



# National Transportation Safety Board

## Aviation Accident Data Summary

<b>Location:</b>	Clayton, AL	<b>Accident Number:</b>	ERA14LA179
<b>Date &amp; Time:</b>	04/03/2014, 1530 CDT	<b>Registration:</b>	N1631X
<b>Aircraft:</b>	CESSNA T210L	<b>Injuries:</b>	1 Minor, 1 None
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Instructional		

### Analysis

The pilot receiving instruction reported that, about 1 hour into the flight, the engine “clunked and shuddered” and then lost total power. The flight instructor assumed control of the airplane and maneuvered it toward a nearby airport, and the pilot receiving instruction initiated an unsuccessful restart of the engine. After determining that the airplane was not going to reach the airport, the flight instructor executed a forced landing to a road, which resulted in substantial damage to the wings and firewall.

Examination of the engine crankshaft revealed that it had fractured at the No. 2 main bearing journal; the fracture surface exhibited evidence consistent with fatigue crack propagation. The adjacent bearing materials had deformed and disintegrated. The failure of these components likely preceded the final fracture of the crankshaft. The bearing components from this section were generally too damaged to conclude the mode of failure. However, examination of the No. 6 bearing components and connecting rod bearing journal exhibited wear patterns and damage consistent with oil starvation; the oil starvation likely resulted from bearing movement, which can result from inadequate torque on the engine case through bolts. Although the torque values on the through bolts could not be determined, the failure of the engine’s internal components and the oil starvation were consistent with the through bolts not being torqued properly. Further, the damage was also consistent with damage found on another airplane engine that had experienced a crankshaft failure and oil starvation, which was determined to had been caused by the engine through bolts not being properly torqued (NTSB accident number ERA14LA193). A review of maintenance records revealed that maintenance personnel had replaced the Nos. 2, 3, and 6 engine cylinders about 3 months before the accident. It is likely that maintenance personnel did not torque the through bolts in accordance with the manufacturer’s specifications during this maintenance and that this led to the eventual fracture of the crankshaft.

Further, during postaccident engine examination, metal particles were found in the oil sump. The maintenance records indicated that the engine oil was changed the day before the accident. However, the entry did not indicate that the oil filter was dissected or that the filter element was examined. It is likely that maintenance personnel did not examine the oil filter after the oil change and that, if they had examined the oil filter element, they would have detected the metal particles, which would have indicated an impending failure of an internal engine component.

### Flight Events

Enroute-cruise - Loss of engine power (total)

Emergency descent - Off-field or emergency landing

Landing-flare/touchdown - Collision with terr/obj (non-CFIT)

### Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Maintenance personnel's failure to properly torque the engine case through bolts, which resulted in the fatigue fracture of the crankshaft and subsequent total loss of engine power.

## Findings

Aircraft-Aircraft power plant-Engine (reciprocating)-Recip eng cyl section-Incorrect service/maintenance - C

Aircraft-Aircraft power plant-Engine (reciprocating)-Recip engine power section-Failure - C  
 Personnel issues-Task performance-Maintenance-Replacement-Maintenance personnel - C  
 Personnel issues-Task performance-Inspection-(general)-Maintenance personnel

## Flight Instructor Information

<b>Certificate:</b>	Airline Transport; Flight Instructor; Commercial	<b>Age:</b>	47
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land; Single-engine Sea	<b>Instrument Rating(s):</b>	Airplane
<b>Other Aircraft Rating(s):</b>		<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane
<b>Flight Time:</b>	5418 hours (Total, all aircraft), 179 hours (Total, this make and model), 4220 hours (Pilot In Command, all aircraft), 29 hours (Last 90 days, all aircraft), 22 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

## Pilot Information

<b>Certificate:</b>	Commercial; Private	<b>Age:</b>	44
<b>Airplane Rating(s):</b>	Single-engine Land	<b>Instrument Rating(s):</b>	Airplane
<b>Other Aircraft Rating(s):</b>	None	<b>Instructor Rating(s):</b>	None
<b>Flight Time:</b>	340 hours (Total, all aircraft), 16 hours (Total, this make and model), 270 hours (Pilot In Command, all aircraft), 12 hours (Last 90 days, all aircraft), 4 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	CESSNA	<b>Registration:</b>	N1631X
<b>Model/Series:</b>	T210L	<b>Engines:</b>	1 Reciprocating
<b>Operator:</b>	SOUTHERN AERIAL IMAGES INC	<b>Engine Manufacturer:</b>	Continental
<b>Air Carrier Operating Certificate:</b>	None	<b>Engine Model/Series:</b>	TSIO-520-R
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Instructional		

## Meteorological Information and Flight Plan

Observation Facility, Elevation:	EUf, 285 ft msl	Weather Information Source:	Weather Observation Facility
Conditions at Accident Site:	Visual Conditions	Lowest Ceiling:	None
Condition of Light:	Day	Wind Speed/Gusts, Direction:	10 knots/ 7 knots, 180°
Temperature:	29° C / 13° C	Visibility	10 Miles
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	VALDOSTA, GA (VLD)	Destination:	Tuscaloosa, AL (TCL)

## Wreckage and Impact Information

Crew Injuries:	1 Minor, 1 None	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None

## Administrative Information

Investigator In Charge (IIC):	Patrick M Murray	Adopted Date:	07/07/2015
Investigation Docket:	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=89008">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=89008</a>		

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