NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Western Pacific Region

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AIRFRAME EXAMINATION REPORT

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Van Nuys, California

August 2, 2016

1322 PDT

Arion Aircraft LS-1; N341AL

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HISTORY OF FLIGHT

On August 2, 2016, about 1322 Pacific daylight time, an Arion Lightning LS-1, N341AL, was substantially damaged after it collided with a building during a touch and go at Van Nuys Airport (VNY), Van Nuys, California. The private pilot was fatally injured. The personal flight was operated under the provisions of Title 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local flight that departed Santa Monica Municipal Airport (SMO), Santa Monica, California at 1315.

PERSONNEL INFORMATION

The pilot, age 78, held a private pilot certificate with ratings for single-engine land and instrument airplane. The pilot's most recent third-class medical certificate was issued on September 12, 2012, which did not include any limitations. During the exam, the pilot reported that he had accumulated 908 flight hours; 60 hours of which were in the previous 6 months.

AIRCRAFT INFORMATION

According to Federal Aviation Administration (FAA) records, the airplane was manufactured in 2014 and registered to Arion Aircraft, LLC on March 21, 2014. The airplane was powered by a Jabiru 3300, a normally-aspirated, direct drive, air cooled, 120 hp engine. The pilot's service facility provided the original logbooks. A review of the aircraft logbooks revealed that the airplane's most recent 100 hour inspection was completed on December 1, 2015 at which time the airplane and engine had accumulated 46 total flight hours.

The pilot's service facility additionally provided several maintenance work orders that spanned from July 7, 2015 to January 12, 2016. According to the work orders, the no. 3 cylinder heat temperature probe was replaced on January 12, 2016. During the replacement the service facility fabricated and installed a new trim tab using an epoxy to the rudder. The brake pads were replaced along with the hydraulic piston "O" rings on December 10, 2015. At the time of the replacement, the right wing fuel quick drain valve contained a leak and the service facility replaced the "O" ring around the quick drain valve to contain it. On November 16, 2015, the service facility cut "bigger" holes in the wheel fairings and plugged them with caps. In the same notation, the facility recorded that the canopy trim was hard to close. The entry states that they "pounded latch & flattened trim around latch." Additionally, they attached a nose fairing using cosmetic tape, sand and paint. The first work order was recorded on July 7, 2015 and stated that the facility serviced the spark plugs and checked the no. 5 exhaust gas temperature probe and baffles.

A Los Angeles Airport Police Officer reported that he detected a strong fuel odor and observed fuel staining as he arrived on-scene, minutes after the accident. According to records furnished by a refueling station at SMO, the pilot had purchased about 17 gallons of 100 LL AVGAS fuel from a self-service facility at the airport at 1224 on the day of the accident.

COMMUNICATIONS

Preliminary Air Traffic Control (ATC) audio data provided by the FAA captured the pilot's conversation with the VNY tower controller. According to the audio, the pilot made contact with the tower controller when the airplane was south of the airport. The pilot requested a full stop landing on runway 16L and the controller instructed the pilot to remain west of the interstate 405 freeway. The pilot stated that he was not familiar with the area and made multiple requests for navigation assistance including a request for the controller to call his base turn. Once the controller instructed the pilot to make a base turn, the pilot made a request to extend his downwind leg to descend further.

The pilot subsequently amended his landing request to complete a touch and go on runway 16L. According to the controller, the airplane touched down hard approximately 1,500 feet down the runway and subsequently departed. The pilot reported to the controller that he heard a "banging" sound and the controller informed the pilot that his left main landing gear appeared to be "dangling."

The tower controller advised the pilot that he could return to VNY or proceed to another airport at his discretion. After the pilot stated that he planned to return to VNY, the tower controller observed the airplane immediately veer to the left and descend. Another aircraft reported over the tower frequency that an airplane had crashed east of the airport.

METEOROLOGICAL INFORMATION

The 1351 recorded weather observation at VNY included wind 120 degrees true at 08 knots, visibility 10 statute miles, clear skies, temperature 32 degrees C, dew point 11 degrees C, and an altimeter setting of 29.96 inches of mercury.

