

**AIR FORCE  
QUALIFICATION TRAINING PACKAGE (AFQTP)**



**FOR  
PAVEMENTS AND CONSTRUCTION EQUIPMENT OPERATOR  
(3E2X1)**

**MODULE 22  
EXCAVATING/TRENCHING MACHINES**

**TABLE OF CONTENTS**

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**MODULE 22**

**EXCAVATING/TRENCHING MACHINES**

**AFQTP GUIDANCE**

INTRODUCTION.....22-3

**AFQTP UNIT 1**

**BACKHOE**

PERFORM OPERATIONAL CHECKS (22.1.1.) .....22-4

PERFORM OPERATOR MAINTENANCE (22.1.2.).....22-9

**PERFORM BACKHOE OPERATIONS SUCH AS:**

EXCAVATE WITH REAR BUCKET (22.1.3.2.) .....22-14

LOAD WITH REAR BUCKET (22.1.3.4.) .....22-14

BACKFILL WITH FRONT BUCKET (22.1.3.5.) **(OPTIONAL)** .....22-22

**REVIEW ANSWER KEY** .....KEY-1

**CORRECTIONS/IMPROVEMENT LETTER**..... APPENDIX A

Career Field Education and Training Plan (CFETP) references from 5 August 2002 version.

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**Notice.** This AFQTP is NOT intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

**AIR FORCE QUALIFICATION TRAINING PACKAGES  
FOR  
PAVEMENTS AND CONSTRUCTION EQUIPMENT OPERATOR  
(3E2X1)**

**INTRODUCTION**

**Before starting this AFQTP**, refer to and read the "[AFQTP Trainer/Trainee Guide](#)."

**AFQTPs are mandatory and must be completed** to fulfill task knowledge requirements on **core** and **diamond tasks** for upgrade training. **It is important for the trainer and trainee to understand** that an AFQTP **does not** replace hands-on training, nor will completion of an AFQTP meet the requirement for core task certification. AFQTPs will be used in conjunction with applicable technical references and hands-on training.

**AFQTPs and Certification and Testing (CerTest) must be used as minimum upgrade requirements for Diamond tasks.**

**MANDATORY minimum upgrade requirements:**

**Core task:**

AFQTP completion  
Hands-on certification

**Diamond task:**

AFQTP completion  
CerTest completion (80% minimum to pass)

**Note:** *Trainees will receive hands-on certification training for Diamond Tasks when equipment becomes available either at home station or at a TDY location.*

**Put this package to use.** Subject matter experts under the direction and guidance of HQ AFCESA/CEOF revised this AFQTP. If you have any recommendations for improving this document, please contact the Career Field Manager at the address below.

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## BACKHOE

MODULE 22

AFQTP UNIT 1

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PERFORM OPERATIONAL CHECKS (22.1.1.)

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**PERFORM OPERATIONAL CHECKS**  
***Task Training Guide***

<b>STS Reference Number/Title:</b>	22.1.1. - Perform operational checks on backhoe.
<b>Training References:</b>	<ol style="list-style-type: none"> <li>1. Career Development Course (CDC) Pavements and Construction Equipment Operator Journeyman 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224; <i>Operating Trenchers and Backhoes</i>.</li> <li>2. <a href="#">Technical Order (TO) 36C-1-6, Safety Rules For Operation Of Vehicular Equipment Used In Material Handling, Construction, And Site Clearing Operations.</a></li> <li>3. <a href="#">Air Force Joint Manual (AFJMAN) 24-306, Manual for the Wheeled Vehicle Driver.</a></li> <li>4. <a href="#">AF Form 1806, Operator's Inspection Guide and Trouble Report (Aircraft Towing, Base Maintenance Deicers, High Reach and Snow Removal).</a></li> <li>5. Owner's manual.</li> <li>6. Local procedures.</li> </ol>
<b>Prerequisites:</b>	<ol style="list-style-type: none"> <li>1. <b>Possess a minimum of a 3E231 AFSC.</b></li> <li>2. <b>Review the following references:</b> <ol style="list-style-type: none"> <li>2.1. CDC Pavements and Construction Equipment Operator Journeyman 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224.</li> <li>2.2. TO 36C-1-6.</li> <li>2.3. AFJMAN 24-306, Chapter 1, page 1-6; <i>Driver Responsibilities</i> and Chapter 15, page 15-1; <i>Inspections</i>.</li> <li>2.4. AF Form 1806.</li> <li>2.5. Owner's manual.</li> <li>2.6. Local procedures.</li> </ol> </li> </ol>
<b>Equipment/Tools Required:</b>	<ol style="list-style-type: none"> <li>1. Backhoe.</li> <li>2. Personal protective equipment.</li> <li>3. AF Form 1806.</li> </ol>
<b>Learning Objective:</b>	The trainee will be able to properly conduct operational checks on a backhoe.
<b>Samples of Behavior:</b>	The trainee will demonstrate the ability to perform operational checks on a backhoe.
<b>Notes:</b>	
<ol style="list-style-type: none"> <li>1. Personnel are <b>required</b> to wear all <i>personal protective equipment</i> pertaining to each task (i.e. work gloves, hearing protection, and safety glass/goggles).</li> <li>2. Any safety violation is an <b>automatic failure</b>.</li> </ol>	

