



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Corinth, MS	<b>Accident Number:</b>	ERA16LA078
<b>Date &amp; Time:</b>	12/24/2015, 0840 CST	<b>Registration:</b>	N891CR
<b>Aircraft:</b>	PIPER AIRCRAFT INC PA-46	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of control in flight	<b>Injuries:</b>	2 Serious, 2 Minor
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

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## Analysis

On the day of the accident, a line service technician had disconnected the airplane from a battery charger. After disconnecting the battery, he left the right access door open which provided access to the fuel control unit, fuses, fuel line, oil line, and battery charging port as he always did. He then towed the airplane from the hangar it was stored in, and parked it in front of the airport's terminal building.

The three passengers arrived first, and then about 30 minutes later the pilot arrived. He uploaded his navigational charts and did a preflight check "which was normal." The engine start, taxi, and engine run up, were also normal. The wing flaps were set to 10°. After liftoff he "retracted the landing gear" and continued to climb. Shortly thereafter the right cowl door opened partially, and started "flopping" up and down 3 to 4 inches in each direction. He reduced the torque to try to prevent the right cowl door from coming completely open. However, when he turned on the left crosswind leg to return to the runway, the right cowl door opened completely, and the airplane would not maintain altitude even with full power, so he "put the nose back down." The airplane struck trees, and then pancaked, and slid sideways and came to rest, in the front yard of an abandoned house.

The private pilot and one passenger received minor injuries. Two passengers received serious injuries, one of whom was found out of her seat, unconscious, on the floor of the airplane shortly after the accident, and died about 227 days later. During the investigation, it could not be determined, if she had properly used the restraint system, as it was found unlatched with the seatbelt portion of the assembly extended.

Examination of the wreckage revealed no evidence of any preimpact failures or malfunctions of the airplane or engine that would have precluded normal operation. It was discovered though, that the right access door had not been closed and latched by the pilot before takeoff, as examination of the right access door latches and clevis keepers found them to be functional, with no indication of overstress or deformation which would have been present if the access door had been forced open due to air loads in-flight, or during the impact sequence. Further

examination also revealed that the battery charging port cover which was inside the compartment that the right access door allowed access to, had not been placed and secured over the battery charging port, indicating that the preflight inspection had not been properly completed.

A checklist that was provided by a simulator training provider was found by the pilot's seat station. Examination of the checklist revealed that under the section titled: "EXTERIOR PREFLIGHT" only one item was listed which stated, "EXTERIOR PREFLIGHT...COMPLETE." It also stated on both sides of the checklist: "FOR SIMULATOR TRAINING PURPOSES ONLY." A copy of the airplane manufacturer's published pilot's operating handbook (POH) was found in a cabinet behind the pilot's seat where it was not accessible from the pilot's station. Review of the POH revealed that it contained detailed guidance regarding the preflight check of the airplane.

Additionally, it was discovered that the landing gear was in the down and locked position which would have degraded the airplane's ability to accelerate and climb by producing excess drag, and indicated that the pilot had not retracted the landing gear as he thought he did, as the landing gear handle was still in the down position. Review of recorded data from the airplane's avionics system also indicated that the airplane had roughly followed the runway heading while climbing until it reached the end of the runway. The pilot had then entered a left turn and allowed the bank angle to increase to about 45°, and angle of attack to increase to about 8°, which caused the airspeed to decrease below the stalling speed (which would have been about 20% higher than normal due to the increased load factor from the steep turn) until the airplane entered an aerodynamic stall, indicating that the pilot allowed himself to become distracted by the open door, rather than maintaining control of the airplane.

## Probable Cause and Findings

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

The pilot's inadequate preflight inspection and his subsequent failure to maintain airplane control, which resulted in an access door opening after takeoff, and the airplane exceeding its critical angle of attack and experiencing an aerodynamic stall.

