DEPARTMENT OF THE AIR FORCE
Headquarters US Air Force
Washington, D.C. 20330-1030

AFQTP 24-3-E936
18 November 2022

25K Halvorsen Loader

Vehicle Management Codes: E936

QUALIFICATION TRAINING PACKAGE

Table of Contents

Section 1

OVERVIEW

1.1. **Overview.**

1.1.1. This publication implements Air Force standardized vehicle training in accordance with (IAW) AFI 24-301, *Ground Transportation.* This publication is applicable to all authorized users of Air Force Government Motor Vehicles (GMV) regardless of service affiliation to include Air National Guard (ANG) and Air Force Reserve, as well as Civil Air Patrol and non-appropriated fund activities.

1.1.2. This Air Force Qualification Training Package (AFQTP) will be used in the training of individuals to operate the 25K Halvorsen Loader and perform tasks with the equipment.

1.1.3. Send comments and suggested improvements on AF Form 847, *Recommendation for Change of Publication* through Air Force Installation and Mission Support Center (AFIMSC) functional managers via e-mail at AFIMSC.IZSL.GroundTrans@us.af.mil.

1.2. **Objectives**.

1.2.1. Provide comprehensive training plan and performance evaluations to ensure the trainer adequately qualifies the trainee. Upon completion, trainees will be prepared for licensing and operation.

- Trainee becomes proficient and qualified to inspect and operate the 25K Halvorsen Loader.
- Pass the performance evaluation (**Attachment 4** of this AFQTP) without trainer assistance.
- Pass the 25 multiple choice question knowledge test (**Attachment 5** of this AFQTP) with a minimum score of 80% (minimum of 20/25 correct).

1.2.2. Prerequisites.

- Licensing Requirements
- Trainee must possess a valid state driver's license.
- AF Form 171, Request for Driver's Training and Addition to U.S. Government Driver's License IAW AFI 24-301, Ground Transportation.
- Applicable local licensing jurisdiction requirements

1.3. **Duration**.

1.3.1. Recommended instructional and hands on training time is 24 hours.

Table 1.1. Recommended Training Time:

Training Activity	Training Time
Trainee's Preparation	2 Hours
Trainer's Lecture	8 Hours
Trainee's Knowledge Test	2 Hours
Trainer's Demonstration	2 Hours
Trainee's Performance Demonstration	6 Hours (+/- based on personal experience, proficiency and confidence)
Trainee's Performance Evaluation	4 Hours

1.4. **Instructional Training Aids and Equipment.**

1.4.1. Key References and Forms:

- AFI 24-301, Ground Transportation.
- AFI 24-302, Vehicle Management.
- AFI 24-605 V2, Air Transportation Operations.
    - Chapter 3 (Cargo and Mail Operations), Paragraph 3.2 (Safety).
    - **Attachment 7** (K-Loader Parking and Traffic Flow Plan).
- AFMAN 24-306, *Operation of Air Force Government Motor Vehicles.*
    - Chapter 4 (Basic Operating Procedures and Maneuvers), Paragraph 4F (Spotter Safety).
- AFQTP 24-3-E936, 25K Halvorsen Loader.
- DAFI 36-2670, Total Force Development.
- TO 36-1-191, Technical and Managerial Reference for Motor Vehicle Maintenance.
    - Chapter 3 (Motor Vehicle and Base Support Equipment Inspection).
        - Paragraph 3.4 (Types of Inspections).
        - Paragraph 3.12 (Operator Daily/Weekly Inspection Requirements).
        - Table 3.1 (Vehicle and Equipment Inspection and Service Intervals), "Operator Inspection" column.

- TO 36M2-3-45-1, 25,000 lb Halvorsen Loader (or applicable TO/Manufacturer's Operator's Manual) required.
- AF Form 1800, Operator's Inspection Guide and Trouble Report.
    - Equipment:
        - 25K Halvorsen Loader (vehicle).
        - Controlled training area; should incorporate highline dock (or equivalent) and simulated cargo (palletized loads/rolling stock).
        - Traffic cones and/or training markers.

Section 2

RESPONSIBILITIES

2.1. **Responsibilities**.

2.1.1. Trainer:

- Understand trainer's role IAW DAFI 36-2670, Total Force Development.
- Wear and ensure trainee are wearing all applicable Personal Protective Equipment (PPE) as required (e.g., safety toe boots, safety gloves, hearing protection, eye protection, etc.).
- Provide lectures from references in Paragraph 1.4.1 of this AFQTP.
- Explain and demonstrate vehicle operation (Sections 3 & 4 of this AFQTP).
- Administer performance evaluation (**Attachments 3 & 4** of this AFQTP) and retrain trainee on performance deficiencies.
- Administer written knowledge test (**Attachment 5** of this AFQTP) and review missed questions with the trainee.
- Annotate training IAW DAFI 36-2670, Total Force Development and AFMAN 24-306, Operation of Air Force Government Motor Vehicles.

2.1.2. Trainee:

- Understand trainee's role IAW DAFI 36-2670, Total Force Development.
- Wear proper Personal Protective Equipment (PPE) IAW Paragraph 2.1.1.2 of this AFQTP.
- Review AFMAN 24-306, Operation of Air Force Government Motor Vehicles, Chapters 4, 6, 7, 9, and 10.
- Conduct performance demonstration until proficient.
- Pass the 25K Halvorsen Loader performance evaluation (**Attachments 3 & 4** of this AFQTP).
- Pass the 25K Halvorsen Loader knowledge test (**Attachment 5** of this AFQTP)

Section 3

KNOWLEDGE OVERVIEW

3.1. **Knowledge Overview.**

3.1.1. Safety precautions to be followed before-, during-, and after- operation of the 25K Halvorsen Loader:

- Do NOT stand under, work under, or pass under the elevated portion of any loader deck when it is not on maintenance stands.
- Never place arms or legs between pinch or crush points.
- Do NOT drive loaders in the direction of anyone standing in the path of the loader or between the loader and a fixed object.
- The maximum speed of the 25K Halvorsen Loader is 17 mph. In adherence with flightline safety guidelines, operators will not exceed 10 mph while on the flightline and will not exceed 5 mph when within 25 feet of any aircraft (e.g., "circle of safety").
- No riders are allowed while the vehicle is in motion. During lift and/or lower motions (aka "elevator"), load crew personnel (maximum of four) may remain on the K-loader catwalks IAW AFI 24-605 V2, Air Transportation Operations.
    - IAW TO 36M2-3-45-1, *25,000 lb Halvorsen Loader*, personnel shall not be transported on the front right or the ladder catwalk sections and no more than 2 personnel shall be on a single catwalk section at a time.
- If the loader will be left unattended, the deck shall be in the fully lowered position, with the parking brake set, chocked if required, and the battery switch in the off position.
- Spotting. A spotter will be used when the vehicle is within 15 feet of any stationary vehicle or obstacle or when the driver's view is obstructed, regardless of the level of experience of the operator IAW AFI 24-605 V2, Air Transportation Operations and AFMAN 24-306, Operation of Air Force Government Motor Vehicles.

3.1.2. Purpose. Designed to load/unload cargo on all military and civilian aircraft used by the Department of Defense (DoD). Cargo includes but is not limited to 463L pallets, Type V airdrop platforms (up to 20 ft), Container Delivery System (CDS) containers (up to 25,000 lbs.), commercial containers, and rolling stock.

3.1.3. Design. Self-propelled, hydraulically operated, electronically controlled vehicle with a six-cylinder, liquid cooled, turbocharged, four-cycle diesel engine coupled with a four-speed automatic transmission, which provides overall power to propel the vehicle and operate the hydraulic and electrical systems.

