



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Andrews, North Carolina	<b>Accident Number:</b>	ERA23FA194
<b>Date &amp; Time:</b>	April 15, 2023, 10:39 Local	<b>Registration:</b>	N2357
<b>Aircraft:</b>	HOLLAND TRAVIS E VELOCITY	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Analysis

The owner recently purchased the experimental amateur-built, modified airplane. He did not have a lot of experience in the make and model airplane, so he hired the accident pilot to conduct the first flight since recent modifications.

Witness statements and recorded video showed that during the takeoff roll from the 5,500-ft-long asphalt runway, the airplane accelerated slower than normal, used more runway than normal, and lifted off the runway in a nose-high attitude. The airplane then descended back to the runway and bounced before lifting off nose-high again toward the end of the runway. It climbed about 300 ft above ground level while flying a left traffic pattern back to the runway. Near the crosswind to downwind turn, the engine sounded loud, and the airplane descended into a wooded field and a postimpact fire ensued.

The owner stated that the engine was equipped with a fixed-pitch cruise propeller. With the turbocharger engaged, the engine would produce 2,300 rpm; however, with the turbocharger bypassed, the engine would only produce about 2,050 rpm. A spring switch in the cockpit controlled the turbocharger wastegate, to select whether the turbocharger was engaged or bypassed (or midrange). The owner added that, at 2,050 rpm, the airplane would not be able to fly with one pilot and full fuel, which it had for the accident takeoff. The owner reported that he discussed the turbocharger operation with the pilot.

Examination of the wreckage revealed that the turbocharger wastegate was found in an open position. No other anomalies were noted that would have precluded normal operation. It is likely that the pilot had inadvertently bypassed the turbocharger and then attempted to continue the takeoff with the engine only developing partial power. His decision to continue, rather than reject the takeoff, resulted in the airplane's subsequent powered descent and collision with terrain.

## Probable Cause and Findings

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

The pilot’s failure to engage the turbocharger for takeoff and his improper decision to continue the takeoff with partial power, rather than reject the takeoff.

### Findings

Personnel issues	Decision making/judgment - Pilot
Personnel issues	Use of equip/system - Pilot
Aircraft	Angle of attack - Capability exceeded
Aircraft	Turbocharger - Incorrect use/operation

# Factual Information

## History of Flight

Initial climb	Loss of control in flight (Defining event)
Initial climb	Aerodynamic stall/spin
Uncontrolled descent	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

On April 15, 2023, about 1039 eastern daylight time, an experimental amateur-built Velocity, N2357, was destroyed when it was involved in an accident near Andrews, North Carolina. The commercial pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

According to the current airplane owner, who was the fifth owner, the airplane suffered a landing accident in 2004 and was purchased by a salvage facility. That facility removed the engine and avionics, then sold it to the previous owner, who installed a newly overhauled engine equipped with a turbocharger. The current owner purchased the airplane and installed a new propeller and avionics. At the time of the accident, the engine had about 54 hours of operation since overhaul in 2012. Due to the modifications, a Federal Aviation Administration (FAA) designated airworthiness representative (DAR) inspected the airplane, issued an amended airworthiness certificate with revised operating limitations, and endorsed the airframe logbook on April 1, 2023. The accident flight was the first flight since that endorsement.

The current owner added that he was a private pilot with about 90 hours of flight experience, of which about 10 hours were in the make and model airplane. Since he had little experience, he hired the accident pilot to fly the first flight since the modifications/DAR endorsement. The accident pilot inspected the airplane for about 1.5 hours before the accident takeoff. The owner saw the airplane take off on runway 26, a 5,500-ft-long runway, but subsequently lost sight of it behind buildings.

Witnesses reported that the airplane took off and climbed about 300 ft above ground level while flying a left traffic pattern back to runway 26. Near the crosswind to downwind turn, the engine sounded loud, and the airplane descended into a wooded field and a postcrash fire ensued.

The owner further stated that the engine was equipped with a fixed-pitch cruise propeller. With the turbocharger engaged, the engine would obtain 2,300 rpm; however, with the turbocharger bypassed, the engine would only obtain about 2,050 rpm. A spring switch in the cockpit

controlled the turbocharger wastegate, to select whether the turbocharger was engaged or bypassed (or midrange). The owner added that, at 2,050 rpm, the airplane would not be able to fly with one pilot and full fuel, which it had for the accident takeoff.