## Findings

<b>Aircraft</b>	Service doors - Not inspected (Cause)
	Service doors - Malfunction (Cause)
	Performance/control parameters - Not attained/maintained (Cause)
	Airspeed - Not attained/maintained (Cause)
	Angle of attack - Capability exceeded (Cause)
<b>Personnel issues</b>	Preflight inspection - Pilot (Cause)
	Forgotten action/omission - Pilot (Cause)
	Decision making/judgment - Pilot (Cause)
	Incorrect action performance - Pilot (Cause)
	Aircraft control - Pilot (Cause)

## Factual Information

### History of Flight

Prior to flight	Preflight or dispatch event
Takeoff	Miscellaneous/other
Initial climb	Attempted remediation/recovery Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)
Post-impact	Fire/smoke (post-impact)

On December 24, 2015, about 0840 central standard time, a Piper PA-46-500TP, N891CR, impacted a tree and terrain during a return to the airport after takeoff from Roscoe Turner Airport (CRX), Corinth, Mississippi. The private pilot and one passenger received minor injuries. Two passengers received serious injuries, one of whom died 227 days after the accident due to her injuries. The airplane sustained substantial damage. The airplane was registered to North Mississippi Pulmonology Clinic, Inc., and was operated by the pilot under Title 14 *Code of Federal Regulations* (CFR) Part 91. Visual meteorological conditions prevailed, and an instrument flight rules flight plan was filed for the cross-country personal flight that was destined for Ocean Reef Club Airport (07FA), Key Largo, Florida.

According to a line service technician at the airport, when he arrived at work on the day of the accident, he received a note stating that the airplane had been previously fueled. He then went to the hangar where the airplane was kept, unplugged the airplane from the battery charger, towed the airplane to the terminal, and parked the airplane so it was parallel to the front of the terminal. The line service technician reported that, when he unplugged the airplane from the battery charger, he did not close the right access door (located behind the engine and forward of the right-wing root), which provided access to the battery charging port. The technician stated that he left the door in the open position, that they would not open or close doors on an aircraft unless requested to, and that he had advised the pilot of this in the past.

The pilot's wife, daughter, and daughter-in-law arrived at the airport about 30 minutes before the pilot, as the pilot had to go to his office first. When the pilot arrived, he told the line service technician, "I'll see you." About 20 minutes later, the line service technician heard the engine start, and then he heard the airplane taxi to runway 18 and takeoff. The line service technician stated that it sounded to him like the airplane's engine was producing full power when the airplane took off. A little while later, the telephone rang, and he was advised that the airplane had crashed.

According to the pilot, he arrived at the airport about 0800, uploaded his navigational charts, and did a preflight check, which was normal. The pilot stated that the airplane's battery was on a trickle charger the night before the flight, which required that the right access door be open, but that he checked the door during his preflight check and secured it. The engine start, taxi, and engine run up were normal. They departed from runway 18 with the wing flaps set to 10°.

Rotation for takeoff was at 85 knots indicated airspeed with power set to 1,240 ft-pounds of torque. After liftoff, he retracted the landing gear and continued to climb. Shortly thereafter, the right access door opened partially and started "flopping" up and down 3 to 4 inches in each direction. He reduced the torque to 900 ft-pounds to try to prevent the right access door from coming completely open and attempted to return to the airport. However, when he turned on the left crosswind leg for runway 18, the right access door opened completely, and the airplane would not maintain altitude even with full power, so he "put the nose back down." The airplane then hit a treetop and came to rest in the front yard of an abandoned house.

According to a witness, who was an airplane mechanic employed at the airport, he was driving past the south end of the runway, when he saw the airplane about 150 ft above ground level flying "real slow." It flew over Highway 2, and its wings were "wagging" like it was going to stall. The left wing "dropped," and the airplane "fell" through some trees, "pancaked," and then slid sideways.

Review of data recovered from the airplane's Avidyne Entegra avionics system indicated that, after becoming airborne, the airplane roughly followed the runway heading while climbing until it reached the end of the runway. The airplane then entered a left turn, and the airspeed, which had reached a maximum of about 102 knots began to decrease. At 0839:57, the airplane was at a pressure altitude of 507 ft. At this point, the airspeed had dropped to about 80 knots, and the airplane was in a left bank of about 45°. The recorded data ended about 60 seconds before impact because the system did not have time to write the buffered data to the system's memory card before the unit lost power.

