

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



CEN23FA084

SURVIVAL FACTORS

Specialist's Factual Report

November 6, 2023

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A ACCIDENT

Location: Yoakum, TX
Date: January 17, 2023
Time: 1039 Central Daylight Time (CDT)
1639 Universal Time Coordinated (UTC)
Airplane: Piper PA-46-350P JetProp DLX N963MA

B SURVIVAL FACTORS SPECIALIST

Specialist Amanda Taylor
National Transportation Safety Board
Washington, DC

C SUMMARY

The airplane departed from the Memphis International Airport (MEM), Memphis, Tennessee, at 0748. The airplane was enroute to its destination at the Yoakum Municipal Airport (T85), Yoakum, Texas. The airplane was substantially damaged when it was involved in an accident near T85.

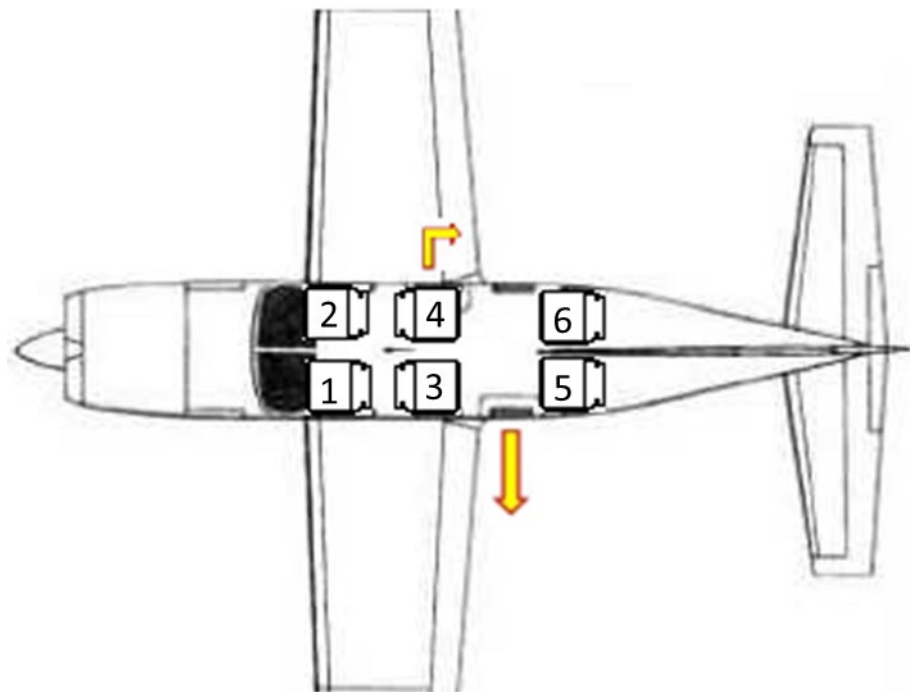
D DETAILS OF THE INVESTIGATION

On August 1, 2023, representatives from the NTSB, FAA, and Piper Aircraft, convened at Air Salvage of Dallas, Lancaster, Texas, to conduct an examination of the Piper PA-46-350P (Malibu Mirage) airplane structure, seats, and restraints.

1.0 Airplane Configuration



Figure 1. Photograph from of the accident airplane. (Source: Ai-Britain Photographic Images)



Piper Malibu Mirage 6 Seats



1 emergency escape hatch



1 two-section airstair door

Figure 2. Diagram of N963MA showing the seating layout, only seat 3 was unoccupied.

The airplane was equipped with six seats, two in the cockpit, two rear facing (3 and 4) and two forward facing passenger seats (5 and 6) in the cabin. There were two pilots and three passengers on board at the time of the accident.

2.0 Accident Narrative

According to the survivor who was seated in seat 6, everyone arrived about 0700 CDT. The pilot packed the luggage into the airplane, and everyone boarded. The pilot demonstrated the operation of the main cabin door and pointed out the location of the seat belts. The survivor could not remember if the pilot spoke about the emergency exit. The airplane departed from the Memphis International Airport (MEM), Memphis, Tennessee, at 0748 for the destination of the Yoakum Municipal Airport (T85), Yoakum, Texas.

