


# MN-PV-CIS-010

# Water Truck Competency Manual

**MN-PV-CIS-010 – Water Truck Competency Manual**
**Rev 2**
**Updated: December 1, 2021**
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# Training Expectation Letter

It is required that this document is completed prior to the Employee starting training on a P&V Water Truck. This document will serve as formal record that all parties have reviewed and understand the expectations for training on the Water Truck.

**Trainee Name:** **Date of Discussion:**

**Expectations of Supervisor/Leader**

- Ensuring trainee has scheduled time for training.
- Ensure trainee has reviewed and understand the technical documentation
- Ensure trainee has been provided a demonstration on equipment operation
- Verify field competency sign offs once completed
- Ensure trainee is working with a competent mentor until they are competent themselves
- Provide support for the assessor, mentor, trainer and trainee whenever possible.
- Ensure training documentation is sent to CEDA Training Department

**Expectations of Trainer, Mentor, assessor**

- Must be qualified in the position for which he/she is training.
- Educate and support trainee with technical review package.
- Ensure trainee has been provided a demonstration on equipment operation
- Review trainee's technical knowledge and verify acceptable understanding
- Educate and support trainee with field tasks identified in the competency check sheet
- Verify trainee has the ability to perform tasks identified in the competency check sheet
- Communicate to Supervisor that the technical review and field competency is complete

**Expectations of Trainee**

- Complete all prerequisites outlined within the training program.
- Understand the training process outlined in this document.
- Understanding systems and spending time in the field.
- Ensure all lessons and tasks are signed off by the appropriate personnel as indicated on the training documents.
- Inform Supervisor/Leader on progress of training through face to face meetings.
- Will utilize all the materials provided to ensure a comprehensive training program is followed.
- Provide feedback on the training process and any updates that are required to the training material.
- Inform Supervisor/Leader of any training barriers that may exist during the training process.

**Training Expectation Acceptance Agreement**

I, _____ understand the expectations of me as a trainee as outlined in this document

(Operator Name)

Operator\Trainee _____

Name Signature Date (MM\DD\YY)

Supervisor/Leader _____

Name Signature Date (MM\DD\YY)

# Acknowledgement

This manual has been developed using information and knowledge obtained from manufacturer's documentation and input from experienced Operators. Additionally, this manual has been validated by numerous Subject Matter Experts at CEDA. We welcome any comments or suggestions pertaining to this manual and its contents.

**Many thanks to those who have demonstrated a clear dedication to CEDA and our values by participating in the creation of this program.**

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# Objective

Welcome to CEDA WATER TRUCK Training

This program is designed to provide you with the training necessary to carry out your job in a manner that safeguards yourself, those around you and our environment. Upon Completion of this Module you will be able to:

- Review Water Truck Operations
- Operate Water Truck
- Maintain/ Care for Water Truck
- Review CEDA-Specific Safety Standards
-

Employee(s) will demonstrate knowledge & skill in the proper application of equipment through practical application.

## Instructions

All material must be completed in the order presented to ensure that prerequisites are met.

Employees will demonstrate knowledge and skill in the proper application of equipment through practical demonstration and application.

NOTE: All forms and procedures included are those required by CEDA. Work must be performed in accordance with these standards. On Client work sites, there may be additional standards and modified work procedures that will also have to be met.

Description: This is a knowledge and practical skill that requires written material to be reviewed along with the completion of an on-the-job demonstration prior to the test being written.

Whenever possible, the on-the-job demonstration should be completed at a job site or the shop under controlled conditions.

Arrange a time with your Mentor/Supervisor/Trainer to complete the On-the-Job Demonstration, where you will observe the proper operation of the Wet Vacuum unit and its components.

Assessment of Competency: Successful completion of this competency requires:

- A score of 100% on the written examination.
- A successful demonstration by trainee requiring a sign-off from Trainer.

## Prerequisites

- CEDA Orientation
- CEDA Introduction to Vacuum Trucks
- CEDA Introduction to High Pressure Water Blasting
- Specific work location Orientation

Below is a list of the learning resources that are included and others you must obtain the most recent version from your Supervisor.

- Potable Water Regulations
- CEDA Pre-Trip Inspection (Vehicle Inspection Report)
- Site specific documentation
- Job Hazard Analysis for the work
- CEDA FLHA
- Other CEDA procedures and practices that pertain to the job being completed

NOTE: All forms and procedures included are those required by CEDA. Work must be performed in accordance with these standards and can be found in CEDA Health, Safety and Environment Management System (HSEMS) or be requested from your Leader. On Client work sites, there may be additional standards and modified work procedures that will also have to be met.

# General Overview

## Federal & Provincial Legislation

All work must be completed in accordance with applicable Municipal, Provincial, & Federal Acts & Regulations, including but not limited to:

Transportation of Dangerous Goods (TDG)

- Vehicle must be DOT Approved and be equipped with appropriate safety devices
- DOT approved vehicles will have sticker on side of unit
- Operator must place appropriate placards on side of vehicle
- Operator must prepare bill of lading prior to transporting materials

The Workplaces Hazardous Materials Information System (WHMIS)

- All CEDA field employees working with or around equipment will have WHMIS and TDG training prior to starting work.

Occupational Health & Safety (OH&S)




## Seat Belts

Anytime a vehicle (CEDA owned or personal) is being operated during business hours for business use, or on CEDA property, the occupants must be wearing seatbelts.

## Personal Protective Equipment (PPE)

To operate the Water Truck unit, employees must have and utilize the following personal protective equipment (PPE):

- CSA Certified Hard Hat
- CSA Certified Safety Boots (Boot Grips when required)
- Fire Retardant Coveralls
- Hearing Protection (plugs or muffs)
- Approved Gloves for the Site/Task
- Safety Glasses with Side Shields.
- Rain Gear as Required

For hot materials, the following additional personal protective equipment may also be required:

- Rubber gloves

- Steel-toed rubber boots
- Face shield

## Workplace Organization

CEDA's goal is to reduce waste (time, energy and materials) by maintaining an orderly and clean workplace, including our trucks and equipment. We ask that you take pride in the equipment you operate; treat it as if it were your own. A clean and organized vehicle/workspace is a safer vehicle/workspace. There are many ways to eliminate waste:

**Allocation & Utilization of Resources**: Have the right people and equipment in the right place, at the right time. Use equipment and resources on tasks and activities that are required and add value to our business.

**Improve Productivity**: Eliminate redundant or unnecessary steps/tasks without negative impact to the safety or quality of our products and services.

**Use of Materials:** Ensure equipment is stocked with required supplies (filter bags, duct tape etc.) before leaving for jobsite – replace the materials you have used during the shift to ensure that the next crew is adequately stocked. Use the correct materials in the quantities required to do the job safely & correctly.

**Preventative Maintenance:** Tools and equipment should be assessed as per the performance maintenance schedule to ensure safe operation. Regular maintenance will reduce costly breakdowns in the field.