WITNESS REPORTS

Eyewitnesses

A total of 5 eyewitnesses were interviewed; two of which were in the cockpit about midfield of runway 16R, another witness was seated in a fuel truck facing south beyond the southern end of runway 16L, one witness was in the cabin of an airplane located at the south end of the airport, and another witness was in a helicopter east of the airport.

According to witnesses 1 & 2, they observed something dangling from the left main landing gear that appeared to be a wheel fairing. The airplane made exaggerated movements and was flying "erratically, like he [the pilot] was overcontrolling the airplane." The witnesses heard the pilot state that he was returning to the airport on the airport tower control radio frequency. Immediately following the transmission, the airplane entered a steep left turn. The airplane appeared to enter an accelerated stall as the nose continued through the horizon. Witness 1 further added that he witnessed an incipient stall, indicated by an increase in the airplane's attitude. The airplane subsequently rotated one quarter turn to the left and then entered a nose down attitude towards the ground and disappeared below the witnesses' field of view.

Witness 3 reported that he initially observed the airplane when he looked to his right and noticed it approximately 35 feet above ground level in a climb. The witness reported that the left landing gear was hanging by a brake line and the airplane was in a shallow climb and appeared to be incrementally gaining altitude. The airplane then began a left turn near the south end of the airport. Initially, the turn "looked good," but then the airplane slowed, the airplane banked hard into a knife edge attitude and subsequently "fell." In this moment the airplane yawed to a nose down position and the airplane entered a rapid descent. The airplane disappeared from the witnesses' view. The witness did not recall if the engine was functioning at the time of the event.

According to witness 4, located at the south end of the airport adjacent to the accident site, he heard a small single engine airplane overhead. He remarked that the engine was "cutting in and out" for a moment and then the sound abruptly stopped. Approximately 5 seconds later, the witness heard a "whack" sound. He reported that this event took place about 1354 on the day of the accident.

Witness 5 reported that he was in a traffic helicopter at the time of the accident. He started to watch the airplane seconds after the pilot reported that he wanted to return to the airport on the

airport's tower control radio frequency. The airplane entered a steep left turn from approximately 350 feet above ground level and the nose appeared to be in a level attitude. Subsequently, the airplane began a descent and impacted an industrial building east of the airport. The witness' pilot notified the tower controller that an airplane had crashed. His pilot reported to the witness that the airplane's attitude through the steep turn resembled an accelerated stall.

