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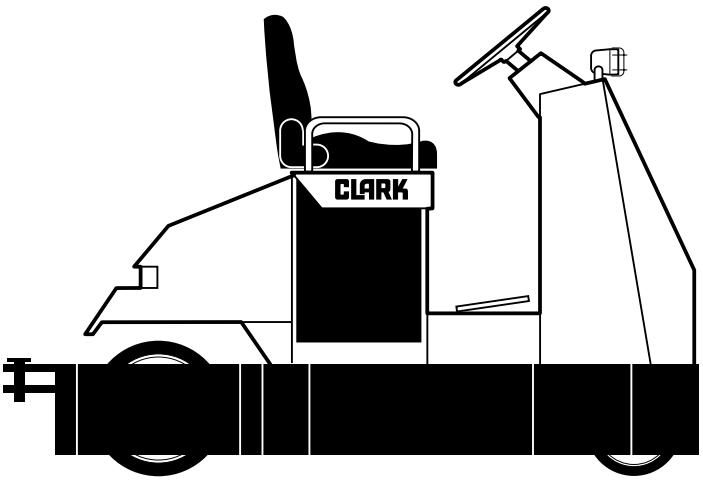
CLARK®



Operator's Manual

CTT 7

Book No. 5350306
OM-659

Do not remove this manual from the truck.

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INSIDE FRONT COVER

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Operator's Manual

You must be trained and authorized to operate a CTT 7 tow truck.

YOU can prevent accidents

First: Learn safe operating rules and your company rules.

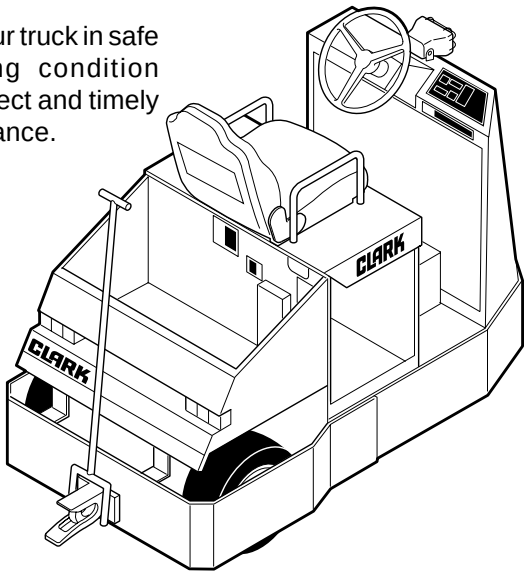
Next: Read your Operator's Manual. If you do not understand it, ask your supervisor for help.

Learn about the unit you operate.

KNOW YOUR TRUCK

Then: Practice operating your tow truck safely.

And: Keep your truck in safe operating condition with correct and timely maintenance.



Breaking these rules will cause serious or fatal injury to yourself and others

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Contents of this Manual

Introduction ..... Section *i*

General Safety Rules ..... Section 1

Operating Your Truck ..... Section 2

Operator Maintenance and Care ..... Section 3

Planned Maintenance ..... Section 4

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A Message to CLARK Operators

Tow trucks are specialized machines with unique operating characteristics, designed to perform a specific job. Their function and operation is not like a car or ordinary truck. They require specific instructions and rules for safe operation and maintenance.

Safe Operation

Safe operation of a tow truck is of primary importance to CLARK. Our experience with tow truck accidents has shown that when accidents happen and people are killed or injured, the causes are:

- **Operator is not properly trained**
- **Operator is not experienced with operation**
- **Basic safety rules are not followed**
- **Tow truck is not maintained in safe operating condition.**

For these reasons, CLARK wants you to know about the safe operation and correct maintenance of your CTT 7 tow truck.

This manual is not a training manual, however. It is a guide to help trained and authorized operators safely operate their trucks. It emphasizes and illustrates the correct procedures, but it cannot cover every possible situation which may result in an accident. You must watch for all hazards in your work areas and avoid or correct them.

While it is important that you know and understand the information in this manual, you must also know and follow your company safety rules! Be sure that your equipment is maintained in a safe condition. Do not operate a damaged truck. Practice safe operation every time you use your tow truck.

Remember, before you start operating this tow truck, be sure that you understand all operating procedures. It is your responsibility, and it is important to you and your family, to operate safely and efficiently. Be aware that the Federal Occupational Safety and Health Act (OSHA) and state laws require that operators be completely trained in the safe operation of this equipment. If you have not received training, ask your supervisor.

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Safety and Planned Maintenance

Regular maintenance and care is essential for your safety. A faulty tow truck is a potential source of danger to the operator, and to other personnel working near it. Proper maintenance is also important for economy and utilization. As with all quality equipment, keep your truck in good operating condition by following the recommended schedule of maintenance.

A tow truck should be examined by the user on a daily basis to be sure it is safe to operate. Do not make any repairs to this truck unless you have been trained in safe repair procedures and are authorized by your employer.

In addition to the daily user inspection, CLARK recommends that a planned maintenance and safety inspection program (PM) be performed by trained and authorized personnel. Inspections, adjustments, and repairs done during the PM increase the life of components and reduce unscheduled downtime. The PM can be scheduled to meet your particular application and usage.

Your CLARK dealer is prepared to help you implement a PM program with trained service personnel who know your tow truck and can keep it operating safely and efficiently.

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Use of this Manual

To operate a truck safely and productively, the operator must know and understand the appropriate safety practices, including safe driving and load handling techniques. To develop the skill required, the operator must become familiar with the construction and features. The operator must also understand the truck's capabilities and limitations and see that it is kept in a safe condition.

This manual is a digest of essential information on the above subjects. The information is provided in seven sections:

Section *i*, Introduction, (this Section) gives information that you should read before proceeding with this manual.

Section 1, General Safety Rules, reviews and illustrates accepted practices for safe operation.

Section 2, Operating Your Truck, describes the components, systems, controls and other features of your truck and presents specific instructions on safe, efficient operation.

Section 3, Operator Maintenance and Care, describes safety inspections and checks operators should make before operating the tow truck.

Section 4, **Planned Maintenance,** serves as reference for trained service personnel performing planned maintenance and battery maintenance.

Section 5, Specifications, provides reference information on features, components, and maintenance items.

Section x, **Index,** at the back of the manual is an alphabetical listing that you use for locating topics by name.

Page Numbering: Each page has a section designator and page number.

For example, this is section i, page 6.

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NOTICE: The descriptions and specifications in this manual were in effect at the time of printing. CLARK Material Handling Company reserves the right to make improvements and changes in specifications or design, without notice and without incurring obligation. Check with your authorized CLARK dealer for information on possible updates or revisions.

We urge you to carefully read this manual from cover to cover. Take time to understand the information on general safety rules, operating hazards, and operating procedures. Understand how all gauges, indicator lights, and controls function.

