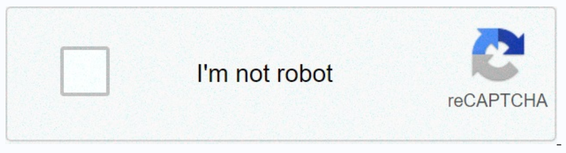

I'm not robot!

Lancair 235 flight manual

Lancair 235 specs. Lancair 235.

This section contains a review. Please note that statements made here are (mostly based on) a single person's opinion. Note This review is for the PAF version of this aircraft. The Lancair 235 is an aircraft I have looked forward to flying - in FG at least - for some time. The 200 kt plus speed would be useful in doing my cross- country flight training, and the rate of climb that would undoubtedly accompany the powerful engine would help in clearing the mountains. Take off was quite brisk, although I had problems keeping to the center line, and climb was established at about 1000 fpm from liftoff, it never had to dip below that. At height, with the g-indicator blackout that FG has implemented set to 3.5 for blackouts, I was able to do some hard turns left and right, without any problems, the aircraft is very stable, however seems 'wooden' in its handling, acceptably responsive, but roll is a little laggy, not what I would have expected. Apart from that the aircraft is very stable about all axes and easy to fly, again, surprising for me, maybe the FDM needs to be tweaked, maybe not. The panel is very sparsely populated, however if you look at the latest model in the Wiki the screenshots show a fairly comprehensive set up. I am not sure if version 2.8 aircraft work with the version 2.4 FG but it is worth a try. Not having time to fly back to the airport, I decided to land the aircraft on the grey ribbon roadway that appeared in front of me, and did without any problems. Handling was safe down to the limit, without stalling. (I did not test that, yet.) The pilot figure is also unusually detailed, at least in facial features, with a lanky, determined look on his face, as if he built the thing himself. Overall a nice aircraft but the FDM needs to be checked against reality and the newest model needs to be downloaded for better instrumentation. A note about the screenshots - due to an issues with the VGA driver some black shadows show up - no matter I think the shots give a good detail on the aircraft. Version Tested: Lancair-235_20110118.zip In FG 2.4 --Openflight (talk) 00:20, 18 February 2014 (UTC) Features Autopilot KAP 140 Fully operational GPS Garmin 196 -optional- and ZKV 500 KNS80 Fully operational -> HSI Options Smoke generator on both wing tips. Divers VOR 2 and ADF receiver -> RMI Speeds & limits Speeds in KIAS (Knots indicated airspeed) : airspeed indicated VSO (Vitesse de décrochage en configuration d'atterrissage) : TBN VS1 ( ) : TBN VMC (Vitesse minimale de contrôle) : TBN V1/V2 (vitesse de décision/sécurité) : TBN VR (Vitesse de rotation) : TBN VX (vitesse d'angle de montée optimale) : TBN VXse (VX avec un seul moteur) : TBN VY (Vitesse de taux de montée optimale) : TBN VLO (vitesse maxi en manoevre train sorti):TBN VA (vitesse maximale en manœuvre) : TBN VNO (Vitesse maximale en croisière) : TBN VNE (Vitesse à ne jamais dépasser) : TBN VLE (Vitesse maximale train sorti) : TBN VF (Vitesse maximale avec 1/2 volets) : TBN VF (Vitesse maximale volets sorti) : TBN Gallery Gallery 2 A close up of the Lancair in a right turn Landing Gear out at low level The useful tail camera view is good for analysing the flight 14 CFR Part 91: General AviationAccident occurred Saturday, April 14, 2012 in Hudson, KYProbable Cause Approval Date: 08/13/2013Aircraft: MANZITTO MICHAEL A MWLANCAIR 235, registration: N235MWInjuries: 1 Fatal.NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this aircraft accident report.About 2 months before the accident, the homebuilt experimental airplane began to experience electrical problems. This was first discovered when the landing gear hesitated before extending. To extend the landing gear during subsequent flights, the pilot shut off all nonessential electrical equipment in the airplane, extended the landing gear, and then turned the electrical equipment back on. On the morning of the accident, while on approach at the destination airport, the electrical system failed and the landing gear would not extend. The pilot reached behind his seat, "jiggled" the airplane's battery cables, and was able to restore electricity and extend the landing gear. He landed the airplane uneventfully and shut the airplane down.After shutdown, the airplane had to be "hand propped" to be restarted; however, the pilot could not adjust the electrically-controlled propeller to the proper pitch for takeoff. The pilot removed the battery from his airplane and returned to his home airport with another pilot. He charged two batteries and returned with the charged batteries to his airplane. The pilot installed one of the batteries in his airplane and stated that if he could get the airplane started, he would fly it back to his home airport with the landing gear down.The airplane started after three attempts, and the pilot taxied to the runway. A witness observed fuel exiting the right wingtip fuel vent during taxi, indicating that there was fuel in the main wing tanks. The pilot departed, and while he was en route, he transmitted that he was experiencing a problem and that he was going to land in a field. A witness observed the airplane at low altitude but did not hear any engine noise as the airplane passed him. The airplane then maneuvered around a barn and touched down in a level attitude in a harvested corn field. The airplane's landing gear collapsed, and the airplane nosed over.Examination of the airplane and engine revealed no evidence of any preimpact mechanical failure or malfunction; however, examination of the propeller indicated that the engine was not producing power, and the header tank, which supplied fuel to the engine, contained only 8 ounces of fuel. The inline fuel filter and fuel strainer contained only trace amounts of fuel.

