

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24FA309

WRECKAGE EXAMINATION REPORT

October 29, 2024

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A. ACCIDENT

Location: Lancaster, California
Date: September 22, 2024
Time: 1248 Pacific Daylight Time
Airplane: Nanchang CJ-6A, Registration N313YK; Yakovlev Yak 52 N5287

B. PARTICIPANTS

IIC	Stephen Stein National Transportation Safety Board Federal Way, Washington
Investigator	Kathryn Whitaker National Transportation Safety Board Federal Way, Washington
Engine Technical Expert	Jill Gernetzke M-14P, Inc. Kingman, Arizona
Engine Technical Expert	Kevin Curtis M-14P, Inc. Kingman, Arizona

C. SUMMARY

The CJ-6A impacted the ground upright approximately 1.5 nm northwest of the Yak 52 and was extensively damaged by impact forces. The left elevator was not found onscene and a subsequent ground search of the surrounding area located a portion of a VOR antenna from the vertical stabilizer of the CJ-6A and a portion of cowling from the Yak 52. Propeller blade fragments were found in the left wing of the CJ-6A accompanied by a large tear and deformation to the top skin. Both propeller blades from the Yak 52 had separated at their blade roots.

D. DETAILS OF THE INVESTIGATION

1.0 Airframe Examination

1.1 Flight Controls

N313YK

The flight controls were traced from the right and left aileron to the forward flight stick in the cockpit. The right aileron control push rod beneath the cockpit was fractured and had separated from the flight control stick. Both flight control sticks were broken. The elevator control rod between the forward and aft flight control sticks was intact and remained secure at each of its attachment points. Elevator control authority was traced from the elevator bell crank in the empennage to the cockpit. The rudder system was continuous from the rudder horn to separations at the right and left rudder in the forward cockpit through its attachments in the aft cockpit.

The Yak 52 flight control system was intact and unremarkable.

1.2 Midair Contact Signatures

N313YK

The CJ6 displayed multiple paint transfer signatures, score marks, tears, gouges, and separations. The left wing contained a 3 foot long tear abut midspan with a section of wooden propeller with wood fragmentation inside the wing. Yellow paint transfer marks and light gray or white scuffing was observed aft of the tear. The scuffing was oriented about 25° to the right of the longitudinal axis of the airplane. White/light grey scuffing was also observed on the outboard top skin of the left horizontal stabilizer oriented 47° to the right of the longitudinal axis. The leading edge of the left horizontal stabilizer exhibited a chordwise tear and was deformed from midspan to the stabilizer tip, with an impression and paint deterioration at the leading edge of the horizontal stabilizer tip. Additional light grey striated marks were observed on the top skin of the aft fuselage oriented 25° to the right of the longitudinal axis of the airplane. The lower leading edge of the vertical stabilizer was crushed.



Figure 1: N313YK left wing with propeller fragments



Figure 2: Yellow paint transfer marks and white/grey scuffing on left wing of N313YK

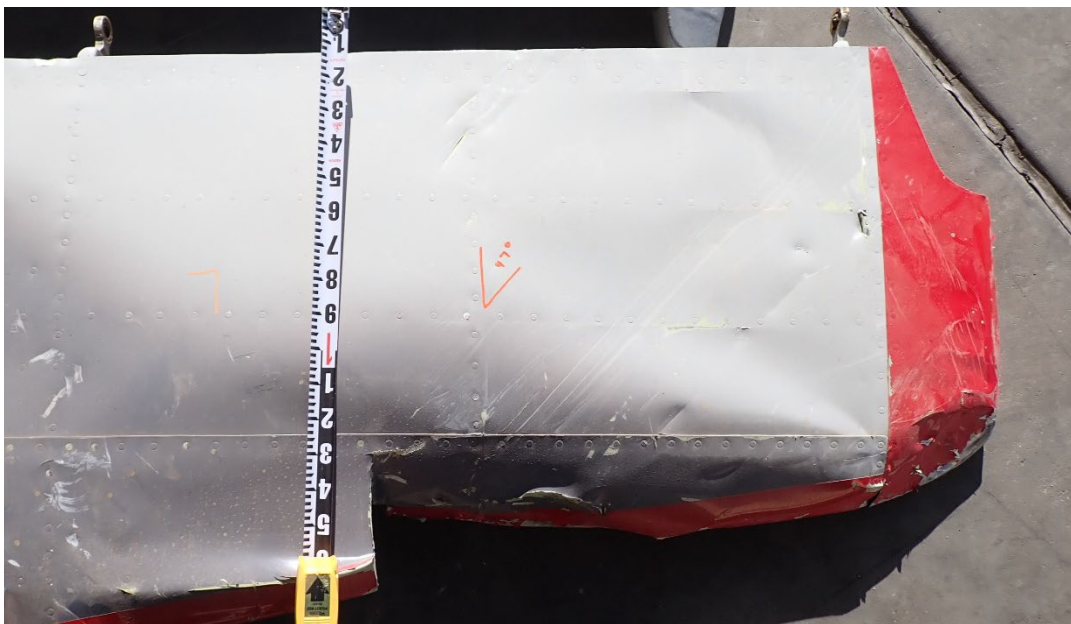


Figure 3: Left horizontal stabilizer of N313YK



Figure 4: Top skin of aft fuselage (N313YK)

N5287

The left wing of the Yak 52 exhibited white/light grey scuffing that was oriented 47° relative to the longitudinal axis of the airplane. An arcing red paint transfer mark that had an approximate diameter of 4 foot 7 inches was observed on the top skin at the inboard left wing. The left side canopy plexiglass at the aft cockpit was broken and a portion of the left side canopy frame was bent. An approximately 1 foot 7 inch long gouge along the chordwise axis of the left wing that terminated with a concaved shaped depression was located about midspan.



