



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Show Low, AZ	<b>Accident Number:</b>	GAA18CA141
<b>Date &amp; Time:</b>	02/23/2018, 1015 MST	<b>Registration:</b>	N5147N
<b>Aircraft:</b>	CESSNA 172	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control on ground	<b>Injuries:</b>	2 None
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Instructional		

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## Analysis

The flight instructor reported that, during approach in a gusting crosswind, he took the flight controls from the student pilot about 500 to 700 ft above ground level. He added that, during the landing roll while decelerating, a wind gust lifted the back of the airplane "from the rear right to the front left, forcing the front wheel onto the ground and lifting the plane onto the left main" landing gear. He applied full left rudder and right aileron to correct, but when it did not improve the situation, he "relaxed the controls slightly back towards neutral." Subsequently, the airplane exited the runway to the right and came to rest inverted.

The airplane sustained substantial damage to both wings and the fuselage and empennage.

The flight instructor reported that there were no preaccident mechanical failures or malfunctions with the airplane that would have precluded normal operation.

The automated weather observation station located on the airport reported that, at the time of the accident, the wind was from 210° at 26 knots, gusting to 32 knots. The airplane landed on runway 06.

## Probable Cause and Findings

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

The flight instructor's failure to maintain directional control during the landing roll in gusting crosswind and tailwind conditions.

## Findings

<b>Aircraft</b>	Directional control - Not attained/maintained (Cause)
<b>Personnel issues</b>	Aircraft control - Instructor/check pilot (Cause)
<b>Environmental issues</b>	Tailwind - Effect on operation Crosswind - Effect on operation Gusts - Effect on operation

## Factual Information

### History of Flight

Landing-landing roll	Other weather encounter Loss of control on ground (Defining event) Attempted remediation/recovery Runway excursion Nose over/nose down
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### Flight Instructor Information

Certificate:	Flight Instructor; Commercial	Age:	28, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Single-engine	Toxicology Performed:	No
Medical Certification:	Class 1 Without Waivers/Limitations	Last FAA Medical Exam:	02/02/2018
Occupational Pilot:	No	Last Flight Review or Equivalent:	02/08/2018
Flight Time:	(Estimated) 803 hours (Total, all aircraft), 533 hours (Total, this make and model), 750 hours (Pilot In Command, all aircraft), 65 hours (Last 90 days, all aircraft), 31 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

### Student Pilot Information

Certificate:	None	Age:	, Male
Airplane Rating(s):	None	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

## Aircraft and Owner/Operator Information

Aircraft Make:	CESSNA	Registration:	N5147N
Model/Series:	172 M	Aircraft Category:	Airplane
Year of Manufacture:	1973	Amateur Built:	No
Airworthiness Certificate:	Normal; Utility	Serial Number:	17261417
Landing Gear Type:	Tricycle	Seats:	4
Date/Type of Last Inspection:	03/28/2017, Annual	Certified Max Gross Wt.:	2300 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	9442.6 Hours as of last inspection	Engine Manufacturer:	Lycoming
ELT:	C91 installed, not activated	Engine Model/Series:	O-320-E2D
Registered Owner:	ROBERT C. MACE JR	Rated Power:	150 hp
Operator:	Canyon State Aero LLC	Operating Certificate(s) Held:	Pilot School (141)

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	KSOW, 6411 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	1715 UTC	Direction from Accident Site:	96°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	26 knots / 32 knots	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	210°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	2° C / -11° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	MESA, AZ (FFZ)	Type of Flight Plan Filed:	None
Destination:	Show Low, AZ (SOW)	Type of Clearance:	None
Departure Time:	0903 MST	Type of Airspace:	Class G

## Airport Information

Airport:	SHOW LOW RGNL (SOW)	Runway Surface Type:	Asphalt
Airport Elevation:	6415 ft	Runway Surface Condition:	Dry
Runway Used:	06	IFR Approach:	None
Runway Length/Width:	7200 ft / 100 ft	VFR Approach/Landing:	Full Stop; Straight-in

## Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 None	Latitude, Longitude:	34.264444, -110.012778 (est)

## Preventing Similar Accidents

### Stay Centered: Preventing Loss of Control During Landing

Loss of control during landing is one of the leading causes of general aviation accidents and is often attributed to operational issues. Although most loss of control during landing accidents do not result in serious injuries, they typically require extensive airplane repairs and may involve potential damage to nearby objects such as fences, signs, and lighting.

