



Aviation Investigation Final Report

Location:	Houston, Texas	Accident Number:	DFW06LA038
Date & Time:	December 9, 2005, 15:00 Local	Registration:	N302BY
Aircraft:	Cirrus Design Corp. SR22	Aircraft Damage:	Substantial
Defining Event:		Injuries:	3 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

After an extended taxi the single-engine airplane experienced a right brake fire. The pilot and his two passengers were able to egress the airplane unassisted before the fire was extinguished using large capacity fire extinguishers. Data downloaded from the engine monitor revealed that the 4,100-hour airline transport pilot had taxied the airplane at an average engine speed of 1,640 RPM. The data also revealed that during the taxi, the pilot reached speeds up to 29 mph and often reduced speed without reducing the engine RPM. The Pilot Operating Hand Book listed the following: "Taxi with minimum power needed for forward movement. Excessive braking may result in overheating or damaged brakes. Damage due to overheated brakes may result in brake system malfunction or failure." An examination of the left and right brakes was performed. The O-rings on the left brake pistons were soft and round in shape. The O-rings on the right brake pistons were hard and brittle.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's excessive taxi speed and his excessive use of brakes.

Findings

Occurrence #1: FIRE

Phase of Operation: TAXI - TO TAKEOFF

Findings

1. (C) TAXISPEED - EXCESSIVE - PILOT IN COMMAND
2. (C) BRAKES(NORMAL) - EXCESSIVE - PILOT IN COMMAND

Factual Information

On December 9, 2005, about 1500 central standard time, a single-engine Cirrus Design Corp. SR22 composite airplane, N302BY, was substantially damaged during a brake fire on the right main landing gear following an extended taxi at the David Wayne Hooks Memorial Airport (DWH) near Houston, Texas. The airline transport rated pilot and two passengers were not injured. The airplane was registered to and operated by a private individual. Visual meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the planned 14 Code of Federal Regulations Part 91 personal flight. The cross-country flight was destined for the Mobile Regional Airport (MOB), near Mobile, Alabama.

The pilot reported that the airplane was initially parked facing a westerly direction on ramp B. After engine startup the pilot performed an approximate 270-degree right turn and taxied south on taxiway K. About 2,000 feet along taxiway K the pilot made a right turn onto taxiway E followed by a near immediate left turn onto taxiway F. Approximately 3,000 feet along taxiway F the pilot stopped the airplane and performed the "Before Takeoff Checklist." Shortly after completing the checklist, and before the pilot resumed taxiing, the tower radioed and reported that the airplane's right main landing gear was on fire.

The pilot and his two passengers were able to egress the airplane unassisted. The airplane's onboard fire extinguisher was applied to the fire to no avail. Two mechanics from a nearby hangar were able to extinguish the fire using large capacity fire extinguishers.

The 4,100-hour Air Force pilot had previously completed five and a half hours of flight training at a Cirrus certified training center to obtain a SR22/20 Cirrus training certificate. This training was required in order to qualify as a pilot on the operator's insurance policy. Since receiving this certification the pilot had accumulated about 150 combined flying hours between the SR20 and SR22 aircraft.

According to photographs provided to the investigator-in-charge (IIC), the right main landing gear and lower right wing sustained substantial thermal damage. An examination of the left and right brakes was performed. The O-rings on the left brake pistons were soft and round in shape. The O-rings on the right brake pistons were hard and brittle.

The airframe manufacturer provided data to the IIC, which had been downloaded from the airplane's E-MAX (engine monitor). The data was recorded at six-second intervals during the approximate four-minute taxi. A review of the data revealed that the engine's revolutions per minute (RPM) varied from 1,280 RPM to 1,970 RPM during the taxi, and averaged 1,640 RPM. The data also revealed that during the taxi, the pilot reached speeds up to 29 mph and often reduced speed without reducing the engine RPM.

