

Module 15, GAS TURBINE ENGINE.

15.19, Powerplant Installation.

Q. 1. Pipes, electrical cables and associated components of a fire-detection system should be.

- A. fire resistant.
- B. fire proof.
- C. fire retardant.

Ans.- fire resistant.

Explanation. Sensors are set to actuate at a temperature below melting point of the detector and its associated cables.

Q. 2. The minimum bend radius for a continuous loop type fire wire is.

- A. 1/2 inch.
- B. 1/8 inch.
- C. 1 inch.

Ans.- 1 inch.

Explanation. NIL.

Q. 3. Acoustic linings made from composite materials are used in what section of the engine?

- A. Not used to suppress noise.
- B. Hot section & Cold Section.
- C. Cold section only.

Ans.- Cold section only.

Explanation. RR Page 205 Para 18 refers, but see also Jeppesen Aircraft Gas Turbine Powerplant Page 3-5.

Q. 4. Vibration mounts are used for.

- A. stopping vibrations entering the engines.
- B. preventing engine vibration loads being transmitted to the airframe structure.
- C. damping out vibration stresses on engine when being transported on an engine stand.

Ans.- preventing engine vibration loads being transmitted to the airframe structure.

Explanation. Small GTE's such as the A.P.U in Boeing 757 and 767 use anti vibration mounts.

Q. 5. An aircraft has a heavy landing and on inspection of the engine mounting bolts the bolts torque loading has reduced, you should.

- A. add washers to take up any gap or slackness and re-torque to correct value.

B. remove bolt and carry out inspection as the bolt may have increased in length due to heavy landing.

C. re-torque bolt up to correct torque value.

Ans.- remove bolt and carry out inspection as the bolt may have increased in length due to heavy landing.

Explanation. If the bolt has stretched answers a or b will not return the bolts to the original strength!!.

Q. 6. Forward engine mounts take which loads?.

- A. Thrust, vertical and shear loads.
- B. Centrifugal, thrust and axial.
- C. Thrust, vertical and impact.

Ans.- Thrust, vertical and shear loads.

Explanation. This question is referring to pylon mounted engine mounts.

Q. 7. Forward engine mounts take which form?.

- A. Castings.
- B. forgings.
- C. Fabricated sheet steel.

Ans.- forgings.

Explanation. forgings are the strongest form of manufacture for substantial structure.

Q. 8. Pipes around engines are.

- A. aluminium.
- B. mild seamless steel.
- C. stainless steel.

Ans.- stainless steel.

Explanation. stainless steel is best for corrosion and heat resistance.

Q. 9. Fibrous metallic lining for noise suppression is used.

- A. for lobe type noise suppressors.
- B. in cold area.
- C. in hot area.

Ans.- in hot area.

Explanation. Rolls Royce The Jet engine Page 205 refers.

Q. 10. Noise lining in the fan area is made from.

- A. layers of bonded resin.
- B. porous type Honeycomb and backing sheet.
- C. felt with aluminium sheet.

Ans.- porous type Honeycomb and backing sheet.

Explanation. Rolls Royce The Jet engine Page 205 refers.

Q. 11. A powerplant consists of.

- A. a basic engine plus E.C.U.
- B. a basic engine plus thrust reverser, exhaust system and gear box with accessories.
- C. the complete engine as it would be found on aircraft including all connections, controls, cowlings, intake etc.

Ans.- the complete engine as it would be found on aircraft including all connections, controls, cowlings, intake etc.

Explanation. Rolls Royce the Jet Engine Page 243 para 1 refers.

Q. 12. Acoustic blankets are installed to.

- A. reduce noise levels.
- B. increase thermal efficiency.
- C. aid the streamlining of the engine.

Ans.- reduce noise levels.

Explanation. Acoustic blankets are used in both hot and cold sections. The material depends on the temperature.

Q. 13. When checking the effect of inertia on the engine after heavy landing you would first check the.

- A. thrust line.
- B. compressor shaft for distortion.
- C. module alignment.

Ans.- module alignment.
Explanation. We assume that 'the module' means the powerplant, an initial check will always be the general visual of the powerplant and its cowlings.

Q. 14. Following the reports of a heavy landing you would.

- A. carry out a complete visual examination of the power plant.
- B. examine the engine mountings and borescope the nozzle guide vanes and turbine.
- C. examine the engine mountings and fuse pins.

Ans.- carry out a complete visual examination of the power plant.

Explanation. C.A.A.I.Ps Leaflet 6-3 refers to inspection of pylons, mounts and cowlings. As all of these form part of the Powerplant then answer b is most correct.

Q. 15. The purpose of spring back and cushion on an engine power lever is.

- A. used when friction builds up in a system.

- B. used to prevent the controls hitting the fuel control stops.

- C. used when full travel is used but slight movement is still required on the fuel control unit.

Ans.- used when full travel is used but slight movement is still required on the fuel control unit.

Explanation. See the dash-pot throttle in RR The Jet Engine page 101.