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## PERFORM OPERATIONAL CHECKS

**1. Background.** There are many types of backhoes in the Air Force inventory. Specific pre-operational inspection procedures will be found in the owner's manual that accompanied the equipment. It is important to properly check and service the equipment prior to operation.

**2. Inspections Procedures.** Follow these steps to perform operational checks on a backhoe:

**Step 1: Utilizing AF Form 1806.**

- 1.1. Inspect all items listed that pertain to the backhoe.
- 1.2. Sign AF form 1806 after proper checks have been made.

**Step 2: Inspect Vehicle Exterior.** Inspection of the vehicle exterior begins with a 360-degree walk-around looking for damage and leaks or puddles underneath the equipment.

- 2.1. Check wheels/tires for wear, lug nut tightness, and correct air pressure.
- 2.2. Check mirrors and windows for cleanliness and cracks.
- 2.3. Check lights and safety devices.
- 2.4. Check the lower boom, dipper arm, and bucket assemblies for wear and broken welds.
- 2.5. Note any discrepancies on the AF form 1806 and notify supervisor.

**HINT:**

Puddles of fluid and dirty areas on the engine or ground normally indicate problem areas and should be investigated and repaired as soon as possible.

**Step 3: Inspect Drive Engine / Battery Compartments.**

- 3.1. Check engine oil, coolant, brake, power steering, and transmission fluid levels (if applicable) and fill as needed.
- 3.2. Inspect the engine drive belts for wear, tension, and alignment.
- 3.3. Ensure battery connections are secure and free from corrosion.
- 3.4. Start engine and let idle. Look for oil and water leaks.

**Step 4: Inspection of Excavation Equipment Unique Items.**

- 4.1. Check hydraulic cylinders for leaking seals.
- 4.2. Complete a function check by testing brakes, steering, and hydraulic system.
- 4.3. With boom and dipper extended fully and bucket grounded, **shut off engine** and inspect the upper components.
- 4.4. Note any discrepancies on the AF form 1806 and notify supervisor.

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**REVIEW QUESTIONS  
FOR  
PERFORM OPERATIONAL CHECKS**

<b>QUESTION</b>	<b>ANSWER</b>
1. What is the AF Form 1806 used for?	a. Inspect AF vehicles. b. It is not used by the Air Force. c. It is used to authorize digging. d. Report damage to a facility.
2. What are you looking for when conducting a 360-degree walk around?	a. Leaks or puddles under the equipment. b. Lug nut tightness or tire wear. c. Broken lights or safety devices. d. All of the above.
3. All of the following items will be checked in the engine compartment, except what?	a. Drive belts. b. Engine oil. c. Transaxle. d. Coolant.

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**PERFORM OPERATIONAL CHECKS**

**PERFORMANCE CHECKLIST**

**INSTRUCTIONS:**

The trainee must satisfactorily perform all parts of the task without assistance. Evaluate the trainee's performance using this checklist.

DID THE TRAINEE....	YES	NO
1. utilize AF Form 1806?		
2. check vehicle exterior by: 2.1. completing a 360 degree walk around? 2.2. checking tires lug nuts and air pressure? 2.3. checking lights and safety devices?		
3. inspect drive engine/battery compartment by checking: 3.1. engine oil, coolant, and transmission fluid levels and fill as needed? 3.2. engine drive belts for wear, tension, and alignment? 3.3. battery connections for tightness and free of corrosion? 3.4. for leaks after starting engine?		
4. inspect unique items by: 4.1. checking hydraulic cylinders for leaking seals? 4.2. completing a function check by testing brakes, steering, and hydraulic system? 4.3. inspecting the upper components of the boom?		
5. sign AF form 1806?		
6. comply with all safety requirements?		

**FEEDBACK:** Trainer/Certifier should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer/certifier.

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## BACKHOE

MODULE 22

AFQTP UNIT 1

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PERFORM OPERATOR MAINTENANCE (22.1.2.)