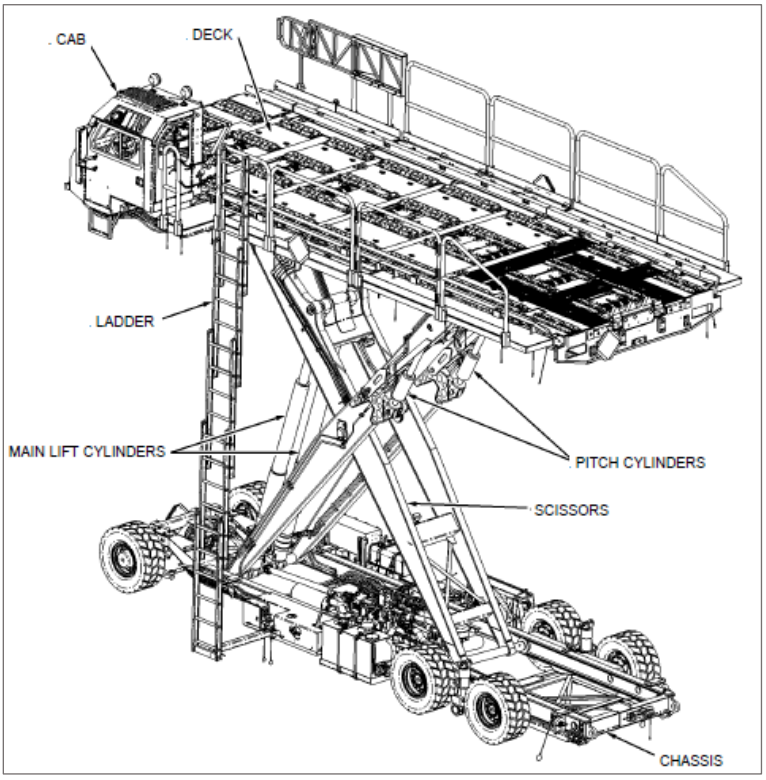
3.1.4. Specifications.

Table 3.1. Specifications:

25K Halvorsen Loader Specifications Table	
Category	**Specification**
General Vehicle Specs	
Gross Weight (without cargo)	31,350 lbs. (wet)
Max Speeds	17 mph forward / 5 mph reverse
Length	355 in
Width	170 in (operation configuration)
	109 in (transport configuration)
Height	94 in (ground height/cab)
	39 in – 220 in (deck range)
Ground Clearance	5 in
Turning Diameter	50 ft
Rated Load Capacities	
Max	25,000 lbs.
Fluid Capacities	
Fuel Tank	23.75 gal (DFA, DF1-DF2, JP5, JP8, 2-DS15)
Heater Fuel Tank	2 gal (DF1-DF2, JP5, JP8)
Engine Oil	10 qts (Mobil Delvac 1, Synthetic 5W40)
Transmission Fluid	13 qts (Mobil ATF D/M)
Coolant (Glycol / Distilled Water mix)	15 gal (above -34°F: 50/50 / below -34°F: 60/40)
Hydraulic Oil Tank	32 gal (MIL-H-83282, NATO STD-H-537)
Batteries	
Quantity	2
Voltage	12 VDC (each)
Electrical	
Components	24 VDC
Tires / Wheels	
Tire & Wheel Size	355/65 R15 & 15”
Tire Pressure (maximum load)	100 psi (+/- 2 psi)
Lug Torque	200 ft-lb

3.1.5. Major Components. Chassis assembly, Scissors (Inner / Outer), Main Lift Cylinders, Pitch Cylinders, Deck, Cab, and Ladder.

Figure 3.1. Major Components:



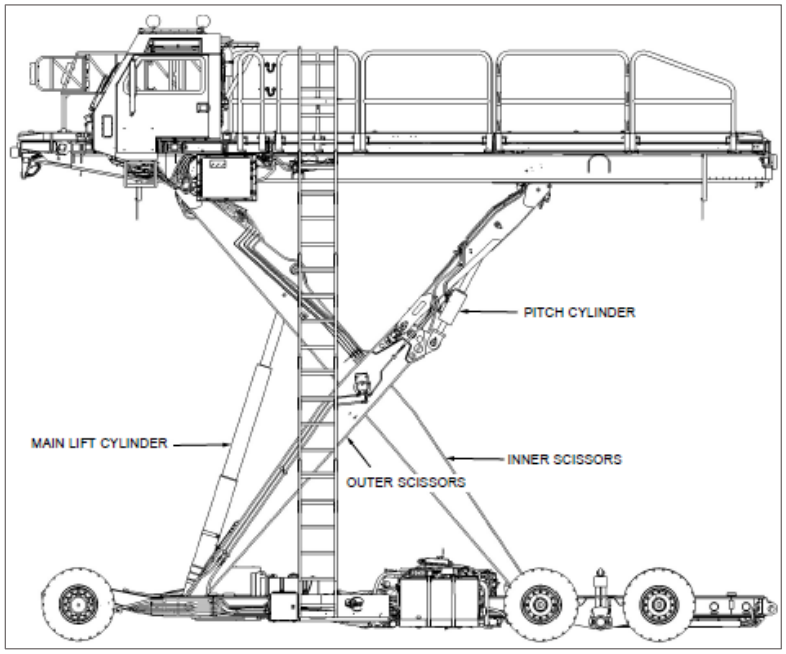
- Chassis assembly.
    - Welded steel frame.
    - Structural foundation.
    - Drive/Steer Axle.
        - Front axle produces drive and steer. Axle is mounted rigidly to chassis frame. Differential, planetary wheel ends, and power steering cylinders are incorporated in the axle.
        - Brake disk attached to differential pinion. Parking and service brake calipers react on disk.
        - Differential lock provides positive driving of both wheels on slippery surface when needed.
    - Rear Axle Assembly. Provides support for rear of chassis. Allows for travel over irregular surfaces and provides additional chassis clearance when driving up/down ramps.

- Bogie (aka “Bogy”) Assembly. Bogie wheel arm, two-wheel assemblies and helping cylinder.
  - Bogie pivot shaft.
  - External disk brakes (hydraulic).
  - Attached to chassis by two pivot pins.
  - Additional ramp clearance obtained by engaging air transportability latch and raising deck.
- Power Unit. Six-cylinder, liquid cooled, turbocharged diesel engine.
  - Powers automatic transmission coupled to the flywheel to propel the loader.
  - Powers a variable displacement hydraulic pump coupled to the front end of crankshaft to operate hydraulic systems.
  - Powers the alternator to produce electrical power, enabling batteries to remain fully charged.
- Electrical System.
- Hydraulic System.
- Fuel System.
- Cooling System.
  - Radiator.
  - Fan.
  - Water Pump.
  - Coolant Reservoir.
  - Coolant Recovery Tank.
- Transmission. Four-speed automatic couple to engine flywheel for directional control.
  - Torque converter provides inching capability
  - Range selection accomplished by electrically controlled joystick.

- Scissors. Provides the means to raise, lower and pitch the deck.

- Outer Scissors. Front pivots on main lift cylinder pivot pins. Rear travels deck frame as deck raises/lowers. Consists of two sections to allow pitch.
- Inner Scissors. Front pivots on deck pivot points. Rear travels on main frame as deck raises/lowers.
- Main Lift Cylinders. Provides lift and lower capabilities for the deck.
- Pitch Cylinders. Provides forward and aft pitch capabilities for the deck.

