TAYLOR-DUNN®

Commercial and Industrial Vehicles Since 1949

# Operator's Manual

# Models E-451 & E-457


*The best way to go about your business*

Serial Number Range:
Starting: 206900
Ending: See Introduction Chapter

*Use with Model Numbers:*
*E0-034-51*
*E0-034-57*

## ⚠WARNING

**READ AND UNDERSTAND THIS MANUAL BEFORE OPERATION OR PERFORMING MAINTENANCE.**

**This manual contains important information regarding the safe operation and maintenance of this vehicle. This manual should be kept with the vehicle.**

## My Vehicle information

Serial Number: _____.

Date Purchased: _____.

Date Delivered: _____.

Dealer Purchased From: _____.

Salesman Name: _____.

Your satisfaction is our #1 goal. If you have questions or concerns with your vehicle, please contact your Sales Representative or Service Advisor at your local dealership.

Taylor-Dunn has a worldwide dealer and distribution network to provide replacement parts and service for our vehicles.

Refer to our web site, www.taylor-dunn.com, for a dealer lookup application.

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*Visit our Web site: www.taylor-dunn.com*

# CONTACT INFORMATION

## Service, Parts, Sales:

Taylor-Dunn has a network of dealers distributed around the globe to support our vehicles. Information regarding vehicle sales, replacement parts, or service should be obtained through your local dealer.

A dealer locator can be found on the Taylor-Dunn website at www.taylor-dunn.com.

If you do not have access to the internet, you can call the factory direct at:

01 (714) 956-4040

Feedback regarding this or any Taylor-Dunn manual can be sent to:

Taylor-Dunn Manufacturing
Attn: Tech Writer
2114 West Ball Road
Anaheim, CA 92804

# *The Taylor-Dunn Corporation:*

*Leading Provider of Commercial & Industrial Vehicles since 1949*

## Taylor-Dunn Manufacturing:

From the day we shipped our first vehicle in 1949, we have pursued a singular goal: to build tough, rugged, dependable vehicles to help our customers move personnel, equipment, and materials. It's that simple. For over sixty years, our standard and custom vehicles - Burden Carriers, Personnel Carriers, Stock Chasers, Electric Carts, Tow Tractors & more - have been the leading solution for customers in a broad range of industrial, commercial, and ground-support markets.

Decades of experience are an invaluable asset, and it is an asset we cherish and protect. Our guiding principle is to provide application-specific solutions, which are reliable, efficient, and economical.

Our domestic and international network of quality Taylor-Dunn Dealers and Parts & Service Support keeps our customers moving.

## Tiger Tractor:

Tiger manufacturing has become a leading manufacturer of internal combustion engine industrial tractors and ground support equipment. With tractor capacities ranging from 3,000 - 12,000 pounds drawbar pull, they are ideal for industrial applications as well as aircraft ground support. As with all Taylor-Dunn vehicles; quality, service, support and reliability are built into all Tiger Tractor products.

***Shown below is just a small sample of what Taylor-Dunn has to offer to keep your business moving:***

# Table of Contents

# Introduction

## Who Should Read This Manual

This manual is intended for use by anyone operating or performing routine maintenance on this vehicle. Each person should be familiar with the parts of this manual that apply to their use of this vehicle.

## About This Manual

This manual is valid only for the serial numbers listed on the front cover. If the ending serial number is blank, then this manual was for current production vehicles when printed. If you did not receive this manual with the vehicle, you should confirm this manual is valid for your serial number at the Taylor-Dunn web site. A place to record your vehicle information is provided on the inside front cover

This manual is subject to change without notice. Updates are available through your dealer or the Taylor-Dunn web site at www.taylor-dunn.com.

Taylor-Dunn is not to be held liable for errors in this manual or any consequential damage that results from the use of this manual.

The purchase of this vehicle shows a belief in high quality products manufactured in the USA.

Taylor-Dunn, a leading manufacturer of electric burden and personnel carriers since 1949, wants to be sure this vehicle provides years of reliable service. Please continue to read this manual and enjoy this high quality Taylor-Dunn vehicle.

This manual is to serve as a guide for the operation and maintenance of your Taylor-Dunn vehicle. Taylor-Dunn has made every effort to include as much information as possible about the operation and maintenance of this vehicle.

This manual contains information about the standard equipment and options available for this model. This vehicle may not be equipped with all available options. If you do not know which information applies to your vehicle, then you should contact your dealer.

Included in this manual are:

- Vehicle Description
- Safety Rules and Guidelines
- Operational Information
- Operator Responsibilities
- Owner Responsibilities
- Control Operation and Location Information
- Maintenance Information

Before operating or performing maintenance on this or any other Taylor-Dunn vehicle, read the appropriate Taylor-Dunn manual.

Please, be aware of all cautions, warnings, instructions, and notes contained in this manual.