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**PERFORM OPERATOR MAINTENANCE**  
***Task Training Guide***

<b>STS Reference Number/Title:</b>	22.1.2. - Perform operator maintenance on backhoe.
<b>Training References:</b>	<ol style="list-style-type: none"> <li>1. Career Development Course (CDC) Pavements and Construction Equipment Operator Journeyman 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224; <i>Operating Trenchers and Backhoes</i>.</li> <li>2. <a href="#">Technical Order (TO) 36C-1-6, Safety Rules For Operation Of Vehicular Equipment Used In Material Handling, Construction, And Site Clearing Operations.</a></li> <li>3. <a href="#">Air Force Joint Manual (AFJMAN) 24-306, Manual for the Wheeled Vehicle Driver.</a></li> <li>4. <a href="#">AF FORM 1806, Operator's Inspection Guide and Trouble Report (Aircraft Towing, Base Maintenance Deicers, High Reach and Snow Removal).</a></li> <li>5. Owner's manual.</li> <li>6. Local procedures.</li> </ol>
<b>Prerequisites:</b>	<ol style="list-style-type: none"> <li>1. <b>Possess a minimum of a 3E231 AFSC.</b></li> <li>2. <b>Review the following references:</b></li> <li>3. CDC Pavements and Construction Equipment Operator Journeyman 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224.</li> <li>4. TO 36C-1-6.</li> <li>5. AFJMAN 24-306, Chapter 1, page 1-6; <i>Driver Responsibilities</i> and Chapter 15, page 15-1; <i>Preventive Maintenance</i>.</li> <li>6. AF Form 1806.</li> <li>7. Owner's manual.</li> <li>8. Local procedures.</li> </ol>
<b>Equipment/Tools Required:</b>	<ol style="list-style-type: none"> <li>1. Backhoe.</li> <li>2. Personal protective equipment.</li> <li>3. AF Form 1806.</li> </ol>
<b>Learning Objective:</b>	The trainee will be able to perform operator maintenance on a backhoe.
<b>Samples of Behavior:</b>	The trainee will demonstrate the proper procedures for operator maintenance.
<b>Notes:</b>	
<ol style="list-style-type: none"> <li>1. Personnel are <b>required</b> to wear all <i>personal protective equipment</i> pertaining to each task (i.e. work gloves, hearing protection, and safety glass/goggles).</li> <li>2. Any safety violation is an <b>automatic failure</b>.</li> </ol>	

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## PERFORM OPERATOR MAINTENANCE

**1. Background.** Backhoe maintenance, like any other maintenance, is very important. If the machine is not running well, then how is the job going to get done? The more effective maintenance program we have for the equipment, the better our operation will run. Correct and timely operator maintenance ensures that the equipment will do the job when needed and it will last longer. This saves the Air Force money. A good, money saving, operator maintenance program includes inspections to detect and correct minor deficiencies before they develop into major defects that could result in costly repairs. It also includes cleaning and servicing. Poor maintenance will not result in mission success.

**2. Maintenance Procedures.** Follow these steps to perform this task:

### Step 1: Clean Backhoe.

- 1.1. Wash backhoe at approved wash rack.
- 1.2. Remove trash and dirt from the vehicle.
- 1.3. Clean dirt from around lubrication points and fittings. Find lubrication points from the lube chart.
- 1.4. Inspect the equipment for damaged or loose bolts.

#### NOTE:

Remove large debris before cleaning to prevent clogging the wash rack drainage system.

### Step 2: Lubrication. (Lubrication is the responsibility of the operator!)

- 2.1. Lubricate the vehicle according to intervals listed in the maintenance chart. When operating the machine in severe conditions, lubricate the machine more frequently.
- 2.2. Remove all dirt and grease from grease fittings before and after lubricating.

### Step 3: Refueling.

- 3.1. Fuel the equipment **at the end of each working day** to prevent moisture from condensing and forming droplets within the fuel tank.
- 3.2. Contact base fuels for delivery of fuel to the job site if the equipment can't be driven to the service station. Ensure the correct tank is filled with the correct fuel.
- 3.3. Ensure the vehicle has a minimum of  $\frac{3}{4}$  of a tank of fuel at the end of the duty day to ensure the equipment will be ready for any emergencies.

**Step 4: Post Operation Inspection.** As stated in operational checks, inspection is the best way to ensure that you give the proper care to your equipment. A short post operation inspection will ensure the equipment is ready for the next task. Air intake filters are of special importance. There are generally two elements: (1) the primary (outer) element and, (2) the secondary (inner) element.

- 4.1. Clean both elements daily under dusty operating conditions (even more often if working conditions are extremely dusty).
- 4.2. Use guidelines stated in the operator's maintenance manual for cleaning procedures.

### Step 5: Check Cutting Edges.

- 5.1. Ensure all the cutting edges (front and rear buckets) are in good condition. Specifically, ensure they are not loose or worn excessively. Replace as necessary.
- 5.2. Check bucket shank welds for cracks and that bucket teeth are attached with proper pins. Ensure teeth are not worn down to shanks.