Q. 16. What are sometimes installed in an engine mounting system to tune out the worst engine vibrations?.

- A. Spring cushioned mounting pads.
- B. Vibration absorbers of calibrated weight.
- C. Rubber encased wire-mesh vibration isolators.

Ans.- Rubber encased wire-mesh vibration isolators.

Explanation. A.P.U's use this sort of engine mount.

Q. 17. Where are the lifting points on a high bypass turbine engine?.

- A. On the fan and compressor casing.
- B. On the fan, turbine and compressor casing.
- C. On the fan and turbine casing.

Ans.- On the fan and turbine casing.

Explanation. Assuming this means lifting with a typical bootstrap kit forward and aft mounts attach to the winches.

Q. 18. Rubber anti-vibration pads are fitted to engine.

- A. components to prevent fatigue.
- B. cradles to prevent damage during transportation.
- C. pylons to prevent vibration through the airframe.

Ans.- pylons to prevent vibration through the airframe.

Explanation. Quite often used in conjunction with cone bolt mountings.

Q. 19. Engine thrust is transmitted through mountings that.

- A. are designed to transmit eng thrust equally through front and rear supports.

- B. are designed to prevent the thrust line of the engine varying.

- C. allow for radial and axial expansion.

Ans.- allow for radial and axial expansion.

Explanation. NIL.

Q. 20. If you reduced the length of bellcrank (2) what would happen to the input to the F.C.U?.

- A. remain the same.

B. reduce.

C. increase.

Ans.- increase.

Explanation. Reducing the arm from points 1 to 2 would decrease the arm length from the centre of rotation on the F.C.U to the connection on the belcrank. This would INCREASE the amount of rotary movement into the F.C.U.

15.20 Fire Protection Systems

Q. 1. A fire wire is installed.

A. to withstand inertia, vibration, etc, encountered during normal operation.

B. vertically.

C. horizontally.

Ans.- to withstand inertia, vibration, etc, encountered during normal operation.

Explanation. Firewires can be any shape or position, retained in rubber clips.

Q. 2. Resistive and capacitive type firewires are tested with.

A. megger/voltmeter.

B. megger/ohmmeter.

C. multimeter.

Ans.- megger/ohmmeter.

Explanation. Jepperson A&P Powerplant Page 11-11 refers.

Q. 3. Fire wire clips have rubber in them to.

A. stop heat transfer to the element.

B. insulate the fire wire electrically.

C. support the wire.

Ans.- support the wire.

Explanation. Jepperson A&P Powerplant Page 11-9 refers.

Q. 4. Fire extinguishers work by.

A. combining with remaining oxygen to get rid of it.

B. creating more oxygen.

C. reducing oxygen.

Ans.- combining with remaining oxygen to get rid of it.

Explanation. Jepperson Gas Turbine Powerplants Page 13-6 refers (Halon 1211).

Q. 5. Fire detection systems which are routed

through another zone.

A. must be protected by the use of heat sinks.

B. must be protected from heat sources in the zone.

C. are not allowed.

Ans.- must be protected from heat sources in the zone.

Explanation. JAR 25.1203 states that a fire detection device must not pass through another zone unless it is protected from the heat of that zone.

Q. 6. The test switch of a continuous loop detector gives a.

A. continuity check.

B. insulation check.

C. bonding check.

Ans.- continuity check.

Explanation. Jepperson Gas Turbine Powerplant Page 13-3.

Q. 7. What are the types of continuous fire detection system?.

A. Capacitance.

B. Capacitance and resistance.

C. Inductance and capacitance.

Ans.- Capacitance and resistance.

Explanation. Jepperson Gas Turbine Powerplant Page 13-3.

Q. 8. What is the operating principle of the spot detector sensor in a fire detection system?.

A. A conventional thermocouple that produces a current flow.

B. A bimetallic thermoswitch that closes when heated to a high temperature.

C. Resistant core material that prevents current flow at normal temperatures.

Ans.- A bimetallic thermoswitch that closes when heated to a high temperature.

Explanation. Jeppesen A&P Powerplant Textbook 11-2.

Q. 9. In a fixed fire-extinguishing system, there are two small lines running from the system and exiting overboard. These line exit ports are covered with a blowout type indicator disc. Which of the following statements is true?.

A. When the red indicator disc is missing, it indicates the fire extinguishing system has been normally discharged.

B. When the green indicator disc is missing, it indicates the fire extinguishing system has had a thermal discharge.

C. When the yellow indicator disc is missing, it indicates the fire extinguishing system has been normally discharged.

Ans.- When the yellow indicator disc is missing, it indicates the fire extinguishing system has been normally discharged.

Explanation. NIL.

Q. 10. Two continuous-loop fire detection systems that will not test due to a broken detector element are the.

A. thermocouple system and the Lindberg system.

B. Kidde system and the Fenwal system.

C. Kidde system and the Lindberg system.

Ans.- Kidde system and the Fenwal system.

Explanation. Jeppesen A&P Powerplant Textbook 16-15.

Q. 11. Which of the following fire detection systems measures temperature rise compared to a reference temperature?.

A. Lindberg continuous element.

B. Thermocouple.

C. Thermal switch.

Ans.- Thermocouple.

