



Multi-Engine

ORAL EXAM GUIDE



MICHAEL D. HAYES

THE COMPREHENSIVE GUIDE
TO PREPARE YOU FOR THE
FAA CHECKRIDE

SEVENTH EDITION

Multi-Engine Oral Exam Guide
Seventh Edition
by Michael D. Hayes

Aviation Supplies & Academics, Inc.
7005 132nd Place SE
Newcastle, Washington 98059-3153

Visit ASA's website often (www.asa2fly.com) to find updates posted there due to FAA regulation revisions that may affect this book. See also www.asa2fly.com/reader/oegme for the "Reader Resources" page with additional information and updates.

© 1994 – 2017 Aviation Supplies & Academics, Inc.
All rights reserved. Seventh Edition published 2017.

No part of this book shall be reproduced, stored in any retrieval system, or transmitted by any means, electronic, mechanical, xerographic, audio/visual record, or otherwise, without written permission from the publisher. While every precaution has been taken in the preparation of this book, the publisher and Michael D. Hayes assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. None of the material in this guide supersedes any documents, procedures, or regulations issued by the Federal Aviation Administration.

ASA-OEG-ME7

ISBN 978-1-61954-462-8

Printed in the United States of America

2020 2019 2018 2017 9 8 7 6 5 4 3 2 1

Library of Congress Cataloging-in-Publication Data:

Hayes, Michael D.

Multi-engine oral exam guide : the comprehensive guide to prepare you for the FAA oral exam / by Michael D. Hayes.

p. cm.

"ASA-OEG-ME"—T.p. verso

1. Multiengine flying—Examinations, questions, etc. 2. Air pilots—

Licenses—United States. I. Title.

TL711.T85H39

629.132'5216'076—dc20

94-5808

CIP

This guide is dedicated to the many talented students, pilots, and flight instructors I have had the opportunity to work with over the years. Also, special thanks to Mark Hayes and many others who supplied the patience, encouragement, and understanding necessary to complete the project.

— M.D.H.

Contents

Introduction.....	vii
1 Multi-Engine Operations	
A. Normal Procedures	1–3
B. Aerodynamics	1–12
C. Determining Performance and Limitations	1–13
D. Weight and Balance	1–22
Additional Study Questions.....	1–25
2 Flight Principles: Engine Inoperative	
A. Factors Affecting Single-Engine Flight	2–3
B. Directional Control	2–9
C. Engine-Out Operations	2–13
Additional Study Questions.....	2–23
3 Operation of Systems	
A. Primary Flight Controls and Trim	3–3
B. Wing Flaps.....	3–4
C. Powerplant and Propeller.....	3–6
D. Landing Gear	3–12
E. Fuel, Oil, and Hydraulic	3–16
F. Electrical	3–21
G. Avionics	3–24
H. Pitot-Static, Vacuum/Pressure, and Associated Flight Instruments.....	3–28
I. Environmental.....	3–31
J. Deicing and Anti-Icing	3–33
Additional Study Questions.....	3–35

4 Multi-Engine Maneuvers

A. Taxiing	4-3
B. Before Takeoff Check	4-4
C. Normal Takeoff and Climb	4-4
D. Normal Approach and Landing	4-6
E. Short-Field Takeoff and Maximum Performance Climb	4-7
F. Short-Field Approach and Landing	4-9
G. Steep Turns	4-11
H. Maneuvering During Slow Flight	4-12
I. Power-Off Stalls.....	4-13
J. Power-On Stalls	4-14
K. Emergency Descent	4-15
L. Maneuvering with One Engine Inoperative	4-16
M. V_{MC} Demonstration	4-17
N. Engine Failure During Takeoff Before V_{MC} (Simulated) ...	4-19
O. Engine Failure After Lift-Off (Simulated).....	4-19
P. Approach and Landing with an Inoperative Engine (Simulated).....	4-21
Q. After Landing, Parking and Securing (ASEL, AMEL)	4-22
R. Engine Failure During Flight (by reference to instruments).....	4-23
S. Instrument Approach and Landing with an Inoperative Engine (Simulated) (by reference to instruments)	4-24
Additional Study Questions.....	4-25

Appendix 1 Applicant's Practical Test Checklist..... A1-1

Appendix 2 Know Your Aircraft..... A2-1

Appendix 3 Operations of Aircraft Without/With an MEL

Appendix 4 Light Twin Takeoff Control and Performance
 Briefing..... A4-1

Introduction

The *Multi-Engine Oral Exam Guide* is a comprehensive guide designed for pilots training for the addition of a Multi-Engine Land rating to an existing Private Pilot Certificate. This guide was originally designed for use in Part 141 flight schools, but it quickly became popular with those training under Part 61 who are not affiliated with an approved school. The guide also proves beneficial to pilots who wish to refresh their knowledge or who are preparing for a flight review.

