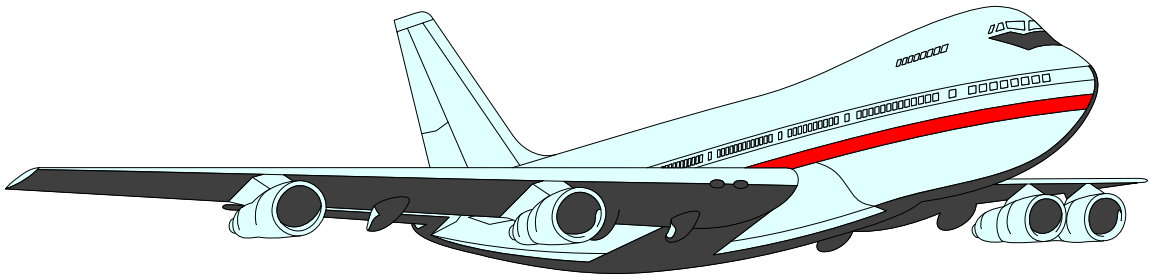
FAA-G-8082-9B

FLIGHT ENGINEER

KNOWLEDGE TEST GUIDE



2007

U.S. Department of Transportation
Federal Aviation Administration

FLIGHT ENGINEER

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Flight Standards Service

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INTRODUCTION

FAA-G-8082-9B, Flight Engineer Knowledge Test Guide, provides information for preparing you to take one or all of the following knowledge tests. This document supersedes FAA-G-8082-9A, dated October 15, 2003.

At one time, the flight engineer functioned as an inflight maintenance person. Today, the flight engineer is a technical expert, who must be thoroughly familiar with the operation and function of various airplane components. The principal function of the flight engineer is to assist the pilots in the operation of the airplane. Specific duties vary with different airplanes and operators.

The questions and answers on the flight engineer knowledge tests pertain only to airplanes that require a flight engineer. Because the questions and answers cover a wide scope of airplanes, powerplants, and systems, some questions are general in nature. The information contained in the questions and answers should never take precedence over specific information furnished by a manufacturer in the operation of an airplane.

Federal Aviation Administration (FAA) airman knowledge tests are effective instruments for aviation safety and regulation measurement. However, these tests can only sample the vast amount of knowledge every pilot needs to operate safely in the National Airspace System (NAS).

Comments may be e-mailed to AFS630Comments@faa.gov.

KNOWLEDGE TEST ELIGIBILITY REQUIREMENTS

Prior to taking a flight engineer knowledge test, you must be able to read, speak, and understand the English language; have appropriate documentation to verify that you are 19 years of age; and meet the experience requirements of Title 14 of the Code of Federal Regulation (14 CFR) part 63, section 63.37.

The proof of age may be satisfied by presenting photo identification, such as driver's license, a government or military identification card, passport, or similar identification.

To verify that you meet the experience requirements of 14 CFR part 63, section 63.37, it is necessary to obtain a written statement and signature from one of the following authorized persons:

- A qualified flight engineer with the appropriate class rating
- A U.S. Armed Forces flight engineer instructor for the same class of airplane
- A flight engineer instructor associated with 14 CFR part 121 training program
- An FAA Aviation Safety Inspector (operations/airworthiness)

The endorser must include a statement that they have personally verified that you meet the experience requirements of 14 CFR part 63, section 63.37. They must also identify their position, such as flight engineer certificate number, name of the training facility, and FAA inspector's office identification.

The verification of experience requirements is not required if you hold one of the following.

- A commercial pilot certificate with an instrument rating or an Airline Transport Pilot certificate issued by the FAA.
- A foreign unrestricted commercial pilot or Airline Transport Pilot license issued by an International Civil Aviation Organization (ICAO) member state.
- A passed, failed, or expired original test report for that specific test.

You may take an additional class rating knowledge test without further demonstration of eligibility if you possess a flight engineer certificate or an original flight engineer test report.

KNOWLEDGE AREAS ON THE TESTS

You must pass a knowledge test on the areas specified by 14 CFR part 63, section 63.35. The areas are arranged in the following order on the knowledge tests: applicable Code of Federal Regulations; theory of flight and aerodynamics; meteorology with respect to engine operations; operating procedures (preflight, normal, and emergency); airplane equipment; airplane systems; limitations (airplane procedures and engine operations); and math computations (engine operations, fuel consumption, center of gravity, and airplane loading).

