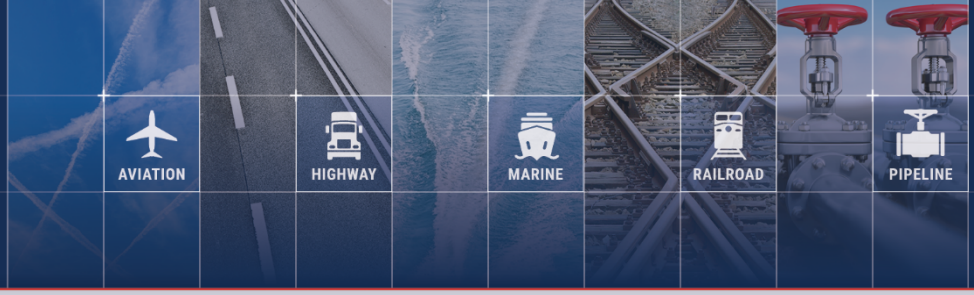

Aviation Investigation Final Report

Location:	Amana, Iowa	**Accident Number:**	CEN21LA329
Date & Time:	July 19, 2021, 14:10 Local	**Registration:**	N8422K
Aircraft:	GRUMMAN ACFT ENG COR-SCHWEIZER G-164B	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The pilot of the agricultural airplane reported that the airplane's engine lost power shortly after takeoff. The airplane settled into the corn field off the departure end of the runway and nosed over. The airplane sustained substantial damage to its left wing and fuselage.

All three propeller blades exhibited aft bending, bending opposite rotation, twisting toward low pitch and chordwise/rotational scoring predominately on the camber side which was consistent with impact at low power. Examination of the engine revealed a discontinuity in the drive system consisting of a broken torsion shaft. The broken torsion shaft is indicative of the engine operating at the time of impact. Examination of the fuel control unit and the propeller governor did not reveal any anomalies. No anomalies were found with respect to the engine, propeller, fuel control unit, or propeller governor that would explain the reported loss of engine power.

Based on the results of testing and examination, the reason for the reported loss of engine power could not be determined.

Probable Cause and Findings

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

The loss of engine power for reasons that could not be determined.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)

On July 19, 2021, about 1410 central daylight time, a Grumman G-164B agricultural airplane, N8422K, was substantially damaged when it was involved in an accident near Amana, Iowa. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 137 aerial application flight.

The airplane operator reported that the airplane's engine lost power shortly after departure from runway 26 at the Amana Airport (C11). The accident takeoff was the 6th takeoff of the day after the engine was started about 0630. Before takeoff, the airplane was loaded with 420 gallons of fungicide and 110 gallons of fuel. The pretakeoff engine indications were normal and the airplane accelerated normally, lifted off at an airspeed of about 65 mph, and then accelerated in ground effect to about 78 mph when the engine lost power. The airplane then settled back into a cornfield about 300 ft from the end of the runway. The airplane nosed over and came to rest inverted and sustained substantial damage to the fuselage and wings.

During a postaccident examination, all three propeller blades were bent aft and opposite the direction of rotation. The blades were twisted toward low pitch and chordwise/rotational scoring was visible predominately on the cambered side of the blades. Additionally, the propeller examination found no visible preimpact discrepancies that would have prevented normal propeller operation.

The engine was a Honeywell model TPE331-6-252M turbo-propeller engine. It was a single-shaft engine with a two-stage centrifugal compressor, an annular combustion chamber, and a three-stage axial turbine that drives the compressor and the reduction/accessory gearbox. An attempted engine run at the manufacturer's facility indicated low torque indicative of a discontinuity in the drive system. Subsequent disassembly of the engine confirmed that the aft end of the torsion shaft was found free and resting against the splined end of the main shaft. Further examination of the engine revealed that burnt fibrous material was found throughout the engine. No pre-impact damage was found in the engine that would have precluded normal operation.

The propeller governor and fuel control unit were tested at the manufacturer's facility. Except for slight deviations attributed to possible field adjustments, both the governor and fuel control unit operated within the manufacturer's specifications. No anomalies were detected that would have prevented normal operation.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	44
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	August 12, 2020
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 18, 2021
Flight Time:	10693 hours (Total, all aircraft), 7912.8 hours (Total, this make and model), 343.6 hours (Last 90 days, all aircraft), 206.8 hours (Last 30 days, all aircraft), 12 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	GRUMMAN ACFT ENG COR-SCHWEIZER	**Registration:**	N8422K
Model/Series:	G-164B	**Aircraft Category:**	Airplane
Year of Manufacture:	1976	**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	80B
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	1 Turbo prop
Airframe Total Time:		**Engine Manufacturer:**	Honeywell
ELT:	Not installed	**Engine Model/Series:**	TPE-331
Registered Owner:	THOMPSON AERO INC	**Rated Power:**	
Operator:	THOMPSON AERO INC	**Operating Certificate(s) Held:**	Agricultural aircraft (137)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KCID,868 ft msl	**Distance from Accident Site:**	8 Nautical Miles
Observation Time:	13:52 Local	**Direction from Accident Site:**	51°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 4100 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	20°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.19 inches Hg	**Temperature/Dew Point:**	28°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Amana, IA	**Type of Flight Plan Filed:**	None
Destination:	Amana, IA	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Airport Information

Airport:	AMANA C11	**Runway Surface Type:**	Grass/turf
Airport Elevation:	712 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	26	**IFR Approach:**	None
Runway Length/Width:	2600 ft / 95 ft	**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:**	41.794664,-91.865018(est)

Administrative Information

Investigator In Charge (IIC):	Hatch, Craig
Additional Participating Persons:	Mike Newhall; FAA FSDO; Des Moines, IA Dana Metz; Honeywell; AZ Les Doud; Hartzell Propellers; OH
Original Publish Date:	August 16, 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=103512