The *Multi-Engine Oral Exam Guide* is divided into four main sections. The first three sections represent the basic knowledge areas that must be demonstrated by applicants before they are issued a multi-engine rating. The fourth section is a general review of the Airman Certification Standards (ACS) tasks required during the flight portion of the checkride. You should review the ACS and/or Practical Test Standards (PTS) applicable to your particular certification check in addition to the material in this section. For additional reference, several appendices have been included at the end of this guide. Appendix 1 reprints the FAA's "Applicant's Practical Test Checklist." Appendix 2 contains questions common to understanding of aircraft performance, limitations, systems and procedures that are particularly helpful when checking out in a new airplane. Appendix 3 "Operations of Aircraft Without/With an MEL" depicts the typical sequence of events a pilot, operating with and without an MEL, should follow when inoperative equipment is discovered to be onboard. Appendix 4 is a copy of the FAA's "Light Twin Takeoff Control and Performance Briefing."

An FAA evaluator may ask questions at any time during the practical test to determine the applicant has the required knowledge. The result of intensive post-multi checkride debriefings, this book provides the most consistent questions asked, along with the information necessary for a knowledgeable response.

The guide may be supplemented with other comprehensive study materials as noted in parentheses after each question. For example: (FAA-H-8083-1). The abbreviations for these materials and their titles are listed below. Be sure to use the latest revision of these references when reviewing for the test.

14 CFR Part 23	<i>Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes</i>
14 CFR Part 43	<i>Maintenance, Preventive Maintenance, Rebuilding, and Alteration</i>
14 CFR Part 45	<i>Identification and Registration Marking</i>
14 CFR Part 61	<i>Certification: Pilots, Flight Instructors, and Ground Instructors</i>
14 CFR Part 91	<i>General Operating and Flight Rules</i>
AC 61-67	<i>Stall and Spin Awareness Training</i>
AC 91-67	<i>Minimum Equipment requirements for General Aviation Operations under 14 CFR Part 91</i>
AC 91-73	<i>Part 91 and 135 Single-Pilot Procedures During Taxi Operations</i>
AC 120-80	<i>In-Flight Fires</i>
AC 150-5340-18	<i>Standards for Airport Sign Systems</i>
FAA-H-8083-1	<i>Aircraft Weight and Balance Handbook</i>
FAA-H-8083-2	<i>Risk Management Handbook</i>
FAA-H-8083-3	<i>Airplane Flying Handbook</i>
FAA-H-8083-6	<i>Advanced Avionics Handbook</i>
FAA-H-8083-15	<i>Instrument Rating Handbook</i>
FAA-H-8083-25	<i>Pilot's Handbook of Aeronautical Knowledge</i>
FAA-H-8083-30	<i>Aviation Maintenance Technician Handbook—General</i>
FAA-H-8083-31	<i>Aviation Maintenance Technician Handbook—Airframe</i>
FAA-H-8083-32	<i>Aviation Maintenance Technician Handbook—Powerplant</i>
FAA-P-8740-2	<i>Destiny Altitude</i>
FAA-P-8740-13	<i>Engine Operation for Pilots</i>
FAA-P-8740-19	<i>Flying Light Twins Safely (AFS-800 9-78)</i>

FAA-P-8740-66	<i>Flying Light Twins Safely (AFS-800 2008)</i>
FAA-S-ACS-6	<i>Private Pilot Airman Certification Standards</i>
FAA-S-ACS-8	<i>Instrument Rating Airman Certification Standards</i>
FAA Order 8900.1	<i>Flight Standards Information Management Systems</i>
FAA Safety ALC-30	<i>FAA Multi-Engine Safety Review</i>
AFM	<i>FAA-Approved Flight Manuals</i>
AIM	<i>Aeronautical Information Manual</i>
POH	<i>Pertinent Pilot Operating Handbooks</i>
SAIB CE-05-51	<i>FAA Special Airworthiness Information Bulletin</i>
SAIB CE-10-11	<i>FAA Special Airworthiness Information Bulletin CE-10-11, "Electrical: Fire Hazard in Resetting Circuit Breakers (C/Bs)"</i>

Most of the books listed above are reprinted by ASA and available from aviation retailers worldwide. A review of the information presented within this guide should provide the necessary preparation for the FAA Multi-Engine Land practical test.

Were you asked a question during your checkride that was not covered in this book? If so, please send the question to ASA. We are constantly striving to improve our publications to meet the industry needs. Visit the ASA website for updates that may be posted in between printings, on the "Product Update" webpage.

internet: www.asa2fly.com
 email: asa@asa2fly.com
 Fax: 425.235.0128

Aviation Supplies & Academics
 7005 132nd Place SE
 Newcastle, WA 98059-3153

A. Normal Procedures

1. What documents are required on board a multi-engine aircraft? (14 CFR 91.9, 91.203)

A irworthiness Certificate (14 CFR 91.203)

R egistration Certificate (14 CFR 91.203)

R adio Station License (if operating outside of U.S., an FCC Regulation)

O perating Limitations (POH/AFM and supplements, placards, markings) (14 CFR 91.9)

W eight and Balance data—(current)

Compass Deviation Card—(14 CFR 23.1547)

External Data Plate/Serial Number—(14 CFR 45.11)

Exam Tip: During the practical test your evaluator may wish to examine the various required aircraft documents (ARROW) during the preflight inspection as well as the currency of any aeronautical charts, electronic flight bag (EFB) data, etc. on board the aircraft. Prior to the test, verify that all of the necessary aircraft documentation, on-board databases and charts are current and available.

2. What are the required tests and inspections to be performed on multi-engine aircraft? (Include inspections for IFR.) (14 CFR 91.409, 91.171, 91.411, 91.413, 91.207)

A Annual inspection within the preceding 12 calendar months. (14 CFR 91.409)

A Airworthiness Directives and life-limited parts complied with, as required. (14 CFR 91.403, 91.417)

V VOR equipment check every 30 days (for IFR ops). (14 CFR 91.171)

1 100-hour inspection, if used for hire or flight instruction in aircraft CFI provides. (14 CFR 91.409)

A Altimeter, altitude reporting equipment, and static pressure systems tested and inspected (for IFR ops), every 24 calendar months. (14 CFR 91.411)

T Transponder tests and inspections, every 24 calendar months. (14 CFR 91.413)

E Emergency locator transmitter, operation and battery condition inspected every 12 calendar months. (14 CFR 91.207)

Exam Tip: Be prepared to locate all of the required inspections, ADs, life-limited parts, etc., in the aircraft and engine logbooks and be able to determine when the next inspections are due. Create an aircraft status sheet that indicates the status of all required inspections, ADs, life-limited parts, and other related items; use post-it notes to tab the specific pages in the aircraft and engine logbooks. Write the due date of the next inspection on the post-it note.

3. Is taxiing a multi-engine airplane significantly different than taxiing a single-engine airplane? (FAA-H-8083-3)

No, it is generally the same. The following general guidelines may be used:

- a. Brakes and throttles are used to control momentum.
- b. Steering is done primarily with the steerable nose wheel.
- c. Directional control may also be obtained through use of differential power, if necessary.
- d. Plan ahead. Multi-engine airplanes are heavier, larger, and more powerful. They require more time and distance to stop.
- e. Also, due to size, pilot perspective may change, requiring additional vigilance to avoid obstacles, other aircraft, or bystanders.

4. How can a pilot use differential power during taxiing? (FAA-H-8083-3)

While taxiing, a tight turn to the right, for example, may be accomplished by reducing power on the right engine and increasing power on the left engine while applying right rudder/brake. Also, in a crosswind condition, differential power assists in controlling direction. Power should be applied on the upwind engine causing a turning moment away from the crosswind.

Note: Making sharp turns assisted by brakes and differential power can cause the airplane to pivot about a stationary inboard wheel and landing gear. The airplane was not designed for such abuse, and you should avoid doing this.

Multi-Engine

ORAL EXAM GUIDE



The OEG Series is an excellent study tool for students and instructors alike, arranged in a question-and-answer format. Use when you're gearing up for the Practical Exam, as well as for a general refresher! Other Oral Exam Guides available from ASA...

- Private Pilot
- Instrument Pilot
- Commercial Pilot
- Flight Instructor
- Airline Transport Pilot
- Helicopter Pilot
- Aircraft Dispatcher
- Flight Review
- Aviation Maintenance Technician

Aviation Supplies & Academics, Inc.
7005 132nd Place SE
Newcastle, Washington 98059-3153
425-235-1500
www.asa2fly.com

TRANSPORTATION USD \$12.95

ISBN 978-1-61954-462-8



5 1295 >



9 781619 544628