According to the pilot, when the airplane came to a stop, the left wing was burning. The pilot told his daughter to get out of the airplane, which she did. His wife and daughter-in-law were both unconscious, so he asked his daughter to help him get them out. They got his daughter-in-law out first and then his wife, who was conscious by then.

When the witness got to the airplane, there was a small fire coming from the left wing. The pilot had already egressed, and his daughter was in the process of exiting the airplane. The pilot's daughter-in-law was laying on the floor of the airplane between the middle and aft rows of seats. The witness picked her up and laid her down by the road in front of the house. The pilot then went back into the airplane to get his wife out. She had facial injuries, and the witness helped to get her out of the airplane by kicking open the lower cabin door, grabbing her by her hands, and dragging her out of the airplane.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	63, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; 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>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 Without Waivers/Limitations	<b>Last FAA Medical Exam:</b>	06/17/2015
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	08/19/2015
<b>Flight Time:</b>	1990 hours (Total, all aircraft), 427 hours (Total, this make and model), 1628 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 2 hours (Last 30 days, all aircraft)		

According to Federal Aviation Administration (FAA) airman records, the pilot held a private pilot certificate with ratings for airplane single-engine land, airplane multi-engine land, and instrument airplane. He held an FAA third-class medical certificate dated June 17, 2015, with no limitations. The pilot reported that he had accrued about 1,990 total hours of flight experience, of which 427 hours were in the accident airplane make and model.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	PIPER AIRCRAFT INC	<b>Registration:</b>	N891CR
<b>Model/Series:</b>	PA-46 500TP	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	4697321
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	10/01/2015, Annual	<b>Certified Max Gross Wt.:</b>	4850 lbs
<b>Time Since Last Inspection:</b>	16 Hours	<b>Engines:</b>	1 Turbo Prop
<b>Airframe Total Time:</b>	1407 Hours at time of accident	<b>Engine Manufacturer:</b>	P&W CANADA
<b>ELT:</b>	C126 installed, not activated	<b>Engine Model/Series:</b>	PT6A-42A
<b>Registered Owner:</b>	NORTH MISSISSIPPI PULMONOLOGY CLINIC INC	<b>Rated Power:</b>	500 hp
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The airplane was a high-performance, single-engine, pressurized, six-place, low-wing monoplane certificated in the normal category. It was equipped with retractable landing gear and wing flaps. It was powered by a 500-shaft horsepower, Pratt & Whitney Canada PT6A-42A turboprop engine, driving a 4-bladed, hydraulically actuated, constant-speed, full-feathering, reversible-type propeller. The airplane was certificated for flight in visual, instrument, day, night, and icing conditions.

According to FAA airworthiness records and airplane maintenance records, the airplane was manufactured in 2007. Its most recent annual inspection was completed on October 1, 2015. At the time of the accident, the airplane had accrued about 1,407 total hours of operation.

The unpressurized nose section included the engine compartment and nose landing gear assembly. The engine compartment contained the powerplant and associated accessories. The forward section of the engine compartment was enclosed by a two-piece nose cowl. Aft of the nose cowl, two hinged access doors (also identified as "cowl doors" or "gull wing doors" in the airplane manufacturer's various documents) provided servicing and inspection access to components in the aft engine compartment. The left access door provided access to the engine oil sight gauge and the brake fluid reservoir. The right access door provided access to the fuel control unit, fuses, fuel line, oil line, and the battery charging port.

The access doors were attached to the airplane structure with piano-type hinges and secured with latches. Once opened, each door was held in the open position by a support rod with a "twist-lock" mechanism. The doors were closed by slightly lifting on the door, then unlocking the mechanism by twisting the upper part of the support rod a quarter-turn while holding the lower part of the support rod. Once the mechanism was unlocked, the door could be lowered into the closed position and latched.

Review of flight test data for the PA-46-500TP indicated that at 0° of bank (1G), the airplane would stall at 79 knots indicated airspeed (KIAS) with the landing gear down and the wing flaps set at 10°. With the airplane in the same configuration in a 45° bank (about 1.4G), the stall speed would be about 95 KIAS (about 20% higher).