The examples, illustrations, and explanations in this manual should help you improve your skill and knowledge as a professional operator and take full advantage of the capabilities and safety features of your new tow truck.

This manual is permanently attached to serve as a reference for anyone who may operate or service it. If the tow truck is not equipped with this manual, ask your supervisor to obtain one and have it attached to the truck. And remember, your CLARK dealer is pleased to answer questions about the operation and maintenance and will provide you with additional information should you require it.

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Safety Signs and Safety Messages

Improper operation can cause accidents. Don't take chances with incorrect or damaged equipment. **Read** and **understand** the procedures for safe driving and maintenance outlined in this manual. Don't hesitate to ask for help. **Stay alert!** Follow safety rules, regulations, and procedures. Avoid accidents by recognizing dangerous procedures or situations before they occur. **Drive and work safely** and follow the safety signs and their messages on the truck and in this manual.

Safety signs and messages are placed in this manual and on the truck to provide instructions and identify specific areas where potential hazards exist and special precautions should be taken. Know and understand the meaning of these instructions, signs, and messages. Damage to the truck, death, or serious injury to you or other persons may result if these messages are not followed. If warning decals are damaged, they must be replaced. Contact your CLARK dealer for replacements.

NOTICE

This message is used when special information, instructions or identification is required relating to procedures, equipment, tools, pressures, capacities and other special data.

IMPORTANT

This message is used when special precautions should be taken to ensure a correct action or to avoid damage to or malfunction of the truck or a component.

CAUTION

This message is a reminder of unsafe practices that can result in personal injury if proper precautions are not taken.

WARNING

This message indicates a hazard exists that can result in injury or death if proper precautions are not taken.

DANGER

This message is used when an extreme hazard exists.

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General Safety Rules

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Pedestrians **1-4**

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Pinch points **1-7**

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Do's and Don'ts

OM0001

Don't mix drugs or alcohol with your job.

Do watch for pedestrians.

OM0002

OM0003

Don't block safety or emergency equipment.

Do wear safety equipment when required.

OM0004

OM0005

Don't smoke in "NO SMOKING" areas.

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No Riders / Pedestrians

659002

The operator is the only one that should be on the tow truck. Never allow a passenger

659003

Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots. Watch for people in your work area. People may not watch for you.

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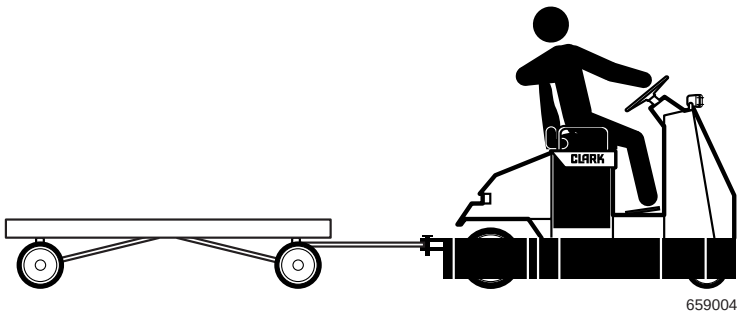
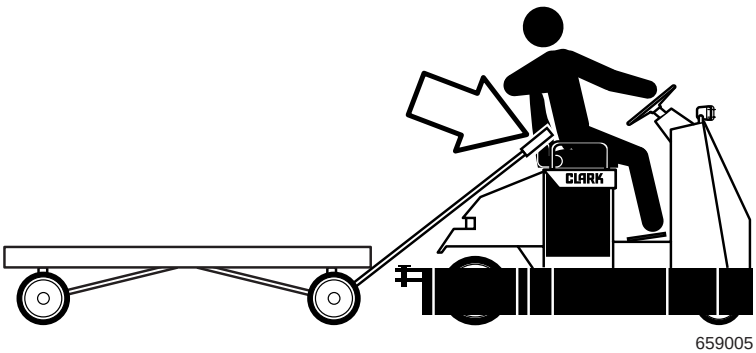
Operator Protection



CAUTION

Be especially careful when traveling in reverse and maneuvering in tight areas.



CAUTION

Watch for intrusion into the operator compartment.

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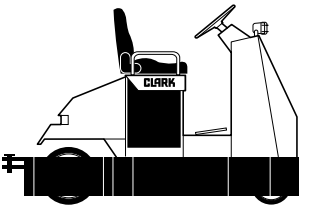
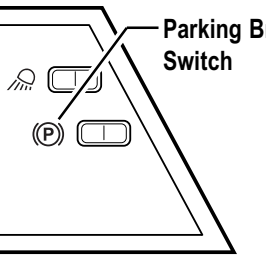
Parking

WARNING

Never park on a grade or incline.

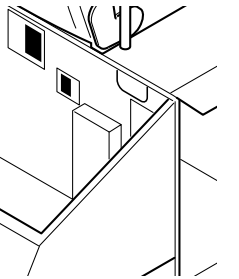


- Park tow tractor in designated areas only. Do not obstruct traffic lanes or aisles.

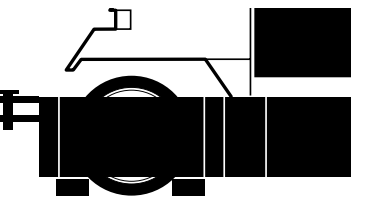


- Set parking brake switch.

- Unplug battery connector.



- Block drive wheel to prevent accidental roll.



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Summary of Safe Operating Procedures

1. Do not operate this tow tractor unless you have been trained and authorized to do so. Read all warnings and instructions in the operator's manual and on this tow tractor.
2. Do not operate this tow tractor until you have checked its condition. Give special attention to tires, horn, lights, battery, brakes, and steering systems.
3. Operate tractor only from designated operating position. Never place any part of your body outside of the confines of the tow tractor. Do not carry passengers.
4. Make sure the tow coupler is secure.
5. Do not handle unstable or loosely stacked loads. Use special care when handling long, high or wide loads to avoid losing the load, striking bystanders, or tipping the tractor. Loads on trailers must be evenly distributed and secure.
6. Tow tractors generally tow loads in excess of the weight of the tractor. A loaded trailer requires increased stopping distance.
7. Start, stop, travel, steer and brake smoothly. Slow down for turns on uneven or slippery surfaces. Violent application of brakes is dangerous and may cause "jack-knifing" of trailers.
8. When making a turn, allow for "corner-cutting" of the trailer.
9. When moving in reverse direction with a trailer, get assistance if vision is obstructed. Moving in reverse direction with more than one trailer is not recommended.
10. Before driving over a dockboard or bridge plate, make sure it is correctly secured. Drive carefully and slowly across the dockboard or bridge plate, and never exceed its rated capacity with tractor or trailers.
11. Do not run over objects on the travel surface.
12. Use special care when operating on ramps. Travel slowly and do not angle or turn.
13. If a tractor must be parked on an incline, put blocks at the wheels.
14. Observe applicable traffic regulations. Yield right-of-way to pedestrians. Slow down and sound horn at cross aisles and whenever vision is obstructed.
15. Before getting off of tow tractor, put direction control in neutral and set parking brake switch.