There are steps we can take to improve our current state and move towards a more productive, organized and safe work environment. Improving workplace organization will reduce costs, improve morale and create a safer work environment. The following steps outline how best to achieve an organized workplace:

**Sort, organize and eliminate unnecessary items from the workplace to eliminate clutter. Keep only essential items.**

- Tools and equipment that are not utilized for day-to-day operations should be re-purposed within the organization or discarded.
- Garbage or loose items should be removed or properly stored.

**Prioritize tools, parts and materials based on usage and keep them in easily-accessible places.**

- A place for everything and everything in its place.

**Create storage areas that are easy to access and clearly laid out:**

- Tools and equipment should be stored clean and ready for use.
- Storage areas and stored items should be properly identified using signage, labels or a visual outline.

**Set clear standards for workplace organization:**

- Hold yourself and others accountable for keeping the work areas clean and safe. Make workplace organization a standard work rule in your area.
- Clean general work areas and equipment after each shift.
- Put clean tools away in the proper place.
- Note any spills, leaks or other messes – clean and report if equipment requires maintenance
- Inspect the area(s) regularly and immediately record and correct any infractions. Handle deviations from work rules in a timely manner.
- Review processes and procedures regularly and adjust as required.

# Equipment Overview

## Water Truck Basics

Water Trucks are used to transfer potable water, hot condensate & chemicals between sites/locations. Materials are offloaded as per permit at an approved facility for processing.

**Common Materials Transported:**

**Potable Water:** Water that is safe for human consumption (i.e. cooking & drinking)

**Hot Condensate**: Water produced as a result of steam production & is usually at or near boiling temperature

**Chemicals**: *Citrikleen- a d*egreasing agent used for cleaning components on site & *Glycol* which is used for hydrostatic testing

**Raw Water:** Water not intended for consumption.

CEDA uses water trucks from different vendors; unit controls may vary. CEDA exercises every caution to ensure that controls are consistent on each unit, however, Operators must be aware of all controls (including safety controls) and operating limits of the unit(s) they are operating.

The content of this learning module describes the general operating overview and is not intended to replace the manufacturer's operator manual for any given water truck. Every effort has been made to ensure that key elements of water truck operations have been included.

**Manpower Roles & Responsibilities**

CEDA Water Truck units are typically operated by a one person crew (Operator) but may operate with a two person crew (Operator & Labourer) depending on the materials being handled. It is the responsibility of both individuals to ensure they are aware of the chemical composition of the materials that are loaded. When necessary, refer to the ***Material Safety Data Sheets*** for proper handling guidelines.

Specific details for each role were communicated at the point of hire and can be very generally summarized as the following:

**Labourer**

Acts as Spotter when positioning equipment & assists the Operator when needed during operation.

**Operator**

In addition to Labourer duties, the Operator is responsible for driving (where applicable), general maintenance and overall the operation of the Water Truck.

**Any Operator driving CEDA vehicles must hold a valid Class 1 or Class 3 license AND must have passed CEDA's driving assessment.**

# Equipment Safety Features

## Fire Extinguisher & Spill Containment Kit

Every Water Truck is equipped with a Fire Extinguisher and Spill Containment Kit. The location of these items on the unit should be identified prior to operation.

## Emergency Stop (Rig Saver) Switch

Typically located on the dash of the truck, the Emergency Stop Switch- also known as the "Rig Saver Switch" can be used in case of an emergency to shut down the truck's engine.



## Grounding System

One of the most important elements of the unit, CEDA's Water Trucks typically utilize a single grounding cable system. Prior to starting transfer operations the truck needs to be grounded directly to the earth or bonded to another object that is inherently grounded, such as a large storage tank or underground piping. Grounding minimizes the electrical potential differences between objects and the earth to prevent a static charge. Grounding brings all parts of any system to zero electrical potential by allowing electrical currents to dissipate to earth.



**Single Cable Grounding System**

## Wheel Chocks

Any vehicle weighing over 4500kg or any trailer regardless of size shall be parked using wheel chocks. Wheel chocks should be placed between the tandem wheels as shown below.



## Seat Belts




Anytime a vehicle (CEDA owned or personal) is being operated during business hours for business use, or on CEDA property, the occupants must be wearing seatbelts.

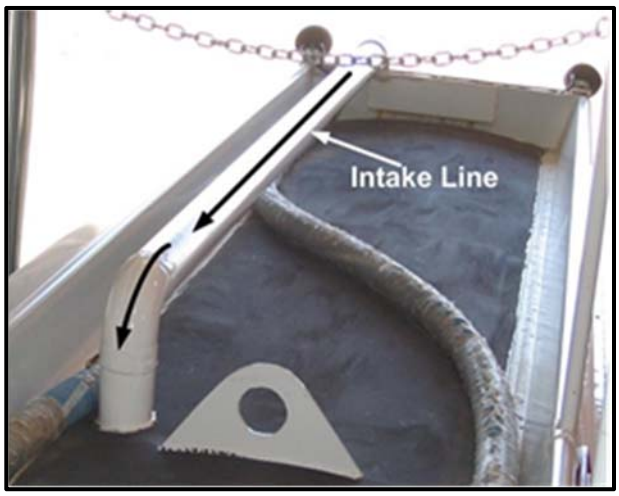
# MAJOR COMPONENTS

## Cargo Tank

The tank on the water truck may be made from carbon steel, stainless steel or aluminum and has a capacity of up to 4,000 gallons. The tank on the water truck is not pressurized.

The tank can be loaded by a supply line (located at the rear of the unit). The water travels up the intake (load) line and enters the tank from the top. The load line is the main inlet line to the tank. When securing the hose to the line it is important to install the whip checks and use cam straps or duct tape to secure the cam lock ears closed.




**Top View of Tank**

**Arrows Indicate Direction of Water Flow**

## Tank Level Indicator



The level indicator located on the exterior of the tank indicates the level of fluid in the tank. The tank should never be filled above 75% (3/4) capacity.

## Intake Line & Tank Hatch

Located at the top of the tank, the Operator must climb the ladder to open and close the hatch. The hatch must be open when loading and offloading to ensure proper ventilation. Potable water is often top loaded from a municipal water storage facility through the tank hatch instead of the intake line. Exercise appropriate safety measures when climbing on top of the tank to open/close hatch by maintaining 3-point contact at all times.



