Aviation Investigation Final Report

Location:	Arlington, Texas	**Accident Number:**	CEN14LA331
Date & Time:	June 27, 2014, 16:45 Local	**Registration:**	N8157V
Aircraft:	Cessna A188	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Banner tow		

Analysis

The pilot reported that he was maneuvering the airplane with a banner attached when he noticed a loss of oil pressure. He notified an air traffic controller of the emergency and indicated that he could not reach an airport. The engine then experienced a total loss of power, and the pilot made an emergency landing to a grassy area near a highway interchange. During the landing, the airplane collided with a vehicle, and then another vehicle struck the airplane.

A postaccident examination of the engine revealed that the oil filter adapter was loose, and no oil was observed inside the engine. The threads on the adapter were worn and damaged. The lock nut on the adapter was not properly torqued, and oil residue was observed on the engine near the adapter and on the underside of the airframe. A large amount of metallic debris was found throughout the entire oil filter element, which is consistent with engine oil starvation. Maintenance personnel replaced the oil and oil filter 4 days before the accident; however, they did not comply with Federal Aviation Administration Airworthiness Directive 96-12-22, which required, in part, inspecting the oil filter and adapter assembly for oil leakage and proper installation of the adapter retaining nut and replacing any oil filter adapter assembly with security problems to prevent loss of engine oil caused by loose or separated oil filter adapters because the loss of oil could result in engine stoppage while in flight and loss of airplane control.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

The total loss of engine power due to a loose oil filter adapter, which resulted in oil starvation. Contributing to the accident was maintenance personnel's failure to comply with a Federal Aviation Administration airworthiness directive.

Findings

Aircraft	Oil - Fluid level
Aircraft	Recip eng oil sys - Not serviced/maintained
Personnel issues	Replacement - Maintenance personnel
Aircraft	Return to service - Not serviced/maintained
Aircraft	Scheduled maint checks - Not serviced/maintained
Aircraft	Scheduled maint checks - Inadequate inspection

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of engine power (total) (Defining event)
Maneuvering-low-alt flying	Off-field or emergency landing

On June 27, 2014, about 1700, central daylight time, a Cessna A188 airplane, N8157V, made a forced landing to a road after a loss of engine oil pressure near Arlington, Texas. The airline transport pilot, who was the sole occupant, was not injured. The airplane sustained substantial damage. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations Part 91 as a banner tow flight. Visual meteorological conditions prevailed for the flight and no flight plan was filed. The local flight originated from the Dallas Executive Airport (KRBD), Dallas, Texas about 1600.

According to the pilot, he was maneuvering the airplane with the banner attached when he noticed a loss of oil pressure. He notified air traffic control of the emergency and that he could not reach an airport. The engine experienced a total loss of power and the pilot made an emergency landing to a grass area near a highway interchange. During the landing roll, the airplane continued onto the highway interchange and struck a vehicle. After the airplane came to rest, another vehicle struck the airplane from the rear. The airplane's empennage was twisted to the right but remained attached to the rear fuselage.

A postaccident examination of the engine revealed insignificant impact exterior damage, although the engine mounts had excessive wear, and several cracks had been stop drilled in the muffler. The oil dip stick was removed and no oil was observed. The propeller was rotated by hand; the crankshaft was stiff and made a grinding sound as it rotated inside the crankcase. The oil filter adapter was loose from its fitting and had "CESSNA" branded on the side of the unit. The threads on the adapter were worn and damaged. The lock nut on the adapter was not properly torqued. Oil residue was observed on the engine near the adapter and on the underside of the airframe. The oil filter was removed and cut open. The filter element contained metallic debris throughout the entire filter.

On July 31, 1996, the Federal Aviation Administration issued Airworthiness Directive (AD) 96-12-22: CESSNA AIRCRAFT COMPANY: Amendment 39-9665, for Cessna Models 100, 200, 300, and 400 Series airplanes (all serial numbers), certificated in any category, that are equipped with at least one Teledyne Continental Motors engine. The AD required, in part, inspecting the oil filter and adapter assembly for oil leakage and proper installation of the adapter retaining nut and replacing any oil filter adapter assembly with security problems "to prevent loss of engine oil caused by loose or separated oil filter adapters, which could result in engine stoppage while in flight and loss of control of the airplane."

According to the airplane's maintenance logbooks, the oil and oil filter had been changed five times since October 6, 2013. The most recent oil and oil filter change was completed on June 23, 2014. There are no records that show AD 96-12-22 was completed. The maintenance personnel stated that the AD

did not apply to the oil filter adapter because it was replaced by a different type of filter adapter from Continental Motors. According to the manufacturer, there are no Continental Motors oil filter adapters.

Pilot Information

Certificate:	Airline transport	**Age:**	67
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Single
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	June 18, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 30, 2013
Flight Time:	26564 hours (Total, all aircraft), 681 hours (Total, this make and model), 20564 hours (Pilot In Command, all aircraft), 66 hours (Last 90 days, all aircraft), 43 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N8157V
Model/Series:	A188	**Aircraft Category:**	Airplane
Year of Manufacture:	1968	**Amateur Built:**	
Airworthiness Certificate:	Restricted (Special)	**Serial Number:**	188-0407
Landing Gear Type:	Tailwheel	**Seats:**	1
Date/Type of Last Inspection:	April 5, 2014 Annual	**Certified Max Gross Wt.:**	3300 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	9136 Hrs at time of accident	**Engine Manufacturer:**	Continental Motors Inc
ELT:	Not installed	**Engine Model/Series:**	IO-520-D
Registered Owner:	Patrick D Champagne	**Rated Power:**	300 Horsepower
Operator:	Patrick D Champagne	**Operating Certificate(s) Held:**	None
Operator Does Business As:	We Fly Ads	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KGKY,630 ft msl	**Distance from Accident Site:**	7 Nautical Miles
Observation Time:	16:53 Local	**Direction from Accident Site:**	93°
Lowest Cloud Condition:	Few / 4300 ft AGL	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	16 knots / 24 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	150°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.79 inches Hg	**Temperature/Dew Point:**	32°C / 21°C
Precipitation and Obscuration:			
Departure Point:	DALLAS, TX (RBD)	**Type of Flight Plan Filed:**	None
Destination:	DALLAS, TX (RBD)	**Type of Clearance:**	None
Departure Time:	15:20 Local	**Type of Airspace:**	Class E

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:**	32.669445,-97.237777(est)

Administrative Information

Investigator In Charge (IIC):	Lindberg, Joshua
Additional Participating Persons:	Peter Kwaak; Federal Aviation Admisistration; North Texas, TX John Kent; Continental Motors; Mobile, AL
Original Publish Date:	January 12, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89572