

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



ERA24LA333

EXAMINATION

September 4, 2024

A. ACCIDENT

Location: Egg Harbor, NJ
Date: July 31, 2024
Examination: September 4/5, 2024
Time: 1540 est.
1940 (UTC)
Airplane: Cirrus SR-20 N124RR

B. EXAMINATION

NTSB IIC	Aaron McCarter NTSB Washington DC
Lycoming	J. Mike Childers, ASI Lycoming Williamsport, PA
Cirrus	Mark Haroldson Cirrus Duluth, MN
FAA	Alex Nagy FAA FSDO Philadelphia, PA

C. SUMMARY

On July 31, 2024, at 1540 eastern daylight time, a Cirrus SR20, N124RR, was substantially damaged when it was involved in an accident near Egg Harbor City, New Jersey. The private pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight. The pilot lost power during climb. The power reduced, came back to full, then reduced again. There was no suitable place to land, so the pilot pulled the CAPS system, and the airplane settled into the trees causing substantial damage.

D. DETAILS OF THE EXAMINATION

1.0 Accident Site

Lat/Log 39.508922 -74.546326 Hilly wooded terrain outside of Egg Harbor City, NJ.



Figure 1 Accident site, damage and tree propeller chopping/cutting marks.

2.0 Airframe and Engine

2.1 Engine, components, and airframe examination

The powerplant is a four-cylinder, air cooled, direct drive, horizontally opposed, fuel injected naturally aspirated engine with a rating of 210HP @ 2700RPM. The Lycoming IO-390-C3B6, Serial Number L-1550-80E was not damaged and was suitable for operation.

The oil dipstick indicated about 6 quarts. The oil appeared dark brown in color and all lubricated components appeared to be well lubricated.

All the spark plugs displayed normal coloration and normal electrodes as compared to the Champion Aerospace AV-27 Check-A-Plug chart (post engine run)

The engine crankcase was manually rotated 720° degrees of rotation several time to check for crankshaft continuity, compression, and suction. Continuity was confirmed and all pistons, valves springs and pushrods operated as designed. There was adequate thumb suction/compression on each of the four cylinders. Continuity of the crankshaft to the camshaft was confirmed throughout the engine.

The throttle and mixture control were cycled through their full ranges of travel. The spark plugs and rocker covers were reinstalled. A fuel supply was plumbed into the fuel line from the left fuel tank. The fuel selector was placed in the left tank position and the electric fuel pump was operationally tested. The engine was started through normal cockpit engine start procedures and operated for a total of about 10 minutes at varying speeds from idle to 2,700 RPMs. Initially there was some engine roughness, backfires and brief puffs of white smoke observed. After 1 minute, the engine began to operate smoothly and normally.

Engine and performance operating data from the accident flight and from the post-accident engine runs was downloaded by the Cirrus investigator under observation of the IIC. The airplane's recoverable data module (RDM) was downloaded and showed data parameters consistent with a partial loss of engine power, with corresponding significant fluctuations in engine fuel flow and engine RPMs in the minutes preceding the CAPS deployment.

A full examination of the engine and associated components was conducted; the engine was partially disassembled to facilitate examination of the engine accessories.

The fuel injector servo remained attached to the engine. The throttle and mixture control cables remained attached to the throttle and mixture control arms. The servo was partially disassembled, and no damage was observed on the rubber diaphragms or other internal components. The servo fuel inlet screen was absent of debris. The fuel flow divider and injector lines remained attached to the engine. The flow divider was partially disassembled and no damage to the rubber diaphragm noted. The two-piece fuel injector nozzles were unobstructed. The engine driven fuel pump remained attached to the engine. The pump was partially disassembled and no damage to the rubber diaphragms or internal check valves observed.

Fuel was observed in all the engine fuel system components and hoses.

The fuel injector servo was removed revealing a circular aluminum disc floating freely and unattached inside the engine induction housing assembly as shown in figure 2. Further examination revealed that the rivets attaching the two portions of the induction alternate air valve were separated. One of those portions was identified as the disc observed in the induction housing assembly. The opposing half was still

partially installed on its respective mount/actuator inside the induction tube. The valve and induction tube will be sent to the NTSB Materials Lab for examination.