Figure 3.2. Scissors:



- Deck. An aluminum structure raised and lowered by the scissors and contains a powered convey system to control the movements of the pallets.
  - Recessed convey modules.
  - Removable roller trays.
  - Adjustable pallet guide rails.
  - Pallet locks.
  - Tie-down rings.
  - Catwalks.
  - Handrails.
  - Ladder assembly.

- Folding wings.
- Rear/side tine troughs.
- Removable covers.
- Sling bridles.
- Retractable pallet stops.

- Cab.
  - External Cab. Fully enclosed, mounted on left side of loader.
    - Main door.
    - Rear egress door.
    - Washer fluid fill (located at rear of cab).
    - Heater fluid fill (located under windshield).
    - Fire Extinguisher.
    - Spotlights.
    - Sliding handrail.
  - Internal Cab.
    - Dash panel. The dash panel is located directly in front of the operator and contains all switches, gauges, and indicator lights for starting the engine, monitoring the engine and hydraulic system conditions, and shutting down the engine.
      - Switches and levers required for starting and shutting down the engine.
      - Gauges and indicators to monitor the engine and hydraulic systems.
      - Deck positioning controls.
    - Convey Panel. The deck convey panel is at the operator's right. It contains the controls that activate the convey system and both pallet stops to move cargo on and off the deck.
    - Transmission Range Selector Panel. Contains the range selector lever and a digital display.

- Wiper Panel. The wiper panel is an overhead panel located in the upper-right corner of the cab enclosure that contains the switches for the front wiper, rear wiper, front washer, and rear washer. The circuit breakers for the front wiper and rear wiper are adjacent to the switches. The headlights, cab light, dome light, and cabin dash/gauge lights dimmer switches are also located on the wiper panel.

- Emergency System. Electrically powered emergency hydraulic pump. Engages automatically in the event of power pack or hydraulic pump failure while driving.

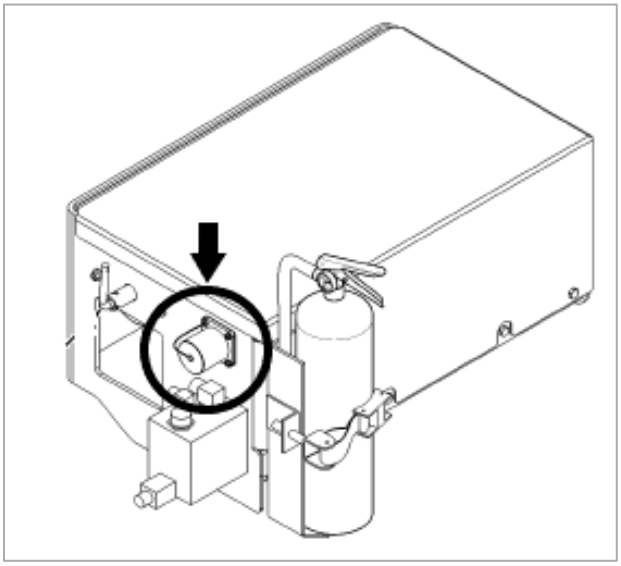
    - Provides power to steering, service brakes, and parking brakes.

    - Automatic feature activates only with ignition on/parking brake off.

    - The emergency pump can be manually actuated by the operator. The momentary switch located on the dash panel allows for deck functions, cargo transfer, and parking brake release. The second switch located on the main panel is used for maintenance.

    - In the event of battery failure, the battery box terminal requires a 24V military style jumper cable/connection (aka “NATO Cable”) and power source. Connect one end of the jumper cable to a 24V power source and the opposite end to the connection on the 25K Halvorsen Loader Battery Box (Figure 3.3 below).

Figure 3.3. 24V Military Vehicle Jumper Cable Connector:



24V Military Vehicle Jumper Cable Connector

- Winterization. Used for sustained operations in cold temperatures.
    - 120 to 240 VAC.
    - Heats engine oil, engine coolant, transmission fluid, hydraulic fluid, and batteries.

3.2. **Inspection.**

3.2.1. Inspections will be performed by the operator daily when used, and monthly when not used, IAW TO 36-1-191, Chapter 3, *Motor Vehicle and Base Support Equipment Inspection,* Table 3.1, *Vehicle and Equipment Inspection and Service Intervals*. Document inspection on the AF Form 1800, *Operator's Inspection Guide and Trouble Report*.

- Inspections are a visual and functional assessment performed by the operator prior to use. The inspection is designed to discover issues with the vehicle before the operator performs function tests and operational use. (Note: If discrepancies are found the operator must be document the discrepancy on the AF Form 1800, *Operator's Inspection Guide and Trouble Report* and report them to a Vehicle Control Official (VCO), supervisor, and/or vehicle maintenance personnel.)

3.3. **Vehicle Safety.**

3.3.1. Vehicle Operation Safety:

- Overall size.
- Ground clearance.
- Off-road driving. Drive carefully on uneven, wet, or slippery surfaces. For more information on off-road driving and safe vehicle operation guidance, refer to AFMAN 24-306, Operation of Air Force Government Motor Vehicles.
- High winds. High wind conditions may cause the deck to sway. Personnel may only operate the loader in winds under 40 knots.
- Pallet stops. Operators are responsible for the cab controls/positions of two pallet stops. The pallet stops are in the center front and the center rear of the deck. Pallet stops are used to prevent palletized cargo from rolling off either end of the deck.
    - When not actively transferring cargo on/off of the deck, pallet stops will remain in the locked-up position (even if there is no cargo on the deck).
- Tie-downs and tools. Properly store in the toolbox when not in use. When tie-downs are used, all excess must be secured/stowed.
- Cab floors must be clear of all loose items to avoid risk of safety/accidents (example: water bottle rolling under brake pedal, preventing braking).

- Transferring pallets. When transferring pallets, it is very important to keep the loader deck level in relation to the aircraft ramp or loading dock.
- Spotting. As directed in paragraph 3.1.1.7. of this AFQTP.

3.3.2. Personnel Safety:

- Safety-toed boots must be worn.
- Gloves will be worn during cargo handling (remove rings/jewelry before handling cargo).
- Hearing protection.
- Eye protection when required (e.g., changing and/or inflating a tire or during Engine Running On/Offload (ERO) operations).
- First aid kit.
- Warning triangles.
- Raingear, cold weather gear, etc.
- Reflective belt during hours of reduced visibility and on flightline.
- Fire extinguisher.

3.4. **Vehicle Operation.**

3.4.1. Before engine start.

- Ensure no starting aids are necessary (winterization or battery support). The loader can perform its mission in ambient temperatures ranging from -40 °F to +125 °F (-40 °C to +52 °C).
    - Ensure all emergency stop switches are pulled out.
    - Ensure power cord is unplugged from winterization receptacle.
    - Check parking brake is in the on position.
    - Test Warning Lights on Dash Panel. Hold the SHUTDOWN OVERRIDE switch down in the LIGHT TEST POSITION.

3.4.2. Starting the engine.

- Move IGNITION SWITCH to the on position.

- Check that N is in the TRANSMISSION RANGE SELECTOR.
- Wait for ENGINE PREHEAT light to go out before moving switch to start.
- While holding the SHUTDOWN OVERRIDE in the up position, hold the IGNITION SWITCH in the START position until the engine starts. After the engine starts, release the IGNITION SWITCH while continuing to hold the SHUTDOWN OVERRIDE switch up.
    - If oil pressure is below 5 psi, the engine may not start, or may start but shutdown.
    - To prevent damage to the starter motor from overheating, do not crank the engine with the starter motor for more than 15 seconds. Allow 30 seconds for the starter motor to cool before attempting to crank the engine.
- Release both switches when the oil pressure gauge indicates 5 psi or higher.
- Observe all gauges and lights for normal ranges.
- Engine will turn off when any of these lights exists: Engine oil pressure, engine hot, transmission fluid hot, hydraulic fluid hot. (Note: Allow the engine to warm-up prior to operating the loader.)

