

Multi-Engine Course Study Guide

This guide is a compilation of all the flashcard questions in the Multi-Engine Course. We highly recommend thinking about the content on your own and discussing any questions with your instructor before consulting this guide for the “answers”. Although it is not necessarily the most enjoyable process, thinking critically about the subject is the best way to encourage *long term retention* of this information, which is the real goal.

We are dedicated to providing the very best material that we can. If you find any errors, confusing phrasing, or have any recommendations for changes to this guide, please don't hesitate to reach out to us at support@flightapprentice.com, on social media, or at FlightApprentice.com

Enjoy!
The Flight Apprentice Team



MULTI-ENGINE AERODYNAMICS

OEI AERODYNAMICS

How do pitch, roll and yaw forces change during an engine failure?

Which axis — pitch, roll, or yaw — usually gives the most obvious indication of an engine failure?

Why does lift change on one wing during an engine failure?

How would the aerodynamic forces be different if an engine failure occurred on the ground?

Why is it so important that pilots practice the body movements required to compensate for changing aerodynamic forces during an engine failure?

OEI CLIMB PERFORMANCE

Why does a 50% reduction in power result in a far greater reduction in performance?

Following an engine failure, how can performance be improved?

What pilot actions distinguish the sideslip angle from the zero sideslip angle?

APPLIED OEI CLIMB PERFORMANCE

How might a pilot plan differently for an engine failure after takeoff at sea level vs. at a high density altitude airport?

What actions can a pilot take to increase single engine performance before departure?

VMC

What aerodynamic force makes V_{MC} the minimum controllable airspeed?

Why is V_{MC} so important during takeoff?

What are all the certifying criteria used to establish V_{MC} ?

What effect does landing gear have on V_{MC} ? On performance?

Why is V_{MC} determined with landing gear up?

How does density altitude affect V_{MC} ? Performance?

CRITICAL ENGINE

What are the four factors that make an engine critical?

How does P-factor affect the critical engine?

How does accelerated slipstream affect the critical engine?

How does spiraling slipstream affect the critical engine?

How does torque affect the critical engine?

Does an airplane with counter-rotating engines have a critical engine? Why or why not?

MULTI-ENGINE SYSTEMS

GENERAL SYSTEMS

What is the major difference between the propeller governors in single-engine and multi-engine constant speed systems? Why are they designed differently?

What is the purpose of an unfeathering accumulator?

What is the purpose of a propeller synchronizer/synchrophaser? How do pilots without either keep the propellers in sync?

What is the difference between fuel cross-feed and fuel transfer systems?

What is the difference between de-ice and anti-ice systems?

How do de-ice boots function? What improper use can cause them to stop working?

How does a glycol bleed system work? What improper use can prevent it from working?

What are the advantages and risks associated with a heated wing de-ice/anti-ice system?

CESSNA 310 FUEL SYSTEM

*** If you are not using a Cessna 310 for your training, feel free to ignore this section ***

What happens to excess fuel that is delivered to the engine driven pump?

What is the purpose of the internal main tank pumps?

Is the Cessna 310 able to cross-feed? Can it transfer fuel directly between main tanks?

What is the total number of fuel pumps?

How many fuel tanks are there?

How many fuel selectors?

How many fuel strainers?

If the wing tip main tanks are full, how long should a pilot fly before switches to the aux tanks?

Which tanks should be used for takeoff and landing? Why?

What incorrect operation could cause a pilot to inadvertently dump fuel overboard?

MULTI-ENGINE OPERATIONS

TAKEOFF SPEEDS

What is critical speed?

Is an aborted takeoff after critical speed ever acceptable?

What is blue line?

What is red line?

In many multi engine airplanes, V_{XSE} and V_{MC} are very close together. What is the significance of that as it pertains to safety?

ACCELERATE STOP/GO

What is accelerate-stop distance?

What is accelerate-go distance?

What is a balanced field condition?

Does a “balanced field condition” have anything to do with the actual runway length?

TAKEOFF BRIEF

Why is a takeoff brief so important, particularly to a multi-engine pilot?

A takeoff brief should include at least three main scenarios. What are they?

The visibility is near approach minimums at your departure airport. How could your takeoff brief change accordingly?

There is rising terrain to your left and water to your right. How might this incorporate into your takeoff brief?

MULTI-ENGINE MANEUVERS

DRAG DEMO

What is the purpose of the drag demo?

What are the approximate drag factors for your airplane?

V_{MC} DEMO

What is the purpose of the V_{MC} demo?

What is an appropriate deceleration rate for the V_{MC} demo?