[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2013-0154; Special Conditions No. 25-484-SC]

Special Conditions: Learjet Inc., Model LJ-200-1A10 Airplane; Use of Automatic Power Reserve (APR), an Automatic Takeoff Thrust Control System (ATTCS), for Go-Around Performance Credit

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Learjet Model LJ-200-1A10 airplane. This airplane will have novel or unusual design features associated with utilizing go-around performance credit when using an automatic takeoff thrust control system. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: The effective date of these special conditions is February 13, 2013. We must receive your comments by **[insert date 45 days after Federal Register publication].**

ADDRESSES: Send comments identified by docket number FAA-2013-0154 using any of the following methods:

- Federal eRegulations Portal: Go to http://www.regulations.gov/ and follow the online instructions for sending your comments electronically.

- Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, D.C., 20590-0001.
- Hand Delivery or Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, D.C., between 8 a.m. and 5 p.m., Monday through Friday, except federal holidays.
- Fax: Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to http://www.regulations.gov/, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at http://DocketsInfo.dot.gov/.

Docket: Background documents or comments received may be read at http://www.regulations.gov/ at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, D.C., between 9 a.m. and 5 p.m., Monday through Friday, except federal holidays.

FOR FURTHER INFORMATION CONTACT: Doug Bryant, FAA, Propulsion/Mechanical Systems, ANM-112, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind

Avenue SW., Renton, Washington, 98057-3356; telephone 425-227-2384; facsimile 425-227-1320.

SUPPLEMENTARY INFORMATION:

The FAA has determined that notice of, and opportunity for prior public comment on, these special conditions are impracticable because these procedures would significantly delay issuance of the design approval and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive on or before the closing date for comments. We may change these special conditions based on the comments we receive.

Background

On February 9, 2009, Learjet Inc. applied for a type certificate for their new Model LJ-200-1A10 airplane (hereafter referred to as the "Model LJ-200"). The Model LJ-200 is a business class aircraft powered by two high-bypass turbine engines with an estimated maximum takeoff weight of 35,550 pounds and an interior configuration for up to 10 passengers.

The Model LJ-200 includes an automatic takeoff thrust control system (ATTCS) described as an automatic power reserve (APR) system. Learjet has requested approval to use

the APR as the performance level in showing compliance with the approach climb requirements of Title 14, Code of Federal Regulations (14 CFR) 25.121(d). Part 25 appendix I limits the application of performance credit for ATTCS to takeoff only. Since the airworthiness regulations do not contain appropriate safety standards for approach climb performance using ATTCS, special conditions are required to ensure a level of safety equivalent to that established in the regulations.

Type Certification Basis

Under the provisions of § 21.17, Learjet Inc. must show that the Model LJ-200 meets the applicable provisions of part 25, as amended by Amendments 25-1 through 25-127 thereto, and part 26, as amended by Amendment 26-1 through 26-2 thereto.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the Model LJ-200 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the Model LJ-200 must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36, and the FAA must issue a finding of regulatory adequacy under § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The Model LJ-200 will incorporate the following novel or unusual design features: An automatic takeoff thrust control system (ATTCS) described as an automatic power reserve (APR) system that is available at all times without any additional action from the pilot. This applies during takeoff and go-around flight operations. The aircraft performance data is based on the availability of the uptrim power during takeoff and approach climb. This results in a novel or unusual design feature for which the applicable airworthiness regulations do not contain adequate or appropriate safety standards. Therefore, special conditions are required that provide the level of safety equivalent to that established by the regulations.

Discussion

Learjet Inc. is proposing to use the APR function of the Model LJ-200 during go-around and is requesting approach climb performance credit for the use of the additional power provided by the APR uptrim. The Model LJ-200 powerplant control system comprises a full authority digital electronic control (FADEC) for the Pratt & Whitney Canada Model PW307B engine. The engine FADEC system includes the APR feature. The configuration provides for APR activation during go-around.

The APR system is available at all times without any additional action from the pilot. This applies during takeoff and go-around flight operations. The aircraft performance data is based on the availability of the uptrim power during takeoff and approach climb.

The part 25 standards for ATTCS, contained in § 25.904 and appendix I to part 25 specifically restrict performance credit for ATTCS to takeoff only. Expanding the scope of the standards to include other phases of flight, including go-around, was considered at the time the standards were issued. However, flightcrew workload issues in the event of an engine failure during a critical point in the approach, landing, or go-around operations precluded further consideration.

The ATTCS incorporated on the Model LJ-200 allows the pilot to use the same power setting procedure during a go-around regardless of whether or not an engine fails. Since the ATTCS is always armed, it will function automatically following an engine failure and advance the remaining engine to the APR power level. This satisfactorily addresses the flightcrew workload issues that were a concern when the ATTCS standards were originally promulgated.