**⚠WARNING**

**The only personnel authorized to repair, modify, or adjust any part of this or any Taylor-Dunn vehicle is a factory authorized service technician. Repairs made by unauthorized personnel may result in damage to the vehicle's systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicle's warranty.**

# GLOSSARY OF TERMS

There are a number of words and phrases used in this document that may have a different, special, or specific definition when use in the context of this document.

| | |
|---|---|
| Approved Operator Position<br>Sit down vehicle | The operator shall be seated in the operator seat with back up against the operator seat back cushion. Additional back support may be added as needed. The back support shall be fastened to the operator seat back cushion to prevent it from falling off the vehicle or onto the seat cushion. The operator's left foot shall be on the floorboard. The right foot should be positioned for easy access to the brake or throttle pedals. Both hands should be on the steering wheel while the vehicle is in motion. |
| Approved Operator Position<br>Stand up vehicle | The operator shall be standing on the operator platform with weight about equally distributed between left and right feet. The left foot shall be placed on the left side of the operator platform to properly engage the operator presence switch. Both hands shall be on the steering wheel while the vehicle is in motion. |
| BDI | Battery Discharge Indicator. Same as BSI: |
| BSI | Battery Status Indicator. The gauge on the dash showing the battery charge level. Also can be referred to as BDI. |
| Caution (signal word) | Refer to Signal Words and Their Definitions. |
| Danger (signal word) | Refer to Signal Words and Their Definitions. |
| Deadman brake | This is a brake that is automatically applied when the operator is not present |
| Direction Control Switch | A switch typically located on the dash that is used to select the direction of travel. |
| DBP | Draw Bar Pull (see below). |
| Draw bar pull | The force seen by the trailer hitch at the rear of the vehicle. |
| Electrolyte | The fluid inside of a battery. |
| Fault | A "fault" is something that happens when the motor speed control system detects a problem with the vehicle. Some faults will prevent operation of the vehicle. |
| FLA battery | Flooded Lead Acid Battery. A battery that requires regular maintenance of electrolyte level. |
| FS-1 | Switch inside of the throttle module that starts the vehicle moving. |
| High/Low | High speed, Low speed. |
| HPD | High Pedal Disable: Motor control system is disabled if the throttle is pressed before controller is turned on. |
| LOBB | Lift Out Battery Box, a type of removable battery. |
| Moderate injury | An injury treatable by first aid and/or follow up treatment by a doctor or other professional medical personnel. |
| Notice (signal word) | Refer to Signal Words and Their Definitions. |
| OPS | "Operator Protective Structure": Steel cab or cage around the occupants. |
| ROBB | Roll Out Battery Box a type of removable battery. |

| | |
|---|---|
| Seating position: | When used in the context of occupant seating positions, “seat” is defined as a single seat cushion or a span of 20 inches on a bench seat. |
| Service Brake | The primary braking system used to stop the vehicle. |
| Severe bodily injury | An injury that requires immediate treatment by a doctor or other professional medical personnel. Not first aid. |
| Signal word | A word used to define hazards to operator, passengers, service technician, or personnel in the immediate vicinity of the vehicle. |
| SLA battery | Sealed Lead Acid Battery. A battery that does not require maintenance of electrolyte level. |
| Small children | Children that must be transported in a child seat as defined by federal or state motor vehicle standards. |
| SRO | Static Return to Off. A fault action that disables the vehicle. |
| Start Switch | A switch typically located on the dash that enables the vehicle for operation. This switch may, or may not require a key to operate. |
| Warning (signal word): | Refer to Signal Words and Their Definitions. |

# CONVENTIONS

Symbols and/or words used to define Dangers, Warnings, Cautions, and Notices are found throughout this manual. The "Words" in this context will be referred to as "Signal words." The words defined here as "signal words" may be used elsewhere in the text of this document without being a signal word. When used as a signal word, the signal word will be enclosed in a solid rectangle with white background (example below).

## Signal Words and Their Definitions:

DANGER: This signal word will be accompanied by the safety alert symbol (see below). "DANGER" will indicate a hazard that, if not avoided, WILL result in death or serious bodily injury to yourself, the operator or passengers of the vehicle, or people in the immediate area of the vehicle.

WARNING: This signal word will be accompanied by the safety alert symbol (see below). "WARNING" will indicate a hazard that, if not avoided, may result in death or serious bodily injury to yourself, the operator or passengers of the vehicle, or people in the immediate area of the vehicle.

CAUTION: This signal word will be accompanied by the safety alert symbol (see below). "CAUTION" will indicate a hazard that, if not avoided, may result in minor or moderate injury to yourself, the operator or passengers of the vehicle, or people in the immediate area of the vehicle.

NOTICE: This signal word will not be accompanied by the safety alert symbol. "NOTICE" will indicate a condition that if not avoided may result in property damage. "Property" is defined and the vehicle, components in the vehicle and/or the surrounding area such as buildings, other vehicles, etc.

## Safety Alert Message

Important information notifying you of any conditions that may result in hazards to yourself, persons nearby, and/or hazards to the vehicle will be presented in a text box with a black border and may include a signal word (see above). To the right is an example of a safety message.

