



## **NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Western Pacific Region

December 19, 2019

### **ACCIDENT SITE / AIRFRAME / ENGINE EXAMINATION SUMMARY**

**WPR19FA215**

This document contains 2 embedded photos.

## A. ACCIDENT

Location: Ontario, Oregon  
Date: August 9, 2019  
Aircraft: North American T28A  
NTSB Investigator-in-Charge: Joshua Cawthra

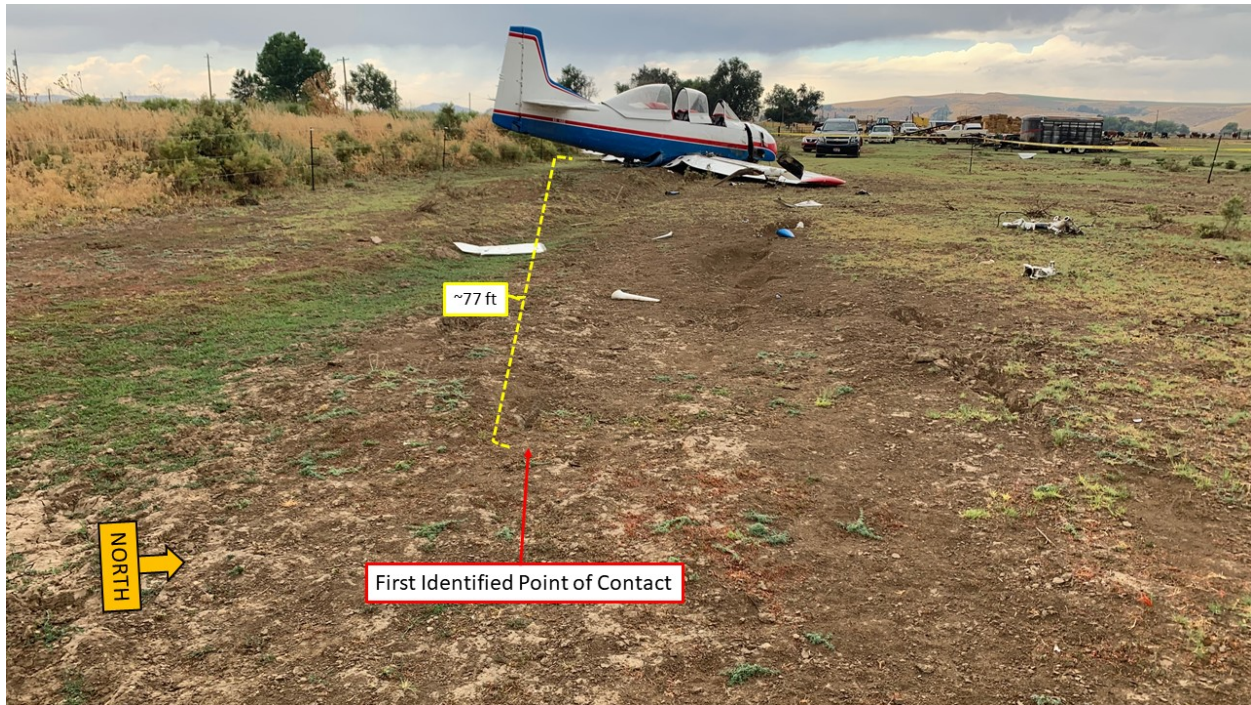
## B. DETAILS OF THE INVESTIGATION

### 1.0 Accident Site

Examination of the accident site revealed that the airplane impacted an open field about 0.8 nm northwest of the airport. The debris path was about 77 ft in length oriented on a magnetic heading of about 266°. The first identified point of impact (FIPC) was a ground impression about 1-ft by 2-ft in size. Throughout the debris path, the left and right main landing gear doors, paint chips, nose landing gear, and right main landing gear were observed. The propeller assembly was located adjacent to the main wreckage. The main wreckage came to rest upright on a heading of about 303°. First responders reported no fuel odor was present following the accident. Additionally, no fuel odor was noted by investigators the following morning, until the right fuel cap was removed.



Figure 1: Accident site and airport location plot.



## 2.0 Airframe Examination

The right wing remained attached to the fuselage and exhibited buckling throughout its span. The leading edge exhibited a circular impression between the folding seam and pitot tube. Both the flap and aileron remained attached. The flap exhibited upward bending / buckling about mid span. The wing structure above the gear attach point was bent upward, with some upper wing skin separation. The right fuel tank cap was removed. Using a wooden stick, about 2 inches of fuel was observed in the right fuel tank. The bladder appeared to be intact and the wing was slanted downward (tip was farther down the inboard root) slightly. The wing spar appeared to be fractured at the fuselage.

The left wing remained attached to the fuselage and exhibited buckling throughout its span. Both the flap and aileron remained attached. The flap exhibited upward bending / buckling about mid span. The wing structure above the gear attach point was bent upward, with some upper wing skin separation. The left fuel tank cap was removed. Only residual fuel on the bottom of the fuel tank bladder was observed. The bladder appeared to be intact.

The fuselage was mostly intact and exhibited buckling on either side. The canopy structure remained intact for the front and rear seats. The empennage was unremarkable. The vertical stabilizer, rudder, horizontal stabilizer, and both elevators were intact and undamaged. The fuselage registration marks, or N-Numbers, were mostly visible with the exception of one digit on either side missing. The inspection access door located aft of the rear seat on the bottom of the fuselage was open and exhibited impact damage. The ELT was in the ARMED position and did not function. The battery expired in 2010, per the sticker on the ELT housing.