Passenger 6 reported that he heard various noises that sounded like alarms from the cockpit throughout the flight; however, he did not feel like those were cause for concern. He then recalled the ride becoming “bumpy” and alarms were going off continuously, which then began causing him concern. He noticed they were in the clouds, and he could not see much outside the windows. He recalled the airplane climbing aggressively just before the nose dropped steeply. The airplane exited the clouds and passenger 6 saw the ground, realizing that a crash was inevitable. He heard no command to brace for impact from the pilot. The airplane impacted a field on private property, about 1.5 miles southeast of T85.

After impact he felt disoriented and struggled to remain conscious. Once he became oriented, he noticed he was still in his seat and the door to his left was open. He unbuckled his restraint and crawled toward the door. He used a phone he found on the floor to call 911, and said it took about 15 minutes for emergency services to arrive. He was able to exit the airplane and was on his knees outside when emergency services arrived.

3.0 Airplane Documentation

3.1 Overall Airplane Exterior



Figure 3. N963MA right side as found at the accident site. (Source: Piper Aircraft)

The airplane was found upright by investigators at the accident site. Both wings separated from the fuselage, and there was significant damage to the front of the airplane with loss of overhead structure in the cockpit (See figure 3 and 4).



Figure 4. N963MA left side as found at the accident site. (Source: Piper Aircraft)

3.2 Overall Airplane Interior

During normal operation, the airplane interior was accessed by a clam shell-type, two-piece door located adjacent to seat 5. The door was operated from the interior by rotating a lever clockwise, which released the top portion, allowing it to open with an outward push and its pneumatic assists. The bottom portion was opened by pulling up on a lever located on the top of the bottom half structure (see figure 5). According to a statement provided by the survivor, the door popped open during the accident sequence. First responders found the door open upon arrival (see figure 6).

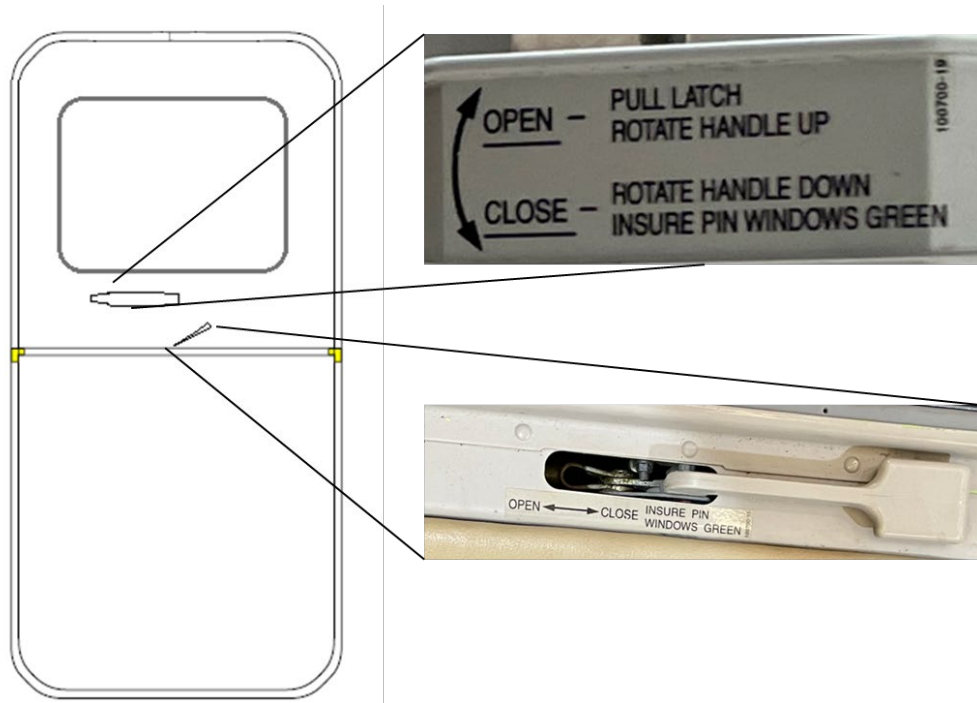


Figure 5. Diagram depicting the internal operation of the door. The top portion is opened first followed by the bottom section.