**Tank Hatch**



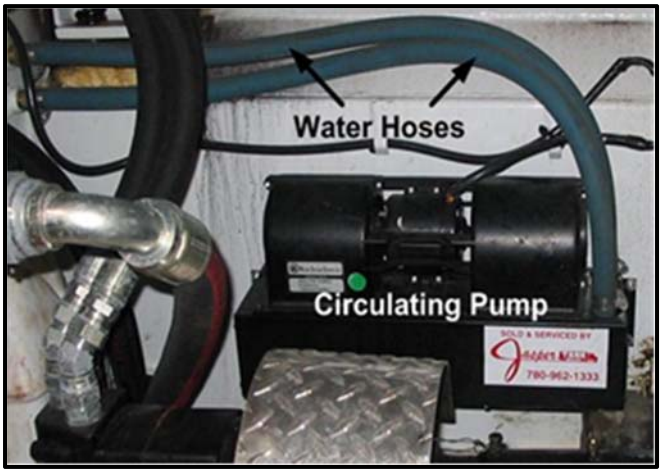

**Tank Ladder & Cat Walk**

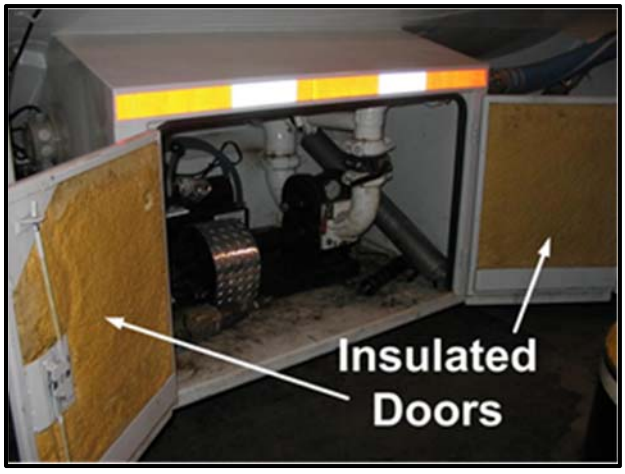
## Hot Box

The hotbox is an insulated box mounted below the tank. The hotbox is used in cold weather conditions to heat devices that have a tendency to freeze. The heat is generated from the engine exhaust or engine coolant and is controlled by a valve or circulating pump.



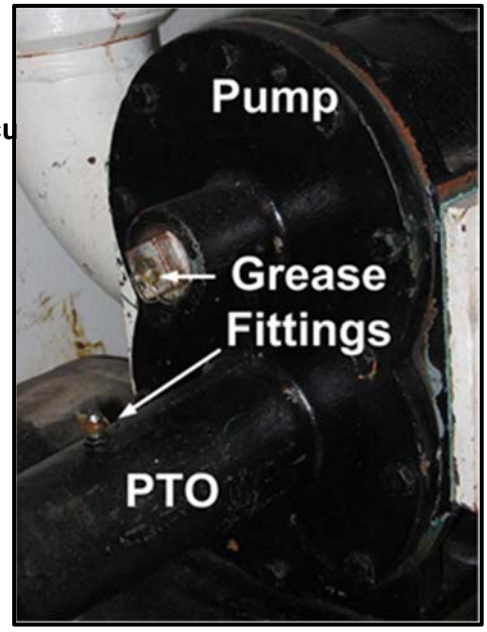
During cold weather operations, the hotbox valve/circulating pump is turned to the open position prior operating the pump. Units heated by engine coolant have valves located near the engine that can be closed during the summer months, preventing the coolant from entering the circulating pump inside the hot box.




**Hot Box with Doors Open**

For units where the heat is supplied to the hotbox by vehicle exhaust, the hotbox does not need to be heated continuously during cold weather operations. However, the valve should be opened approximately 20 – 30 minutes prior to pump offloading.




Care must be taken not to overheat the pump because excessive heat can burn the seals. Therefore, the hotbox heating system should remain off while driving to prevent heat damage to rubber seals.

## Bowie Pump

The most common type of pump used on the water truck is called a Bowie pump. Bowie pumps are used because they are extremely reliable. The pump requires grease for proper operation and is routinely lubricated after each job. When potable water is being transported, the grease used on the pump must be non- petroleum (edible).

The Bowie Pump is located inside the hotbox and used to load or offload fluids from the tank when gravity offloading is not required. The pump is powered by a Power Take Off (PTO) and connected to a hydraulic motor by a shaft.

## Bowie Pump – Pressure Gauge

During offloading procedures when the pump is in operation, the operator must ensure the recommended offloading pressure is not exceeded (maximum 100 PSI). The operator can observe the pressure gauge on the side of the pump.



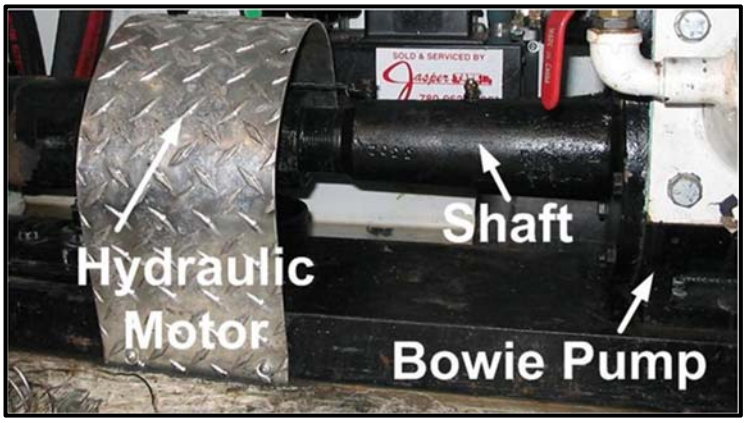

## Bowie Pump – Bleeder Valve



A drain valve located on the side of the pump is used to empty the pump after use. It is very important to empty the pump after use during cold weather conditions because frozen water inside the pump can cause significant damage to internal moving parts.

## Hydraulic Motor

The hydraulic motor is connected to the Bowie pump by a shaft. The hydraulic motor is driven by a power take-off (PTO). Most motors operate at approximately 900 engine RPM. Check to ensure RPM is not exceeded for your



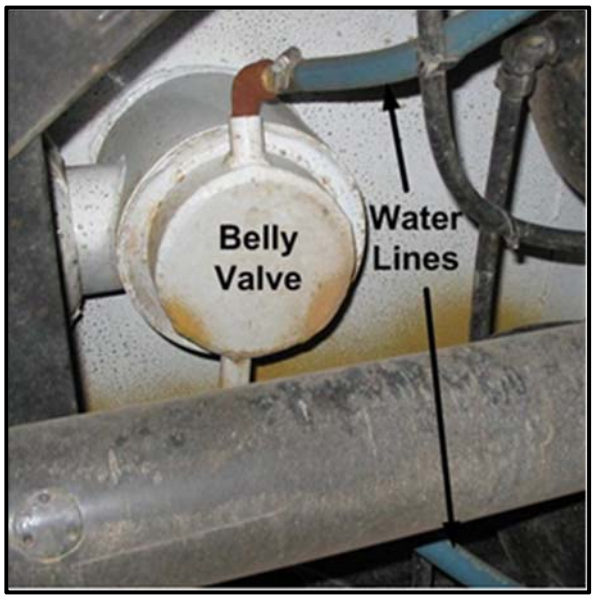

## Hydraulic Motor Control Level

A lever inside the hotbox controls the hydraulic motor. The lever controls the direction in which the shaft turns. The shaft will rotate in one direction for loading and the opposite direction for off-loading.