Often, wind plays a role in these accidents. Landing in a crosswind presents challenges for pilots of all experience levels. Other wind conditions, such as gusting wind, tailwind, variable wind, or wind shifts, can also interfere with pilots' abilities to land the airplane and maintain directional control.

What can pilots do?

- Evaluate your mental and physical fitness before each flight using the Federal Aviation Administration's (FAA) ["I'M SAFE Checklist."](#) Being emotionally and physically ready will help you stay alert and potentially avoid common and preventable loss of control during landing accidents.
- Check wind conditions and forecasts often. Take time during every approach briefing to fully understand the wind conditions. Use simple rules of thumb to help (for example, if the wind direction is 30 degrees off the runway heading, the crosswind component will be half of the total wind velocity).
- Know your limitations and those of the airplane you are flying. Stay current and practice landings on different runways and during various wind conditions. If possible, practice with a flight instructor on board who can provide useful feedback and techniques for maintaining and improving your landing procedures.
- Prepare early to perform a go around if the approach is not stabilized and does not go as planned or if you do not feel comfortable with the landing. Once you are airborne and stable again, you can decide to attempt to land again, reassess your landing runway, or land at an alternate airport. Incorporate go-around procedures into your recurrent training.
- During landing, stay aligned with the centerline. Any misalignment reduces the time available to react if an unexpected event such as a wind gust or a tire blowout occurs.
- Do not allow the airplane to touch down in a drift or in a crab. For airplanes with tricycle landing gear, do not allow the nosewheel to touch down first.

- Maintain positive control of the airplane throughout the landing and be alert for directional control difficulties immediately upon and after touchdown. A loss of directional control can lead to a nose-over or ground loop, which can cause the airplane to tip or lean enough for the wing tip to contact the ground.
- Stay mentally focused throughout the landing roll and taxi. During landing, avoid distractions, such as conversations with passengers or setting radio frequencies.

### Interested in More Information?

The FAA’s “[Airplane Flying Handbook](#)” (FAA-H-8083-3B), [chapter 8](#), “Approaches and Landings,” provides guidance about how to conduct crosswind approaches and landings and discusses maximum safe crosswind velocities. The handbook can be accessed from the FAA’s [website](#) (www.faa.gov).

The FAA Safety Team (FAASafetyTeam) provides access to online training courses, seminars, and webinars as part of the FAA’s “WINGS—Pilot Proficiency Program.” This program includes targeted flight training designed to help pilots develop the knowledge and skills needed to achieve flight proficiency and to assess and mitigate the risks associated with the most common causes of accidents, including loss of directional control. The courses listed below can be accessed from the [FAASafetyTeam website](#) (www.faasafety.gov).

- [Avoiding Loss of Control](#)
- [Maneuvering: Approach and Landing](#)
- [Normal Approach and Landing](#)
- [Takeoffs, Landings, and Aircraft Control](#)

The Aircraft Owners and Pilots Association Air Safety Institute offers several interactive courses, presentations, publications, and other safety resources that can be accessed from its [website](#) (www.aopa.org/asf/).

The NTSB’s Aviation Information Resources web page, [www.nts.gov/air](#), provides convenient access to NTSB aviation safety products.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

### Administrative Information

<b>Investigator In Charge (IIC):</b>	Kathryn R Benhoff	<b>Report Date:</b>	06/14/2018
<b>Additional Participating Persons:</b>	Darren Henley; FAA; Scottsdale, AZ		
<b>Publish Date:</b>	06/14/2018		
<b>Note:</b>	This accident report documents the factual circumstances of this accident as described to the NTSB.		
<b>Investigation Docket:</b>	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=96789">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=96789</a>		

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](#).