3.4.3. Shutdown procedures.

- Engage PARKING BRAKE and observe light.
- Place TRANSMISSION SELECTOR in N position.
- Allow the engine to idle for 3 to 4 minutes for temperature to stabilize.
- Place IGNITION SWITCH to the “OFF” position.
- Turn the battery disconnect switch to the OFF position when finished.
- If operating in temperatures below freezing, engage WINTERIZATION BOX.

3.4.4. Winterization. (Note: Circuit breaker must be in the off position whenever AC power cable is engaged/disengaged.)

- Plug AC power cable into receptacle.
- Turn circuit breaker to the ON position.
- WINTERIZATION CONNECT indicator light on dash panel will illuminate.

3.4.5. Deck operation. To perform all functions of the loader deck, including lifting, cargo transfer, conveyor operation, and platform conversion.

3.4.6. Maintenance blocks (aka stands) positioning and stowage. Maintenance blocks are used to support the deck without a hydraulic lift system. An operator and spotter are required to set the deck on the maintenance (MX) blocks.

3.4.7. Tine trough removal. The deck contains five tine troughs for forklift loading that need to be removed for side and rear loading. Install cover in reverse order.

3.4.8. Pallet restraints operation. Pallet restraints are used to secure pallets on the deck.

- There are six pallet locks on the left side guide rails and six pallet locks on the right-side guide rails, for a total of 12 pallet locks.

3.4.9. Deck configuration. The guide rails can be adjusted to accommodate pallets loading the 108” Aerial Delivery System (ADS) or 88” Logistic (LGS) configuration.

- To rotate the guide rail inboard:
    - Remove retaining pins, securing rail to the pivot lugs.
    - Lift/rotate rail up/inboard and reinstall retaining pins in pivot lugs to secure rail in new location.
    - Reinstall pallet locks in exposed cavity as previously mentioned.
    - Two retaining pins are removed from the pallet lock cavity.
    - After the rail is rotated inboard, lock is placed in new cavities exposed and secured with retaining pins.

3.4.10. Rolling stock. Invert all caster and roller trays (rollers face down/stowed).

- Release latch restraining tray.
- Invert and place back in cavity.
- Engage latch.

3.4.11. Forklift configuration.

- Remove and stow all five-tine trough covers.
- Failure to remove all covers may result in structural damage.
- Ensure all caster/roller trays are in the UP position.

3.4.12. Cover storage.

- Tine trough covers are stored on left/rear handrail.
- Insert the bottom tine trough first, then insert the top tine trough. (Note: Unable to load the bottom tine trough if the top is already in place.)

3.4.13. Side load configuration.

- Remove and stow two right rear handrail sections.
- Remove and stow all five-tine trough covers.
- Ensure caster/roller trays are in the up position.
- Support two right rear catwalk sections and remove retaining pins.
- Lower catwalks and pallet guides.

3.4.14. Deck extension.

- The forward end of the loader may be configured to allow loader interface with the lower lobes (bellies) of wide-body aircraft.

3.4.15. Type V platform.

- Place pallet width switch in the “OFF” position.
- Rotate all convey module latch handles in-line with deck.
- This allows convey modules to raise high enough to make contact with platform. The platform is higher due to the skid plates underneath.

3.4.16. Transport Configuration. Refer to TO 36M2-3-45-1, *25,000 lb Halvorsen Loader* (or applicable TO/Manufacturer’s Operator’s Manual).

Section 4

DEMONSTRATION

4.1. **Trainer Demonstration.**

4.1.1. Operator Inspection Demonstration.

- With trainee, conduct before, during, and after vehicle inspections utilizing the AF Form 1800, *Operator's Inspection Guide and Trouble Report* in conjunction with TO 36M2-3-45-1, *25,000 lb Halvorsen Loader* (or applicable TO/Manufacturer's Operator's Manual). Explain items being inspected. (Note: Utilize **Attachment 2** of this AFQTP for additional assistance.)

4.1.2. Operation Demonstration.

- Throughout the demonstration, allow time for questions and repeat demonstrations as necessary.
- Demonstrate and explain the following:
    - Amount of time the vehicle should be shut down before performing inspection.
    - 25K Halvorsen Loader levers and controls.
    - Point out the items to be inspected during operations.
        - Instruments.
        - Temperature gauges.
        - Pressure gauges.
        - Ammeter/voltmeter.
        - Mirrors.
        - Tires.
        - Foreign object damage (FOD).
        - Cargo, cargo covers.
        - Emergency equipment (e.g., fire extinguisher, emergency kill switches, spill kit).
- Trainer must establish a driving course that will encompass the operations below. Trainer will describe and demonstrate these operations, utilizing spotters as

necessary. (Note: If the driving course does not have all the following, the trainee must be able to explain the correct driving techniques for that operation.)

- Configure deck for different loads.
- All deck controls.
- Obey speed limits.
- Use a highline dock (or equivalent) to load and unload cargo.
- Demonstrate the use of the EMERGENCY STOP (aka "shutdown switch").
- Demonstrate the proper parking procedures.
- Demonstrate the proper use of pallet guides, locks, stops, and chains.
- Describe the proper shutdown procedures.
- Operate all deck control levers.

- Conclude by allowing time for questions and any requested re-demonstrations.

4.1.3. Transitioning to Trainee Demonstration:

- Always ensure safety. (Note: Stop training when safety items are violated. Proceed only when the trainee fully understands how to avoid repeating the safety infraction.)
    - Chock wheel in required situations (e.g., on the flightline, if brakes are inoperable, etc.) when the loader is parked.
- Pay attention to the cautions and warnings listed in TO 36M2-3-45-1, *25,000 lb Halvorsen Loader* (or applicable TO/Manufacturer's Operator's Manual).
- Ensure trainee fastens and wears seat belt properly.
- Ensure trainee properly adjusts the driver's seat and all mirrors.
- Ensure trainee fully understands the driving scenarios they are to perform.
- Conduct before, during, and after-action reviews with the trainee (demonstration may need to be re-accomplished).

4.2. **Trainee Demonstration.**

4.2.1. Trainee Performance.

- Conduct before, during, and after vehicle inspections utilizing the AF Form 1800, Operator's Inspection Guide and Trouble Report in conjunction with TO 36M2-3-45-1, 25,000 lb Halvorsen Loader (or applicable TO/Manufacturer's Operator's Manual). Ensure trainee explains items being inspected. (Note: Trainee's may utilize **Attachment 2** of this AFQTP for additional assistance.)

- Conduct the following operations:

    - Operate all deck control levers.

    - Obey speed limits.

    - Use a highline (or equivalent) to load and unload cargo.

    - Demonstrate the use of the EMERGENCY STOP (aka "shutdown switch").

    - Demonstrate proper parking procedures.

- Continue until trainee shows proficiency in operation.