Figure 5: Leading edge top skin left wing of N5287

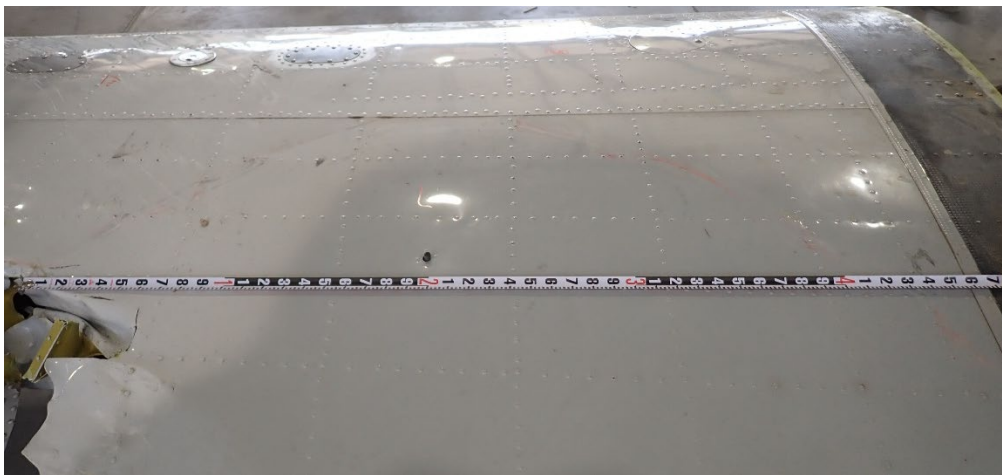


Figure 6: Inboard top skin of left wing N5287



Figure 7: Left wing midspan trailing edge of N5287

2.0 Engine Examination

N313YK

The airplane was equipped with a Vedeneyev, M-14P (s/n K(ya)832018), an air-cooled, radial, 360 hp, reciprocating engine. All of the accessories remained attached to the engine. The power section was displaced slightly downward and the reduction gearbox was fractured along the circumference. The cylinder 4 intake and exhaust push rods were bent and the cylinder 6 exhaust push rod was bent.

Mechanical continuity of the engine could not be achieved due to damage from impact forces. The airplane was equipped with Iridium BR7EIX automotive massive electrode spark plugs. The forward and aft spark plugs remained attached at each cylinder with most of the ignition harness leads secured with exception of no. 5, which was broken at both the terminal and insulator. The forward plugs were removed and mostly exhibited coloration consistent with normal wear with exception of plug 6, which was oil soaked. The left and right magnetos were intact; the left magneto was fractured at its mounting pad and the right magneto remained secured at its pad. The right magneto exhibited normal firing when rotated using a power drill. The left magneto displayed limited rotation only in the direction opposite normal rotation and a spark could not be generated. The ignition harness was

unremarkable. Both magneto distributor caps were normal in appearance and did not display any evidence of striking.

The fuel pump remained attached to its mounting pad at the oil pump. The fuel pump was removed and tested using a flow gauge. The inlet tube was placed in a container of solvent, which was used for the test. The gauge showed 5.5 psi as the unit was rotated with a power drill. The carburetor was intact and secured at the power section. The carburetor fuel screen was free of debris and the unit was left untouched for bench testing. The throttle arm had separated from the carburetor. The stop arm remained attached and was positioned about 60% full throttle. The gascolator cylinder was void of fuel and the screen was free of debris. A trace amount of oil was observed on the screen; however, the gascolator outlet line had separated at the cylinder and oil was found along the rim of the outlet collar. The airbox was crushed into the carburetor.

The oil filter element, oil inlet screen, and airframe oil filter were free of debris.

N5287

The airplane was equipped with a Vedeneyev, M-14P (s/n K(ya)332064), an air cooled, radial, reciprocating engine. The top cowl louvers were crushed along with the engine cowl above the louvers. The engine accessories were all intact and undamaged.



Figure 8: M-41P engine installed on Yak-52 prior to examination

Mechanical continuity of the crankshaft and valvetrain were achieved as the engine was rotated by hand at the propeller. Each of the cylinders displayed normal lift and thumb compression was attained for each of the 9 cylinders as the propeller was rotated. Each of the 9 forward and aft spark plugs remained within their plug ports with their ignition harness leads attached. The forward spark plugs were removed and all exhibited coloration consistent with normal operation. Both the left and right magnetos were secured at their respective mounting pads and both displayed normal spark when rotated using a power drill.

The fuel pump was removed and displayed consistent flow with the inlet line submerged and the drive rotated using a power drill. The carburetor screen was free of debris as was the metal fine fuel screen and the gascolator screen. However, the fuel removed from the gascolator exhibited a dark color and a trace amount of ferrous fragments were observed at the bottom of the sample. The fuel sample exhibited an odor consistent with 100 low lead aviation grade gasoline. The carburetor diaphragm was intact and pliable with no indications of fraying. The butterfly valve articulated freely when the throttle arm was rotated by hand.

The oil inlet screen and chip detector were free of debris.



Figure 9: N5287 forward spark plugs



Figure 10: Metal fine mesh fuel screen from engine (N5287)



Figure 11: Gascolator screen and fuel sample from engine (N5287)



Figure 12: Oil inlet screen and chip detector from engine (N5287)

Submitted by:

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