# Aviation Investigation Final Report

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| **Location:** | Spring, Texas | **Accident Number:** | CEN19LA113 |
| **Date & Time:** | March 28, 2019, 15:45 Local | **Registration:** | N494JB |
| **Aircraft:** | Cessna 172 | **Aircraft Damage:** | Substantial |
| **Defining Event:** | Loss of control on ground | **Injuries:** | 2 None |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The pilot was taxiing the airplane to the runway to depart on a personal flight when the airplane veered to the right and the right main landing gear descended into a drainage ditch. The pilot and the passenger were not injured. The right horizontal stabilizer and elevator were substantially damaged.

In a postaccident statement, the pilot reported no anomalies with the wheel brake system before she began taxiing the airplane. She also reported that the tailwind during taxi caused a high groundspeed but that the airplane was “uncontrollable” via the rudder and brakes.

The airplane’s pilot operating handbook states that the groundspeed and use of brakes should be held to a minimum while taxiing, directional control should be maintained with the steerable nosewheel and the rudder, and the proper positioning of the ailerons and elevator for wind direction is required to maintain directional control and balance. Additionally, according to the FAA’s *Airplane Flying Handbook*, a pilot must maintain a safe taxiing speed to ensure directional control and must have the ability to recognize any potential hazards in time to avoid them and to stop or turn where and when desired without undue reliance on the wheel brakes.

Postaccident examination and testing revealed no anomalies with the airplane’s wheel brake system or the steerable nosewheel. The wind at the airport about the time of the accident was from 140° at 13 knots gusting to 21 knots. Thus, the pilot likely allowed the airplane to accelerate to an unsafe groundspeed during taxi, resulting in a loss of directional control.

## Probable Cause and Findings

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

The pilot's failure to maintain airplane directional control while taxiing at an unsafe ground speed.

## Findings

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| **Aircraft** | Surface speed/braking - Incorrect use/operation |
| **Personnel issues** | Aircraft control - Pilot |

# Factual Information

## History of Flight

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| **Taxi-to runway** | Loss of control on ground (Defining event) |
| **Taxi-to runway** | Collision with terr/obj (non-CFIT) |

On March 28, 2019, about 1545 central daylight time, a Cessna 172S airplane, N494JB, was substantially damaged when it was involved in an accident at David Wayne Hooks Memorial Airport (DWH), Spring, Texas. The private pilot and passenger were not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that her taxi clearance to runway 17L was via taxiways Juliet and Kilo. The pilot completed an uneventful right turn from the ramp to join the north/south taxiway Mike, but the airplane did not respond to her left rudder pedal input to turn left to join taxiway Juliet. The pilot then attempted to steer the airplane by applying the left brake, but the airplane still did not respond. She reduced engine power to idle and depressed both brake pedals to stop the airplane, but the airplane continued north toward taxiway November. The airplane's right main landing gear then departed the pavement and descended into a drainage ditch. The airplane came to rest in the grass alongside the ditch.

In a postaccident statement, the pilot reported that the brakes "worked normally" before starting to taxi the airplane from the ramp. The pilot stated that a "strong" tailwind resulted in a high groundspeed during taxi but that the airplane was "uncontrollable" via the rudder and brakes. Additionally, she stated that her passenger (who she noted was a pilot) had also been unable to apply wheel brakes while she was having a problem maintaining airplane directional control.

The airplane was examined by Federal Aviation Administration (FAA) inspectors from the Houston, Texas, flight standards district office. The right horizontal stabilizer and elevator were substantially damaged. A visual examination of the brake assemblies revealed no anomalies, and a functional check of the brake system confirmed its proper operation. No fluid leaks were observed in the brake system, and both brake master cylinders contained an adequate amount of hydraulic fluid for normal operation. A functional check of the nosewheel confirmed proper rotation with the corresponding rudder pedal input.

