Aviation Investigation Final Report

Location:	North Las Vegas, Nevada	**Accident Number:**	WPR15LA223
Date & Time:	July 25, 2015, 16:30 Local	**Registration:**	N6152M
Aircraft:	Stinson 108 - 3	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to the private pilot, after an uneventful departure in high-density altitude conditions for the personal cross-country flight, he made a left crosswind turn in the airport traffic pattern as instructed by an air traffic controller. When the airplane was about 800 ft above ground level and near the departure end of the runway, the airplane stopped climbing, which was accompanied by a vibration. The airplane likely stopped climbing due to a partial loss of engine power and the high-density altitude conditions. The pilot lowered the airplane's nose to increase airspeed and continued the turn to land on the runway, but when the airplane started to sink, he decided to land on a tarmac located straight ahead. The airplane touched down, with a tailwind, about halfway down the tarmac. The pilot deployed full flaps but was unable to slow the airplane before it impacted a fence and then nosed over.

A postaccident examination of the engine revealed that the No. 1 cylinder exhaust valve seal was degraded, which prevented the valve from seating properly and likely resulted in low cylinder compression and a partial loss of engine power. Further, testing of the magnetos revealed that the primary ignition lead for the No. 6 cylinder was inoperative, which likely resulted in the engine running roughly after the partial loss of power.

Probable Cause and Findings

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

The partial loss of engine power due to a degraded cylinder exhaust valve seal, which resulted in low cylinder compression.

Findings

Aircraft	Recip eng cyl section - Damaged/degraded
Aircraft	Recip eng cyl section - Failure
Aircraft	Magneto/distributor - Inoperative
Environmental issues	High density altitude - Effect on equipment
Environmental issues	Fence/fence post - Contributed to outcome
Environmental issues	Tailwind - Effect on operation

Factual Information

History of Flight

Approach-VFR pattern crosswind	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing
Landing	Collision with terr/obj (non-CFIT)

On July 25, 2015, about 1630 Pacific daylight time, a Stinson 108-3 airplane, N6152M, was substantially damaged during a forced landing near North Las Vegas Airport (VGT), Las Vegas, Nevada. The airplane was registered to Arizona Land Holding LLC, and was operated by the pilot under the provisions of Title 14 Code of Federal Regulations Part 91. The private pilot, sole occupant of the airplane, was not injured. The airplane sustained substantial damage to the rudder. Visual meteorological conditions prevailed and no flight plan was filed for the personal, cross country flight, which was destined for Triangle Airpark (AZ50), White Hills, Arizona, and was originating at the time of the accident.

According to the pilot, he did not observe any anomalies with the airplane or engine during his preflight inspection and engine runup. Prior to departure, the tower controller issued instructions to the pilot to depart runway 12R and to make "left traffic." The pilot departed the runway and maintained about 80 miles per hour (mph) during the climbout. He started a left turn near the departure end of the runway at about 800 feet above ground level but the airplane "quit climbing" and started to shake. He lowered the nose to gain airspeed and some power returned. The pilot initially continued his turn to attempt a landing on runway 30R, but when the airplane began to "sink", he decided to land straight ahead on a paved parking area. He used a slip maneuver to descend quickly and touched down about "halfway down" the tarmac. The pilot deployed flaps and maneuvered to avoid obstacles, but was unable to slow the airplane down before it departed the tarmac, struck a fence, and nosed over. The pilot reported no preimpact mechanical malfunctions or anomalies related to the airframe and stated that he could have stopped the airplane with an additional "50 feet" of distance.

Examination of the airplane by a Federal Aviation Administration (FAA) inspector revealed substantial damage to the rudder.

The pilot/owner held a private pilot certificate with a rating for airplane single-engine land that was issued on July 16, 2014. His most recent FAA third-class medical certificate was issued on September 30, 2010 without limitations. According to the pilot's logbook, he accumulated 98 hours of total flight experience, 48 of which were in the accident airplane make and model. The pilot had not flown in the three calendar months that preceded the accident.

According to FAA airworthiness records, the airplane was manufactured in 1948, and registered to the pilot/owner on July 16, 2014, under Arizona Land Holdings, LLC. Review of the airplane's maintenance logbooks revealed that its most recent annual inspection was completed on June 12, 2014, at a recorded

tachometer time of "2,835.8 hours." The pilot/owner remarked that the logbook tachometer times had been erroneously recorded in the logbooks by the mechanic and should have been documented as "283.58." During a follow-up telephone conversation, the pilot/owner stated that the tachometer had been replaced about 20 years ago, which was reflected in the tachometer time in the airframe logbook; however, there was no record of a tachometer installation during that time.

