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

QTP 24-3-E936
01 December 2025

25K Halvorsen Loader

Vehicle Management Codes: E936

QUALIFICATION TRAINING PACKAGE

Table of Contents

Section 1 - Overview **3**
1.1. Overview 3
1.2. Lesson Objectives 3
1.3. Instructional Training Aid and Equipment 4
Section 2 - Responsibilities **6**
2.1. Responsibilities 6
Section 3 - Knowledge Overview **7**
3.1. Knowledge Overview 7
3.2. Inspection 7
3.3. Vehicle Safety 8
3.4. Vehicle Operation 9
Attachment 1 GLOSSARY **12**
Attachment 2 PERFORMANCE TEST **13**
Attachment 3 STUDENT WALK-AROUND GUIDE **16**
Attachment 4 HALVORSEN KNOWLEDGE TEST **34**
Attachment 5 RECERTIFICATION TRAINING **38**

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 Qualification Training Package (QTP) will be used in the training of individuals to operate the 25K Halvorsen Loader and perform tasks with the equipment. **Attachment 2**, Performance Test, will be used for documentation of student proficiency for initial and recertification training. Recertification training is required every two years.

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 training requirements to ensure the trainer adequately qualifies the trainee.

1.2.1.1. Trainee becomes proficient and qualified to inspect and operate the 25K Halvorsen Loader.

1.2.2**.** Prerequisites.

1.2.2.1. Licensing Requirements

1.2.2.1.1. Trainee must possess a valid state driver's license.

1.2.2.1.2. AF Form 171, Request for Driver's Training and Addition to U.S. Government Driver's License IAW AFI 24-301, Ground Transportation.

1.2.2.1.3. Applicable local licensing jurisdiction requirements

1.2.3. Training requirement.

1.2.3.1. Complete Halvorsen Course

1.2.3.2. A certified trainer is responsible for ensuring the trainee completes on-the-job training after completing the Halvorsen course and prior to licensing IAW DAFI 24-605 Vol5, Para 2.11.5.2.

1.2.3.2.1. OJT should include but not limited to the following:

1.2.3.2.1.1. Complex loads:

1.2.3.2.1.1.1. Restricted view operations. Restricted right-side view (pallet in pallet position #1 on Halvorson) – used to emphasize the importance of using spotters when driving with something blocking your view and the dangers of

turning to the right with impeded view. Develops confidence and experience as an operator in a common situation.

1.2.3.2.1.1.2. T-2 or greater – used to emphasize the importance of properly aligning the K-loader.

1.2.3.2.1.1.3. Heavy Cargo (8,000 pounds or greater) – used to emphasize the importance of properly maintaining equal height with aircraft / loader to loader / highline dock while transferring cargo.

1.2.3.2.1.1.4. **Rolling Stock** – used to demonstrate bridge plates, emphasizes the importance of properly maintaining equal height with aircraft / loader to loader / highline dock while transferring cargo, and demonstrates converting the deck (flipping the rollers).

1.2.3.2.1.1.5. **Multiple pallets** – used to demonstrate the use of conveyors and the High/Low switch. Emphasizes the importance of shutting off rollers not in use (preventing damage to the conveyors).

1.2.3.2.1.1.6. Combination load (pallet and rolling stock mix) – used to demonstrate the process of switching between different types of cargo.

1.2.3.2.1.2. Monitor the trainee to guarantee compliance with all safety operations and check-out procedures.

1.2.3.3. Additional training requirements are listed in DAFI 24-605 Vol5, Chapter 2.

1.3. Instructional Training Aids and Equipment

1.3.1. Key References and Forms:

1.3.1.1. *Student Walk-Around Guide*, **Attachment 3**

1.3.1.2. AFI 24-301, *Ground Transportation*

1.3.1.3. AFI 24-302, *Vehicle Management*

1.3.1.4. DAFI 24-605 V5, *Standardization & Resources* Chapter 2, Training

1.3.1.5. DAFI 24-605 V2, *Air Transportation Operations:*

1.3.1.5.1. Chapter 3 (Cargo and Mail Operations), Paragraph 3.2 (Safety).

1.3.1.6. AFMAN 24-306, *Operation of Air Force Government Motor Vehicles,* Chapter 4 (Basic Operating Procedures and Maneuvers)*,* Paragraph 4F (Spotter Safety).

1.3.1.7. QTP 24-3-E936, *25K Halvorsen Loader*.

1.3.1.8. DAFMAN 36-2689, *Training Program*

1.3.1.9. TO 36-1-191, *Technical and Managerial Reference for Motor Vehicle Maintenance*:

1.3.1.9.1. Chapter 3 (Motor Vehicle and Base Support Equipment Inspection)*:*

1.3.1.9.2. Paragraph 3.4 (Types of Inspections)

1.3.1.9.3. Paragraph 3.12 (Operator Daily/Weekly Inspection Requirements).

1.3.1.9.4. 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. NOTE: Trainer should ensure the most current version is being utilized.

1.3.1.10. AF Form 1800, Operator's Inspection Guide and Trouble Report.

1.3.1.11. T.O. 36M2-3-45-1, 25,000LB Halvorsen Loader (or applicable T.O./Manufacturer's Operator's Manual) required.

1.3.2. Equipment:

1.3.2.1. 25K Halvorsen Loader (vehicle)

1.3.2.2. Controlled training area; should incorporate highline dock (or equivalent) and simulated cargo (palletized loads/rolling stock).

1.3.2.3. Traffic cones and/or training markers.

Section 2

Responsibilities

2.1. **Responsibilities**.

2.1.1. Trainer:

2.1.1.1. Understand trainer's responsibilities IAW DAFMAN 36-2689.

2.1.1.2. 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.).

2.1.1.3. Responsible for ensuring that trainees accomplish OJT following successful completion of the Halvorsen course. This OJT should encompass complex loads, specifically: restricted view operations, rolling stock, and/or T2, as well as 8000lb loads. See **Paragraph 1.2.3.** for training requirements.

2.1.1.3.1. Administer final Performance Assessment IAW with DAFI 24-605V5, Para 2.11.5.2.3. Annotate training IAW AFMAN 24-306, Operation of Air Force Government Motor Vehicles. PA will be conducted and documented using the Performance Test (**Attachment 2** of this QTP) to verify the trainee's competency. Trainee must score 100% to receive approval for licensing.