No evidence of a breach in the fuel system was observed.

Control continuity was established throughout the airframe to all primary flight controls. The area of the mixing unit for the ailerons and elevator, just aft of the rear seat was impact damaged with multiple areas of separation, consistent with impact. Both the forward and aft seat controls, including engine controls remained attached and moved accordingly when the opposite seat controls were moved.

#### Forward Seat:

##### Instrument Panel:

Altimeter: 2,300 ' – kollsman: 29.93 inches

Airspeed: 0

RMI: Card: 260 – Needle: 168 degrees

Attitude Indicator: 90-degree right bank

Manifold Pressure: 29 inches – Only gauge marking was 44 inches

RPM: below 5. Markings included red between 800 and 1000 rpm, green from 1400 rpm to 1750 rpm, red from 1750 to 1950 rpm, and green from 1950 to 2400 rpm, and a red band at 2550 rpm.

VSI: 0

Nav 1: 360 / needle also at 360

Nav 2: Card: 120, needle centered

Flaps: needle deflected left of “up”

Acceleration Units (G Meter): 1 G

Oil Temp: Deflected left

Cylinder Head Temp: 49

Ammeter: 0

Fuel pressure: 3.1

Oil pressure: 0

Right Tank: Just below 260 lbs

Left Tank: Deflected below 0

Oxygen: 0

Gear Switch: Down

Throttle: Full Forward

Mixture: about 1 inch from full rich

Propeller: Just aft of mid travel

Fuel Selector: Both

Aileron Trim: 3 degrees right

Elevator Trim: almost 15 degrees nose up

Rudder Trim: 5 degrees nose right

Magnetos: Left

Battery: On

Oil Dil: Off

Pitot Heat: Off

Position Light: Bright

Fuse: Bright

Taxi Lights / Beacon: Off

Standby Compass: Off

Comm 1: 122.8

Comm 2: 122.8

Nav 1: 113.40

Seat: Bottom seat pan was crushed downward with a majority of the pan structure separated from the side and aft portions of the seat at the rivet line. Seat was equipped with shoulder harnesses and lap belts.

The forward seat lap restraint clasp remained attached and locked, however, both sides of the lap belt appeared to be cut. The shoulder restraints were intact, and the locking mechanism was not engaged. When the locking mechanism was engaged, the shoulder harness were locked in place.

Aft Seat:

Throttle: Full forward

Mixture: About 1 inch aft of full rich

Propeller: Just aft of mid travel

Fuel Selector: Both

Position Light: Flash / Off

Fuse Bright: Off

Pass: Off

Magneto: Left

Airspeed: 0

RMI: Card: 360 / needle: 220

Attitude Indicator: 90-degree bank left

Manifold Pressure: 28 inches – markings: green from 18 inches to 39 inches, red at 44 inches

RPM: 600, markings: green from 1400 to 2400, red at 2500

Gear Switch: Down

Fuel Quantity – Left tank: below 0 Right tank: below 0

Oil Pressure: 0

Fuel Pressure: 2

Cylinder Head Temp: 150 C

Oil Temp: deflected left

Acceleration Units: 0

Flaps: Deflected past “up”

Altimeter: 2,100 – kollsman: 29.93 inches

VSI: 100 ft up

Hobbs: 108.3

Seat: The aft seat appeared intact, restraints remained attached to the attach points. Shoulder harnesses were also equipped.

The aft seat restrains were intact, however, the shoulder restraints when pulled, were not locked into place despite the shoulder restraint lock being engaged. The cable was moved by hand near the locking mechanism, and the shoulder restraints locked. However, when pressure was released on the cable, the shoulder restraints unlocked.

## **2.1 Engine Examination**

The engine was displaced about 30 to 40° downward. The propeller assembly and a portion of the gear reduction nose case was separated. Oil was observed throughout the immediate area under the engine. The carburetor inlet fuel screen was removed and found to be free of debris. A slight amount of liquid was expelled when the screen was removed. The retaining nut for the screen (inside the carburetor side) was also missing. Throttle and mixture control continuity was established to the engine. The propeller control cables exhibited separations consistent with tension overload.

The propeller was separated from the engine, along with some of the internal gears and control arm. One propeller blade was slightly bent aft about 10 to 15 degrees. Scratching on the blade face from the tip, and oriented in a direction toward the blade root was observed on the outboard 10 to 12 inches of the blade. Multiple bends and dents in the blade were observed. The opposing blade was bent forward about 100 degrees, and exhibited striations oriented from the blade tip to the blade root on the outboard 5 inches of the blade tip. The propeller hub remained intact.

Examination of the recovered wreckage was conducted on December 19, 2019. The engine remained partially attached to the airframe via its mounts. The carburetor and both magnetos were removed from the engine. The number 1 cylinder was removed from the engine. Partial movement of the supercharger was observed when the master rod was hit using a dead blow hammer. No movement of the magneto drive shafts were observed. The engine was retained and shipped to a facility for further examination.

Both the left and right magneto produced spark when the magneto drive shafts were rotated.

The carburetor was retained for further examination.

Submitted by: Joshua Cawthra