Further examination revealed that the header tank received its fuel from the wing tanks via electrically-operated transfer pumps. Examination of a connector that connected the positive battery cable to the master relay revealed that the inside of the connector's collar, which had been soldered and crimped onto the battery cable, was moist and heavily corroded, and that not all of the battery cable's wire strands were in contact with the collar of the connector. Further examination revealed that the end of battery cable that had been retained by the connector's collar was also moist and exhibited significant corrosion, indicating that the connector had been exposed to a corrosive environment. Examination of the battery box revealed corrosion and electrolyte (sulfuric acid) residue, which indicated that a release of electrolyte from a previously-installed battery had occurred. Additionally, comparison of the position of the positive battery cable's run from the battery terminal to the master contactor revealed that the master contactor was mounted below the top of the battery and that no precautions had been taken to prevent liquid from running down the cable into the base of the connector.With a failure of the electrical wiring interconnect, the airplane's battery was unable to power the electrical system. Because the fuel transfer pumps were electrically powered, fuel was not transferred to the header tank to feed the engine, and a loss of engine power occurred. Additionally, without electrical power, the propeller could not be adjusted and the electrically-actuated landing gear could not be retracted to reduce drag and extend the airplane's glide. Further, because the wing flaps were electrically operated, they could not be extended during the landing, thus the airplane touched down at a higher speed (13 or more knots) than normal touchdown speed, which reduced the survivability of the accident when the airplane nosed over.The National Transportation Safety Board determines the probable cause(s) of this accident to be:The pilot's decision to operate the airplane with known electrical system problems, which resulted in the in-flight failure of the electrical wiring interconnect system, loss of electrical power, and subsequent fuel starvation and loss of engine power.HISTORY OF FLIGHTOn April 14, 2012, about 1330 central daylight time, an experimental, amateur-built Lancair 235, N235MW was substantially damaged during a forced landing near Hudson, Kentucky. The private pilot was fatally injured. Visual meteorological conditions prevailed and no flight plan was filed for the Title 14 Code of Federal Regulations Part 91 personal flight, which departed from Rough River State Park Airport (2I3), Falls of Rough, Kentucky, destined for Bowman Field Airport (LOU), Louisville, Kentucky.According to witnesses, approximately 2 months prior to the accident the pilot began to experience electrical issues with the airplane. This was first discovered by him when he went to extend the landing gear on one flight and the landing gear at first did not extend but after hesitating it then extended. This continued to occur every time he flew the airplane, so the pilot would shut off all non essential electrical equipment in the airplane before extending the landing gear and then turn the electrical equipment back on after the landing gear was extended.On the morning of the accident, the pilot flew from LOU to have breakfast with some fellow pilots. On approach to 2I3, he went to extend the landing gear but, the electrical system failed and it would not come down. He then reached behind his seat, jiggled the airplane's battery cables and was able to restore electricity and lower the landing gear. Later when it was time to depart for LOU, he had someone "hand prop" the airplane for him. After it started he could not get the propeller which was electrically controlled and actuated to come out of coarse pitch (low rpm, cruise setting), so that he could take off. He then shut down, removed the battery from his airplane, and returned to LOU with another pilot.Once back at LOU a friend lent him a battery charger.

The pilot of the accident airplane then charged up two batteries and rode back to 2I3 in the friend's airplane.The pilot of the accident airplane then installed one of the batteries in his airplane and stated that if he could get it started, he would fly it back to LOU with the landing gear down.

His plan, if the radios and electrical system did not work, was for him and his friend to return as a flight of two to LOU.His friend then advised him that if the airplane started but he did not get a positive indication on the "amp gauge" (ammeter) to "shut it down". The pilot then "blew him off".The pilot of the accident airplane tried three times to start the airplane before it finally started. He then waved and gave a "thumbs up" to his friend. After taxing to the runway the pilot stopped the airplane for 6 to 7 seconds and then took off. Prior to the takeoff as the airplane made a turn on the taxiway fuel was observed to come out of the right wingtip vent.His friend then took off, 3 to 4 minutes behind him, and when climbing through 1,700 feet above mean sea level, heard the pilot of the accident airplane ask over the radio if he was still on the frequency. His friend stated that he knew due to the accident pilot's regular phraseology that something was wrong and advised him that he was coming. They were talking on the Unicom frequency for 2I3 and the accident pilot was using a handheld radio rather than the aircraft radios.The accident pilot stated that he was 1 to 2 miles south of Breckinridge County Airport (I93), Hardinsburg, Kentucky and was going to land in a field. His friend responded “I’m coming as fast as I can”. The pilot of the accident airplane then stated “I’m going in hard”. His friend could hear the emergency locator transmitter transmitting. He then circled the area a few times but could not see the accident pilot or airplane, so he landed at I93 and called 911.According to a witness, just prior to the accident, he observed the airplane traveling southeast in a straight line. He could not hear any engine noise. It then disappeared behind a rise in the terrain and then reappeared. The airplane then climbed momentarily, turned right missing a barn, and then disappeared once again behind a rise in the terrain. Moments later the sound of impact was heard.PERSONNEL INFORMATIONAccording to Federal Aviation Administration (FAA) records, the pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent FAA third-class medical certificate was issued on July 18, 2011.According to pilot records, he had accrued approximately 484 hours of total flight experience.AIRCRAFT INFORMATIONThe accident aircraft was a single engine, propeller driven, low wing monoplane of composite construction.

