



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Houston, Texas	<b>Accident Number:</b>	CEN23LA023
<b>Date &amp; Time:</b>	October 29, 2022, 11:40 Local	<b>Registration:</b>	N778MS
<b>Aircraft:</b>	STEPHEN J HOFFMAN MS-500	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Ground collision	<b>Injuries:</b>	1 Minor
<b>Flight Conducted Under:</b>	Part 91: General aviation - Air race/show		

## Analysis

The pilot reported that he was preparing for a display flight in a local airshow which included a preflight procedure to rotate the engine prior to start for lubrication purposes. During the procedure, the electric starter motor struggled to rotate the engine due to viscous oil because of cooler overnight temperatures, and the main circuit breaker had tripped. The pilot turned off all cockpit switches, but forgot to turn off the magneto switch, and exited the airplane. The pilot then utilized a hand crank to rotate the engine, and the engine unexpectedly started. The wheel chocks had been previously removed in preparation for the planned flight, and the airplane began to move. Several ground personnel attempted to stop the airplane but were unsuccessful before the airplane impacted two parked airplanes.

The airplane sustained substantial damage to both wings and the elevator. The pilot reported no preimpact mechanical malfunctions or failures with the airplane that would have precluded normal operation.

## Probable Cause and Findings

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

The pilot's failure to secure the magneto switch before attempting to hand rotate the engine which resulted in an inadvertent engine start, a runaway airplane, and subsequent impact with parked airplanes. Contributing to the accident was the failure to properly secure the airplane with chocks.

## Findings

<b>Personnel issues</b>	(general) - Pilot
<b>Aircraft</b>	(general) - Incorrect use/operation

## Factual Information

### History of Flight

<b>Standing-engine(s) start-up</b>	Ground collision (Defining event)
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### Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	66,Male
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	None
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	BasicMed Without waivers/limitations	<b>Last FAA Medical Exam:</b>	August 26, 2022
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	June 19, 2021
<b>Flight Time:</b>	500 hours (Total, all aircraft), 57 hours (Total, this make and model), 394 hours (Pilot In Command, all aircraft), 5 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft)		

### Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	STEPHEN J HOFFMAN	<b>Registration:</b>	N778MS
<b>Model/Series:</b>	MS-500	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	2018	<b>Amateur Built:</b>	Yes
<b>Airworthiness Certificate:</b>	Experimental (Special)	<b>Serial Number:</b>	4
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	November 1, 2021 Condition	<b>Certified Max Gross Wt.:</b>	3506 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	69 Hrs at time of accident	<b>Engine Manufacturer:</b>	Argus Motoren
<b>ELT:</b>	C126 installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	AS-10C
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	240 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KEFD,32 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	12:54 Local	Direction from Accident Site:	358°
Lowest Cloud Condition:		Visibility	10 miles
Lowest Ceiling:	Broken / 2600 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	9 knots / None	Turbulence Type Forecast/Actual:	/
Wind Direction:	250°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.03 inches Hg	Temperature/Dew Point:	18°C / 12°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Houston, TX	Type of Flight Plan Filed:	None
Destination:	Houston, TX	Type of Clearance:	None
Departure Time:		Type of Airspace:	Class D

## Airport Information

Airport:	ELLINGTON EFD	Runway Surface Type:	
Airport Elevation:	32 ft msl	Runway Surface Condition:	Dry
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

## Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:		Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	29.60559,-95.166497(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Sauer, Aaron
<b>Additional Participating Persons:</b>	Doug Idema; FAA; Houston, TX
<b>Original Publish Date:</b>	December 20, 2022
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class 4</a>
<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=106231">https://data.nts.gov/Docket?ProjectID=106231</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).