## Belly Valve

Opened by a lever, the belly valve is the main valve at the bottom of the tank used to control the water that empties from the tank. In most cases, the belly valve controls the water that enters the pump from the bottom of the tank. It is important that this valve remain closed in cold weather conditions. If the valve is allowed to freeze before it is closed, water may trickle into the pump and cause the pump to freeze.

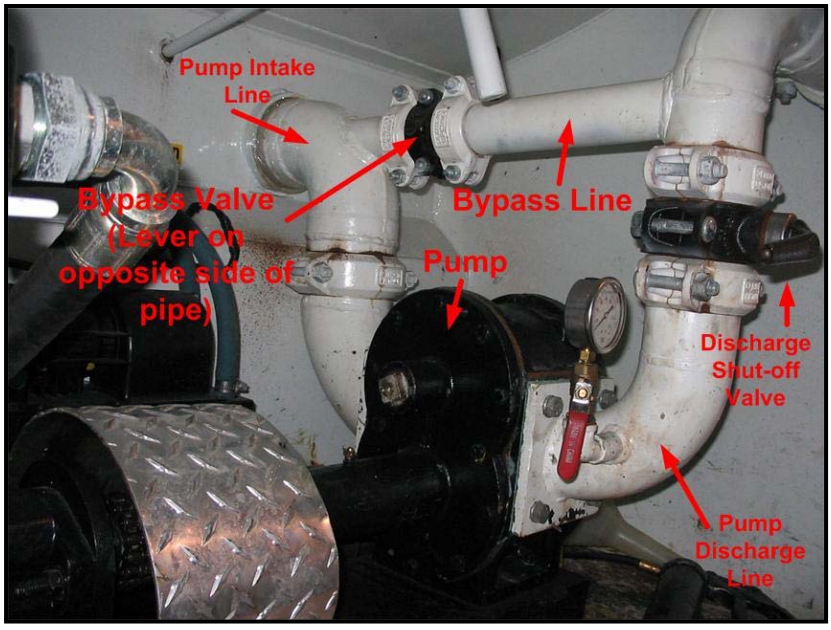



Depending on the manufacturer of the water truck unit, the belly valve may be contained within the hotbox or configured with a separate heating device.

The image above was taken from the underside of the tank and displays the belly valve and water lines that heat the valve during cold weather conditions. In this particular configuration, the belly valve is not contained

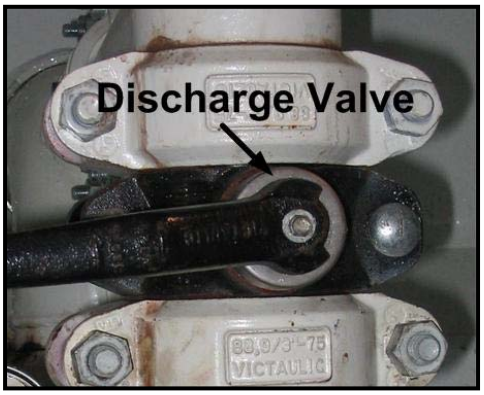
**Note: When the pump and belly valve are located in a hotbox that is heated by engine exhaust, care must be taken not to overheat valve because excessive heat can burn the seals. Therefore, the hotbox heat system should remain closed while driving to prevent heat damage to the rubber seals.**

## Discharge/Shut-Off Valve




The discharge/ shut-off valve controls the fluid pumped from the tank. The image to the left demonstrates the line assembly at the pump. The pump intake line feeds water into the pump. The water then travels out the discharge line. The discharge/ shut-off valve must be in the open position to allow water to flow through the pump.

In some units, a bypass line does not exist. In these units, water is gravity fed through the pump. When the discharge valve is in the closed position, water will not flow through the pump.




## Hoses & Fittings

All hoses and fittings must be visually inspected before each use. The hoses used for potable water are clearly labeled as “Food and Beverage Hose”. Most hoses will also have a pressure rating indicating the maximum allowable pressure.




**Potable Water Hose**

When the hoses are connected to the water truck, the operator must ensure the camlocks are secured in the closed position with cam straps or duct tape. He/she must also ensure the whip checks are properly installed around both the hose and load lines.

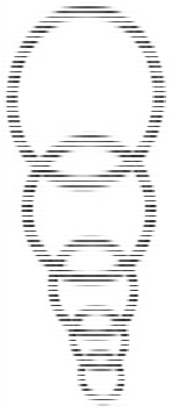




## Camlocks & Reducers

Hoses are connected together with camlocks and secured with duct tape and utilize gaskets to prevent leaking. When required to reduce the hose line from one diameter to another, you will be required to use reducers like those shown below.







## Bypass

A bypass should be used pumping into/out of any tank with an intake that is smaller than 2". Too much pressure could cause a hose to burst or a shear pin to break. The bypass allows the Operator to control the product pressure by using a valve to divert some of the material through the top of the bypass and back to the truck through a 2" outlet. Typically, the bypass will have a 3" inlet and a 3" outlet.

Extra care must be taken to minimize spills. Some of the materials handled by water trucks can cause environmental damage. You should be aware of the hazards and consequences of these spills and know how to recover materials that can damage the environment.

# EQUIPMENT OPERATION

## Venting



When loading or unloading a tank, it is critical that the tank is properly vented. If you have a ½" vent line and you are pumping through a 3" line into a reservoir tank, make sure you can see the vent line by standing by the PTO. You only have seconds to shut off the pump when water exits the vent line. If you can't see the vent line, refuse to fill due to the possibility of over-pressuring.

Venting is also required during offloading. This prevents negative pressure from building inside the tank.

## Cold Weather Operations



Due to the nature of work and cold climate conditions, Operators must take extra precaution. The nature of the work will ultimately result in ice formation, particularly around the vehicle and the step leading into the cab. When climbing up/down from the cab/tank unit, use 3-point contact at all times.

Frozen load lines and vent-lines on reservoirs that are being filled must be properly handled. In these situations you can open the lock and hit the hose about 6" or 7" back from the camlock. This will loosen the ice build-up within the hose and will not cause damage to the hose or camlock.

When water is being hauled to the same location every day, slippery conditions will exist. Ensure these areas are routinely sanded.

The cold weather conditions may cause damage to equipment, particularly the pump and hoses. Extra caution must be exercised to prevent ice build-up within the pump unit or hoses. If the pump is allowed to engage when frozen hoses are connected, dangerous pressure build-up may result. To prevent ice build-up within pumps and hoses ensure both are properly drained when the job is completed. Inevitably, ice will form on the hose adaptors during transport and should be carefully removed.