It was assembled from a kit and was constructed of temperature cured prepreg E-glass skins over a high temperature honey-comb core.The aileron and elevators were controlled through push-pull tubes. The rudder control was via stainless steel cables.It was powered by a 4-cylinder, 118 horsepower, Lycoming O-235-L2C engine equipped with an Ellison EFS-3A throttle body fuel injection system, and a three bladed, MTV-7-F, constant speed, variable pitch propeller.Range was 869 nm. The airplane could cruise at 182 knots, and would stall at 61 knots in the clean configuration (wing flaps up), and would stall at 48 knots with the wing flaps fully extended. It could climb at 1,550 feet per minute. Ceiling was 20,000 feet. Takeoff distance was 1,250 feet and landing distance was 1,380 feet.According to FAA and aircraft maintenance records, the airplane's special airworthiness certificate was issued on February 18, 2006, and it was purchased by the pilot on February 28, 2008.The airplane's most recent conditional inspection was completed on May 11, 2011. At the time of the inspection; the airplane had accrued 238.42 total hours of operation, and the engine had accrued 432.52 hours of operation since major overhaul.METEOROLOGICAL INFORMATIONThe recorded weather at Godman Army Airfield (FTK), Fort Knox, Kentucky located approximately 23 nautical miles east of the accident site, at 1355, included: winds 180 degrees at 15 knots, 10 miles visibility, broken clouds at 8,500 feet, temperature 24 degrees C, dew point 11 degrees C, and an altimeter setting of 30.04 inches of mercury.WRECKAGE AND IMPACT INFORMATIONThe airplane after clearing trees that were approximately 30 feet high, struck the ground in a level attitude in a corn field where the corn had already been harvested. The landing gear collapsed and the airplane then traveled 63 feet on a 124 degree heading before nosing over, tumbling, and coming to rest.Examination of the accident site revealed that the majority of the airplane was co-located where the airplane came to rest. The fuselage had broken into three pieces, and both wings had separated from their mounting locations. Multiple lighter pieces of the airplane including the right aileron, left elevator balance weight, left landing gear door, and nose gear door were located along the ground scar that led from the initial impact location to the main wreckage. The canopy and other lighter portions of the airplane and its systems were spread throughout the cornfield.Examination of the cockpit revealed that the magneto switch was in the "BOTH" position, the landing gear handle was in the "DOWN" position, the split rocker master switch was in the "ON" position, and the avionics master switch was in the "ON" position. Both the fuel boost pump and fuel transfer switches were in the "OFF" position.The throttle was found in the full open position, and the mixture control was approximately 1 inch out from the full rich position. The primer was in and locked.Airframe and Flight Controls ExaminationExamination of the airframe and flight controls did not reveal any evidence of any preimpact failure or malfunction. All of the major components of the airframe were present at the accident site and control continuity was established from the ailerons, elevator, and rudder to the cockpit.Engine ExaminationExamination of the engine revealed no evidence of any preimpact malfunctions or failures.The engine was found to be lying nose low on its left side and had remained attached to the tubular engine mount. The No.1 cylinder exhaust pipe was impact damaged and the engine induction air box was crushed.The engine drive train was rotated by turning the propeller hub and continuity of the crankshaft to the rear gears, and to the valve train, was confirmed. Spark was produced from all 8 ignition leads, and compression and suction were observed from all 4 cylinders. Oil was present in the rocker boxes, and oil sump.The Ellison Fluid Systems throttle body injector and the engine driven fuel pump had remained attached to the engine. A small amount of fuel was observed in the engine driven fuel pump, the hose from the pump to the throttle body injector, and in the throttle body injector. The engine driven fuel pump produced air when actuated by hand. The engine driven fuel pump actuator plunger was felt to move as the engine crankshaft was rotated, and no debris was present in the throttle body fuel inlet screen.TESTS AND RESEARCHFuel and Fuel SystemReview of fueling records indicated that the airplane had last been refueled with 21.66 gallons of aviation gasoline at Capital City Airport (FFT), Frankfort, Kentucky on March 5, 2012. Witness statements also revealed that fuel was observed to come out of the right wing tip fuel vent during a turn on the taxiway at 2I3 indicating that fuel had been present in the wing tanks prior to the accident.The engine driven fuel pump received its fuel from an 11 gallon capacity header tank located behind the instrument panel. An inline fuel filter and fuel strainer were located upstream of the pump. The header tank was fed independently from either the left or right 33 gallon capacity wing tanks by electrically operated fuel pumps which received their electrical power from the main electrical bus. Each wing tank had a filter at its outlet and the fuel was pumped directly into the header tank. The left and right fuel transfer pumps were independent, pilot operated, and could be used to control roll trim.Examination of the fuel system revealed that the header tank contained about 8 ounces of fuel, and the inline filter and fuel strainer contained only trace amounts of fuel. Both wing tanks had been compromised however when the wings and fuselage were moved for examination a slight smell of fuel could be detected. All of the fuel caps were in the closed and locked position.Review of the Lancair 235 Pilot Operating Handbook (POH), revealed that takeoff should not occur with less than 8 gallons of fuel in the header tank since the engine was supplied fuel solely from the header tank.Wing FlapsThe wing flaps were electrically operated and received electrical power from the main electrical buss.

A linear actuator (a two way electric motor driving a jack screw) was located in the lower console. Attached to the actuator shaft was a limit switch assembly which contained limit switches for full up and full down. These switches were used to determine the extreme flap positions. Partial flaps were obtained by the pilot by simply timing the actuation of the switch. For example, a "count" of 5 would generally result in approach flaps.Examination of the wing flaps revealed that they were in the up position.Landing GearOperation of the landing gear was by a self contained hydraulic system driven by an electric motor which received its electrical power from the main electrical buss. The main landing gear was of a trailing arm type and was fully retractable.

In the fully extended position, the gear linkage was over-centered. In the retracted position the landing gear was held up by system pressure. Retracting the landing gear was accomplished by moving the electrically powered landing gear switch into the gear up position. This would initiate a pressure buildup by the hydraulic pump, unlock the over-center links and raise the landing gear, each leg of which had its own hydraulic strut with its own limit switches. Extending the landing gear was accomplished by moving the electrically powered landing gear switch into the gear down position. This would initiate the low pressure side of the hydraulic pump and this pressure would lower the landing gear.Examination of the landing gear revealed that it was in the down position.PropellerThe electrically controlled variable pitch propeller received its electrical power from the main electrical bus.

