



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	GRAND CANYON, AZ	<b>Accident Number:</b>	LAX96LA036
<b>Date &amp; Time:</b>	11/02/1995, 1450 MST	<b>Registration:</b>	N404FD
<b>Aircraft:</b>	Agusta F.260D	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	1 Serious
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Ferry		

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## Analysis

The aircraft experienced a loss of engine power on the initial climb. The pilot reported the low pressure fuel light illuminated, and the fuel pressure gauge read near zero. The pilot manipulated the fuel selector through all tank positions with the electric fuel boost pump switch in the 'on' position, but fuel pressure was not restored. Subsequently, the airplane collided with trees during a forced landing on mountainous terrain about 2.3 miles southwest of the airport. The airplane had been modified with the installation of an auxiliary ferry fuel tank, which was only to be used during cruise flight. Fuel flow to the engine from the ferry tank was controlled by a selector valve handle, which had two positions, off and on. During a postcrash examination, the selector valve handle was found positioned a few degrees off the closed position. The ferry tank fuel line received suction whenever the mechanical or electrical fuel pumps are operating. When the valve was set at least 5 degrees off the closed position, air entered the fuel line to the engine. The valve was located near the right foot of the right seat occupant. This airplane was normally to be flown from the right seat.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot inadvertently allowed the ferry tank fuel selector to be in (or to be moved to) a partially open position before or during takeoff, which allowed air to enter the fuel system lines and result in fuel starvation. The location of the valve in the cockpit allowed the ferry tank fuel selector handle to be susceptible to inadvertent movement by the pilot's foot.

## Findings

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Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL  
Phase of Operation: TAKEOFF - INITIAL CLIMB

### Findings

1. (C) FLUID,FUEL - STARVATION
2. (C) FUEL TANK SELECTOR POSITION - IMPROPER - PILOT IN COMMAND
3. (F) ACFT/EQUIP,INADEQUATE CONTROL LOCATION

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Occurrence #2: FORCED LANDING

Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

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Occurrence #3: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

### Findings

4. TERRAIN CONDITION - MOUNTAINOUS/HILLY
5. OBJECT - TREE(S)

## Factual Information

On November 2, 1995, at 1450 hours mountain standard time, an Agusta Spa F.260D, N404FD, collided with trees and mountainous terrain during a forced landing after takeoff from the Grand Canyon National Park Airport, Grand Canyon, Arizona. The aircraft was destroyed, and the airline transport certificated pilot received serious injuries. The restricted category aircraft was being operated as a ferry flight by Valhalla Aviation, Inc. of Los Angeles, California. Visual meteorological conditions prevailed. A VFR flight plan had been filed for the flight which originated from the Grand Canyon around 1440.

The aircraft had taken off from runway 21 and was on initial climb out when the pilot reported to the controller at the airport traffic control tower (ATCT) that the aircraft was losing power and altitude. The aircraft impacted mountainous terrain 2.3 miles southwest of the airport, striking approximately 18 pine trees in the process.

The pilot later reported that on climb out the low pressure fuel light illuminated. When he checked the fuel pressure gauge he noticed it was reading near zero. He switched the fuel selector from the left main tank to the right main tank. Fuel pressure was not restored. The pilot then verified that the fuel boost pump was in the on position. As a last resort he switched the fuel selector to the right tip tank position.

The pilot stated that he had not taken on any fuel after landing at the Grand Canyon Airport. His last refueling stop was at Executive Aviation in Albuquerque, New Mexico. On October 26, 1995, the airplane had been ferried from London, England, to the United States.

An inspection of the aircraft revealed its fuel system consisted of five fuel tanks. Recovery personnel reported that the two main tanks each contained 13 gallons of fuel. The two tip tanks each contained about 10 gallons of fuel, and the temporary ferry tank contained 32 gallons of fuel. The fuel shutoff valve was found in the open position. The fuel system was inspected for continuity and obstructions in the lines and vents.