2.1.2. Trainee

2.1.2.1. Understand trainee's role IAW DAFMAN 36-2689, *Training Program*.

2.1.2.2. Wear all applicable PPE as required (e.g., safety toe boots safety gloves, hearing protection, eye protection, etc.) as explained by trainer.

2.1.2.3. Review AFMAN 24-306, Operation of Air Force Government Motor Vehicles, Chapters 4, 6, 7, 9, and 10.

2.1.2.4. Explain and demonstrate vehicle operation utilizing the Student Walk- Around Guide (**Attachment 3**).

2.1.2.5. Will complete OJT and pass PA utilizing the Performance Test (**Attachment 2** of this QTP) **See Paragraph 1.2.3.2.1.** for OJT requirements.

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:

3.1.1.1. Do NOT stand under, work under, or pass under the elevated portion of any loader deck when it is not on maintenance stands.

3.1.1.2. Never place arms or legs between pinch or crush points.

3.1.1.3. Do NOT drive loaders in the direction of anyone standing in the path of the loader or between the loader and a fixed object.

3.1.1.4. 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").

3.1.1.5. 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 DAFI 24-605 V2, Air Transportation Operations.

3.1.1.5.1. 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.

3.1.1.6. 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.

3.1.1.7. 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 DAFI 24-605 V2, Air Transportation Operations, Attachment 7 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. Specifications are detailed in the Student Walk-Around Guide, **Attachment 3**.

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.*

3.2.1.1. 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.)

3.2.1.2. Attachment 3, The Student Information Walk-Around Guide and T.O. 36M2-3-45-1, Table 2-4, *Operator Inspection Checklist* can be used as aids in vehicle inspection.

3.3. **Vehicle Safety.**

3.3.1. Vehicle Operation Safety:

3.3.1.1. Overall size.

3.3.1.2. Ground clearance.

3.3.1.3. 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.

3.3.1.4. High winds. High wind conditions may cause the deck to sway. Personnel may only operate the loader in winds under 40 knots.

3.3.1.5. 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.

3.3.1.5.1. 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).

3.3.1.6. Tie-downs and tools. Properly store in the toolbox when not in use. When tie-downs are used, all excess must be secured/stowed.

3.3.1.7. Cab floors must be clear of all loose items to avoid risk of safety/accidents (example: water bottle rolling under brake pedal, preventing braking).

3.3.1.8. Transferring pallets. When transferring pallets, it is very important to keep the loader deck level in relation to the aircraft ramp or loading dock.

3.3.1.9. Spotting. As directed in paragraph 3.1.1.7. of this QTP.

3.3.2. Personnel Safety

3.3.2.1. Safety-toed boots must be worn

3.3.2.2. Gloves will be worn during cargo handling. No jewelry will be worn in accordance with DAFMAN 91-203.

3.3.2.3. Hearing protection

3.3.2.4. Eye protection when required (e.g., changing and/or inflating a tire or during Engine Running On/Offload (ERO) operations)

3.3.2.5. First aid kit

3.3.2.6. Warning triangles

3.3.2.7. Raingear, cold weather gear, etc.

3.3.2.8. Reflective belt during hours of reduced visibility and on flightline

3.3.2.9. Fire extinguisher.

3.4. **Vehicle Operation.**

3.4.1. Before engine starts.

3.4.1.1. 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).

3.4.1.1.1. Ensure all emergency stop switches are pulled out.

3.4.1.1.2. Ensure power cord is unplugged from winterization receptacle.

3.4.1.1.3. Check parking brake is in the on position.

3.4.1.1.3.1. Test Warning Lights on Dash Panel. Hold the SHUTDOWN OVERRIDE switch down in the LIGHT TEST POSITION.

3.4.2. Starting the engine.

3.4.2.1. Move IGNITION SWITCH to the on position.

3.4.2.2. Check that N is in the TRANSMISSION RANGE SELECTOR.

3.4.2.3. Wait for ENGINE PREHEAT light to go out before moving switch to start.

3.4.2.4. 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.

3.4.2.4.1. If oil pressure is below 5 psi, the engine may not start or may start but shutdown.

3.4.2.4.2. 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.

3.4.2.4.3. Release both switches when the oil pressure gauge indicates 5 psi or higher.

3.4.2.4.4. Observe all gauges and lights for normal ranges.

3.4.2.4.5. Engine will turn off when any of these lights illuminate: 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.

3.4.3.1. Engage PARKING BRAKE and observe light.

3.4.3.2. Place TRANSMISSION SELECTOR in N position.

3.4.3.3. Allow the engine to idle for 3 to 4 minutes for temperature to stabilize.

3.4.3.4. Place IGNITION SWITCH to the “OFF” position.

3.4.3.5. Turn the battery disconnect switch to the OFF position when finished.

3.4.3.6. 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.)

3.4.4.1. Plug AC power cable into receptacle.

3.4.4.2. Turn circuit breaker to the ON position.

3.4.4.3. 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.

3.4.8.1. 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.

3.4.9.1. To rotate the guide rail inboard:

3.4.9.1.1. Remove retaining pins, securing rail to the pivot lugs.

3.4.9.1.2. Lift/rotate rail up/inboard and reinstall retaining pins in pivot lugs to secure rail in new location.

3.4.9.1.3. Reinstall pallet locks in exposed cavity as previously mentioned. ○ Two retaining pins are removed from the pallet lock cavity.

3.4.9.1.4. 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).

3.4.10.1. Release latch restraining tray.

3.4.10.2. Invert and place back in cavity.

3.4.10.3. Engage latch.

3.4.11. Forklift configuration.

3.4.11.1. Remove and stow all five-tine trough covers.

3.4.11.2. Failure to remove all covers may result in structural damage.

3.4.11.3. Ensure all caster/roller trays are in the UP position.

3.4.12. Cover storage.

3.4.12.1. Tine trough covers are stored on left/rear handrail.

3.4.12.2. 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.

3.4.13.1. Remove and stow two right rear handrail sections.

3.4.13.2. Remove and stow all five-tine trough covers.

3.4.13.3. Ensure caster/roller trays are in the up position.

3.4.13.4. Support two right rear catwalk sections and remove retaining pins.

3.4.13.5. Lower catwalks and pallet guides.

3.4.14. Deck extension.

3.4.14.1. 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.