The pitch change mechanism was actuated by a threaded spindle which would move a fork axially. The spindle was turned by an electric motor.

Pitch change blocks moving in the slots of the fork connected the blade pitch change pins with the fork. This transferred the axial movement into a turning motion.The propeller control unit had two operating modes: "Automatic" and "Manual". A selector switch was installed that enabled the pilot to switch between the two modes. A dial selector was also installed that allowed the pilot to set the desired rpm when the propeller control unit was operating in the automatic mode. A green light would indicate low pitch position for takeoff. The normal operation mode was in automatic where the rpm was kept constant during flight. In case of an electrical failure, the propeller blades would remain at their present blade pitch angle.Examination of the propeller revealed that it had remained attached to the crankshaft flange. The spinner was fragmented and the propeller blades were impact damaged. Two of the three composite propeller blades were separated from the propeller hub at the blade roots. The third blade was broken mid span and was bent back but remained attached to the propeller hub.Examination of the propeller control unit revealed that it was in the "AUTO" position and the RPM dial selector was in the 2700 rpm (Takeoff, fine pitch) position.Electrical SystemThe accident airplane's electrical system consisted of an alternator, voltage regulator, and a battery. The alternator provided power to the main electrical buss and the battery. A separate avionics bus was also installed and was controlled by an avionics master switch.Control of the electrical system by the pilot was through the split master switch. One half was labeled "BAT" and the other half was labeled "ALT". Turning off the ALT side of the switch would take the alternator off line allowing the battery to be on-line without the alternator. Operation of the alternator without the battery on the line however, was not possible.The alternator would convert alternating current to direct current (DC) for charging the battery. Its DC voltage output was 14.2 to 14.8 volts. Field excitation of the alternator was provided by the battery. Examination of the alternator revealed that it was impact damaged and that when rotated by hand would exhibit binding. Testing revealed however that when connected to a test unit that it was functional. It would output approximately 14 volts.The voltage regulator would regulate the charging voltage that the alternator produced keeping it between 13.5 and 14.5 volts to recharge the battery and to protect the airplane's electrical components. Testing of the voltage regulator revealed that it was functional and that it would peak at 14 volts.The starter relay was used to relay power to the starter from the battery. Testing revealed that it was functional. It would close at 5 volts and open at 2 volts.The master relay was used to relay power from the battery to the electrical system. Examination revealed that the top of its case showed evidence of it having been exposed to electrolyte and that a connector from the positive battery cable was still attached to one of the terminals. Testing revealed that it was functional. It would close at 5 volts and open at 2 volts.Battery and Battery Box ExaminationThe battery which was normally secured inside a battery box in the aft fuselage had been ejected from the airplane's battery box during the impact sequence and was found lying on its side in the corn field. The battery was used for storage of electrical energy for starting the engine, powering the electrical system, and as an electrical equalizer, protecting the airplane from transient electrical charges.On-scene examination of the battery revealed indentations and holes in the plastic battery case with characteristics that appeared similar to chemical and soot stains. A short length of battery cable was still attached to the positive terminal by a battery connector.

Further on-scene examination revealed that the other end of the battery cable was missing its connector, and that the negative terminal on the battery was broken off.Examination of the battery box revealed that it was of composite construction, was discolored, and a significant amount of corrosion and electrolyte residue was present.Further examination of the battery revealed that the indentations and holes in the battery case which appeared to be chemical and soot stains were in actuality discolorations of the plastic from stress marks consistent with impact damage.No evidence of preimpact malfunction or failure was discovered, and internal examination revealed that the valves were all in place, were properly seated, and the area was dry with no indication of acid or gassing.Visual examination of the top lead within the battery revealed that the terminal straps were twisted and the positive terminal was bent. However, the straps and terminals were intact and functional with no breaks or shorts, other than the visible break of the negative terminal stud.Open Circuit Voltage (OCV) of the battery was measured and was found to be 10.8 volts (V). OCV measurements of the six individual cells (measured from the positive end of the battery) were: 1.989V, 1.963V, 0.931V, 1.983V, and 1.929V. The third cell, which had the lowest OCV (0.931V), had one of the holes through the case. This was consistent with the cell having been exposed to air, as oxygen ingress has the effect of discharging the negative electrode and lowering the cell voltage in valve regulated lead acid batteries, and the battery having been discharged during multiple start attempts without opportunity for recharging.Examination of the cell packs revealed that they were intact and that the electrolyte was still fully contained within the separator paper of the cell packs indicating that the corrosion and residue in the battery box was not from this battery and was from a previously installed one.Electrical Wiring Interconnect SystemExamination of the electrical wiring interconnect system revealed that the majority of the connectors in the airplane displayed no evidence of any preimpact failure or malfunction. However, during examination of the connector that was separated from the positive battery cable, and was still connected to the master relay, it was discovered that the inside of the connector's collar which had been originally soldered and crimped on to the battery cable, was moist, heavily corroded, and had only 12 of the battery cable's wire strands in contact with the collar of the connector.

