



National Transportation Safety Board Aviation Accident Final Report

Location:	TEMECULA, CA	Accident Number:	LAX02LA005
Date & Time:	10/13/2001, 2130 PDT	Registration:	N690JM
Aircraft:	Aero Commander 690	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Minor, 1 None

Flight Conducted Under: Part 91: General Aviation - Positioning

Analysis

The airplane collided with an airport boundary fence during an aborted landing. The pilot made a normal approach following the visual approach slope indicator (VASI) with gear down and full flaps and touched down just past the numbers and began to decelerate. The pilot selected reverse thrust with both engines. As he added power to decelerate, the airplane suddenly veered to the left and off the runway when the right engine did not go into reverse thrust. He deselected reverse thrust and aligned the airplane with the runway. He was approaching the end of the runway at high speed and elected to attempt a takeoff. The airplane went off the end of the runway onto smooth grass. The pilot rotated the airplane, but the airplane collided with an airport boundary fence and came to rest in a field. In a post accident examination, when the power levers were placed in the full reverse position, the left fuel control measured 4 degrees, while the right measured 0 degrees. The left pitch control measured 10 degrees, while the right measured 0 degrees; the controls should have read 0 degrees. A controls engineer determined that during landing, there would be a 10-degree propeller pitch control (PPC) angle mismatch, which would be about 2.5 degrees of BETA angle. With matched levers, there would be asymmetric reverse thrust with the left engine lower in torque. This would result in the airplane turning towards the left if both propellers had gone into reverse pitch.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: a misrigging of the engine controls that resulted in an asymmetric reverse thrust condition.

Findings

Occurrence #1: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: LANDING - ROLL

Findings

1. (C) PROPELLER SYSTEM/ACCESSORIES, REVERSING SYSTEM - OUT OF BALANCE
2. (C) MAINTENANCE, ADJUSTMENT - IMPROPER - OTHER MAINTENANCE PERSONNEL
3. (C) REVERSERS - INCORRECT
4. DIRECTIONAL CONTROL - NOT MAINTAINED - PILOT IN COMMAND

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: LANDING - ABORTED

Findings

5. OBJECT - FENCE
6. ABORTED LANDING - ATTEMPTED - PILOT IN COMMAND

Factual Information

On October 13, 2001, about 2130 Pacific daylight time, an Aero Commander 690, N690JM, collided with an airport boundary fence during takeoff from the French Valley Airport, Temecula, California. The owner was operating the airplane under the provisions of 14 CFR Part 91. The commercial pilot sustained minor injuries and the private rated copilot was not injured; the airplane sustained substantial damage. The positioning cross-country flight departed Flagstaff, Arizona, about 2030 PDT. Visual meteorological conditions prevailed, and an instrument flight rules flight plan had been filed.

The pilot submitted a written report. He stated that he was making a visual approach to runway 18. The winds were calm, the runway lights were on, and there was no other traffic. He made a normal approach with gear down and full flaps when on final with the visual approach slope indicator (VASI). He maintained blue line plus down to short final, and came back slowly on the power as the airplane crossed the numbers at 90 to 100 knots. He touched down just past the numbers with a normal run out, and began to decelerate. During the landing roll, he selected reverse thrust (BETA) with both engines. As he slowly added power to decelerate, the left engine went into BETA, but the right engine did not. The airplane suddenly veered to the left and off the runway. He deselected reverse thrust and aligned the airplane with the runway. He was approaching the end of the runway at high speed and elected to attempt a takeoff. The airplane went off the end of the runway onto a smooth grass field. The pilot rotated the airplane, but the airplane collided with an airport boundary fence and came to rest in the field. The wings and fuselage sustained substantial damage.

A technician from the engine manufacturer inspected the engines under the supervision of the Federal Aviation Administration (FAA) accident coordinator, and submitted a written report. They rotated the propellers. The left engine did not turn, but the right engine did. They observed two propeller linkages fractured on the left propeller and one linkage broken on the right propeller. All propeller blades were in the feather position. Both rpm levers in the cockpit were difficult to move.

