

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR24LA275

LANDING GEAR SYSTEM EXAMINATION REPORT

August 8, 2024

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A. ACCIDENT

Location: Concord, California
Date: August 8, 2024
Time: 1959 Pacific daylight time
Airplane: Piper PA-30 (N8458Y)

B. PARTICIPANTS

IIC	Stephen Stein National Transportation Safety Board Federal Way, Washington
Party Coordinator	Harry Palmer Federal Aviation Administration Oakland, California
Party Coordinator	Sean Holloway Piper Aircraft Company Vero Beach, Florida

C. DETAILS OF THE INVESTIGATION

1.0 Summary

On August 8, 2024, at about 1959 Pacific daylight time, a Piper PA-30 airplane, N8458Y, was substantially damaged when it was involved in an accident near Buchanan Field Airport (CCR), Concord, California. The pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot reported that the tower controller at CCR told him to report a “2 mile right base for runway 32R.” He notified the tower that he was on a “3 mile right base” and then extended the landing gear. After receiving clearance to land from the tower controller, he made the turn for final approach and completed a GUMPS check, at which time he noted that the landing gear switch was in the down position while the corresponding annunciator showed the gear in the up position. The pilot attempted to recycle the landing gear, but the landing gear annunciator light still indicated the gear was up and locked.

The tower controller approved a go-around; however, the pilot’s next attempt to recycle the gear was unsuccessful. He then overflew the runway (a fly-by) and the

tower confirmed that the landing gear was partially down and did not appear to be locked. The pilot briefly checked the circuit breakers with his hand and noted that none had popped.

During this time, he continued to circle the field above traffic pattern altitude while he recycled the gear multiple times and tried to shake the gear loose by turning abruptly. After these unsuccessful attempts, a mechanic and the owner of the airplane were allowed to enter the tower to help troubleshoot the failure. At their suggestion, the pilot raised the jackscrew lock to manually release the landing gear, but was unsuccessful. After attempting several additional maneuvers (rolling, climbing, diving) to lower the landing gear, the tower controller noted that the sun was going down and asked if he wanted to continue. The pilot decided that he should land as he was mentally and physically worn out by his effort. The tower controller cleared the pilot to land on runway 19R and after one more low pass, the pilot landed the airplane on the partially extended landing gear. During touchdown, the gear collapsed and the airplane skidded to a stop, which resulted in substantial damage to the fuselage.

2.0 Landing Gear Examination

2.1 System Description and Airworthiness Directives

According to the airplane maintenance manual, the landing gear system is electrically operated allowing the nose and main landing gear to fully retract into the nose section and inboard wings, respectively. The retraction mechanism consists of an electric motor and transmission assembly, torque tube assembly, push-pull cables to each main gear and push-pull tube to the nose gear. Limit switches are installed in the system to cut off the transmission motor when the gear is fully extended or retracted. These switches also operate the gear indicator lights in the cockpit.

A manual extension handle is located under a floor panel between the pilot seats to manually extend the landing gear in flight.

The landing gear selector switch is placed in the up position activating the retraction motor which operates the transmission. The retraction transmission pushes the torque arm forward which pulls the main landing gear cables and pushes the nose gear retraction tube forward, retracting the landing gear. When the gear is fully retracted, the gear up limit switch stops the motor and the amber gear up indicator light illuminates. The landing gear selector switch is placed in the down position to extend the landing gear, which operates the motor and retraction transmission. The transmission pulls the torque arms back which pushes on the main gear cables and pulls the nose gear tube extending the landing gear. When the gear is fully extended, the gear down switches stop the motor and the green gear down and locked indicator light on the instrument panel illuminates.

The landing gear manual extension system consists of a release tube and release arm that decouples from the retraction torque tube when the release arm is engaged. To engage the manual extension, the release arm is pulled up and subsequently pushed forward. During this action, the release tube that covers the transmission screw slides forward and decouples from the retraction torque tube, which immediately drops the landing gear.

The main landing gear lever must then be lowered, which turns the jackscrew clockwise using the motor, to recouple the manual gear release tube with the retraction torque tube.

Airworthiness Directives

AD 77-13-21

AD 77-13-21 was published in 1977 and applies to PA-30s with 1,000 flight hours or more in service and requires an inspection of the main landing gear bungee cords for frayed protective covering, breaks, soft areas and to replace any cords exhibiting any of these conditions. In addition, the bungee cords are required to be replaced every 500 hours in service, or every three years, whichever occurs first.

The aircraft left tachometer indicated 3,377 flight hours at the time of the accident. According to the aircraft logbook, the AD was last complied with during an inspection on November 23, 2016 at 3,322.21 flight hours.

Postaccident examination of the bungee cords did not reveal any breaks or fraying.

AD 97-01-01 R1

AD 97-01-01 R1 was published in 1998 and applies to all model PA-30 airplanes and requires the repetitious inspection of the main gear sidebrace studs for cracks. Compliance with the AD is required within 100 flight hours from the issuance of this AD, or 500 hours time in service after the last inspection or replacement if the AD has already been complied with, whichever occurs later.

The AD is not referenced in the aircraft logbooks; however, an entry dated February 6, 2018 states the side brace bushings were replaced.