**⚠WARNING**

**This is an example of a safety alert message. This message will contain information about a hazard and/or instructions on avoiding a hazard. The actual size, location, and signal word used for the message box may vary.**

The safety message may include additional warning icons representing the type of hazard. Below is a list of these icons and what they represent. These icons may also be included on the various warning and information decals applied to the vehicle.


Safety alert symbol (see above).


High voltage hazard.


Explosion hazard.


Corrosive chemical hazard.


Fire hazard.


Poisonous chemical hazard.

Decals applied to the vehicle may have other icons representing their function. The icons and their definitions are listed below:


Read the operators manual.


Read the maintenance manual.


Keep arms and legs inside the vehicle.


Parking brake ON.


Parking brake OFF.


Do not get wet.


Do not spray wash.

# RESPONSIBILITIES

## Of the Owner...

The owner of this or any Taylor-Dunn vehicle is responsible for the overall maintenance and repairs of the vehicle, as well as the training of operators.

The owner is responsible for operator training. Refer to Driver Training section for details.

The owner shall provide a copy of this manual if rented or loaned to another party and instruct the other party to read and understand the contents of this manual.

The owner shall provide a copy of this manual when and if the vehicle is transferred to another party.

## Of the Operator...

All operators should complete an operator training course provided by the owner of the vehicle.

The operator is responsible for the proper use of the vehicle on authorized roads, highways, and approved installations only.

The operator is responsible to confirm that all passengers are properly seated and properly using the available restraints.

The operator is responsible for the safe operation of the vehicle, preoperational and operational checks on the vehicle, and the reporting of any problems to service and repair personnel.

## Of the Service Personnel...

The service personnel are responsible for the service and maintenance of the vehicle. At no time should a service person allow any untrained personnel to service or repair this or any Taylor-Dunn vehicle. For the purposes of training, a qualified service person may oversee the repairs or services being made to a vehicle by an individual in training. At no time should an untrained individual be allowed to service or repair a vehicle without supervision. This manual is not a training guide.

**⚠ WARNING**

**The only personnel authorized to repair, modify, or adjust any part of this or any Taylor-Dunn vehicle is a factory authorized service technician. Repairs made by unauthorized personnel may result in damage to the vehicle's systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicle's warranty.**

Personnel performing service and repair should have knowledge of:

- Basic standard automotive repair procedures
- Basic DC and AC electrical theory
- Series wound DC motor speed control operation
- Use of digital and analog multi-meters
- Lead acid batteries

Personnel performing maintenance should have basic knowledge of standard automotive maintenance procedures and lead acid batteries.

# *VEHICLE MODIFICATIONS*

Taylor-Dunn vehicles are designed and manufactured in accordance with ANSI/ITSDF and OSHA regulations. Per ANSI/ITSDF and OHSA, modifications to the vehicle must be approved by the manufacturer. Listed below are the specific regulations:

## ANSI/ITSDF B56.8-2006 Personnel and Burden Carriers

Paragraph 8.2q:

Modifications and additions which affect capacity and safe machine operation shall not be performed by the customer or user without manufacture's prior written authorization; where authorized modifications have been made, the user shall ensure that capacity, operation, warning, and maintenance instructions plates, tags, or decals are changed accordingly.

Paragraph 8.2r:

Care shall be taken to ensure that all replacement parts are interchangeable with the original parts and of a quality at least equal to that provided in the original equipment.

## ANSI/ITSDF B56.9 – 2012 Safety Standard for Operator Controlled Industrial Tow Tractors

Paragraph 6.2.14:

Modifications and additions which affect capacity and safe tow tractor operation shall not be performed without manufacture's prior written approval. Capacity, operation, and maintenance instructions plates, tags, or decals are changed accordingly.

## Code of Federal Regulations (CFR) Title 29, Subtitle B, Chapter Xvii OSHA, Part 1910.178 Powered Industrial Trucks (2011)

1910.178(a)(4)

Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without manufacturers prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

1910.178(q)(6)

Industrial trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts, except as provided in paragraph (q)(12) of this section. Additional counterweighting of fork trucks shall not be done unless approved by the truck manufacturer.

# REPLACEMENT PARTS

## ⚠WARNING

**To maintain peak performance, always use original Taylor-Dunn replacement parts intended for use on your vehicle. Taylor-Dunn components are designed and tested for use on specific Taylor-Dunn model vehicles. Only use the correct Taylor-Dunn replacement components for your Taylor-Dunn vehicle.**

**Do not modify your vehicle:**

**Modifications to this vehicle may have an undesirable effect on the operation of the vehicle, result in additional frame stress, or stress other components resulting in premature failure or an unsafe condition and may lead to an accident resulting in serious injury or death.**

## Using Non-OEM Replacement Components

To maintain peak performance, always use original Taylor-Dunn replacement parts intended for use on your vehicle.

Taylor-Dunn components are designed and tested for use on specific Taylor-Dunn model vehicles. Only use the correct Taylor-Dunn replacement components for your Taylor-Dunn vehicle.