Explanation. Jeppesen A&P Powerplant Textbook 11-4.

Q. 12. A fire involving energized electrical equipment is defined as a.

A. class B fire.

B. class D fire.

C. class C fire.

Ans.- class C fire.

Explanation. NIL.

Q. 13. How are most aircraft turbine engine fire extinguishing systems activated?.

A. Manual remote control valve.

B. Pushrod assembly.

C. Electrically discharged cartridges.

Ans.- Electrically discharged cartridges.

Explanation. NIL.

Q. 14. A fire detection system that operates on the rate of temperature rise is a.

A. thermocouple system.

B. thermal switch system.

C. continuous loop system.

Ans.- thermocouple system.

Explanation. NIL.

Q. 15. Why does one type of Fenwal fire detection system use spot detectors wired in parallel between two separate circuits?.

A. So that a single fault may exist in the system without sounding a false alarm.

B. To provide an installation that is equal to two separate systems: a primary system and a secondary, or back-up system.

C. So that a double fault may exist in the system without sounding a false alarm.

Ans.- So that a single fault may exist in the system without sounding a false alarm.

Explanation. NIL.

Q. 16. How does carbon dioxide (CO₂) extinguish an aircraft engine fire?.

A. By lowering the temperature to a point where combustion will not take place.

B. The high pressure spray lowers the temperature and blows out the fire.

C. Contact with the air converts the liquid into snow and gas which smothers the flame.

Ans.- Contact with the air converts the liquid into snow and gas which smothers the flame.

Explanation. NIL.

Q. 17. A fuel or oil fire is defined as a.

A. class B fire.

B. class C fire.

C. class A fire.

Ans.- class B fire.

Explanation. NIL.

Q. 18. Which of the following is the safest fire extinguishing agent to use from a standpoint of toxicity and corrosion hazards?.

A. Bromotrifluoromethane (Halon 1301).

B. Bromochlorodifluoromethane (Halon 1211).

C. Dibromodifluoromethane (Halon 1202).

Ans.- Bromotrifluoromethane (Halon 1301).

Explanation. NIL.

Q. 19. The explosive cartridge in the discharge valve of a fire extinguisher container is.

A. not a life dated unit.

B. a life dated unit.

C. mechanically fired.

Ans.- a life dated unit.

Explanation. Jeppesen A&P Technician Airframe Textbook 16-22.

Q. 20. A fire detection system operates on the principle of a buildup of gas pressure within a tube proportional to temperature. Which of the following systems does this statement define?.

- A. Thermal switch system.
- B. Lindberg continuous element system.
- C. Kidde continuous loop system.

Ans.- Lindberg continuous element system.

Explanation. Jeppesen A&P Technician Powerplant Textbook 11-16.

Q. 21. The most satisfactory extinguishing agent for an intake fire is.

- A. methyl bromide.
- B. dry chemical.
- C. carbon dioxide.

Ans.- dry chemical.

Explanation. Jeppesen A&P Technician Propulsion Textbook 16-22.

Q. 22. How is the fire extinguishing agent distributed in the engine section?.

- A. Spray nozzles and perforated tubing.
- B. Spray nozzles and fluid pumps.
- C. Nitrogen pressure and slinger rings.

Ans.- Spray nozzles and perforated tubing.

Explanation. Jeppesen A&P Technician Propulsion Textbook 16-22.

Q. 23. What is the principle of operation of the continuous loop fire detector system sensor?.

- A. Core resistance material which prevents current flow at normal temperatures.
- B. A bimetallic thermoswitch which closes when heated to a high temperature.
- C. Fuse material which melts at high temperatures.

Ans.- Core resistance material which prevents current flow at normal temperatures.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 24. The fire detection system that uses a single wire surrounded by a continuous string of ceramic beads in a tube is the.

- A. Kidde system.
- B. thermocouple system.
- C. Fenwal system.

Ans.- Fenwal system.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 25. The fire detection system that uses two wires imbedded in a ceramic core within a tube is the.

- A. Lindberg system.
- B. Kidde system.
- C. Fenwal system.

Ans.- Kidde system.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 26. A continuous loop fire detector is what type of detector?.

- A. Rate of temperature rise detector.
- B. Spot detector.
- C. Overheat detector.

Ans.- Overheat detector.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 27. Which of the following fire detection systems will detect a fire when an element is inoperative but will not test when the test circuit is energized?.

- A. The Kidde system and the Fenwal system.
- B. The thermocouple system and the Lindberg system.

C. The Kidde system and the thermocouple system.

Ans.- The Kidde system and the Fenwal system.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 28. After a fire is extinguished, or overheat condition removed in aircraft equipped with a Systron-Donner fire detector, the detection system.

- A. must be manually reset.
- B. automatically resets.
- C. sensing component must be replaced.

Ans.- automatically resets.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-7.

Q. 29. For fire detection and extinguishing purposes, aircraft powerplant areas are divided into fire zones based on.

- A. the volume and smoothness of the airflow through engine compartments.
- B. engine type and size.
- C. hot and cold sections of the engine.