Additional Information

The Cessna 172S *Pilot Operating Handbook* states that effective ground control while taxiing is accomplished through nosewheel steering by using the rudder pedals. The handbook notes that the ground speed and use of brakes should be "held to a minimum" and that the proper positioning of the ailerons and elevator for wind direction is required to maintain directional control and balance. Additionally, the handbook notes that strong quartering tailwinds require

caution while taxiing, sudden applications of engine throttle and sharp braking should be avoided with a tailwind, and directional control should be maintained with the steerable nosewheel and the rudder.

According to the FAA *Airplane Flying Handbook* (FAA-H-8083-3C, a pilot must maintain a safe taxiing speed to ensure directional control and that safe taxiing involves the pilot's ability to recognize any potential hazards in time to avoid them and to stop or turn where and when desired without undue reliance on the wheel brakes. The handbook recommends that the taxi speed be slow enough so that the airplane can be stopped promptly when the engine throttle is closed.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 22,Female |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | None | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 3 With waivers/limitations | **Last FAA Medical Exam:** | June 5, 2018 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | December 21, 2018 |
| **Flight Time:** | 197.6 hours (Total, all aircraft), 83.5 hours (Total, this make and model), 89.2 hours (Pilot In Command, all aircraft), 73.7 hours (Last 90 days, all aircraft), 34.1 hours (Last 30 days, all aircraft), 1.4 hours (Last 24 hours, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | Cessna | **Registration:** | N494JB |
| **Model/Series:** | 172 S | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 2002 | **Amateur Built:** | |
| **Airworthiness Certificate:** | Normal | **Serial Number:** | 172S9099 |
| **Landing Gear Type:** | Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | February 20, 2019 100 hour | **Certified Max Gross Wt.:** | 2550 lbs |
| **Time Since Last Inspection:** | 94.5 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 8427.6 Hrs at time of accident | **Engine Manufacturer:** | Lycoming |
| **ELT:** | Installed, not activated | **Engine Model/Series:** | IO-360-L2A |
| **Registered Owner:** | | **Rated Power:** | 180 Horsepower |
| **Operator:** | | **Operating Certificate(s) Held:** | Pilot school (141) |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Day |
| **Observation Facility, Elevation:** | DWH,152 ft msl | **Distance from Accident Site:** | 0 Nautical Miles |
| **Observation Time:** | 15:53 Local | **Direction from Accident Site:** | |
| **Lowest Cloud Condition:** | Few / 4700 ft AGL | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | 13 knots / 21 knots | **Turbulence Type Forecast/Actual:** | None / None |
| **Wind Direction:** | 140° | **Turbulence Severity Forecast/Actual:** | N/A / N/A |
| **Altimeter Setting:** | 30.12 inches Hg | **Temperature/Dew Point:** | 24°C / 13°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Spring, TX (DWH ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Austin, TX (AUS ) | **Type of Clearance:** | VFR flight following |
| **Departure Time:** | 15:45 Local | **Type of Airspace:** | Class D |

## Airport Information

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| **Airport:** | David Wayne Hooks Memorial DWH | **Runway Surface Type:** | |
| **Airport Elevation:** | 153 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | | **IFR Approach:** | None |
| **Runway Length/Width:** | | **VFR Approach/Landing:** | None |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 None | **Aircraft Damage:** | Substantial |
| **Passenger Injuries:** | 1 None | **Aircraft Fire:** | None |
| **Ground Injuries:** | | **Aircraft Explosion:** | None |
| **Total Injuries:** | 2 None | **Latitude, Longitude:** | 30.061666,-95.55278(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Fox, Andrew | | |
| **Additional Participating Persons:** | Rick Bolton; Federal Aviation Administration - Houston FSDO; Houston, TX<br>Daniel Prince; Federal Aviation Administration - Houston FSDO; Houston, TX | | |
| **Original Publish Date:** | March 3, 2022 | **Investigation Class:** | 3 |
| **Note:** | The NTSB did not travel to the scene of this accident. | | |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=99203 | | |