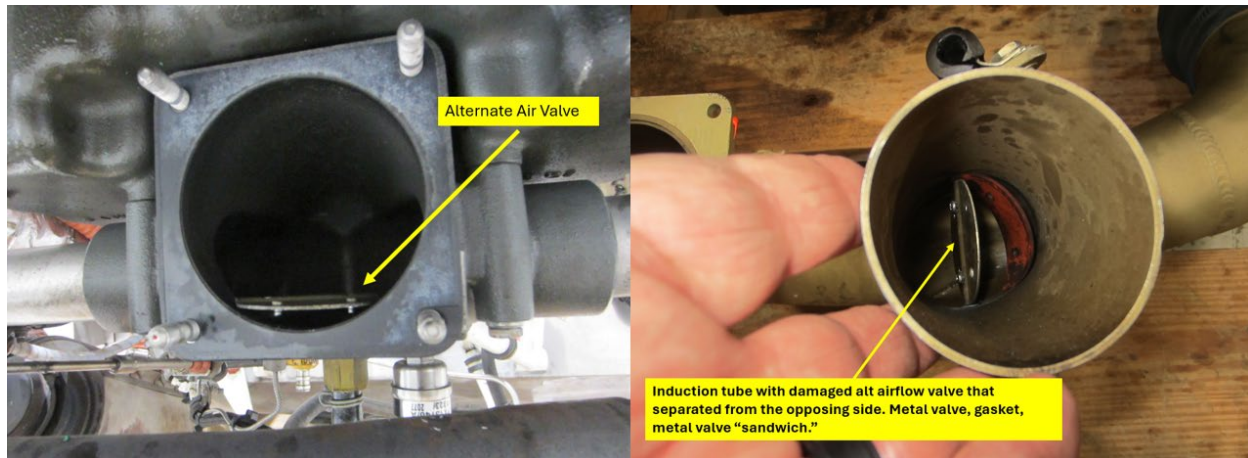


Figure 2 Alternate air valve as discovered during the examination.

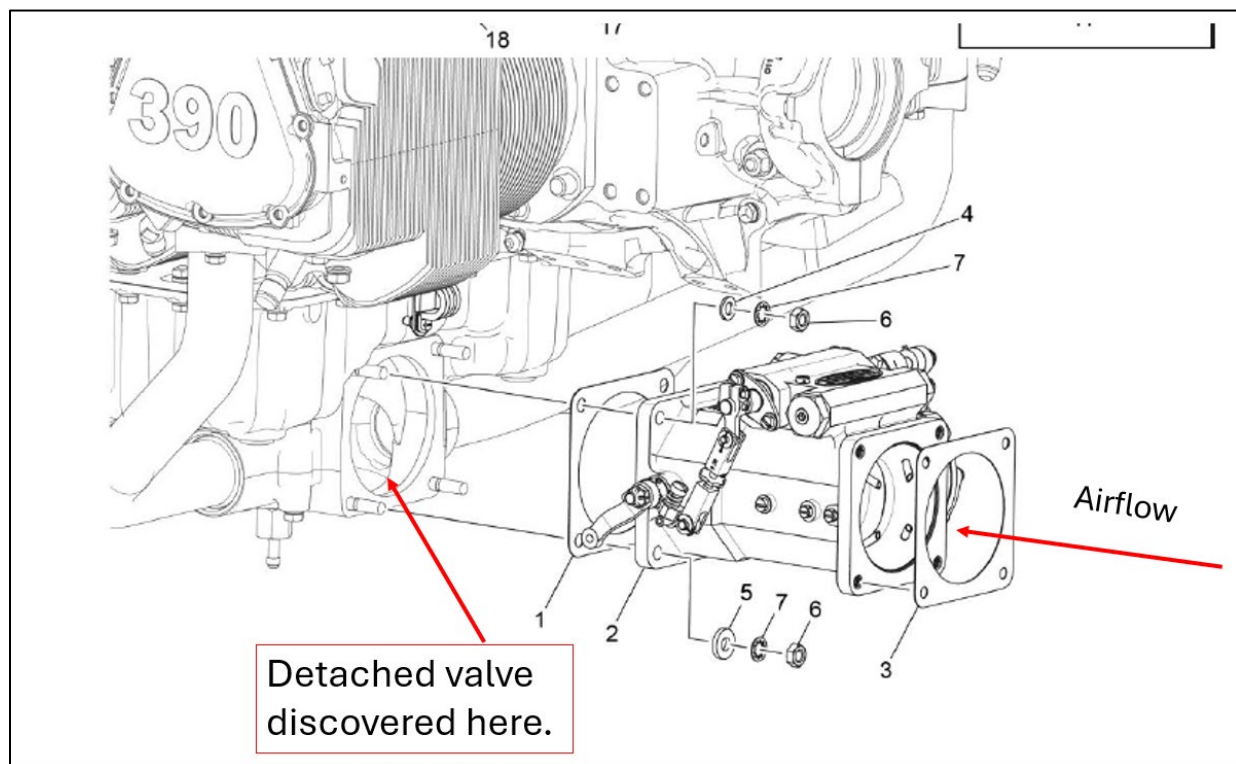


Figure 3 Engine and induction system diagram showing location of valve as discovered.