Further examination revealed that the battery cable end which had been retained by the connector's collar was also moist, and exhibited significant corrosion. Additionally, comparison of the position of the positive battery cable's run from the battery terminal to the master contactor revealed that the master relay's mounting location placed it below the top of the battery and the cable was not of sufficient length to include a drip loop, which would prevent electrolyte and other liquids from running down the cable into the base of the connector, which was only covered with a loose fitting plastic sleeve.Fuel Transfer Pumps and Emergency ProceduresReview of the POH revealed that in order to transfer fuel to the header tank, electrical energy was required to operate the fuel transfer pumps.Electrical energy was also required to perform among others, the emergency procedures for:- "ENGINE FAILURE": Which required the fuel pump to be "ON", the transfer pumps to be "ON", the engine starter if time permitted, the wing flaps when on final to be "FULL".- "EMERGENCY DESCENT": Which required the Propeller to be set to "HIGH RPM", and the landing gear to be moved to the "DOWN" position.- "MAXIMUM GLIDE CONFIGURATION": Which required the landing gear to be moved to the "UP" position, the wing flaps to be moved to the "UP" position, and the propeller to be set to the "LOW RPM" position.- "LANDING EMERGENCIES" (Landing without engine power): Which required in addition to moving the wing flaps to the "AS REQD" position, required that a landing site be selected and determine whether the landing gear should be "UP" or "DOWN". For instance if the landing was to be made on water, a foamed runway, or "sod", the landing gear would "generally be best left up". If the terrain was harsh, the gear may well absorb energy and although resulting in substantial damage to the airplane may in that process afford some protection to the occupants and therefore be a preferable option.ADDITIONAL INFORMATIONAircraft Electrical SystemsAircraft electrical systems must be highly reliable and fault tolerant. Historically, electrical system failures often result from interconnection breakdowns. Significantly, environmental factors, especially corrosion have been identified as contributors to connector problems. Depending on the severity of the electrical failure the consequences could be various, ranging from isolated system or subsystem malfunctions and navigational problems, to failures having adverse effects on the aircraft's handling and performance.FAA Advisory Circular (AC) 43.13-1BAccording to FAA AC 43.13-1B (Acceptable Methods Techniques and Practices-Aircraft Inspection and Repair), the satisfactory performance of an aircraft is dependent upon the continued reliability of the electrical system. Damaged wiring or equipment in an aircraft, regardless of how minor it may appear to be, cannot be tolerated. Reliability of the system is proportional to the amount of maintenance received and the knowledge of those who perform such maintenance. It is, therefore, important that maintenance be accomplished using the best techniques and practices to minimize the possibility of failure.Equipment, electrical assemblies, and wiring installations should be inspected for damage, general condition, and proper functioning to ensure the continued satisfactory operation of the electrical system. Electrical systems should be adjusted, repaired, and overhauled, and electrical equipment and systems should be tested in accordance with the recommendations and procedures in the aircraft and/or component manufacturer’s maintenance instructions. Components of the electrical system that are damaged or defective should also be replaced with identical parts, with aircraft manufacturer’s approved equipment, or its equivalent to the original in operating characteristics, mechanical strength, and environmental specifications.The AC also advises in part to look for problems and check for:- Damaged, discolored, or overheated equipment, connections, wiring, and installations.- Poor electrical bonding (broken, disconnected or corroded bonding strap) and grounding, including evidence of corrosion.- Improper, broken, inadequately supported wiring and conduit, loose connections of terminals, and loose ferrules.- Poor mechanical or cold solder joints.FAA Aircraft Electrical Interconnect System Practices Job AidFAA's Aircraft Electrical Wiring Interconnect System (EWIS) Best Practices Job Aid also provides guidance regarding EWIS maintenance, advising that chemicals such as hydraulic fluid, battery electrolytes, fuel, corrosion inhibiting compounds, waste system chemicals, cleaning agents, deicing fluids, paint, and soft drinks can contribute to degradation of EWIS.
Interconnect systems in the vicinity of these chemicals should be inspected for damage or degradation. Recommended original equipment manufacturer cleaning instructions should be followed.Terminal lugs and splices are also susceptible to mechanical damage, corrosion, heat damage and chemical contamination and wires and EWIS hardware in the vicinity of all aircraft batteries should be inspected for corrosion and discoloration. Discolored wires should be inspected for serviceability.
Corroded wires and/or EWIS hardware should be replaced.Furthermore, worn environmental seals, loose connectors, excessive corrosion, missing seal plugs, missing dummy contacts, or lack of strain relief on connector grommets can compromise connector integrity and allow contamination to enter the connector, leading to corrosion or grommet degradation. Drip loops should be maintained when connectors are below the level of the harness and tight bends at connectors should be avoided or corrected. NTSB Identification: ERA12FA280 14 CFR Part 91: General AviationAccident occurred Saturday, April 14, 2012 in Hudson, KYAircraft: MANZITTO MICHAEL A MW LANCAIR 235, registration: N235MWInjuries: 1 Fatal.This is preliminary information, subject to change, and may contain errors. Any errors in this report will be corrected when the final report has been completed. NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this aircraft accident report.On April 14, 2012, about 1330 central daylight time, an experimental, amateur-built Lancair 235, N235MW was substantially damaged during a forced landing near Hudson, Kentucky.
The certificated private pilot was fatally injured. Visual meteorological conditions prevailed and no flight plan was filed for the Title 14 Code of Federal Regulations Part 91 personal flight, which departed from Rough River State Park Airport (2I3), Falls of Rough, Kentucky, destined for Bowman Field Airport (LOU), Louisville, Kentucky.According to a pilot who was a friend of the accident pilot, the pilot of the accident airplane flew from LOU to 2I3 the morning of the accident to have breakfast with some fellow pilots. He was having electrical issues, so he removed the battery from his airplane and returned to LOU with another pilot.Once back at LOU the pilot lent him a battery charger. The pilot of the accident airplane then charged up two batteries and rode back to 2I3 in his friend's airplane.The pilot of the accident airplane then installed one of the batteries in his airplane and stated that if he could get it started, he would fly it back to LOU with the landing gear down. His plan, if the radios and electrical system did not work, was for him and his friend to return as a flight of two to LOU.The pilot of the accident airplane tried three times to start the airplane before it finally started.
