National Transportation Safety Board
Aviation Accident Final Report

Location:	San Bernardino, CA	**Accident Number:**	WPR16LA101
Date & Time:	05/06/2016, 1200 PDT	**Registration:**	N2AN
Aircraft:	ANTONOV AN2	**Aircraft Damage:**	Substantial
Defining Event:	Fuel contamination	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The commercial pilot was entering the airport traffic pattern for landing during a familiarization flight. He reported that he turned on the carburetor heat, switched the fuel tank selector to the right fuel tank, and shortly thereafter, the engine experienced a total loss of power. The pilot attempted numerous times to restart the engine but was unsuccessful. After realizing that he would not be able to reach the runway, he decided to make a forced landing to a small field. During the landing approach, the airplane contacted a power line, nosed over, and came to rest inverted, resulting in substantial damage to the wings and fuselage.

During the postaccident examination of the airplane, about 16 ounces of water were removed from the fuel system. Water was present in the lower gascolator, the fine fuel filter (upper gascolator), and subsequent fuel line to the carburetor inlet. A brass screen at the carburetor inlet and 2 carburetor fuel bowl thumb screens also contained corrosion, water, and rust.

The approved aircraft inspection checklist called for washing the carburetor and main fuel filter every 50 hours and cleaning and/or replacing the fine fuel filter every 100 hours. The fine fuel filter is not easily accessible and not able to be drained during a preflight inspection. The mechanic who completed the most recent inspection stated that he did not drain or check the fine fuel filter. The last logbook entry that specifically stated the fuel filters were cleaned was about 4 years before the accident.

Probable Cause and Findings

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

The mechanic's failure to inspect the fine fuel filter gascolator as required during the most recent inspection, which resulted in a total loss of engine power due to fuel contamination.

Findings

Aircraft	Fuel filter-strainer - Not serviced/maintained (Cause)
Personnel issues	Scheduled/routine maintenance - Maintenance personnel (Cause)

Factual Information

On May 06, 2016, about 1200 Pacific daylight time, an ANTONOV AN2 airplane, N2AN, sustained substantial damage during a forced landing, following a reported loss of engine power during approach to the San Bernardino International Airport, San Bernardino, California. The airplane was owned by the American Airpower Heritage Flying Museum, and was being operated by the pilot as a familiarization flight under the provisions of 14 Code of Federal Regulations Part 91. The commercial pilot and sole passenger were not injured. Visual meteorological conditions prevailed and no flight plan had been filed for the flight. The airplane departed the Cable Airport, Upland, California, about 1145.

In a telephone conversation with the National Transportation Safety Board investigator-in-charge, the pilot stated that the flight was a familiarization flight for a new member of their chapter of the Commemorative Air Force. The flight departed the Cable airport and flew east along the mountains, headed to San Bernardino. They contacted the San Bernardino tower and were instructed to enter the crosswind for runway 24. As part of the before landing checklist, the pilot turned on the carburetor heat and switched the fuel tank selector to the right fuel tank. Shortly thereafter, the engine lost all power. The pilot attempted numerous times to restart the engine, but was unsuccessful.

The pilot realized that he would not be able to reach the airport, and decided to make a forced landing to a small field in a residential area. During the landing approach, the airplane contacted a power line. After touching down in the field the airplane nosed over and came to rest inverted, which resulted in substantial damage to the wings and fuselage.

During the NTSB examination of the airplane, about 16 ounces of water was removed from the fuel system. Water was present in the lower gascolator, the fine fuel filter (upper gascolator), and subsequent fuel line to the carburetor inlet. A brass screen at the carburetor inlet and 2 carburetor fuel bowl thumb screens also contained corrosion, water and rust. (See Photo 1.)

Photo 1 - Fuel and contamination removed from fuel lines and gascolator

The approved aircraft inspection checklist called for washing the carburetor and main fuel filter every 50 hours and cleaning and/or replacing the fine fuel filter every 100 hours. The fine fuel filter located halfway up the firewall on the left side of the aircraft is not easily accessible and not in a position to be drained prior to flight. The mechanic that completed the most recent inspection stated that he did not drain or check the fine fuel filter. The last logbook entry that specifically stated the fuel filters were cleaned was in September 2012.