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**REVIEW QUESTIONS  
FOR  
PERFORM OPERATOR MAINTENANCE**

<b>QUESTION</b>	<b>ANSWER</b>
1. Why is cleaning the backhoe a part of vehicle maintenance?	a. To find lubrication points and keep dirt out of the fittings. b. It makes it easy to inspect the backhoe for damage or loose bolts. c. Assist in lubrication. d. All the above.
2. Lubrication is done by vehicle maintenance and should not be attempted by an operator.	a. True. b. False.
3. What are you looking for when inspecting the cutting edge?	a. For debris stuck in the cracks. b. For excessive wear. c. For reversibility. d. You shouldn't.

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## PERFORM OPERATOR MAINTENANCE

### PERFORMANCE CHECKLIST

#### INSTRUCTIONS:

The trainee must satisfactorily perform all parts of the task without assistance. Evaluate the trainee's performance using this checklist.

DID THE TRAINEE....	YES	NO
1. clean the vehicle?		
2. lubricate the backhoe according to the maintenance chart?		
3. remove all the dirt and grease from the grease fittings before and after lubricating?		
4. check the fuel level and refuel if needed?		
5. inspect and clean the air intake breathers if needed?		
6. inspect and change cutting edges if needed?		
7. comply with all safety requirements?		

**FEEDBACK:** Trainer/Certifier should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer/certifier.

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## BACKHOE

PERFORM BACKHOE OPERATIONS SUCH AS

MODULE 22

AFQTP UNIT 1

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EXCAVATE WITH REAR BUCKET (22.1.3.2.)

LOAD WITH REAR BUCKET (22.1.3.4.)

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**EXCAVATE WITH REAR BUCKET / LOAD WITH REAR BUCKET**  
***Task Training Guide***

<p><b>STS Reference Number/Title:</b></p>	<p>22.1.3.2. - Perform backhoe operations such as excavate with rear bucket. 22.1.3.4. - Perform backhoe operations such as load with rear bucket.</p>
<p><b>Training References:</b></p>	<ol style="list-style-type: none"> <li>1. Career Development Course (CDC) Pavements and Construction Equipment Operator Journeyman 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224; <i>Operating Trenchers and Backhoes.</i></li> <li>2. <a href="#">Technical Order (TO) 36C-1-6, Safety Rules For Operation Of Vehicular Equipment Used In Material Handling, Construction, And Site Clearing Operations.</a></li> <li>3. <a href="#">Air Force Joint Manual (AFJMAN) 24-306, Manual for the Wheeled Vehicle Driver.</a></li> <li>4. <a href="#">AF Form 1806, Operator's Inspection Guide and Trouble Report (Aircraft Towing, Base Maintenance Deicers, High Reach and Snow Removal).</a></li> <li>5. <a href="#">AF Form 103, Base Civil Engineering Work Clearance Request.</a></li> <li>6. Air Force Qualification Training Package (AFQTP) <a href="#">Video PIN # 613955: Backhoe Operations – Excavate, Load, and Backfill Material.</a></li> <li>7. Owner's manual.</li> <li>8. Local procedures.</li> </ol>
<p><b>Prerequisites:</b></p>	<ol style="list-style-type: none"> <li>1. <b>Possess a minimum of a 3E231 AFSC.</b></li> <li>2. <b>Possess AF Form 171, <a href="#">Request for Driver's Training and Addition to U.S. Governments Driving License.</a></b></li> <li>3. <b>Review the following references:</b> <ol style="list-style-type: none"> <li>3.1. CDC 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224.</li> <li>3.2. TO 36C-1-6.</li> <li>3.3. AFJMAN 24-306, Chapter 1, page 1-6; <i>Driver Responsibilities</i> and Chapter 15, page 15-1; <i>Inspections.</i></li> <li>3.4. AF Form 103 and 1806.</li> <li>3.5. Owner's manual.</li> <li>3.6. Local procedures.</li> </ol> </li> <li>4. <b>Complete the following:</b> <ol style="list-style-type: none"> <li>4.1. AFQTP Module 3E2X1-22, Unit 1; <i>Perform Operational Checks.</i></li> <li>4.2. AFQTP Video PIN # 613955.</li> </ol> </li> </ol>
<p><b>Equipment/Tools Required:</b></p>	<ol style="list-style-type: none"> <li>1. Backhoe.</li> <li>2. Dump truck.</li> <li>3. Personal safety equipment.</li> <li>4. AF Form 1806.</li> <li>5. AF form 103.</li> </ol>

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### ***Task Training Guide (CONTINUED)***

<b>Learning Objective:</b>	Trainee will be able to properly excavate and load material with the rear bucket of a backhoe.
<b>Samples of Behavior:</b>	The trainee will demonstrate the proper procedures in excavating and loading materials with the rear bucket of a backhoe.
<b>Notes:</b>	
1. Personnel are <b>required</b> to wear all <i>personal protective equipment</i> pertaining to each task (i.e. work gloves, hearing protection, and safety glass/goggles). 2. Any safety violation is an <b>automatic failure</b> .	

