U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
National Policy

NOTICE N 8000.331

Effective Date:
11/2/06
Cancellation Date:
11/2/07

SUBJ: Airplanes Equipped with Retractable Landing Gear, Flaps, and FADEC Meet the Definition of a Complex Airplane

1. PURPOSE. The Federal Aviation Administration (FAA) has determined that airplanes equipped with retractable landing gear, flaps, and a full authority digital engine control (FADEC) meet the definition of being a complex airplane and may be used for commercial pilot and flight instructor certification.

2. DISTRIBUTION. We will distribute this notice to the division level in the Flight Standards Service in Washington headquarters, including the Regulatory Standards Division at the Mike Monroney Aeronautical Center; to the branch level in the regional Flight Standards divisions; and to all Flight Standards District Offices. Inspectors can access this notice through the Flight Standards Information Management System (FSIMS) at http://fsims.avr.faa.gov. Operators may find this information on the FAA Web site at: http://www.faa.gov/library/manuals/examiners_inspectors/8000/.

3. BACKGROUND.

a. Some training providers have requested to use airplanes equipped with a FADEC system in their commercial pilot certification courses. We have received several inquires about whether these kinds of airplanes may be used for the airplane single-engine and multiengine ratings for commercial pilot certification or for flight instructor certification that require the use of complex airplanes. To date, the FAA is only aware of the Diamond Aircraft company's DA42 that would qualify as the kind of airplane that is equipped with a retractable landing gear, flaps, and FADEC, and would meet the requirements of being a complex airplane. Any questions about the other possible makes and models of airplanes that would qualify as being similarly equipped and be considered a complex airplane should be directed to the FAA's Certification and General Aviation Operations Branch, AFS-810.

b. FADEC is a system consisting of a digital computer (described as an electronic engine control (EEC) or electronic control unit (ECU) and its related accessories) that controls an airplane's engine and propeller.

c. FADEC is considered an essential part of the engine and propeller control. A complete failure of the FADEC may cause the complete loss of engine thrust. For redundancy reasons, FADEC incorporates two separate and identical digital channels. Each channel may provide all engine and propeller functions without restrictions. FADEC may be powered by the airplane's electrical system, and in most modern airplanes it uses power from a separate generator connected to the engine. FADEC systems are employed by almost all current generation turbine engines and increasingly in the newer piston engines.

d. The Commercial Pilot Practical Test Standards for Airplane, FAA-S-8081-12B, specifically requires that the airplane used be either a complex single-engine airplane or complex multiengine airplane. This is per Title 14 of the Code of Federal Regulations (14 CFR) part 61, § 61.123(e) and (g), § 61.129(a)(3)(ii) and (b)(3)(ii), and part 141, appendix D, paragraph 4(b)(1)(ii) and (2)(ii).

e. The Flight Instructor Practical Test Standards for Airplane, FAA-S-8081-6B, specifically requires that the airplane used be either a complex single-engine airplane or complex multiengine airplane. This is per part 61, § 61.183(g) and (h)(1) and part 141, appendix F, paragraph 4(c)(1) and (2).

4. GUIDANCE.

a. This notice provides a determination that airplanes equipped with a retractable landing gear, flaps, and FADEC meet the definition of being a complex airplane. A FADEC-equipped airplane with a retractable landing gear and flaps may be used for the airplane single-engine and multiengine land ratings at the commercial pilot certification and flight instructor certification. A FADEC-equipped airplane with flaps and floats may be used for the airplane single-engine and multiengine sea ratings at the commercial pilot certification and flight instructor certification.

b. To parallel the information in this notice, we will revise FAA-S-8081-6B and FAA-S-8081-12B; FAA Order 8700.1, General Aviation Operations Inspector's Handbook, in FSIMS; and FAA Order 8710.3, Designated Pilot and Flight Engineer Examiners' Handbook. See Appendices 1, 2, and 3 for these revisions.

5. DISPOSITION. We will permanently incorporate the information in this notice in FSIMS before this notice expires. We will also incorporate the information in this notice into FAA-S-8081-12B, FAA-S-8081-6B, and FAA Order 8710.3. Questions concerning this notice should be directed to AFS-810 at (202) 267-8212.

ORIGINAL SIGNED BY
Carol Giles (for)

James J. Ballough
Director, Flight Standards Service

APPENDIX 1. REVISIONS TO THE COMMERCIAL PILOT AND THE FLIGHT INSTRUCTOR PRACTICAL TEST STANDARDS FOR AIRPLANES

The following practical test standards are revised as noted below.

a. Commercial Pilot Practical Test Standards for Airplane, FAA-S-8081-12B, the paragraph within the introduction titled Aircraft and Equipment Required for the Practical Test on page 7 is revised to read as follows:

> 4. be a complex airplane furnished by the applicant, unless the applicant currently holds a commercial pilot certificate with a single-engine or multiengine class rating, as appropriate, for the performance of takeoffs, landings, and appropriate emergency procedures. A complex landplane is one having a retractable landing gear, flaps, and controllable propeller. A complex seaplane is one having flaps, floats, and a controllable propeller. Airplanes equipped with a full authority digital engine control (FADEC) system are considered to have a controllable propeller.

b. Flight Instructor Practical Test Standards for Airplane, FAA-S-8081-6B, the paragraph within the introduction titled Aircraft and Equipment Required for the Practical Test on pages 8 and 9 is revised to read as follows:

> 3. be capable of performing all appropriate TASKs for the flight instructor rating sought and have no operating limitations, which prohibit the performance of those TASKs. A complex landplane is one having a retractable landing gear, flaps, and controllable propeller. A complex seaplane is one having flaps, floats, and a controllable propeller. Airplanes that are equipped with a full authority digital engine control (FADEC) system are considered to have a controllable propeller.

APPENDIX 2. REVISION TO FAA ORDER 8700.1, VOLUME 2, CHAPTER 6

Revise FAA Order 8700.1, General Aviation Operations Inspector's Handbook, Volume 2, Chapter 6, Conduct a Commercial Pilot Certification Including Additional Category/Class Ratings, section 1 by adding a new paragraph 7 on page 6-3:

> **7. COMPLEX AIRPLANE REQUIREMENTS.** A complex airplane for the airplane single-engine land or airplane multiengine land rating is one that has a retractable landing gear, flaps, and controllable propeller. A complex airplane for the airplane single-engine sea or airplane multiengine sea rating is one having flaps, floats, and a controllable propeller. A controllable propeller may be manually controlled by the pilot or automatically controlled by a full authority digital engine control (FADEC) system.

APPENDIX 3. REVISION TO FAA ORDER 8710.3E, CHAPTER 10

Revise FAA Order 8710.3E, Designated Pilot and Flight Engineer Examiners' Handbook, Chapter 10, Conduct a Commercial Pilot Certification, Including Additional Category/Class Ratings at the Commercial Pilot Certification Level, section 1 by adding a new paragraph 6 on page 10-3:

> **6. COMPLEX AIRPLANE REQUIREMENTS.** A complex airplane for the airplane single-engine land or airplane multiengine land rating is one that has a retractable landing gear, flaps, and controllable propeller. A complex airplane for the airplane single-engine sea or airplane multiengine sea rating is one having flaps, floats, and a controllable propeller. A controllable propeller may be controlled manually by the pilot or automatically controlled by a full authority digital engine control (FADEC) system.