## Electrical Components

Electrical components not tested by Taylor-Dunn (or intended for use on other Taylor-Dunn vehicles) may have unanticipated interaction and/or interference with the vehicle's control system resulting in unsafe vehicle operation or damage to the electrical system.

## Mechanical Components

Mechanical components not tested by Taylor-Dunn (or from other model Taylor-Dunn vehicles) may have an undesirable affect on the operation of the vehicle, result in additional frame stress, or stress other components resulting in premature failure or an unsafe condition.

Due to the unknown properties of non-Taylor-Dunn tested components or from components not originally equipped on the vehicle, we cannot approve their use in a Taylor-Dunn vehicle.

# About Your Vehicle

The purchase of your Taylor-Dunn vehicle shows a belief in high quality products manufactured in the USA. Your new vehicle operates entirely on electric battery power. It is an emissions free vehicle.

Taylor-Dunn, a leading manufacturer of electric burden and personnel carriers since 1949, wants to be sure this vehicle provides years of reliable service. Please continue to read this manual and enjoy this high quality Taylor-Dunn vehicle.

Each base model is available in numerous configurations depending on what options were requested when the vehicle was ordered.

## ⚠WARNING

**This vehicle does not provide protection from lightning, flying objects, or other storm related hazards. If caught in a storm, immediately seek shelter in accordance with local safety guidelines for your area. Not seeking shelter may result in severe personal injury.**

## Licensing Requirements

This vehicle **IS NOT** approved for licensed operation on public roads and highways.

## Vehicle compliance

This model conforms to one or more of the following:

- American National Standards Institute Controlled Personnel and Burden Carriers ANSI B56.8.
- American National Standards Institute Controlled Industrial Tow Tractors ANSI B56.9.
- O.S.H.A. Standard Section 1910.178, Powered Industrial Trucks Type G
- O.S.H.A. Standard Section 1910.178, Powered Industrial Trucks Type D
- O.S.H.A. Standard Section 1910.178, Powered Industrial Trucks Type LP

The vehicle identification tag lists the specific compliance designation. Operate this vehicle only in environments consistent with the compliance designation. Operation in other more hazardous environments can cause injury or death. Vehicles complying with more stringent designations are labeled as to the designation. Type EE compliance vehicles will have the EE label applied.

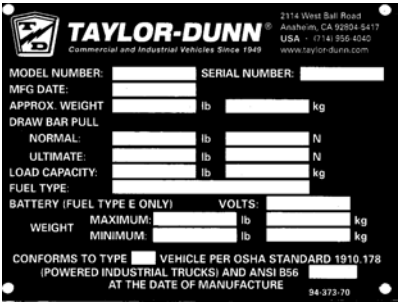

## Electric tow trucks:

This vehicle is designed for operation on hard smooth road surfaces such as around warehouses or paved lots and may be operated on other hard surfaces such as smooth packed dirt or light gravel. Operating this vehicle on rough surfaces will result in premature failure of axles, wheel bearings and/or the vehicle frame.

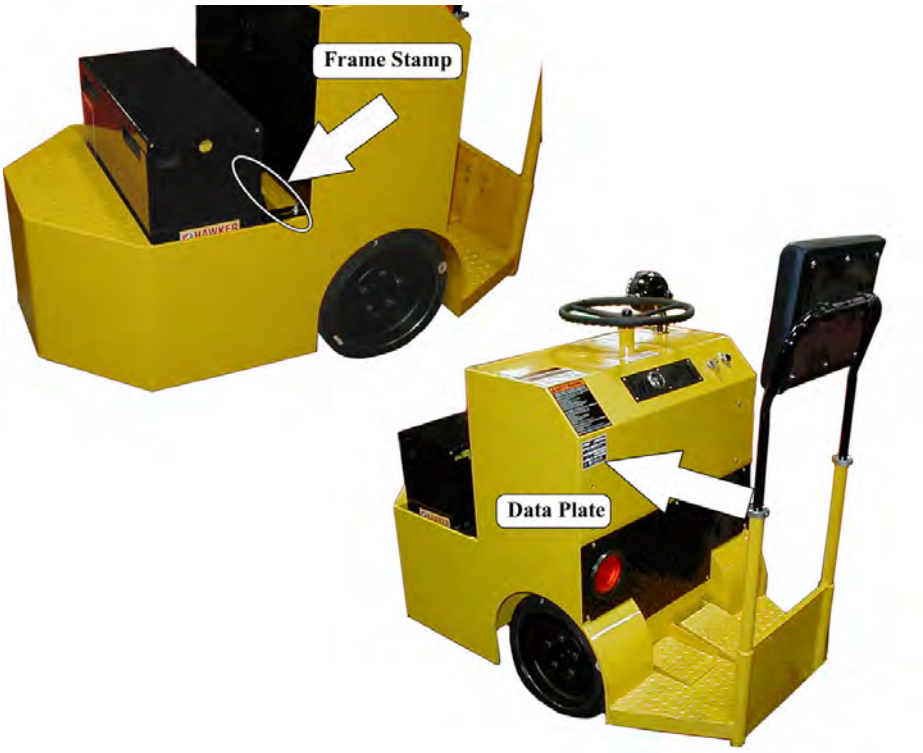
# HOW TO IDENTIFY YOUR VEHICLE

## Data Plate

To identify the model series of your vehicle, refer to the vehicle data plate.




