Fort Lauderdale Fire Rescue Driver Engineer Manual Practice Exam (Sample)

Study Guide

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Questions

1. Which of the following factors is NOT considered when calculating friction loss?

- **A. Length of the hose**
- **B. Flow rate of water**
- **C. Height of the building**
- **D. Coefficient for the specific hose type**

2. What should be done with the rope connected to the barrel strainer?

- **A. Leave it loose for flexibility**
- **B. Cut it to ensure no interference**
- **C. Tie it off to keep the strainer in proper position**
- **D. Attach it to the truck for easy access**

3. What type of electric generator is used in the fire truck?

- **A. Honda EU1000iS, 1000KW gas powered**
- **B. Honda EU3000iS, 3000KW gas powered**
- **C. Kawasaki 2000, 2000KW diesel powered**
- **D. Yamaha 4000, 4000KW gas powered**

4. What should the transfer valve be set to for a sprinkler system only?

- **A. Pressure position**
- **B. Volume/capacity position**
- **C. Flow position**
- **D. Emergency position**

5. What is the first step in the engine shutdown procedures?

- **A. Put transmission in 'Drive' position**
- **B. Decrease engine speed back to normal idle and put transmission in 'NEUTRAL' position**
- **C. Turn off all electrical components**
- **D. Activate the emergency brake**

6. What button do you press to select the mode for filling the foam tank?

A. Press FILL to start

B. Press MODE to access options

C. Press PAGE to get to MODE SELECT

D. Press START to initiate

7. What is the recommended procedure for topping off the booster tank during flow operations?

A. Open the tank fill valve fully

B. Open the tank fill valve slightly and control engine RPMs

C. Leave the tank fill valve closed

D. Increase engine speed to maximum

8. When should the engine oil be checked?

A. When the engine is running

B. When the engine is hot

C. When the engine is not running

D. When the engine is cooled

9. How much friction loss occurs for a 5" hose flowing 700 GPM?

A. 3 psi per 100' section

B. 1 psi per 100' section

C. 2 psi per 100' section

D. 4 psi per 100' section

10. What is the maximum working pressure recommended for water relay operations?

A. 100 PSI

B. 150 PSI

C. 200 PSI

D. 250 PSI

Answers

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

Explanations

1. Which of the following factors is NOT considered when calculating friction loss?

A. Length of the hose

B. Flow rate of water

C. Height of the building

D. Coefficient for the specific hose type

When calculating friction loss in a fire service context, factors like the length of the hose, the flow rate of water, and the coefficient for the specific hose type are integral to determining the friction loss that occurs as water travels through the hose. The length of the hose directly impacts friction loss since longer hoses will create more resistance to the flow of water. The flow rate of water is also a critical factor; increased flow rates generally lead to increased friction loss due to the turbulence created within the hose. Additionally, the coefficient for the specific hose type accounts for variations in design and material, which can affect how much friction occurs. In contrast, the height of the building is not directly related to friction loss. While it does influence other aspects of firefighting operations, such as required pumping pressures and elevation differentials, it does not factor into the calculations of friction loss within the hose itself. Therefore, the height of the building is not considered when calculating friction loss.

2. What should be done with the rope connected to the barrel strainer?

A. Leave it loose for flexibility

B. Cut it to ensure no interference

C. Tie it off to keep the strainer in proper position

D. Attach it to the truck for easy access

The choice to tie off the rope connected to the barrel strainer is correct because it ensures that the strainer remains in the proper position during operation. Proper positioning of the strainer is crucial for efficient water drafting, as it needs to remain submerged and stabilized in the water source to function effectively. If the rope is left loose, it could lead to the strainer being pulled out of the optimal position, causing it to suck air instead of water, which would hinder the drafting process. Cutting the rope would eliminate its utility altogether, risking the strainer's stability. Similarly, attaching the rope to the truck may complicate the operation and doesn't provide the necessary stability to keep the strainer in place. Therefore, securing the rope by tying it off is essential for maintaining proper functionality and safety during operations.

3. What type of electric generator is used in the fire truck?

A. Honda EU1000iS, 1000KW gas powered

B. Honda EU3000iS, 3000KW gas powered

C. Kawasaki 2000, 2000KW diesel powered

D. Yamaha 4000, 4000KW gas powered

The choice of the Honda EU3000iS as the type of electric generator used in the fire truck is based on its suitability for emergency response situations. This generator provides a reliable and adequate power output of 3000 watts, which is essential for operating various equipment, tools, and systems on the fire truck during emergencies. Honda generators are well-regarded for their efficiency, portability, and low noise levels, making them ideal for fire rescue operations where noise can be a concern. The EU3000iS model is designed to be lightweight, easy to transport, and set up quickly, which is crucial for fire crews who need to respond rapidly to incidents. Additionally, the gas-powered operation of the Honda EU3000iS allows for greater versatility and ease of refueling in the field compared to diesel options, which can sometimes lead to accessibility issues in certain environments. Overall, its combination of power, reliability, and ease of use make it an appropriate choice for fire truck applications.

4. What should the transfer valve be set to for a sprinkler system only?

A. Pressure position

B. Volume/capacity position

C. Flow position

D. Emergency position

The appropriate setting for the transfer valve in a sprinkler system is the volume/capacity position. This setting ensures that the water supply to the sprinkler system is optimized for volume and flow rate, which is crucial for maintaining adequate pressure and coverage throughout the system. In volume/capacity position, the system can effectively deliver a steady flow of water necessary to activate the sprinklers and sustain their operation during a fire event. This contrasts with other settings which may prioritize pressure or flow in ways that are not ideal for the consistent water delivery required by a sprinkler system. The pressure position would typically be used in situations where maintaining a specific pressure is paramount, which is not the primary focus for sprinkler systems that require a broader volume of water to operate efficiently. The flow position is more suited for conditions where specific flow requirements need to be met, rather than ensuring a sustained volume. Lastly, the emergency position is usually reserved for critical situations where immediate action is required, rather than normal operations of sprinkler systems.