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## EXCAVATE WITH REAR BUCKET / LOAD WITH REAR BUCKET

**1. Background.** Before beginning any digging operation, you must have an AF Form 103, Base Civil Engineering Work Clearance Request, in your possession. With the AF Form 103 in hand, check the area in and around the excavation site. Look for any hazards and utilities marked on the Form and for any additional obstructions or hazards in the area (culverts, cable markers, grade stakes, or underground utilities). Finally, look for marked construction stakes that may provide additional information concerning the proposed trench. Once you have checked the area, align your backhoe with the proposed trench.

**2. Requirements.** View AFQTP Video PIN # 613955: *Backhoe Operations – Excavate, Load, and Backfill Material*. After completing the AFQTP Video properly excavate and load material with a backhoe using the step-by-step procedures listed below.

### NOTE TO TRAINER/CERTIFIER:

If excavation project is not available, the following is the minimum required for upgrade: have the trainee demonstrate proper trenching and loading methods at a stockpile or debris pile. Dig a trench (12-foot long by 2-foot depth) in the pile and load spoil into dump truck. **FOR TRAINING PURPOSES:** use this scenario with section 22.1.3.5. *Backfill with front bucket*.

**3. Excavate and Load Procedures.** Follow these steps to perform these tasks:

#### 3.1. Excavating.

**Step 1: The first step is to make sure there is an AF Form 103 approved for the area to be excavated.**

**Step 2: Perform an operational inspection.** (See Module 3E2X1-22, Unit 1; Perform *Operational Checks*.)

**Step 3: Stabilize the front of the backhoe.**

**3.1.** With the backhoe in line with the proposed trench, level and lower the front bucket on the ground just enough to take the pressure off the front tires.

**3.2.** See owner's manual for the proper position of the front bucket.

**Step 4: Rotate the seat 180°.** Rotate the seat so you are facing to the rear of the machine with the controls in front of you.

**Step 5: Stabilize the rear of the backhoe.** Lower the rear stabilizers with only enough down pressure to slightly lift the rear tires off the ground.

**Step 6: Level the backhoe.**

**6.1.** Ensure the backhoe is level by raising or lowering the stabilizers as necessary.

**6.2.** If the stabilizers aren't long enough to level the machine, it may be necessary to place dunnage under the pad to assist in leveling.

**Step 7: Set the hand throttle to recommended revolution per minute (rpm).**

**7.1.** Depending on the digging conditions and obstructions in the area, the throttle may be increased or decreased as necessary.

**7.2.** The more throttle, the less chance of "feeling" any hidden obstructions.

**Step 8: Position boom for digging.** Unlock the boom according to operator's manual and fully extend the dipper while keeping the bucket close to the ground.

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**Step 9: Make a marking pass to outline the trench.**

- 9.1. Curl the bucket 3- to 5-inches before placing on the ground.
- 9.2. Bring the dipper in and raise the boom simultaneously to cut an even trench.
- 9.3. The first cut is to dig just deep enough to outline the trench.
- 9.4. When the dipper has been pulled back and is at a 90° angle with the ground, the marking pass is complete.

**Step 10: Curl bucket at end of pass.**

- 10.1. When the dipper reaches the end of the pass, curl the bucket, lift the dipper and boom, and swing the bucket to the outside of the trench.
- 10.2. Evenly place the spoil on the side of the trench by uncurling the bucket. If loading into a dump truck, raise boom and swing to center of dump bed, uncurl bucket and load into dump truck.

**NOTE:**

Spoil can be placed along trench edge no closer than 2-feet, if it is to be used for backfill. If spoil is not to be used, load it into a dump truck and hauled it away. **FOR TRAINING PURPOSES**, see paragraph [3.2. Loading](#).

**SAFETY:**

**IF ANYONE STEPS INTO THE SWING AREA OF THE BOOM DURING OPERATIONS, IMMEDIATELY GROUND THE BUCKET AND HAVE THEM MOVE OUT OF THE AREA.**

**Step 11: Continue digging.**

- 11.1. Make continuous cuts until the desired depth is achieved.
- 11.2. Use the same procedures as the marking pass, except deeper allowing the bucket to dig into the ground without exceeding the digging capability of the backhoe.

**Step 12: Level the bottom of the trench.**

- 12.1. Once you reach the desired depth, level the bottom of the trench.
- 12.2. This can be accomplished by scraping the bottom using the same technique used for the marking pass.