The owner provided a video that he recorded of a portion of the takeoff. Review of the video revealed that during the takeoff roll the airplane accelerated slower than normal, used more runway than normal, and lifted off the runway in a nose-high attitude. The airplane then descended back to the runway and bounced before lifting off nose-high again toward the end of the runway, where the video ended.

### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	36, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	Airplane; Helicopter	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Helicopter; Instrument helicopter	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 None	<b>Last FAA Medical Exam:</b>	February 7, 2018
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	(Estimated) 450 hours (Total, all aircraft)		

The pilot's logbook was not recovered. On his most recent application for an FAA first class medical certificate, dated February 7, 2018, he reported a total flight experience of 450 hours.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	HOLLAND TRAVIS E	<b>Registration:</b>	N2357
<b>Model/Series:</b>	VELOCITY	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1996	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	FGA-001
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	March 31, 2023 Condition	<b>Certified Max Gross Wt.:</b>	2300 lbs
<b>Time Since Last Inspection:</b>	0 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	197 Hrs at time of accident	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	C126 installed, not activated	<b>Engine Model/Series:</b>	IO-360-A1D
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	RHP,1698 ft msl	<b>Distance from Accident Site:</b>	1 Nautical Miles
<b>Observation Time:</b>	10:39 Local	<b>Direction from Accident Site:</b>	44°
<b>Lowest Cloud Condition:</b>	Scattered / 1200 ft AGL	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	Broken / 2900 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots /	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	260°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.05 inches Hg	<b>Temperature/Dew Point:</b>	17°C / 12°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Andrews, NC	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Andrews, NC	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>	Western Carolina Regional Airport RHP	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	1698 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	26	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	5500 ft / 100 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Fatal	<b>Latitude, Longitude:</b>	35.1834,-83.880433(est)

The wreckage came to rest inverted, oriented about a 075° magnetic heading. The left wing was separated and found against a tree inverted at the beginning of the debris path. The main wreckage was at the end of the 50-ft-long debris path and consumed by fire. No cockpit controls or instrumentation was identified.

No seats or restraints were identified. The left aileron and left rudder separated and were recovered near the left wing. The right wing and canard remained with the main wreckage and were consumed by fire. The flight controls consisted of control rods and push-pull tubes. Flight control continuity and trim continuity could not be verified due to fire damage.

The engine came to rest inverted and separated from the airframe. The two-blade propeller remained attached to the hub. One blade appeared undamaged while the other blade exhibited charring and tip separation. The top spark plugs were removed; their electrodes were intact and light gray in color (the Nos. 1 and 3 electrodes were oil soaked).

Borescope examination of the cylinders did not reveal any anomalies. The crankshaft was rotated via an accessory gear drive. Crankshaft, camshaft, and valvetrain continuity were confirmed to the rear accessory section of the engine, and thumb compression was attained on all cylinders. Both magnetos had separated from the engine. One magneto was recovered, and it produced spark at all leads when rotated via electric drill. The other magneto was not located. Due to thermal damage, the fuel system could not be tested. The turbocharger wastegate was found in an open position.

The turbocharger was further examined following wreckage recovery. It exhibited thermal damage, and the turbine would not initially rotate. WD-40 lubricant was applied to the turbine side and compressor side and the unit sat for several minutes. The turbine and its shaft then rotated freely by hand; however, the compressor was melted and did not turn along with the shaft. The compressor side was disassembled for further examination. No scoring was noted on the compressor housing and all compressor wheel blades were intact. The compressor nut was found about two threads loose. The internal housing of the compressor wheel and its corresponding position on the shaft were examined and no rotational scoring was noted.

### **Medical and Pathological Information**

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An autopsy was performed on the pilot by the North Carolina Office of The Chief Medical Examiner, Raleigh, NC. The cause of death was reported as "multiple blunt force injuries." Toxicological testing was performed on specimens from the pilot by the FAA Office of Forensic Sciences, Oklahoma City, Oklahoma. The results were negative for drugs and alcohol.

## Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Michael Guidice; FAA/FSDO; Charlotte, NC James Childers; Lycoming; Williamsport, PA
Original Publish Date:	June 5, 2024
Last Revision Date:	
Investigation Class:	<a href="#">Class 3</a>
Note:	
Investigation Docket:	<a href="https://data.nts.gov/Docket?ProjectID=107060">https://data.nts.gov/Docket?ProjectID=107060</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).