Aviation Investigation Final Report

Location:	Melba, Idaho	**Accident Number:**	WPR19LA092
Date & Time:	March 1, 2019, 13:45 Local	**Registration:**	N6486J
Aircraft:	Cessna 172	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor and student pilot were performing maneuvers when the engine lost total power. The instructor pitched the nose of the airplane down and asked the student pilot to restart the engine. The student pilot was unable to rotate the engine using the starter, and the flight instructor verified that the master switch was in the "ON" position. The instructor tried to start the engine himself and was unsuccessful. The flight instructor performed a forced landing in a field.

Examination revealed that the idle mixture adjustment screw and spring assembly had separated from the carburetor and were found in the lower cowling area. After the airplane was relocated to a nearby road the engine rotated via the starter.

Examination of the idle mixture adjustment screw and spring assembly revealed no anomalies. The reason that the screw backed out of the carburetor could not be determined. The starter solenoid was removed and disassembled. The starter solenoid was examined and revealed a frayed and separated wire from the coil to a terminal end. The reasons for this fraying and separation could not be determined. Although the starter solenoid was faulty, it is unlikely that the engine would have restarted due to the separated idle mixture screw and spring assembly.

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 separated carburetor idle mixture adjustment screw and spring assembly for reasons that could not be determined.

Findings

Not determined	(general) - Unknown/Not determined
Aircraft	Fuel control/carburetor - Not specified
Aircraft	(general) - Damaged/degraded

Factual Information

History of Flight

Maneuvering	Loss of engine power (total) (Defining event)
Emergency descent	Off-field or emergency landing
Emergency descent	Powerplant sys/comp malf/fail
Landing-landing roll	Collision with terr/obj (non-CFIT)

On March 1, 2019, about 1345 mountain standard time, a Cessna 172N airplane, N6486J, was substantially when it was involved in an accident near Melba, Idaho. The flight instructor and student pilot were not injured. The airplane operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

The instructor reported that they had performed about 12 power-off and power-on stalls, while maintaining an altitude between 4,500 ft and 2,000 ft during the maneuvers. While performing the last power-off stall, with the nose of the airplane pitched up, the engine lost total power. During that maneuver, the throttle lever was in the closed position, and the carburetor heat was in the “ON” position. The instructor pitched the nose of the airplane down and asked the student to restart the engine. The student pilot was unable to rotate the engine using the starter, and the instructor verified that the master switch was in the “ON” position. The instructor tried to start the engine himself and was also unsuccessful. The instructor performed a forced landing in a field about 12 miles southwest of the departure airport. During the landing roll, the right wing impacted the ground and the right wing spar sustained substantial damage.

The initial examination of the airplane at the accident site was performed by the operator's mechanic. The examination revealed that the idle mixture adjustment screw and spring assembly had separated from the carburetor and was found in the lower cowling area. While on site, the flight instructor told the mechanic about the inability to rotate the engine with the starter after the power loss. The airplane was moved to a nearby road and the mechanic was able to rotate the engine via the starter. The airplane was recovered for further examination.

The examination of the airplane by a Federal Aviation Administration inspector revealed no other anomalies, and the airplane was released back to the owner.

During a conversation with the National Transportation Safety Board investigator-in-charge after the accident, the owner stated that he could not rotate the engine using the starter following the accident. The ignition switch and associated wiring were subsequently examined, and no anomalies were noted. The starter rotated when the starter cable was removed from the starter solenoid and connected to the battery. The starter solenoid was removed and disassembled. The examination of the starter solenoid revealed a frayed and separated wire from the coil to a terminal end. The owner replaced the starter solenoid with a new solenoid and installed the idle mixture adjustment screw and spring assembly; the

engine operated normally. He concluded by stating that, with the idle mixture adjustment screw assembly removed from the carburetor, the engine would not operate below 1,000 rpm.

Maintenance records indicated that, on October 18, 2016, 1,281.6 flight hours before the accident, the carburetor was removed and the throttle shaft assembly, accelerator pump assembly, throttle shaft bushings, gaskets and cotter keys were replaced with new. The carburetor was reinstalled, and the engine was test run with no anomalies noted. On January 19, 2016, a faulty starter solenoid was replaced with a new starter solenoid and the part number was correct for this airplane. The last annual inspection was completed on January 29, 2019, about 24 flight hours before the accident.

Flight instructor Information

Certificate:	Commercial; Flight instructor	**Age:**	66,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	October 17, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 25, 2017
Flight Time:	10100 hours (Total, all aircraft), 1700 hours (Total, this make and model), 10020 hours (Pilot In Command, all aircraft), 45 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Student	**Age:**	77,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	4-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:	Class 3 Waiver time limited special	**Last FAA Medical Exam:**	October 15, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	223 hours (Total, all aircraft), 223 hours (Total, this make and model), 45 hours (Pilot In Command, all aircraft), 7 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N6486J
Model/Series:	172 N	**Aircraft Category:**	Airplane
Year of Manufacture:	1980	**Amateur Built:**	
Airworthiness Certificate:	Normal; Utility	**Serial Number:**	17273877
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 29, 2019 100 hour	**Certified Max Gross Wt.:**	2300 lbs
Time Since Last Inspection:	24 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	17797.1 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-320-H2AD
Registered Owner:		**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KMAN,2537 ft msl	**Distance from Accident Site:**	10 Nautical Miles
Observation Time:	13:05 Local	**Direction from Accident Site:**	25°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	7°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Nampa, ID (KMAN)	**Type of Flight Plan Filed:**	None
Destination:	Nampa, ID (KMAN)	**Type of Clearance:**	None
Departure Time:	13:10 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	Nampa Muni MAN	**Runway Surface Type:**	
Airport Elevation:	2536 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	43.426944,-116.621109(est)

Administrative Information

Investigator In Charge (IIC):	Swick, Andrew		
Additional Participating Persons:	Cara M Barbera; FAA-FSDO; Boise, ID		
Original Publish Date:	April 21, 2022	**Investigation Class:**	3
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=99075		