Left Engine

The turbine and compressor section of the engine decoupled from the propeller. The technician noted a heavy drag when manually rotating the propeller, and the reduction gearbox was noisy.

The input gearbox had two long cracks at the bottom and side of the engine inlet, but no oil leaked from the gearbox. The fuel pump's mounting flange fractured where it mated with the gearbox. The starter-generator adapter plate fractured where the starter-generator disengaged from the engine.

Oil was in the oil tank on the bottom of the screen.

Linkages of both the power lever and the rpm lever were connected.

Right Engine

The engine did not decouple from the turbine and compressor section. The propeller rotated freely, and there was no heavy drag or noise from the gearbox.

Oil was in the oil tank on the bottom of the screen.

Linkages of both the power lever and the rpm lever were connected, and rigging in full reverse was normal.

The technician placed both power levers in the full reverse position. The left fuel control measured 4 degrees, while the right measured 0 degrees. The left pitch control measured 10 degrees, while the right measured 0 degrees. He said that the controls should have read 0 degrees.

A controls engineer evaluated the rigging findings. He noted that the left engine would lag the right engine by 4 degrees in the main metering valve (MMV), and by 10 degrees in BETA. This meant that in governing mode (flight) there would be a split of 25 pounds per hour with the levers matched. The pilot would just adjust the left-hand power lever forward to match the right.

During landing, there would be a 10-degree propeller pitch control (PPC) angle mismatch, which would be about 2.5 degrees of BETA angle. With matched levers, there would be asymmetric reverse thrust with the left engine lower in torque. This would result in the airplane turning towards the left. Weight flow (fuel flow) would not suffer because the fuel control unit (FCU) was on the under speed governor of the fuel control and not the power angle schedule. This explanation assumed that the rigging parallelograms were good and set correctly. The angles for the PPC and FCU were not determined for the higher angles.

Pilot Information

Certificate:	Commercial	Age:	60, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	02/01/2000
Occupational Pilot:		Last Flight Review or Equivalent:	10/01/2000
Flight Time:	12880 hours (Total, all aircraft), 4205 hours (Total, this make and model), 12829 hours (Pilot In Command, all aircraft), 129 hours (Last 90 days, all aircraft), 9 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Private	Age:	27, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 1 Valid Medical--w/ waivers/lim.	Last FAA Medical Exam:	02/01/2000
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Aero Commander	Registration:	N690JM
Model/Series:	690	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	11072
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	04/14/2000, 100 Hour	Certified Max Gross Wt.:	10250 lbs
Time Since Last Inspection:	97.7 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	4844.6 Hours as of last inspection	Engine Manufacturer:	Garret/Honeywell
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	TPE-331-5215K
Registered Owner:	MACH 1 AIRCRAFT, INC.	Rated Power:	840 hp
Operator:	MACH 1 AIRCRAFT, INC.	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night
Observation Facility, Elevation:	RIV, 818 ft msl	Distance from Accident Site:	
Observation Time:	2153 PDT	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	4 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	230°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.95 inches Hg	Temperature/Dew Point:	17° C / 5° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	FLAGSTAFF, AZ (FLG)	Type of Flight Plan Filed:	IFR
Destination:	TEMECULA, CA (F70)	Type of Clearance:	None
Departure Time:	2120 MST	Type of Airspace:	Class G

Airport Information

Airport:	French Valley Airport (F70)	Runway Surface Type:	Asphalt
Airport Elevation:	1350 ft	Runway Surface Condition:	Dry
Runway Used:	18	IFR Approach:	None
Runway Length/Width:	4600 ft / 75 ft	VFR Approach/Landing:	Straight-in

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor, 1 None	Latitude, Longitude:	33.576111, -117.128056

Administrative Information

Investigator In Charge (IIC):	HOWARD D PLAGENS	Report Date:	07/31/2006
Additional Participating Persons:	Anthony Costanza; Federal Aviation Administration Riverside FSDO; Riverside, CA HOMER SHIROMA; Honeywell; Phoenix, AZ		
Publish Date:			
Investigation Docket:	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 pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

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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](#).