3.4.14.2. Place pallet width switch in the “OFF” position.

3.4.14.3. Rotate all convey module latch handles in-line with deck.

3.4.14.3. 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 T.O. 36M2-3-45-1, *25,000 lb. Halvorsen Loader* (or applicable TO/Manufacturer’s Operator’s Manual).

Attachment 1

GLOSSARY

References

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

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

DAFI 24-605 V2, *Air Transportation Operations*, 29 January 2025

QTP 24-3-E936, *25K Halvorsen Loader*, XXXX

TO 36-1-191, *Technical and Managerial Reference for Motor Vehicle Maintenance*, 5 February 2025

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

QTP—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 Official

Attachment 2

Performance Test

Preface

This Performance Test is utilized for initial and recertification that assesses your competency in Halvorsen operations and safety procedures, as required for licensing. The test includes maneuvers designed to evaluate your competence and knowledge of loader and inspection operations. A score of 100% is required to pass this test. For initial and recertification training, any "no-go" items will necessitate a review of missed material followed by OJT and retest.

PERFORMANCE TEST			
Trainees Name:	**Date:**		
Ensure Operator possesses a valid civilian driver's license Ensure Operator possesses a valid government driver's license or AF Form 171			
Event	**Go**	**No Go**	**Notes**
1. PRE, DURING, AND POST- OPERATION INSPECTION			
1.1. Operator has required Personal Protective Equipment.			
1.2. Follows general pattern of pre-trip checklist.			
1.3. Performs brake component check			
1.4. Signs AF Form 1800 to signify accomplishment of complete inspection.			
1.5. Knows the amount of time the vehicle should be shut-down before performing inspection.			
1.6. Inspects all emergency equipment on the K-Loader.			
1.7. Inspect all levers, controls and fluid levels.			
1.8. Cleans windshield, windows, mirrors, lights and reflectors.			
1.9. Inspects tires for FOD.			
1.10. Continues during operations inspection checks.			
1.11. Performs post trip inspection and reports malfunctions to Vehicle Management.			
1.12. Operator ensures deck and catwalk are clear of unused tie-down/ obstruction prior to operation.			

Event	Go	No Go	Notes
2. OPERATIONS TEST			
2.1. General - safety belt is used; obeys all traffic signs, signals, and laws; completes test without an accident or moving violation. Properly uses all necessary safety equipment. Prohibits personnel from walking under the raised deck.			
2.2. Operating the starter for the correct amount of time.			
2.3. Operating all deck controls.			
2.4. Obeying speed limits.			
2.5. Configure deck for varied loads.			
2.6. Demonstrate safe loader operations.			
2.6.1. Restricted view operations. Restricted right-side view (pallet position #1 at least 48" high)			
2.6.2. T-2 or greater – used to emphasize the importance of properly aligning the K-loader.			
2.6.3. Heavy Cargo (8k lbs.) - Used to emphasize the importance of properly maintaining equal height with aircraft / loader to loader / highline dock while transferring cargo.			
2.6.4. Rolling Stock – used to demonstrate bridge plates, emphasizes the importance of properly maintaining equal height with aircraft / loader to loader / highline dock while transferring cargo, and demonstrates converting the deck (flipping the rollers).			
2.6.5. Demonstrating the use of conveyors and the High/Low switch. Emphasizes the importance of shutting off rollers not in use (preventing damage to the conveyors).			
2.6.6. Combination load (pallet and rolling stock mix) – used to demonstrate the process of switching between different types of cargo.			
2.7. Show proficiency in identifying situations requiring a spotter.			
2.8. Demonstrating the proper use of the emergency shutdown switch.			
2.9. Demonstrating proper parking procedures.			
CERTIFIER COMMENTS:			

Trainee (print): _____ Start Date: _____

Trainer (print): _____ Complete Date: _____

Trainer's Signature: _____ Complete Date: _____

Attachment 3

Halvorsen Loader

Student Walk-Around Guide

Student Working Guide

Safety

- Warnings – Protection of Personnel
- Cautions- Protection of Equipment and Property
- Notes- Brief comments or explanations
- ***If it is listed as a warning, caution or note it has happened*.**

Requirements for Inspection

- AF 1800
- T.O. **36M2-3-45-1**
- 2-person team *(minimum)*
- PPE *(Eye protection if using pneumatic tools)*
- AF 171 and/or government license

Verify k-loader is mission capable -Notify vehicle maintenance and/or supervisor of any discrepancies.

Specifications

■ Maximum Payload:	25,000 lbs.
■ Gross Weight:	31,350 lbs. (unloaded)
■ Maximum Speed:	17 mph (forward) 5 mph (reverse)
■ Turning Radius:	100 ft
■ 463L Pallets:	3 @ ~ 8,000 lbs. each
■ Rolling Stock:	25,000 lbs.
■ Fuel Types:	DF1 - DF2, JP-5 - JP-8, 2-DS15, Biodiesel (see caution)

Capacities

■ Fuel tank:	23.75 gal
■ Fuel tank (heater):	2 gal
■ Cooling System (engine):	15 gal
■ Engine Oil:	10 qt
■ Transmission:	13 qt
■ Hydraulic Oil Reservoir:	32 gal

Deck heights and Adjustments

■ Length:	335”
■ Width:	170” (Ops Config.)
■ Width:	109” (Air Trans Config.)
■ Max Height:	220” (18.5’)
■ Normal Height:	98” (with work light) 94” (without work light)
■ Chassis Ground Clearance	5”
■ Min Height:	39”
■ Pitch (forward/aft):	6° degrees
■ Roll (left/right):	4° degrees
■ Side Shift (left/right):	3” off centerline

