

AIRFRAME & POWERPLANT MECHANICS

AIRFRAME TEST GUIDE

Written, Oral, and Practical

ALIGNS WITH

FAA-H-8083-31B & FAA-H-8083-31B-ATB

Airframe & Powerplant Mechanics Airframe Handbook

2024 EDITION



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AERODYNAMICS, AIRCRAFT ASSEMBLY, AND RIGGING

QUESTIONS

2-7 AM.I.J.K8

The angle of incidence is that acute angle formed by _____

- A. a line parallel to the wing from root to tip and a line parallel to the lateral axis of the aircraft.
- B. a line parallel to the wing chord and a line parallel to the longitudinal axis of the aircraft.
- C. the angular difference between the setting of the main airfoil and the auxiliary airfoil (horizontal stabilizer) in reference to the longitudinal axis of the aircraft.

2-10 AM.I.J.K8

In order to maintain level flight, as thrust increases, the angle of attack must _____

- A. increase.
- B. decrease.
- C. remain the same.

2-8 AM.I.J.K8

The acute angle formed by the chord line of a wing and the relative wind is known as the _____

- A. angle of attack.
- B. angle of incidence.
- C. longitudinal dihedral angle.

2-11 AM.I.J.K8

The angle of incidence of an airplane at rest _____

- A. does not change when in flight.
- B. affects the dihedral of the wings in flight.
- C. is the same as the angle between the relative wind and the chord of the wing.

2-9 AM.I.J.K8

As the angle of attack of an airfoil increases, the center of pressure will _____

- A. move toward the leading edge.
- B. remain stationary because both lift and drag components increase proportionally to increased angle of attack.
- C. move toward the trailing edge.

2-12 AM.I.J.K8

As lift increases on an aircraft, parasitic drag _____ and induced drag _____

- A. increases; increases.
- B. increases; decreases.
- C. decreases, increases.

AERODYNAMICS, AIRCRAFT ASSEMBLY, AND RIGGING

ANSWERS

2-13 Answer C

The axis that passes through the center, from top to bottom, is called the vertical, or yaw, axis. Yaw is controlled by the rudder located at the rear portion of the vertical tail assembly.

Ref: Airframe Handbook H-8083-31B-ATB, Chapter 2 Page 8

2-14 Answer C

The axis that extends crosswise from wing tip to wing tip is the lateral, or pitch, axis. Pitch is affected by the elevators located at the rear portion of the horizontal tail assembly.

Ref: Airframe Handbook H-8083-31B-ATB, Chapter 2 Page 8

2-15 Answer B

When an aircraft has a tendency to keep a constant AOA with reference to the relative wind (i.e., it does not tend to put its nose down and dive or lift its nose and stall); it is said to have longitudinal stability. Longitudinal stability refers to motion in pitch. The horizontal stabilizer is the primary surface that controls longitudinal stability. The action of the stabilizer depends upon the speed and AOA of the aircraft. Trim tabs are small airfoils recessed into the trailing edges of the primary control surfaces. Trim tabs can be used to correct any tendency of the aircraft to move toward an undesirable flight attitude. Their purpose is to enable the pilot to trim out any unbalanced condition which may exist during flight, without exerting any pressure on the primary controls. See Figure 2-10 in the text for a table of flight control surfaces and their relationship to aircraft stability.

Ref: Airframe Handbook H-8083-31B-ATB, Chapter 2 Page 8-9

2-16 Answer A

When an aircraft has a tendency to keep a constant AOA with reference to the relative wind (i.e., it does not tend to put its nose down and dive or lift its nose and stall); it is said to have longitudinal stability. Longitudinal stability refers to motion in pitch. See Figure 2-10 in the text for a table of flight control surfaces and their relationship to aircraft stability.

Ref: Airframe Handbook H-8083-31B-ATB, Chapter 2 Page 9

2-17 Answer B

When an aircraft has a tendency to keep a constant AOA with reference to the relative wind (i.e., it does not tend to put its nose down and dive or lift its nose and stall); it is said to have longitudinal stability. Longitudinal stability refers to motion in pitch. See Figure 2-10 in the text for a table of flight control surfaces and their relationship to aircraft stability.

