National Transportation Safety Board
Aviation Accident Final Report

Location:	Miami, FL	**Accident Number:**	ERA13LA187
Date & Time:	04/04/2013, 0840 EDT	**Registration:**	N6141Q
Aircraft:	CESSNA 152	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	2 None
Flight Conducted Under:	Part 91: General Aviation - Instructional		

Analysis

Near the conclusion of a local training flight, the airplane's engine experienced a partial loss of power, and the flight instructor performed a forced landing to a road. The airplane departed the road during the landing, and the right wing was substantially damaged. Postaccident examination of the engine found that the No. 3 cylinder exhaust valve had fractured and separated from the valve stem. Review of maintenance records showed that the valve may have been installed during a repair to the No. 3 cylinder that occurred about 28 years before the accident flight; however, due to the incomplete nature of the records provided, a definitive determination of the engine's complete service history could not be made. Recent engine log entries showed that the engine had accumulated nearly 2,500 flight hours since the most recent overhaul. The engine-manufacturer-recommended time between overhaul is every 2,400 flight hours or 12 calendar years.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A partial loss of engine power due to the failure of the No. 3 exhaust valve. Contributing to the accident was the airplane operator's failure to follow the engine manufacturer's recommended engine overhaul intervals.

Findings

Aircraft	Recip eng cyl section - Failure (Cause)
Personnel issues	Scheduled/routine maintenance - Maintenance personnel (Factor)

Factual Information

On April 4, 2013, at 0840 eastern daylight time, a Cessna 152, N6141Q, was substantially damaged during a forced landing following a partial loss of engine power near Miami, Florida. The certificated flight instructor and the certificated student pilot were not injured. Visual meteorological conditions prevailed, and no flight plan was filed for the local flight, which originated from Kendall-Tamiami Executive Airport (TMB), Miami, Florida, at 0745. The instructional flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

At the conclusion of an uneventful training flight, the flight instructor asked the student pilot to demonstrate a steep turn prior to returning to TMB. While in the turn, the engine experienced a partial loss of power, and the propeller continued to "windmill." The flight instructor then took control of the airplane and returned to straight-and-level flight before attempting to restore power to the engine. After determining that engine power could not be restored, and that the airplane would be unable to reach TMB from their current position, the flight instructor elected to perform a forced landing to a road. During the landing, the left main landing gear caught on a grassy area next to the runway, yawing the nose left. The airplane subsequently struck a bush, resulting in substantial damage to the right wing.

The engine was examined following the accident under the supervision of a Federal Aviation Administration inspector. Internal examination of the number 3 cylinder showed that the exhaust valve head had fractured and was separated from the valve stem. The valve head was recovered from the engine cylinder, and showed evidence of post-separation damage and contact with the interior of the cylinder and piston dome.

No other mechanical deficiencies of the engine were identified during the examination.

The accident airplane was manufactured in 1981 and was equipped with a Lycoming O-235-L2C engine. Review of maintenance logs provided by the operator revealed that the engine was installed in the accident airplane following a field overhaul in June 1985. At the time of the overhaul, the engine had accumulated 1,994 total hours of operation. In December 1985, after the engine had accumulated 299 flight hours since the most recent overhaul, inspection of the number 3 cylinder revealed a broken rocker shaft boss. The remedy to the discrepancy included the installation of "serviceable valves." Between 1985 and the date of the accident, no other replacement of the number 3 cylinder or its valves was noted. No other documents accompanied the log entry, and the prior service history of the installed "serviceable" valves could not be determined.

Based on the maintenance records provided, the engine's maintenance history between 1985 and 2011 could not be determined; however review of an entry dated October 2011 noted that the engine had accumulated 1,876 total hours since its most recent overhaul. The airplane's most recent annual inspection was completed on April 14, 2012. At that time the engine had accumulated 5,702 total hours, and 1,929 hours since overhaul. The most recent 100 hour inspection was completed on March 26, 2013, and at that time the engine had accumulated 2,408 hours of operation since the most recent overhaul. At the time of the accident, the engine had accumulated 2,495 hours since the most recent overhaul, and 6,269 hours since its manufacture.

According to Lycoming Service Instruction 1009AS, revised May 25, 2006, the recommended

overhaul interval for the O-235 engine was 2,400 hours or 12 calendar years.

History of Flight

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

Flight Instructor Information

Certificate:	Flight Instructor; Commercial	**Age:**	25, Female
Airplane Rating(s):	Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Seatbelt
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without Waivers/Limitations	**Last Medical Exam:**	10/21/2010
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	01/04/2013
Flight Time:	903 hours (Total, all aircraft), 901 hours (Total, this make and model), 828 hours (Pilot In Command, all aircraft), 368 hours (Last 90 days, all aircraft), 124 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Student Pilot Information

Certificate:	Student	**Age:**	23, Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With Waivers/Limitations	**Last Medical Exam:**	05/07/2012
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	64 hours (Total, all aircraft), 64 hours (Total, this make and model), 49 hours (Last 90 days, all aircraft), 16 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	CESSNA	**Registration:**	N6141Q
Model/Series:	152	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Utility	**Serial Number:**	15285164
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	03/26/2013, 100 Hour	**Certified Max Gross Wt.:**	1670 lbs
Time Since Last Inspection:	87 Hours	**Engines:**	1 Reciprocating
Airframe Total Time:	6408 Hours	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, activated, did not aid in locating accident	**Engine Model/Series:**	O-235
Registered Owner:	C&G Aircraft Maintenance Inc.	**Rated Power:**	110 hp
Operator:	C&G Aircraft Maintenance Inc.	**Air Carrier Operating Certificate:**	None

Meteorological Information and Flight Plan

Observation Facility, Elevation:	TMB, 10 ft msl	**Observation Time:**	0853 EDT
Distance from Accident Site:	7 Nautical Miles	**Condition of Light:**	Day
Direction from Accident Site:	230°	**Conditions at Accident Site:**	Visual Conditions
Lowest Cloud Condition:	Few / 1700 ft agl	**Temperature/Dew Point:**	25°C / 21°C
Lowest Ceiling:	None	**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	7 knots, 160°	**Visibility (RVR):**	
Altimeter Setting:	30.02 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Miami, FL (TMB)	**Type of Flight Plan Filed:**	None
Destination:	Miami, FL (TMB)	**Type of Clearance:**	None
Departure Time:	0745 EDT	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None		

Administrative Information

Investigator In Charge (IIC):	Dennis Diaz	**Adopted Date:**	08/07/2013
Additional Participating Persons:	Helene Porche; FAA/FSDO; Miami, FL		
Publish Date:	08/07/2013		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=86585		