Chassis

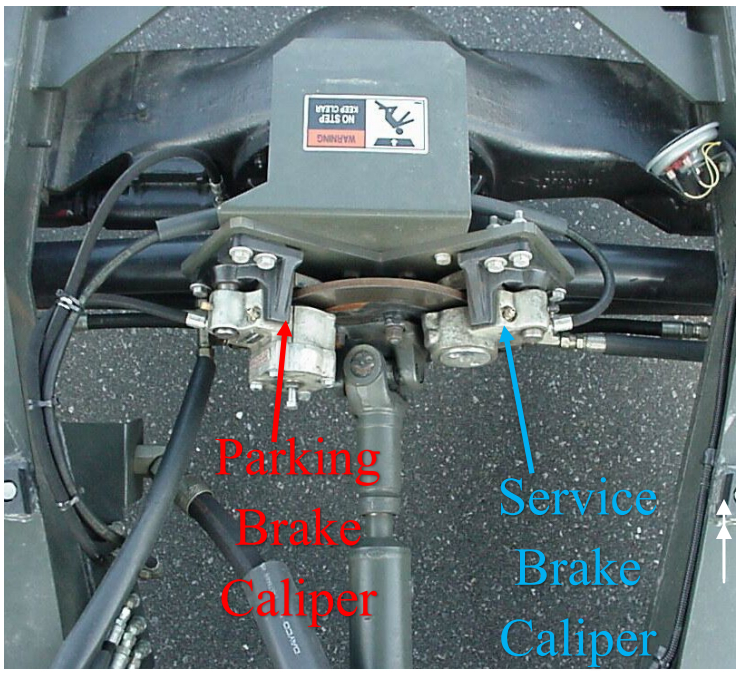
- Welded steel frame
- Structural Foundation
  - Drive/Steer Axle
  - Rear Axel Assembly
  - Power Unit
  - Electrical System
  - Hydraulic System
  - Fuel System

Drive and 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.

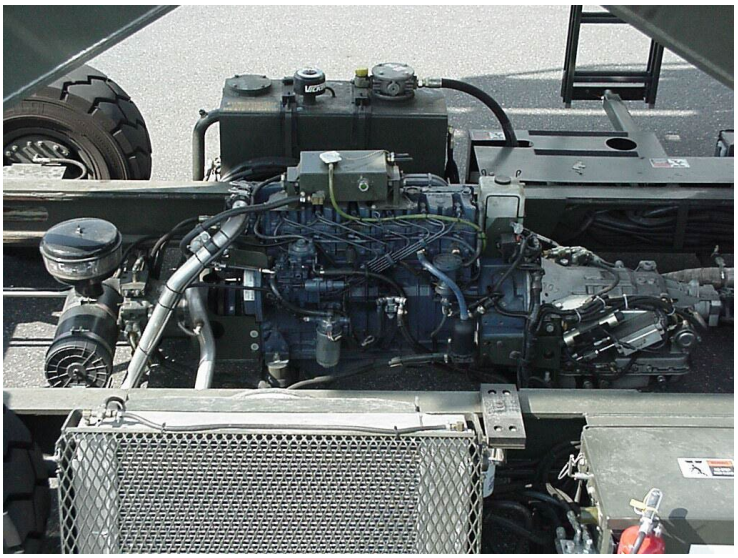
Drive and Steer Axle

- 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

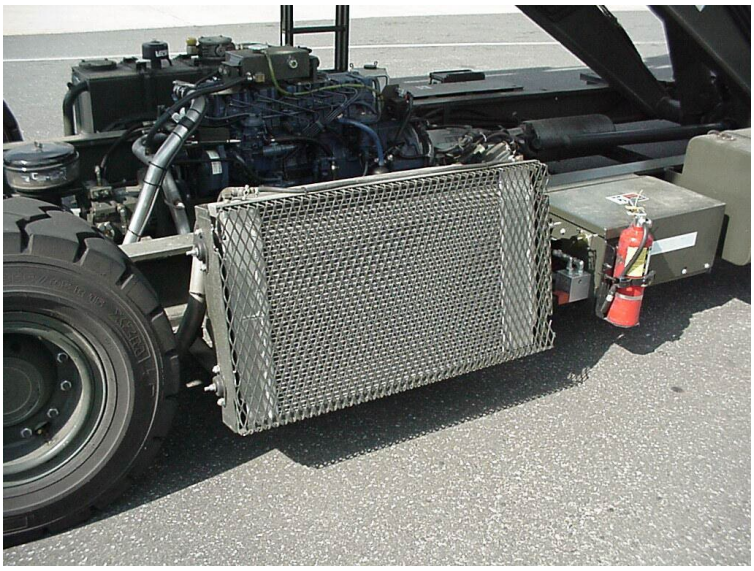
- Bogy Assembly: bogy wheel arm, two-wheel assemblies, and telescoping hydraulic cylinder Bogy pivot shaft
- External Disk brakes (hydraulic)
- Attached to chassis by two pivot pins.
- Additional ramp clearance obtained by engaging air transportability latch and raising deck.
- Attached to chassis by two pivot pins.
- Additional ramp clearance obtained by engaging air transportability latch and raising deck.



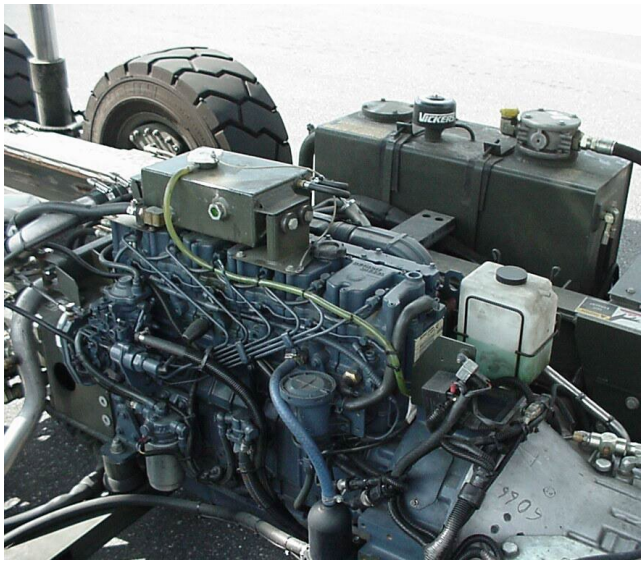
Power Unit

- Six-cylinder, liquid cooled, turbocharged Detroit Diesel engine
- Drives automatic transmission coupled to the flywheel to propel the loader.
- Drives a Variable displacement hydraulic pump coupled to the front end of crankshaft to operate hydraulic systems.
- Drives a generator for electrical power to keep batteries fully charged.

Cooling System

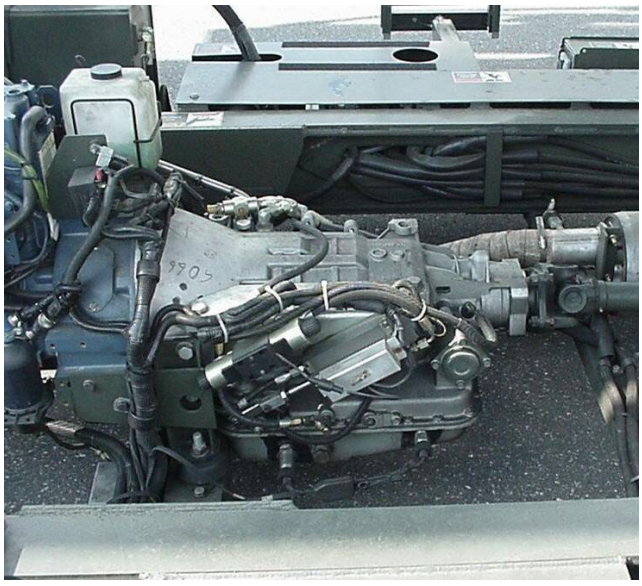


- Closed-loop engine cooling system system consisting of:
  - Radiator: Remotely mounted outside right-side of chassis frame.
  - Fan: 2-speed Hydraulic motor controlled by sensors in the cooling system. Automatically actuates at 190°F.
  - Water Pump: Circulates coolant as determined by thermostat.



- Coolant reservoir: Mounted on top of engine, reserves fluid volume required to maintain cooling system operating range. Contains a sight gauge.
- Coolant recovery tank: Mounted on rear of engine. Allows coolant recovery, maintains a constant fluid level, prevents introduction of air in the closed loop system.

Transmission



- Four-speed automatic coupled to engine flywheel for directional control.
- Torque converter provides inching capability.
- Range selection accomplished by electrically controlled joystick.

Scissors

- Provide means to raise, lower and pitch the deck.

Outer Scissors

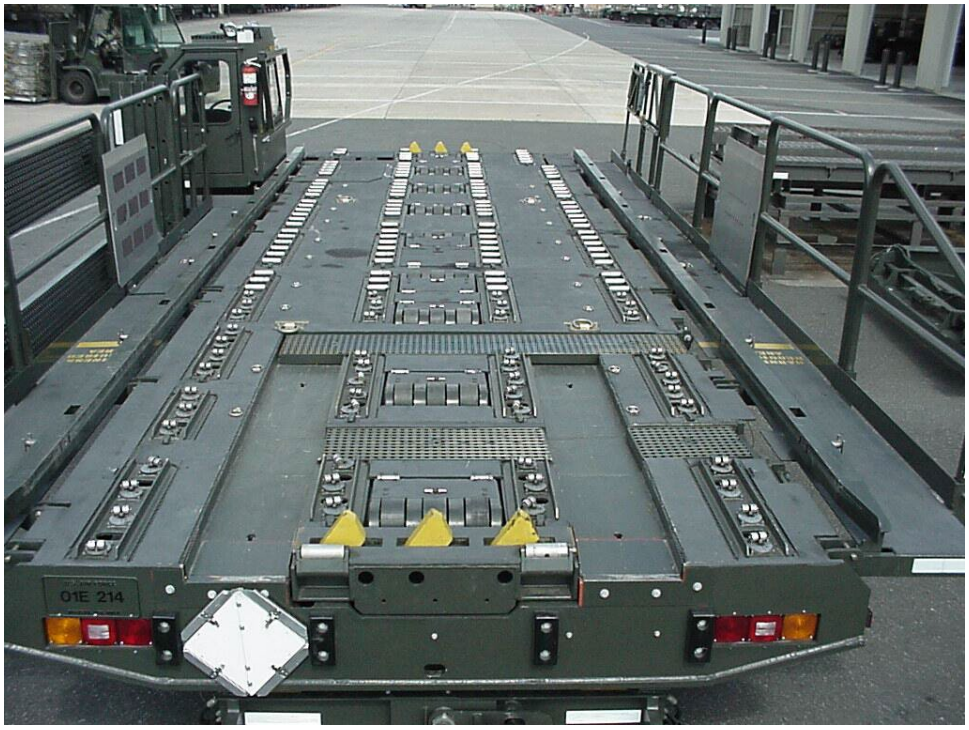
- Front pivots on main lift cylinder pivot pins.
- Rear travels deck frame as deck raises/lowers.
- Consists of two sections to allow pitch.

Inner Scissors

- Front pivots on deck pivot points.
- Rear travels on main frame as deck raises/lowers.

Deck

- An aluminum structure raised and lowered by the scissors and contains a powered convey system to control the movement of 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



Emergency System

- Electrically powered emergency hydraulic pump
- Engages automatically in the event of power pack or hydraulic pump failure <u>while driving</u>
  - Provides power to steering, service brakes, and parking brakes
  - Automatic feature activates only with ignition on/parking brake off

Emergency System

- Emergency pump can be manually actuated by the operator
  - Momentary switch located on Dash Panel allows for deck functions, cargo transfer, and parking brake release.
  - Second switch located on Main Panel used for maintenance

Winterization

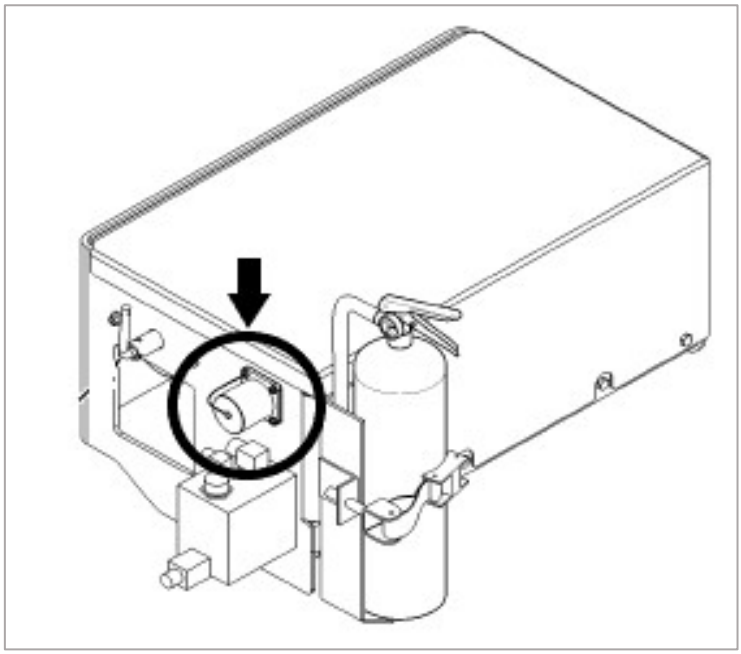
- Sustained operations at 0º F or below.
- 120 or 240 VAC
- Heats engine oil, engine coolant, transmission fluid, hydraulic fluid, and batteries
- When connected “Winterization” indicator is illuminated on dash panel.