Ans.- hot and cold sections of the engine.

Explanation. NIL.

Q. 30. What is the function of a fire detection system?.

- A. To discharge the powerplant fire extinguishing system at the origin of the fire.
- B. To activate a warning device in the event of a powerplant fire.
- C. To identify the location of a powerplant fire.

Ans.- To activate a warning device in the event of a powerplant fire.

Explanation. NIL.

Q. 31. What retains the nitrogen charge and fire extinguishing agent in a high rate of discharge (HRD) container?.

- A. Pressure gauge and cartridge.
- B. Breakable disk or fusible disk.
- C. Pressure switch and check tee valve.

Ans.- Breakable disk or fusible disk.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-15.

Q. 32. The use of water on class D fires.

- A. will cause the fire to burn more violently and can cause explosions.
- B. has no effect.
- C. is most effective if sprayed in a fine mist.

Ans.- will cause the fire to burn more violently and can cause explosions.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-12.

Q. 33. The pulling out (or down) of an illuminated fire handle in a typical large jet aircraft fire protection system commonly accomplishes what events?.

- A. Closes fuel shutoff, closes hydraulic shutoff, disconnects the generator field, and arms the fire extinguishing system.
- B. Closes fuel shutoff, closes hydraulic shutoff, closes the oxygen shutoff, disconnects the generator field, and arms the fire-extinguishing system.
- C. Closes all firewall shutoff valves, disconnects the generator, and discharges a fire bottle.

Ans.- Closes fuel shutoff, closes hydraulic shutoff, disconnects the generator field, and arms the fire extinguishing system.

Explanation. NIL.

Q. 34. The most satisfactory extinguishing agent for an electrical fire is.

- A. carbon tetrachloride.
- B. methyl bromide.
- C. carbon dioxide.

Ans.- carbon dioxide.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-13

Q. 35. Which of the following fire detectors are commonly used in the power section of an engine nacelle?.

- A. Rate of temperature rise detectors.
- B. CO detectors.
- C. Smoke detectors.

Ans.- Rate of temperature rise detectors.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-3.

Q. 36. Which of the following fire detection systems uses heat in the normal testing of the system?.

- A. The Kidde system and the Fenwal system.
- B. The thermocouple system and the Lindberg system.
- C. The thermocouple system and the Fenwal system.

Ans.- The thermocouple system and the Lindberg system.

Explanation. Jeppesen A&P Technician Propulsion Textbook 11-5.

Q. 37. How are extinguisher spray rings checked for freedom from obstruction?.

- A. Firing the system.
- B. Blowing through with compressed air.
- C. Pumping water through the system.

Ans.- Blowing through with compressed air.

Explanation. Answer a is the only reasonable answer.

Q. 38. What is used as an extinguishant in fire bottles?.

- A. Freon compounds.
- B. Halogenated hydrocarbons.
- C. Water.

Ans.- Halogenated hydrocarbons.

Explanation. Jeppesen Aircraft Gas Turbines Powerplant Page 13-6 refers, BUT Halogenated Hydrocarbons are Freon compounds. Rolls Royce Page 157 also refers.

Q. 39. The advantage of the two shot fire bottle system is.

- A. one bottle can be discharged after certain time delay from the other bottle.
- B. both bottles can be used in either of the engines.
- C. one bottle can be used twice.

Ans.- both bottles can be used in either of the engines.

Explanation. Jeppesen Gas Turbine Engines 13-6 refers. Note that each bottle can only be discharged once.

Q. 40. To check a fire bottle in situ is serviceable.

- A. weigh it, check blow out discs, check pressure.
- B. check blow out disc only.
- C. check blow out disc, pop up indicators, expiry date and pressure.

Ans.- check blow out disc, pop up indicators, expiry date and pressure.

Explanation. C.A.I.Ps AL3/10 para 4.3 mentions all these things.

Q. 41. Resistive type fire-wires are tested using.

- A. megger/ohmmeter.
- B. ammeter/ohmmeter.
- C. megger/voltmeter.

Ans.- megger/ohmmeter.

Explanation. The megger tests insulation the ohmmeter tests continuity.

Q. 42. When testing an installed fire bottle.

- A. a multimeter used.
- B. a lamp and 1.5V cell used.
- C. a safety ohmmeter is used.

Ans.- a safety ohmmeter is used.

Explanation. Any explosive device requires the use of a safety ohmmeter to limit current flow through the ignitor.

Q. 43. On checking a fault free fire detection system.

- A. use megger as per normal.
- B. a megger is never to be used.
- C. use a megger only for a short while as it can polarise the element.

Ans.- use a megger only for a short while as it can polarise the element.

Explanation. The fault free or continuous loop firewire is capacitive and resistive. Prolonged use of the

megger could polarise or charge the firewire, to give a false capacitive reading.

Q. 44. 3 ways to test serviceability of a fixed fire bottle in situ are.

- A. weigh, pressure, blow-out disc.
- B. weigh, pressure, pop up indicator.
- C. pressure, pop up indicator, blow-out disc.