Figure 6. Main door as found by investigators at the accident site. (Source: Piper Aircraft)

There was an emergency exit hatch located adjacent to seat 4 that was closed and secured when first responders and investigators arrived. The trim on the door was dislodged (see figure 7). The hatch was opened normally and without resistance at the salvage facility.



Figure 7. Emergency exit as found by investigators at the accident site. (Source: Piper Aircraft).

3.2.1 Cockpit

The cockpit area sustained substantial damage upon impact. Additionally, during the extrication of the occupants, emergency responders cut away structure and debris (see figure 8). The overhead trim was bent forward, and flight control cables next to the front, left seats were moved or cut as required.



Figure 8. The cockpit area marked where emergency services moved structure to remove the occupants.

3.2.2 Cabin

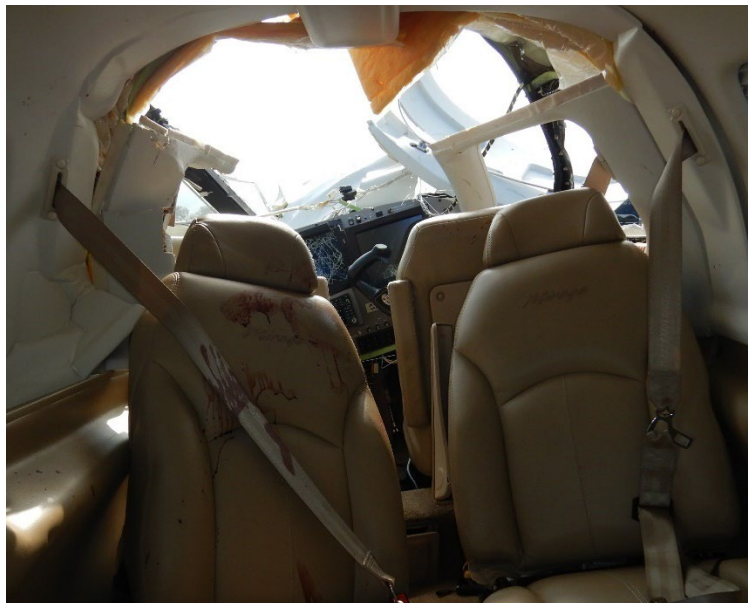


Figure 9. Forward-facing view of seats 3 and 4.



Figure 10. Aft-facing view of seats 5 and 6.

Measurements were taken from the floor to the ceiling in between seats 3 and 4 and measured about 46 inches, the nominal height as provided by Piper Aircraft was 46.67 inches. The height from the boxed structure that seats 5 and 6 were secured on to overhead structure measured about 41 inches. The nominal height provided by the representative from Piper Aircraft was 40.17 inches.

Measurements were taken across the back at seats 5 and 6 and measured 44 inches, with the nominal as provided 44.24 inches. The width at the pilot, copilot, and seats 3 and 4 were unable to be measured due to cabin damage from the impact.

3.3 Seats and Restraints

All seats remained anchored to their supporting structure. The pilot and copilot seats were manufactured by Piper Aircraft and were adjustable fore and aft on seat rails, and there was no data tag identified. Passenger seats 3 and 4 were attached directly to a boxed structure attached to the airplane. The seatpan for passenger 4 had a Piper Aircraft Part Identity Tag which read:

Part NO. 102939-7
Rev D
JO No 937443
Shop Date 9529
Qty 1
AC # 4636453

Passenger seats 5 and 6 consisted of a single large cushion, single seatpan which was attached to a boxed structure underneath. There were no data tags.

All seats were equipped with a three-point restraint system, and all shoulder harnesses were found connected to their inertia reels. All inertia reels remained secured to their structure. Post-accident testing found that all inertia reels functioned normally.

