National Transportation Safety Board
Aviation Incident Final Report

Location:	Northport, FL	**Incident Number:**	ERA09FA228
Date & Time:	04/03/2009, 1853 EDT	**Registration:**	N509SR
Aircraft:	CIRRUS DESIGN CORP SR22	**Aircraft Damage:**	Minor
Defining Event:	Loss of engine power (total)	**Injuries:**	3 None
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

About 10 minutes after takeoff, when the airplane was in level cruise flight, the engine lost power. The pilot performed a forced landing to a road, which resulted in minor damage to the airplane when the right wing impacted a road sign. An initial examination of the engine revealed a hole in the upper deck in the vicinity of the Nos. 5 and 6 pistons. Further examination revealed that both of the No. 6 connecting rod bolts were fractured. One bolt was missing the self-locking nut, and fretting adjacent to the bolt hole on the split-line face of the connecting rod indicates that the bolt was probably not tightened with sufficient torque and backed off the bolt. The bolt then likely backed out of its hole on the connecting rod, enabling the cap to hinge open, and the loading of the other bolt in tension and bending to the point of overstress. The connecting rod then separated from the crankshaft and punched a hole in the crankcase.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: Inadequate torque on one of the No. 6 connecting rod bolt retaining nuts, which resulted in the connecting rod's separation from the crankshaft and a subsequent total loss of engine power.

Findings

Aircraft	Recip engine power section - Incorrect service/maintenance (Cause)
Personnel issues	Fabrication - Owner/builder (Cause)

Factual Information

HISTORY OF FLIGHT

On April 3, 2009, at 1853 eastern daylight time, a Cirrus SR22, N509SR, incurred minor damage during a forced landing, following an engine failure, in Northport, Florida. The certificated airline transport pilot and the two passengers were not injured. Visual meteorological conditions prevailed. The airplane was operating on an instrument flight rules flight plan from Page Field (FMY), Fort Myers, Florida, to St. Petersburg-Clearwater International Airport (PIE), St. Petersburg, Florida. The on-demand air taxi flight was conducted under the provisions of 14 Code of Federal Regulations Part 135.

According to the pilot, about 10 minutes after takeoff, when the airplane was level at 6,000 feet, he noticed that the engine oil pressure had dropped to about 28 psi. About 2 minutes later, the engine began to run "real rough," and the oil pressure dropped to 10 psi. Shortly after that, the engine quit, and the pilot performed a forced landing to a road. During the landing rollout, the right wing hit a road sign.

A download of flight data revealed that the airplane took off about 1841; at 1850, the engine failed; and at 1853, the airplane landed.

AIRPLANE INFORMATION

The airplane was powered by a Teledyne Continental Motors (TCM) IO-550-N engine. According to maintenance records, total engine time was 1,707.7 hours since new. The build date was August 28, 2006.

The latest phase inspection was completed on March 30, 2009, at 1,695.5 hours since new.

There was no indication in the maintenance records that the number 6 connecting rod had been removed since the engine was new.

WRECKAGE AND IMPACT INFORMATION

An examination of the airplane revealed only minor damage to the right wing leading edge. An initial examination of the engine revealed that the upper deck was breached in the vicinity of the number 5 and number 6 cylinder positions.

The engine was subsequently disassembled and examined under NTSB oversight at the manufacturer's facilities. Examination confirmed that the crankcase was breached above the number 5 and number 6 cylinder positions.

The crankshaft and counterweight assembly exhibited lubrication distress, thermal damage, and mechanical damage. The number 2 and number 3 crankshaft main bearings exhibited thermal discoloration. The number 3, 5 and 6 connecting rods were separated from the crankshaft journal, and the number 1 through 5 connecting rod bearings exhibited thermal discoloration and damage.

The number 6 connecting rod exhibited mechanical damage and was bent below the pin bushing. The connecting rod cap was distorted, and both cap bolts were fractured. The connecting rod bearing exhibited some mechanical damage, but no sign of thermal distress. One of the cap bolt self locking retaining nuts was missing.

The oil galleys and passages in the left and right crankcase halves were clear and unrestricted.

With agreement from the NTSB Materials Laboratory, the number 6 connecting rod, piston, piston pin, and connecting rod bolts were submitted to the TCM materials laboratory (M&P Laboratory) for analysis.

According to the laboratory factual report, which was reviewed by the Chief, NTSB Materials Laboratory, one bolt exhibited separation consistent with ductile overload below the splitline location. The self locking retaining nut was still in its original position on the bolt.

The fracture surface of the other bolt exhibited "extensive" post-separation damage to the fracture surface, which occurred above the split line location on the bolt. There was fretting adjacent to the bolt hole on the split line face of the connecting rod, indicating that the rod cap and rod were separating and hitting for a period of time. The bolt also showed "extensive" thread damage.

The hardness of each bolt and the one nut conformed to the manufacturing requirements.

History of Flight

Enroute-cruise	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Landing-landing roll	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial	**Age:**	37, 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:**	No
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 2	**Last Medical Exam:**	03/23/2009
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	5077 hours (Total, all aircraft), 1355 hours (Total, this make and model), 4526 hours (Pilot In Command, all aircraft), 148 hours (Last 90 days, all aircraft), 60 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	CIRRUS DESIGN CORP	**Registration:**	N509SR
Model/Series:	SR22	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	2180
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	100 Hour	**Certified Max Gross Wt.:**	3400 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	1707 Hours	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, not activated	**Engine Model/Series:**	IO-550-N
Registered Owner:	SATSAIR LLC	**Rated Power:**	310 hp
Operator:	SATSAIR LLC	**Air Carrier Operating Certificate:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	J4PA

Meteorological Information and Flight Plan

Observation Facility, Elevation:	PGD, 26 ft msl	**Observation Time:**	1853 EDT
Distance from Accident Site:	15 Nautical Miles	**Condition of Light:**	Day
Direction from Accident Site:	110°	**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:		**Temperature/Dew Point:**	23°C / 21°C
Lowest Ceiling:	Overcast / 2300 ft agl	**Visibility**	8 Miles
Wind Speed/Gusts, Direction:	4 knots, 220°	**Visibility (RVR):**	
Altimeter Setting:	30 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Fort Myers, FL (FMY)	**Type of Flight Plan Filed:**	IFR
Destination:	St. Petersburg, FL (PIE)	**Type of Clearance:**	IFR
Departure Time:		**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Minor
Passenger Injuries:	2 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	3 None		

Administrative Information

Investigator In Charge (IIC):	Paul R Cox	**Adopted Date:**	03/16/2011
Additional Participating Persons:	Robert Blake; FAA/FSDO; Tampa, FL Jason Lukasik; Teledyne Continental Motors; Mobile, AL Brannon Mayer; Cirrus Design Corporation; Duluth, MN Douglas Duncan; SATSair; Greenville, SC		
Publish Date:	03/16/2011		
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.ntsb.gov/pubdms/.		