He then waved and gave a "thumbs up" to his friend. After taxing to the runway the pilot stopped the airplane for 6 to 7 seconds and then took off.His friend then took off, 3 to 4 minutes behind him, and when climbing through 1,700 feet above mean sea level, heard the pilot of the accident airplane ask over the radio if he was still on the frequency. His friend stated that he knew due to the accident pilot's regular phraseology that something was wrong and advised him that he was coming. They were talking on the Unicom frequency for 2I3 and the accident pilot was using a handheld radio rather than the aircraft radios.The accident pilot stated that he was 1 to 2 miles south of Breckinridge County Airport (I93), Hardinsburg, Kentucky and was going to land in a field. His friend responded “I’m coming as fast as I can”. The pilot of the accident airplane then stated “I’m going in hard”. His friend could hear the emergency locator transmitter transmitting. He then circled the area a few times but could not see the accident pilot or airplane, so he landed at I93 and called 911.According to a witness, just prior to the accident, he observed the airplane traveling southeast in a straight line. It then disappeared behind a rise in the terrain and then reappeared. The airplane then climbed about 100 feet, turned right missing a barn, and then disappeared once again behind a rise in the terrain. Moments later he heard the sound of an impact.Examination of the accident site revealed that the airplane came to rest in a corn field where the corn had already been harvested.
After striking the ground in a level attitude the airplane traveled approximately 63 feet before nosing over and coming to rest.Examination of the engine revealed no evidence of any preimpact malfunctions or anomalies.Examination of the electrical system revealed however, that the airplane's battery exhibited evidence of outgassing from the side and top of the case and the inside of the battery box exhibited chemical and soot staining.The battery, battery box, and portions of the airplane's electrical system were retained by the NTSB for further examination.
One man is dead after his single engine propeller Lancair airplane crashed on Saturday afternoon in a wooded area at the intersection of KY 690 and Percy Elliot Drive in Breckinridge County, Kentucky. The pilot is from Louisville, Ky. and is a member of the group at Bowman Field. His name is not being released at this time. Jordan Klunk, a friend of the pilot said that after having breakfast together near the airport at Rough River, his friend mentioned some electrical issues. He rode back with a friend to Louisville, recharged his battery, and then went back to get his plane at Rough River. He crashed shortly after taking off on his way home to Louisville.
"He put the battery in there and started up the airplane and everything seemed fine and we took off, probably I wanna say two or three minutes behind him," said Klunk. "He was trying to reach us on the frequency and as soon as I called him and let him know we were on frequency, he said he was putting his plane down in a field. [He] told us he was about two miles to the south of Breckinridge County airport." According to Klunk, the last thing he said was that he was going down hard. A plane crash in Breckinridge County has killed a man from the Louisville-area. The pilot's name has not been released, but investigators tell us he is from the Louisville area, and he was headed to Bowman Field. He was the only passenger in the plane, and he apparently was killed instantly. The single engine plane went down at about 2:30 Louisville time in a field near Hardinsburg. The Breckinridge Co. sheriff says it was one of three planes that had taken off from the Rough River State Park airport, about 20 miles away, headed for Louisville's Bowman Field. About a half-hour into the flight, two of the pilots notified authorities that the third was in trouble. "Those two pilots landed at the Hardinsbug airport to attempt to try to help him," said Breckinridge Co. Sheriff Todd Pate. "Shortly thereafter, we received information from a neighbor stating that they had seen the plane go down and that a hunter shortly after that located the wreckage." The plane went down on property belonging to Barry Elliott's family. Elliott is himself a former pilot. "My condolences to the family. I feel for the family. I sure hate it. It's tragic." The crash site was compact.
The plane appeared to have broken into pieces on impact. There was no visible sign that the plane had skidded a long distance. It will be up to the National Transportation Safety Board to determine the exact cause of this crash.
Investigators will arrive here early Sunday morning. "We intend to maintain of the scene until they get here, and they're investigation may take a couple of days, said Pate." The pilot was flying a Lancair. According to Lancair's website, it specializes in high-performance single engine plane kits. The plane can be purchased already assembled or it can be homebuilt. Designed by Lance Neibauer- founder of the United States Lancair aviation company (pronounced LANSE-air), the Lancair 235 is an easy-to-fly, two-seated light aircraft. In 1981, Neibauer founded his company as a producer of amateur-built airplane kits.