All seat belts were manufactured by BAE Systems Safety Products Inc. located in Pompano Beach, Florida. The seat belts met TSO - C114, which was manufactured in October 2008. The project code was PIP08060, and the seatbelts had a rated strength of 3,000 lbs. Each seatbelt restraint had a separate type, sub type, and number along the bottom of seats. Information on seats 2 and 3 were not recorded during the exam:

Seat place	Type	Sub P/N	Tag number
Pilot (seat 1)	5-01-1P5768	B/6-01-1P6788	504-908
Seat 4	5-01-1V0768	B/5-01-1V0768	504-909
Seat 5	5-01-470768	B/5-01-470768	564-911
Seat 6	5-01-475768	B/5-01-475768	564-912

Figure 11. Part numbers, sub part numbers, and additional number.

According to the photographic documentation provided by the Texas Department of Public Safety (DPS), the pilot and copilot were using their 3-point restraints at the time of the accident, and both remained fastened postaccident. There was no evidence of damage to the webbing of the belts, except for cuts created by the first responders.

According to the surviving passenger there was a passenger in seat 4 who was rear facing, and in the DPS photographs passenger 4 was not wearing his belt at the time of their arrival. Postaccident inspection at the salvage facility revealed that the buckle latched and unlatched without resistance and the inertial reel functioned as expected. There was no evidence of loading noted on the webbing.

According to DPS photographs the passenger in seat 5 was wearing his restraint, however the shoulder belt was behind his torso, so only the lap belt was providing restraint during the accident. There was no evidence of damage to the webbing of the belts, except for cuts created by the first responders.

The surviving passenger in seat 6 stated he was wearing his 3-point restraint at the time of the accident. The outboard lap belt attachment point was found separated from the structure (see figures 12 to 14). The passenger did not report the failure in flight but did remember unlatching his restraint system. Photographs of the failed lap belt anchor hardware were sent to NTSB metallurgists, who determined based upon those the failure appeared to be likely consistent with overload signatures. Additionally, it was noted that the shoulder belt had about a 4.5-inch wear mark on the webbing about 10 inches from the buckle insert tab. When the insert tab was inserted into the buckle it would not latch. According to the survivor he unbuckled his restraint without difficulty before evacuating the airplane.



Figure 12. Outboard anchor failure at seat 6.



Figure 13. Close up view of the seat 6 outboard anchor with through bolt still secured.



Figure 14. Seat 6 outboard anchor point airplane bracket, red arrows point to failed portion of the bracket.

4.0 Passenger Safety Information Briefing Card

No passenger safety information briefing cards were found at the accident site, nor in the debris at the salvage facility. There was an entry in the pilot's emergency procedures checklist that described how to open the emergency hatch (see figure 15). According to the survivor, the pilot provided a safety briefing to the passengers to include seat belt and door operation.

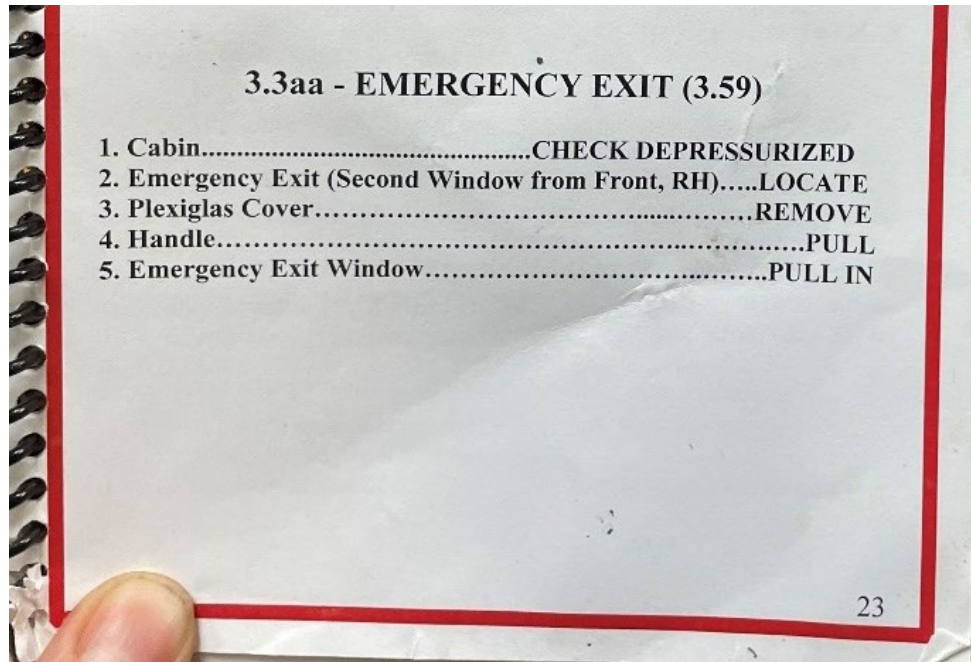


Figure 15. Page 23 of the pilot's emergency procedures checklist that described the emergency exit operation.

