



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Parkin, Arkansas	Accident Number:	CEN18LA211
Date & Time:	May 31, 2018, 11:15 Local	Registration:	N6215P
Aircraft:	THRUSH AIRCRAFT INC S2R-H80	Aircraft Damage:	Substantial
Defining Event:	Loss of control on ground	Injuries:	1 None
Flight Conducted Under:	Part 137: Agricultural		

Analysis

The commercial pilot reported that, during the takeoff roll for the agricultural application flight, the right rudder pedal went full forward against the material hopper and that he subsequently could not maintain directional control of the airplane. The airplane subsequently exited the left side of the runway and struck a ditch.

Examination of the airplane revealed that the right rudder pedal had become detached from the rudder pedal adjustment mechanism due to wear on the adjustment track. The Before Starting Engine checklist included a step to adjust and lock the rudder pedals before starting the engine; however, the condition of the rudder system indicated that the airplane had been operated with the rudder pedal forward of the final detent position and against the safety stop rather than in a locked detent position for an undetermined amount of time. The improper adjustment and locking of the rudder pedal adjustment mechanism over time likely led to the excessive wear on the rudder pedal adjustment track, the detachment of the rudder pedal, and the pilot's subsequent inability to maintain directional control. After the accident, the airplane manufacturer released a service letter detailing the proper use, rigging, and maintenance of the rudder system, including the rudder pedal adjustment mechanism.

Probable Cause and Findings

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

The improper operation of the rudder pedal adjustment mechanism for an undetermined period of time, which led to the failure of the rudder pedal adjustment track, the detachment of the rudder pedal, and the pilot's subsequent inability to maintain directional control.

Findings

Aircraft	Rudder control system - Failure
Aircraft	Rudder control system - Incorrect use/operation
Environmental issues	Sloped/uneven terrain - Contributed to outcome

Factual Information

History of Flight

Takeoff	Miscellaneous/other
Takeoff	Loss of control on ground (Defining event)
Takeoff	Runway excursion
Takeoff	Collision with terr/obj (non-CFIT)

On May 31, 2018, about 1115 central daylight time, a Thrush Aircraft S2R-H80, N6215P, received substantial damage during a runway excursion during takeoff on runway 18 from a private airstrip near Parkin, Arkansas. The pilot was not injured. The aircraft was registered to Mid Continent Aircraft Corp and operated by Air Aids, Inc., under the provisions of Title 14 *Code of Federal Regulations* Part 137 as an aerial application flight. Visual meteorological conditions prevailed for the flight, which was operated without a flight plan. The local flight was originating at the time of the accident.

The pilot reported that during the takeoff roll the right rudder pedal went all the way forward. Since the airplane was equipped with toe-brakes, once the pedal was all the way forward against the material hopper, he had no way to maintain directional control of the airplane. The pilot attempted to stop the airplane using reverse pitch on the propeller, but the airplane went off the east side of the runway and struck a ditch.

Examination of the airplane after the accident revealed that the rudder pedal adjustment mechanism consisted of a track that allowed the rudder pedal shaft to move fore and aft, with a detent pin that engaged holes in the track. The track was equipped with a safety stop bolt to prevent the rudder pedal shaft from travelling too far forward and exiting the end of the track. The track assembly for both the left and right rudder pedal showed wear on the track and the stop bolt installed forward of the most forward detent position. The right adjustment track had a semi-circular section worn completely through that matched the shape of the rudder shaft. This was consistent with the rudder shaft being stopped by the stop bolt rather than being locked in the forward detent position. Determination of how long the rudder system had been used in this manner could not be determined.

The "Before Starting Engines" checklist current at the time of the accident contained the instruction "Rudder Pedals – ADJUST and LOCK".

Review of the airplane maintenance records showed that the airplane had accumulated 991 hours time in service as of its most recent annual inspection dated December 29, 2017.

The airplane manufacturer released a Service Letter, SL-AG-126, on June 11, 2018, entitled "Rudder Pedal Mechanism Inspection", detailing proper use, rigging, and maintenance of the rudder system, including the rudder pedal adjustment mechanism.

Pilot Information

Certificate:	Commercial	Age:	31,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Single
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	May 15, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	2900 hours (Total, all aircraft), 1600 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	THRUSH AIRCRAFT INC	Registration:	N6215P
Model/Series:	S2R-H80 NO SERIES	Aircraft Category:	Airplane
Year of Manufacture:	2016	Amateur Built:	
Airworthiness Certificate:	Restricted (Special)	Serial Number:	H80-180DC
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	December 29, 2017 100 hour	Certified Max Gross Wt.:	10500 lbs
Time Since Last Inspection:		Engines:	Turbo prop
Airframe Total Time:	991 Hrs as of last inspection	Engine Manufacturer:	GE Aviation Czech
ELT:		Engine Model/Series:	H80-100
Registered Owner:		Rated Power:	800 Horsepower
Operator:		Operating Certificate(s) Held:	Agricultural aircraft (137)
Operator Does Business As:		Operator Designator Code:	RGOG

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	AWM,213 ft msl	Distance from Accident Site:	20 Nautical Miles
Observation Time:	20:53 Local	Direction from Accident Site:	115°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	16 knots / 25 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	190°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.81 inches Hg	Temperature/Dew Point:	33°C / 21°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Parkin, MO (PVT)	Type of Flight Plan Filed:	None
Destination:	Parkin, MO (PVT)	Type of Clearance:	None
Departure Time:	15:30 Local	Type of Airspace:	Class G

Airport Information

Airport:	Private PVT	Runway Surface Type:	Grass/turf
Airport Elevation:	200 ft msl	Runway Surface Condition:	Vegetation
Runway Used:	180	IFR Approach:	None
Runway Length/Width:	2500 ft / 75 ft	VFR Approach/Landing:	None

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:	35.243331,-90.570556

Administrative Information

Investigator In Charge (IIC):	Brannen, John
Additional Participating Persons:	Daniel Brickey; FAA -LIT FSDO; Little Rock, AR
Original Publish Date:	April 30, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=97402

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).