



NTSB MEMORANDUM FOR RECORD

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Date: 8/30/2021
Person Contacted: David Vandebroek (FAA Inspector)
NTSB Accident Number: ERA21LA322

Narrative:

The below contents are a summary of what was reported by the FAA Inspector who examined the accident aircraft at the recovery facility:

ELEVATOR SYSTEM EXAMINATION

Task

Check elevator control system for freedom of movement and correct operation
Ref: D42L-AMM-001 27-30-00 Page 201-202
This is in the DA42 L360 supplement

Verify proper operation of variable elevator stop.
Ref: D42L-AMM-001 27-30-00 Page 207
This is in the DA42 L360 supplement

Verify proper operation of Stick Limit caution message.
Ref: D42L-AMM-001 27-30-00 Page 208
This is in the DA42 L360 supplement

Verify proper operation of elevator mechanical trim system
Ref: AMM 27-38-00 pages 845-847
This is in the main DA42 AMM.

Result

The control stick movement was free and correct. No restrictions or obstructions noted. There was full travel of the elevator.

Full up = 15.5 degrees.

Full down = 12 degrees.

Elevator variable stop operated as per the manual with throttle and flap positions.

Measured elevator travel with variable stop engaged.

Full up = 13 degrees

Full down = 12 degrees.

Was unable to verify the operation of the Stick Limit caution message. However, as the normal operation of the stick limiter/variable stop was established, there is no reason to suspect the indication.

Elevator mechanic trim system operated as per the manual. Movement was smooth and operated the trim in the correct direction.

No defects noted.

Full nose up = 41 degrees, Full nose down = 19 degrees



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Verify proper operation of elevator electrical trim system

Ref: AMM 27-39-00

This is in the main DA42 AMM.

Unable to verify electrical trim operation due to the autopilot being inoperative. However, this system was unlikely to cause any issues.

Elevator & Elevator Trim System Summary:

There were no abnormalities discovered in either the elevator control system or the elevator trim system that would account for the inability to properly control the aircraft in pitch as described by the two pilots. The trim wheel was set in a slight nose down position. This was documented in pictures taken by the North Carolina State Police shortly after the accident and before anyone else gained access to the aircraft.



Figure 1: View of the elevator pitch trim control wheel

Left Engine:

- All fuel and oil lines were secure and tight. No leaks noted.
- Dipstick indicated 6.5 quarts of engine oil.



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- All spark plug electrodes looked normal. However, the lower plug on the #1 cylinder was full of engine oil. This was the low point of the engine postaccident.
- Performed borescope. No defects noted.
- Engine rotated freely.
- Pistons moved freely within the cylinders.
- Performed thumb compression test on all cylinders. All cylinders displayed strong compression. This includes #1 which had the oil soaked spark plug.
- Both magnetos were set at 27 degrees before top dead center. Proper timing is 25.
- Air filter was clean, and no obstructions noted in intake.
- No foreign material noted in the engine oil filter.
- There was no indication of the oil being burned onto the plug which would have been likely if the oil existed during combustion.

Right Engine:

- No damage or defects noted that indicated any pre impact issues with the engine.
- All fuel and oil lines were secure and tight. No leaks noted.
- Dipstick indicated 6.0 quarts of engine oil.
- All spark plug electrodes looked normal.
- Performed borescope. No defects noted.
- Engine rotated freely. Pistons moved freely within the cylinders.
- Performed thumb compression test on all cylinders. All cylinders displayed strong compression.
- Both magnetos were set at 25 degrees before top dead center. Proper timing is 25.
- Air filter was clean, and no obstructions noted in intake.
- No foreign material was noted in engine oil filter.



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Additional Photographs:



Figure 2: View of the right engine



Figure 3: View of the left engine



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Figure 4: View of the elevator control linkages