**SAFETY:**

**NEVER LOAD OVER THE CAB OF THE TRUCK. ANY PERSONNEL IN THE IMMEDIATE AREA MUST WEAR HARD HATS. DUMP TRUCK OPERATORS MUST EXIT CAB WHILE LOADING!**

**3.2. Loading.**

**Step 1: Obtain a full bucket.** Follow above steps for excavating to obtain a full bucket of material.

**Step 2: Load dump truck.** The following functions are done simultaneously and take considerable time to achieve.

- 2.1.** Position the truck next to the backhoe where the bucket can reach the center of bed.
- 2.2.** Ensuring the bucket is kept curled, swing/raise the boom, and extend the dipper stick to position the bucket over the bed.
- 2.3.** Once in position, uncurl the bucket slowly to unload the material.
- 2.4.** Swing the boom back over the trench and continue until the job is complete.

**REVIEW QUESTIONS  
FOR  
EXCAVATE WITH REAR BUCKET / LOAD WITH REAR BUCKET**

QUESTION	ANSWER
1. When should you obtain a digging permit?	a. When you suspect utilities in the area. b. When stated on the work order. c. During real digging not training. d. Before starting any dig.
2. How high should the rear wheels be off the ground?	a. Just slightly off the ground. b. Above the outrigger pads. c. 12- to 18-inches. d. Until they spin.
3. For best results, always load the dump truck over the cab.	a. True. b. False.

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**EXCAVATE WITH REAR BUCKET / LOAD WITH REAR BUCKET**

**PERFORMANCE CHECKLIST**

**INSTRUCTIONS:**

The trainee must satisfactorily perform all parts of the task without assistance. Evaluate the trainee's performance using this checklist.

<b>DID THE TRAINEE....</b>	<b>YES</b>	<b>NO</b>
<b>Excavating</b>		
1. perform an operational inspection by utilizing AF Form 1806? (Refer to Unit 1, Perform Operational Checks.)		
2. sign AF form 1806?		
3. have approved AF Form 103?		
4. stabilize the front of the backhoe?		
5. rotate the seat 180°?		
6. stabilize the rear of the backhoe?		
7. level backhoe?		
8. set the hand throttle to desired engine rpm?		
9. position boom for digging?		
10. make marking pass to outline the trench?		
11. curl bucket at end of pass?		
12. make continuous trenching passes?		
13. continue digging at a uniform depth?		
14. level bottom of trench?		
15. comply with all safety requirements?		
<b>Loading</b>		
1. obtain a full bucket?		
2. load dump truck?		
3. comply with all safety requirements?		

**FEEDBACK:** Trainer/Certifier should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer/certifier.

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## BACKHOE

PERFORM BACKHOE OPERATIONS SUCH AS

MODULE 22

AFQTP UNIT 1

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**BACKFILL WITH FRONT BUCKET (22.1.3.5.)**

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THIS UNIT IS **OPTIONAL** AND AVAILABLE TO USE AS A LESSON PLAN WHEN TRAINING ON THIS NON-CORE TASK.

**BACKFILL WITH FRONT BUCKET**  
***Task Training Guide***

<b>STS Reference Number:</b>	22.1.3.5. – Perform backhoe operations such as backfill with front bucket.
<b>Training References:</b>	<ol style="list-style-type: none"> <li>1. Career Development Course (CDC) Pavements and Construction Equipment Operator Journeyman 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224; <i>Operating Trenchers and Backhoes</i>.</li> <li>2. <a href="#">Technical Order (TO) 36C-1-6, Safety Rules For Operation Of Vehicular Equipment Used In Material Handling, Construction, And Site Clearing Operations.</a></li> <li>3. <a href="#">Air Force Joint Manual (AFJMAN) 24-306, Manual for the Wheeled Vehicle Driver.</a></li> <li>4. <a href="#">AF Form 1806, Operator's Inspection Guide and Trouble Report (Aircraft Towing, Base Maintenance Deicers, High Reach and Snow Removal).</a></li> <li>5. Air Force Qualification Training Package (AFQTP) <a href="#">Video PIN # 613955: Backhoe Operations – Excavate, Load, and Backfill Material.</a></li> <li>6. Owner's manual.</li> <li>7. Local procedures.</li> </ol>
<b>Prerequisites:</b>	<ol style="list-style-type: none"> <li>1. <b>Possess a minimum of a 3E231 AFSC.</b></li> <li>2. <b>Possess AF form 171, <a href="#">Request for Driver's Training and Addition to U.S. Governments Driving License.</a></b></li> <li>3. <b>Review the following references:</b> <ol style="list-style-type: none"> <li>3.1. CDC 3E251B, Volume 2, Unit 4, Section 4-1, Lesson 224.</li> <li>3.2. TO 36C-1-6.</li> <li>3.3. AFJMAN 24-306, Chapter 1, page 1-6; <i>Driver Responsibilities</i> and Chapter 15, page 15-1; <i>Inspections</i>.</li> <li>3.4. AF Form 1806.</li> <li>3.5. Owner's manual.</li> <li>3.6. Local procedures.</li> </ol> </li> <li>4. <b>Complete the following:</b> <ol style="list-style-type: none"> <li>4.1. AFQTP Module 3E2X1-22, Unit 1; <i>Perform Operational Checks</i>.</li> <li>4.2. AFQTP Video PIN # 613955.</li> </ol> </li> </ol>
<b>Equipment/Tools Required:</b>	<ol style="list-style-type: none"> <li>1. Backhoe.</li> <li>2. Personal safety equipment.</li> <li>3. AF Form 1806.</li> </ol>
<b>Learning Objective:</b>	The trainee will be able to properly backfill using a backhoe.
<b>Samples of Behavior:</b>	The trainee will demonstrate the ability to backfill using a backhoe.
<b>Notes:</b>	<ol style="list-style-type: none"> <li>1. This area is <b>optional</b> and available to use as a lesson plan when training on this non-core task.</li> <li>2. Personnel are <b>required</b> to wear all <i>personal protective equipment</i> pertaining to each task (i.e. work gloves, hearing protection, and safety glass/goggles).</li> <li>3. Any safety violation is an <b>automatic failure</b>.</li> </ol>