DESCRIPTIONS OF THE TESTS

You must successfully complete a knowledge test appropriate to the desired rating. **The minimum passing score for any of the following flight engineer knowledge tests is 70 percent.**

The following tests are for original class ratings and each contains 80 questions. You are allowed 3 hours to complete each test.

- Flight Engineer Turbojet/Basic (FEX)
- Flight Engineer Turboprop/Basic (FET)
- Flight Engineer Reciprocating Engine/Basic (FEN)

If you desire to add a class rating to your flight engineer certificate, you must successfully complete a knowledge test appropriate to the desired class rating. The following tests are for additional class ratings and each contains 50 questions. You are allowed 2 hours to complete each test.

- Flight Engineer Turbojet (added rating) (FEJ)
- Flight Engineer Turboprop (added rating) (FEP)
- Flight Engineer Reciprocating Engine (added rating) (FER)

All test questions are the objective, multiple-choice type. Each question can be answered by the selection of a single response. Each test question is independent of other questions; therefore, a correct response to one does not depend upon, or influence the correct response to another.

Communication between individuals through the use of words is a complicated process. In addition to being an exercise in the application and use of aeronautical knowledge, a test is also an exercise in communication since it involves the use of the written language. Since the tests involve written rather than spoken words, communication between the test writer and the person being tested may become a difficult matter if care is not exercised by both parties. Consequently, considerable effort is expended to write each question in a clear, precise manner. Make sure you carefully read the instructions given with each test, as well as the statements in each test item.

When taking a test, keep the following points in mind:

- Answer each question in accordance with the latest regulations and guidance publications.
- Read each question carefully before looking at the possible answers. You should clearly understand the problem before attempting to solve it.
- After formulating an answer, determine which choice most nearly corresponds with that answer. The answer chosen should completely resolve the problem.
- From the answers given, it may appear that there is more than one possible answer; however, there is only one answer that is correct and complete. The other answers are either incomplete, erroneous, or represent a common misconception.
- If a certain question is difficult for you, it is best to mark it for review and proceed to the next question. After you answer the less difficult questions, return to those which you marked for review and answer them. The review marking procedure will be explained to you prior to starting the test. Although the computer should alert you to unanswered questions, make sure every question has an answer recorded. This procedure will enable you to use the available time to the maximum advantage.
- When solving a calculation problem, select the answer closest to your solution. The problem has been checked with various types of calculators; therefore, if you have solved it correctly, your answer will be closer to the correct answer than any of the other choices.

PROCESS FOR TAKING A KNOWLEDGE TEST

The FAA has available hundreds of computer testing centers worldwide. These testing centers offer the full range of airman knowledge tests including military competence, instrument foreign pilot, and pilot examiner pre-designated tests. A list of computer testing designees (CTDs) and phone numbers is provided in the section titled *Obtaining Training and Testing Publications and General Information*.

The first step in taking a knowledge test is the registration process. You may either call the central 1-800 numbers or simply use the walk-in basis. If you choose to use the 1-800 numbers to register, you will need to select a testing center, schedule a test date, and make financial arrangements for test payment. You may register for tests several weeks in advance, and you may cancel your appointment according to the CTD's cancellation policy. If you do not follow the CTD's cancellation policies, you could be subject to a cancellation fee.

The next step in taking a knowledge test is providing proper identification. You should determine what knowledge test prerequisites are necessary before going to the computer testing center. Your instructor or local Flight Standards District Office (FSDO) can assist you with what documentation to take to the testing facility. Testing center personnel will not begin the test until your identification is verified.

Acceptable forms of authorization:

- A certificate of graduation or a statement of accomplishment certifying the satisfactory completion of the ground school portion of a course from an FAA-certificated pilot school.
- A certificate of graduation or a statement of accomplishment certifying the satisfactory completion of the ground school portion of a course from an agency such as a high school, college, adult education program, U.S. Armed Force, ROTC Flight Training School, or Civil Air Patrol.
- A written statement or logbook endorsement from an authorized instructor certifying that you have accomplished a ground training or home study course required for the rating sought and you are prepared for the knowledge test.
- Failed Airman Knowledge Test Report, passing Airman Knowledge Test Report, or expired Airman Knowledge Test Report (pass or fail), provided that you still have the original Airman Knowledge Test Report in your possession. Before you take the actual test, you will have the option to take a sample test. The actual test is time limited; however, you should have sufficient time to complete and review your test.