## Operating Limits

| PHYSICAL LIMITS | CONSEQUENSE OF NON-COMPLIANCE |
|---|---|
| 900 RPM (as per manufacturer's recommendation) | ▪ *Equipment wear/damage*<br>▪ *Overflow of materials*<br>▪ *Blow-out of seals*<br>▪ *Broken shear pin* |
| Potable water must use industry approved hoses | ▪ *Contamination of potable water supply, tank, valves and lines* |
| 200°F (93.3°c) Maximum material temperature | ▪ *Burning of seals* |
| Minimum line size 1.5" | ▪ *Too much system pressure causing hoses to burst or shear pin to break*<br>▪ *Use bypass for lines smaller than 2"* |

# HOT CONDENSATE HANDLING & TRANSPORTATION

Loading hot condensate over 60°F (15.5°C) requires authorization from the site manager, divisional manager, or assistant divisional manager. The foreman will provide the necessary dispatch information. When transporting hot condensate over 180°F (82.2°C) outside a plant site, a Bill of Lading is required.

Employees operating the water truck are required to sign the procedure prior to loading the hot condensate. If there are any revisions to the procedure, only the site manager can approve changes.

## Chemical Handling and Transportation

When transporting chemicals, proper precautions must be exercised by the operator. A safe work permit must be obtained and the appropriate placard must be placed on the vehicle, indicating cargo.

The operator must review the appropriate MSDS prior to handling the chemical and become familiar with the precautions and first aid requirements. A Bill of Lading is also required when hauling chemicals.

## Potable Water Transportation & Handling

When preparing the water truck for potable water delivery, ensure the health and food guidelines are followed (i.e. hoses are capped, load line capped, top hatch is closed).

Prior to connecting hoses, the connections should be sprayed with a disinfecting solution (10:1 water to bleach mixture). Additionally, the tank, hoses and pump must be chlorinated every 6 months.

Potable water trucks require annual inspection by the Regional Health Inspector and Food Establishment Permits must be kept in a visible location in the truck. Food permits must be renewed annually.

In order to ensure that potable water is contaminant-free, a water sample must be drawn from the vehicle once a month. Test results are retained on file.

## Procedural Guideline – Load Cold Water Using Bowie Pump

| STEPS | | NOTES |
|---|---|---|
| 1. | Complete Pre-Trip & inspect equipment | |
| 2. | Obtain Work & Waste disposal permits | ▪ If applicable |
| 3. | Conduct Pre-Job meeting to review permits, procedures and MSDS as required | ▪ Use Pre-job Checklist. All personnel working the job must attend |
| 4. | Complete FLHA as per CEDA standards | ▪ All personnel working the job must attend<br>▪ Must be reviewed and updated if any changes occur on the job |
| 5. | Position equipment safely on level ground | ▪ Use a Spotter when backing up & lifting the tank |
| 6. | Install wheel chocks | ▪ |
| 7. | Flag & Tag, Install signage and pylons as required | ▪ “DO NOT ENTER”/Caution tape & flagging tags |
| 8. | Ensure vehicle is properly grounded | ▪ Using Single Cable Grounding System |
| 9. | Open vent hatch on top of tank | ▪ Use 3-point contact when climbing ladder |
| 10. | Engage PTO from inside of units cab | ▪ Allow to run at idle for 1st 5 minutes prior to operation |
| 11. | Remove caps from pump & connect hoses | ▪ Use whip checks and cam straps or duct tape on all connections<br>▪ Use Food & Beverage hose for potable water |
| 12. | Close drain valve on pump and open belly valve | ▪ |
| 13. | Open Supply tank valve | ▪ Check for leaks on all connections |
| 14. | Engage pump and adjust RMP level | ▪ Do not exceed 900 RPM |

| | | |
|---|---|---|
| 15. | Monitor load level gauge to prevent overfilling | ▪ Do not exceed ¾ capacity |
| 16. | When ¾ full, shut down supply line valve at reservoir tank | |
| 17. | Walk line back by lifting hoses to drain through pump back into tank | ▪ Use “buddy” system |
| 18. | Idle RPM down when complete and dis-engage PTO | ▪ Cap & place hoses onto truck and secure in place |
| 19. | Close vent hatch on top of tank | ▪ Use 3-point contact when climbing ladder |
| 20. | Stow hoses, remove grounding equipment, Remove Flag/Tag, signage & pylons. Complete housekeeping. Prepare for transport. | ▪ Conduct housekeeping |

## Procedural Guideline – Offload Cold Water Using Bowie Pump

| STEPS | | NOTES |
|---|---|---|
| 1. | Review Work & Waste disposal permits | ▪ If applicable |
| 2. | Review/Update FLHA as per CEDA standards | ▪ All personnel working the job must attend<br>▪ Must be reviewed and updated if any changes occur on the job |
| 3. | Position equipment safely on level ground | ▪ Use a Spotter when backing up & lifting the tank |
| 4. | Install wheel chocks | ▪ |
| 5. | Flag & Tag. Install signage and pylons | ▪ “DO NOT ENTER”/Caution tape & flagging tags |
| 6. | Ensure system is properly grounded | ▪ |
| 7. | Remove caps and connect hoses from pump to tank being filled | ▪ Whip checks, cam straps and duct tape on all connections |
| 8. | Open vent hatch on top of tank | ▪ Use 3-point contact when climbing on ladder |
| 9. | Open the valve on the tank being filled | ▪ |
| 10. | Open belly valve on water truck | ▪ Drain on pump is closed |
| 11. | Engage PTO and Engage Pump | ▪ MAX 900 RPM |
| 12. | Monitor Tank being filled and check for leaks | ▪ |

| | | |
|---|---|---|
| 13. | When finished close valve on tank filled | ▪ |
| 14. | Reverse bowie pump (load) | ▪ Open bleeder valve on tank being filled |
| 15. | Disconnect hose from supply line on tank | ▪ Use spill tray |
| 16. | Drain water from hose by lifting hose up and walking it back to pump | ▪ Use buddy system |
| 17. | Close discharge valve and belly valve | ▪ Contain water in the tank |
| 18. | Place hoses on truck and secure | ▪ Hoses must be capped |
| 19. | Close vent hatch | ▪ Use 3-point contact when climbing on ladder |
| 20. | Stow hoses, remove grounding equipment, Remove Flag/Tag, signage & pylons. Complete housekeeping. Prepare for transport. | ▪ |
| 21. | Remove wheel chocks and leave area | ▪ Use a spotter when backing up |