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## BACKFILL WITH FRONT BUCKET

**1. Background.** The backhoe is a good piece of equipment for backfilling ditches and trenches. An advantageous feature is the rubber tires that have a minimum tearing effect when working on a hard surface such as asphalt. By lowering the bucket to grade level, the forward movement of the machine will push the stockpiled earth into the trench.

**2. Requirements.** View AFQTP Video PIN # 613955: *Backhoe Operations – Excavate, Load, and Backfill Material*. After completing the AFQTP Video properly backfill material with a backhoe using the step-by-step procedures listed below.

**NOTE TO TRAINER/CERTIFIER:**

Use the scenario from the previous section, have the dump truck driver dump the spoil next to edge of trench. The following is the minimum required for this task: have the trainee backfill the trench and then back drag to level the area.

**3. Backfill Procedures.** Follow these steps to backfill an area using the front bucket:

**Step 1: Perform an operational inspection.** (See Module 3E2X1-22, Unit 1; Perform *Operational Checks*.)

**Step 2: Approach the spoil material area.**

- 2.1. Level the bucket on the ground and proceed forward in low gear, perpendicular to the trench, until you penetrate the material.
- 2.2. Limit the amount of material to about half a bucket.
- 2.3. Raise the engine speed just high enough to push the material ahead without spinning the tires.
- 2.4. Push the material into the center of the trench, stop, and uncurl the bucket.
- 2.5. Look behind the machine and back up.
- 2.6. Continue backfilling the trench while compacting the material in layers with proper compaction equipment (not backhoe tires) as required.

**Step 3: Clean up the area.**

- 3.1. Once the trench is compacted, straddle the filled trench and back-drag to smooth any ridges.
- 3.2. As the machine nears the end of the trench, gradually raise the bucket to feather the material.
- 3.3. Back-drag the rest of the area with the front bucket in the float position to flatten any windrows.

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**REVIEW QUESTIONS  
FOR  
BACKFILL WITH FRONT BUCKET**

<b>QUESTION</b>	<b>ANSWER</b>
1. From what direction do you approach a trench for backfilling purposes?	a. Against the offset path of the loader. b. Perpendicular to the trench. c. Cross grain to the path of the loader. d. Parallel to the trench.
2. The proper way to compact a trench being backfilled is to drive over the trench with the back tires.	a. True. b. False.

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## BACKFILL WITH FRONT BUCKET