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	CRX, 424 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	0840 CST	Direction from Accident Site:	360°
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	100°	Turbulence Severity Forecast/Actual:	/ N/A
Altimeter Setting:	29.98 inches Hg	Temperature/Dew Point:	15°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Corinth, MS (CRX)	Type of Flight Plan Filed:	None
Destination:	KEY LARGO, FL (07FA)	Type of Clearance:	None
Departure Time:	0835 CST	Type of Airspace:	Class G

The reported weather at CRX, at 0915, included wind 100° at 4 knots, 10 miles visibility, clear skies, temperature 15°C, dew point 11°C, and an altimeter setting of 29.98 inches of mercury.

## Airport Information

Airport:	ROSCOE TURNER (CRX)	Runway Surface Type:	Asphalt
Airport Elevation:	424 ft	Runway Surface Condition:	Dry
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	6500 ft / 100 ft	VFR Approach/Landing:	None

CRX is a non-towered, publicly-owned airport located 4 miles southwest of Corinth, Mississippi. The airport elevation is about 425 ft above mean sea level, and there is one runway oriented in a 18/36 configuration. Runway 18 is asphalt, grooved, marked with precision markings, and measures 6,500-ft-long by 100-ft-wide.

## Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	2 Serious, 1 Minor	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Serious, 2 Minor	Latitude, Longitude:	34.902778, -88.598056 (est)

The airplane came to rest about 1,792 ft from the departure end of runway 18 on a 132° magnetic heading on the front lawn of a residence. Examination of photographs of the wreckage taken at the accident site revealed that the right cowl door was open (see Figure 1).



Figure 1 – Right Side Access Door

### Wreckage Examination

Examination of the wreckage revealed that during the impact sequence the nose landing gear was separated from the airframe. The nose gear actuator was found in the down and locked position. The firewall was separated from the forward pressure bulkhead.

The tail section of the aircraft from fuselage station 249.60 to station 326.05 was impact-damaged and crushed downward.

The pilot's side window was fire damaged, and the window just aft of the pilot's side window was also fire damaged and was partially separated from the window frame. The fuselage was accordion-crushed forward and down between the pilot's side window and the number three window. The bottom of the fuselage was crushed upward into the cabin floor.

The top engine cowl had separated from the airframe and was impact-damaged. The top engine cowl mounting points were separated from the cowl on the right side and remained attached to the airframe and bottom cowl.

The left access door was found separated from its mounting points. The hinges were found to be bent forward, and the forward clevis keeper was pulled upward deforming its mounting area.

The right access door was found open and unlatched with minimal damage noted to the door. The right access door support rod was found lying on top of the battery bay, and the battery charging port cover was not installed over the charging port. A functional check of the right access door latches found them to be functional with no indication of overstress or deformation, and there was no deformation or indication of overstress to the clevis keepers.

The rudder and rudder trim tab remained attached to the vertical fin. The rudder was impact damaged on the bottom right side. The rudder skin was crushed down along the entire span of the rudder; the top rudder attach point was partially separated from the vertical fin; and the rudder torque tube remained attached to the rudder bellcrank. The rudder trim actuator was extended about 1.5 inches, which indicated a neutral to slight-nose-right trim setting.

The elevator and elevator trim tab remained attached to the horizontal stabilizer. The left and right sides of the horizontal stabilizer had leading edge impact damage. The aft spar of the horizontal stabilizer was separated from the remainder of the structure.

The elevator pitch torque tube remained attached to the elevator and to mounting area of the pitch sector. The elevator trim rods remained attached to the elevator trim tab, but the rod ends were found to be fragmented from the elevator trim barrel assembly. The elevator trim barrel remained attached to the fuselage and had three threads exposed on the leading edge of the trim barrel, which indicated a neutral to slight-nose-down elevator trim setting.

The left wing had fire damage to the outboard wing section from wing station 220.00 to the wing tip. Fire damage was also noted between wing stations 71.00 and 134.00. The left main landing gear was fire damaged but had remained attached to its mounts; the left main landing gear actuator was found in the down-and-locked position. The left aileron remained attached to the wing, and about 12 inches of the outboard side had been consumed by fire.

