Aviation Investigation Final Report

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

Analysis

Shortly after takeoff, the engine lost power and the propellor 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

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

Factual Information

History of Flight

Initial climb	Loss of engine power (total) (Defining event)
Landing-landing roll	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 propellor began to windmill. The flight instructor conducted emergency procedures but was unable to regain engine power. The flight instuctor 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

Certificate:	Commercial; Flight instructor	**Age:**	31,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	June 30, 2020
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 18, 2022
Flight Time:	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

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

Aircraft and Owner/Operator Information

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

Meteorological Information and Flight Plan

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

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	60.542275,-151.19815

Administrative Information

Investigator In Charge (IIC):	Ward, Mark
Additional Participating Persons:	Kirk Engnes; FAA; Juneau, AK
Original Publish Date:	October 5, 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=106291