

C-5 Auxiliary Power Unit (APU) Practice Test (Sample)

Study Guide



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SAMPLE

Questions

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- 1. What key feature enhances the operational capability of the C-5 APU?**
 - A. Its ability to generate thrust**
 - B. Its independence from external power sources**
 - C. Its use of renewable energy sources**
 - D. Its lightweight construction**
- 2. What must be accomplished if there is no external power available for an APU start?**
 - A. No action is needed**
 - B. A fire truck must be standing by**
 - C. Backup generator must be activated**
 - D. Inform the captain of the situation**
- 3. What is involved in the starting sequence of the C-5 APU?**
 - A. Engaging a hydraulic system to initiate power**
 - B. Turning the APU turbine with a starter motor**
 - C. Using external battery power for startup**
 - D. Jump-starting from another aircraft**
- 4. What is a significant indicator of APU performance issues?**
 - A. Irregular fluctuations in RPM or power output**
 - B. Consistent fuel consumption**
 - C. Stable temperature readings**
 - D. Visual clarity of exhaust**
- 5. What might occur if safety precautions are not followed during APU maintenance?**
 - A. Enhanced efficiency**
 - B. Increased risk of accidents**
 - C. Improved APU performance**
 - D. Extended service life**

- 6. What component allows the APU to shut down automatically under specific conditions?**
- A. Automatic shutdown system**
 - B. Manual override switch**
 - C. Fuel cutoff valve**
 - D. Electrical emergency disconnect**
- 7. Which hydraulic systems are used to pressurize the APU accumulators?**
- A. Left APU accumulator from #1 SYS, and right APU from the #4 SYS**
 - B. Both APU accumulators from #3 SYS**
 - C. Both APU accumulators from #4 SYS**
 - D. Left APU accumulator from #2 SYS, and right APU from the #1 SYS**
- 8. What is the consequence of not allowing the APU appropriate warm-up time before applying an air load?**
- A. Increased efficiency**
 - B. Risk of damage to APU components**
 - C. No consequence**
 - D. Improved performance**
- 9. What indicates a malfunction if starting the APU?**
- A. Low fuel pressure**
 - B. Incorrect load meter reading**
 - C. Fire detection failure**
 - D. EGT exceeding acceptable limits**
- 10. Where are the APU fire extinguisher bottles located on the aircraft?**
- A. In the cockpit**
 - B. Near the engine compartment**
 - C. In the lower aft corner of the number 4 main landing gear wheel well**
 - D. At the front of the fuselage**

Answers

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1. B
2. B
3. B
4. A
5. B
6. A
7. A
8. B
9. D
10. C

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Explanations

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1. What key feature enhances the operational capability of the C-5 APU?

- A. Its ability to generate thrust**
- B. Its independence from external power sources**
- C. Its use of renewable energy sources**
- D. Its lightweight construction**

The correct answer highlights the independence of the C-5 APU from external power sources. This independence is a crucial feature because it allows the aircraft to operate its systems and engine start without relying on ground support or external power units. This capability is particularly beneficial in remote locations or situations where ground power might not be readily available. As a result, the APU can provide electrical power and pneumatic pressure for air conditioning and engine starting while the aircraft is on the ground, ensuring operational readiness at all times. In contrast, the other features listed, while they may be beneficial in different contexts, do not specifically enhance the operational capability of the C-5 APU in the same fundamental way. The generation of thrust is not the primary function of an APU, since its main role is to support ground operations rather than to propel the aircraft. While lightweight construction can contribute to overall aircraft efficiency, it is not a defining characteristic of the APU's operational capabilities. The use of renewable energy sources is not applicable to the APU, as it typically operates on conventional fuel types, focusing instead on reliability and efficiency in its power generation tasks.

2. What must be accomplished if there is no external power available for an APU start?

- A. No action is needed**
- B. A fire truck must be standing by**
- C. Backup generator must be activated**
- D. Inform the captain of the situation**

When starting the Auxiliary Power Unit (APU) without external power available, having a fire truck standing by is a critical safety measure. This is due to the potential risks involved in the APU start sequence, especially if the procedure does not go as planned. APUs can produce significant heat and include fuel systems that could pose a fire hazard, particularly in confined spaces or in situations where there is a malfunction during start. Having a fire truck on standby ensures that emergency response resources are immediately available to deal with any issues that may arise, such as an engine fire or other emergency conditions that might occur during the start-up process. This proactive approach helps ensure the safety of personnel and equipment during operations where external power is not available.

