Aviation Investigation Final Report

Location:	Trenton, Georgia	**Accident Number:**	MIA02LA138
Date & Time:	July 23, 2002, 17:00 Local	**Registration:**	N10550
Aircraft:	Maule MXT-7-180A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

According to the pilot, he had to clear a ridgeline on his approach path to a 2,000 foot grass strip, necessitating a short field approach that was steep, using idle power. When he rapidly applied power in the flare, the engine hesitated, and the touchdown was firm. The left main wheel fractured at the weld joint between the axle and the hub spacer , causing the wheel to separate, the left landing strut to dig into the sod, and the aircraft to ground loop. The ground loop resulted in a collapsed nose gear strut and a propeller strike. Postcrash examination of the engine revealed metal shavings contamination in the gascolator. Postcrash run of the engine revealed an idle rpm of less than 500 rpm. The normal idle rpm range should be 600 to 800 rpm. The left main wheel/axle was sent to the NTSB Materials Laboratory for analysis of the fracture. The examination showed the axle to spacer weld had only achieved about 30 percent fusion of the surface at the end of the axle. The remaining fracture surface was consistent with overstress separation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The failure of the pilot to clear the engine during a prolonged approach at idle power resulting in the engine hesitating during application of power to arrest the descent for landing touchdown resulting in a hard landing and separation of the left main landing gear wheel. Contributing to the accident was incomplete fusion of the weld joint between the left main landing gear axle and wheel spacer and the lower than normal idle setting of the engine.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
1. (C) LANDING GEAR,AXLE - IMPROPER/POOR WELD
2. FUEL SYSTEM,CARBURETOR - UNDERSPEED
3. (C) MAINTENANCE,ADJUSTMENT - IMPROPER - OTHER MAINTENANCE PERSONNEL
4. (C) THROTTLE/POWER CONTROL - IMPROPER USE OF - PILOT IN COMMAND
5. ENGINE ASSEMBLY - OUTPUT LOW
6. LANDING GEAR,AXLE - OVERLOAD

Occurrence #2: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING

Findings
7. TERRAIN CONDITION - GRASS

Factual Information

On July 23, 2002, about 1700 eastern daylight time, a Maule MXT-7-180A , N10550, registered to Wellfound Air Inc., operated by a private individual as a Title 14 CFR Part 91 personal flight, crashed while landing at the Lookout Mountain Ultralight Airport, near Trenton, Georgia. Visual meteorological conditions prevailed and no flight plan was filed. The airplane received substantial damage, and the private-rated pilot, the sole occupant aboard, was not injured. The flight departed the Cobb County-McCollum Field Airport near Marietta, Georgia, about 50 minutes before the accident.

The pilot stated that during his short field approach to a 2,000-foot grass strip, the engine was slow to respond to his throttle advancement during his landing flare and the airplane landed hard. The pilot stated that the left axle broke, the left landing gear strut dug into the ground, and during the subsequent ground loop, the nose gear collapsed, the propeller struck the ground, and the airframe sustained some twisting deformation.

On August 8, 2002, the aircraft's left wheel axle assembly, consisting of a steel tube of 1.5-inch length and .12-inch wall thickness welded to a 3-inch diameter low carbon steel hub spacer, was shipped to the NTSB Materials Laboratory, Washington, DC, for failure mode examination. According to the Laboratory Report, "Visual and optical microscopic examination of the fracture surfaces revealed that the welding process had achieved incomplete fusion with the axle." The portion of the weld between the axle and hub spacer that exhibited proper fusion, (about 30-per cent of the total weldment) revealed overstress fracture. There was no evidence of fatigue, and the corrosion that was observed on the fracture surfaces occurred after the parts were separated during the hard landing. The Materials Laboratory Report is an attachment to this report.

On September 17, 2002, during a telephone call to the NTSB, the pilot confirmed that fuel system repairs had been recently performed on the aircraft. Due to a fuel leak in the left wing, the left wing fuel tank had been removed and the left fuel strainer had been replaced. Additionally, the fuel selector valve had been replaced. On October 8, 2002, during a subsequent telephone call to the NTSB, the pilot stated that, if the aircraft's engine had a low idle condition, that the low idle combined with the use of carburetor heat, may have led to the power hesitation he experienced. He mentioned this had been a theory of his all along. He could not recall any recent adjustment made to the throttle linkage or carburetor. He further stated he could not recall what rpm the engine idled at, only that it idled "OK" during his runup. A data sheet provided by Maule Air, Inc., revealed the minimum idle rpm for the MXT-7-180A should be no less than 600 rpm and no more than 800 rpm. Copies of "Record of Phone Conversation" forms and factory data sheets are attachments to this report.

On October 2, 2002, under NTSB oversight, the engine underwent a static test run. Prerun

examination by NTSB personnel revealed that the gascolator and its filter screen contained both ferrous and non-ferrous metal shavings of a silver color. The carburetor filter screen was found clean and clear of contaminates. The engine was run using a test propeller and the engine's own electrical and ignition system. The engine started easily and idled for about 2 minutes indicating normal fuel pressure. While insuring that the carburetor linkage adjustment screw was hard against its low speed stop, the idle rpm was less than 500 rpm. When the throttle was jam accelerated from its idle setting, the engine died. When the idle rpm was raised to 700 rpm and carburetor heat was applied, the carburetor easily accepted the jam acceleration. Throttle range of motion was abruptly actioned in both directions with no adverse operation.

Pilot Information

Certificate:	Private	**Age:**	32,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	June 7, 2000
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	September 25, 2001
Flight Time:	316 hours (Total, all aircraft), 225 hours (Total, this make and model), 253 hours (Pilot In Command, all aircraft), 27 hours (Last 90 days, all aircraft), 5 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Maule	**Registration:**	N10550
Model/Series:	MXT-7-180A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	21060C
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	June 20, 2002 100 hour	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:	19 Hrs	**Engines:**	Reciprocating
Airframe Total Time:	1201 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-360-C4F
Registered Owner:	Wellfound Air Inc.	**Rated Power:**	180 Horsepower
Operator:	Roderick Henderson	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CHA,682 ft msl	**Distance from Accident Site:**	18 Nautical Miles
Observation Time:	16:53 Local	**Direction from Accident Site:**	45°
Lowest Cloud Condition:	Few / 2800 ft AGL	**Visibility**	7 miles
Lowest Ceiling:	Broken / 7000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	210°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.07 inches Hg	**Temperature/Dew Point:**	24°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Marietta, GA (RYY)	**Type of Flight Plan Filed:**	None
Destination:	Trenton, GA (0GE3)	**Type of Clearance:**	None
Departure Time:	16:10 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Lookout Mountain Flight Park OGE3	**Runway Surface Type:**	Grass/turf
Airport Elevation:	635 ft msl	**Runway Surface Condition:**	Wet
Runway Used:	18	**IFR Approach:**	None
Runway Length/Width:	2000 ft / 50 ft	**VFR Approach/Landing:**	Full stop;Valley/terrain following

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:**	34.904724,-85.459724

Administrative Information

Investigator In Charge (IIC):	Stone, Alan
Additional Participating Persons:	Mike Lozano; FSDO FAA; Atlanta, GA
Original Publish Date:	April 23, 2003
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55288