## Where to Find Data Plate and Serial Number



# Taking Delivery of Your Vehicle

Inspect the vehicle immediately after delivery. Use the following guidelines to help identify any obvious problems:

- Examine the contents of all packages and accessories that may have come in separate packages along with the vehicle.
- Make sure everything listed on the packing slip is there.
- Check that all wire connections, battery cables, and other electrical connections are secure.
- Check battery cells to be sure they are filled.
- Check the tire pressure and tightness of the lug nuts
- Check for any signs of damage.

## NOTICE

**New front wheel bearing adjustment must be inspected after the first 24 hours of operation. This includes new vehicle installations. Failure to inspect the bearings after the break in period may result in premature failure of the bearings.**

### Check the operation of each of the following controls:

- Accelerator/Brake treadle
- Parking Brake (deadman)
- Key Switch
- Direction Control Switch
- Reverse Warning Alarm (if equipped)
- All lights
- Steering Wheel
- Horn

## *WHAT TO DO IF A PROBLEM IS FOUND*

If there is a problem or damage as a result of shipping, note the damage or problem on the bill of lading and file a claim with the freight carrier. The claim must be filed within 48 hours of receiving the vehicle and its accessories. Also, notify your dealer of the claim.

If there is any problem with the operation of the vehicle, DO NOT OPERATE THE VEHICLE. Immediately contact your dealer and report the problem. The report must be made within 24 hours of receiving the vehicle and its accessories.

The only personnel authorized to repair, modify, or adjust any part of this or any Taylor-Dunn vehicle is a factory authorized service technician.

## ⚠WARNING

**The only personnel authorized to repair, modify, or adjust any part of this or any Taylor-Dunn vehicle is a factory authorized service technician. Repairs made by unauthorized personnel may result in damage to the vehicle's systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicle's warranty.**

# Operator Training

Per the following regulations, the owner of this vehicle shall conduct an Operator Training program for all those who will be operating this vehicle:

- ANSI/ITSDF 56.8-2006 Personnel and Burden Carriers: Part II, Paragraph 6.2a.
- ANSI/ITSDF 56.9 – 2007 Safety Standard for Operator Controlled Industrial Tow Tractors: Part II, paragraph 4.11.
- Code of Federal Regulations (CFR) Title 29, Subtitle B, Chapter Xvii OSHA, Part 1910.178 Powered Industrial Trucks (2011): 1910.178, Section (l).
- Per OSHA Regulation, 29 CFR 1910.178 Powered Industrial Truck Operator Training, the owner must keep a record of conducted training and maintenance performed on the vehicle.

The training program shall not be condensed for those claiming to have previous vehicle operation experience. Successful completion of the Operator Training program shall be required for all personnel who operate this vehicle.

The Operator Training program shall include the following:

- Operation of this vehicle under circumstances normally associated with your particular environment.
- Emphasis on the safety of cargo and personnel.
- All safety rules contained within this manual.
- Proper operation of all vehicle controls.
- A vehicle operation and driving test.

## Driver Qualifications

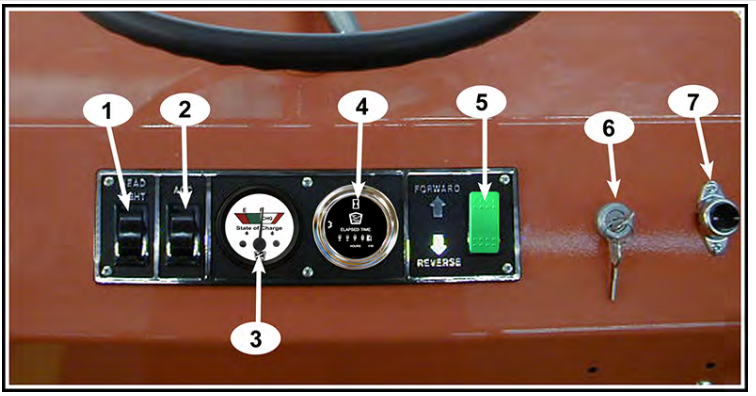
Only those who have successfully completed the Operator Training program are authorized to drive this vehicle. Operators must possess the visual, auditory, physical, and mental ability to safely operate this vehicle as specified in the American National Standards Institute Controlled Personnel and Burden Carriers ANSI B56.8 or American National Standards Institute Controlled Industrial Tow Tractors ANSI B56.9.

The following are minimum requirements necessary to qualify as an operator of this vehicle:

- Demonstrate a working knowledge of each control.
- Understand all safety rules and guidelines as presented in this manual.
- Know how to properly load and unload cargo.
- Know how to properly park this vehicle.
- Recognize an improperly maintained vehicle.
- Demonstrate the ability to handle this vehicle in all conditions.