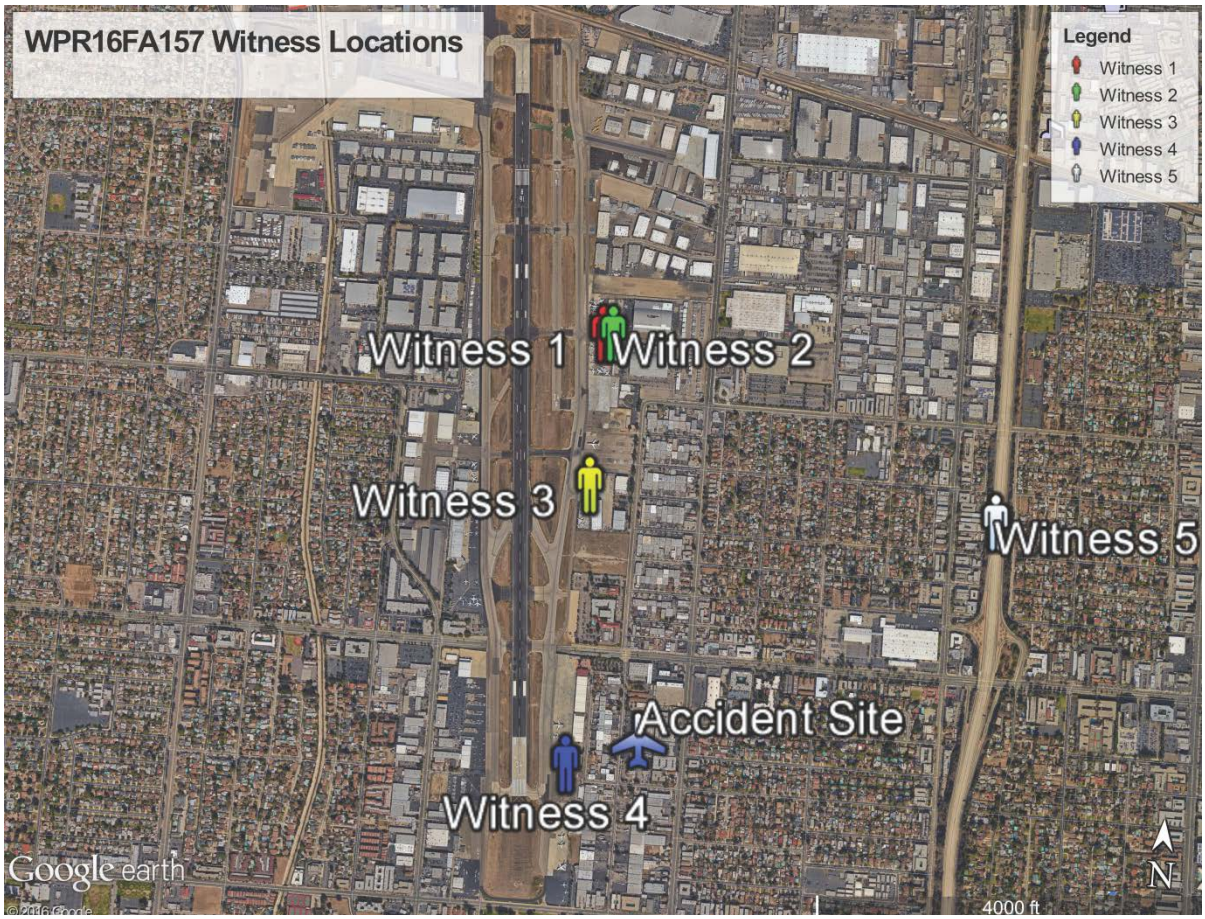

Figure 1 – Witness Locations

Other Witnesses

Ray Myllyla

Another witness stated that he had been friends with the pilot for about 12 years. The pilot was scheduled for an FAA 709 ride about 2 weeks after the accident, a result of an incident that had occurred a few weeks prior. The pilot previously had 2 accidents that resulted in the separation of the nose landing gear. The first accident occurred about 2 years ago at Hawthorne Airport and the most recent accident occurred at Camarillo Airport. The witness observed the pilot depart SMO at 1315. According to the witness, the pilot had planned to execute several of touch and go maneuvers at VNY and then return to SMO.

Approximately 3 years ago, the pilot was involved in a car accident and may have suffered a stroke before or during the accident. The pilot took several months to recuperate, but was not the

same person, physically. He previously owned a Grumman Tiger and a Bonanza. He sold the Bonanza after the witness and several others told the pilot to sell the airplane because it was "too much for him." The pilot was taking lessons to familiarize himself with the accident airplane. Several instructors refused to fly with him, but eventually the pilot found one instructor who agreed to sign him off. The witness stated that everyone he knew instructed him to stop flying.

Nicholas Ullmann

In a telephone conversation with the NTSB IIC, Nicholas Ullmann stated that he was a full time instructor for 14 years at Proteus Air Services and was the previous CFI to the accident pilot about 10-12 years ago. He stated “that was when he [the pilot] had his mental faculties prior to the terrible car crash which diminished his mental capacity to a horrible degree”. He stopped instructing him after the pilot received his license and after he became involved in a fractional partnership with a group at Santa Monica Airport. Mr. Ullmann stated that Newman sold his share in the group’s airplane and purchased a Beechcraft Bonanza. Mr. Ullmann stated that “it might have been too much airplane for him”. During a flight to Oceana, Ullmann had to “save” the airplane on the landing attempt and directed the pilot to about 50 other procedural errors that he made during the flight.

He stated that he was concerned about the pilot's driving. The day prior to the accident he went into Ullmann's office and asked him to help him push airplane into hangar. A line employee agreed to assist Mr. Newman who drove both of them to the hangar. The line employee noticed Mr. Newman’s hands were shaking during the brief trip. She described his driving as “frightening”.