Ans.- pressure, pop up indicator, blow-out disc.

Explanation. A&P Mechanic Handbook EA-AC-65 Page 401 refers(You can't weigh the bottle in situ).

Q. 45. When installing a flow valve on a 'two shot' fire extinguishing system care must be taken to make sure.

- A. flow arrow should be in a correct direction.
- B. flow valve is pointing towards the respective bottle.

C. priority system must have the bigger flow side.

Ans.- flow arrow should be in a correct direction.

Explanation. Two shot systems do not have any priority. Any flow valve must be fitted in the right direction which is toward the engine not the bottle!

Q. 46. Omission of crushable washer on engine fire-wire connector will.

- A. allow moisture ingress.
- B. affect fire wire continuity.
- C. affect fire wire capacitance.

Ans.- allow moisture ingress.

Explanation. Jeppesen A&P power plant page 11-10 refers to copper crush washers at the connectors.

Answers a and c cannot be right therefore b makes best sense.

Q. 47. Discharge cartridges of the fire bottle have.

A. life time in hours/calendar and replace which ever is longer.

B. life time in hours/or calendar and replace which ever is sooner.

C. no life time it is only replaced when unserviceable.

Ans.- life time in hours/or calendar and replace which ever is sooner.

Explanation. Operators usually change cartridges at planned checks. The cartridge also has a finite manufactures calendar life. This is normally longer.

Q. 48. The Kidde Fault Free Fire detection system has how many internal wires in the sensing element?.

A. 1.

B. 3.

C. 2.

Ans.- 2.

Explanation. Jeppesen Gas Turbine Powerplants

Page 12-5 Refers.

B. extinguisher distributed twice to each

enginecompartment.

C. one squib can be fired, if that fails then the 2nd squib can be fired.

Ans.- extinguishers distributed once to either engine compartment.

Explanation. One shot from each bottle to either engine or both shots to one engine.

Q. 49. When testing a two pin fire bottle connector.

A. continuity test 1 pin then short two together.

B. short two pins together.

C. continuity test 1 pin, then the other, then short two together.

Ans.- short two pins together.

Explanation. C.A.I.Ps EEL/1-7 para 3.6.4 States that to check for insulation short two pins together and check for insulation resistance between body and shorted pins from body.

Q. 50. Gas type fire-wires operate by utilising.

A. the change in the gas pressure.

B. the change in the gas dielectric level.

C. the change in the electrical resistance of the gas.

Ans.- the change in the gas pressure.

Explanation. RR The Jet Engine page 156 Para 16 refers. These gas filled type fire-wires go by the name of 'Systron Donner'.

Q. 51. On a fire bottle, if the indicator pin was protruding, this would indicate.

A. the bottle is under weight.

B. extinguisher had been fired.

C. an over pressure had occurred in the bottle.

Ans.- extinguisher had been fired.

Explanation. C.A.I.P's AL/3-10 describes and shows a discharge indicator pin device.

Q. 52. When testing a squib on a fire bottle, you use

a.

A. multimeter (AVO).

B. low current ohmmeter.

C. lamp and 1.5V cell.

Ans.- low current ohmmeter.

Explanation. Rolls Royce the Jet Engine Page 28 refers.

Q. 53. In a two shot fire extinguishing system.

A. extinguishers distributed once to either engine compartment.

Q. 54. Methyl Bromide fire extinguisher are installed with neck.

A. horizontal.

B. at the bottom.

C. at the top.

Ans.- at the top.

Explanation. The heavier fluid is pushed out of the bottle by the head of gas sitting above the liquid.

Q. 55. In a Fenwall fire detection system.

A. the tube is inconel and wire is nickel.

B. inner electrode is inconel wire.

C. outer electrode is nickel tube.

Ans.- the tube is inconel and wire is nickel.

Explanation. NIL www.fenwallcontrols.com

Q. 56. When a fire extinguisher is discharged the immediate action is.

A. operate engine to idle.

B. clean with cold water.

C. clean with hot water.

Ans.- clean with hot water.

Explanation. When the extinguishant is introduced into the gas path hot water should be used. Jeppesen Gas Turbine Powerplants Page 13-8 refers.

15.21, Engine Monitoring and Ground Operation.

Q. 1. Who establishes the recommended operating time between overhauls (T.B.O) of a gas turbine engine.

A. The engine manufacturer.

B. The operator (utilizing manufacturer data and trend analysis) working in conjunction with the Airworthiness Authority.

C. The Airworthiness Authority alone.

Ans.- The operator (utilizing manufacturer data and trend analysis) working in conjunction with the Airworthiness Authority.

Explanation. Jeppesen A&P Powerplant Textbook 3-27.

Q. 2. What is the first engine instrument indication of a successful start of a turbine engine?.

- A. A rise in oil pressure.
- B. A rise in the engine fuel flow.
- C. A rise in the exhaust gas temperature.

Ans.- A rise in the exhaust gas temperature.

Explanation. NIL.