The left flap separated at the inboard and center attaching points but remained partially attached to the outboard attaching point. Fire damage to the flap was noted between wing stations 82.50 and 116.00. Impact damage was noted within the outboard section of the flap. Examination of the flap motor jack screw indicated that the wing flaps were in the 10° position.

The right wing had leading edge damage to the entire span of the wing; circular leading edge

damage was noted inboard of the recognition light. The right main landing gear door was impact damaged. The right main landing gear remained attached to the wing, and the right main landing gear wheel assembly, scissor link, and strut tube were separated. The right main landing gear actuator was observed to be in the down and locked position. The right flap and the right aileron remained attached to their mounts

Control continuity was established from all the flight control surfaces to the breaks and cuts in the system and from the breaks and cuts in the system to the cockpit.

The bleed air switch was in the "ON" position. The power lever was in the "FULL" position. The condition lever was in the "RUN" position. The manual override was in the "OFF" (stowed) position. The fuel shutoff valve was stowed. The landing gear selector was found in the down position. The wing flap lever was set to 10°.

The pilot's and copilot's seats were undamaged, and a functional check of the seat stops of both seats revealed no anomalies. The pilot's and copilot's seat belts were examined and found to be functional. The left and right center row seats were undamaged, and their seat belts were functional. The left and right aft row seat backs were found canted inward and aft. The seat back stops were in place and operational. The left aft seat belt was found unlatched, and the seat belt was extended. Functional checks of the aft seat belts found them to be operational.

#### Engine Examination

The spinner was impact damaged and crushed aft. The propeller blades exhibited chordwise scratching, and three of the four blades were bent aft mid span about 90°. The fourth blade was twisted about midspan.

The power lever cable remained attached to the cam assembly; the condition lever cable remained attached to the control arm; and the manual override cable remained attached to the fuel control unit. All the engine fuel lines remained intact and were attached to their respective fittings. The engine displayed impact damage including compressional deformation of the exhaust duct.

Strong circumferential contact signatures were displayed by the compressor 1st stage blades and shroud; compressor turbine vane ring and turbine; power turbine 1st stage vane ring, shroud, and turbine; and power turbine 2nd stage shroud and turbine, which was consistent with them making contact under impact loads and external housing deformation.

None of the engine mechanical components displayed any indications of any preimpact anomalies or distress.

#### Medical And Pathological Information

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On August 7, 2016, the pilot's daughter-in-law, who had been seated in the left seat of the aft row, died. According to the Harris County Institute of Forensic Sciences, Houston, Texas, the daughter-in-law's cause of death was complications of subdural hemorrhage due to blunt force head injuries.

## Tests And Research

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The mechanic witness reported that he had seen the airplane in the hangar many times and that the right access door was always open, as the airplane was always hooked up to a battery cart.

### Checklists

During the wreckage examination, a checklist that was provided by a simulator training provider was found on the floor by the pilot's rudder pedals. Examination of the checklist revealed that the section titled "EXTERIOR PREFLIGHT" only listed one item, which stated, "EXTERIOR PREFLIGHT...COMPLETE." Both sides of the checklist stated, "FOR SIMULATOR TRAINING PURPOSES ONLY."

A copy of the airplane manufacturer's published pilot's operating handbook (POH) was found in the cabinet behind the pilot's seat, a location that was not accessible from the pilot's station. Review of the POH revealed that it contained detailed guidance regarding the preflight check of the airplane. One item in the "Preflight Checklist" stated, "Right Cowl Door...OPEN-CHECK GENERAL CONDITION-SECURE DOOR."

Under "AMPLIFIED NORMAL PROCEDURES," the POH stated that, during the preflight check, the pilot should "open the right side cowling door and check general condition of the linkage, hoses, and wiring, then close and secure the door."