A review of the aircraft maintenance logbooks revealed that the most recent aircraft annual inspection was completed on October 9, 2023, and the 100 hour inspection was accomplished on May 15, 2024. At the time of the accident, the engine had accumulated 1119.5 hours of time-in-service since new. The airplane had flown about 39 hours since the most recent maintenance.

Date: 10/09/2023; Aircraft: N124RR; Type: Cirrus SR20; S/N: 2745; Hobbs: 1155.40; Total Time: 826.00

- 1) PERFORMED ANNUAL/100 HR INSPECTION IN ACCORDANCE WITH THE CIRRUS SR20 MAINTENANCE MANUAL.
- 2) FAR 91.411/91.413 PITOT-STATIC/TRANSPONDER CERTIFICATION PERFORMED BY PENINSULA AVIONICS, NEXT DUE : 10/2025.
- 3) FAR 91.207 ELT INSPECTION. BATTERY NEXT DUE : 11/2027.
- 4) INSPECTED CABIN FIRE EXTINGUISHER WEIGHT : 2 LBS, NEXT DUE : 10/2024.
- 5) PERFORMED CAPS ELECTRICAL INSPECTION.
- 6) INSTALLED NEW ENGINE AIR FILTER P/N # 31077-002
- 7) SERVICED NLG OLEO STRUT WITH NITROGEN.
- 8) INSTALLED NEW NLG TRUSH WASHER P/N # 50545-001. ADJUSTED NLG STEERING DEFLECTION TENSION.
- 9) INSTALLED NEW LEFT AND RIGHT BRAKE PADS, P/N # 31392-105.
- 10) FLIPPED LEFT AND RIGHT MAIN LANDING GEAR TIRES. INSTALLED NEW (2 EACH) O-RINGS P/N # 31493-110. SERVICED TIRES WITH NITROGEN.
- 11) INSTALLED NEW (2 EACH) #2 BATTERIES, P/N # 50979-001.. (2 YEAR ITEM) NEXT DUE : 10/2025.
- 12) PERFORMED ALTERNATOR #1 500 HR INSPECTION. INSTALLED NEW BRUSH HOLDER ASSEMBLY, P/N # ALU-3045BS. NEXT DUE : FLT 1326.0
- 13) PERFORMED ALTERNATOR #2 500 HR INSPECTION. INSTALLED NEW BRUSH HOLDER ASSY P/N # 40278. NEXT DUE : FLT 1326.0
- 14) PERFORMED CIRRUS SB 2X-25-30 BOLT ADJUSTMENT - INSPECTED AND ADJUSTED CREW SEAT OVER BOLT TO SPECS AND SERVICE BULLETIN.
- 15) PERFORMED CIRRUS 2X-42-23 INTEGRATED MODULAR AVIONICS - UPDATE FIRMWARE, CHECK FOR CAS MESSAGES. SYSTEM OK.
- 16) INSTALLED NEW ENGINE COWLING SEAL P/N # 53168-125U.

Date: 5/15/2024; Aircraft: N124RR; Type: Cirrus SR20; S/N: 2745; Total Time: 1080.60; Engine - Type: IO-390-C3B6, S/N: L-1550-80E, Time: 1080.60