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Operating Your Truck

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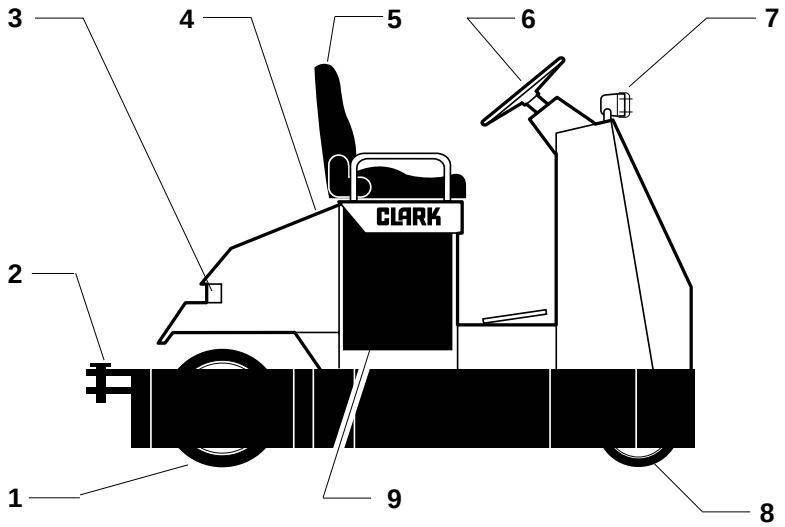
Tow Tractor Model Description



CLARK CTT 7

1. Drive Axle and Wheels
2. Towing Coupler
3. Tail Lights
4. Battery Connector
5. Seat
6. Steering Control Handwheel
7. Headlight
8. Steer Axle and Wheels
9. Battery Compartment

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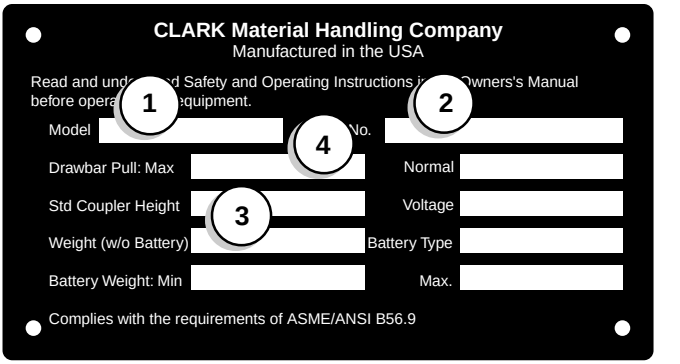
Tractor Data and Capacity Plate



1. Tractor model number or registered name.
2. Tractor serial number—An identification number assigned to this particular tractor and should be used when requesting information or ordering service parts for this tractor from your authorized CLARK dealer.
3. Tractor weight—This is the approximate weight of the tow tractor. This weight plus the weight of the battery and trailers must be considered when operating on elevators, elevated floors, etc., to be sure they are safe.
4. Capacity rating. This shows the maximum capacity with relation to drawbar pull. Personal injury and damage to the tractor can occur if these capacities are exceeded. **Do not exceed the maximum capacity specified**.

CAUTION

When attachments are added or if the tractor is modified, the capacity of the tractor may be affected. Contact your authorized CLARK dealer for a new nameplate showing the revised capacity.

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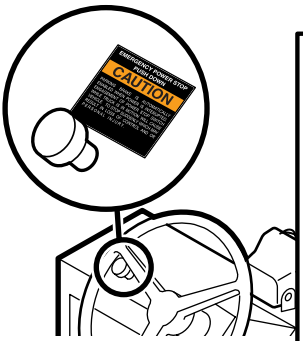
Emergency Power Stop



EMERGENCY POWER STOP
PUSH DOWN

CAUTION

PARKING BRAKE IS AUTOMATICALLY ENABLED WHEN POWER IS INTERUPTED. ENGAGEMENT OF POWER STOP SWITCH WHILE TRUCK IS IN MOTION WILL CAUSE VEHICLE TO STOP SUDDENLY WHICH MAY RESULT IN LOSS OF CONTROL AND OR PERSONAL INJURY.

IMPORTANT

Safety and warning decals are placed in conspicuous locations on the tractor to remind you of essential procedures or to prevent you from making an error that could damage the tractor or possibly cause personal injury. You should know, understand, and follow these instructions. Safety and warning decals should be replaced immediately if missing or defaced (damaged or illegible). Refer to your Service Manual for the location of all decals.

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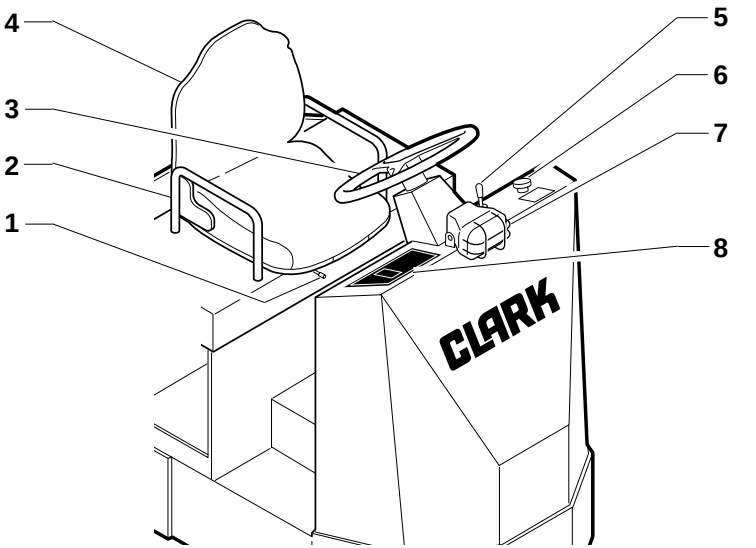
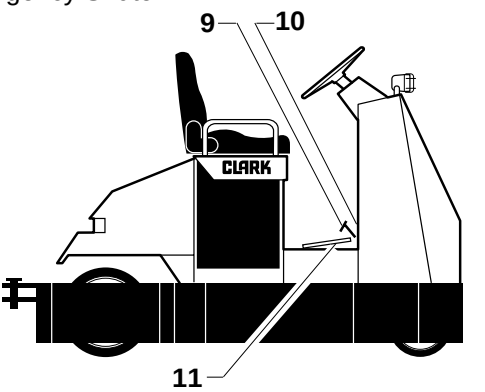
Operator's Compartment & Controls



1. Seat Adjustment
2. Safety Rail
3. Steering Handwheel
4. Seat
5. Directional Control
6. Emergency Shutoff
7. Headlight
8. Dash Display with Switches
9. Service Brake Pedal
10. Horn (Foot Operated)
11. Accelerator Pedal