5.0 ELT

DPS stated that the airplane's 406 MHz ELT was operating when they arrived and was removed from the airframe by first responders to stop the signal. The ELT was located in the debris at the salvage facility with the switch set in the armed position (see figure 16 and 17).

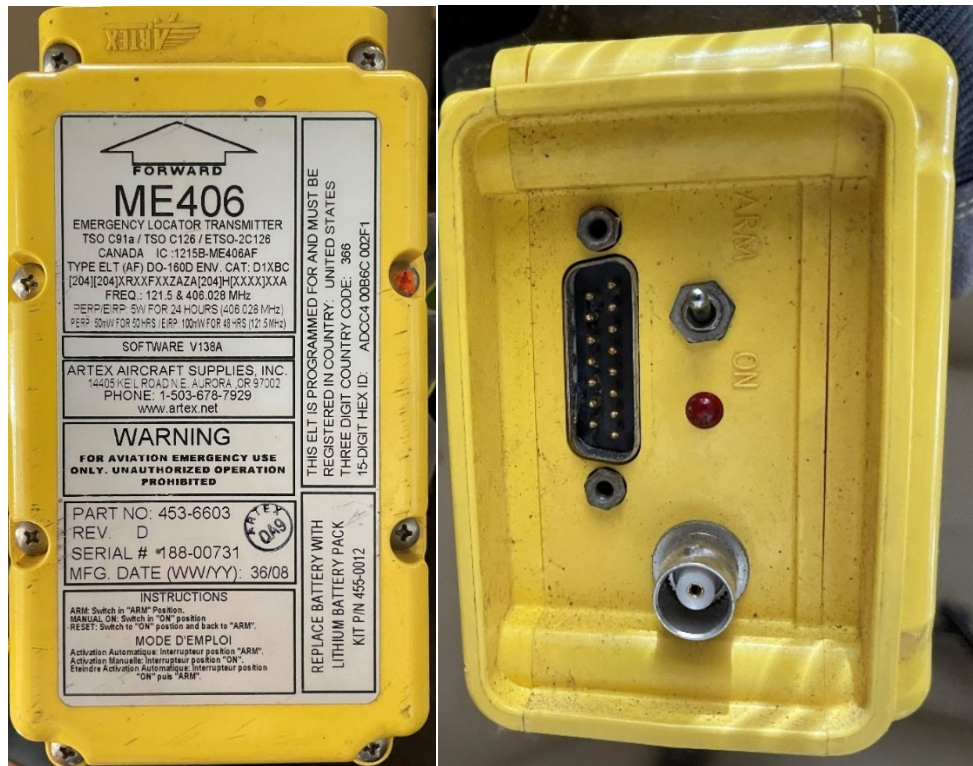


Figure 16. ELT information, including the switch in the armed position.



Figure 17. ELT battery information.

6.0 Injury Information

The pilot and copilot were both fatally injured due to multiple blunt force trauma. The pilot's autopsy report indicated that he sustained multiple injuries to the head, fractures to the skull, chest, multiple ribs, left knee, both ankles, and vertebral bodies of the cervical spine. The copilot's autopsy report indicated that he sustained injuries to the head, fractures of multiple ribs, the left elbow, and the right ankle. Autopsies were not performed on passengers 4 and 5. Passenger 6 reported that he sustained serious injuries including multiple bilateral rib fractures, right hemothorax,

bilateral pneumothoraxes, loss of consciousness, and several internal soft tissue injuries.

6.1 Injury table

Type of injury	Crew	Passengers	Total
Fatal	2	2	4
Serious	0	1	1
Minor	0	0	0
None	0	0	0
TOTAL	2	3	5

Submitted by:

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