- 1) CIRRUS MAINTENANCE PROGRAM CMX IN SERVICE INSPECTION (100 HR INSPECTION) .
- 2) PERFORMED ENGINE OPERATIONAL AND FUNCTION CHECK IAW CIRRUS AMM 5-30.
- 3) PERFORMED ENGINE 100 HR INSPECTION IAW CIRRUS AMM 5-20 AND LYCOMING MAINTENANCE MANUAL.
- 4) DRAINED ENGINE OIL AND SERVICED WITH PHILLIPS 20W50 OIL. REPLACED OIL FILTER WITH NEW. PERFORMED PARTICULATE INSPECTION ON FILTER, NO DISCREPANCIES NOTED. REMOVED, INSPECTED, CLEANED AND REINSTALLED OIL SUCTION SCREEN, NO DISCREPANCIES NOTED. RUN UP AND LEAK CHECKS PERFORMED WITH NO DISCREPANCIES NOTED. ALL WORK ACCOMPLISHED IAW CIRRUS AMM 12-10 AND LYCOMING MAINTENANCE MANUAL.
- 5) PERFORMED CYLINDER BORESCOPE INSPECTION, DIFFERENTIAL COMPRESSION CHECK AND INERCYLINDER BAFFLE INSPECTION IAW LYCOMING MAINTENANCE MANUAL. COMPRESSION RESULTS AS FOLLOWS : #1 76/80, #2 74/80, #3 55/80, #4 66/80.
- 6) CLEANED ALL FUEL NOZZLES. NEXT INSPECTION DUE : 1380.60
- 7) ADJUSTED LEFT AND RIGHT MAGNETO TIMING PER CIRRUS SR20 M.M. AND LYCOMING SPECS.
- 8) INSTALLED NEW #1, #3, #4 SPARK PLUGS P/N # URHB37E
- 9) ADJUSTED IDLE/MIXTURE AS PER AVSTAR LETTER : AFS-SIL-01.
- 10) WASHED ENGINE AND APPLIED CORROSION 'X' TREATMENT.

THE ENGINE IDENTIFIED ABOVE WAS REPAIRED AND INSPECTED IN ACCORDANCE WITH CURRENT REGULATIONS OF THE FEDERAL AVIATION ADMINISTRATION AND IS APPROVED FOR RETURN TO SERVICE. PERTINENT DETAILS OF THE ENGINE ARE ON FILE UNDER CORRESPONDING SHOP ORDER REFERENCED NUMBER : 24-6937
DATE : 05/15/2024
SIGNATURE OF AUTHORIZED REPRESENTATIVE

FOR: ADVANCED AIRCRAFT CENTER, INC PETER J. LO BELLO A& [REDACTED]

Figure 4 Top and bottom: Logbook entries showing the last maintenance on the airframe/engine.

3.0 Propeller Examination

The propeller remained attached to the engine crankshaft flange. The propeller spinner was undamaged. All three propeller blades were cut by recovery

personnel about 18 inches outboard of the propeller hub. All three blades could be rotated in the hub by hand pressure. The cut-off portions of the blades were curled forward near the tips.

About two inches of the blade tips were separated from two of the blades. The blade tips exhibited twisting toward the blade faces. Recovery personnel reported that tree limbs with angular cuts consistent with propeller blade contact were observed at the accident site.

The propeller governor, cable and control arm remained attached. The control cable support bracket was impact damaged. The governor was removed and the governor input spline rotated by hand. The governor oil screen was absent of debris. The blades were cut under the direction of the IIC to facilitate a safe engine run. The blades were measured and cut equally down to the midspan point.

4.0 Pilot Information

The private pilot, [REDACTED] and held an airplane single engine land rating. He held a class 3 medical certificate issued on November 29, 2022. Pilot record documentation showed he had about 204 hours total time hours and 80 hours in the accident airplane make and model.

5.0 Meteorological Information

Location.....: KACY
Day of month.....: 31
Time.....: 19:54 UTC
Report is fully automated, with no human intervention or oversight.
Wind.....: true direction = 220 degrees; speed = 9 knots
Visibility.....: 10 Statute Miles
Cloud coverage.....: few (1 to 2 oktas) at 3600 feet above aerodrome level
Temperature.....: 32 degrees Celsius
Dewpoint.....: 22 degrees Celsius
QNH.....: 29.89 inHg

Remarks
site is automated and has a precipitation sensor.
Unknown Remark token: LTG
Unknown Remark token: DSNT
Unknown Remark token: NE
Sea Level Pressure...: 1012.1 Mb

Temperature.....: 32.2 degrees Celsius
Dew Point.....: 21.7 degrees Celsius

6.0 Documentation

A review of the historical maintenance records going back 27 months did not reveal any maintenance or other repair work that would point to a loss of engine power or performance. There was no work performed on the induction system, nor the alternate air valve. The maintenance records indicated that maintenance was routine 50, 100 hr. and annual inspections and no significant irregularities were documented.

Submitted by:

McCarter, Lawrence Aaron
Aviation Accident Investigator IIC