***www.taylor-dunn.com***

# Vehicle Controls




## 1: Headlight Switch

Push the top of the headlight switch to turn the lights on. Push the bottom of the switch to turn the lights off.

## 2: Accessory Switch

(Optional) This switch will control various accessories that may have been order on your vehicle.

Push the top of the switch to turn the accessory on. Push the bottom of the switch to turn it off.

## 3: Battery Status Indicator

There are two available BSI's depending on how your vehicle was ordered. Detailed description of operation can be found later in this section.

## 4: Hour Meter

Optional. Displays total time vehicle has been in operation. Time is accumulated only while the vehicle is moving with the treadle is pressed.

## 5: Direction Control Switch

This switch determines the direction of travel. The switch has three positions:

- **FORWARD**: Push the top of the switch all the way in to travel forward.
- **REVERSE**: Push the bottom of the switch all the way in to travel reverse.
- **OFF**: There is a center position between forward and reverse, this is the "direction" OFF position. The direction OFF position does **NOT** turn the vehicle control system OFF. Use the Start switch to turn the vehicle control system OFF. Refer to Start Switch in this section for details regarding turning the vehicle control system OFF.

*Note: The OFF position IS NOT neutral and does NOT disconnect the motor from the drive train.*

## 6: Start Switch

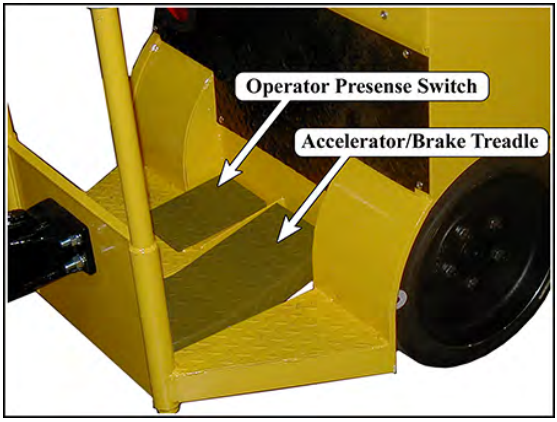
The Start switch turns the vehicle electrical control system ON. This switch may or may not require a key to operate. Rotate the switch clockwise to turn the vehicle system "ON" and counterclockwise to turn the vehicle system "OFF". The vehicle will not run when in the OFF position.

The switch should be in the "OFF" position whenever the operator leaves the approved operator position.

This switch is designed to secure and disable the vehicle. The key can only be removed when the switch is in the "OFF" position.

## 7: Horn Switch

Press the horn switch to sound the horn, release it to turn it off.




## Accelerator/Brake Treadle

### Accelerator:

The accelerator pedal is the treadle located on the right side of the floorboard positioned under the operators right foot. The treadle also functions as the brake pedal. Press the front of the treadle down to increase speed, release the treadle to slow down.

### Brake:

The brake pedal is the treadle located on the right side of the floorboard positioned under the operators right foot. The treadle also functions as the accelerator pedal. Press the rear of the treadle to apply the brake. The brake is automatically released when accelerating.

### Park Brake (deadman)

The parking brake is automatically applied when the accelerator treadle is released (see Accelerator and Brake above). To firmly set the parking brake, push down on the rear of the treadle after the vehicle has come to a complete stop. The brake automatically releases when the front of the treadle is depressed.

### Operator Presence Switch

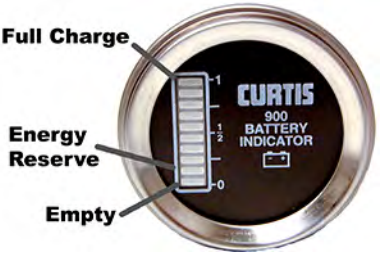
A pedal located under the driver's left foot disables the power to the vehicle when it is released. The pedal must be pressed for the vehicle to operate. Whenever the driver leaves the vehicle, the driver should turn the key-switch off, place the direction control switch in the center "OFF" position, and set the park brake.

### Steering

The steering wheel and steering system are similar to an automobile. To turn right, turn the steering wheel clockwise. To turn left, turn the steering wheel counter-clockwise.

If equipped with tilt steering (not shown), the release lever is located on the lower left of the steering column. Pull the lever up to reposition the steering wheel.

## Battery Status Indicator: Bar Graph




The battery status indicator is located to the left of the hour meter. The battery status indicator has a LED bar graph that indicates the relative state of charge of the battery. The top LED will light only when connected to a fully charged battery or after completing a charging cycle. Successive lower LED's will light as the battery charge diminishes. When the second from the bottom LED flashes the battery energy status is in energy reserve and should be placed on charge as soon as possible. When the two bottom LED's are alternately flashing the batteries are empty and the truck should be taken out of service and charged to avoid damaging the batteries. The BSI will reset to fully charged only after a complete charge cycle is completed. A complete charge cycle is defined as battery voltage exceeding 2.35 volts per cell for a minimum of 6 minutes.

## Battery Status Indicator: Analog


This gauge went into production July, 2015.

This gauge is a limited range voltmeter indicating the current voltage of the batteries.

The red zone to the left is voltage range V1, the green zone is V2, the white is V3 and the red zone to the right is V4. Refer to table below for range voltages.

For a more accurate status, the vehicle should be idle and not used or charged for a minimum of 1 hour.

*Note: While being charged and immediately after a charge cycle is completed, the battery voltage may greatly exceed the fully charged voltage per the gauge.*

| Battery Status @ 80°F (26.67°C) | | |
|---|---|---|
| | Discharged | Fully charged |
| 24 Volt System | 21.18 volts | 25.44 volts |
| 36 Volt System | 32.22 volts | 38.16 volts |

*Note: Battery voltage will vary with the temperature of the battery. Add 0.084 volts per battery for every 10° below 80°F and subtract 0.084 volts per battery for every 0° above 80°F.*

| | System Voltage | |
|---|---|---|
| | 24v | 36v |
| V1 Range | 16-20 | 30-32 |
| V2 Range | 12-24 | 32-36 |
| V3 Range | 24-30 | 36-40 |
| V4 Range | 30-32 | 40-42 |

*Note: Accuracy of the gauge at full scale is ±4% at 77°F (25°C).*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The Best Way To Go About Your Business
TD

# Vehicle Operation

## General Safety Guidelines

**⚠WARNING**

**Your ability to operate a motor vehicle can be seriously impaired with blood alcohol levels far below the legal minimum.**

**If you have been drinking alcohol, don't drive. Ride with a designated non-drinking driver, call a cab, or use public transportation.**

**⚠WARNING**

**The advanced technology built into the vehicle motor control has many systems to monitor the condition and operation of the vehicle to maintain safe operation.**

**Even with advanced technology, it is not possible to change the laws of physics. Improper driving technique for the current conditions could result in loss of vehicle control.**

**⚠WARNING**

**When leaving the approved operating position ALWAYS:**

**1) Firmly set the park brake.**

**2) Place the direction control switch in the center OFF position.**

**3) Turn the start switch OFF and remove the key.**

**Failure to perform these operations may result in unexpected vehicle movement causing severe bodily injury and/or property damage.**

- Only qualified and trained operators with no physical, mental, or sensory disabilities shall operate this vehicle or any of its components..
- No passengers are allowed on this vehicle.
- No occupants other than the operator are allowed on this vehicle.
- Before operating this vehicle, perform all Daily and Pre-operation checks as defined in the Vehicle Maintenance section.
- Confirm proper operation of all vehicle controls before operating the vehicle.
- Wear closed toe low heel shoes when operating the vehicle.
- No reckless driving.
- Do not operate a motor vehicle while under the influence of alcohol or any drug that may impair your ability to drive.
- Keep all body parts (head, arms, legs) inside this vehicle while it is moving.
- The operator shall remain on the operator platform in the approved operator position while the vehicle is in motion.
- Do not exit the vehicle until the vehicle has come to a complete stop.
- Do not transport small children. This vehicle is not designed to accommodate child seats.
- Do not leave children unattended in the vehicle.
- Keep a clear view ahead at all times.
- Keep the vehicle under control at all times.
- Observe all traffic regulations and speed limits.
- The vehicle shall be equipped with head and tail lights if operated at night.
- This vehicle may overturn if turned sharply when driven at high speeds.

- Drive slowly when making a turn, especially if the ground is wet or when driving on an incline.
- Yield right of way to pedestrians, ambulances, fire trucks, or other emergency vehicles.
- Sound your horn when approaching pedestrians. DO NOT assume the pedestrian is aware of your presence; before passing, slow down and allow sufficient clearance between the vehicle and pedestrian.
- Do not overtake another vehicle at intersections, blind spots, narrow isles, or other dangerous locations.
- Stop and sound horn at all intersections regardless if it is posted with a stop sign.
- Do not operate this vehicle in areas at risk to falling objects.
- Do not drive over loose objects, holes, or bumps.
- Do not drive under any object that is less than 90 inches (229 cm) from the ground.
- Do not drive off of curbs or other steep drop-offs more than 2 inches high.
- Stay in your driving lane under normal conditions, maintaining a safe following distance from other vehicles.
- If equipped with doors, the doors must remain closed and latched while vehicle is in motion.
- Driving through water or mud may affect brake performance. ALWAYS test brakes by pressing the rear of the treadle after driving through water or mud.

## ⚠WARNING

**When leaving the approved operating position ALWAYS:**

**1) Firmly set the park brake.**

**2) Place the direction control switch in the center OFF position.**

**3) Turn the start switch OFF and remove the key.**

**Failure to perform these operations may result in unexpected vehicle movement causing severe bodily injury and/or property damage.**

## Collisions or Accidents

A collision or accident may damage the electrical circuits or batteries resulting in a fire hazard or chemical spill. In the event of a collision or accident, immediately turn the Start switch OFF, set the park brake, then exit the vehicle.

Call emergency personnel if there is any indication of smoke, burning smell, electrical arcing, or leaking fluid.