Several instructors refused to fly with the accident pilot because he had a “nasty habit” of refusing to pay his instructors. During Mr. Ullmann's flight to Oceana with the accident pilot they did not discuss compensation. He knows he has “stiffed” the home healthcare provider that helped him after his accident.

Mr. Ullmann stated that about a week prior to the accident, one of their line employees announced “there’s an aircraft sputtered on downwind.” He asked for priority/emergency handling and he landed safely after a very short approach. Mr. Ullmann approached the pilot who was at the self-serve fuel pumps. Mr. Newman snickered and stated that “he thinks he ran out of gas.” Mr. Ullmann looked inside both fuel tanks and noticed they were both “bone dry”. He asked the pilot why he is not going fill up the tanks since he just had a fuel exhaustion incident. The pilot stated that he “doesn't feel like the fuel gauges are working” and added that he needed to practice 3 touch and goes, but planned to refuel the airplane in Camarillo. His former flight instructor arrived at the fuel pumps and scolded the pilot for his actions. Mr. Ullmann believed the pilot's instructor stopped flying with the pilot because of behavioral issues. After everyone left the fuel pumps, Mr. Ullmann returned to his office, and he discovered this was his second priority handling issue that day. During this flight, the pilot encountered engine trouble in the airport traffic pattern while preparing for a FAA 709 examination. The pilot experienced a total loss of power in the traffic pattern, declared an emergency and returned to the field. The air traffic controller asked the pilot if he wanted to proceed to his hangar or maintenance, and the

pilot responded that the “engine is fine." He then departed the airport on the flight that Mr. Ullmann previously described, which resulted in fuel exhaustion.

Mr. Ullmann’s friend, a career professional pilot, ferried the airplane from the aircraft manufacturer's facility in Tennessee had an emergency landing. He reported that the EGT and CHT gauges were "in the red" and that he was not comfortable flying the airplane. The ferry pilot elected to leave airplane in El Paso, Texas and returned to California on a commercial flight.

The first broken gear incident occurred in Camarillo, which triggered in a 709 ride with the FAA. He had a safety pilot onboard that Mr. Ullmann was not “fond “of, because the two had been in an incident together. The pilot got in an argument with his safety pilot and told him “[if] you think its great then you go and land it”. The safety pilot has a negative reputation and has been banned from Mr. Ullmann’s school.

Paul Fine

Mr. Fine stated that he knew the accident pilot for about 35 years. Mr. Fine started flying in 1960 when he lived in Boston, but did not complete his private pilot training. He met the accident pilot in 1980 after he relocated to the West Coast. About 12 years ago, Mr. Fine began flying with the accident pilot's flight instructor.

Mr. Fine described the pilot's attitude and aeronautical decision making as "close enough," which is a phrase the pilot used frequently. The pilot habitually approached Santa Monica Airport from a "very low" altitude and "dragged" the airplane in. He stated that multiple people cautioned him that his approaches were "too low" and his response was "this is the way I do it." In one example, Mr. Fine was flying instruments with the accident pilot in "hard IMC" with Mr. Fine as the safety pilot. An air traffic controller informed them they were several miles passed their turning point. The accident pilot and Mr. Fine corrected their course, but when they landed the accident pilot told Mr. Fine that he felt the instrument flight was successful. They flew together about 12 years ago and, at the time, he routinely noticed a slight tremor in the pilot's right hand. He remarked that the pilot would frequently miss buttons on his Garmin 530 when he attempted to use the unit.

Ray Myllala frequently flew with the pilot when he owned a Beechcraft Bonanza. He decided that the pilot was not equipped to fly the airplane and told him to sell it because he was going to kill himself. During the first week after he purchased the Bonanza, he lowered the hangar door onto the elevator. Approximately 3 weeks after the elevator was repaired he inadvertently lowered the hangar door onto the airplane rudder. He subsequently sold the Bonanza. He then purchased the accident airplane and started taking lessons from an instructor with Santa Monica Flyers. During instruction flights the instructor would commonly take over the flight controls to land the airplane. The flight school eventually decided to discontinue their flight lessons with the accident pilot because they "decided they couldn't do anything with him." The pilot began flying with another instructor who was unable to sign him off. He later found an instructor who signed him off after flying with him for 15 hours. Mr. Fine confronted the instructor who reported to him that the pilot "eventually had a good day and landed the airplane, so he signed him off."