Neibauer first produced the Lancair 200 in December of 1984, after working earlier with Al Meyers to produce his Meyer 200. It was constructed with a 100 HP Continental O-200 engine. Soon, however, the 200 was exchanged with the Lancair 235 in 1985- in which was placed a stronger engine, namely, the 100- 150 HP Lycoming O-235. Thus, the later models were based upon the gradually faster engines each succeeding one was equipped with. In 2017, Lancair was sold and renamed Lancair International, LLC, now owned by Mark, and his currently 26-year-old son Conrad, Huffstutler who operate it as a private business in Uvalde, Texas. At the beginning of production to the late ‘90s, it was quite simple for experienced hands to build a Lancair 235 at home with a kit and was enjoyable for many amateur airplane architects. That being said, it is highly unsafe for anyone who can is unused to building airplanes to undertake this job alone. With an experienced helping hand, however, your dreams of becoming advanced someday can be realized! Not with this Lancair model, however, for production of the kits are discontinued and are seldom seen unfinished anymore. If you would like to build a Lancair from a kit, try the Lancair IV-PT, Evolution, Mako, Barracuda, 320, or 360. Some beautiful aspects of this cross-country monoplane are the side-by-side configuration of its two seats, the low, cantilevered wings, the bubble-canopied cockpit, and the roomy baggage area behind the seats. According to Wikipedia, at least 59 plane kits of this model were produced. Uses A non-commercial, amateur-built, touring aircraft, the Lancair 235 is the perfect choice for beginner aviators and those who appreciate the smooth-flying, compactness, and affordability of a lovely two-seater Lancair. Whether you fly alone or fly with a passenger, you are sure to feel a thrill that the only thing between you and space is the metal bird’s lightweight sides and window. Specifications Crew#: one Maximum # of Passengers: one passenger Engine: 1 × Lycoming O-235 Four-Cylinder, Air-Cooled, Four-Stroke 100- 115 HP Engine Or 1 x Lycoming O-290 125-140 HP Engine Length: 20 Feet, 0 Inches Height: 6 Feet, 1 Inch Wingspan: 23 Feet 6 Inches Empty Weight: 650 Pounds Fuel Capacity: 43 Gallons Maximum Gross Weight: 1,275 Pounds Airfoil: NASA NLF(1)-0215F Propellers: 2-bladed fixed pitch (some are 3-bladed, according to the constructor’s wishes.) Performance Maximum speed: 160 Knots (180 MPH) Cruise speed: 140 Knots (160 MPH) Stall speed: 55 Knots (63 MPH) Never exceed speed: 235 Knots (270 MPH) Service Ceiling: 20,000 Feet Rate of climb: 1,300 Feet/Minute Range: 1,000 Miles g limits: +9/-4.5 G ultimate load Beautiful Features of the Lancair 235 Retractable Undercarriage Three-Wheel Landing Gear Two Seats 8 Cubit Feet Baggage Hold Behind Seats Single Piston-Engined Composite Fiberglass Wings and Fuselage with Nomex Honeycomb Forward-Opening Bubble Canopy Sleek, Streamlined Design High wing Configuration See also: Lancair Plane Types and Models [2021]: A Complete Guide Pricing Guide For Lancair 235s Depending on whether you decide to purchase an unfinished kit plane or an already built model, the prices will be different. Base prices for a kit were around $20,000 in 1988- which, by the way, are now out of production because of the modern models that have replaced the 235. Used, finished Lancair 235 models are still being sold today and can be purchased from around $50,000 to $70,000. Usually, they are rare to find, and I highly expect the listings below to be sold quickly. Performance and Handling Handling a Lancair 235 differs from plane to plane, as they are built to suit each amateur builder’s whims. Generally, their avionics are simple to understand, and flying can be simple for either beginner or expert. However, according to the AOPA, “Lancairs make up just over 3% of the amateur-built (AB) fleet yet have over 10% of the fatal AB accidents. Keep in mind, however, that they also tend to fly significantly more than the typical AB local flights. These are cross-country machines.” That being said, with an eager, willing-to-learn amateur pilot, or an experienced and level-headed aviator, this craft can be flown both safely and very fast. As the slogan once was at the peak of the Lancair kit line production,” You can get into a new Lancair, the Lamborghini of the skies, for far, far less than a slower aircraft.” A couple of things to keep in mind while handling your Lancair 235: Loss of control can happen easily when the aircraft stalls or falls into a spin. These planes are “experimental,” which means the avionics and handling are designed and decided upon by whomever it was who built each one. Some were very experienced and good at building, resulting in their aircraft having fewer instances of accidents due to poor construction. However, some were not. Keeping this in mind, be sure to thoroughly have your plane gone over by an expert (or examine it yourself if you are an expert) to find faulty details which may be detrimental to both plane and occupants. Factory-built aircraft are all required to be FAA certified for compliance, and kit planes are not- the difference results in a great cost deduction for kit planes, which are less dependable on the whole. Weather can adversely affect your 235, so make sure to fly when the weather is right, and a storm is not on the horizon. Below is a lovely video of a pilot taking off, flying, and landing his wonderful Lancair 235. Maintenance According to the official Lancair website, many of the parts of your personal Lancair craft should be checked before each takeoff.
These include the fluid reservoirs, brakes, tires, landing gear, flight controls, fittings, lines, and anything that you can see. Quoting them, they write, saying, “Lancair’s professional flight engineer… says, ‘If it’s on the aircraft and visible, it needs to be checked before flight.'” Make a good habit of giving your 235 the once-over before embarking on it. It may save your life and the plane’s life as well. A thorough wash-down and wax should also be given the 235 every so often- depending upon how dirty your plane gets and how long the wax you use holds- to keep the luster and beautiful paint looking its best. Lancair also suggests making a checklist for regular maintenance and always sticking to that list. It will make you sleep better at night just knowing that you have written and kept a log of taking care of your plane and that it will safely carry you and your loved ones in it for a long while. Make sure you get the original FAA certificates (Airworthiness Certificate and Operating Limitations) from whomever you are purchasing this aircraft from, for it may be very hard to get a duplicate issued, and without them, your 235 is not airworthy. All Lancair 235s are classified as Experimental-Amateur Built (E-AB) aircraft. Also, ask for all builders’ operating, maintenance, and construction manuals the seller has regarding the aircraft you are purchasing.
Modifications and Upgrades Each designer no doubt put their own touches in or on their Lancair 235 whilst building it, and some of those modifications can be readily seen in some of the used 235s for sale. One upgrade that could be purchased at the time of building by the company was the Lycoming O-290 125-140 HP Engine- an advancement to the former engine capable of 110-115 HP. Common Problems Many of the common problems lie in the lightness and lack of sturdiness of this cross-country touring craft, and also issues with landing. As stated below in the statement made by a veteran pilot, even experienced aviators can have difficulty landing this light plane. “Chris: Lancair used to teach this by having students fly down the length of the runway at 6” in the landing configuration with minimum power. Another problem I’ve observed is starting to round out too early and bleeding off speed too early. Jay: To sum up this long discussion, in my opinion, the Lancair 2- and 3- series airplanes are different from most light airplanes. Landings, in particular, demand a skill set that many first-time (and non-current) Lancair pilots do not possess. Gusts and crosswinds can make it difficult for even an experienced pilot to make good landings. Again, in my opinion, flying the Lancair 2- and 3-series should be treated like flying a military airplane, training before the first flight, and regular currency. If a pilot is going to spend the money to own one he should be willing to spend the money to get training and fly fairly regularly.” -Lancair Owners and Builders Organization, Inc.