Q. 3. A hung start is indicated by the.

- A. exhaust gas temperature exceeds specified limits.
- B. fails to reach idle RPM.
- C. RPM exceeds specified operating speed.

Ans.- fails to reach idle RPM.

Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 4. The blending of blades and vanes in a turbine engine.

- A. may sometimes be accomplished with the engine installed, ordinarily using power tools.
- B. should be performed parallel to the length of the blade using smooth contours to minimize stress points.
- C. is usually accomplished only at engine overhaul.

Ans.- No Answer.

Explanation. NIL.

Q. 5. During inspection, turbine engine components exposed to high temperatures may only be marked with such materials as allowed by the manufacturer. These materials generally include.

- A. layout dye, commercial felt tip marker or chalk.
- B. layout dye, commercial felt tip marker, wax or grease pencil.
- C. layout dye, commercial felt tip marker, wax or grease pencil, chalk or graphite lead pencil.

Ans.- layout dye, commercial felt tip marker or chalk.

Explanation. Jeppesen A&P Powerplant Textbook 4-26.

Q. 6. When the leading edge of a first stage turbine blade is found to have stress rupture cracks, which of the following should be suspected?.

- A. Faulty cooling shield.
- B. Over speed condition.
- C. Over temperature condition.

Ans.- Over temperature condition.

Explanation. Jeppesen A&P Powerplant Textbook 4-25.

Q. 7. A magnetic chip detector inspection should be carried out.

- A. within a specified time from shut down.
- B. with engine cold.
- C. with engine running.

Ans.- within a specified time from shut down.

Explanation. A.L.F 502 and 507 engines on 146/R.J specify that the engine M.C.D be checked after 20mins but before 2 hrs since shut down.

Q. 8. What is the proper starting sequence for a turbojet engine?.

- A. Starter, ignition, fuel.
- B. Starter, fuel, ignition.
- C. Ignition, starter, fuel.

Ans.- Starter, ignition, fuel.

Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 9. Foreign object damage on a compressor, when boroscoping, is indicated by.

- A. tip curl.
- B. nicks and scores.
- C. flats.

Ans.- nicks and scores.

Explanation. Jepperson Gas Turbine Powerplants Page 5-13 refers.

Q. 10. Turbine blades are generally more susceptible to operating damage than compressor blades because of.

- A. higher temperature stresses.
- B. higher centrifugal loading.
- C. high pressure and high velocity gas flow.

Ans.- higher temperature stresses.

Explanation. NIL.

Q. 11. A magnetic chip detector detects.

- A. particles held in suspension.
- B. particles which are too small for the naked eye.
- C. ferrous particles only.

Ans.- ferrous particles only.

Explanation. Jepperson Gas Turbine Powerplants Page 6-26 refers.

Q. 12. A cool-off period prior to shutdown of a turbine engine is done to.

A. prevent vapor lock in the fuel control and/or fuel lines.

B. prevent seizure of the engine bearings.

C. allow the turbine wheel to cool before the case contracts around it.

Ans.- allow the turbine wheel to cool before the case contracts around it.

Explanation. Jeppesen A&P Powerplant Textbook 4-9.

Q. 13. When starting a turbine engine, the starter should be disengaged.

A. only after the engine has reached full idle RPM.

B. when the ignition and fuel system are activated.

C. after the engine has reached self-sustaining speed.

Ans.- after the engine has reached self-sustaining speed.

Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 14. What should be done initially if a turbine engine catches fire when starting?.

A. Continue starting attempt in order to blow out the fire.

B. Continue engine start rotation and discharge a fire extinguisher into the intake.

C. Turn off the fuel and continue engine rotation with the starter.

Ans.- Turn off the fuel and continue engine rotation with the starter.

Explanation. Jeppesen A&P Powerplant Textbook 4-7.

Q. 15. A turbine engine hot section is particularly susceptible to which kind of damage?.

A. Scoring.

B. Galling.

C. Cracking.

Ans.- Cracking.

Explanation. NIL.

Q. 16. If a turbine engine is unable to reach takeoff E.P.R before its E.G.T limit is reached, this is an indication that the.

A. fuel control must be replaced.

B. E.G.T controller is out of adjustment.

C. compressor may be contaminated or damaged.

Ans.- compressor may be contaminated or damaged.

Explanation. NIL.

Q. 17. Which of the following engine variables is the most critical during turbine engine operation?.

A. Compressor RPM.

B. Turbine inlet temperature.

C. Compressor inlet air temperature.

Ans.- Turbine inlet temperature.

Explanation. NIL.

Q. 18. With the engine running at idle, the E.P.R system reads just over 1.

A. The system has failed and needs attention.

B. The system needs re-calibration back to '1'.

C. This is a normal condition and does not need attention.

Ans.- This is a normal condition and does not need attention.

Explanation. E.P.R with the engine shut down should read 1. At idle a very small pressure increase occurs in the jet pipe.

Q. 19. The recurrent ingestion of dust or other fine airborne particulates into an engine can result in.

A. the need for less frequent abrasive grit cleaning of the engine.

B. foreign object damage to the compressor section.

C. erosion damage to the compressor and turbine sections.

Ans.- erosion damage to the compressor and turbine sections.