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Upon completion of the knowledge test, you will receive your Airman Knowledge Test Report, with the testing center's embossed seal, which reflects your score.

The Airman Knowledge Test Report lists the subject matter knowledge codes for questions answered incorrectly. The total number of subject matter knowledge codes shown on the Airman Knowledge Test Report is not necessarily an indication of the total number of questions answered incorrectly.

Advisory Circular (AC) 60-25, Subject Matter Knowledge Codes for Airman Knowledge Testing, contains the listings of reference materials and subject matter knowledge codes for airman knowledge testing. You should match the subject matter knowledge codes on your Airman Knowledge Test Report to the codes in AC 60-25 to review your areas of deficiency.

The listings of reference materials and subject matter knowledge codes have been prepared by the FAA to establish specific references for all knowledge standards. The listings contain reference materials to be used when preparing for all airman knowledge tests.

AC 60-25 can be found at http://www.faa.gov/, Advisory Circulars (ACs).

Your instructor is required to provide instruction on each of the knowledge areas listed on your Airman Knowledge Test Report and to complete an endorsement of this instruction. The Airman Knowledge Test Report must be presented to the examiner prior to taking the practical test. During the oral portion of the practical test, the examiner is required to evaluate the noted areas of deficiency.

Should you require a duplicate Airman Knowledge Test Report due to loss or destruction of the original, send a signed request accompanied by a check or money order for $1.00, payable to the FAA. Send the request to the Federal Aviation Administration, Airmen Certification Branch, AFS-760, P.O. Box 25082, Oklahoma City, OK 73125.

VALIDITY OF AIRMAN KNOWLEDGE TEST REPORTS

Airman Knowledge Test Reports are valid for the 24-calendar month period preceding the month you complete the practical test. If the Airman Knowledge Test Report expires before completion of the practical test, you must retake the knowledge test.

1. Air Carrier Employees. The following criteria apply to flight crewmembers and mechanics employed by a 14 CFR part 121 or 14 CFR part 135 air carrier. Employment by a 14 CFR part 135 on-demand operators does not qualify an applicant for an extension:

    a. Applicants who are flight crewmembers must have completed initial new-hire training, initial equipment training, or transition training.
    b. Applicants who are flight crewmembers must be participating in a training program which includes a recurrent training curriculum in accordance with 14 CFR part 121 or 14 CFR part 135.
    c. Applicants who are mechanics must meet the currency requirements of 14 CFR part 65.
    d. Applicants must be currently employed by a 14 CFR part 121 or a 14 CFR part 135 air carrier. However, applicants do not need to have been continuously employed by a qualified air carrier between the time they passed the knowledge test and the time they apply to take the oral and flight tests.

2. Military Applicants. The following criteria apply to military applicants who apply for extensions on the basis of participation in a training program of a scheduled military transport service:

    a. Applicants must have participated in a flight engineer or maintenance training program at the time of passing the knowledge test or begun a flight engineer or maintenance training program within 24-calendar months after passing the knowledge test.
    b. Applicants must be currently participating in a military flight engineer or maintenance training program.

3. Continued Eligibility Documentation. Inspectors and examiners will not accept an expired Airman Knowledge Test Report unless the applicant provides written evidence of continued eligibility. When satisfactory evidence is presented, the inspector or examiner will enter, date, and sign the following statement on the test report: "The period of validity of this form has been extended in accordance with the provisions of 14 CFR part 63, section 63.35(d)."

USE OF TEST AIDS AND MATERIALS

You may use aids, reference materials, and test materials within the guidelines listed below, if actual test questions or answers are not revealed. All models of aviation-oriented calculators may be used, including small electronic calculators that perform only arithmetic functions (add, subtract, multiply, and divide). Simple programmable memories, which allow addition to, subtraction from, or retrieval of one number from the memory, are permissible. Also, simple functions, such as square root and percent keys are permissible.

