Aviation Investigation Final Report

Location:	Findlay, Ohio	**Accident Number:**	ERA22LA310
Date & Time:	July 3, 2022, 09:30 Local	**Registration:**	N55JV
Aircraft:	CUBCRAFTERS INC CC11-160	**Aircraft Damage:**	Substantial
Defining Event:	Sys/Comp malf/fail (non-power)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Flight test		

Analysis

The pilot, who was also a mechanic, purchased the airplane after it had been involved in an accident. The pilot completed major repairs and a conditional inspection on the airplane and planned to complete the first test flight from a soybean farm field near his residence. He taxied the airplane to the field and completed a normal run-up. He then operated the electric horizontal stabilizer trim, via the rocker switch on the control stick, to the takeoff position (full nose up) as indicated on the primary flight display (PFD).

When the trim indicator reached the takeoff position, he removed his thumb from the trim switch and initiated the takeoff roll. The airplane accelerated normally, and he moved the control stick aft to rotate however, a heavy nose down pressure was felt. He immediately aborted the takeoff and, in his effort to slow the airplane, it nosed over. The left wing and empennage sustained substantial damage.

Examination of the horizontal stabilizer trim position found that it was set to a full nose down position, as observed at the control surface and on the PFD trim indication.

Examination of the trim rocker switch found that it would operate the trim actuator; however, when the switch was released, it would not return to the neutral position as designed. In order to stop the trim movement from continuing to run until it reached its maximum nose up/down limit, the switch was required to be moved to the center position, which would stop the trim movement.

It is likely that the stabilizer trim continued to operate towards the nose down position during the takeoff roll, after the pilot had released his thumb from the switch, which resulted in the pilot feeling a heavy nose down force during the takeoff.

There was no evidence that the pilot/mechanic evaluated the rocker switch's proper operation during the major repairs and recent conditional inspection. Had he inspected the switch for

proper movement, it is likely that he would have detected the faulty condition of the switch, and the accident likely would have been prevented.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The pilot/mechanic's inadequate inspection of the faulty horizontal stabilizer trim switch, which resulted in an uncommanded trim movement during the takeoff roll, which resulted in an aborted takeoff, and subsequent nose over.

Findings

Personnel issues	Preflight inspection - Pilot
Aircraft	(general) - Inadequate inspection

Factual Information

History of Flight

Prior to flight	Aircraft inspection event
Takeoff	Sys/Comp malf/fail (non-power) (Defining event)
Takeoff-rejected takeoff	Nose over/nose down

On July 3, 2022, about 0930 eastern daylight time, a Cub Crafters CC11 160 airplane, N55JV, was substantially damaged when it was involved in an accident near Findlay, Ohio. The commercial pilot was not injured. The airplane was operated by the pilot as a flight test conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91.

The pilot reported that the airplane was involved in an accident in 2020 (in which he was not the pilot). He purchased the airplane and made extensive repairs to return it to an airworthy condition. This accident flight was the first test flight since the previous accident. The pilot taxied from his property to an adjacent off-airport soybean farm field and performed a run-up without issue. He then operated the electric horizontal stabilizer trim via the rocker switch on the control stick, to the “nose up position” as indicated on the primary flight display (PFD). He then moved the trim back in a nose down direction towards the neutral takeoff position.

When the trim indicator reached the takeoff position, he removed his thumb from the trim switch and initiated the takeoff roll. The airplane accelerated normally, and he moved the control stick aft to rotate; however, he felt a “very heavy” nose down pressure on the control stick. He immediately aborted the takeoff and, in his effort to slow the airplane, it nosed over. The left wing and empennage sustained substantial damage.

A Federal Aviation Administration (FAA) inspector examined the airplane after it was moved from the accident site. The horizontal stabilizer trim position found at the flight control surface and as indicated on the PFD was consistent with a full nose down setting. The pilot reported that shortly after the accident he observed this trim setting as well.

Examination and tests of the trim rocker switch found that it would move the horizontal stabilizer; however, when the switch was released, it would not return to the neutral position as designed. In order to stop the trim movement, the switch needed to be moved to the center position, or else it would continue until the maximum nose up/down limit was reached.

The airplane’s operating manual described that pitch trim was accomplished via an electric servo which moved the leading edge of the horizontal stabilizer up and down, changing the angle of incidence. The servo was actuated with a rocker switch located on the control stick.

Review of maintenance records found that the accident pilot was the mechanic who completed the major repair and alteration and the most recent conditional inspection. The repairs were completed and signed off on June 27, 2022. According to the FAA inspector who

interviewed the mechanic/pilot, he was unable to provide evidence or indication that the trim switch had been inspected for proper operation during the most recent repairs or preflight prior to the flight test.

The airplane was involved in an accident on September 18, 2020 (National Transportation Safety Board investigation identification number CEN20CA404). The trim system was not reported as a factor in the accident.

Pilot Information

Certificate:	Commercial	**Age:**	71,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	BasicMed None	**Last FAA Medical Exam:**	May 19, 2022
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	November 15, 2020
Flight Time:	18000 hours (Total, all aircraft), 35 hours (Total, this make and model), 17700 hours (Pilot In Command, all aircraft), 20 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	CUBCRAFTERS INC	**Registration:**	N55JV
Model/Series:	CC11-160 NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	2015	**Amateur Built:**	
Airworthiness Certificate:	Experimental light sport (Special)	**Serial Number:**	CC11-00392
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	June 27, 2022 Condition	**Certified Max Gross Wt.:**	1320 lbs
Time Since Last Inspection:	0.3 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	442.3 Hrs at time of accident	**Engine Manufacturer:**	TITAN
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	OX-4300CC-B3J3N4/D8B002
Registered Owner:	C & J AIR INC	**Rated Power:**	180 Horsepower
Operator:	C & J AIR INC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KFDY,812 ft msl	**Distance from Accident Site:**	4 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	281°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	60°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.15 inches Hg	**Temperature/Dew Point:**	26°C / 14°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Findlay, OH	**Type of Flight Plan Filed:**	None
Destination:	Findlay, OH	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	NONE NONE	**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	Dry;Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	41.002437,-83.589526(est)

Administrative Information

Investigator In Charge (IIC):	Gerhardt, Adam
Additional Participating Persons:	John Welsh; FAA/FSDO; Columbus, OH
Original Publish Date:	November 15, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=105470