Aviation Investigation Final Report

Location:	Lufkin, Texas	**Accident Number:**	CEN13LA406
Date & Time:	July 3, 2013, 11:40 Local	**Registration:**	N255SF
Aircraft:	AMERICAN CHAMPION AIRCRAFT 7GCBC	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Aerial observation		

Analysis

The pilot was flying a pipeline patrol flight about 500 feet above ground level. About 6 miles south of the destination, the engine abruptly lost power. The pilot observed that both fuel tanks contained a usable level of fuel. Additionally, he saw no obvious issues with the mixture setting, carburetor heat, magnetos, throttle position, and fuel shutoff valve. The pilot landed the airplane in a field with high vegetation, which resulted in strut damage.

The pilot did not report any fuel or oil leaks. During a postaccident examination, the engine was intermittently operational. The engine would produce power when the carburetor was "tapped" after the engine stopped. A carburetor examination revealed that the accelerator pump was operational and that the fuel screens were clear of debris. However, the forked needle valve's movement within its seat was restricted. The valve clip forks were observed resting on the valve seat when the carburetor's throttle body was inverted. The carburetor maintenance manual specified that a minimum clearance must exist between the forked valve clip and the valve seat. It is likely that the restricted movement of the carburetor's forked needle valve resulted from the mechanic's misadjustment of the valve clip forks, which subsequently caused the engine to lose power due to fuel starvation.

Probable Cause and Findings

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

The restricted movement of the carburetor's forked needle valve within its seat due to the mechanic's misadjustment of the valve clip forks, which resulted in fuel starvation.

Findings

Aircraft	Fuel control/carburetor - Malfunction
Aircraft	Fuel control/carburetor - Incorrect service/maintenance
Personnel issues	Installation - Maintenance personnel

Factual Information

History of Flight

Maneuvering-low-alt flying	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Emergency descent	Collision with terr/obj (non-CFIT)

On July 3, 2013, about 1140 central daylight time, an American Champion Aircraft model 7GCBC airplane, N255SF, impacted high vegetation and terrain during a forced landing following a loss of engine power near Lufkin, Texas. The airline transport rated pilot and his passenger were uninjured. The airplane sustained substantial damage to its wing struts. The aircraft was registered to and operated by KCSI Aerial Patrol Inc. under the provisions of 14 Code of Federal Regulations Part 91 as an aerial observation flight. Day visual flight rules (VFR) conditions prevailed for the flight, which did not operate on a VFR flight plan. The flight originated from the Texas Gulf Coast Regional Airport (LBX), near Angleton, Texas, about 0945 and was destined for the Angelina County Airport (LFK), near Lufkin, Texas.

According to the pilot's accident report, the airplane was serviced with a full load of fuel at LBX. The purpose of the flight was a working pipeline patrol flight, which was flown at 500 feet above ground level. Weather was VFR with light to variable wind. After a radio call to area traffic at LFK to state position and intention, the pilot continued the pipeline patrol flight. About six miles south of LFK, there was an abrupt loss of engine power. The pilot checked fuel tank levels, which were 1/2 tank on the left side and "a little more" than 1/4 tank on the right side. Additionally he checked the mixture setting, carburetor heat, magnetos, throttle position, and the fuel shutoff valve. The pilot observed no obvious issues.

The pilot contacted the LFK common traffic advisory frequency, announced the airplane's engine trouble, and indicated that he would be conducting a forced landing about five miles to the south of the LFK. The pilot landed the airplane in a field with high vegetation. He did not report any fuel or oil leaks as he checked and secured the airplane.

A Federal Aviation Administration inspector examined the airplane and confirmed the substantial damage. The airplane was recovered and the operator started the engine after the accident. The operator indicated that when the carburetor was "tapped" after an engine stoppage, the engine would start producing power again.

The carburetor was shipped to the investigator in charge for a tear down examination. It was a Marvel-Schebler MA-4SPA model carburetor marked with part no. 10-3678-32. The carburetor's accelerator pump link was manufactured with three holes. The selection of a link hole is model specific. The accelerator pump plunger stem was secured in a link hole that was not specified for the accident carburetor part number. The accelerator pump was operational and it ejected a test fluid when the throttle linkage was rotated by hand. Disassembly revealed that the carburetor's fuel screens were clear

of debris. The carburetor was equipped with a solid blue epoxy float. The needle valve's movement within its seat was restricted. The forked valve clip's forks were observed to rest on the valve seat when the carburetor's throttle body was inverted.

The Marvel-Schebler aircraft carburetor maintenance manual describes procedures for overhauling the manufacturer's carburetors. It describes how to determine and adjust the specified minimum clearance that must exist between the forked valve clip and the valve seat on solid blue epoxy float equipped carburetors.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	51
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	May 20, 2013
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	September 18, 2011
Flight Time:	4046 hours (Total, all aircraft), 995 hours (Total, this make and model), 3473 hours (Pilot In Command, all aircraft), 281 hours (Last 90 days, all aircraft), 118 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	AMERICAN CHAMPION AIRCRAFT	**Registration:**	N255SF
Model/Series:	7GCBC	**Aircraft Category:**	Airplane
Year of Manufacture:	2000	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1287-2000
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	June 19, 2013 100 hour	**Certified Max Gross Wt.:**	1800 lbs
Time Since Last Inspection:		**Engines:**	1 Reciprocating
Airframe Total Time:	2842.4 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	C126 installed, not activated	**Engine Model/Series:**	O-320-B2B
Registered Owner:	KCSI AERIAL PATROL INC	**Rated Power:**	180 Horsepower
Operator:	KCSI AERIAL PATROL INC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KLFK,316 ft msl	**Distance from Accident Site:**	5 Nautical Miles
Observation Time:	10:53 Local	**Direction from Accident Site:**	9°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	29°C / 18°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	ANGLETON/LAKE JACKSON, TX (LBX)	**Type of Flight Plan Filed:**	None
Destination:	Lufkin, TX (LFK)	**Type of Clearance:**	None
Departure Time:	09:45 Local	**Type of Airspace:**	

Airport Information

Airport:	ANGELINA COUNTY LFK	**Runway Surface Type:**	
Airport Elevation:	295 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

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:**	31.147777,-94.770835(est)

Administrative Information

Investigator In Charge (IIC):	Malinowski, Edward
Additional Participating Persons:	Matthew D Wetzel; Federal Aviation Administration; Houston, TX
Original Publish Date:	July 30, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87455