

# Top 100 Questions Detail Aircraft Upgrade/Repair

10/17/2016

## *I. Aircraft Structures*

1. Flight Loads are typically divided into what two types?
2. What are the principal load-carrying structures of an airplane?
3. What is the purpose of drag & anti-drag wires?
4. Describe the construction/purpose of a typical stabiliser?
5. Name the primary & secondary control surfaces of an airplane?
6. What is the purpose of a structural fuse on an engine pylon?
7. How are the forces acting on helicopter different than fixed wing aircraft?
8. What are the advantages of composite construction on helicopters?
9. What are the functions of the tailboom on helicopter?
10. What types of landing gear may be used on helicopters?

## *II. Landing Gear*

1. What are two different configurations of landing gear?
2. What is the purpose of the metering pin in a shock strut?
3. What features must a nose gear strut assembly have that are not required for main gear?
4. Explain the purpose of the overcenter linkage in the nose gear mechanism.
5. How are power steering systems typically controlled by the pilot?
6. What is the purpose of the follow-up differential mechanism in a nose-wheel steering system?

7. What power sources are employed for the operation of retractable landing gear?
8. Why is it not possible to land aircraft with wheels locked if the antiskid system is armed?
9. What may be the cause of dragging brakes, grabbing breaks & fading breaks?
10. What would be the effect of a leaking seal in master cylinder?

### ***III. Fuel Systems***

1. What requirements have been established to assure reliability of fuel systems of an aircraft?
2. What internal pressures must a metal fuel tank be able to withstand?
3. What is the general requirement for fuel tank capacity?
4. Why is positive pressure required within the vapor space of fuel cells and how is this pressure maintained?
5. Describe the arrangement required for the venting of fuel tanks.
6. Explain the requirement for a bypass valve in a fuel pump.
7. What provision is made in a fuel pump relief valve to compensate for changes in atmospheric pressure?
8. What provision is made to prevent overfilling of fuel tanks when a pressure fuel system is employed?
9. What precaution must be observed before repairing a metal fuel tank by soldering or welding?
10. What inspections should be made of a fuel system immediately before each flight?

### ***IV. Instruments***

1. What type of mechanism is generally used for instruments that measure high pressures?
2. What correction should be applied to the airspeed indication as altitude increases to obtain true airspeed?
3. What are the two basic types of altimeters and how do their displays differ?

4. What would be the effect of a leaking or disconnected static line inside a pressurised airplane?
5. How does a turn-and-bank indicator differ from a turn coordinator?
6. Explain the basic operation of an engine pressure ratio gauge?
7. How does a resistance-type fuel quantity indicator operate?
8. Explain the basic operational concept of a flux gate.
9. What conditions are observed in the inspection of the tubing, hoses & fittings in instrument systems?
10. What precautions must be taken in blowing air through pitot-static lines to clear out dirt & water?

## ***V. Fluid Power Systems***

1. What is the principal difference between a hydraulic power system and a pneumatic power system?
2. Give three methods by which a hydraulic reservoir can be pressurised?
3. Describe two types of variable delivery pumps and explain the operation of each.
4. How does a pressure regulator or unloading valve serve to prolong the life of the system pump?
5. How are the selector valves in an open-center system connected with respect to each other?
6. What can occur if a sequence valve is not properly adjusted?
7. What precautions should be taken before removing an accumulator from a hydraulic system?
8. How is lowered pressure obtained from the high pressure air source?
9. What conditions can cause banging or chattering in a hydraulic system?
10. What may cause the pressurised section of a hydraulic system to lose pressure?

## ***VI. Plastics***

1. What are the two general classifications of clear plastics used in aircraft and which is more common?
2. Describe the thermal conductivity of plastics in general and its effects upon working with plastics?
3. How is the low thermal conductivity of plastics counteracted?
4. What adjustments to standard drilling practices when drilling partially through plastics?
5. How can heat be applied to plastics for forming?
6. Under what conditions does a technician need to be concerned with the preshrinking of plastics?
7. What is the effect of annealing a plastic and when should annealing be accomplished?
8. Why should machines not be used to polish plastic surfaces?
9. What are the three techniques that can be used to remove paint?
10. Describe the preparation of mounting holes for plastics.

## ***VII. Composite Materials***

1. Why is proper curing technique important to aircraft bonded structures?
2. How are composites different in structure than metals?
3. Where are the greatest and least load-carrying capabilities of a composite?
4. What are the most commonly employed reinforcement fibres used in aviation and how does usage differ?
5. What are the parts of a weave and what is the function of each of these parts?
6. What is a composite matrix and what is its primary function?
7. How are the parts of a two-part matrix measured?
8. What types of defects can be detected by acoustic emission testing?

9. Describe why a knowledge of the coefficient of expansions of the materials involved is important.
10. If damage occurs to core material & replacement piece is required, describe the removal of damaged area.

## ***VIII. Assembly & Rigging***

1. What is the difference between aircraft assembly and rigging?
2. Give a brief description of the procedure for aligning an aircraft structure?
3. How does a controllable trim tab differ from a fixed tab?
4. If the trim tab on a rudder is moved to the right, what effect does it have on the flight of an aircraft?
5. How is the cockpit control for a control system held in the neutral position while rigging?
6. What is the effect of temperature on cable tension?
7. What are the effects of overtightening control cables?
8. How is heading control maintained in a single rotor helicopter?
9. What part of the helicopter is associated with low-frequency vibrations?
10. List the different methods for tracking main rotor blades.

## ***IX. Sheet Metal Structures***

1. Explain some of the causes of cracks in sheet metal structures.
2. Describe how a load is transmitted through a rivet joint.
3. Explain how the rivet gun, rivet set, and bucking bar are used in installing rivets.
4. For what type of work would rotary slitting shears be used?
5. How can very large radius bends be made?

6. Explain how a rivet should be removed from an assembly.
7. If adjacent rows of rivets have different numbers of rivets, how are they best laid out?
8. What are the general design assumptions of an approved sheet metal repair design?
9. How is a load transferred on a multi-row rivet repair?
10. What mechanical property relationships determine edge distance and rivet spacing?

## ***X. Auxiliary Systems***

1. What type of fire-detection system is termed a rate-of-rise detection system?
2. Describe the theory of operation of a spot detector and a thermocouple system.
3. Describe three types of tubular fire detectors, or sensors.
4. Explain the importance of correct routing for overheat and fire warning sensors?
5. Describe the method by which the discharge head attached to a container releases the extinguishing agent.
6. What indicators are required to show the discharge of extinguishing agent?
7. What type of extinguishing agent should be used for electrical fires?
8. What parts of an airplane are subject to ice collection during icing conditions?
9. How are deicer boots attached to leading-edge surfaces and what is the supply source of air and heat?
10. What is the purpose of a takeoff warning system?