At the time of the accident, the airplane had accumulated approximately 44.6 flight hours since its most recent inspection. Based on the airplane's maintenance records, it had accumulated about 2,868 flight hours of total time in service.

The airplane was equipped with a Franklin 6A4-165-B3, 165 horsepower engine. The engine's most recent annual inspection, which was also completed on June 12, 2014, included the following cylinder compression record: #1 - 74 psi, #2 – 73 psi, #3 – 71 psi, #4 – 73 psi, #5 – 71 psi, and #6 – 71 psi. The last recorded engine overhaul could not be determined as the corresponding engine logbook was not provided.

An air traffic controller reported the winds as 180 degrees at 5 knots gusting to 14 knots a few minutes before the airplane departed on the accident flight.

According to the National Oceanic and Atmospheric Administration, the density altitude at the time of the accident was 5,538 feet.

The airplane came to rest inverted on a southerly heading beyond an airport perimeter fence. The landing area was a parking tarmac located on the east side of the airport and measured about 1,000 feet long by 600 feet wide. An airport perimeter fence bordered the north end of the landing site. The airplane's landing path was composed of several obstacles including two concrete drums and two light posts, which were located approximately 50 feet from the accident site. Further, several airplanes were parked along the airport perimeter fence and one was located in the accident airplane's landing path about 60 feet from where the airplane came to rest.

An airport employee stated that he observed "a lot of fuel" drain from the airplane during the recovery process.

An examination of the engine was completed by a certified airframe and powerplant mechanic under the supervision of NTSB and FAA investigators on August 26, 2015, at an aircraft storage facility in Las Vegas, Nevada.

Initial examination of the engine revealed that the right side engine mount was fractured. The crankshaft was rotated by hand and valve-train continuity and thumb compression were observed on all cylinders. The propeller remained attached to the engine. One blade exhibited leading edge damage and the propeller faceplate displayed bending.

The cylinders were examined with a borescope. Each cylinder exhibited normal operating signatures with the exception of the number 1 cylinder, which contained a large volume of carbon deposits. The number 1 cylinder also recorded a compression value of 20/80 psi when tested. A subsequent pressure test revealed a leak in the exhaust valve that directed airflow through the exhaust pipe. A follow-up borescope inspection revealed degradation on one side of the exhaust valve seal, which prevented the valve from seating properly.

Both the top and bottom engine spark plugs were removed and examined. The top spark plugs exhibited wear consistent with normal operation. Each spark plug gap measured about 0.032 inches; however, according to the engine manual the prescribed gap tolerance range for the spark plugs was 0.014 – 0.018 inches.

Both magnetos remained attached to the engine; testing revealed that the number 6 cylinder top magneto primary lead did not produce spark during propeller rotation or when tested with a high tension lead tester.

Pilot Information

Certificate:	Private	**Age:**	35
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without waivers/limitations	**Last FAA Medical Exam:**	September 30, 2010
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	July 16, 2014
Flight Time:	98 hours (Total, all aircraft), 48 hours (Total, this make and model), 77 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Stinson	**Registration:**	N6152M
Model/Series:	108 - 3 3	**Aircraft Category:**	Airplane
Year of Manufacture:	1948	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	108-4152
Landing Gear Type:	Tailwheel	**Seats:**	4
Date/Type of Last Inspection:	June 12, 2014 Annual	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:	44 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2868 Hrs at time of accident	**Engine Manufacturer:**	FRANKLIN
ELT:	C91 installed, not activated	**Engine Model/Series:**	6A4165B2
Registered Owner:		**Rated Power:**	165 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	VGT,2205 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	14:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	190°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.84 inches Hg	**Temperature/Dew Point:**	39°C / -4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	North Las Vegas, NV (VGT)	**Type of Flight Plan Filed:**	None
Destination:	WHITE HILLS, AZ (AZ50)	**Type of Clearance:**	VFR
Departure Time:	16:30 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	NORTH LAS VEGAS VGT	**Runway Surface Type:**	Asphalt
Airport Elevation:	2205 ft msl	**Runway Surface Condition:**	Dry
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	36.20639,-115.190002(est)

Administrative Information

Investigator In Charge (IIC):	Stein, Stephen
Additional Participating Persons:	Carrey Atnit; FAA/FSDO; Las Vegas, NV
Original Publish Date:	April 4, 2016
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=91635