5. What is the first step in the engine shutdown procedures?

A. Put transmission in 'Drive' position

B. Decrease engine speed back to normal idle and put transmission in 'NEUTRAL' position

C. Turn off all electrical components

D. Activate the emergency brake

The first step in the engine shutdown procedures involves decreasing the engine speed back to normal idle and then placing the transmission in the 'NEUTRAL' position. This step is crucial because it ensures the vehicle is stable and not inadvertently engaged in a drive mode, which could lead to accidents or injuries during the shutdown process. Bringing the engine to idle allows for a more controlled and safe environment as you prepare for shutdown. It also helps in reducing wear on the engine and transmission components, making sure they are not under unnecessary strain. Following this procedure establishes a safe baseline before any additional actions, such as activating the emergency brake or turning off electrical components, which are subsequent steps in a complete engine shutdown protocol. Proper adherence to this sequence maintains operational safety and ensures that the vehicle is securely positioned before moving on to further shutdown tasks.

6. What button do you press to select the mode for filling the foam tank?

A. Press FILL to start

B. Press MODE to access options

C. Press PAGE to get to MODE SELECT

D. Press START to initiate

To select the mode for filling the foam tank, accessing the correct function within the control panel is essential. By pressing the PAGE button, you take the necessary step to navigate to the MODE SELECT screen. This action allows you to view and choose the specific mode required for foam tank filling, which is critical for effective operation. This approach ensures that you have visibility of the different options available, making it straightforward to select the right one. Having access to the MODE SELECT is fundamental in ensuring the foam system operates efficiently during firefighting situations. Understanding the function of the PAGE button in this context is crucial for any operator who needs to manage foam operations effectively. While there are other buttons involved in the overall operation of the foam system, reaching MODE SELECT through the PAGE button is the first and critical step in accessing the various filling modes available. This knowledge is imperative for all driver engineers to ensure they can efficiently operate the foam systems on the fire apparatus.

7. What is the recommended procedure for topping off the booster tank during flow operations?

A. Open the tank fill valve fully

B. Open the tank fill valve slightly and control engine RPMs

C. Leave the tank fill valve closed

D. Increase engine speed to maximum

The recommended procedure for topping off the booster tank during flow operations is to open the tank fill valve slightly and control engine RPMs. This method ensures a careful and controlled filling of the tank, reducing the risk of water hammer and potential damage to the water system. By adjusting the engine RPMs, operators can manage the water flow effectively, ensuring that the tank fills without overwhelming the pump system or the tank itself. Controlling the engine speed allows the operator to maintain optimal pressure levels and ensure the system operates within safe parameters. It also helps to prevent surges which could occur if the fill valve were opened fully. Thus, using this approach balances the need for rapid replenishment with the safety and integrity of the entire firefighting system.

8. When should the engine oil be checked?

A. When the engine is running

B. When the engine is hot

C. When the engine is not running

D. When the engine is cooled

The appropriate time to check engine oil is when the engine is not running. This is crucial because checking the oil while the engine is running can lead to inaccurate readings due to the oil being disturbed and circulated throughout the engine. Furthermore, if the engine is hot, the oil may also be thin and not settle properly, which could lead to misinterpretation of the oil level. Allowing the engine to cool ensures that the oil has settled back into the oil pan, providing a more accurate level reading. Therefore, it is standard practice to check the oil level after the engine has been turned off and allowed to rest for a period, ensuring that readings reflect the true quantity of oil present.

9. How much friction loss occurs for a 5" hose flowing 700 GPM?

A. 3 psi per 100' section

B. 1 psi per 100' section

C. 2 psi per 100' section

D. 4 psi per 100' section

To determine the friction loss for a 5-inch hose flowing 700 gallons per minute (GPM), it's important to reference established guidelines and friction loss formulas used in fire hydraulics. For a 5-inch hose, the common friction loss is approximately 1 psi per 100 feet for flows around 500 GPM. However, as the flow rate increases, the friction loss does too. According to the National Fire Protection Association (NFPA) and various hydraulic calculation manuals, a typical friction loss for a 5-inch hose at 700 GPM can be estimated to be around 2 psi for every 100 feet of hose. Understanding that friction loss increases with higher flow rates helps to validate why the answer given is appropriate. It reflects the relationship between the internal diameter of the hose, the flow rate, and the resulting pressure loss that occurs as water is pushed through the hose. This makes the selected answer suitable, given the parameters set forth in hydraulic calculations for fire service operations, enabling engineers and firefighters to effectively manage water supply at emergency scenes.

10. What is the maximum working pressure recommended for water relay operations?

A. 100 PSI

B. 150 PSI

C. 200 PSI

D. 250 PSI

In water relay operations, the maximum working pressure recommended is 200 PSI. This pressure limit is established to ensure optimal performance while maintaining safety throughout the operation. At 200 PSI, fire apparatus can effectively move water over distances and through various connections without risking stress or potential failure in equipment. Using a pressure higher than this recommendation can lead to excessive force on hoses and fittings, increasing the risk of ruptures or blowouts, which could compromise the efficacy of the operation, pose safety hazards to firefighters, and create challenges in maintaining consistent water supply to the firefighting scene. Therefore, keeping the pressure at 200 PSI strikes a balance between effectiveness in water delivery and the safety of personnel and equipment involved in the relay operations.