Since the airworthiness regulations do not contain appropriate safety standards to allow approach climb performance credit for ATTCS, special conditions are required to ensure a level of safety equivalent to that established in the regulations. The definition of a critical time interval for the approach climb case, during which time it must be extremely improbable to violate a flight path based on the § 25.121(d) gradient requirement, is of primary importance. In the event of a simultaneous failure of an engine and the APR function, falling below the minimum flight path defined by the 2.5 degree approach, decision height, and climb gradient required by § 25.121(d) must be shown to be an extremely improbable event during this critical time interval. The § 25.121(d) gradient requirement implies a minimum one-engine-inoperative flight path capability with the airplane in the approach configuration. The engine may have been

inoperative before initiating the go-around, or it may become inoperative during the go-around. The definition of the critical time interval must consider both possibilities.

For approval to use the power provided by the ATTCS to determine the approach climb performance limitations, the Model LJ-200 must comply with the requirements of § 25.904 and appendix I to part 25, including the following special conditions pertaining to the go-around phase of flight.

Applicability

As discussed above, these special conditions are applicable to the Model LJ-200-1A10. Should Learjet Inc. apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, these special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on one model of airplanes. It is not a rule of general applicability.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Learjet Model LJ-200-1A10 airplanes.

1. General. An automatic takeoff thrust control system (ATTCS) is defined as the entire automatic system, including all devices, both mechanical and electrical, that sense engine failure, transmit signals, actuate fuel controls or power levers, or increase engine power by other means on operating engines to achieve scheduled thrust or power increases and furnish flight deck information on system operation.

2. ATTCS. The engine power control system that automatically resets the power or thrust on the operating engine (following engine failure during the approach for landing) must comply with the following requirements stated in paragraphs 2a, 2b, and 2c:

a. Performance and System Reliability Requirements. The probability analysis must include consideration of ATTCS failure occurring after the time at which the flightcrew last verifies that the ATTCS is in a condition to operate until the beginning of the critical time interval.

b. Thrust or Power Setting.

(1) The initial thrust or power setting on each engine at the beginning of the takeoff roll or go-around may not be less than any of the following:

(i) That required to permit normal operation of all safety-related systems and equipment dependent upon engine thrust or power lever position; or

(ii) That shown to be free of hazardous engine response characteristics and not to result in any unsafe aircraft operating or handling characteristics when thrust or power is increased from the initial takeoff or go-around thrust or power to the maximum approved takeoff thrust or power.

(2) For approval of an ATTCS system for go-around, the thrust or power setting procedure for the operating engine(s) must be the same for go-arounds initiated with all engines operating as for go-arounds initiated with one-engine-inoperative.

c. Powerplant Controls. In addition to the requirements of § 25.1141, no single failure or malfunction, or probable combination thereof, of the ATTCS, including associated systems, may cause the failure of any powerplant function necessary for safety. The ATTCS must be designed to:

(1) Apply thrust or power on the operating engine(s), following any one engine failure during takeoff or go-around, to achieve the maximum approved takeoff thrust or power without exceeding engine operating limits; and

(2) Provide a means to verify to the flightcrew before takeoff and before beginning an approach for landing that the ATTCS is in a condition to operate.

3. Critical Time Interval. (Refer to figure 1 and figure 2 below.) The definition of the critical time interval in part 25 appendix I25.2(b) shall be expanded to include the following:

a. When conducting an approach for landing using ATTCS, the critical time interval is defined as follows:

(1) The critical time interval begins at point A on a 2.5 degree approach glide path. (Point A is the point on that glide path from which, assuming a simultaneous engine and ATTCS failure, the resulting approach climb flight path intersects, at point B, a flight path originating at a later point on the same approach path corresponding to the part 25 one-engine-inoperative approach climb gradient.) The period of time, time interval AB, must be no shorter than the time in figure 2, I25.2(b) time interval FG. Figure 2 is reproduced from appendix I and includes a change that identifies the time interval FG.

(2) The critical time interval ends at point D on a minimum performance, all-engines-operating go-around flight path from which, assuming a simultaneous engine and ATTCS failure, the resulting minimum approach climb flight path intersects the flight path (point E) corresponding to the 14 CFR part 25 minimum one-engine-inoperative approach climb gradient represented in figure 1 as the engine failed, ATTCS operating flight path.

The all-engines-operating go-around flight path and the 14 CFR part 25 one-engine-inoperative approach climb gradient flight path (engine failed, ATTCS operating flight path in figure 1) originate from a common point, point C, on a 2.5 degree approach path. The period of time, time interval DE, from the point of simultaneous engine and ATTCS failure, point D, to the intersection of these flight paths, point E, must be no shorter than the corresponding time in figure 2, I25.2(b) interval FG.

b. The critical time interval must be determined at the altitude resulting in the longest critical time interval for which one-engine-inoperative approach climb performance data are presented in the airplane flight manual.

c. The critical time interval is illustrated in figure 1.

