



# Aviation Investigation Final Report

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<b>Location:</b>	Kenai, Alaska	<b>Accident Number:</b>	ANC23LA005
<b>Date &amp; Time:</b>	October 26, 2022, 16:56 Local	<b>Registration:</b>	N8119D
<b>Aircraft:</b>	Piper PA-22-160	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

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## Analysis

Shortly after takeoff, the engine lost power and the propeller began to windmill. The flight instructor conducted emergency procedures but was unable to regain engine power. The flight instructor determined that they did not have sufficient altitude to make it back to the airport and he selected a road on which to make a forced landing. To avoid a car, the pilot turned slightly towards the edge of the road and was pulled into a snow berm, where the aircraft came to a full stop. The airplane sustained substantial damage to the right wing and fuselage.

A postaccident examination of the engine found the crankshaft drive gear bolt was missing and the gear alignment dowel pin on the crankshaft was broken. The missing bolt was not found during the postaccident examination. The engine was last disassembled in 1983 and the accessory gearbox was opened for an oil pump rebuild in 2006; the investigation was not able to identify how long the engine had operated with the bolt missing. The crankshaft drive gear drives the accessory gear box and, according to the engine manufacturer, failure of the gear or the gear attaching parts would result in complete engine stoppage.

## Probable Cause and Findings

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

Improper installation of the crankshaft drive gear by maintenance personnel, who failed to install all required hardware, resulting in an in-flight engine failure.

## Findings

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<b>Aircraft</b>	Recip eng rear section - Incorrect service/maintenance
<b>Personnel issues</b>	Installation - Maintenance personnel

## Factual Information

### History of Flight

<b>Initial climb</b>	Loss of engine power (total) (Defining event)
<b>Landing-landing roll</b>	Collision with terr/obj (non-CFIT)

On October 26, 2022, about 1656 Alaska daylight time, a Piper PA-22-160, N8119D, sustained substantial damage when it was involved in an accident in Kenai, Alaska. The flight instructor and the pilot receiving instruction, who was a private pilot, sustained no injuries. The airplane was operated by the instructor pilot as a Title 14 *Code of Federal Regulations* Part 91 general aviation flight.

The purpose of the flight was to conduct pilot training. The airplane took off from the Kenai Municipal Airport, Kenai. Shortly after takeoff, the engine lost total power and the propeller began to windmill. The flight instructor conducted emergency procedures but was unable to regain engine power. The flight instructor informed the airport tower of their loss of engine power and was cleared to land back at the airport. He determined that they did not have sufficient altitude to make it back to the airport and landed on a road about 2 miles southeast of the airport. During the landing, to avoid a car, the flight instructor turned slightly towards the edge of the road and was pulled into a snow berm where the airplane came to rest. The airplane sustained substantial damage to the right wing and fuselage.

A postaccident examination of the engine revealed that the crankshaft drive gear was missing a bolt and a broken dowel pin on the crankshaft. The missing bolt was not found during the postaccident examination. The engine was last disassembled in 1983. The accessory gearbox was opened for an oil pump rebuild in 2006. The crankshaft drive gear drives the accessory gear box and, according to the engine manufacturer, failure of the gear or the gear attaching parts would result in complete engine stoppage.

## Pilot Information

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	31, Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea; Multi-engine land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 3 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	June 30, 2020
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	July 18, 2022
<b>Flight Time:</b>	963 hours (Total, all aircraft), 340.5 hours (Total, this make and model), 897.5 hours (Pilot In Command, all aircraft), 389.3 hours (Last 90 days, all aircraft), 86.3 hours (Last 30 days, all aircraft), 1.9 hours (Last 24 hours, all aircraft)		

## Student pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	17, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 3 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	July 28, 2022
<b>Occupational Pilot:</b>	UNK	<b>Last Flight Review or Equivalent:</b>	October 17, 2022
<b>Flight Time:</b>	116 hours (Total, all aircraft), 0 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N8119D
<b>Model/Series:</b>	PA-22-160	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1957	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	22-5610
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	100 hour	<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	C126 installed, not activated	<b>Engine Model/Series:</b>	O-360-A4A
<b>Registered Owner:</b>	HAM KEITH W	<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>	HAM KEITH W	<b>Operating Certificate(s) Held:</b>	Pilot school (141)
<b>Operator Does Business As:</b>	Kenai Aviation Training Academy	<b>Operator Designator Code:</b>	JCCS

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	PASX	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	16:30 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	/	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>		<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>		<b>Temperature/Dew Point:</b>	-3.9°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Kenai, AK (PAEN)	<b>Type of Flight Plan Filed:</b>	VFR
<b>Destination:</b>	Kenai, AK (PAEN)	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	16:30 Local	<b>Type of Airspace:</b>	Class D

## Wreckage and Impact Information

<b>Crew Injuries:</b>	2 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>		<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	60.542275,-151.19815

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Ward, Mark
<b>Additional Participating Persons:</b>	Kirk Engnes; FAA; Juneau, AK
<b>Original Publish Date:</b>	October 5, 2023
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=106291">https://data.nts.gov/Docket?ProjectID=106291</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](#).