Ref: Airframe Handbook H-8083-31B-ATB, Chapter 2 Page 61

2-18 Answer B

Motion about the aircraft's longitudinal (fore and aft) axis is a lateral, or rolling, motion. The tendency to return to the original attitude from such motion is called lateral stability. See Figure 2-10 in the text for a table of flight control surfaces and their relationship to aircraft stability.

Ref: Airframe Handbook H-8083-31B-ATB, Chapter 2 Page 10

ORAL EXAM

- 2-1(O). What material are aircraft control cables made?
- 2-2(O). What instrument is used to determine the amount of tension on a cable?
- 2-3(O). How can you inspect for broken wires of a control cable?
- 2-4(O). What is the purpose of a turnbuckle?
- 2-5(O). What are used to guide cables as well as change the direction of cable movement?
- 2-6(O). Why are push rods used as links in the flight control system?
- 2-7(O). When are torque tubes used in a control system?
- 2-8(O). What must be accomplished after repairing a control surface the flight control balance condition?
- 2-9(O). Where will you find the procedures and specifications for rigging an aircraft?
- 2-10(O). List the three main primary flight controls on an aircraft.
- 2-11(O). What is the purpose of trim tabs on a flight control surface?
- 2-12(O). What is the main purpose of a Stability Augmentation Systems (SAS)?
- 2-13(O). Name the three basic classifications of rotors found on helicopters.
- 2-14(O). How is pylon rock reduced in a helicopter?

PRACTICAL EXAM

- 2-1(P). Given an actual aircraft or mockup, required tools, appropriate publications check or set the tension of a control surface cable and record maintenance.
- 2-2(P). Given an actual aircraft or mockup, required tools, appropriate publications install a control surface and record maintenance.
- 2-3(P). Given an actual aircraft or mockup, required tools, appropriate publications check the static balance of a control surface and record findings.
- 2-4(P). Given a specific helicopter model and the maintenance manuals, locate the procedures for rigging a helicopter.
- 2-5(P). Given a specific helicopter model and the maintenance manuals, locate helicopter rotor blade tracking procedures.
- 2-6(P). Given an actual aircraft or mockup and the maintenance manuals, identify fixed-wing aircraft rigging adjustment locations.
- 2-7(P). Given the appropriate publications for a specific aircraft, locate leveling methods and procedures for a specific aircraft.
- 2-8(P). Given an actual aircraft or mockup, inspect a flight control system for travel and security and record findings.
- 2-9(P). Given an actual aircraft or mockup, inspect a primary flight control cable and document your findings.
- 2-10(P). Given an actual aircraft or mockup, required tools, and appropriate publications install one or more swaged cable terminals, check them with the appropriate gage and record maintenance.
- 2-11(P). Given an actual aircraft or mockup, required tools, and appropriate publications install one or more Nicopress sleeves, check with the appropriate gage and record maintenance.
- 2-12(P). Given an actual aircraft or mockup, required tools, and appropriate publications check, adjust as necessary a push-pull flight control system and record maintenance.
- 2-13(P). Given an actual aircraft or mockup and the appropriate publications for a specific aircraft, locate jacking points and leveling locations.
- 2-14(P). Given the appropriate publications for a specific aircraft, determine the jacking requirements for a particular aircraft.
- 2-15(P). Given an actual aircraft or mockup, required tools, and appropriate publications jack an aircraft or portion thereof, e.g., as appropriate for tire/wheel change, or gear retraction.
- 2-16(P). Given a sample of an aircraft maintenance record, determine if inspection and/or maintenance is due and record findings.
- 2-17(P). Given an actual aircraft, mockup, or component, accomplish a 14 CFR part 91 required inspection and record your findings.
- 2-18(P). Given an actual aircraft, mockup, or component, accomplish an inspection after maintenance or preventive maintenance and record your findings.