FWD LANDING GEAR DAMPERS.

Neither version (CSP-C-2 or CSP-C-10) of the manufacturers manual Handbook of Maintenance Instructions (HMI) has any instruction on RECHARGING the dampers. HMI Section 12 paragraph 12-14 Periodic Inspection of the Landing Gear Damper Extension sub paragraphs a. thru g. detail a procedure for dimensional inspection of installed dampers with reference to tables of allowable measurement. "If average dimensions for aft damper is less that the following dimension replace the aft damper." There is also an additional step to check the forward damper with same wording to replace if less than dimension in second table. The CSP-C-12 is the APPENDIX C to the HMI, PART III is the Landing Gear Damper section and details complete disassembly, inspection reassembly and charging of the various part number dampers.

No entries discussing the 600 hour extension check of the Main Rotor elastomeric dampers was provided. Proceed and limits are detailed in the HMI Section 8 paragraph 8-21 Damper Extension Check and Fig. 8-16. From the life limited component list provide with the 7 Feb 2023 entry these were the original equipment MR dampers. Observed condition from the photos previously examined shows there is damage to the internal elastomer that predates the accident impact/extension to the installed dampers.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

END OF STATEMENT