Explanation. NIL.

Q. 20. When the engine is not running, and engine blanks are installed. The E.P.R gauge shows 1.0, then.

A. the transmitter is faulty.

B. the receiver is faulty.

C. it is normal.

Ans.- it is normal.

Explanation. Jepperson Gas Turbine Powerplant Page 12-17 Figure 12-12A.

Q. 21. Which of the following may be used to accomplish internal inspection of an assembled gas turbine engine?.

A. Ultrasound, and fluorescent penetrant and ultraviolet light.

B. X-ray and a borescope.

C. Infrared photography and fluorescent penetrant and ultraviolet light.

Ans.- X-ray and a borescope.

Explanation. NIL.

Q. 22. Run down time is indicative of.

- A. an F.C.U malfunction.
- B. compressor malfunction.
- C. the freedom of rotation of the compressor.

Ans.- the freedom of rotation of the compressor.

Explanation. Short run down time is indicative of bearing failure.

Q. 23. A hung start or false start is one in which.

- A. 'light up' occurs, but the RPM does not increase.
- B. there is no 'light up'.
- C. the engine does not rotate.

Ans.- 'light up' occurs, but the RPM does not increase.

Explanation. Jeppesen Gas Turbine Powerplants Page 10-1 Refers.

Q. 24. What would be the possible cause if a gas turbine engine has high exhaust gas temperature, high fuel flow, and low RPM at all engine power settings?

- A. Fuel control out of adjustment.
- B. Loose or corroded thermocouple probes for the E.G.T indicator.
- C. Turbine damage or loss of turbine efficiency.

Ans.- Turbine damage or loss of turbine efficiency.

Explanation. Jeppesen A&P Powerplant Textbook 4-5.

Q. 25. In regard to using a turbine engine oil analysis program, which of the following is NOT true?

- A. It is best to start an oil analysis program on an engine when it is new.
- B. A successful oil analysis program should be run over an engine's total operating life so that normal trends can be established.
- C. Generally, an accurate trend forecast may be made after an engine's first oil sample analysis.

Ans.- Generally, an accurate trend forecast may be made after an engine's first oil sample analysis.

Explanation. NIL.

Q. 26. Which of the following is the least likely indication of a main bearing failure?

- A. High oil consumption.
- B. High oil temperature.
- C. High oil pressure.

Ans.- High oil pressure.

Explanation. Low oil pressure would indicate bearing failure not High!.

Q. 27. After shutdown, flames are present in the exhaust pipe. The probable cause is.

- A. a defective fuel control unit (F.C.U).
- B. a defective pressurizing and dump valve.
- C. a defective H.P cock.

Ans.- a defective pressurizing and dump valve.

Explanation. Jeppesen Gas Turbine Powerplant Page 7-56 refers.

Q. 28. If the L.P cock is used to shutdown an engine.

- A. the F.C.U will continue to function.
- B. flames will appear in the exhaust.
- C. the H.P fuel pump will run dry.

Ans.- the H.P fuel pump will run dry.

Explanation. The L.P cock is normally aircraft mounted. The engine will run until the H.P fuel pump runs dry.

Q. 29. When accelerating from 'light-up' to ground idling speed, the E.G.T will.

- A. remain constant.
- B. increase above idle value then decrease to normal.
- C. decrease below idle value then increase to normal.

Ans.- increase above idle value then decrease to normal.

Explanation. All Gas Turbines tend to overfuel until the RPM increases sufficiently to supply correct idle air flow.

Q. 30. A gas turbine engine is stopped by closing.

- A. L.P cock.
- B. H.P cock.
- C. throttle valve.

Ans.- H.P cock.

Explanation. Rolls Royce The Jet Engine Page 110 refers.

Q. 31. A 'wet start' is indicated by.

- A. no temperature indication.
- B. low RPM.
- C. a prolonged cranking period.

Ans.- no temperature indication.

Explanation. Due to lack of ignition.

Q. 32. The engine accelerates to idling by.

- A. gas flow.
- B. combined efforts of starter motor and gas flow.
- C. starter motor.

Ans.- combined efforts of starter motor and gas flow.

Explanation. NIL.

Q. 33. An oil emission spectrometer measures.

- A. particles in suspension.
- B. particles on the surface.
- C. specific gravity of the oil.

Ans.- particles in suspension.

Explanation. The colour of the spectrum produced upon burning the oil indicates parts per million of all metallic elements contained in the sample.

Q. 34. A broadband vibration reading indicates.

- A. the total vibration sensed by the transducer.
- B. the peak allowable vibration.
- C. the N1 vibration.

Ans.- the total vibration sensed by the transducer.
Explanation. Broadband is the total of all the vibrations sensed.

Q. 35. Vibration analysers determine which component is vibrating by analysing.

- A. voltage.
- B. amplitude.
- C. frequency.

Ans.- frequency.

Explanation. The faster the compressor shafts rotate the higher the frequency.