A few years ago the pilot was involved in a car accident on Topenga Canyon. As a result, he was treated in intensive care for about 5 months and when he returned to the airport he was unable to hold his head up straight. He was frequently hunched over and was only capable of using about 10% of his right arm and hand. When driving, the pilot frequently used his left hand to pick up his right arm and place it on the gear shift.

Mr. Fine reported that the pilot had a total of three incidents in the airplane not including the accident flight. The first incident occurred in March 2015 during a landing attempt at Hawthorne Airport. The pilot landed hard and damaged the nose landing gear and propeller. The pilot's service center, Bill's Air Center, sent the engine out to be torn down as a result of the event.

The second incident occurred in July 2016 at Camarillo Airport during a landing attempt that resulted in damage to the nose landing gear. A mechanic at the pilot's service facility refused to make the repair, so another mechanic drove out to Camarillo and completed the repair on-site. The pilot then ferried the airplane back to Santa Monica Airport.

The most recent incident occurred about one month prior to the accident during a landing attempt at Santa Monica Airport. According to Mr. Fine, the pilot "came roaring down the runway" and landed long. The pilot brought the airplane to a complete stop in the airport's non-movement area.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest about one eighth of a nautical mile from VNY. The initial impact point (IIP) was identified by a broken wooden utility pole and multiple severed wires. The end of the debris path was marked by the main wreckage, which came to rest in fragments about 15 feet beyond the IIP. An odor of fuel was detected at the accident site, which was accompanied by a large fuel stain on the ground beneath the main wreckage. One wooden propeller blade remained attached to the propeller hub and the other blade was sheared at the propeller root.

COCKPIT/CABIN OBSERVATIONS

Master – OFF
Avionics – OFF
Pump – OFF
Strobe – OFF
Nav – OFF
Landing – OFF
Taxi – OFF
Wig Wag – OFF
Pitot – OFF
Ignition – OFF
Fuel selector – In a transition position between the left and right selector positions
Carburetor Heat – COLD
Throttle – CLOSED (full forward position)

Choke – OFF
Cabin – COLD

The left seat occupant's lap belt was cut by rescue personnel and the right and left shoulder harness retention cables were intentionally severed during the recovery process.

The pitot tube was free of obstructions.

AIRFRAME

The wreckage separated into fragments that were located between two buildings in a confined space that measured approximately 4 feet in width. As a result of the space restriction, the wreckage could not be examined until the postaccident examination, which took place on September 14, 2016. At this time, the wreckage fragments were arranged to facilitate a proper examination.

Postaccident Airframe Examination

Left Wing

The left wing was separated into fragments that were arranged to complete the shape of the wing. The wing spar fractured at the wing root. Left aileron control continuity was traced from the left aileron to the flight controls in the cockpit. The left aileron control tube was separated into three pieces that each displayed signatures consistent with overload failure. While the aileron push/pull tube was not recovered, the tube rod end threaded fittings each displayed signatures consistent with overload failure. Flap control continuity was observed from the flap motor to the airfoil, which had separated into two pieces that each failed in overload. The flap separated from the cockpit intermediate control tube at the rod end. The left wing fuel tank was breached and void of residual fuel.

The left main landing gear wheel and fairing separated from the landing gear strut. The cylinder block of the landing gear strut that normally attaches to the main landing gear wheel exhibited impact signatures consistent with overload separation.

The forward face of a box plate at the junction of the strut and nose landing gear tire displayed scraping and polishing.