## Procedural Guideline – Loading Cold Water Through Load Line

| STEPS | | NOTES |
|---|---|---|
| **1.** | Complete Pre-Trip & inspect equipment | ▪ |
| **2.** | Obtain Work & Waste disposal permits | ▪ If applicable |
| **3.** | Conduct Pre-Job meeting to review permits, procedures and MSDS as required | ▪ Use Pre-job Checklist.<br>▪ All personnel working the job must attend |
| **4.** | Complete FLHA as per CEDA standards | ▪ All personnel working the job must attend<br>▪ Must be reviewed and updated if any changes occur on the job |
| **5.** | Position equipment safely on level ground | ▪ Use a Spotter when backing up |
| **6.** | Install wheel chocks | |
| **7.** | Flag & Tag area. Install signage & pylons. | ▪ “DO NOT ENTER”/Caution tape & flagging tags |
| **8.** | Ensure equipment is properly grounded | ▪ Using single cable grounding system |
| **9.** | Open vent hatch on tank | ▪ When climbing, maintain 3 point contact at all times |
| **10.** | Connect potable water supply line to fill line on unit | ▪ Use only capped hoses<br>▪ Ensure connections are cleaned as per regulation |

| | | |
|---|---|---|
| **11.** | Install whip checks on all connections & secure cam lock ears with cam straps or duct tape | ▪ |
| **12.** | Open potable water supply line valve ¼ and check for leaks | ▪ Stand off to the side<br>▪ Open slowly<br>▪ If no leaks occur, open line fully |
| **13.** | Monitor load level to prevent overfilling and prepare to rig out | ▪ 75% (3/4) tank only |
| **14.** | Close supply line valve | |
| **15.** | Open drain valve on load line | |
| **16.** | Disconnect hose from unit & drain | |
| **17.** | Close vent hatch on tank | ▪ When climbing, maintain 3-point contact at all times |
| **18.** | Stow hoses, remove grounding equipment, Remove Flag/Tag, signage & pylons. Complete housekeeping. Prepare for transport. | |

## Minimizing Hazards During Operation

| HAZARD | STAY SAFE BY… |
|---|---|
| **Line of fire** | ▪ Stand off to side when disconnecting hoses<br>▪ Keep face away from hose |
| **Unauthorized Personnel** | ▪ Flag & Tag work area |
| **Spills** | ▪ Valves closed, sealed & in place before starting work<br>▪ Use appropriate spill containment products (spill pan) |
| **Backing up/Striking Objects** | ▪ Utilize Spotter |
| **Heavy/Awkward Lifting** | ▪ 2 Person lifts – lift with legs |
| **Lower Explosive Limits (LELs)/Vapors/Sour Liquids** | ▪ Monitor vent line<br>▪ H2S Alive training where required |
| **Temperature of product** | ▪ Know temperature of product before starting work |
| **Static Charge** | ▪ Utilizing grounding system |
| **Slips, Trips & Falls** | ▪ Housekeeping |
| **Tank Contamination** | ▪ Know the products & clean between loads |
| **Noise level** | ▪ Wear appropriate PPE |
| **Lack of Experience/Training** | ▪ Attend training, know your limits & ASK QUESTIONS |

# Water Truck Maintenance

## Preventative Maintenance Program

CEDA's Preventative Maintenance Program requires that all Water Trucks are evaluated by a certified Mechanic after 250 hours of operation. Operation hours are gathered and confirmed on job reports and submitted to Maintenance Group. All components of the Water Truck must receive appropriate preventative maintenance in order to operate safely.

| Component | Required Maintenance | Frequency |
|---|---|---|
| Hoses and Plumbing | 1. Check for Leaks<br>2. Check Gasket<br>3. Chlorinate (potable water) | 1. Daily<br>2. Every 6 Months |
| Fittings | Ensure Proper Operation | Daily |
| Top Hatch | Ensure Proper Seal | Daily |
| Valve Bypass | Ensure Proper Operation | Daily |
| Release Valve | Ensure Proper Operation | Daily |
| Pump | 1. Grease (food grade for potable water)<br>2. Check Hydraulic oil level<br>3. Chlorinate (Potable water) | 1. Every Load<br>2. Every 6 Months |
| Tank | Chlorinate (potable water) | |

## Maintain Hotbox

When the ambient temperature is very warm, an open valve on the hotbox can cause the pump seal and belly valve seals to burn. If you are pump offloading every 10 – 15 minutes, you can leave the hotbox valve open because the cold water will keep the assembly cool. You can use your hand to check the temperature inside the hotbox, and if it's warm, the seals will not burn. However, if it feels hot, shut the hotbox valve half way to prevent burning.

It is important to identify the following components and perform the required maintenance for routine operation.

## Maintain Pump

Before parking the unit, the pump should be greased, which helps prevent freeze-up during cold weather conditions. Only food grease should be used when transporting potable water.

## Pump Grease Procedure

| ACTION | NOTES |
|---|---|
| 1. Ensure vehicle is parked on level ground | |
| 2. Disconnect hose from pump discharge | |
| 3. Grease pump with PTO disengaged | Use food grease when transporting potable water<br>Use idle speed |
| 4. Pump approximately 200 gallons of water to remove excess grease | Ensure disposal site is approved. |

## Winterization

Due to the cold weather conditions, appropriate winterization of the Water Truck is critical for proper operation. Winterizing the pump must be done after the job is completed and/or if the pump will not be used for a period of time. The winterization procedure is as follows:

| STEP | ACTION | NOTES |
|---|---|---|
| 1. | Close valve/shutdown hot boxes | |
| 2. | Drain water truck | Use offloading procedure |
| 3. | Drain Pump | Using idle speed |
| 4. | Drain hoses | |
| 5. | Leave drain valve open | |
| 6. | Leave belly valve open | |
| 7. | Turn on pump and “spin out” | Use spill trays under leaks/connections |

## Alcohol Pot Winterization

| STEP | ACTION | NOTES |
|---|---|---|
| 1. | Drain off air pressure. | Ensure bleed valve on bottom of alcohol pot is open. |
| 2. | Open drain valve on pot. | |
| 3. | Remove fill nut from top of alcohol pot. | Use wrench |
| 4. | Close drain valve on alcohol pot. | |
| 5. | Fill alcohol pot with brake line antifreeze. | |
| 6. | Reinstall fill nut and tighten. | Use wrench |
| 7. | Close all air bleed valves on system and re-pressurize. | |

## Troubleshooting Water Truck

To efficiently run the Water Truck unit, the operator must be aware of the common failures that might prevent smooth operation. The following is a list of common problems encountered.

| SYMPTOM | POSSIBLE CAUSES | SOLUTIONS |
|---|---|---|
| Bowie Pump will not pump/engage | Frozen Pump | ▪ Turn on hotbox and allow pump to thaw<br>▪ Apply steam to thaw<br>▪ Check shear pin |
| Low discharge pressure when pumping off | Leaking packing<br><br>Pump is worn<br><br>Bypass is open | ▪ Adjust packing nut<br>▪ Close bypass<br>▪ Generate work order for pump inspection/repair |
| No discharge pressure | Broken shear pin<br><br>Broken key-way<br><br>Bad discharge gauge | ▪ Replace shear pin<br>▪ Replace key-way<br>▪ Replace gauge |



If you suspect that an ice plug has formed in the hose, you should not engage the pump since this can cause a significant amount of pressure (100 – 120 PSI).