The following guidelines apply:

1. You may use any reference materials provided with the test. In addition, you may use scales, straightedges, protractors, plotters, navigation computers, log sheets, and electronic or mechanical calculators that are directly related to the test.
2. Manufacturer's permanently inscribed instructions on the front and back of such aids, e.g., formulas, conversions, regulations, signals, weather data, frequencies, weight and balance formulas.
3. Testing centers may provide a calculator to you and/or deny use of your personal calculator based on the following limitations:

    a. Prior to, and upon completion of the test, while in the presence of the proctor, you must actuate the ON/OFF switch and perform any other function that ensures erasure of any data stored in memory circuits.
    b. The use of electronic calculators incorporating permanent or continuous type memory circuits without erasure capability is prohibited. The proctor may refuse the use of your calculator when unable to determine the calculator's erasure capability.
    c. Printouts of data must be surrendered at the completion of the test if the calculator incorporates this design feature.
    d. The use of magnetic cards, magnetic tapes, modules, computer chips, or any other device upon which pre-written programs or information related to the test can be stored and retrieved is prohibited.
    e. You are not permitted to use any booklet or manual containing instructions related to use of test aids.

4. Dictionaries are not allowed in the testing area.
5. The proctor makes the final determination relating to test materials and personal possessions you may take into the testing area.

DYSLEXIC TESTING PROCEDURES

If you are a dyslexic applicant, you may request approval from the local Flight Standards District Office (FSDO) or International Field Office (IFO) to take airman knowledge test using one of the three options listed in preferential order:

1. **Option one.** Use current testing facilities and procedures whenever possible.
2. **Option two.** You may use a Franklin Speaking Wordmaster® to facilitate the testing process. The Wordmaster® is a self-contained electronic thesaurus that audibly pronounces typed in words and presents them on a display screen. It has a built-in headphone jack for private listening. The headphone feature must be used during testing to avoid disturbing others.
3. **Option three.** If you do not choose to use the first or second option, you may request a proctor to assist in reading specific words or terms from the test questions and supplement material. In the interest of preventing compromise of the testing process, the proctor must be someone who is non-aviation oriented. The proctor must provide reading assistance only, with no explanation of words or terms. When this option is requested, the FSDO or IFO inspector must contact the Airman Testing Standards Branch (AFS-630) for assistance in selecting the test site and proctor.

Prior to approval of any option, the FSDO or IFO inspector must advise you of the regulatory certification requirement of being able to read, write, speak, and understand the English language.

CHEATING OR OTHER UNAUTHORIZED CONDUCT

Computer testing centers must follow strict security procedures to avoid test compromise. These procedures are established by the FAA and are covered in FAA Order 8080.6, (as amended) Conduct of Airman Knowledge Tests. The FAA has directed testing centers to terminate a test at any time a test proctor suspects a cheating incident has occurred. An FAA investigation will then be conducted. If the investigation determines that cheating or unauthorized conduct has occurred, then any airman certificate or rating that you hold may be revoked, and you will be prohibited for 1 year from applying for or taking any test for a certificate or rating under 14 CFR part 61.

RETESTING PROCEDURES

If you receive a grade lower than 70 percent and wish to retest, you must present the following to testing center personnel.

- Failed Airman Knowledge Test Report.
- A written endorsement from an authorized instructor certifying that additional instruction has been given, and the instructor finds you competent to pass the test.

If you decide to retake the test in anticipation of a better score, you may retake the test after 30 days from the date your last test was taken. The FAA will not allow you to retake a passed test before the 30-day period has lapsed. Prior to retesting, you must give your current Airman Knowledge Test Report to the test proctor. The last test taken will reflect the official score.

ELIGIBILITY REQUIREMENTS FOR THE ORAL AND FLIGHT TESTS

The minimum age for the oral and flight tests are 19; however, to obtain a flight engineer certificate, the minimum age is 21.

The applicant must present a completed FAA Form 8400-3, Application for an Airman Certificate and/or Rating.

A current second-class medical certificate or better is required for taking the oral and flight tests.

Applicants must present a valid Airman Knowledge Test Report.

The flight training must be completed in the airplane type which will be used for the tests. The minimum amount of flight training time is 5 hours for applicants qualifying under the provisions of 14 CFR part 63, section 63.37(b) subparagraphs (1), (2), (3), (4) and (7). Applicants who qualify under the provisions of section 63.37(b) subparagraph (7) and hold a commercial pilot certificate or higher with an instrument rating may complete all their flight training in a simulator. There is no minimum amount of flight training time specified for applicants qualifying under the provisions of section 63.37(b) subparagraphs (5) and (6).

The applicant must present an authorized instructor's recommendation and verification of the instructor's eligibility to provide the endorsement, if retesting within 30 days after failing the oral or flight test.