Figure 1. Go-around ATTCS

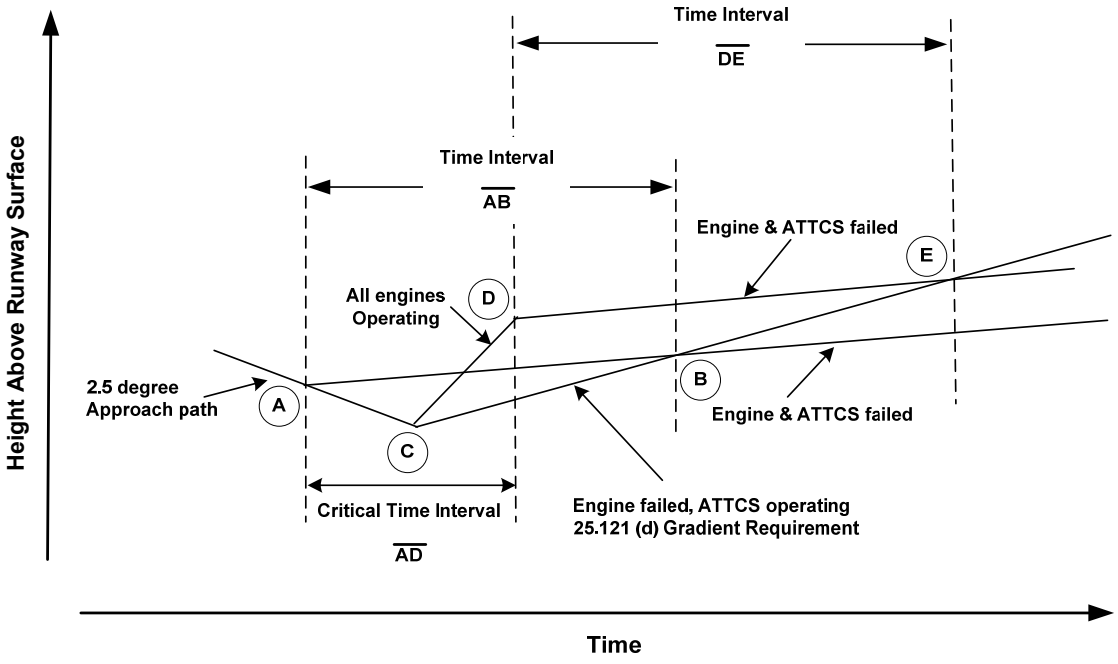
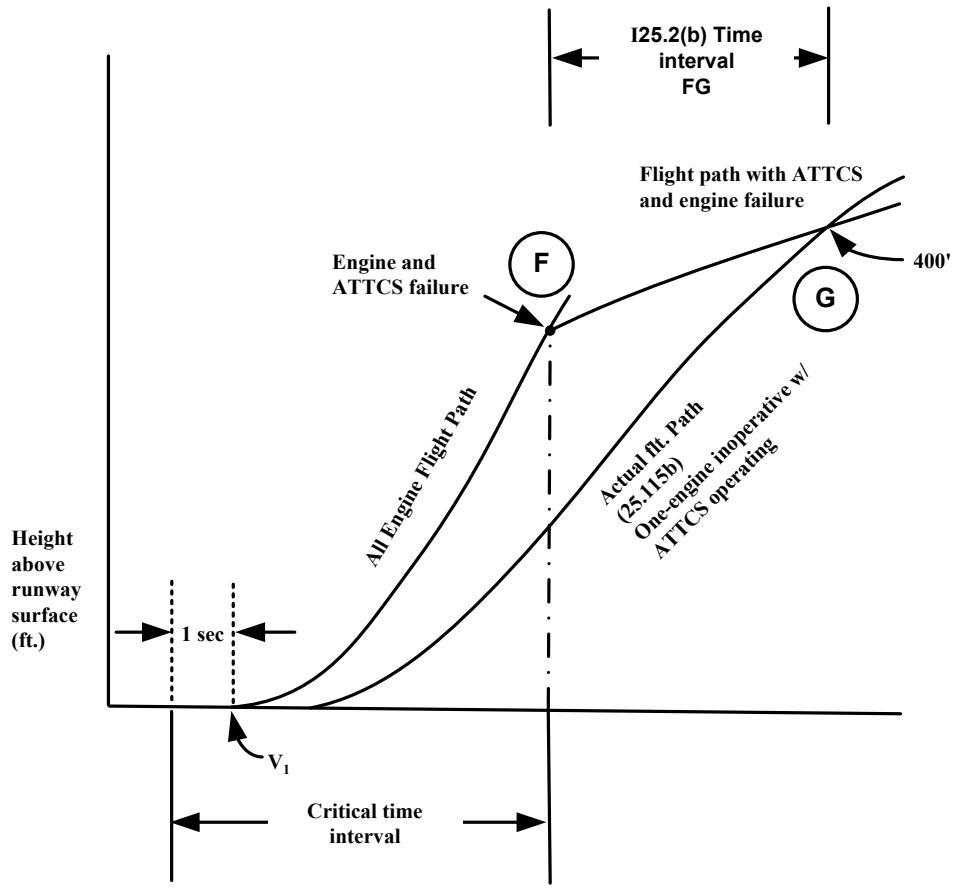


Figure 2. Appendix I25.2(b), "Critical Time Interval" Illustration (ATTCS takeoff)



Note: Figure 2 is included for reference and clarity to show time interval FG. It has not been included in previous special conditions on the same subject and does not include any new requirements. It does not change the meaning or intent of the special conditions.

Issued in Renton, Washington, on February 13, 2013.

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service

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