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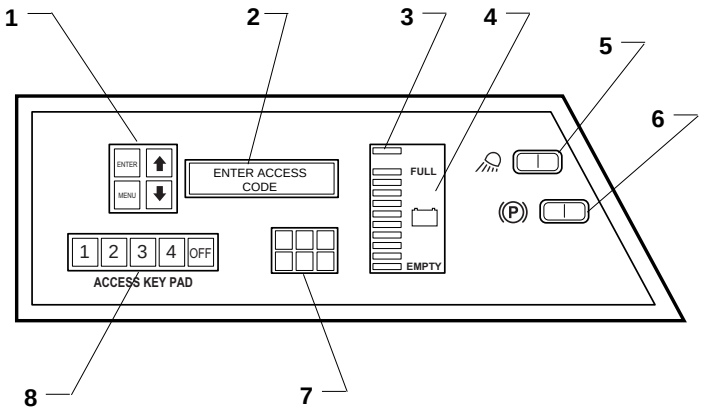
The Dash Display



1. **Command Buttons** - Used by service personnel to select options shown on the LCD display. See *Service Manual*.
2. **LCD Display** - Displays operator and service information.
3. **Control Over Temperature Indicator** - Lights when the controller is overheated. Truck speed reduces to Speed Limit 1 until motor cools. To cool the controller, reduce load, speed, or grade.
4. **Battery Discharge Gauge** - Shows charge level of battery. Flashes when battery charge falls below 20%.
5. **Light Switch** - Switches lights off and on.
6. **Parking Brake Switch** - Sets or releases parking brake electrically.

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7. **Status Indicators** - Flashing indicators mean:
   - **Service** - It is time for planned service. The truck will operate normally for up to four hours, then it will operate at the Speed Limit 1 setting. Have truck serviced.
   - **Park Brake** - The parking brake switch is set to the On position. The truck should not operate.
   - **Motor Temp** - The drive motor is overworked. Truck speed reduces to Speed Limit 1 until motor cools. To cool the motor, reduce load, speed, or grade.
   - **Brush Wear** - The drive motor brushes are worn too short. The truck will operate normally for up to four hours, then it will operate at the Speed Limit 1 setting. Have truck serviced.
   - **Speed Limit 1** - The preset speed limit has been activated by conditions shown on other status indicators.
8. **Access Key Pad** - Lets you enter a code to unlock the control system and start the truck. When the truck is off, the "Enter Access Code" prompt displays. Press the five-digit user code. The truck then begins its start-up routine.

   To change the code or access service routines, you must have a supervisor code, as explained in the *Service Manual*. If the operator and supervisor codes are lost, contact the factory for assistance.

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Operating the Tow Tractor

1. Inspection

Before operating the truck, inspect it as described in Section 3, "Operator Maintenance and Care."

CAUTION

Do not operate the tow tractor until you have read the "General Safety Rules" and "Safety Signs and Messages" section of this manual and have successfully completed an operator training course.

2. Seat Adjustment

The forward and aft adjustment lever is located on the right side under the seat. To unlock, push the lever to the left and adjust the seat so that all controls may be comfortably reached. Then release the lever. Be sure that the seat locks in position.

CAUTION

Never adjust driver's seat while tractor is moving, to avoid the possibility of loss of control and of personal injury.

3. Start-up

a. Connect the battery connector.

b. Sit in the driver's seat and place the direction lever in neutral. Make sure the emergency stop button is raised. Keep your feet off the accelerator pedal.

c. Enter your five-digit access code with the keypad.

d. Press the parking brake switch to the Off position.

e. Look for a possible start up error on the LCD display. If "Safety Error..." or "Start-up Error..." displays, check that steps b, c, and d are done properly.

f. When the LCD display shows "Drive Hours," move the direction lever to Forward or Reverse and press the accelerator pedal to make the truck travel.

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4. Stopping

- To stop the truck, release the accelerator pedal and depress the service brake pedal. The truck should come to a smooth stop.
- If the brakes fail, use the Emergency Stop button. Mash it down to stop. Pull it back out before restarting the truck.

5. Parking

a. Stop the truck in the designated parking area or other area not blocking fire aisles, fire equipment, stairs, or walkways.

b. Place the direction lever in the Neutral position.

c. Press the parking brake switch to the On position.

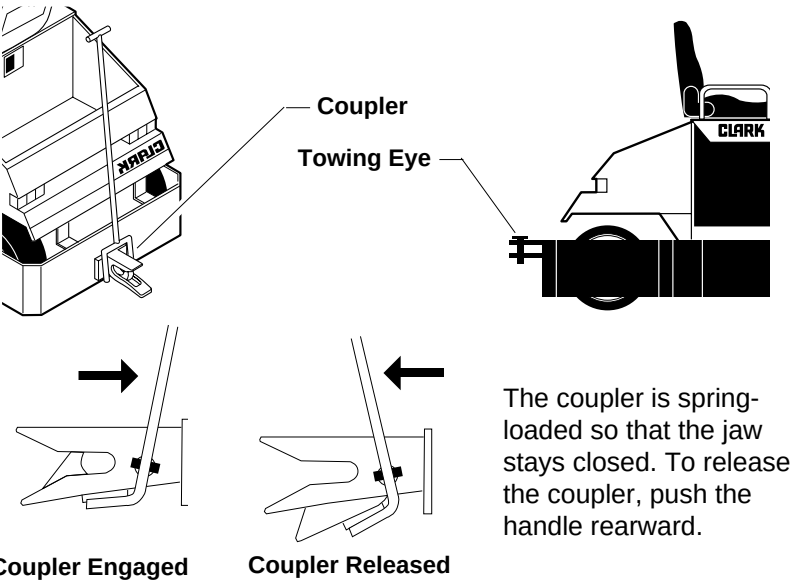
If the parking brake switch is not returned to Off within 30 minutes, the control will lock and the access code will be required for restart.

d. To lock the control immediately, press the Off button.

e. Disconnect the battery connector, if you are going to leave the truck unattended.

6. Operating the Coupler

The trucks are available with an optional towing coupler or towing eye.



The coupler is spring-loaded so that the jaw stays closed. To release the coupler, push the handle rearward.

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Operator Maintenance and Care

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Functional Checks 3-3

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CAUTION

The Occupational Safety and Health Act (OSHA) requires that truck users examine their trucks before each shift to be sure they are in safe working order. Defects when found shall be immediately reported and corrected. The truck shall be tagged with an "Out Of Service" tag and taken out of service until it has been restored to safe operating condition.

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Daily Safety Inspection

Before using a tow truck, **it is the operator's responsibility** to check its condition and be sure it is safe to operate.

Check for damage and maintenance problems; have repairs made before you operate the truck. Unusual noises or problems must be reported immediately to your supervisor or other designated authority.

Do not make repairs yourself unless you are trained in tow truck repair procedures and authorized by your employer. Have a qualified mechanic make repairs using approved parts.

CAUTION

Do not operate a truck if it is in need of repair. If it is in an unsafe condition, remove the key and report the condition to the proper authority. If the truck becomes unsafe in any way while you are operating it, stop operating the truck, report the problem immediately, and have it corrected.

Tow trucks should be inspected every eight hours, or at the start of each shift. In general, the daily inspection should include the **visual** and **functional checks** described on the following pages.

As an aid in carrying out this inspection, the manufacturer has prepared a form called the **"Driver's Daily Checklist."** We recommend that you use this form to make a daily record of your inspections and truck condition. You may obtain copies of this form from your dealer.

Visual Checks

First, perform a visual inspection of the truck and its major components:

1. Walk around your tow truck and take note of obvious damage that may have been caused by operation during the last shift.
2. Check that all capacity, safety, and warning plates or decals are attached and legible.
3. Check that the battery is installed and secured in position correctly. Check battery connector for safe condition.
4. Be sure that safety devices are in place, securely fastened and undamaged. Inspect for damaged or missing parts, corrosion, cracks , breaks etc.
5. Check for leakage around the drive axle.
6. Check the tow coupler for proper operation.
7. Inspect the wheels and tires for safe mounting, wear condition.

Functional Checks

Check the operation of the truck as follows:

NOTICE

Before performing these checks, learn the operating procedures in Section 2.

1. Test warning devices, horn, lights, and other safety equipment and accessories.
2. Check the dash display. Enter your access code as described in Section 2. If everything is OK, the display should show "Drive Hours." If an operator fault displays, correct the condition. If other faults display, take the truck out of service and call a service technician.
3. Operate the truck to see that all controls operate freely and return to neutral properly. Check all systems, including the:
   - Parking brake
   - Steering
   - Braking
   - Direction control.

   If any of these are not functioning properly, take the truck out of service and call a service technician.

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Concluding the Inspection

Make a record on the "Driver's Daily Checklist' of all the operating and truck problems that you find. Review the checklist to be sure it has been completed and turn it in to the person responsible for tow truck maintenance. Be sure any unusual noises or problems are investigated immediately.

Do not operate a tow truck that has a maintenance problem, or is not safe to operate.

Be sure to put this Operator's Manual back in the holder in the operator's compartment. Read the manual again if you are not sure of all tow truck operating procedures.

If all of the Daily Inspection checks were normal or satisfactory, the truck can be operated.

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Planned Maintenance and Lubrication

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NOTICE

THIS SECTION IS FOR TRAINED SERVICE PERSONNEL to use as a reference for Planned Maintenance procedures. Complete maintenance information is in the *Service Manual*.

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Daily Inspection Points

The following should be done every 8-10 hours:

- Check truck for obvious damage and leaks.
- Check/clean battery terminals.
- Check battery electrolyte level and specific gravity.
- Check capacity plate, warning plates & decals.
- Check condition of tires and wheels and remove embedded objects.
- Check drive wheel lug nuts.
- Check hour meter and optional battery discharge indicator.
- Check service and parking brake operation.
- Check horn operation.
- Check emergenecy stop button.
- Check directional and speed control operation.
- Check coupler operation.

Typical Operating Conditions

Time intervals between maintenance are largely determined by operating conditions. The intervals specified in the following schedule are for normal operation. For more severe operation, the maintenance intervals should be shortened accordingly. Contact your dealer for recommendations.

Normal Operation:
Basically, eight hour material handling in clean buildings with smooth level floors and clean, open air.

Severe Operation:
Prolonged operating hours or constant usage, with ramps and/or bumpy floors.

Extreme Operation:

- Sandy or dusty locations.
- High temperature locations.
- Sudden temperature changes such as refrigeration facilities.

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Maintenance and Lubrication Schedule

Planned maintenance should be performed every 200 to 500 operating hours, or monthly, and includes the following tasks:

- Check truck for obvious damage and leaks.
- Check dash display.
- Check electric park brake operation.
- Test drive truck--check functional performance.
- Air clean truck.
- Check torque on critical fasteners.
- Lubricate truck.
- Clean/check battery terminals, electrolyte level.
- Check battery cables & truck receptacle.
- Perform battery load test.
- Check drive motor brushes.
- Test truck ground.
- Clean drive motor air vents.
- Check brake fluid level.
- Drain and replace drive unit fluid.

Safe Maintenance Practices

The following instructions have been prepared from current industry and government safety standards applicable to industrial truck operations and maintenance. They are listed here for the reference and safety of all workers during inspection / maintenance operations. When in doubt of any inspection / maintenance procedures, please contact your local dealer.

1. Powered industrial trucks can become hazardous if maintenance is neglected. Therefore, suitable maintenance facilities, trained personnel and procedures shall be provided.
2. Maintenance and inspection of all powered industrial trucks shall be done in conformance with the manufacturer's recommendations.
3. A scheduled planned maintenance, lubrication and inspection system shall be followed.
4. Only trained and authorized personnel shall be permitted to maintain, repair, adjust and inspect industrial trucks and in accordance with the manufacturer's specifications.

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5. Properly ventilate work area, vent exhaust fumes, keep shop clean and floor dry.
6. Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check electrolyte level. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
7. Before Starting to Work on the Truck:
   a) Raise drive wheels free of floor or disconnect power source and use blocks or other positive truck positioning devices.
   b) Disconnect battery before working on the electrical system.
8. Operation of the truck to check performance must be conducted in an authorized, safe, clear area.
9. Before Starting to Drive the Truck:
   a) Remove drive wheel chocks.
   b) Plug-in battery connector.
   c) Start truck.
   d) Make sure path of travel is clear.
   e) Check function of controls and emergency stop button.
   f) Check function of brakes.
10. Before Leaving the Truck:
   a) Park truck in designated area.
   b) Place directional control in Neutral.
   c) Turn off truck with Off button on dash.
   d) Unplug battery connector.
   e) Block drive wheels.
11. Brakes, steering mechanisms, control mechanisms, warning devices, lights, guards and safety devices, and frame members must be carefully and regularly inspected and maintained in a safe operating condition.
12. The truck manufacturer's capacity, operation and maintenance instruction plates, tags or decals must be maintained in legible condition.
13. Batteries, motors, controllers, switches, protective devices, electrical conductors and connections must be inspected and maintained in conformance with good practices. Special attention must be paid

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to the condition of electrical insulation.

14. To avoid injury to personnel or damage to the equipment, consult the manufacturer's procedures in replacing contacts on any battery connector.
15. Industrial trucks must be kept in a clean condition to minimize fire hazards and help in the detection of loose or defective parts.
16. Modifications and additions that affect capacity and safe truck operation must not be done without the manufacturer's prior written approval. Capacity, operation and maintenance instruction plates, tags or decals must be changed accordingly.
17. Care must be taken to assure that all replacement parts, including tires, are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment. Parts, including tires, are to be installed per the manufacturer's procedures. Always use approved parts.

Safety Standards

NOTICE

You should also be familiar with additional operating and maintenance safety instructions contained in the following publications:

ANSI / ASME B56.1: Safety Standard for Low Lift and High Lift Trucks (Safety Code For Powered Industrial Trucks). Published by: American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, N.Y. 10017.

NFPA 505: Fire Safety Standard for Powered Industrial Trucks: Type Designations, Areas of Use, Maintenance and Operation. Available from: National Fire Protection Assoc., Inc., Batterymarch Park, Quincy, MA 02269.

General Industry Standards, OSHA 2206: OSHA Safety and Health Standards (29 CFR 1910), Subpart N - Materials Handling and Storage, Section 1910.178 Powered Industrial Trucks. For sale by: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 or contact your dealer.

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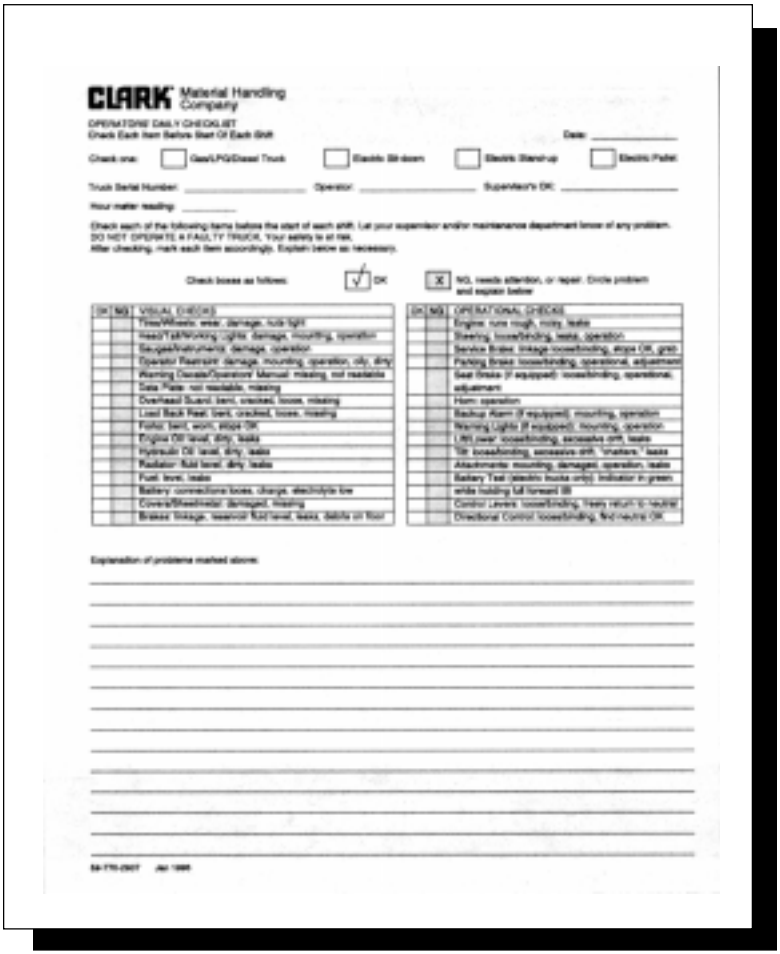
PM Report Form



CLARK Material Handling Company

OPERATORS' DAILY CHECKLIST
Check Each Item Before Start Of Each Shift

Date: _____

Check one: ☐ Gas/LPG/Diesel Truck ☐ Electric Sit-down ☐ Electric Stand-up ☐ Electric Pallet

Truck Serial Number: _____ Operator: _____ Supervisor's OK: _____

Hour meter reading: _____

Check each of the following items before the start of each shift. Let your supervisor and/or maintenance department know of any problem.
DO NOT OPERATE A FAULTY TRUCK. Your safety is at risk.
After checking, mark each item accordingly. Explain below as necessary.

Check boxes as follows: √ OK X NG, needs attention, or repair. Circle problem and explain below

OK	NG	VISUAL CHECKS
		Tires/Wheels: wear, damage, nuts tight
		Head/Tail/Working Lights: damage, mounting, operation
		Gauges/Instruments: damage, operation
		Operator Restraint: damage, mounting, operation, oily, dirty
		Warning Decals/Operators' Manual: missing, not readable
		Data Plate: not readable, missing
		Overhead Guard: bent, cracked, loose, missing
		Load Back Rest: bent, cracked, loose, missing
		Forks: bent, worn, slope OK
		Engine Oil: level, dirty, leaks
		Hydraulic Oil: level, dirty, leaks
		Radiator: fluid level, dirty, leaks
		Fuel: level, leaks
		Battery: connections loose, charge, electrolyte low
		Covers/Shrouds/Hood: damaged, missing
		Brakes: linkage, reservoir fluid level, leaks, debris on floor

OK	NG	OPERATIONAL CHECKS
		Engine: runs rough, noisy, leaks
		Steering: loose/binding, leaks, operation
		Service Brake: linkage loose/binding, stops OK, grab
		Parking Brake: loose/binding, operational, adjustment
		Seat Brake (if equipped): loose/binding, operational, adjustment
		Horn: operation
		Backup Alarm (if equipped): mounting, operation
		Warning Lights (if equipped): mounting, operation
		Lift/Lower: loose/binding, excessive drift, leaks
		Tilt: loose/binding, excessive drift, "markers," leaks
		Attachments: mounting, damaged, operation, leaks
		Battery Test (electric trucks only): indicator in green
		while holding full forward tilt
		Control Levers: loose/binding, freely return to neutral
		Directional Control: loose/binding, find neutral OK

Explanation of problems marked above:

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A planned maintenance (PM) program of regular, routine inspections and lubrication is important for long life and trouble-free operation of your tow truck. Make and keep records of your inspections. Use these records to help establish the correct PM intervals for your application and to indicate maintenance required to prevent major problems from occurring during operation.

As an aid in performing and documenting your PM inspections, the manufacturer has prepared an ***Electric Truck Planned Maintenance Report Form*** (PM Report Form). Copies of this form may be obtained from your authorized dealer. We recommend that you use this form as a checklist and a record of your inspection and truck condition.

The maintenance procedures outlined in this section are intended to be used in conjunction with the PM Report Form. They are arranged in groupings of maintenance work that are done in a logical and efficient sequence.

You make check marks or entries on the PM Report Form when you perform the PM. Please notice on the form a special coding system for indicating the importance of needed repairs and/or adjustments appears on the form.

When you have finished the PM inspections, be sure to give a copy of the report to the designated authority responsible for tow truck maintenance.

Do not make repairs or adjustments unless authorized to do so.

CAUTION

For safety, it is good practice to:

- **Remove all jewelry (watch, rings, bracelets, etc.) before working on the truck.**
- **Disconnect the battery before working on truck.**
- **Always wear safety glasses. Wear a safety (hard) hat in industrial plants and in special work areas where protection is necessary and required.**

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Visual Inspection

First perform a visual inspection of the tow truck and its components. Walk around the truck and take note of any obvious damage or maintenance problems.

Check to be sure all capacity, safety, and warning plates attached are legible.

NOTICE

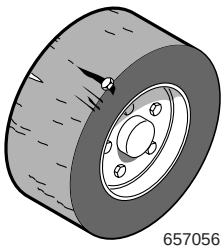
NAMEPLATES AND DECALS: Do not operate a tow truck with damaged or lost decals and nameplates. Replace them immediately. They contain important information.

Check for any signs of external leakage: transmission fluid etc.

Check the condition of the drive and steer wheels and tires. Remove objects that are embedded in the tire. Inspect the tires for excessive wear and breaks or "chunking out" and bond failure between the tire and the rim.

Check all wheel lug bolts to be sure none are loose or missing.

Have missing bolts replaced and loose bolts tightened to the correct torque before operating truck.



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Functional Tests

Now, start the truck and operate it as explained in "Operating the Tow Tractor" in the "Know Your Truck Section." Make sure that all controls and systems are functioning correctly. This includes horn, service brake,lights, parking brake, directional control, steering, accelerator pedal, and braking.

If any part does not operate properly, report the failure, and have it repaired before the truck is put into operation.

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Critical Fastener Checks

Fasteners in highly loaded (critical) components can quickly fail if they become loosened. Also, loose fasteners can cause damage or failure of the component. For safety, it is important that the correct torque be maintained on all critical fasteners of components that directly support, handle, or control the load and protect the operator.

Check critical items, including the drive axle mounting and drive and steer wheel mounting.

Air Cleaning the Truck

Always maintain a tow truck in a clean condition. Do not allow dirt, dust, lint, or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and floorboards clean, dry, and safe. A clean truck makes it easier to see leakage and loose, missing, or damaged parts. A clean condition helps prevent fires and helps the truck run cooler.

The environment in which a tow truck operates determines how often and to what extent cleaning is necessary. For example, trucks operating in manufacturing plants with a high level of dirt, dust, or lint, (e.g., cotton fibers, paper dust, etc.) in the air or on the floor require more frequent cleaning. If air pressure does not remove heavy deposits of grease, oil, etc., it may be necessary to use steam or liquid spray cleaner.

Tow trucks should be air cleaned at every PM interval, and more often if needed.

CAUTION

Do not steam clean electrical components. U**se an air hose with special adapter or extension having a control valve and nozzle to direct the air properly. Use clean, dry, low-pressure compressed air. Restrict air pressure to 30 psi (207 kPa), maximum (OSHA requirement).**

Wear suitable eye protection and protective clothing.

Air clean: drive axle; battery; cables; switches and wiring harness; traction controls and wiring; drive motor; and steer axle and steer linkage.

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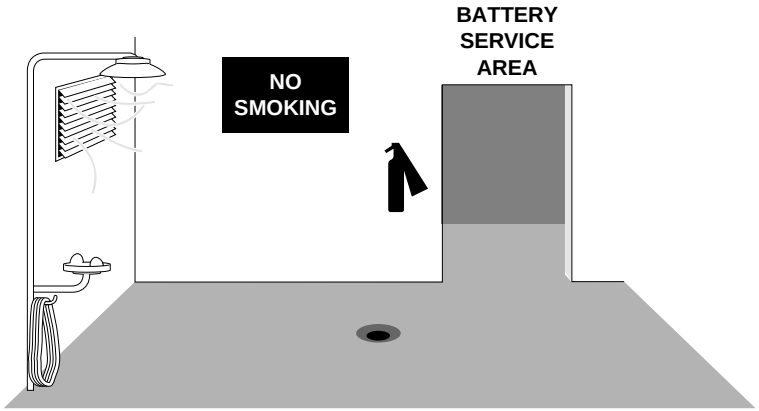
Electric Truck Battery Maintenance



Battery charging installations must be located in areas designated for that purpose. These areas must be kept free of all nonessential combustible materials.

Facilities must be provided for:

- Flushing spilled electrolyte.
- Fire protection.
- Protecting charging apparatus from damage by trucks.
- Adequate ventilation for dispersal of fumes from gassing batteries.

When handling acid concentrates greater than 50% acid (above 1.400 specific gravity), an eye wash fountain must be provided.

A conveyor, overhead hoist, or equivalent material handling equipment must be provided for handling batteries.

IMPORTANT

Electric truck batteries are heavy and awkward to handle. They are filled with a very hazardous chemical solution. On charge, they give off hydrogen which, in certain concentrations, is explosive. And, they are costly. Before you remove, service, or install a truck battery, carefully read the following recommendations and instructions.

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Battery Handling

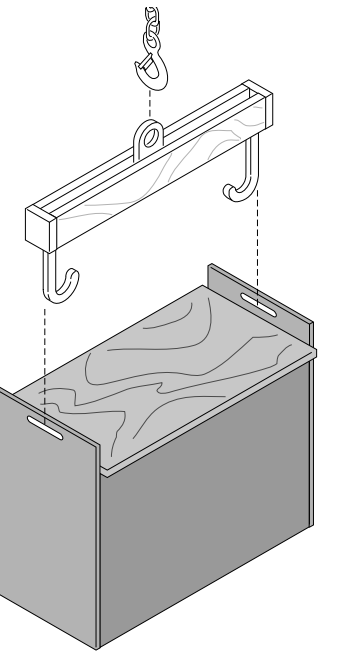
1. Change (remove) or service storage batteries only in an area designated for this purpose.

2. Be sure this area has provisions to flush and neutralize spillage, to ventilate fumes from gassing batteries, and for fire protection.

3. This area should be equipped with material handling tools designed for removing and replacing batteries, including a conveyor or overhead hoist. Use lift hooks that have safety latches.

4. Always use a special lifting device such as an insulted spreader bar to attach the hoist to the battery. The width of the spreader bar must be the same as the lifting eyes of the battery, to prevent damage to the battery. If the spreader bar hooks are movable, carefully adjust the position (width) of the hooks so that the pull is directly upward (vertical) and no side load or force (pressure) is exerted on the battery case. Be sure the lift hooks are the correct size to fit the lifting eyes of the battery.

5. If the battery does not have a cover of its own or has exposed terminals and connectors, cover the top with a non-conductive (insulating) material, such as a sheet of plywood or heavy cardboard, prior to attaching the lifting device.