3. What is involved in the starting sequence of the C-5 APU?

- A. Engaging a hydraulic system to initiate power
- B. Turning the APU turbine with a starter motor**
- C. Using external battery power for startup
- D. Jump-starting from another aircraft

The starting sequence of the C-5 APU involves turning the APU turbine with a starter motor. This is an essential process since the starter motor is specifically designed to provide the initial rotational energy required to start the APU. When the APU is initiated, the starter motor engages to spin the turbine until it reaches a sufficient speed for the main combustor to ignite, allowing the APU to generate power for systems on board the aircraft. This method of starting is reliable and is part of the basic operation of APUs in many aircraft, ensuring a seamless transition from powered-off to operational status. In contrast, engaging a hydraulic system is not a primary function in starting the APU, as hydraulic systems operate independently of the APU startup process. Using external battery power may be a consideration for supporting systems but is not a direct part of the APU's self-contained starting mechanism. Similarly, jump-starting from another aircraft is not a common or standard procedure for starting an APU. The starter motor serves as the definitive starting component in this process, making it the correct answer.

4. What is a significant indicator of APU performance issues?

- A. Irregular fluctuations in RPM or power output**
- B. Consistent fuel consumption
- C. Stable temperature readings
- D. Visual clarity of exhaust

Irregular fluctuations in RPM or power output are indeed a significant indicator of APU performance issues. The Auxiliary Power Unit relies on stable operational parameters to function effectively, and any inconsistencies in RPM or power output can suggest underlying problems, such as mechanical wear, fuel delivery issues, or electrical system malfunctions. These fluctuations often indicate that the APU is not operating within its designed performance envelope, which may lead to unreliable power supply and could compromise the overall functionality of the aircraft systems that rely on it. Identifying and addressing these irregularities promptly is essential to maintain operational efficiency and prevent more serious failures. Consistent fuel consumption, stable temperature readings, and visual clarity of exhaust typically suggest that the APU is functioning normally. While consistent fuel consumption can be a positive sign, it does not provide direct evidence of performance issues, and stable temperature readings would indicate that the APU is operating within expected limits. Similarly, visual clarity of exhaust does not necessarily correlate directly to performance issues, as exhaust quality may vary without signaling a fundamental problem in operation.

5. What might occur if safety precautions are not followed during APU maintenance?

- A. Enhanced efficiency**
- B. Increased risk of accidents**
- C. Improved APU performance**
- D. Extended service life**

During APU maintenance, not following safety precautions can significantly increase the risk of accidents. Safety measures are crucial to protect personnel and equipment from potential hazards that could arise from working with the APU. For instance, the APU includes components that may be hot, pressurized, or contain hazardous fluids. Engaging in maintenance without adhering to safety protocols could lead to injuries such as burns, cuts, or exposure to toxic substances. Moreover, neglecting safety can compromise the operation of the APU itself, leading to incorrect adjustments or repairs that might result in malfunction or failure. In contrast, enhanced efficiency, improved APU performance, and extended service life are outcomes that typically arise from properly performed maintenance done in adherence to safety standards. These outcomes depend on the effectiveness and accuracy of the maintenance process, which safety protocols help to ensure. Without these precautions, the focus shifts from enhancing performance or efficiency to mitigating the risks of harmful incidents.

6. What component allows the APU to shut down automatically under specific conditions?

- A. Automatic shutdown system**
- B. Manual override switch**
- C. Fuel cutoff valve**
- D. Electrical emergency disconnect**

The automatic shutdown system is a critical component in the APU that is designed to enhance safety and reliability. It monitors various parameters such as temperature, oil pressure, and other critical operating conditions. When the system detects abnormal values or conditions that may indicate potential failure or unsafe operation, it initiates an automatic shutdown of the APU to prevent damage to the unit or associated systems. For instance, if the APU overheats or experiences a drop in oil pressure, the automatic shutdown system acts quickly and decisively, ensuring that the APU ceases operation. This function is essential to protect both the equipment and the safety of personnel around the APU. In contrast, options like the manual override switch allow operators to control the APU manually but do not provide automatic protection. The fuel cutoff valve and electrical emergency disconnect are mechanisms that can interrupt the operation of the APU, but they do not autonomously monitor conditions and are not primarily designed for automatic shutdown under specific conditions. Thus, the automatic shutdown system is the most accurate answer to this question as it encapsulates the essential functionality of preventing unsafe operations through automatic detection and response.

