Aviation Investigation Final Report

Location:	ROCKWALL, Texas	**Accident Number:**	FTW99LA227
Date & Time:	August 14, 1999, 08:10 Local	**Registration:**	N3184E
Aircraft:	Aeronca 11AC	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

While maneuvering in the traffic pattern, the airplane experienced a total loss of engine power. The private pilot elected to land in a field that contained 5-foot tall maize crops. Examination of the Continental A-75-8 engine revealed that the crankshaft was separated aft of the #3 connecting rod journal. Examination of the crankshaft fracture revealed that a fatigue crack had developed in a secondary radius between the journal and the cheek. The secondary radius contained machining marks. The engine's maintenance records revealed that during the last major overhaul, the crankshaft had been ground .010 inches.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The mechanic's improper machining of the crankshaft during a major overhaul, which resulted in a fatigue crack and subsequent failure of the crankshaft. A factor was the lack of suitable terrain for the forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings
1. (C) MAINTENANCE,OVERHAUL,MAJOR - IMPROPER - OTHER MAINTENANCE PERSONNEL
2. (C) ENGINE ASSEMBLY,CRANKSHAFT - FATIGUE

3. (C) ENGINE ASSEMBLY,CRANKSHAFT - FAILURE,TOTAL

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings
4. TERRAIN CONDITION - CROP
5. (F) TERRAIN CONDITION - NONE SUITABLE

Factual Information

On August 14, 1999, at 0810 central daylight time, an Aeronca 11AC airplane, N3184E, was substantially damaged during a forced landing following a total loss of engine power while maneuvering in the traffic pattern at the Rockwall Municipal Airport, Rockwall, Texas. The non-instrument rated private pilot, sole occupant, was not injured. The airplane was registered to the pilot and operated under 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and a flight plan was not filed for the local flight, which originated from the Rockwall Municipal Airport approximately 0630.

During a telephone interview conducted by the NTSB investigator-in-charge, the pilot stated that he had been practicing touch-and-go landings for about 30 minutes when, on the last takeoff, during the turn to crosswind, the engine lost power. The pilot performed the emergency checklist, which included checking the magnetos, the carburetor heat, and the throttle position; however, the power was not restored. The pilot elected to set up for a forced landing in a field, which paralleled the runway and contained a maize crop 5-feet tall. The airplane came to an "abrupt stop in a very short distance."

The pilot, who is also an aircraft mechanic, stated that the right and left main landing gear were collapsed, the right wing v-strut was accordion crushed, and both the left and right wings sustained structural damage. The pilot also stated that the vertical stabilizer was structurally damaged.

On August 17, 1999, the engine was examined by an FAA inspector and a representative of the engine manufacturer. The Continental A-75-8 engine (serial number 769219) was intact with no external damage. The crankshaft was rotated manually and a grinding sound was heard. The engine was disassembled and found to have a separated crankshaft. The crankshaft was removed for further examination. See the enclosed Manufacturer's Factual Report for more details concerning the engine examination.

The crankshaft (with the connecting rods attached) was examined at the NTSB Materials Laboratory in Washington, D.C. The crankshaft was separated aft of the #3 connecting rod journal. The #3 connecting rod rotated freely and was removed for examination of the journal surface. Examination of the fracture surface revealed a "flat face with faint crack arrest markings, consistent with progressive fatigue cracking. The crack originated on the aft edge of the journal and progressed nearly all the way through the thickness of the cheek." The journal and fracture area were examined using a scanning electron microscope. Examination of the journal surface in the vicinity of the crack revealed that "all of the origins were located in a secondary radius that was located within the original radius between the rod journal and the cheek." The secondary radius was smaller than the original radius and contained machining marks, which were "found to be rougher than typically associated with a normal journal

surface." See the enclosed Materials Laboratory Factual Report for more information.

Review of the engine maintenance records revealed an entry, dated August 28, 1991, that read, "this engine was found installed in Aeronca 11AC-Reg. No. N3184E without current logbook or any other history of engine. Engine was removed, and major overhauled and reinstalled in same aircraft. See the following page for work accomplished during overhaul." On the following page, it stated that all steel parts had been magnafluxed. It also stated that the crankshaft had been ground .010 inches. During the last annual inspection, dated April 9, 1999, the engine had accumulated 170.9 hours since the major overhaul. At the time of the accident, the engine had accumulated 178.4 hours since the overhaul.

Pilot Information

Certificate:	Private	**Age:**	41,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	September 18, 1998
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	540 hours (Total, all aircraft), 109 hours (Total, this make and model), 439 hours (Pilot In Command, all aircraft), 10 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Aeronca	**Registration:**	N3184E
Model/Series:	11AC 11AC	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	11AC-1529
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	April 9, 1999 Annual	**Certified Max Gross Wt.:**	1250 lbs
Time Since Last Inspection:	8 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2581 Hrs	**Engine Manufacturer:**	Continental
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	A-75-8
Registered Owner:	CHARLES D. CAWTHON	**Rated Power:**	75 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	20 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	2 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:		**Temperature/Dew Point:**	25°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	(F46)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	06:30 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	ROCKWALL MUNICIPAL F46	**Runway Surface Type:**	Asphalt
Airport Elevation:	574 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	16	**IFR Approach:**	
Runway Length/Width:	3400 ft / 45 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	32.919818,-96.449043(est)

Administrative Information

Investigator In Charge (IIC):	Lupino, Nicole
Additional Participating Persons:	ENID KASPAR; DALLAS , TX
Original Publish Date:	November 30, 2000
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=47091