For an additional class rating, the applicant must present his or her flight engineer certificate.
Note: For additional guidance, see FAA-S-8081-21, Flight Engineer Practical Test Standard for Reciprocating Engine, Turbopropeller, and Turbojet Powered Aircraft.

OBTAINING TRAINING AND TESTING PUBLICATIONS AND GENERAL INFORMATION

Current Flight Standards Service airman training and testing publications can be obtained in electronic format at http://www.faa.gov/.

You will find the following links available on AFS-630's portion of the web site.

- Advisory Circulars
- Airman Knowledge Test Questions
- Practical Test Standards
- Test Statistics
- Training Handbooks
- Subject Matter Knowledge Codes

Advisory Circulars

The advisory circulars provide guidance and information on various subjects related to airman certification.

Airman Knowledge Test Items

The airman knowledge test items contain the airman knowledge question banks representative of questions for airman knowledge tests and the corresponding subject matter knowledge codes, indicating specific references from which questions are developed.

The sample questions that are published on the web site are organized by content category and represent the types of questions included in the actual test banks. Practicing these questions will help you become familiar with similar questions on the airman knowledge tests. The knowledge test is not designed to intimidate any prospective airman; it is designed to measure their understanding of the rules and regulations required to receive an FAA certificate.

The policy regarding public access to test questions is to continue publishing questions that affect special emphasis areas regarding safety, such as aeronautical decision-making, airspace, aircraft performance, operations/airworthiness regulations, weather services and reports, etc. However, we do not publish all test questions. Many questions in the test banks are parallel in content area or format and publishing same types of questions would not help the applicant in determining areas to study. Examples would include questions involving a process or calculation, such as weight and balance or performance questions using the same chart. Our intent in not publishing every question in the airman test bank is to respond to the public demand for proper evaluation of prospective airmen. It is our duty to respond to these issues and provide valid and reliable tests to make certain that qualified applicants meet the FAA airman knowledge testing standards.

Airman Knowledge Testing Sites

A current listing of computer testing designees and computer testing centers, and the registration telephone numbers required when registering for a test.

The following is a list of the computer testing designees authorized to administer FAA airman knowledge tests. This list should be helpful in case you choose to register for a test or simply want more information. This information is current as of May 2007.

Computer Assisted Testing Service (CATS)

1801 Murchison Drive, Suite 288
Burlingame, CA 94010

Applicant inquiry and test registration: 1-800-947-4228

From outside the U.S.: (650) 259-8550

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LaserGrade Computer Testing

16821 S.E. McGillivray, Suite 201
Vancouver, WA 98683

Applicant inquiry and test registration: 1-800-211-2753

From outside the U.S.: (360) 896-9111

Airman Knowledge Testing Supplements

The airman knowledge testing supplements contain the graphics, legends, and maps that are needed to successfully respond to certain knowledge test items.

Knowledge Test Guides

The knowledge test guides describe the knowledge testing policy and procedures for each certification area.

Other Computer Testing Information

Other computer testing information provides specific test information, such as test name, test code (three-digit test identifiers), number of questions, and the time (in hours) allotted for each knowledge test. The test identifiers will assist you in selecting the proper test for the certification/rating being sought.

Practical Test Standards

The practical test standards outline the knowledge and skill requirements for each airman certificate and rating. The references listed in each task of the practical test standards indicate the specific publications used to develop the skill standards. The ability to issue immediate changes prior to publishing revised printed copies ensures the practical test standards are always accurate and usable.

Test Statistics

Test statistics for all airman knowledge tests are contained in a series of tables organized by year and subject area. Individual tables are provided for the following subject areas: test volume, pass rates, average test scores, countries, regions, and district offices.

Training Handbooks

The training handbooks are the basic information sources an airman applicant should refer to when preparing for the knowledge and practical tests for a specific certificate or rating.

Subject Matter Knowledge Codes

Advisory Circular (AC) 60-25, Reference Materials and Subject Matter Knowledge Codes for Airman Knowledge Testing, Appendixes 1 and 2 contain the listings of reference materials and subject matter knowledge codes for airman knowledge testing. Appendix 1 includes codes for pilots, instructors, flight engineers, dispatchers, navigators, pilot examiners, inspection authorization, and parachute riggers. Appendix 2 includes codes for aircraft mechanics.

The listings contain reference materials to be used when preparing for all airman knowledge tests. The subject matter knowledge codes should be referred to when reviewing areas of deficiency on airman knowledge test reports.