



# Aviation Investigation Final Report

---

<b>Location:</b>	Pearsall, Texas	<b>Accident Number:</b>	CEN14LA287
<b>Date &amp; Time:</b>	June 12, 2014, 12:00 Local	<b>Registration:</b>	N8593S
<b>Aircraft:</b>	AIR TRACTOR INC AT 301	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (partial)	<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 137: Agricultural		

---

## Analysis

The pilot reported that, while returning to the airport after spraying a cornfield, he noticed that the engine cylinder head temperature was high. After landing, he checked the engine cylinders for discrepancies and found none, so he decided to continue the spraying operations at the cornfield. As the pilot pulled up the airplane from a spray run, the engine started to vibrate and lose power. He subsequently made a forced landing in a nearby field, which resulted in the airplane sustaining substantial damage to both wings.

During postaccident examination, a considerable amount of metal was found in the oil drain. The No. 2 cylinder front spark plug was loose. After removing all of the spark plugs, an attempt was made to rotate the engine, but it seized. After removing the No. 1 cylinder, it was discovered that the piston rod had broken at the link pin; no other rods were broken. The No. 1 cylinder link pin was scored, and there was evidence of oil starvation at the rod bearing. According to the operator, the engine had accrued about 100 hours since it had received extensive maintenance, including the replacement of the crankshaft. It is likely that the oil cooler was not properly flushed when the crankshaft was replaced and that metal and other debris remained in the oil, clogged the drain, and caused the piston to fail.

## Probable Cause and Findings

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

The failure of the No. 1 cylinder rod at the link pin. Contributing to the accident was oil starvation to the rod bearing due to the improper flushing of the oil cooler, which allowed metal and other debris in the oil to clog the drain and the led to the piston's failure.

## Findings

<b>Aircraft</b>	Recip eng cyl section - Failure
<b>Environmental issues</b>	(general) - Contributed to outcome
<b>Aircraft</b>	Recip eng cyl section - Incorrect service/maintenance
<b>Aircraft</b>	Oil - Fluid level

## Factual Information

### History of Flight

<b>Maneuvering</b>	Loss of engine power (partial) (Defining event)
<b>Emergency descent</b>	Off-field or emergency landing
<b>Landing</b>	Collision with terr/obj (non-CFIT)

On June 12, 2014, about 1200 central daylight time, the pilot of an Air Tractor AT 301, N8593S, made a forced landing in a field near Pearsall, Texas, following a loss of engine power. The pilot, the sole occupant on board, was not injured. The airplane was substantially damaged. The airplane was registered to Matt Fitch and operated Smith Flying Service, doing business as Fitch Flying Service, of Pearsall, Texas, under the provisions of 14 Code of Federal Regulations Part 137 as an aerial application flight. Visual meteorological conditions prevailed at the time of the accident, and no flight plan had been filed. The local flight originated from Pearsall about 1140.

According to the pilot, he returned to the airport after spraying a corn field and noticed the cylinder head temperature was high. After landing the engine cylinders were checked for discrepancies; none were found, so he decided to continue spraying. He took off and returned to the corn field. As he pulled up from a spray run, the engine started to vibrate and lose power. He made a forced landing in a nearby field. Examination of the airplane revealed both wings had sustained substantial damage during the forced landing.

According to the operator, the engine had accrued about 11 hours since the engine received extensive maintenance, including the replacement of a crankshaft.

The engine was shipped to Tulsa Engines in Tulsa, Oklahoma, where, on September 3, it was partially disassembled and examined under the auspices of a Federal Aviation Administration inspector. According to the FAA inspector's report, there was a large amount of metal in the oil drain. It was noted that the number 2 cylinder front spark plug was loose. After removing all the spark plugs, an attempt was made to rotate the engine. It was seized. Numbers 4, 5, 6, and 7 cylinders had oil; number 4 cylinder had more oil. After some difficulty in removing the no. 1 cylinder, it was discovered that the piston rod had broken at the link pin. No other rods were broken. The link pin was scored and there was evidence of oil starvation of the rod bearing.

## Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	23
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Single
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	4-point
<b>Instrument Rating(s):</b>	None	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Without waivers/limitations	<b>Last FAA Medical Exam:</b>	November 29, 2013
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	October 4, 2013
<b>Flight Time:</b>	472 hours (Total, all aircraft), 220 hours (Total, this make and model), 415 hours (Pilot In Command, all aircraft), 150 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft), 7 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	AIR TRACTOR INC	<b>Registration:</b>	N8593S
<b>Model/Series:</b>	AT 301 NO SERIES	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1978	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Restricted (Special)	<b>Serial Number:</b>	301-0157
<b>Landing Gear Type:</b>	Tailwheel	<b>Seats:</b>	1
<b>Date/Type of Last Inspection:</b>	May 27, 2014 Annual	<b>Certified Max Gross Wt.:</b>	5000 lbs
<b>Time Since Last Inspection:</b>	11 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	8357 Hrs as of last inspection	<b>Engine Manufacturer:</b>	P&W
<b>ELT:</b>	Not installed	<b>Engine Model/Series:</b>	R 1340-AN-1
<b>Registered Owner:</b>	Matt Fitch	<b>Rated Power:</b>	600 Horsepower
<b>Operator:</b>	Smith Company Flying Service	<b>Operating Certificate(s) Held:</b>	Agricultural aircraft (137)
<b>Operator Does Business As:</b>	Fitch Flying Service	<b>Operator Designator Code:</b>	FQWG

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KCOT,474 ft msl	<b>Distance from Accident Site:</b>	23 Nautical Miles
<b>Observation Time:</b>	11:53 Local	<b>Direction from Accident Site:</b>	360°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	9 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	12 knots / 18 knots	<b>Turbulence Type Forecast/Actual:</b>	/ None
<b>Wind Direction:</b>	150°	<b>Turbulence Severity Forecast/Actual:</b>	/ N/A
<b>Altimeter Setting:</b>	29.82 inches Hg	<b>Temperature/Dew Point:</b>	34°C / 22°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Pearsall, TX (T30 )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Pearsall, TX (T30 )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	11:40 Local	<b>Type of Airspace:</b>	Class G

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	28.879985,-99.089492(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Scott, Arnold
<b>Additional Participating Persons:</b>	Victor H Lopez; FAA Flight Standards District Office; San Antonio, TX
<b>Original Publish Date:</b>	June 22, 2015
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=89431">https://data.ntsb.gov/Docket?ProjectID=89431</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).