### PERFORMANCE CHECKLIST

#### INSTRUCTIONS:

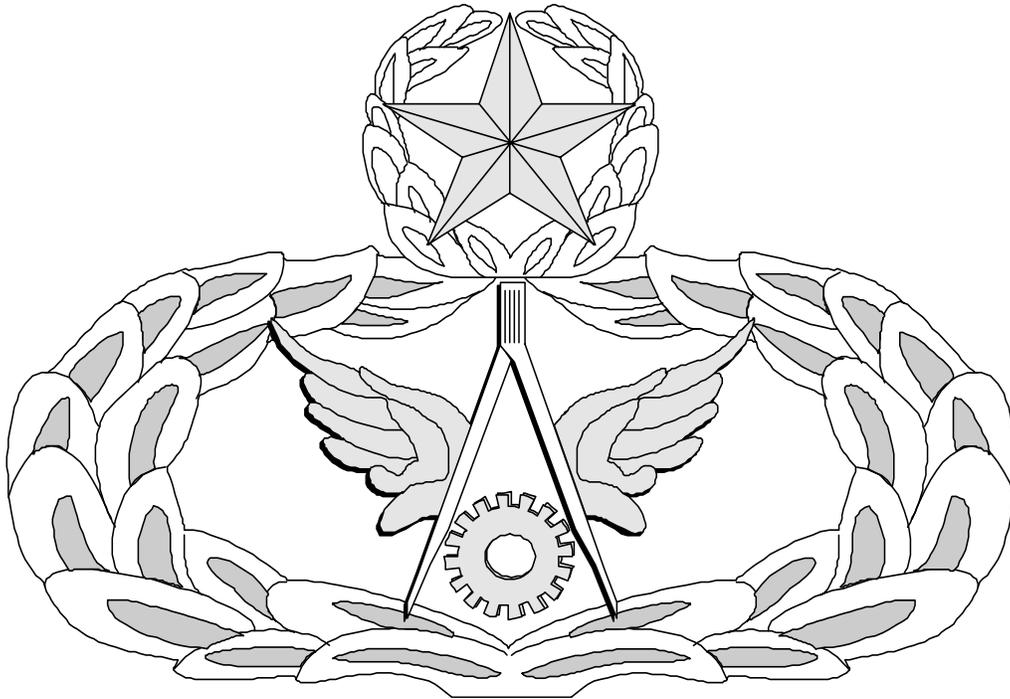
The trainee must satisfactorily perform all parts of the task without assistance. Evaluate the trainee's performance using this checklist.

DID THE TRAINEE....	YES	NO
1. perform an operational inspection by utilizing AF Form 1806? (Refer to Unit 1, Perform Operational Checks.)		
2. sign AF Form 1806?		
3. approach the stockpile and push the material into trench?		
4. clean up the area?		
5. comply with all safety requirements?		

**FEEDBACK:** Trainer/Certifier should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer/certifier.

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**Air Force Civil Engineer**  
**QUALIFICATION TRAINING PACKAGE (QTP)**  
**REVIEW ANSWER KEY**



FOR  
**PAVEMENTS & CONSTRUCTION EQUIPMENT OPERATOR**  
**(3E2X1)**

**MODULE 22**  
**EXCAVATING/TRENCHING MACHINES**

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**Key-1**

**PERFORM OPERATIONAL CHECKS  
(3E2X1-22.1.1.)**

QUESTION	ANSWER
1. What is the AF Form 1806 used for?	a. Inspect AF vehicles.
2. What are you looking for when conducting a 360-degree walk around?	d. All of the above.
3. All of the following items will be checked in the engine compartment, except what?	c. Transaxle.

**PERFORM OPERATOR MAINTENANCE  
(3E2X1-22.1.2.)**

QUESTION	ANSWER
1. Why is cleaning the backhoe a part of vehicle maintenance?	d. All of the above.
2. Lubrication is done by vehicle maintenance and should not be attempted by an operator.	b. False.
3. What are you looking for when inspecting the cutting edge?	b. For excessive wear.

**EXCAVATE WITH REAR BUCKET / LOAD WITH REAR BUCKET  
(3E2X1-22.1.3.2. & 22.1.3.4.)**

QUESTION	ANSWER
1. When should you obtain a digging permit?	d. Before starting any dig.
2. How high should the rear wheels be off the ground?	a. Just slightly off the ground.
3. For best results, always load the dump truck over the cab.	b. False.

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**BACKFILL WITH FRONT BUCKET  
(3E2X1-22.1.3.5.)  
(OPTIONAL)**

<b>QUESTION</b>	<b>ANSWER</b>
1. From what direction do you approach a trench for backfilling purposes?	b. Perpendicular to the trench.
2. Drive over the trench with the back tires for proper compaction.	b. False.

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MEMORANDUM FOR HQ AFCESA/CEOF  
139 Barnes Drive Suite 1  
Tyndall AFB, FL 32403-5319

FROM:

SUBJECT: Qualification Training Package Improvement

1. Identify module.

Module # and title \_\_\_\_\_

2. Identify improvement/correction section(s):

_____ STS Task Reference	_____ Performance Checklist
_____ Training Reference	_____ Feedback
_____ Evaluation Instructions	_____ Format
_____ Performance Resources	_____ Other
_____ Steps in Task Performance	

3. Recommended changes--use a continuation sheet if necessary.

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4. You may choose to call in your recommendations to DSN 523-6074 or FAX DSN/Commercial 523-6488 or (850) 283-6488 or email [ceof.helpdesk@tyndall.af.mil](mailto:ceof.helpdesk@tyndall.af.mil).

5. Thank you for your time and interest.

YOUR NAME, RANK, USAF  
Title/Position