Aviation Investigation Final Report

Location:	Laughlin, Nevada	**Accident Number:**	WPR15FA163
Date & Time:	May 17, 2015, 18:00 Local	**Registration:**	N4775W
Aircraft:	ROCKWELL COMMANDER 114	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of engine power (partial)	**Injuries:**	3 Fatal, 1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot/owner reported that, during the climb to between about 300 and 400 ft above the ground, the engine started running roughly, and the airplane was not accelerating or climbing. The terrain ahead was rising, so the pilot turned right. Due to the low altitude and reduced engine power, the pilot chose to conduct an off-airport landing, during which he attempted to troubleshoot the engine issue without success. As the airplane continued to descend, the pilot saw houses and bushes ahead; he aimed the airplane away from the houses, and the airplane eventually hit trees and terrain about 4.6 nautical miles from the airport. A postimpact engine fire ensued.

Postaccident examination of the engine revealed that the turbocharger was seized and that the exhaust side of the turbowheel was severely eroded, which led to the engine running rough. A review of the airplane's maintenance records revealed that a turbocharger normalization system had been installed on the airplane under a supplemental type certificate (STC) 13 years before the accident. The STC's instructions for continued airworthiness required that the turbocharger normalization system be inspected every 100 hours. However, a review of the airplane's maintenance records revealed that the system had only been inspected once since its installation and that the inspection was completed 6 years before the accident. No other abnormalities were noted with the airframe or engine that would have precluded normal operation. It is likely that the eroded turbowheel would have been detected if the turbocharger normalization system had been inspected as required.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:
A partial loss of engine power due to the turbocharger's seizure as a result of a severely worn turbowheel. Contributing to the accident was the failure of the pilot/owner to have the turbo

normalization system inspected every 100 hours as required, which allowed erosion on the exhaust side of the turbowheel to go undetected.

Findings

Personnel issues	Scheduled/routine inspection - Maintenance personnel
Aircraft	Turbocharger - Fatigue/wear/corrosion
Environmental issues	Rough terrain - Contributed to outcome

Factual Information

History of Flight

Initial climb	Loss of engine power (partial) (Defining event)
Emergency descent	Collision with terr/obj (non-CFIT)

On May 17, 2015, about 1800 Pacific daylight time, a Rockwell Commander 114B airplane, N4775W, crashed shortly after takeoff near Laughlin, Nevada. The private pilot/owner sustained serious injuries, and the three passengers sustained fatal injuries. The airplane was destroyed by impact forces and postcrash fire. The pilot was operating the airplane as a 14 Code of Federal Regulations Part 91 personal flight. Visual meteorological conditions existed at the accident site about the time of the accident, and no flight plan had been filed. The flight departed Laughlin/Bullhead International Airport (IFP), Bullhead City, Arizona, at 1756, destined for Goodyear, Arizona.

According to the pilot, he conducted an engine test run with no anomalies noted. At 1756, the tower controller cleared the flight for a straight-out departure to the south. During the climb to between about 300 and 400 ft above the ground, the engine started running roughly, and the airplane was not accelerating or climbing. The terrain ahead was rising, so the pilot turned right. Due to the low altitude and power, the pilot chose to conduct an off-airport landing, during which he attempted to troubleshoot the engine issue without success. As the airplane continued to descend, the pilot saw houses and bushes ahead; he aimed the airplane away from the houses, and the airplane eventually hit trees and terrain. A postimpact engine fire ensued.

Several witnesses near the accident site reported seeing the airplane flying at a very low altitude. One witness reported seeing it descend into trees followed by a fireball. Another witness reported seeing the airplane flying on a southbound track with its wings level and then descending out of his sight; he then saw an explosion followed by a fireball.

Pilot Information

Certificate:	Private	**Age:**	59,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Unknown
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	December 18, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 12, 2013
Flight Time:	2069 hours (Total, all aircraft), 1920 hours (Pilot In Command, all aircraft), 9 hours (Last 90 days, all aircraft), 2.2 hours (Last 30 days, all aircraft)		

Passenger Information

Certificate:		**Age:**	72
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Unknown
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	63
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	Unknown
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	57
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	Unknown
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

The pilot held a private pilot certificate with an airplane single-engine land rating. The pilot was issued a Federal Aviation Administration third-class medical certificate on December 18, 2014, with the limitations that he must wear corrective lenses/glasses for distant vision and possess glasses for near vision.

