National Transportation Safety Board
Aviation Accident Factual Report

Location:	Goodyear, Arizona	**Accident Number:**	WPR17LA099
Date & Time:	April 20, 2017, 07:19 Local	**Registration:**	N154BY
Aircraft:	DIAMOND AIRCRAFT IND GMBH DA 40 NG	**Aircraft Damage:**	Substantial
Defining Event:	Controlled flight into terr/obj (CFIT)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Factual Information

On April 20, 2017, at 0719 hours mountain standard time, a Diamond Aircraft Industries DA-40NG, N154BY, was substantially damaged when it was involved in an accident near Goodyear, Arizona. The student pilot was not injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the student pilot, he was on his first solo flight after completing his pre-solo checkout exam. During the preflight check, the student pilot performed a check of the engine control unit (ECU). There were no discrepancies noted with the ECU, and the preflight check, run-up, taxi, and initial takeoff were normal. During the takeoff climb out, about 400 ft above ground level (agl), he heard a power change from the engine. As the student pilot checked the engine load indicator, which read 35%, he moved the power lever up and down to see if he had engine control; however, the engine load indicator remained at 35%. About 5 seconds later, he observed two annunciators illuminated, ECU A FAIL and ECU B FAIL.

The airplane's flight and systems data from the accident flight, captured by its Garmin G1000 integrated flight deck system download, revealed that the engine lost power near the departure end of runway 21 at an altitude of 1,560 ft. mean sea level and an airspeed of 88.6 knots. The data also revealed a sudden drop in engine load from 97% to 39% in less than 4 seconds. The student pilot reported that, because the flight school's standard operating procedures advised students not to turn back to the airport below an altitude of 1,000 ft agl, he did not have sufficient altitude to turn back to the runway.

The student pilot maneuvered to a field to the right of the airplane and attempted to attain an airspeed of 88 knots (glide speed). However, he stated that his altitude was low, and he did not think he was going to be able to clear the power lines around the field, so he decided to fly under the power lines. According to the pilot, as the airplane flew under the power lines, the airplane struck the bottom power line and a white flash appeared in the cockpit. The pilot also reported that, when the airplane first touched down in the field, it bounced.
The operator reported that the airplane then impacted two drainage ditches before it came to rest near a third drainage ditch, resulting in substantial damage to the right wing. The pilot reported that he then switched off the fuel pumps, opened the canopy, and exited the airplane.

A review of flight and systems data from the G1000 revealed both a nominal rpm change and a decrease in fuel flow during the takeoff; there was no engine roughness and no significant changes in oil temperature, oil pressure, and engine temperature.

Postaccident examination of the turbocharger system revealed no visible abnormalities. When it was disassembled, evidence of oil loss was found at the turbocharger seals and outlet; the turbocharger was found to spin freely. Further inspection of the system revealed that the interior lining of the air induction hose between the alternate air valve and turbocharger showed signs of deterioration. The air induction hose was installed and tested on another aircraft. During the test, the engine lost power. A subsequent inspection of the air induction hose revealed that its inner liner had separated and collapsed in such a way that it prevented sufficient air intake to the turbocharger.

The investigation found that a generic air induction hose had been installed on the accident airplane that was not part number specific. The Diamond illustrated parts breakdown calls for a specific part number for two flexible induction hoses. The operator reported that they inspected their fleet of airplanes and replaced the generic hoses with Diamond Aircraft Industries Inc. (DAI) hose.

Pilot Information

Certificate:	Student	**Age:**	25,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	May 9, 2017
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	(Estimated) 14 hours (Total, all aircraft), 14 hours (Total, this make and model), 0 hours (Pilot In Command, all aircraft), 14 hours (Last 90 days, all aircraft), 8 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	DIAMOND AIRCRAFT IND GMBH	**Registration:**	N154BY
Model/Series:	DA 40 NG NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	40.N302
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	April 11, 2017 AAIP	**Certified Max Gross Wt.:**	2822 lbs
Time Since Last Inspection:	19.3 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	864.4 Hrs at time of accident	**Engine Manufacturer:**	Austro
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	E4-A
Registered Owner:		**Rated Power:**	168 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KGYR,968 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	06:47 Local	**Direction from Accident Site:**	62°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	29.97 inches Hg	**Temperature/Dew Point:**	19°C / -1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Goodyear, AZ (GYR)	**Type of Flight Plan Filed:**	None
Destination:	Goodyear, AZ (GYR)	**Type of Clearance:**	VFR
Departure Time:	07:19 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	PHOENIX GOODYEAR GYR	**Runway Surface Type:**	
Airport Elevation:	968 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:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	Unknown
Total Injuries:	1 None	**Latitude, Longitude:**	33.405834,-112.408607(est)

Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye	**Report Date:**	
Additional Participating Persons:	Thomas Dickerson; Federal Aviation Administration; Scottsdale, AZ		
Note:	The NTSB did not travel to the scene of this accident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=95120		