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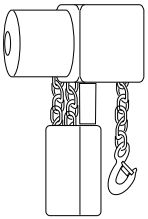
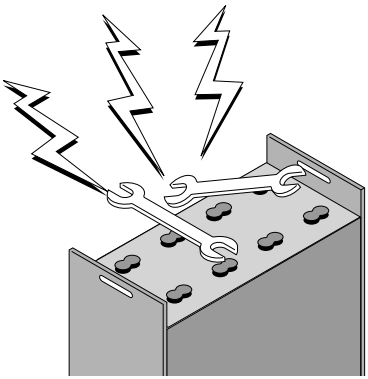
6. Chain hoists or power battery hoists must be equipped with load chain containers to accumulate the excess lifting chain.



7. Keep all tools and other metallic objects away from terminals.



WARNING

BATTERY SERVICE must be done by trained and authorized personnel. Battery acid can cause severe burns and injury.

Battery Charging

1. Persons maintaining storage batteries must wear protective clothing such as face shield, long sleeves, and gloves.
2. Hydrogen emissions from charging batteries are flammable. No smoking is allowed in the charging area. Do not check the electrolyte level with an open flame. Do not allow open flame, sparks, or electric arcs in battery charging area.

WARNING

SULFURIC ACID: The battery contains corrosive acid that can cause injury. If acid contacts your eyes or skin, flush immediately with water and get medical assistance.

WARNING

EXPLOSIVE GASES: Do not smoke or have open flames or sparks in battery charging areas or near batteries. An explosion can cause injury or death.

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3. When charging batteries, the vent caps must be kept in place to avoid electrolyte spray. Care must be taken to assure that vent caps are open (clean) and functioning. The battery (or compartment) cover(s) must be open to dissipate heat and gas.

IMPORTANT

If batteries discharge rapidly during normal operation or do not charge to the correct specifications, contact a qualified battery service technician to check the battery for you. Do not add electrolyte or attempt to service the battery.

Battery Removal from Truck

1. Check the designated service and charging area for fire protection, and be sure all sources of ignition are cleared from the area. **Do not smoke**. Be sure all previous noted equipment is in the area, in good repair, and working properly. If the battery is to be serviced, be sure there are provisions to flush and neutralize spillage and to disperse (ventilate) fumes from gassing batteries on charge. And, be sure there are provisions for handling electrolyte.
2. Before attempting to remove or charge a storage battery, the truck should be positioned in the designated battery service area and the parking brake applied so the truck cannot move.
3. Disconnect the battery connector.
4. If the battery to be handled is not equipped with its own cover, cover the battery when handling with a non-conductive (insulating) material, e.g., plywood or heavy cardboard, before attaching the lifting device.

⚠ WARNING

Disconnect battery before handling electrical components. Polarity must be correct to prevent damage.

5. Use an approved lifting device with an insulated spreader bar, to remove and transport a truck battery. Be sure the hoist and lifting chains are equipped with safety hooks.
6. Remove the battery and move it to a safe storage location. Store batteries either on an approved battery rack or on a wooden pallet.

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Battery Cleaning and Care

Never wash the battery when it is in the truck. The easiest and most satisfactory method of cleaning a battery is to wash it occasionally with a low-pressure cold-water spray. The top can also be washed off with a solution of baking soda and water (add a box of baking soda to a pail of water and stir until dissolved) and rinsed with clean water. It is good practice to have this solution in a battery room at all times.

IMPORTANT

During cleaning, the battery vent caps must be tightly in place.

Refer to the battery manufacturer or supplier for their recommended battery maintenance and care procedures.

BATTERY SAVER and CLEANER, Part No. 886398, may be used to clean and protect the truck battery.

New Truck Batteries: Apply a light coat of BATTERY SAVER and CLEANER to entire surface of battery. Allow to set for approximately 30 seconds, then wipe thoroughly with a wiping cloth or rag. Chemical action will dissolve rust and corrosion. After cleaning, apply a second coating for protection. This will prevent the start and growth of corrosion on battery terminals and cable connections.

Battery Service Records

Keep a record of battery service and maintenance to obtain the best service life from your battery and truck. Select a pilot cell, take readings of specific gravity and temperature before and after charging, and record the readings with the date. It is best to change the location of the pilot cell occasionally to distribute any electrolyte loss over the battery. Every 2 or 3 months, take complete battery readings (specific gravity, temperature, and voltage) and make a record of them.

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How to Get Maximum Battery Life

1. Follow normal battery maintenance procedures, re-charging before 80% discharged and with periodic equalizing charges.
2. Don't add acid to a battery. Only a person trained and qualified to do battery maintenance should determine if this is necessary.
3. Lift battery only with a correctly-constructed lifting device that will not put pressure on the battery case.
4. Keep open flames, tools, and metal objects away from the top of battery to prevent short circuits and explosions.
5. Do not overcharge.
6. Check the battery electrolyte level **after** each charging. Add water if the top of the separator or plates are visible. **Do not overfill!**
7. **Keep the battery clean and dry**. Wash down as needed.
8. Keep battery service records.

Battery Installation

1. Use only a lead-acid battery with the voltage and ampere-hour rating specified for the truck.
2. When changing batteries on battery electric trucks, replacement batteries must be of the service weight that falls within the minimum/maximum range specified on truck nameplate.
3. Handle battery only with approved lifting device.
4. Install the battery correctly in the truck and secure it in position.

NOTICE

Some trucks are equipped with battery stops or blocks. Others do not require them. If the truck being serviced has battery stops or blocks, be sure none are missing or damaged. Replace them as necessary. If they are an adjustable type, be sure they are correctly adjusted and tightened.

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Specifications for CTT 7 Tow Truck

		48 Volt	36 Volt
Drawbar pull (max)		2100 lbs / 955 kg	
Power unit		Electric	
Tire type		Solid Cushion	
Overall dimensions	Length	73.5 in / 1865 mm	
	Width	42.5 in / 1080 mm	
	Height without cab	58.6 in / 1490 mm	
Turning radius		67 in / 1700 mm	
Travel speed	Maximum, with load	5.5 mph / 8.9 kph	4.5 mph / 7.2 kph
	Maximum, without load	9.2 mph / 14.8 kph	7.2 mph / 11.5 kph
Service weight	Without battery	2475 lbs / 1125 kg	
Tires (standard)	Size, front	10x4x6.5 in / 255x100x165 mm	
	Size, rear	18x7x12 in / 460x180x305 mm	
Ground clearance	Center of wheelbase	3.5 in / 90 mm	
Service brake type		Hydraulic	
Parking brake type		Electric	
Battery	Type	Lead-acid	
	Voltage, maximum	48 / 118 kwH	36 / 31.3 kwH
	Weight , minimum	1375 lbs / 625 kg	
	Weight , maximum	1620 lbs / 735 kg	
Motors, controls	Drive motor, 60 min. rating	12.2 hp / 9.1 kw	9.0 hp / 6.7 kw
Drive control	Type	Solid state	
	Speed control	Infinitely variable	
Transmission	Type	Geared	

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