In these circumstances the operator should close the supply valve and then:

1. Stand to the side of the hose connections.
2. Put one hand over the ear lock.
3. Open the opposite lock while still holding the lock close to you.
4. Pull the hose towards you – this will break the seal and release pressure from the hose.
5. Remove hose and thaw with steam or hot water.

(This situation can be completely avoided by ensuring hoses are properly drained after each use.)

# General Safety Overview

The following are guidelines to the safe working practices for Water Trucks:

1. Always apply the parking brakes when operating the unit.

2. Be sure all valves are clear before pressuring-off.

3. Do NOT open inspection covers, man-ways or other fittings when the tank is under pressure.

4. Do NOT enter the tank without testing the atmosphere and utilizing proper breathing apparatus. The tank is considered a “Confined Space” and should be treated accordingly. Use caution when entering a tank. Use proper protective equipment. Establish proper rescue procedures. Another person should be stationed outside the tank who thoroughly understands rescue procedures.

5. Do NOT open valves without hoses attached.

6. Do NOT make repairs or adjustments while the equipment is operating.

7. Do NOT pressurize the system against closed valves.

8. Do NOT leave equipment unattended when operating.

9. Do NOT walk on the tank or catwalks without fall protection equipment (i.e. safety harness and lifelines). Please follow all rules/laws in regards to fall protection.

10. When operating PTO’s, pumps, hydraulically operated equipment, etc., please follow the manufacturer’s instructions.

11. Do NOT reach under or stand under any hydraulically operated hoist or rear door without a safety prop or support.

12. Do NOT reach under or go under any vehicle when the engine is running and the PTO is operating equipment.

13. Do NOT operate the unit with any safety guards removed.

14. Stay clear of hoses that are under pressure as they are known to jump and buck thereby causing injury to anyone nearby.

15. Ask yourself if the truck is designed to do the job? Make sure the product to be loaded is compatible with the unit’s design and construction. If in doubt, contact your Supervisor.

16. Wear hearing protection while operating the system and bleeding the main valves.

17. Prevent potential fire hazards at all times by:

- Keeping fire extinguishers in working order and readily available

- Keeping the machine clear of dirt and oil
- Keeping all electrical wiring and components in good working order
- Ensuring that the engine air intake, fuel and exhaust systems are maintained properly.

18. Do NOT load or unload on an incline or grade. Ensure the ground is stable.

19. Ensure truck is grounded using the grounding straps before performing any operation.

20. Ensure truck has a complete spill kit.

21. Never stand in front of any caps to remove them. Stand off to the side, out of the line of fire.

22. Ensure the area around the back of the truck and around the hoses is flagged off with barrier tape, when pressuring off loads.

23. Ensure all cam-lock connections are secured with cam straps & duct tape.

24. Ensure wing nuts are tightened anytime positive pressure is applied to the tank.

# Multiple Choice Questions (Technical Quiz)

Complete the following test, and have it graded by your assessor. If any questions are answered incorrectly, your assessor will explain what the correct answer is, and why it is correct. Once you understand the correct answer, both the assessor and students initials are required to indicate that mentoring or coaching has taken place.

| Question | Assessor's Initials | Student's Initials |
|---|---|---|
| 1. CEDA water trucks are used to haul the following:<br>A. Potable Water<br>B. Citrikleen<br>C Hot Condensate<br>D. All of the Above | | |
| 2. The capacity of the water truck's tank is approximately 5000 gallons.<br>a. True<br>b. False | | |
| 3. Water trucks are loaded to 95% capacity.<br>a. True<br>b. False | | |
| 4. When operating, the pump should not exceed 100 psi.<br>a. True<br>b. False | | |
| 5. The engine runs at approximately 900rpm when operating the Bowie pump.<br>a. True<br>b. False | | |
| 6. To drive CEDA Water Trucks you must:<br>A. Hold a valid class 5 license<br>B. Hold a valid class 5 license & assessed by CEDA to drive<br>C. Hold a valid class 1 or 3 license<br>D. Hold a valid class 1 or 3 license & assessed by CEDA to drive | | |
| 7. Only hoses labeled "Food & Beverage" can be used for potable water.<br>a. True<br>b. False | | |
| 8. When handling hot condensate, you should wear the following PPE:<br>A. Hard hat, safety glasses, leather gloves, Nomex coveralls, CSA footwear & a face shield<br>B. Hard hat, face shield, Nomex coveralls, hearing protection & CSA footwear<br>C. Hard hat, safety glasses, rubber gloves, full rain suit, Nomex coveralls, CSA rubber boots, face shield & hearing protection<br>D. None of the above | | |
| 9. It is acceptable to alter PPE if it does not fit properly.<br>a. True<br>b. False | | |
| 10. When handling potable water, tank and pump must be chlorinated:<br>A. Daily<br>B. Weekly<br>C. Monthly<br>D. Every 6 months | | |

| | | |
|---|---|---|
| 11. The Bowie Pump must be greased after pumping:<br>A. Before parking the unit<br>B. Only in winter<br>C. After each load<br>D. Both A & C | | |
| 12. Winterization of the truck is necessary during cold weather conditions<br>a. True<br>b. False | | |
| 13. If the Bowie Pump does not pump….<br>A. The bypass is open<br>B. The shear pin is broken<br>C. The pump is frozen<br>D. B and C | | |
| 14. A bypass is required when reducing a line to below 2 inches.<br>a. True<br>b. False | | |
| 15. When handling potable water, it's okay to grease the pump with petroleum products.<br>a. True<br>b. False | | |
| 16. A clean and organized vehicle and/or work area is a safer vehicle/work area.<br>a. True<br>b. False | | |
| 17. Failing to improperly vent a vessel when loading/offloading could result in:<br>A. Explosion<br>B. Implosion<br>C. Plugged Hoses<br>D. A and B | | |
| 18. When operating a potable water truck, both operators and labourer are responsible to ensure Potable Water Regulations are followed.<br>a. True<br>b. False | | |
| 19. CEDA's Water Truck units are equipped with:<br>A. Single Grounding Cable System<br>B. Posiground System<br>C. Cardiac Defibrillator<br>D. None of the above | | |
| 20. To avoid burning seals, materials must never be more than:<br>A. 500°F<br>B. 500°F<br>C. 200°F<br>D. -100°F | | |

# Practical Assessment – Water Truck Operations

This form is to be filled out by the assessor as they observe the student successfully demonstrate these items in order to be deemed competent.