Attachment 1

GLOSSARY

References

AFI 24-301, *Ground Transportation*, 22 October 2019

AFI 24-302, *Vehicle Management*, 21 February 2020

AFI 24-605 V2, *Air Transportation Operations*, 2 July 2020

AFMAN 24-306, *Operation of Air Force Government Motor Vehicles*, 30 July 2020

AFQTP 24-3-E936, *25K Halvorsen Loader*, 28 February 2022

DAFI 36-2670, *Total Force Development*, 12 October 2021

TO 36-1-191, *Technical and Managerial Reference for Motor Vehicle Maintenance*, 4 December 2020

TO 36M2-3-45-1, *Technical Manual Operator Instructions - 25,000 lb Halvorsen Loader*, 29 May 2020

Adopted Forms

AF Form 171, *Request for Driver's Training and Addition to U.S. Government Drivers*, 25 October 2019

AF Form 847, *Recommendation for Change of Publication*, 22 September 2009

AF Form 1800, *Operator's Inspection Guide and Trouble Report*, 1 April 2010

Abbreviations and Acronyms

ADS—Aerial Delivery System

AFIMSC—Air Force Installation Mission Support Center

AFQTP—Air Force Qualification Training Plan

CDS—Container Delivery System

DAFI—Department of the Air Force Instruction

ERO—Engine Running Onload/Offload

FOD—Foreign Object Damage

LGS—Logistics System

PSI—Pounds per Square Inch

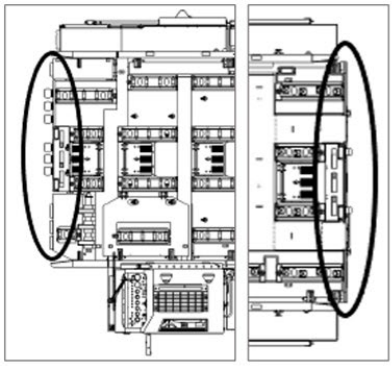
RM—Risk Management

VAC / VDC—Voltage in Alternating Current / Voltage in Direct Current

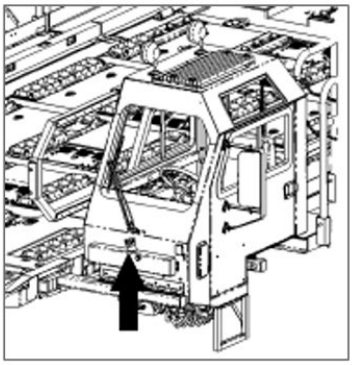
VCO—Vehicle Control Officer

Attachment 2
VEHICLE INSPECTION QUICK REFERENCE GUIDE

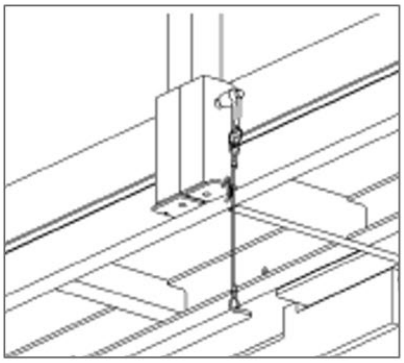
25K Halvorsen Loader Inspection Quick Reference Guide			
Item / Procedure	**TO Page / Image**	☑	☒
Deck of Loader			
Check condition of ladder	1-2		
Check casters and rollers on deck for damage and ease of rolling	2-44		
Check rubber bumpers	Image		
Check folding wings for damage, free movement, and pin engagement	2-31 to 2-32		
External Cab Inspection			
Check heater fuel level	Image		
Check windows/mirrors for cracks	1-20 to 1-21		
Check windshield washer fluid level	1-20		
Ensure cabin pin is properly installed	2-51		
Check condition on all handrails, mounting brackets, and locking pins	1-18.1 & Image		
Check general condition power rollers	Image		
Lift engine access panel on deck between power rollers 5 and 6:	Image		
Check engine oil level	2-70 (#1)		
Close and secure engine access panel	Image		
🔔: Before starting the next procedure, ensure the loader is on a level surface and has sufficient clearance in front and back. Ensure all personnel are clear of the loader in the event of unexpected movement. Place chocks approximately 2 inches from the front and rear of a tire to prevent excessive movement of the loader in either forward or reverse direction should the parking brake fail.			
Turn battery on	2-17 & 2-59		
Start loader	1-24		
Raise loader to first maintenance stand and install maintenance stand and pins	2-23		
Check air cleaner restriction indicator for air cleaner serviceability	1-11 to 1-12		
Shut down loader	1-24		