External Cab

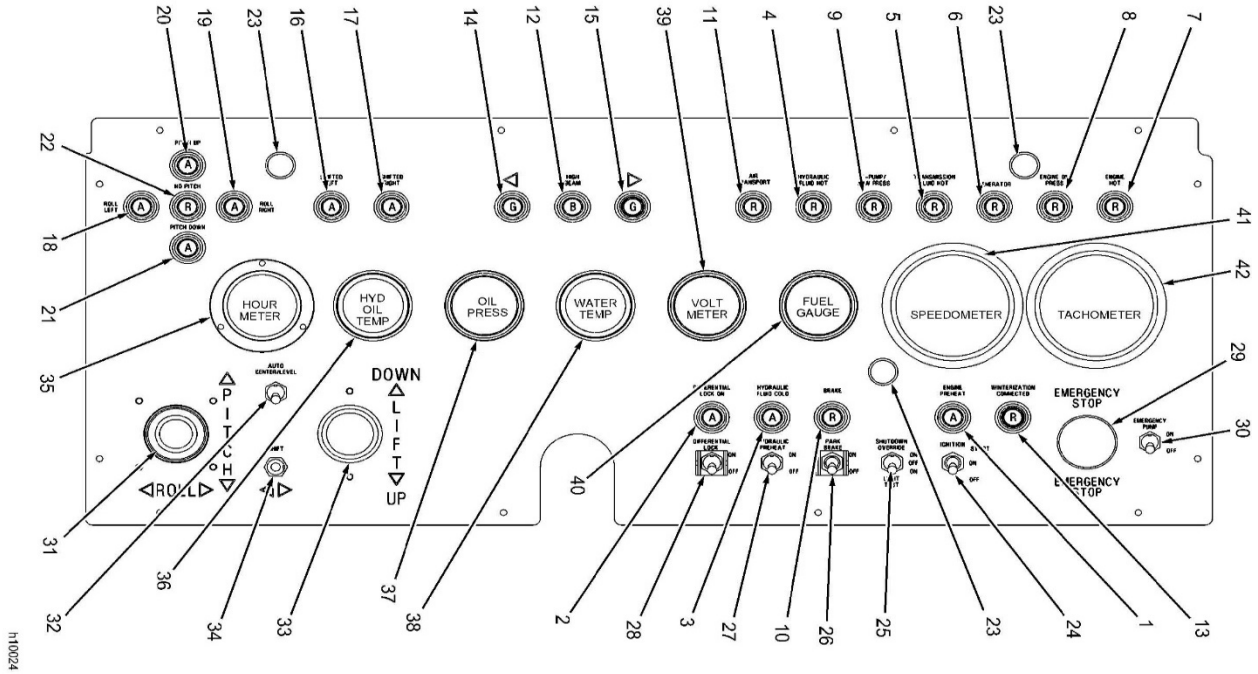
- Fully enclosed, mounted on left side
  - Main door
  - Rear egress door
  - Washer fluid fill
  - Heater fuel fill
  - Fire extinguisher
  - Spot lights
  - Sliding hand rail

NATO Plug

- 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

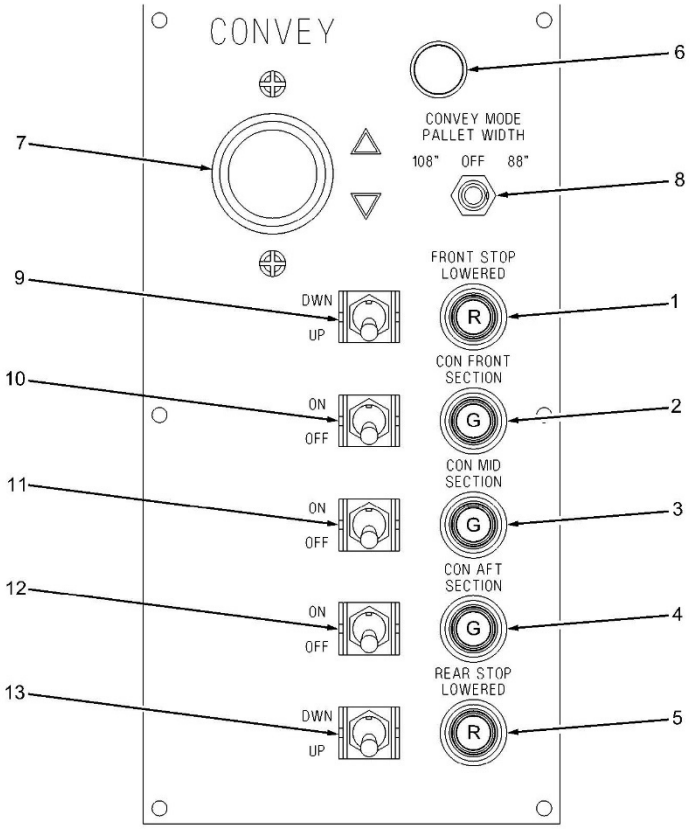


24 V Military Vehicle Jumper Cable Connector



A. Name the panel then identify and define the numbered items below:
3.
4.
5.
6.
7.
8.
11.

16/17.
18/19.
20/21.
22.
24.
25.
26.
27.
28.
29.
30.
31.
32.
33.
34.