Insurance Options Aviation Insurance Resources has affordable insurance options, as does Ladd Gardner Aviation Insurance and Gallagher Aircraft Insurance. Since 2019, 2007, and 1927(amazingly!), respectively, each of these firms is legitimate and trustworthy, though I would recommend Gallagher above them all. And, for that matter, so does the Lancair Owners and Builders Organization (LOBO). Resale Value For resale, you can probably get a good price out of your 235 if it is in good condition and airworthy. Depending upon location, condition, and appearance, you should probably get around to what the other good 235s are selling for. Check out sold listings on the online marketplaces from which you can buy aircraft. Owner Reviews Most people love their 235s and rarely will give them up. Nevertheless, because of their lightweight frame and small size, many will choose a more dependable aircraft that will withstand crashes much more safely. Here are a few owners’ reviews- some positive and some negative. “I owned one from 1998 until 2001. Pros Cruised at 172kts at 9gph Fast, agile, responsive Fully aerobatic – Snap rolls, barrel rolls, loops, and a few others. +7g/-3g (non sustained negative due to no inverted fuel or oil) Mine had an O-290-D2 that was STC’d for car gas ~1,000fpm climb w/ 2 people and fuel. Overhead canopy – AWESOME view Cons Electric gear without a mechanical or blow-down option Castering nose gear can be problematic Super clean airplane, so descents need to be planned way ahead Negative faired (reflexed) flaps for cruise Only a 2 place Mooney donut mains – (Can you say “boing, boing”?) Miss a greased landing, and it has a propensity to bounce. Best way to land it is nose high, pushing a little bit of power, and assertive corrections with rudder (had good rudder authority, even at slow speed).
Sloppy, mechanical, friction-based trim slider – In bumpy air, the trim could work its way out.
Overhead canopy – AWESOME roasting oven in the heat. Not a ton of headroom – At 6’2”, 185lbs, I had to pull the original seat lining and have new ones made that were 1/5 as thick so I could get my noggin in the airplane.” -Reddit Commenter “I’ve got maybe 10 hours in the 235. Awesome airplane. It’s a lot to handle if you have no experience flying faster than 100 knots in the pattern.” -Reddit Commenter “Bill: This paragraph contains what I believe to be one of the most important and useful pieces of information that a new Lancair pilot needs. The geometry of the airplane is simply different from any other civilian airplane with regard to eye position in the fuselage. In a Cessna 182, for example, the pilot’s eye is about 25% back from the nose and considerably higher than the top of the cowling. A fairly nose-high attitude can be held without compromising over-the-nose visibility. The 235/320/360 airframes have the pilot’s eye at the 50% point and, due to the semi-reclining posture, are just a few inches above the cowling. Even a “normal” flare attitude compromises the pilot’s over-the-nose visibility of the runway. Visibility can likewise be compromised when rotating for takeoff, especially with early rotation, such as with a soft-field takeoff. I always teach that the pilot needs to consciously redirect his vision to the left of the nose before rotation and before flare. I suspect that several of the landing accidents that I have reviewed might have been avoided with this technique.” -Lancair Owners and Builders Organization, Inc. Similar Aircraft BRISTELL – B23 The Czech-produced Bristell B23 is also low-winged, has a 3-bladed propeller as is found in some 235s, is formed with three landing wheels, is equipped with autopilot ability, steerable nose wheel, its cockpit canopy opens upward toward the nose, and- unlike the 235- is VFR night certified. It is a lovely model and has pleased many owners around the world. Aerospool – WT9 Dynamic LSA Designed and produced in Slovakia, Aerospool’s lovely low-wing light sport plane combines safety with fast speeds and glamourous aesthetic detailing. Some extra benefits of the WT9 Dynamic which are not found in the Lancair 2354 are its low noise emission, emergency parachute system, and low operating costs. Diamond – DA20 C1 Eclipse According to GlobalAir, “The C1 can climb at impressive speeds of 1,000 fpm from 1,000 feet MSL, 800 fpm from 3,500 feet MSL, and 500 fpm from 5,000 feet MSL.” It’s a beautiful sport aircraft similar to the Lancair 235 in its 2-bladed fixed-pitch prop, steerable nose wheel, three-wheel landing gear, bubble canopy, low wing configuration, and two-occupant seating.
It is a variant of the Diamond DA20 Katana. Clubs You Can Join A few good Lancair clubs are available, but as the 235 is out of production, it may be difficult or impossible to find an online club revolving around 235s alone. Here are the ones I recommend and am sure you will enjoy them! FAQs Answer: At top speed, the 235 can reach 186 safely, and in some instances, all the way up to 200- which is generally not recommended. Answer: No. The Lancair 235 is not aerobatic. It has not even been rated as an aircraft capable of spins. This is an experimental kit plane and should not be relied upon for any unusual or strenuous flying. Answer: Depending upon the year, condition of the airplane, and how much the seller is asking for it, a Lancair 235 can generally be purchased for a reasonable price- between $40,000 to $70,000. If there is anything else you may require as a Lancair pilot and owner, you may find all the official advice and resources you need on this page of the LOBO website. Lancair 235s are wonderful little high-performance planes and, in the right, skillful hands, will bring the owner much joy! If your passion is collecting many experimental aircraft or owning one alone, I am sure you would love to check this little beauty out. Be careful, and may only fair winds blow upon your airship and bring you safely down. Recommended Reads: