

Survivability Notes CEN19FA109

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Civil Aerospace Medical Institute
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I. ACCIDENT INFORMATION:

NTSB ID: CEN19FA109
Location: Montgomery, TX
Aircraft: Eurocopter AS350 B3
Tail number: N818MC
Accident date: March 27, 2019 1435 CDT
Injuries: 1 fatal (Passenger), 2 serious (pilot/ passenger)

II. SUMMARY:

No one from the FAA's Civil Aerospace Medical Institute (CAMI) launched on this accident, two representatives from the Transportation Safety Institute traveled to the scene and collected on site photos, the helmets, a single harness and tether. They then delivered these to CAMI on April 1st for documentation. The Helmets were documented on May 30, 2019 and taken to Air Salvage of Dallas, where the wreckage is located, on August 6, 2019.

III. CONFIGURATION:

There were three occupants inside of the helicopter at the time of the accident. A pilot, located in the in the front right seat, passenger located in the front left seat, and a passenger in the aft right seat in the aircraft.

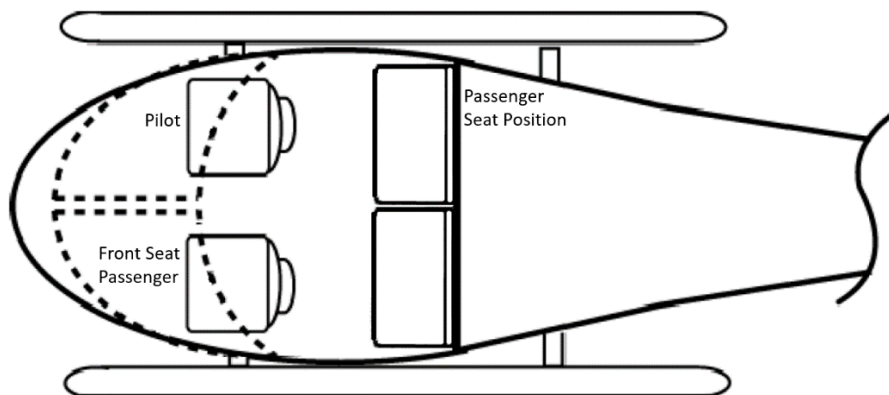


Figure 1 – Helicopter Seat Configuration

IV. SEATS, RESTRAINTS, AND HELMETS:

1.0 Seats

1.1 Front Right (pilot)



Photograph 1 - Pilot Seat

The pilot seat was located on the right side of the cockpit, the outboard seat track fractured and the seat separated from the floor on that side, the inboard seat track remained intact. The seat is a Sicma Aero Seat, now owned by Zodiac France, and the data label reads:

P/N: 159100

EF: 20 9582

COMPLIES WITH TSO-C127a

The rest of the data tag was illegible.

1.2 Front Left (Passenger)



Photograph 2 – Front Left Passenger Seat

The passenger seat was located on the left side of the cockpit, it is a Sicma Aero Seat, now owned by Zodiac France, and was attached to the floor on both sides. The data label was not photographed.

1.3 Aft Bench Seats



Photograph 3 – Aft Right Double Place Bench Seat



Photograph 4 – Aft Left Double Place Bench Seat

The rear bench seats consisted of two seating positions. Each bench seat was attached to the floor of the helicopter with 2 screw points. The aft seat tube attached to the rear bulkhead via a locking yoke. The aft left double bench was unoccupied and had its cushions removed and restraints tied together to keep them from moving within the cabin.

2.0 Restraints

2.1 Front Right (pilot)

The pilot seat was equipped with a rotary buckle four-point harness manufacturer by Pacific Scientific Co. Data.

The label on the buckle reads
Pacific Scientific Co
Code Ident NO.45402
Pat No. 2.899,732 2.921.353

The data label on the belt reads
Pacific Scientific 45402
D (illegible) 91010
PN 200M5-213
FA 200M5-101
Date of MFG. 02/08
RATED STRENGTH 2500 lbs
CONFORMS TO FAA-TSO-C114

2.2 Front Left (Passenger)

The seat was equipped with a rotary buckle four-point harness manufactured by Pacific Scientific Co. Data.

The label on the buckle reads
Pacific Scientific Co
Code Ident NO.45402
Pat No. 2.899,732 2.921.353

The data label on the belt reads
Pacific Scientific 45402
Duarte, CA 91010
PN 200M5-213
FA 200M5-101
Date of MFG. 08/10
Rated Strength 2500 lbs
Conforms to FAA-TSO-C114

2.3 Aft Bench Seats

The passenger bench seats on the helicopter were equipped with FAA-approved 3-point TSO C114 restraints. These restraints consisted of lap belts with lift latch buckles and inertia reel shoulder harnesses. The data tags were not photographed.

3.0 Helmet

3.1 Front Right (Pilot)



Photo 5 - Pilot helmet

White

Gentex

Interior label reads:

SPH-5® HELMET, GGAPHL (REST ILLEGIBLE)

97427/01045309

SIZE X-L

ORDER NO. 25250

GENTEX CORPORATION 3/06

CARBONDALE, PA. 18407

Liner label markings worn off

Ear cups intact with visible wear

Rear of helmet show damage consistent with impact, starting at 1" from the aft bottom edge of helmet extending 3" upwards. Additional scratches and chips in the painted surface extend forward up to the NVG mounting cover. No additional damage is noted.

3.2 Front Left (Passenger)



Photograph 6 – Left Seat Passenger Helmet

Metallic Grey

Dual visor helmet with inner and outer visor, outer visor down, inner visor retracted

MSA

LH250

XS, S, M

Made in France

N 38750

NVG Hardvisor cover without interface plate installed on top.

Liner

Boxell

Comfort Liner PN: CL1218

Right ear cup area has a noticeable crack on the exterior of the helmet. Interior shows no damage. The crackling in the paint extends outward from the large crack approximately 3”.

3.3 Aft Seat Passenger



Photograph 7 – Rear Passenger Helmet

White Helmet

Single visor helmet with visor retracted.

Gentex

HELMET SHELL, GLSWHT, SPARE

SIZE X-LARGE

97427/91D8050-1S

CONTRACT NO: 0000003143

GENTEX COPORATION 9/14

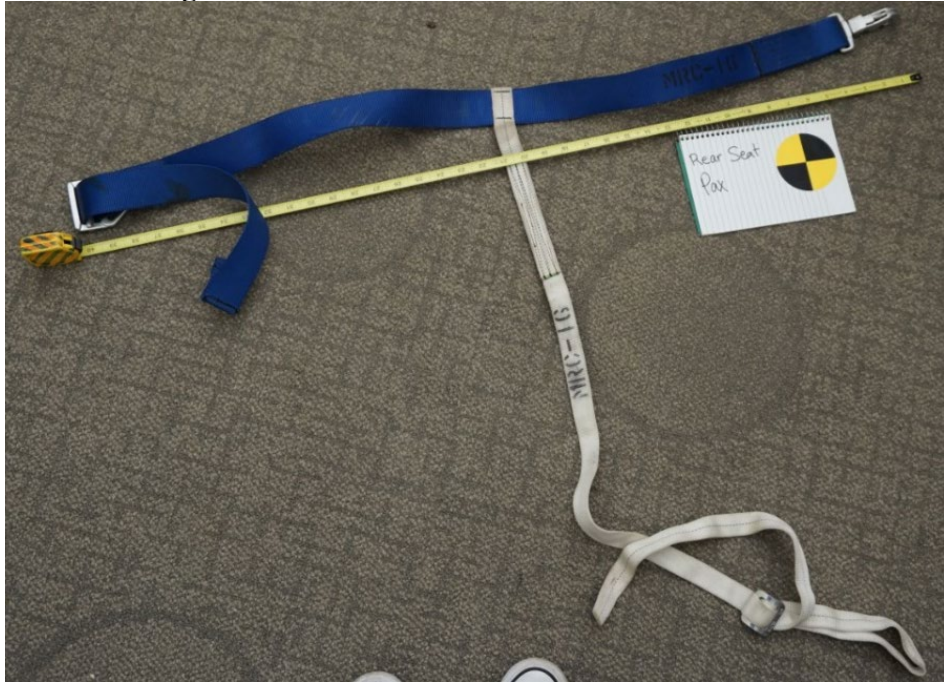
Liner markings worn off

Helmet shows no cracks or indications of impact on the exterior on interior.

V. SUPPLEMENTAL PASSENGER RESTRAINT SYSTEM

The passenger in the rear right outboard seat of the aircraft had an additional means of restraint; this included a harness, which was secured around his torso, and an off white strap which was connected to a tether via a locking carabineer, which was connected to a hard point on the aircraft floor via a locking carabineer. The harness had a length of 37 inches of 2 inch blue webbing, with a hook length of 3 inches, and an adjuster where the hook connected with a length of 2.5 inches for a total circumference as adjusted and found at the scene of 42.5 inches.

1.0 Harness Webbing



Photograph 8 – Harness of Rear Supplemental Passenger Restraint System

The webbing had no manufacturer tag but a marking of MRC-16 and the stitching was in a crisscross pattern with black thread the hook end. The blue webbing was bisected by an off-white colored webbing, 1-inch wide, centered at 20.5 inches from the end of the silver hook, and sewn in place.

The 1" wide webbing did not have a manufacturer tag but had a marking of MRC-16, with black thread. The stitching on the blue webbing was a 0.75-inch wide straight line of close set zig zag stitching in two places. The off-white strap was further secured 2 inches from the blue strap by a large crisscross pattern securing the tail of the webbing. The off-white strap was adjusted to a length of 35.5 inches as found.

2.0 Hook



Photograph 9 – Hook of Rear Supplemental Passenger Restraint System

The silver hook was labeled:
MS22017 ◇ 0212

3.0 Adjuster



Photograph 10 – Adjuster of Rear Supplemental Passenger Restraint System

The silver adjuster was labeled:
PS27765-1 ◇ 0712

4.0 Tether



Photograph 11 – Rear Occupant Tether

A tether was attached to the aircraft in between the two double seat benches in the rear of the cabin. It is made of a length of 1 inch webbing that has been routed through a ring, doubled over and secured via 5 rows of zig-zag stitching. The proximal end is constructed by looping each of the two ends of the webbing through an adjuster to form loops where a second carabineer is passed through and secured to the cabin floor. The length of the webbing is 35 inches, each of the carabineers was 4.25 inches in length, and the ring had a diameter of 2 inches, for a total assembled length of 45.5 inches. The carabineer that secured the tether to the floor was connected to the floor anchor adjacent to the rear bulkhead where the lap belts were also connected.



Photograph 12 - Tether Routed Between Double Bench Seats and Secured to the Cabin Floor