Q. 36. High frequency vibration.

- A. causes engine components to crack.
- B. energises air particles prior to compression.
- C. can give an indication of a fluctuating (E.P.R).

Ans.- causes engine components to crack.

Explanation. The more vibration cycles the nearer to failure the component will become.

Q. 37. Engine oil sampling analysis is taken.

- A. after engine shut down.
- B. at specific time after engine shut down.
- C. when oil level is high.

Ans.- at specific time after engine shut down.

Explanation. Jeppesen A&P Powerplant page 9-35 refers.

Q. 38. With external power applied, the engine will not run up to idle after reaching starting speed. The likely fault would be with the.

- A. Fuel Control Unit.
- B. clutch.
- C. battery.

Ans.- Fuel Control Unit.

Explanation. Once an engine has reached starter cut out speed the only thing that can stop it accelerating is underfuelling.

Q. 39. When running down an engine.

- A. it should be done as slowly as possible to assist thermal stress.
- B. it should be done as quickly as possible to stop excess of fuel gathering.
- C. it should be done as slowly as possible to reduce thermal stress.

Ans.- it should be done as slowly as possible to reduce thermal stress.

Explanation. Jeppesen Aircraft Gas Turbine Powerplant Page 14-2 refers.

Q. 40. What may be an indication of a bleed valve stuck in the closed position?.

- A. Over speed.
- B. Low E.G.T reading.
- C. Compressor stalling at low RPM.

Ans.- Compressor stalling at low RPM.

Explanation. A closed bleed valve at low RPM means the compressor has too much air to handle, hence it may stall or surge.

Q. 41. Excessive E.G.T can.

- A. cause N.G.V to creep.
- B. cause damage to turbine.
- C. cause damage to jet pipe.

Ans.- cause damage to turbine.

Explanation. The turbine is the highest stressed component in the engine.

Q. 42. A jet engine has a high oil temperature but all other power parameters are normal. The probable cause is.

- A. a large quantity of oil being returned to tank.
- B. gear box leakage.
- C. a main bearing in distress.

Ans.- a main bearing in distress.

Explanation. Oil systems cool as well as lubricate.

Q. 43. When cleaning salt from a compressor.

- A. use water then manufacturer's cleaning solution.
- B. use water at low power then water at high power.
- C. never use water, use only the recommended solution.

Ans.- use water at low power then water at high power.

Explanation. Jeppesen Aircraft gas turbine Powerplants Page 5-5 refers to desalination washes using water only.

Q. 44. A hot start refers to.

- A. early ignition.
- B. high E.G.T before idle RPM is achieved.
- C. too much fuel being supplied.

Ans.- high E.G.T before idle RPM is achieved.

Explanation. A hot start is defined as an overtemping of the engine as the engine starts. It may be caused by overfuelling, but not necessarily.

Q. 45. If a compressor surge occurs, it is recognized by.

- A. coughing in the compressor and vibration.
- B. fluctuating RPM and fuel flow.
- C. fluctuating E.G.T and thrust.

Ans.- coughing in the compressor and vibration.

Explanation. Whilst E.G.T and RPM will fluctuate, fuel flow will not and thrust cannot be measured.

Therefore coughing and vibration is the correct answer.

Q. 46. Cracks may occur in hot section components of a turbine engine if they are marked during inspection with.

- A. a lead pencil.
- B. chalk.
- C. layout dye.

Ans.- a lead pencil.

Explanation. Graphite based markers can cause intergranular corrosion. See Jeppesen Gas Turbine Powerplants Page 5-31.

Q. 47. What must not be used during an engine compressor wash?.

- A. Chlorine.
- B. Desalinization solution.
- C. Crushed almond.

Ans.- Chlorine.

Explanation. By elimination b is correct. Crushed almond and desalination solutions are accepted compressor wash applications.

Q. 48. Trend monitoring of spectrometric oil analysis is carried out how often?.

- A. During each scheduled maintenance period.
- B. At set periods once the rate of wear has been established.
- C. After every repair or modification.

Ans.- At set periods once the rate of wear has been established.

Explanation. New components always wear more than when they are run in. SOAP monitoring periods depend on the component not on the aircraft servicing cycle.

Q. 49. Starting an engine with a bleed valve stuck closed would cause:..

- A. low E.G.T.
- B. possible stalling of the engine.
- C. high E.G.T.

Ans.- possible stalling of the engine.

Explanation. Bleed valves are normally open on start to prevent stalling.

Q. 50. Galling is a condition caused by excessive.

- A. chafing.
- B. scoring.
- C. temperatures.

Ans.- chafing.

Explanation. See Dale Crane - Dictionary of Aircraft Terms.

Q. 51. If a burner was down, in a multi-can system, the engine would tend to.

- A. hang up.
- B. run up.
- C. surge.

Ans.- surge.

Explanation. If a combustor tube fails to ignite there will be a pressure build up at the entrance to that burner can.

Q. 52. If the rundown time is less than the minimum stated for a given engine.

- A. unacceptable wear is occurring at the main bearings.
- B. the rotating assembly is free.
- C. the rotating assembly is being restricted.