Right Wing

The right wing was separated into multiple pieces, which were reconstructed for the exam. Right aileron flight control continuity was traced from the cockpit flight controls to the control surface, which remained intact. The control tube was separated into three pieces, which exhibited signatures consistent with overload failure. A residual section of control tube was connected to the aileron bellcrank that had separated from the aileron push/pull tube at the rod end. The push/pull tube rod end threaded studs failed in overload. Flap control continuity was confirmed from the flap motor in the cockpit to the airfoil, which broke about midspan into two pieces. The

flap control assembly failed at the flap hinge. The right wing fuel tank was breached and was void of fuel residue; however, the fuel strainer and fuel filter were free of debris.

Fuselage

The flight control assembly was located within the avionics bay, but was intact. Both flight sticks controls were joined by a cross member. The elevator control tube was traced from the flight controls to the fuselage between the seats, but separated from the mounting bracket lever. The intermediate elevator control tube was attached to the lever and traced to the aft fuselage, which separated from the empennage. The intermediate aileron control tubes were attached to the flight control assembly, but separated at the wing root in overload.

Continuity of the rudder assembly was traced from the rudder pedals to the aft fuselage, where the rudder cables had been cut by recovery personnel. Both the right and left seat occupant rudder pedal assemblies were bent forward into the avionics bay. The rudder pedal assemblies were connected through a center tube.

The flap actuator cylinder was separated from a portion of the actuator that measured approximately 1.5 inches. The manufacturer speculates this is consistent with a flap extension of 10 degrees, but plans to conduct a test at his facility to verify the actual flap position. The flap system was continuous from the flap motor to the right and left control arms at the wing roots.

The fuel selector valve was found in a transition positon between the right and left fuel tank positions. The unit was tested and subsequently disassembled. The left and right fuel lines were not obstructed. The selector valve rotated successfully to the LEFT, RIGHT, and OFF fuel tank detents. The airplane manufacture will test the flow rate of the selector valve at his facility. Further testing will be requested to find the fuel flow rate for the valve in a transition position between the right and left valve positions. The mixture control knob was found in the full rich position, and the pin rotated freely by hand to the lean stop and returned to the rich stop without any resistance.

Approximately 4 oz of fuel was drained from the gascolator bowl along with some debris. The gascolator screen displayed some debris.

Air evacuated through the boost pump outlet line and air was drawn through the fuel inlet hose when the fuel boost pump was tested with an 18 volt battery.

Two pitot ram air tubes were joined by a small red tube that was compressed inside the two tubes. According to the manufacturer, this design is part of their standard practice during airplane manufacturing. The manufacturer was told that joined pitot lines deteriorate overtime and, as a result, they should require the pitot tube to be inspected during annual inspections to minimize the potential for long term wear. The manufacturer agreed to include a pitot tube inspection requirement in their annual inspection guidance.

A maintenance work order dated November 16, 2015 showed that the service facility pounded and flattened the trim around the latch after they received a complaint from the pilot that the latch was "hard to close."

Empennage

The empennage assembly was in one piece, but was damaged during the accident. The rudder cables were attached to the base of the rudder and were traced to the forward portion of the empennage where the cables had been cut by recovery personnel. The rudder moved freely when actuated by the rudder cables.

The elevators were attached to a center control tube and the control surfaces moved up and down through the tube when actuated by hand.

A push/pull arm remained connected to the trim tab; however, the arm slid freely inside the flap motor unit, indicative of a break in the flap motor. Subsequent examination of the flap motor unit revealed that the jackscrew broke free from the threaded portion of the motor gears. The exposed jackscrew measured approximately 1.4 cm. According to the airplane manufacturer, the jackscrew setting may be indicative of a flap extension. The manufacturer plans to test the trim motor and jackscrew at his facility to determine the precise setting of the trim tab. An 18 volt battery was used to test the gear motor. The motor and its attached gear extension functioned normally, but the associated gears were seized as a result of the damaged jackscrew housing and did not move during the test.

According to a service facility work order, a trim tab for the rudder was fabricated and installed on January 28, 2016. The work was performed in response to a complaint that the airplane yawed to the right. The manufacturer reported that his company was not consulted before the trim tab was installed.

ENGINE

The engine examination notes are covered in a separate report.

EMERGENCY LOCATOR TRANSMITTER (ELT)

The ELT was manufactured by ACK, model number E-04.