History of Flight

Enroute	Fuel contamination (Defining event)
Emergency descent	Loss of engine power (total) Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial	**Age:**	77, Male
Airplane Rating(s):	Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap Only
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With Waivers/Limitations	**Last Medical Exam:**	09/21/2015
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	08/16/2014
Flight Time:	3350 hours (Total, all aircraft), 58 hours (Total, this make and model)		

Pilot-Rated Passenger Information

Certificate:	Airline Transport	**Age:**	44, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap Only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Multi-engine	**Toxicology Performed:**	No
Medical Certification:	Class 3 Without Waivers/Limitations	**Last Medical Exam:**	07/29/2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	05/04/2016
Flight Time:	4000 hours (Total, all aircraft), 0 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	ANTONOV	**Registration:**	N2AN
Model/Series:	AN2	**Aircraft Category:**	Airplane
Year of Manufacture:	1984	**Amateur Built:**	No
Airworthiness Certificate:	Experimental	**Serial Number:**	43798
Landing Gear Type:	Tailwheel	**Seats:**	
Date/Type of Last Inspection:	12/01/2015, AAIP	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	14 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	2924 Hours	**Engine Manufacturer:**	PZL
ELT:	C91A installed, activated, did not aid in locating accident	**Engine Model/Series:**	ASH 62 IR
Registered Owner:	American Airpower Heritage Flying Museum	**Rated Power:**	1000 hp
Operator:	American Airpower Heritage Flying Museum	**Air Carrier Operating Certificate:**	None
Operator Does Business As:	Confederate Air Force	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	KSBD, 1159 ft msl	**Observation Time:**	1747 UTC
Distance from Accident Site:	1 Nautical Miles	**Direction from Accident Site:**	220°
Lowest Cloud Condition:	Scattered / 2700 ft agl	**Temperature/Dew Point:**	17°C / 9°C
Lowest Ceiling:	Overcast / 3500 ft agl	**Visibility**	7 Miles
Wind Speed/Gusts, Direction:	4 knots, 320°	**Visibility (RVR):**	
Altimeter Setting:	29.89 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Upland, CA (CCB)	**Type of Flight Plan Filed:**	None
Destination:	San Bernardino, CA (SBD)	**Type of Clearance:**	None
Departure Time:	1130 PDT	**Type of Airspace:**	Class D

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	34.114167, -117.215833 (est)

Preventing Similar Accidents

Mechanics: Manage Risks to Ensure Safety

Mistakes made while performing aircraft maintenance and inspection procedures have led to in-flight emergencies and fatal accidents. System or component failures are among the most common defining events for fatal general aviation accidents. Mechanics should learn about and adhere to sound risk management practices to prevent common errors; even well-meaning, motivated, experienced technicians can make mistakes. Fatigue can also be a hazard; it can cause forgetfulness, poor decision-making, reduced vigilance, and interfere with the mechanic's ability to do the job safely.

Mechanics should carefully follow manufacturers' instructions to ensure that the work is completed as specified. Also, up-to-date instructions and manuals should be used; other qualified mechanics are also a great resource. Mechanics need to pay close attention to the safety and security of the items that undergo maintenance as well as the surrounding components that may have been disconnected or loosened during the maintenance.

Inspecting maintenance work is a great way to ensure that it is done correctly. Routine inspections should be thorough, and items needing immediate attention should be addressed rather than deferred.

See http://www.ntsb.gov/safety/safety-alerts/documents/SA_022.pdf for additional resources.

The NTSB presents this information to prevent recurrence of similar accidents. Note that this should not be considered guidance from the regulator, nor does this supersede existing FAA Regulations (FARs).

Administrative Information

Investigator In Charge (IIC):	Christopher R Shaver	**Adopted Date:**	05/01/2017
Additional Participating Persons:	Rod Early; FAA Riverside FSDO; Riverside, CA Jim Lasche; Confederate Air Force; Dallas, TX		
Publish Date:	05/01/2017		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=93115		