Item Number	Description
(1)	FRONT STOP LOWERED - Red light indicating front pallet stop is lowered.
(2)	CON FRONT SECTION - Green light indicating front convey section is active.
(3)	CON MID SECTION - Green light indicating middle convey section is active.
(4)	CON AFT SECTION - Green light indicating aft convey section is active.
(5)	REAR STOP LOWERED - Red light indicating rear pallet stop is lowered.
(6)	PANEL LIGHT - Illuminates the convey panel.
(7)	CONVEY - Two-way joystick control for selecting direction to convey cargo and the speed of the convey rollers. Joystick will latch in the center position (neutral) to prevent accidental actuation. Convey speed increases as the joystick handle is moved farther away from the neutral position.
(8)	CONVEY MODE PALLET WIDTH - Three-position switch that raises the convey modules and selects the rollers in each section to rotate for the pallet width selected (88-inch or 108-inch). When the OFF position is selected, the convey modules are lowered.
(9)	FRONT STOP LOWERED - Two-position switch that raises and lowers the front cargo stop.
(10)	CON FRONT SECTION - Two-position switch that activates the rollers on the front convey section.
(11)	CON MID SECTION - Two-position switch that activates the rollers on the middle convey section.
(12)	CON AFT SECTION - Two-position switch that activates the rollers on the aft convey section.
(13)	REAR STOP LOWERED - Two-position switch with a momentary contact that lowers the rear cargo stop.

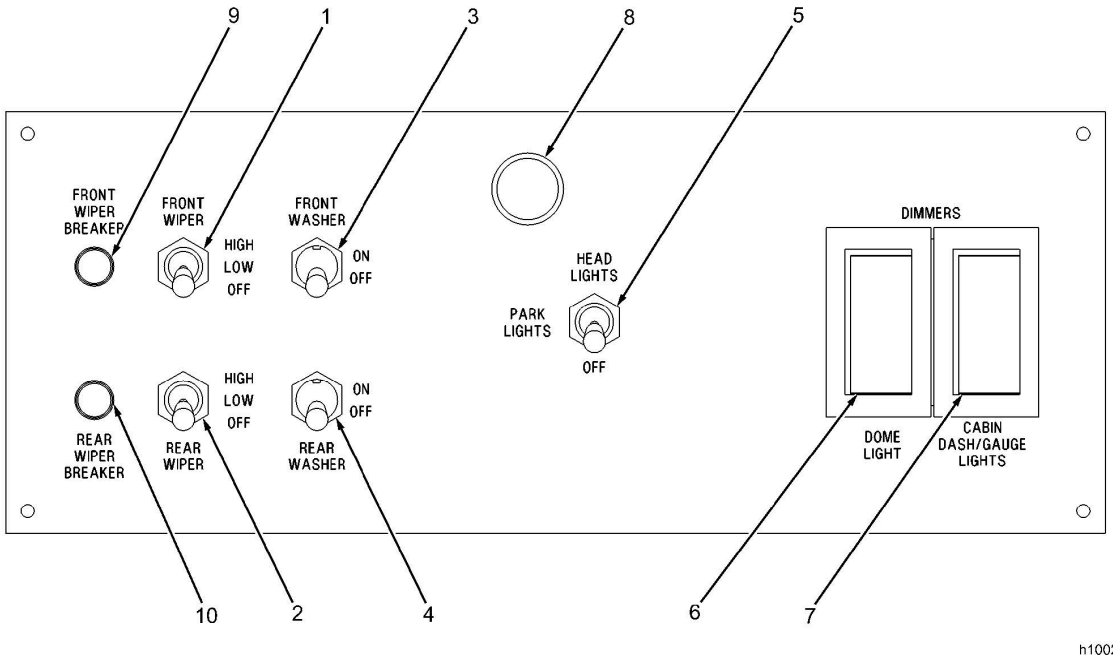


Figure 2-3. Wiper Panel

Table 2-3. Wiper Panel Controls and Indicators

Item Number	Description
(1)	FRONT WIPER - Three-position switch for operating the windshield wiper motor with two speeds.
(2)	REAR WIPER - Three-position switch for operating the rear door wiper motor with two speeds.
(3)	FRONT WASHER - Two-position switch with a momentary contact that actuates the pump for the windshield washer.
(4)	REAR WASHER - Two-position switch with a momentary contact that actuates the pump for the rear door washer.
(5)	HEADLIGHTS - Three-position switch for operating the parking lights and headlights.
(6)	DOME LIGHT - Rotary switch for turning dome light OFF and ON and adjusting the brightness.
(7)	CABIN DASH/GAUGE - Rotary switch that adjusts the brightness of the dash panel illumination lights and the gauge illumination lights.
(8)	PANEL LIGHT - Illuminates the overhead panel.
(9)	FRONT WIPER BREAKER - Resettable circuit breaker for front wipers.
(10)	REAR WIPER BREAKER - Resettable circuit breaker for rear wipers.

1. What conditions will cause the engine to shut down:

2. A spotter is always required anytime the Halvorsen Loader is operated within _____ feet of another vehicle, building, loading dock, etc.