The main fuel system was equipped with a fuel selector that was installed on the aft side of the throttle quadrant. The fuel selector handle was found positioned to the right main tank. The fuel selector was inspected for binding, misalignment, and leaks. The fuel system was also equipped with a suction type electrical fuel boost pump and an engine-driven mechanical fuel pump.

The temporary ferry tank had been installed pursuant to an FAA Form 337, dated October 12, 1995. In pertinent part, the FAA Form 337 listed the following operating limitations: (1) All takeoffs and landings are to be made on the main wing tanks; and (2) The auxiliary fuel system should be used in cruise flight only.

Ferry tank fuel flow was controlled by a tank selector valve which was installed a few inches above the floor and along the right forward side of the cabin. The valve is a two position ball valve which is either closed or open. The ferry tank valve handle was found a few degrees from the fully closed (off) position. The valve assembly did not incorporate a positive detent in either position.

The ferry tank fuel line is independent of the main fuel selector in that suction to the ferry tank line exists whenever the mechanical or electrical fuel pumps are operating. During a further examination of the valve, it was found that the valve would allow air to enter the fuel line if the

selector handle was positioned as little as 5 degrees from the full off position. The installed position of the valve places it in close proximity to the right foot of an occupant climbing in or out of the right seat. The pilot in this aircraft flies from the right seat.

In preparation for an engine test run, fuel was temporarily supplied to the engine through the right main fuel line. The electric fuel pump was powered and produced about 6 psi. No leaks were detected during its operation. The engine was then started and ran normally. With the electric fuel pump in the off position, the engine-driven fuel pump sustained a fuel pressure of about 4 psi. The low fuel pressure light was observed to operate during the run. Because of the damaged propeller and resulting vibration, engine speed was limited to 1,200 rpm. No discrepancies were identified during the aircraft inspection and subsequent engine run.

### Pilot Information

<b>Certificate:</b>	Airline Transport; Flight Instructor; Commercial	<b>Age:</b>	45, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Glider	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	02/06/1995
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	7500 hours (Total, all aircraft), 215 hours (Total, this make and model), 7000 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 90 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	Agusta	Registration:	N404FD
Model/Series:	F.260D F.260D	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Restricted	Serial Number:	769
Landing Gear Type:	Retractable - Tricycle	Seats:	2
Date/Type of Last Inspection:	01/03/1995, Annual	Certified Max Gross Wt.:	2668 lbs
Time Since Last Inspection:	139 Hours	Engines:	1 Reciprocating
Airframe Total Time:	380 Hours	Engine Manufacturer:	Lycoming
ELT:	Installed, activated	Engine Model/Series:	O-540-E4A5
Registered Owner:	VALHALLA AVIATION INC.	Rated Power:	260 hp
Operator:	VALHALLA AVIATION INC.	Operating Certificate(s) Held:	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	GCN, 6606 ft msl	Distance from Accident Site:	2 Nautical Miles
Observation Time:	1450 MST	Direction from Accident Site:	55°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	8 knots / 17 knots	Turbulence Type Forecast/Actual:	/
Wind Direction:	260°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	11° C / 1° C
Precipitation and Obscuration:			
Departure Point:	(GCN)	Type of Flight Plan Filed:	VFR
Destination:	LAS VEGAS, NV (LAS)	Type of Clearance:	VFR
Departure Time:	1440 MST	Type of Airspace:	Class D

## Airport Information

Airport:	GRAND CANYON NATL PARK (GCN)	Runway Surface Type:	Asphalt
Airport Elevation:	6606 ft	Runway Surface Condition:	Dry
Runway Used:	21	IFR Approach:	None
Runway Length/Width:	8999 ft / 150 ft	VFR Approach/Landing:	Forced Landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Serious	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>	N/A	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 Serious	<b>Latitude, Longitude:</b>	

## Administrative Information

<b>Investigator In Charge (IIC):</b>	ROBERT R CRISPIN	<b>Report Date:</b>	06/07/1996
<b>Additional Participating Persons:</b>	BRIAN CALENDINE; LAS VEGAS, NV MARK W PLATT; VAN NUYS, CA		
<b>Publish Date:</b>			
<b>Investigation Docket:</b>	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

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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](#).