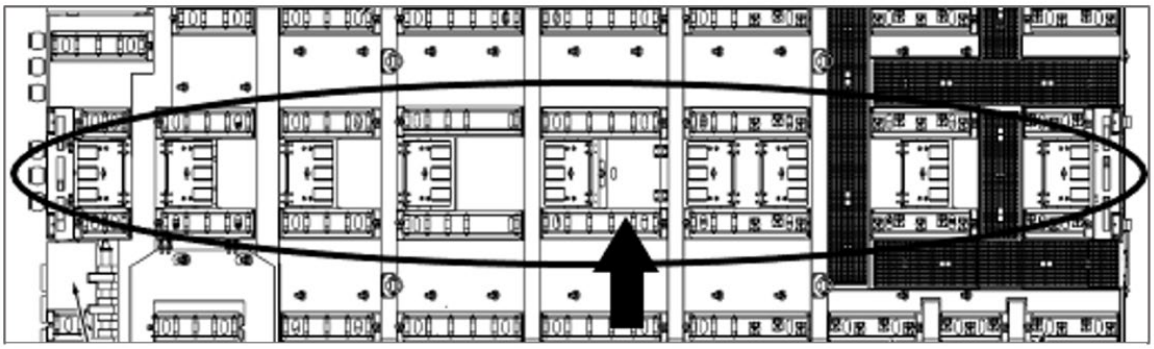
Front / Rear Rubber Bumpers



Heater Fuel

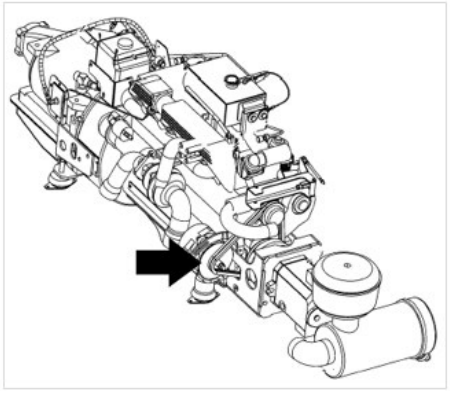


Handrail Locking Pins

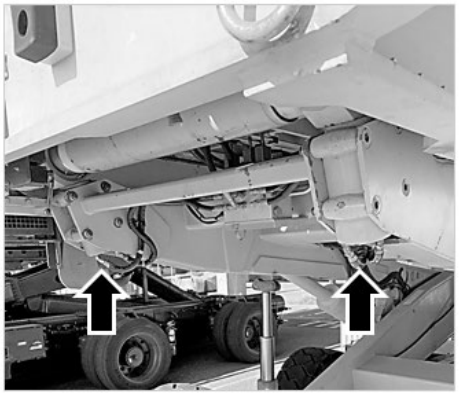


Power Rollers / Engine Access Panel

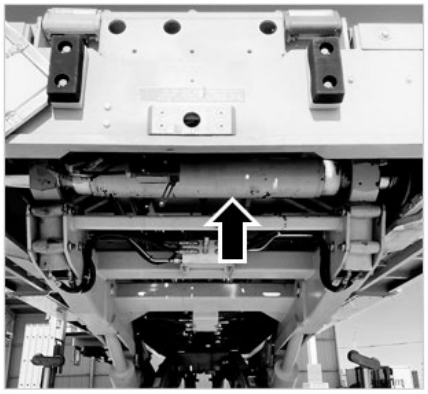
Item / Procedure	TO Page / Image	☑	☒
Chassis			
Check condition of drive wheels	1-13 to 1-14		
Check condition of park/service brake (mounting/leaks)	1-13		
Check hydraulic filter high pressure indicator	1-11 (#24)		
Check coolant level in coolant recovery tank	1-17		
Check coolant reservoir (peephole)	1-17		
Check hydraulic oil level	1-11 (#19)		
Check hydraulic breather indicator	1-11 (#20)		
Check belts (condition and adjustment)	Image		
Check pre-cleaner (air filter) for dirt -If the dirt level is at the arrow on the bowl, remove the wing nut and empty the bowl	1-11 (#31)		
Check that engine and transmission dipstick tube is secured and not leaking	2-70		
Check condition of bogie wheels	1-14		
Check helper cylinders	1-15		
Check area around radiator and battery box	1-11 (#10-14)		
Check area around fuel tank and circuit breaker box	1-11 (#7-8)		
Check air pressure in all tires and inflate to specification (100±2 PSI)	1-6		
Check condition of hydraulic return filter. -To check filter condition, place hydraulic preheat switch in the ON position and observe reading on gauge (Figure 2-5). Gauge is located on return filter housing on the top of the hydraulic reservoir. The filter element should be replaced if gauge indicator is in red area (1).	1-11 (#23)		
Underside of Deck			
Check main lift cylinder	1-2 & 1-18		
Check pitch cylinders (wear and leaks)	1-2 & 1-18		
Check roll cylinders (wear and leaks)	Image		
Check side shift cylinders (wear and leaks)	Image		
Check pallet stops cylinders	Image		



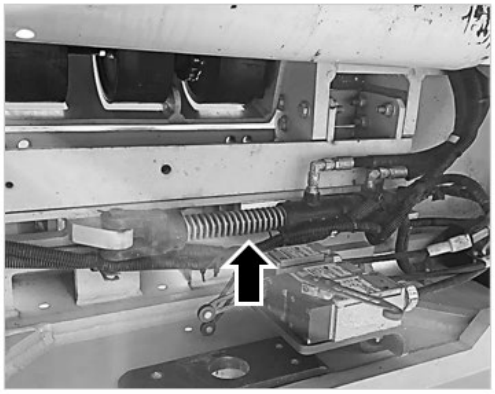
Belts (x2)



Roll Cylinders

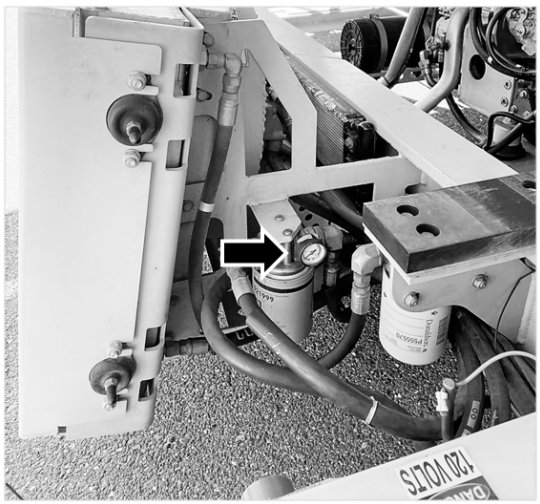


Side Shift Cylinders



Pallet Stop Cylinders

Item / Procedure	TO Page / Image	☑	☒
Cab			
Check condition cab seat and controls for adjustments	1-21		
Check condition seat belt and latch operation	1-21		
Check test warning lights (toggle the selector to the down position)	2-20 (#6)		
Start loader (follow instructions of paragraph "h" on page 2-21)	2-2 (#24-25)		
Check all rear lights (including rear spotlight / #10 on page 1-20)	2-7		
Check all front lights (including front spotlight / #10 on page 1-20)	2-7		
Check dome light	2-7		
Check cabin dash light	2-7		
Check heater operation	2-44.2		
Check fan	1-20		
Check wipers/washers for operation	2-7		
Check horn (located in center of steering wheel)	1-21		
Check operation of air conditioning system and evaporator box	1-28 & 2-9		
Check power steering (turn steering wheel left/right)	1-21		
Check transmission shifting (all ranges)	1-21 (#3 & 10)		
Deck Operation			
Check operation of all deck position lights	2-2 to 2-4		
Check auto center (toggle switch up and hold until centered	2-35 (#2)		
Check front pallet stop	2-5 (#9)		
Check rear pallet stop	2-5 (#13)		
Check power rollers	2-5 (#7 & #10-12)		
Check hydraulic filter gauge	1-11 (#24)		
Check transmission fluid (with engine running)	2-70 (#4)		
Check case drain gauge	Image		
Check deck movements:			
Deck (raise/lower)	2-2 (#33)		
Deck Pitch (up/down)	2-2 (#31)		
Deck Shift (left/right)	2-2 (#34)		
Deck Roll (left/right)	2-2 (#31)		
Front Pallet Stop (cycle pallet stop and verify that it returns to the up position)	2-5 (#9)		
Rear Pallet Stop (cycle pallet stop and verify that it returns to the up position)	2-5 (#13)		
Deck Convey (forward/aft for front/mid/aft sections)	2-5 (#7 & #10-12)		
Turn battery disconnect switch to the OFF position after each operation.	2-17 & 2-59		
Test emergency pump (Written instructions on TO pages: 1-22 to 1-24 and 2-47 to 2-49)	1-11 (#26) 1-24 (#1) 2-49 (#3)		



Case Drain Gauge

Item / Procedure	TO Page / Image	☑	☒
Brakes			
Inspect service brakes and rotors.	1-13 to 1-14		
Inspect Park brake.	1-13		
⚠: Before starting the next procedure, ensure the loader is on a level surface and has sufficient clearance in front and back. Ensure all personnel are clear of the loader in the event of unexpected movement. Place chocks approximately 2 inches from the front and rear of a tire to prevent excessive movement of the loader in either forward or reverse direction should the parking brake fail.			
Start loader (written instructions on TO page 2-21, paragraph "h")	2-2 (#24-25)		
Check Park brake forward movement:			
Place foot pressure on the service brake foot pedal and release parking brake	1-21 (#8) & 2-22 (#1)		
Shift transmission to drive	1-21 (#3)		
Apply parking brake. (Toggle switch to "on" position)	2-22 (#1)		
Release foot brake.	1-21 (#8)		
Increase engine speed slowly to verify parking brake holds -Do not exceed 1200 rpm; ensure loader does not move -If the loader moves, report problem to maintenance	1-21 (#7)		
⚠: Before starting the next procedure, ensure the loader is on a level surface and has sufficient clearance in front and back. Ensure all personnel are clear of the loader in the event of unexpected movement. Place chocks approximately 2 inches from the front and rear of a tire to prevent excessive movement of the loader in either forward or reverse direction should the parking brake fail.			
Start the loader.	2-2 (#24-25)		
Check Park brake reverse movement:			
Place foot pressure on the service brake foot pedal and release parking brake.	1-21 (#8) & 2-22 (#1)		
Shift transmission to reverse.	1-21 (#3)		
Apply parking brake. (Toggle switch to "on" position)	2-22 (#1)		
Release foot brake.	1-21 (#8)		
Increase engine speed slowly to verify parking brake holds -Do not exceed 1200 rpm; ensure loader does not move -If the loader moves, report problem to maintenance	1-21 (#7)		

Attachment 3

PERFORMANCE EVALUATION & KNOWLEDGE TEST GUIDE

A3.1. Performance Evaluation and Knowledge Test.