## Additional Information

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### Airplane Flying Handbook

Under the heading, "Door Opening In-Flight," the FAA's Airplane Flying Handbook (FAA-H-8083-3B) states: In most instances, the occurrence of an inadvertent door opening is not of great concern to the safety of a flight, but rather, the pilot's reaction at the moment the incident happens. A door opening in flight may be accompanied by a sudden loud noise, sustained noise level, and possible vibration or buffeting. If a pilot allows himself or herself to become distracted to the point where attention is focused on the open door rather than maintaining control of the airplane, loss of control may result even though disruption of airflow by the door is minimal."

The handbook explains that, in the event of an inadvertent door opening in flight or on takeoff, the pilot should concentrate on flying the airplane. It states that "there may be some handling effects, such as roll and/or yaw, but in most instances, these can be easily overcome." It further

states that, "if a door opens after lift off, do not rush to land. Climb to normal traffic pattern altitude, fly a normal traffic pattern, and make a normal landing."

The handbook cautions that "attempting to get the airplane on the ground as quickly as possible may result in steep turns at low altitude." It further cautions the pilot to complete all items on the landing checklist and to "remember that accidents are almost never caused by an open door. Rather, an open door accident is caused by the pilot's distraction or failure to maintain control of the airplane."

### Aerodynamic Stalls

The Airplane Flying Handbook, also contained information regarding aerodynamic stalls, advising that, at low angles of attack (AOA), the airflow over the top of the wing flows smoothly and produces lift with a relatively small amount of drag. As the AOA increases, lift as well as drag increases; however, above a wing's critical AOA, the flow of air separates from the upper surface and backfills, burbles and eddies, which reduces lift and increases drag. This condition is a stall, which can lead to loss of control if the AOA is not reduced.

The handbook further advised that, it is important for the pilot to understand that a stall is the result of exceeding the critical AOA, not of insufficient airspeed. The term "stalling speed" can be misleading, as this speed is often discussed when assuming 1G flight at a particular weight, and configuration. Increased load factor directly affects stall speed (as well as do other factors such as gross weight, center of gravity, and flap setting). Therefore, it is possible to stall the wing at any airspeed, at any flight attitude, and at any power setting. For example, if a pilot maintains airspeed and rolls into a coordinated, level 60° banked turn, the load factor is 2Gs, and the airplane will stall at a speed that is 40 percent higher than the straight-and-level stall speed. In that 2G level turn, the pilot must increase AOA to increase the lift required to maintain altitude. At this condition, the pilot is closer to the critical AOA than during level flight and therefore closer to the higher speed that the airplane will stall at. Because "stalling speed" is not a constant number, pilots must understand the underlying factors that affect it to maintain aircraft control in all circumstances.

### Use of Seatbelts and Shoulder Harnesses

According to the CFRs, the regulations give the pilot in command two tasks regarding seat belts and shoulder harnesses.

The first is to brief the passengers on how the seat belts work:

...the pilot in command of that aircraft ensures that each person on board is briefed on how to fasten and unfasten that person's seat belt and, if installed, shoulder harness. (14 CFR 91.107(a)(1)).

The second is to notify the passengers that seat belts must be fastened:

...the pilot in command of that aircraft ensures that each person on board has been notified to fasten his or her safety belt and, if installed, his or her shoulder harness. (14 CFR 91.107(a)(2).)

The POH, also provided guidance under "NORMAL PROCEDURES," on the "BEFORE STARTING ENGINE CHECKLIST.":

"Seat Belts and Harness...FASTEN / ADJUST – CHECK inertia reel"

It also states Under "BEFORE TAKEOFF":

"Belts/Harness...FASTENED/ADJUSTED"

### Administrative Information

<b>Investigator In Charge (IIC):</b>	Todd G Gunther	<b>Report Date:</b>	04/17/2018
<b>Additional Participating Persons:</b>	Albert L McCray; FAA/FSDO; Jackson, MS Damian Galbraith; Piper Aircraft; Vero Beach, FL Marc Gratton; Pratt & Whitney Canada; Montreal, Beverley Harvey; TSBC; Ottawa,		
<b>Publish Date:</b>	04/17/2018		
<b>Note:</b>	The NTSB did not travel to the scene of this accident.		
<b>Investigation Docket:</b>	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=92497">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=92497</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](#).