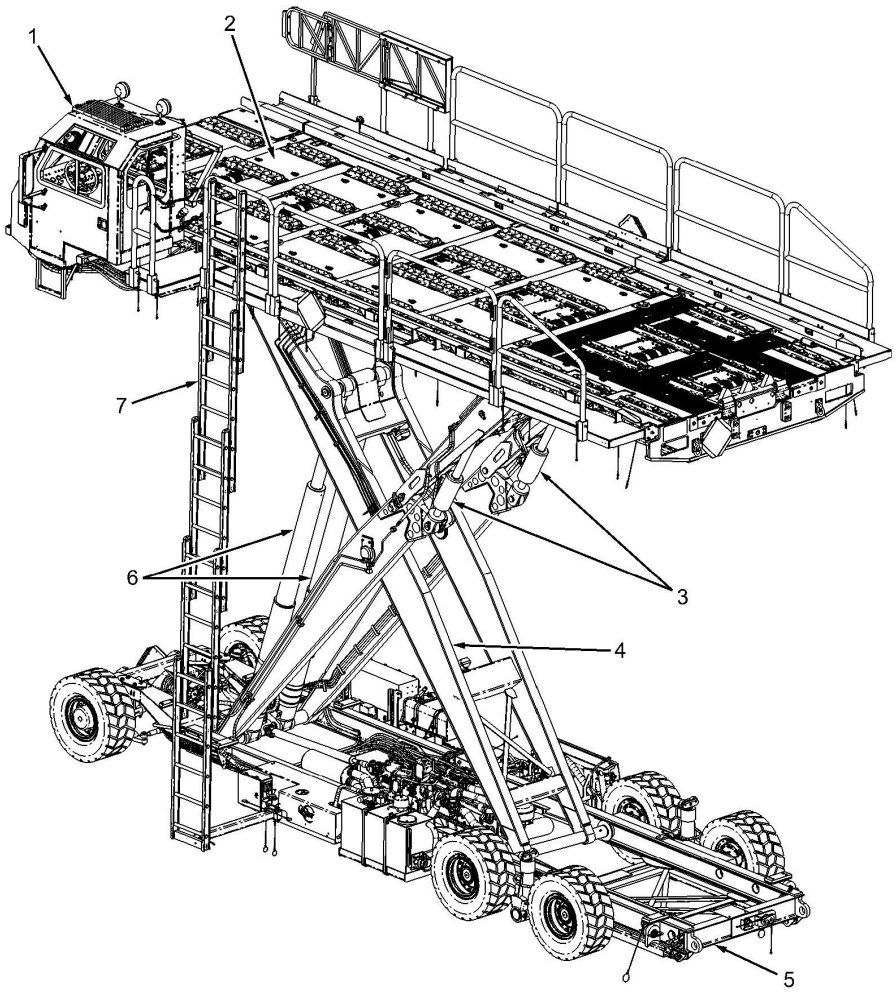
3. The maximum speed of the loader is _____ mph, however, operators will not exceed _____ mph on the flightline and _____ mph within 25 feet of any aircraft.

4. The battery disconnect switch located on the battery box is OFF when the handle is in the _____ position.

5. Loader operations are restricted to winds under _____.

6. What components are warmed when Winterization heating elements are installed?

7. What are the starter on / off cycles conditions?



Notes:

Attachment 4

KNOWLEDGE TEST
25K HALVORSEN LOADER

Preface

The following questions will allow the instructor/trainer to evaluate your retention of the material covered in training. Some questions are designed to test your ability to recall information, and others are designed to evaluate your ability to locate information in the operator technical manual. Use the copy of TO 36M2-3-45-1 given to you with your test booklet. Read each question-and-answer choice carefully. Select the most correct answer and record your response on the answer sheet provided. You must achieve 80% or higher to successfully past this exam. Test score of less than 80% will require a mandatory review of all items missed and a retest.

THE ONLY DOCUMENT YOU CAN USE DURING THE TEST IS
T.O. 36M2-3-45-1
YOU HAVE 60 MINUTES TO COMPLETE THIS EXAM

1. The battery disconnect switch located on the battery box is "OFF" when the handle is in the _____ position.

a. vertical b. horizontal

2. When using the emergency pump to raise the deck, the operator must ensure the _____.

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

3. At its lowest position, the loader deck height is___ and ___ when fully raised.

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

4. When the deck is elevated and a transmission range "D", "3", or "2" is selected, the throttle will be inactive, and the engine will remain at idle speed and a "no drive condition" will exist.

a. True b. False

5. Loader operations are restricted to winds under _____.

a. 35 knots b. 40 knots
c. 35 mph d. 40 mph

6. According to the Halvorsen T.O., you must push the cab inward into the shipping configuration anytime the loader is shipped by air.

a. True b. False

7. Which of the following indicators will not illuminate when holding the SHUTDOWN OVERRIDE switch in the down position?

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

For questions 8 - 11 match the following system types with their fluid capacities.

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

12. The NATO cable (slave cable) is utilized to start the loader in the event the batteries are dead or too weak to start the engine? The NATO connector is located _____.

a. on the main panel box
b. C & D
c. inside the cab under the seat
d. on the battery box

13. The aft ends of the outer scissors have lugs for securing the roll cylinders and the forward ends pivot on _____.

a. The pitch cylinder
b. Bogy pivot shafts
c. Axle assembly pivot points
d. Main lift cylinder pivot pins

14. *After* locking the deck and frame together by rotating the airportability latch counterclockwise and re-installing pin, the operator must observe a flashing red indicator on the dash panel.

a. True
b. False

15. Which transmission range should you select when operating the loader near an aircraft or when the deck is elevated?

a. 1 or R (Reverse)
b. D (Drive)
c. 1, 2 or 3
d. N (Neutral)

16. The maximum speed of the loader is _____ mph, however, operators will not exceed _____ mph on the flightline and _____ mph within 10 feet of any aircraft.

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

17. 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

18. The engine will automatically shut down if the engine coolant exceeds _____.

a. 180° F
b. 190° F
c. 210° F
d. 225° F

19. To check the condition of the hydraulic return filter:

a. Place the hydraulic preheat switch in the ON position and observe reading on 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.

20. A spotter is always required anytime the Halvorsen Loader is operated within _____ feet of another vehicle, building, loading dock, etc.?

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

Attachment 5

RECERTIFICATION TRAINING

A5.1. Recertification Training.

A5.1.1. Trainer will conduct an individual performance assessment on the trainee's current knowledge, proficiency, and confidence in operating the 25K Halvorsen Loader. The trainee will be given recertification training tailored to areas that the trainer considers necessary.

A5.1.2. Trainee must pass the Performance Test and Knowledge Test **(Attachments 2 & 4** of the QTP) in order to be recertified.

A5.2. Performance and Knowledge Test.

A5.2.1. Performance Test:

A5.2.1.1. The trainer will conduct an individual performance 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 Test (**Attachment 2,** of this QTP).

A5.2.1.1.1. Recertification requires a passing score of 100%. If the operator does not achieve 100% score, a retest is required. Failure to pass the retest will result in decertification, and initial vehicle training requirements must be re-accomplished. Document the PA and decertification, if applicable, in operator's training record.

A5.2.2. Knowledge Test.

A5.2.2.1. Trainer will use **Attachment 4** in this QTP to administer a Halvorsen Knowledge Test once the trainee has demonstrated the knowledge retention required. Trainees are required to score at least an 80% on the knowledge test in order to be licensed.

A5.2.2.2. Retesting. Trainer will review all missed questions with the trainee until trainee comprehends/retains the knowledge and passes the written test.