Aircraft and Owner/Operator Information

Aircraft Make:	ROCKWELL COMMANDER	**Registration:**	N4775W
Model/Series:	114 B	**Aircraft Category:**	Airplane
Year of Manufacture:	1976	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	14105
Landing Gear Type:	Retractable - Tricycle	**Seats:**	4
Date/Type of Last Inspection:	October 28, 2014 100 hour	**Certified Max Gross Wt.:**	3250 lbs
Time Since Last Inspection:	20 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	3436.5 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, not activated	**Engine Model/Series:**	IO-540-T4A5D
Registered Owner:	On file	**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

The four-seat airplane, serial number 14105, was equipped with a Lycoming IO-540-T4A5D engine, serial number L-15117-48A. A review of the airplane's logbooks revealed that its last annual inspection was completed on October 28, 2014, at a total airframe time of 3,436.5 hours. A review of the airplane's maintenance records revealed a total time since engine overhaul of 1,148.8 hours.

The maintenance records showed that, on May 11, 1995, A McCauley 3-bladed propeller and a Woodward Governor were installed in accordance with STC No. SA4444NM. The original propeller installed on the Rockwell 114 was a 2-bladed Hartzell propeller model HC-C2YR-1BF.

The maintenance records also showed that, on April 18, 2002, an aftermarket turbo normalization system was installed on the engine under Supplemental Type Certificate (STC) Number SE00357DE. At that time, the total airframe time was 2,758.0 hours, and the time since engine overhaul was 480.3 hours. The STC's instructions for continued airworthiness required that the turbo normalization system be inspected every 100 hours.

On December 9, 2009, the turbo normalization system was removed, inspected, and reinstalled. The logbook entry noted that casting voids were found on the exhaust side of the turbocharger. The entry also noted that photographs had been provided to the turbocharger manufacturer for evaluation and that the manufacturer had deemed it airworthy. The engine logbooks contained no other entries indicating that the turbo normalization system was inspected in the 6 years before the accident.

IFP fueling records indicated that the airplane was last fueled on May 17, 2015, with 20.0 gallons of 100LL aviation fuel.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KIFP,695 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	00:55 Local	**Direction from Accident Site:**	58°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	13 knots / 21 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	170°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.85 inches Hg	**Temperature/Dew Point:**	29°C / -2°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	BULLHEAD CITY, AZ (IFP)	**Type of Flight Plan Filed:**	None
Destination:	GOODYEAR, AZ (GYR)	**Type of Clearance:**	None
Departure Time:	17:56 Local	**Type of Airspace:**	

Airport Information

Airport:	LAUGHLIN/BULLHEAD INTL IFP	**Runway Surface Type:**	
Airport Elevation:	701 ft msl	**Runway Surface Condition:**	Vegetation
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:	3 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	3 Fatal, 1 Serious	**Latitude, Longitude:**	35.116664,-114.639167

The airplane crashed in Big Bend State Park. The main wreckage was located 4.6 nautical miles southwest of IFP. The airplane initially hit a mesquite tree, then impacted sand, and finally came to rest 120 ft south of the first impact point on a magnetic heading of 273°. The postimpact fire consumed most of the airplane.

Flight control continuity was established with all the flight control surfaces. The structure of all of the

flight control surfaces and their corresponding counterweights were found in their correct positions. The landing gear were found in the retracted position. All of the cockpit components and instrumentation were consumed by fire.

The main wing assembly sustained thermal damage consistent with a fuel-fed fire. All of the wing components were found in their respective locations. Both flap assemblies were consumed by fire and found near the attachment point to the wing structure. The right wing was found up against the right side of the fuselage and was consumed by fire.

Tests and Research

The wreckage was transported to Air Transport, Phoenix, Arizona, for further examination.

No abnormalities were noted with the airframe that would have precluded normal operation.

The engine was removed and disassembled. The propeller hub remained attached to the engine. The three propeller blades were present and exhibited thermal damage. The turbocharger, magnetos, and oil filter remained attached to the engine. All the other engine components were attached at their respective positions and exhibited thermal damage.

The turbocharger was found to be seized, it was disassembled, and examination of the turbowheel revealed that the blades were eroded. The overall diameter of the turbowheel was 2.451 inches. According to the manufacturer, a new turbowheel diameter is about 2.5 inches. It was also noted that the turbine impeller was significantly eroded and the heat shield was eroded which would allow hot gases to enter the bearing area and coke up the shaft.

Administrative Information

Investigator In Charge (IIC):	Jones, Patrick
Additional Participating Persons:	John C Waugh; Federal Aviation Administration; Las Vegas, NV Mark Platt; Lycoming Engines; Mesa, AZ
Original Publish Date:	June 7, 2017
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=91181