A review of the Pilot Operating Handbook (POH), revision A3, dated October 10, 2003, listed the following "Caution" under the section titled "Taxiing." "Taxi with minimum power needed for forward movement. Excessive braking may result in overheating or damaged brakes. Damage due to overheated brakes may result in brake system malfunction or failure."

Cirrus Design had issued Owner Service Advisory (OSA) SA 25-04, on June 30, 2005. The stated subject of the OSA was "Proper Braking Practices." In this advisory it stated the following: "Do not ride the brakes. Pilots should consciously remove pressure from the brakes while taxiing. Failure to do so results in excessive heat, premature brake wear, and increased possibility of brake failure."

Approximately two months after this accident, the Federal Aviation Administration issued Special Airworthiness Information Bulletin (SAIB) CE-06-30. In the section titled "Discussion" the following was stated: "Helical propwash with a free casting nose wheel leads to occasional right braking during taxi for directional control. Taxi with reduced power and right rudder reduces the need for right braking. Improper taxi procedure (excessive or continuous use of the right brake) can lead to an overheated brake. The brake caliper piston seal overheats and no longer performs its function. This results in the loss of hydraulic fluid with possible resultant loss of braking or brake fire." This SAIB also referred the reader to Mandatory Service Bulletin (SB) SB2X-32-14R1.

Mandatory Service Bulletin SB2X-32-14R1 was issued January 18, 2006 and revised on February 17, 2006. "This Service Bulletin provides for the installation of temperature indicators on the brake assemblies and modification of the main landing gear fairings to include inspection holes that facilitate monitoring brake assembly temperature. Additionally, the Service Bulletin contains instructions for trimming the main gear fairings to provide additional clearance, and the insertion of Revision A6 into the Pilot's Operating Handbook."

In Revision A6 of the POH, the previous "Caution" that was in Revision A3, was replaced with the following: "Warning. Maximum continuous engine speed for taxiing is 1,000 RPM on flat, smooth, hard surfaces. Power settings slightly above 1,000 RPM are permissible to start motion, for turf, soft surfaces, and on inclines. Use minimum power to maintain taxi speed. If the 1,000 RPM taxi power limit and proper braking procedures are not observed, the brake system may overheat and result in brake damage or brake fire."

Pilot Information

Certificate:	Airline transport; Private	Age:	40, Male
Airplane Rating(s):	Single-engine sea; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	July 1, 2004
Occupational Pilot:	UNK	Last Flight Review or Equivalent:	
Flight Time:	4100 hours (Total, all aircraft), 155 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cirrus Design Corp.	Registration:	N302BY
Model/Series:	SR22	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	0985
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	July 1, 2005 Annual	Certified Max Gross Wt.:	3000 lbs
Time Since Last Inspection:	130 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	282 Hrs at time of accident	Engine Manufacturer:	Teledyne Continental
ELT:	Installed, not activated	Engine Model/Series:	IO-550N
Registered Owner:	On file	Rated Power:	310 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:	DWH,152 ft msl	Distance from Accident Site:	
Observation Time:	14:53 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	Overcast / 5500 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	6 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	40°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.34 inches Hg	Temperature/Dew Point:	7°C / -7°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Houston, TX (DWH)	Type of Flight Plan Filed:	Unknown
Destination:	MOBILE, AL (MOB)	Type of Clearance:	None
Departure Time:		Type of Airspace:	

Airport Information

Airport:	DAVID WAYNE HOOKS MEMORIAL DWH	Runway Surface Type:	
Airport Elevation:	152 ft msl	Runway Surface Condition:	
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 None	Aircraft Fire:	On-ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	30.061944,-95.55278

Administrative Information

Investigator In Charge (IIC):	LeBaron, Timothy
Additional Participating Persons:	Brian Gallagher; FAA; Houston, TX Mark Manning; Cirrus Design Corp; Duluth, MN
Original Publish Date:	June 28, 2006
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=62937

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