A3.1.1. Before the trainee begins the performance evaluation, the trainer will brief the scenario required to be accomplished. The trainee will be given additional directions and instructions as needed as the trainee proceeds through the scenario.

A3.1.2. Trainer will utilize **Attachment 4** of this AFQTP to document/evaluate the trainee's performance once the trainee has demonstrated the proficiency and confidence required to operate a 25K Halvorsen Loader.

A3.1.3. Trainer and trainee will review **Attachment 4** of this AFQTP together before and after the performance evaluation.

A3.1.4. Trainer will answer trainee's questions before and after the performance evaluation.

A3.1.5. Trainee will perform all items in the performance evaluation checklist (**Attachment 4** of this AFQTP) with zero trainer assists.

A3.1.5.1. Trainer will conduct after-action reviews with the trainee.

A3.1.5.2. Retraining. Trainer will retrain the trainee on failed item(s) by re-demonstrating proper operation of the failed item(s) and allowing the trainee to practice until they are proficient on the failed item(s). Re-evaluate and critique deficiencies as observed.

A3.1.6. Trainer will use **Attachment 5** in this AFQTP to administer a knowledge test once the trainee has demonstrated the knowledge retention required. Trainee is required to score at least an 80% on the knowledge test in order to be licensed.

A3.1.6.1. Retesting. Trainer will review all missed questions with the trainee until trainee comprehends/retains the knowledge and passes the written test.

Attachment 4

PERFORMANCE EVALUATION CHECKLIST

Item #	Procedure	☑	☒
Verification of Documentation			
Ensure Operator possesses a valid civilian driver's license			
Ensure Operator possesses a valid government driver's license or AF Form 171			
Evaluation Tasks			
1	Did Operator have and use proper PPE (gloves/ hearing protection)?		
2	Did Operator check ladder to ensure it was secure with no damage?		
3	Did Operator check general condition of casters/rollers and powered rollers?		
4	Did Operator check cab pin is properly installed?		
5	Did Operator check all handrails, mounting brackets, and locking pins?		
6	Did Operator check engine oil level (cold/before engine start)?		
7	Did Operator ensure vehicle was supported by maintenance blocks on the first setting?		
8	Did Operator check air cleaner restriction indicator and filter?		
9	Did Operator check hydraulic high pressure filter indicator and hydraulic fluid level?		
10	Did Operator check coolant fluid levels in the recovery tank and the reservoir (peephole)?		
11	Did Operator check helper cylinders for wear and leaks?		
12	Did Operator check radiator fan and fins for damage and leaks?		
13	Did Operator check general condition/air pressure of all tires?		
14	Did Operator check main lift cylinders for wear and leaks?		
15	Did Operator check pitch cylinders for wear and leaks?		
16	Did Operator check roll cylinders for wear and leaks?		
17	Did Operator check side-shift cylinders for wear and leaks?		
18	Did Operator check pallet stop cylinders (front/rear) for wear and leaks?		
19	Did Operator check condition of all lights (front, spotlights, rear, reverse, hazard, cab)?		
20	Did Operator check transmission oil level (warm/engine running)?		
21	Did Operator check case drain gauge?		
22	Did Operator check service and parking brakes for excessive wear and functionality?		
23	Did Operator properly fasten seatbelt?		
24	Did Operator wait for the chocker to get into place?		
25	Did Operator use a spotter as necessary/required (backing up/driving in congested area)?		
26	Did Operator understand and follow spotter directions?		
27	Did Operator come to a complete stop before changing gears?		
28	Did Operator demonstrate proper parking procedures?		
29	Did Operator use appropriate controls during pallet transfer?		
30	Did Operator have power conveyor setting set to applicable pallet configuration?		
31	Did Operator ensure front pallet stop was returned to the upright position?		
32	Did Operator re-center deck before lowering?		
Knowledge Test Score	80%+ = pass (20/25 correct)	%		
Note: Trainer and trainee will review/retrain/correct all deficient items together until trainee shows proficiency/passes.			

Attachment 5

KNOWLEDGE TEST

1. True or False: Riders are allowed to be on the 25K Halvorsen Loader while the vehicle is in forward or reverse motion.

    a. True
    b. False

2. What form is used to document inspection of the 25K Halvorsen Loader?

    a. DD Form 1810, *Annual Vehicle Inspection Report*
    b. AF Form 4355, *Vehicle Incoming Inspection*
    c. AF Form 1800, *Operator's Inspection Guide and Trouble Report*
    d. AF Form 4427, *Operator's Inspection Guide and Trouble Report (Fuels Support Equipment)*

3. The battery disconnect switch located on the battery box is "OFF" when the handle is in which of the following positions?

    a. Vertical
    b. Horizontal

4. When using the emergency pump to raise the deck, the operator must ensure which of the following?

    a. PARKING BRAKE switch is off
    b. IGNITION switch is off
    c. DECK SUPPLY CUTOFF valve is off
    d. All of the above

5. At its lowest position, the 25K Halvorsen Loader deck height is _____ and _____ when fully raised.

    a. 49" / 222"
    b. 49" / 157"
    c. 39" / 220"
    d. 39" / 222"

6. True or False: When the deck is elevated and then a transmission range of "D", "3", or "2" is selected… the throttle will become inactive, the engine will remain at idle speed, and a "no drive condition" will exist.

    a. True
    b. False

7. Loader operations are restricted to wind speeds under which of following?

    a. 35 knots (nautical mile per hour)
    b. 40 knots
    c. 35 MPH (miles per hour)
    d. 40 MPH

8. True or False: According to TO 36M2-3-45-1 (25K Halvorsen Loader), you must push the cab inward (into shipping configuration) anytime the loader is shipped by air.

    a. True
    b. False

9. While holding the "SHUTDOWN OVERRIDE" switch in the down position, which of the following indicators will not illuminate?

    a. TRANSMISSION FLUID HOT
    b. ENGINE HOT
    c. ENGINE OIL PRESSURE
    d. HYDRAULIC FLUID HOT

For questions 10 – 13, match the system types with their fluid capacities:

10. Cooling System	a. 32 gal
11. Transmission System	b. 13 qt
12. Hydraulic System	c. 23.75 gal
13. Engine Fuel System	d. 15 gal

14. True or False: The air conditioning system can be used in conjunction with the heater to de-fog windows, dehumidify, and cool the cab as required.

    a. True
    b. False

15. A 24V military style jumper cable (aka "NATO Cable") is utilized to start the 25K Halvorsen Loader in the event the batteries are dead or too weak to start the engine. Where is the military jumper cable connector located on the 25K Halvorsen Loader?

    a. On the Main Panel Box
    b. Both C & D
    c. Inside the cab, under the seat
    d. On the Battery Box

16. The 120/240 VAC Winterization System automatically adjusts output voltage for heating elements installed for which of the following components?

    a. Engine block, hydraulic fluid, heater fuel, and batteries
    b. Oil, coolant, transmission fluid, hydraulic fluid, and batteries
    c. Oil, coolant, engine fuel, hydraulic fluid, and batteries
    d. Oil, coolant, transmission fluid, hydraulic fluid, ether, and batteries

17. True or False: When reconfiguring the 25K Halvorsen Loader for air shipment, the roller trays located directly to the right of the cab must be inverted (rollers down and smooth side facing up).

    a. True
    b. False

18. Which of the following is a step in Stopping the Loader (Shutdown Procedures) of the 25K Halvorsen Loader?

    a. Shut all windows, turn off additional lighting, turn off fan, and turn off wipers
    b. Place the 25K Halvorsen Loader on maintenance stands
    c. Place the Transmission Range Selector in the P (park) position
    d. Allow the engine to idle for 3 to 4 minutes for temperature to stabilize

