



# Aviation Investigation Final Report

<b>Location:</b>	Leesburg, Florida	<b>Accident Number:</b>	ERA19LA125
<b>Date &amp; Time:</b>	March 8, 2019, 10:00 Local	<b>Registration:</b>	N45MJ
<b>Aircraft:</b>	Piper PA31	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Landing gear collapse	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Flight test		

## Analysis

The pilot reported that, while his airplane was undergoing an annual inspection, maintenance personnel suggested that an inner landing gear door kit be installed. After the door kit installation was completed, numerous test flights were conducted. Rigging adjustments were made after each flight, and while taxiing back to the ramp following the last flight, the right landing gear collapsed. A postaccident extension and retraction test were performed using a hydraulic test unit. Both normal and emergency (hand pump) landing gear extension and retraction tests were performed. When checking the actuator rigging, both left and right main landing gear actuators did not drive the main gear into a locked position. No preimpact mechanical malfunctions or failures of the landing gear system were observed, thus it is likely that the rigging condition resulted in the collapse of the right main landing gear.

## Probable Cause and Findings

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

Maintenance personnel's improper rigging of the main landing gear actuators, which resulted in the collapse of the right main landing gear.

## Findings

<b>Aircraft</b>	Gear extension and retract sys - Incorrect service/maintenance
<b>Personnel issues</b>	Repair - Maintenance personnel

# Factual Information

## History of Flight

Taxi-from runway	Landing gear collapse (Defining event)
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On March 8, 2019, about 1000 eastern standard time, a Piper PA-31-325, N45MJ, was substantially damaged when it was involved in an accident near Leesburg, Florida. The pilot was not injured. The airplane was operated by the pilot as a flight test under the provisions of Title 14 *Code of Federal Regulations* Part 91.

According to the pilot, he delivered his airplane to a maintenance facility for an annual inspection. It was suggested by maintenance personnel that an inner landing gear door kit be installed (STC SA00555DE) during the annual inspection. After the door kit installation was completed, numerous test flights were conducted. During the landing gear extension, two green landing lights appeared as expected, but the third light (right main landing gear) was very slow to illuminate. Adjustments were made after each flight, and on the last flight while taxiing back to the ramp after landing the right landing gear collapsed.

Examination of the airplane by a Federal Aviation Administration inspector revealed buckling of the right inboard wing.

Post-accident extension and retraction test were performed using a hydraulic test unit. Both normal and emergency (hand pump) landing gear extension and retraction test were performed. During normal extension it was noted the landing gear locking time was approximately 25 seconds, which exceeded the manufacturer’s specified time limit; however, the hydraulic test fixture used did not have flow control, which could account for this anomaly. It was discovered when checking the actuator rigging that both left and right main landing gear actuators did not drive the main gears into a locked position. Slight hand pressure on the gear door (inboard force) would keep the main landing gear from locking as actuator piston travel was bottomed out. When the force was removed, the weight of the gear would lock the gear.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	73,Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-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 With waivers/limitations	<b>Last FAA Medical Exam:</b>	July 11, 2017
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	July 8, 2017
<b>Flight Time:</b>	3385 hours (Total, all aircraft), 694 hours (Total, this make and model), 3385 hours (Pilot In Command, all aircraft), 2 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N45MJ
<b>Model/Series:</b>	PA31 325	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1979	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	31-7912104
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	7
<b>Date/Type of Last Inspection:</b>	January 17, 2019 Annual	<b>Certified Max Gross Wt.:</b>	3745 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	4984 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	C91A installed, not activated	<b>Engine Model/Series:</b>	TIO-540-J2B
<b>Registered Owner:</b>		<b>Rated Power:</b>	350 Horsepower
<b>Operator:</b>	On file	<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>	LEE,75 ft msl	<b>Distance from Accident Site:</b>	1 Nautical Miles
<b>Observation Time:</b>	10:29 Local	<b>Direction from Accident Site:</b>	162°
<b>Lowest Cloud Condition:</b>		<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>		<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	7 knots /	<b>Turbulence Type Forecast/Actual:</b>	None / None
<b>Wind Direction:</b>	170°	<b>Turbulence Severity Forecast/Actual:</b>	N/A / N/A
<b>Altimeter Setting:</b>	30.27 inches Hg	<b>Temperature/Dew Point:</b>	21°C / 12°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Orlando, FL (LEE )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Orlando, FL (LEE )	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	09:50 Local	<b>Type of Airspace:</b>	Class D

## Airport Information

<b>Airport:</b>	Leesburg Intl LEE	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	75 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	13	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	6300 ft / 100 ft	<b>VFR Approach/Landing:</b>	Full stop;Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	28.822778,-81.808334(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Alleyne, Eric		
<b>Additional Participating Persons:</b>	Robert Melcher; FAA/FSDO; Orlando, FL		
<b>Original Publish Date:</b>	June 14, 2022	<b>Investigation Class:</b>	3
<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=99106">https://data.nts.gov/Docket?ProjectID=99106</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](#).