



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Portsmouth, New Hampshire	<b>Accident Number:</b>	ERA21LA099
<b>Date &amp; Time:</b>	January 3, 2021, 11:18 Local	<b>Registration:</b>	N489RS
<b>Aircraft:</b>	Diamond Aircraft DA 40	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Fire/smoke (non-impact)	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

## Analysis

After landing, the flight instructor assumed control of the airplane during the roll, taxied to the hold-short line at the approach end of the runway, and waited for landing traffic. Soon after, the pilot of the landing airplane announced over the tower radio frequency that the airplane holding short was “on fire.” The instructor confirmed that smoke was rising from beneath the right wing and both he and the pilot receiving instruction egressed the airplane without injury.

Examination of video revealed fire emanating from the right main landing gear wheel and brake assembly, wheel pant, and involved the right wing, which was substantially damaged.

Data downloaded from the airplane’s multifunction display revealed high groundspeeds during taxi after landing, and rapid decelerations consistent with hard braking actions before the airplane reached the hold short line. Postaccident examination revealed normal wear of the brake pads and no pre-accident mechanical anomalies. Examination of the fuel cell directly above the right main landing gear wheel and brake assembly revealed that it was intact with no leaks and contained about 15 gallons of fuel. Based on the available evidence, it is likely that the instructor’s high taxi speeds, which required multiple brake applications, resulted in the right brake assembly overheating and catching fire.

## Probable Cause and Findings

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

The instructor's multiple applications of the airplane's brakes during high-speed taxi over a short duration, which overheated and ignited the right main landing gear wheel brake assembly.

## Findings

Aircraft	
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	Landing gear brakes system - Incorrect use/operation
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# Factual Information

## History of Flight

Taxi-to runway	Fire/smoke (non-impact) (Defining event)
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On January 3, 2021, about 1118 eastern standard time, a Diamond Aircraft DA 40, N489RS, was substantially damaged when it was involved in an accident near Portsmouth, New Hampshire. The flight instructor and pilot receiving instruction were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

After a short flight, the pilot performed a landing on runway 34. The instructor assumed control of the airplane during the roll, taxied to the hold-short line at the approach end of runway 34, and waited for landing traffic. Soon after, the pilot of the landing airplane announced over the tower radio frequency that the airplane holding short was “on fire.” The instructor confirmed that smoke was rising from beneath the right wing and both he and the pilot egressed the airplane without injury.

Video recorded by the pilots before the arrival of aircraft rescue and firefighting (ARFF) vehicles showed the right main landing gear tire, wheel pant, landing gear strut, and underside of the right wing in flames. ARFF arrived within 3 minutes of notification and extinguished the fire. The instructor reported that he noticed no anomalies with the performance and handling of the airplane during taxi. He stated that, throughout the taxi back to the hold-short line, the steering forces required and the braking power he experienced were “normal.”

The removable SD card from the Garmin G1000 Multifunction Display was undamaged and was downloaded normally. A review of the recorded data revealed that, after landing, the airplane turned right at the first perpendicular taxiway (Bravo) and again turned right onto the parallel taxiway (Alpha). While on taxiway Alpha, the ground speed varied between about 22 and 27 knots. The ground speed indication was displayed to the flight crew.

At the start of a right turn where Alpha taxiway turned 90° and intersected the approach end of runway 34, the ground speed was about 23 knots. The ground speed then decreased sharply several times, each time followed by several seconds of constant or slightly increasing ground speed until the data ended, as the airplane neared the hold short line for runway 34.

The airplane was recovered to a maintenance facility and examined by a representative of the manufacturer under the supervision of a Federal Aviation Administration aviation safety inspector. Examination revealed normal wear of the brake pads and no pre-accident mechanical anomalies. Examination of the fuel tank directly above the right main landing gear wheel and brake assembly revealed that it was intact with no leaks and contained about 15 gallons of fuel.

## Flight instructor Information

<b>Certificate:</b>	Commercial; Flight instructor	<b>Age:</b>	52, Male
<b>Airplane Rating(s):</b>	Single-engine land; Single-engine sea	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	
<b>Instructor Rating(s):</b>	Airplane multi-engine; Airplane single-engine; Instrument airplane	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 2 With waivers/limitations	<b>Last FAA Medical Exam:</b>	February 27, 2020
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	6509 hours (Total, all aircraft), 32.6 hours (Total, this make and model), 5970 hours (Pilot In Command, all aircraft), 72.2 hours (Last 90 days, all aircraft), 7.5 hours (Last 30 days, all aircraft)		

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	50, Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	3-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	August 9, 2019
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	October 29, 2020
<b>Flight Time:</b>	375 hours (Total, all aircraft), 1 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Diamond Aircraft	<b>Registration:</b>	N489RS
<b>Model/Series:</b>	DA 40	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2004	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	40.379
<b>Landing Gear Type:</b>	Tricycle	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	September 30, 2020 100 hour	<b>Certified Max Gross Wt.:</b>	2535 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	3149.9 Hrs at time of accident	<b>Engine Manufacturer:</b>	LYCOMING
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	I0360 MIA
<b>Registered Owner:</b>	VIAGE LLC	<b>Rated Power:</b>	180 Horsepower
<b>Operator:</b>	Avier Flight School	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KPSM, 100 ft msl	<b>Distance from Accident Site:</b>	0 Nautical Miles
<b>Observation Time:</b>	11:26 Local	<b>Direction from Accident Site:</b>	42°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	5 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	20°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.18 inches Hg	<b>Temperature/Dew Point:</b>	0°C / -4°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Beverly, MA (BVY)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Portsmouth, NH	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	11:00 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	Portsmouth International KPSM	<b>Runway Surface Type:</b>	Asphalt;Concrete
<b>Airport Elevation:</b>	100 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	34	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	11322 ft / 150 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 None	<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 None	<b>Latitude, Longitude:</b>	43.077944,-70.823278(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Rayner, Brian
<b>Additional Participating Persons:</b>	William Moore; FAA; Portland, ME Beverley Harvey; TSB Canada; Quebec, OF
<b>Original Publish Date:</b>	December 20, 2022
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 3</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=102515">https://data.nts.gov/Docket?ProjectID=102515</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).