7. Which hydraulic systems are used to pressurize the APU accumulators?

- A. Left APU accumulator from #1 SYS, and right APU from the #4 SYS**
- B. Both APU accumulators from #3 SYS**
- C. Both APU accumulators from #4 SYS**
- D. Left APU accumulator from #2 SYS, and right APU from the #1 SYS**

The correct choice, indicating that the left APU accumulator is pressurized by the #1 hydraulic system while the right APU accumulator is pressurized by the #4 hydraulic system, reflects the specific design and functionality of the C-5's hydraulic systems. In the C-5, the APU accumulators rely on separate hydraulic systems for their pressurization to ensure redundancy and reliability in operation. This design is significant because it means that even if one hydraulic system fails, the other can still maintain functionality, enhancing the safety and performance of the APU. The different systems being utilized for each accumulator also allows for better load distribution and can help in balancing hydraulic pressures throughout the aircraft. Other options discussing the use of the #3 or #2 hydraulic systems do not align with the established design principles and operational requirements of the C-5's hydraulic setup, which specifically designates these particular systems for the APU accumulators. Thus, understanding the rationale behind the choice clarifies the importance of hydraulic system configurations in ensuring operational efficacy and reliability.

8. What is the consequence of not allowing the APU appropriate warm-up time before applying an air load?

- A. Increased efficiency**
- B. Risk of damage to APU components**
- C. No consequence**
- D. Improved performance**

Allowing the Auxiliary Power Unit (APU) to warm up properly before applying an air load is crucial for maintaining the integrity and longevity of its components. When an APU is started, its internal components—including the engine, fuel system, and control systems—need to reach optimal operating temperatures to function effectively. If an air load is applied too early, these components might be subjected to excessive stress, leading to potential overheating or mechanical failure. The risk of damage arises because the APU's lubrication system may not be fully effective until the unit has warmed up, which can lead to increased friction and wear on moving parts. Additionally, operating under load before the APU is ready can create imbalances that might strain the engine and its allied systems, potentially leading to premature wear or catastrophic failure. Thus, it is critical to follow recommended warm-up procedures to ensure that the APU functions safely and efficiently, minimizing the likelihood of component damage that could result in costly repairs or replacements.

9. What indicates a malfunction if starting the APU?

- A. Low fuel pressure
- B. Incorrect load meter reading
- C. Fire detection failure
- D. EGT exceeding acceptable limits**

When starting the Auxiliary Power Unit (APU), the indication of a malfunction can be reflected by an Exceeding Gas Temperature (EGT) reading. This is crucial because EGT is a key parameter that monitors the performance and health of the engine. An EGT that exceeds acceptable limits usually signifies that the engine is operating outside its safe operational parameters, which may lead to overheating or potential damage to the APU. Monitoring the EGT is critical during the start-up phase, as it helps ensure the engine is functioning properly and within the designed thermal limits. If the temperature rises excessively, it indicates that there might be underlying problems such as poor airflow, excessive fuel flow, or a malfunctioning component within the APU, all of which require immediate attention to prevent further damage or operational failure. In contrast, while low fuel pressure, incorrect load meter readings, and fire detection failures are also important indicators of APU functionality, they relate to specific operational aspects rather than the immediate health of the engine during start-up like the EGT does. The EGT is a direct measure of engine performance during critical phases, emphasizing its role in indicating potential malfunctions more effectively in this scenario.

10. Where are the APU fire extinguisher bottles located on the aircraft?

- A. In the cockpit
- B. Near the engine compartment
- C. In the lower aft corner of the number 4 main landing gear wheel well**
- D. At the front of the fuselage

The APU fire extinguisher bottles are located in the lower aft corner of the number 4 main landing gear wheel well. This location is strategically chosen for effective access and operation during an emergency situation. The positioning allows for direct application of the extinguishing agent to the APU, which is located in the aft section of the fuselage of the C-5 aircraft. Placing the extinguisher in this area also ensures that it is shielded from potential heat and damage that could occur elsewhere on the aircraft. The correct placement is crucial for quick response times in firefighting scenarios, as it minimizes the distance rescue personnel must travel to access the firefighting equipment. Additionally, the lower aft corner is conducive to the plumbing and mechanics involved in deploying the fire suppression system effectively. Understanding the operational design of the aircraft is essential for addressing safety concerns efficiently, especially in the event of an APU fire where prompt action can prevent damage and ensure the safety of the crew and passengers.