19. True or False: **After** locking the deck and frame together (by rotating the Airportability Latch counter clockwise and re-installing pin), the operator must observe a flashing red indicator on the dash panel.

    a. True
    b. False

20. Which transmission range should you select when operating the 25K Halvorsen Loader near an aircraft or when the deck is elevated?

    a. N (neutral)
    b. D (drive)
    c. 1, 2, or 3
    d. 1 or R (reverse)

21. The maximum speed of the 25K Halvorsen Loader is _____ mph; however, operators will not exceed _____ mph on the flightline, and will not exceed _____ mph within 25 feet of any aircraft.

    a. 17, 15, 10
    b. 24, 10, 5
    c. 17, 10, 5
    d. 24, 15, 10

22. What must be in place before performing any maintenance checks or any other work that requires personnel to be under the elevated deck?

    a. Airportability Latch
    b. Maintenance Stands
    c. Differential Lock
    d. Spotters

23. The engine will automatically shut down if the engine coolant exceeds which of the following?

    a. 180° F (Fahrenheit)
    b. 190° F
    c. 210° F
    d. 225° F

24. Which of the following is the correct procedure to check the condition of the hydraulic return filter?

    a. Place the hydraulic preheat switch in the ON position, then observe the reading on the hydraulic return filter gauge.
    b. Place "CONVEY MODE PALLET WIDTH" switch to the AD position and check the hydraulic breather indicator.
    c. Turn off convey system and check the case drain filter gauge to ensure gauge read less than 25 psi.
    d. Place convey switch to the HIGH setting allowing modules to raise higher than normal and check the hydraulic reservoir fluid level.

25. When operating a 25K Halvorsen Loader in locations/conditions not explicitly addressed by local traffic flow plans, a spotter is required within how many feet of any obstacle?

    a. 5 feet
    b. 7.5 feet
    c. 10 feet
    d. 15 feet

Answer Key

#	Correct Answer	Reference
1.	b. False	AFQTP 24-3-E936, pg. 6 *(3.1.1.5.)* AFI 24-605 V2, pg. 73 *(3.2.2.2.)*
2.	c. AF Form 1800, *Operator's Inspection Guide and Trouble Report*	AFQTP 24-3-E936, pg. 14 *(3.2)* AFI 24-302, pg. 133 *(Section 7B)* TO 36-1-191, pg. 172 *(Table 3.1)*
3.	b. Horizontal	TO 36M2-3-45-1, pg. 2-17, *(2.2.3. Starting Engine, Figure 2-6)*
4.	c. DECK SUPPLY CUTOFF valve is off	TO 36M2-3-45-1, pg. 2-47 *(2.4 Emergency Operation, e, 1)*
5.	c. 39" / 220"	TO 36M2-3-45-1, pg. 1-1 *(1.2 General Description, d)*
6.	a. True	TO 36M2-3-45-1, pg. 2-34 *(2.2.6 Driving and Operating the Loader, b, 4, "Note "3")*
7.	b. 40 knots	TO 36M2-3-45-1, pg. 1-1 *(1.1 Purpose of Equipment)*
8.	a. True	TO 36M2-3-45-1, pg. 2-52 *(2.7 Prep for Air Transportation, e, 2)*
9.	c. ENGINE OIL PRESSURE	TO 36M2-3-45-1, pg. 2-20 *(2.2.3. Starting Engine, f, 2, Figure 2-8)*
10.	Cooling System: d. 15 gallons	TO 36M2-3-45-1, pg. 1-4 *(Table 1-1, Capacities)*
11.	Transmission System: b. 13 quarts	TO 36M2-3-45-1, pg. 1-4 *(Table 1-1, Capacities)*
12.	Hydraulic System: a. 32 gallons	TO 36M2-3-45-1, pg. 1-4 *(Table 1-1, Capacities)*
13.	Engine Fuel System: c. 23.75 gallons	TO 36M2-3-45-1, pg. 1-4 *(Table 1-1, Capacities)*
14.	a. True	TO 36M2-3-45-1, pg. 1-1 *(1.2 General Description, b)*
15.	d. On the Battery Box	AFQTP 24-3-E936, pg. 13 *(Figure 3.3)*
16.	b. Oil, coolant, transmission fluid, hydraulic fluid, and batteries	TO 36M2-3-45-1, pg. 1-25 *(1.4.11 Winterization)*
17.	a. True	TO 36M2-3-45-1, pg. 2-50 *(2.7 Prep for Air Transportation, c)*
18.	d. allow the engine to idle for 3 to 4 minutes for temperature to stabilize	TO 36M2-3-45-1, pg. 2-22 *(2.2.4. Stopping the Loader)*
19.	a. True	TO 36M2-3-45-1, pg. 2-57 *(2.8 Onloading onto Transport Vehicle, a, 1)*
20.	d. 1 or R (reverse)	TO 36M2-3-45-1, pg. 2-34 *(2.2.6 Driving and Operating the Loader, b, 4, "Note 1")*
21.	c. 17, 10, 5	TO 36M2-3-45-1, pg. 1-4 *(Table 1.1, Maximum Speed)* AFQTP 24-3-E936, pg. 7 *(3.1.1.4.)*
22.	b. Maintenance Stands	TO 36M2-3-45-1, pg. 2-50 *(2.7 Prep for Air Transport, "Warning Note")*
23.	d. 225° F	TO 36M2-3-45-1, pg. 2-3 *(Table 2-1, 7)*
24.	a. Place the hydraulic preheat switch in the ON position and observe reading on hydraulic return filter gauge	TO 36M2-3-45-1, pg. 2-11 *(Table 2-4, Hydraulic Return Filter "Note")*
25.	d. 15 ft	AFQTP 24-3-E936, pg. 7 *(3.1.1.7.)* AFI 24-605 V2, pg. 173 *(**Attachment 7**, A7.1.2.)* AFMAN 24-306, pg. 40 *(Section 4F, Spotter Safety)*

Attachment 6

REFRESHER TRAINING

A6.1. Refresher Training.

A6.1.1. Trainer will conduct an individual assessment on the trainee's current knowledge, proficiency, and confidence in operating the 25K Halvorsen Loader. The trainee will be given refresher training tailored to areas that the trainer considers necessary.

A6.1.2. Trainee must pass the Performance Evaluation and Knowledge Test **(Attachments 4 & 5** of the AFQTP) in order to be recertified.

A6.2. Performance Evaluation and Knowledge Test.

A6.2.1. Performance Evaluation:

A6.2.1.1. The trainer will conduct an individual assessment on the trainee's operator inspection, general safe driving practices and operation of the 25K Halvorsen Loader. Trainer will document the trainee's performance on the Performance Evaluation Checklist (**Attachment 4** of this AFQTP).

A6.2.1.2. Retraining. Trainer will retrain the trainee on failed item(s) by re-demonstrating proper operation of the failed item(s) and allowing the trainee to practice until they are proficient on (pass) the failed item(s). Re-evaluate and critique deficiencies as observed.

A6.2.2. Knowledge Test.

A6.2.2.1. Trainer will use **Attachment 5** in this AFQTP to administer a knowledge test once the trainee has demonstrated the knowledge retention required. Trainee is required to score at least an 80% on the knowledge test in order to be licensed.

A6.2.2.2. Retesting. Trainer will review all missed questions with the trainee until trainee comprehends/retains the knowledge and passes the written test.