## Assessment Check List

| **Section 1** | | | |
|---|---|---|---|
| The following items must be identified and their purpose, inspection requirements, and preventative maintenance must be explained. Failure to successfully explain inspection and maintenance requirements does not constitute a FAIL, but will require a mentorship agreement to bring the employees level of knowledge to an acceptable level. | | | |
| ITEM | | YES | NO |
| 1 | Tank & Level Gauge | | |
| 2 | Hot Box | | |
| 3 | Bowie Pump | | |
| 4 | Hydraulic Motor | | |
| 5 | Belly Valve | | |
| 6 | Discharge/Shut off Valve | | |
| 7 | Emergency Shut off Switch | | |
| 8 | Grounding Cables (if equipped) | | |
| 9 | Intake Line | | |
| 10 | Tank Hatch | | |
| 11 | Grease Fittings | | |
| 12 | Bleeder line (bowie pump) | | |
| 13 | Reducers | | |
| 14 | Hoses, Cam locks (male vs Female) | | |
| 15 | Bypass (if equipped) | | |
| 16 | Packing Nut | | |

**Section 2**

The following tasks must be completed in the prescribed sequence. Any exceptions must be noted in the comments section with justification. Assessor will check YES column if the item was actioned satisfactorily, or circle the number in the NO column if it was not. If enough demerits are accumulated to warrant a fail, or employee performs an unsafe or dangerous action, the assessment may be terminated immediately. If necessary, all near-miss/incident reporting requirements must be met.

**Copies of the completed Daily Inspection, FLHA and Procedure must be attached to the assessment.*

| TASK | | YES | NO |
|---|---|---|---|
| 1 | Attend Pre-job meeting/toolbox talk. Review permits and procedures | | |
| 1a | Describe troubleshooting problems for leaks on hoses and pumps (Assessor to ask during Toolbox talk) | | |
| 1b | Describe troubleshooting problems for over and under pressure (Assessor to ask during Toolbox talk) | | |
| 1c | Describe troubleshooting problems if pump will not engage (Assessor to ask during Toolbox talk) | | |
| 2 | Complete Pre-Trip & inspect equipment | | |
| 3 | Move to job location | | |
| 4 | Walk down of work area. Complete FLHA | | |
| 5 | Position unit, install wheel chocks. | | |
| 6 | Flag & Tag area, install signs & pylons | | |
| 7 | Open vent hatch on top of tank | | |
| 8 | Close drain valve on pump | | |
| 9 | Connect hoses- secure camlocks and install whip checks | | |
| 10 | Open belly valve | | |
| 11 | Open Reservoir tank valve(if applicable) | | |
| 12 | Engage PTO, pump and adjust RPM level. Check for leaks | | |
| 13 | Monitor load level gauge to prevent overfilling | | |

| | | | |
|---|---|---|---|
| 14 | When at required level or ¾ full, close reservoir valve. | | |
| 15 | Walk line back to drain through pump into tank | | |
| 16 | Idle down RPM when complete and disengage PTO | | |
| 17 | Close vent hatch on top of tank | | |
| 20 | Rig out, Stow hoses and equipment (winterize if required) | | |
| 21 | Final Housekeeping | | |
| 22 | Remove Flags, tags, signs, pylons and stow wheel chocks | | |
| 23 | Sign off permits and FLHA | | |
| Comments: | | | |

| **Section 3** | | |
|---|---|---|
| The following precautions must be observed at all times. Assessor will check YES column if the item was actioned satisfactorily or NO column if it was not. If the employee fails to adhere to any of these precautions at any time, it constitutes a fail and the assessment shall be terminated immediately. If necessary, all near-miss/incident reporting requirements must be met. | | |
| PPE: Has all necessary PPE to perform task. PPE has been inspected and is in good condition. Proper PPE is worn at all times. | YES | NO |
| Backing: Operator- Proper spotter briefing and walk down of area with spotter before backing. window down, radio off, hearing protection removed. Confirmed hands signals with spotter before backing for the first time. Sounds horn prior to backing, keeps spotter in mirror, follows spotters direction. | YES | NO |
| Backing: Labourer- Proper spotter briefing and walk down of area with operator before backing. wears high visibility vest, confirms hand signals with operator before backing for the first time. Uses proper hand signals, does not walk backwards while spotting or repositioning, always facing unit while it is in motion. | YES | NO |
| Line of fire: Does not place themselves in the line of fire at any time. This includes standing off to the side when opening valves, removing caps, and disconnecting hoses. Does not place themselves directly in front of/behind unit while in motion. Uses whip checks on all connections | YES | NO |

| | | |
|---|---|---|
| Communication: Has established and reviewed method of communication with co-workers to ensure equipment is operated safely and all hand signals are understood. | YES | NO |
| Paperwork: Properly complete or participate in the completion of any required paperwork. Have necessary paperwork completed prior to commencing a task. | YES | NO |
| If there are any items that are marked NO, it is a failure of the assessment | PASS | FAIL |
| Comments: | | |

**Section 4**

Trainee must be able to clearly explain or demonstrate the proper procedure for winterizing the air brake system and high pressure pump. Failure to successfully explain winterization requirements does not constitute a FAIL, but will require a mentorship agreement to bring the employees level of knowledge to an acceptable level.

**AIR SYSTEM WINTERIZATION (ALCOHOL POTS)**

| TASK | | YES | NO |
|---|---|---|---|
| 1 | Drain-off air pressure. | | |
| 2 | Open drain valve on pot. | | |
| 3 | Remove fill nut from top of alcohol pot. | | |
| 4 | Close drain valve on pot. | | |
| 5 | Fill pot with brake line antifreeze. | | |
| 6 | Replace fill nut. | | |
| 7 | Close all air bleed valve on system and re-pressurize. | | |

**PUMP WINTERIZATION**

| TASK | | YES | NO |
|---|---|---|---|
| 1 | Drain Water Truck | | |
| 2 | Drain Pump & Tank | | |

| | | | |
|---|---|---|---|
| 3 | Drain Hoses | | |
| 4 | Leave drain valve open | | |
| 5 | Leave belly valve open | | |
| 6 | Turn on pump and run for approx. 5 min to “spin out” water in pump | | |

## Assessment Sign Off

All boxes must be completed before signing an employee competent.

- ☐ Expectation Letter Signed
- ☐ Minimum 100 hours of on the job training completed
- ☐ On the Job Practical Assessment Completed by an approved Assessor
- ☐ Has reviewed and understands the operator manuals for the Water Truck Units
- ☐ Reviewed and understands Procedures and Safety Documentation
- ☐ Technical review and Knowledge Exam complete
- ☐ Training documentation sent to CEDA Training Department

**Assessor**

I,_____ have taken the below named employee through this Assessment, and he/she has successfully demonstrated competence in the areas identified.

_____

Signature Date

**Student**

I, _____ have completed this competency, including the on-job demonstration, practical assessment and multiple-choice questions. I understand the information presented and agree to follow all of the rules and procedures set out by CEDA.

_____

Signature Date

## Revision Log

| Revision Date | Section Affected | Changes Made |
|---|---|---|
| **October 21, 2021** | All | Updated Template, multiple changes throughout. |
| | | |
| | | |

## Training Change Request Form

Date: _____

Location: _____

Name: _____

Contact information: _____

*Email/Phone number*

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**Description**
Please use the back of this sheet to make additional comments.

**Section Name:** _____

**Page Number:** _____

**Description of Problem/ Suggested Resolution:**

_____

_____

_____

_____