2.2 Landing Gear System Examination

The investigation team convened on October 16, 2025 to examine the landing gear system. The landing gear was cycled 6 times and fully retracted and extended during each cycle. The left main landing gear linkage was cut during the recovery process

and remained in the extended position during each cycle. No preimpact anomalies were noted with right and left main landing gear assemblies.

The landing gear was then placed in the retracted position to facilitate a test of the manual extension system. According to the pilot's operating manual, airspeed should be reduced to 100 mph and the landing gear selector switch should be placed in the gear down locked position. The gear motor should be disengaged by raising the release arm and pushing it forward through its full travel. The gear extension, normally stored in the manual extension compartment between the pilot seats, should be placed in the left or right socket and twisted clockwise to lock in place. The handle should then be extended and rotated forward until the left socket is in a clear position. The handle should then be placed in the left socket (if not already) and then rotated full travel to extend the landing gear. The green light on the panel indicates if the landing gear is down and locked.

The manual also contains three notes: 1) "do not retract with handle in slot"; 2) "do not re-engage motor in flight"; and 3) "reducing power and rocking the gear extension handle will aid in manually extending the landing gear."

During the test, the release arm was pulled upward and forward, consistent with the manual instructions; however, the landing gear would not manually release until the release arm was pushed to the right side, which was met with significant resistance. This happened repeatedly during three separate attempts to extend the landing gear manually. Visual inspection of the manual system revealed that the hardware that secured the release arm to the transmission nut shaft was loose, which allowed the release arm to rotate in place. According to the release arm drawing, the clevis pin bushing hole should be 0.129", which was the measurement of the bushing hole on the accident airplane.

The release arm was partially disassembled by removing the clevis pins. Both clevis pins were intact and were the correct sizes, 1/8 inch diameter and 7/32 length.

The push/pull rod clevis was binding against a side wall on the left side structure that housed the manual extension system. When the manual release arm was pulled up and pushed forward, the lightening hole was preventing the bolt on the left side of the push/pull rod clevis from moving aft and the torque tube from rotating. When the release arm was pushed to the right, the bolt was liberated from the hole allowing the torque tube to rotate and the landing gear to fall.

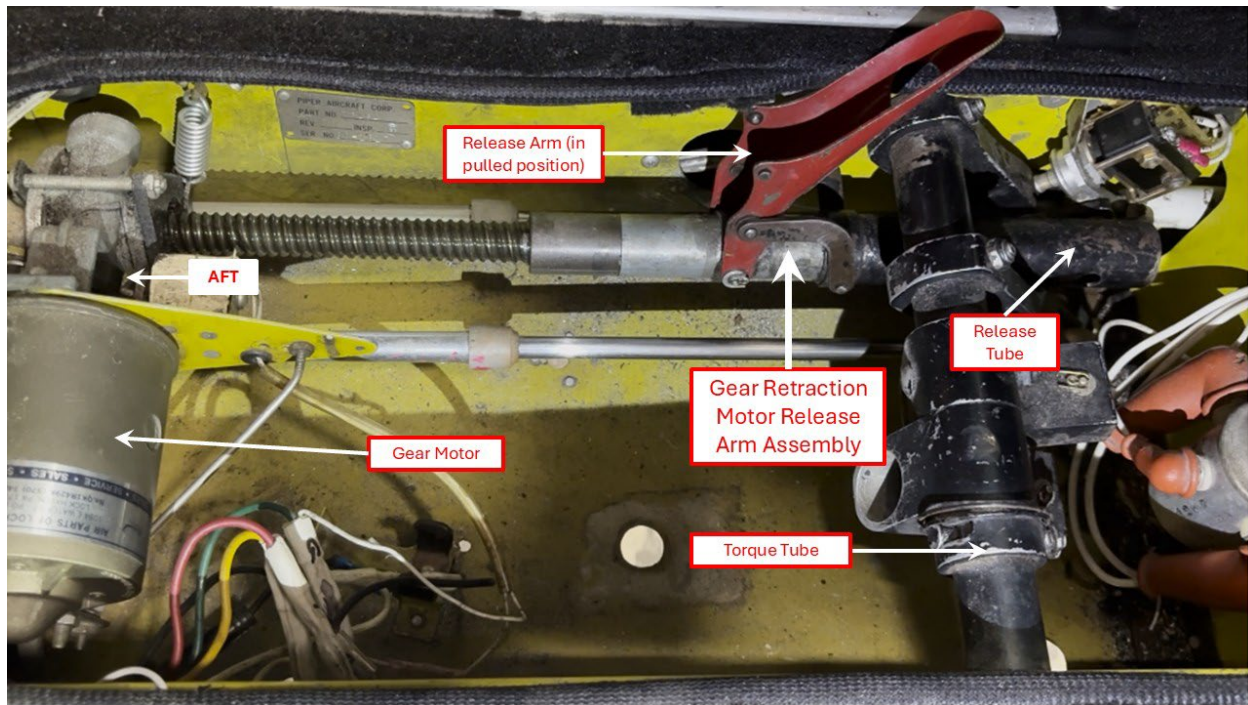


Figure 1: Manual extension system with release arm in pulled position, gear retraction arm assembly and torque tube

Submitted by:

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