## Tip Over

In the event of a tip over, quickly move away from the vehicle while avoiding the steering tower and seat back.

## Starting

Before operating this vehicle: Refer to General Safety Guidelines at the beginning of this chapter.

*Note: This vehicle is equipped with an operator presence switch which disables the vehicle when the driver is not present.*

**⚠WARNING**

**NO PASSENGERS are to be transported on this vehicle. Operator ONLY in the approved operator position.**

**⚠WARNING**

**The operator presence switch is part of the vehicle safety system. DO NOT rely on the switch as the only method to prevent vehicle movement. ALWAYS turn the start switch OFF, place the direction control switch in the center OFF position, and set the park brake when leaving the approved operator position.**

**DO NOT bypass, modify, or disable the operator presence switch. Doing so could result in unexpected movement of the vehicle causing severe bodily injury and/or property damage.**

**DO NOT place or store any object on the operator platform. Any object placed on the operator platform may turn on the operator presence switch resulting in unexpected vehicle movement causing severe bodily injury and/or property damage.**

1. Stand in the approved operator position and press the rear of the treadle firmly applying the brake.
2. Place the Direction Control switch in the center OFF position.
3. Place the Start switch on the ON position and wait 1 second.
4. Select a direction of travel.
5. Slowly press the treadle to accelerate to the desired speed.

*Note: In an emergency, the Start switch may be turned OFF to disable the motor speed control. Refer to additional information regarding optional automatic parking brake in the Driving section.*

Refer to the Driving section for additional information in the operation of your vehicle.

**⚠WARNING**

**DO NOT exceed the maximum rated speed for your vehicle, locally imposed speed limits, or the safe operating speed for conditions. Exceeding any of these speed limits will increase the likelihood of an accident causing personal injury. In addition, exceeding the maximum rated speed for your vehicle may result in damage to the vehicle drive train and/or control system.**

## Driving

Before operating this vehicle:

- Perform all daily and pre-operation checks as defined in the Vehicle Maintenance section.
- Refer to General Safety Guidelines at the beginning of this section.

**⚠WARNING**

**DO NOT exceed the maximum rated speed for your vehicle, locally imposed speed limits, or the safe operating speed for conditions. Exceeding any of these speed limits will increase the likelihood of an accident causing personal injury. In addition, exceeding the maximum rated speed for your vehicle may result in damage to the vehicle drive train and/or control system.**

## Selecting Direction of Travel

The direction of travel is selected with the Direction Control switch. The direction of travel must be selected before pressing the treadle. If the treadle is pressed then a HPD fault will occur. Release the treadle to reset the fault.

Your vehicle may be equipped with a reverse or motion alarm.

- The motion alarm will sound in forward *and* reverse.
- The reverse alarm will only sound when the reverse direction is selected.

*Note: The alarm will only sound while the treadle is pressed.*

## Changing Direction of Travel

The direction selected by the Direction Control switch can be changed at any time but you may have to release the treadle to reverse direction.

If the vehicle is in motion when the direction is changed, the motor control system will reverse the current flow in the motor slowing the vehicle to a stop and then continue in the new direction selected.

The treadle must be released after selecting a new direction. If the treadle is not released, then a HPD fault will occur. Release the treadle to reset the fault.

## Driving in Forward

1. Turn the start switch ON, then select FORWARD using the Direction Control switch.
2. Slowly press the treadle to accelerate to the desired speed.

*Note: This vehicle is equipped with a operator presence switch. The motor control system will be disabled unless the driver is in the approved operator position*

## Driving in Reverse

1. Check and confirm that there are no obstacles behind the vehicle before backing up.
2. Turn the start switch ON, then select REVERSE using the Direction Control switch.
3. Slowly press the treadle to accelerate to the desired speed.

## Emergency Power Cut Switch

Optional. This vehicle may be equipped with an optional Emergency Power Cut Switch. The switch is a large red mushroom shaped knob that will be within reach of the driver. The actual mounting location may vary depending on the vehicle configuration.

The Emergency Stop Switch should be used if the vehicle starts to operate in an unexpected manner or if there is an odor or sound that may indicate an overloaded electrical circuit. If any of the above occurs, immediately and safely pull to the side of the road and stop. Then push on the switch knob and exit the vehicle. Do not reengage the switch until the vehicle has been inspected by a qualified technician.

The Emergency Stop Switch should only be activated if the vehicle must be immediately stopped. Do not use the switch when only parking the vehicle.

# ⚠WARNING

**Brakes contaminated with water or mud may not work properly until dried out.**

**ALWAYS test brake operation immediately after driving through puddles or mud. Failure to test brake operation may result in the inability to stop in an emergency causing in severe personal injury and/or property damage.**

## Stopping

Releasing the treadle will apply a light to moderate braking force. Press on the rear of the treadle if additional braking force is required. The amount of force required to stop the vehicle will vary depending on the environment and load on the vehicle.

## Parking

1. Bring the vehicle to a stop at an authorized parking space.
2. Place the Direction Control switch in the center OFF position.
3. Turn the start switch OFF.
4. Firmly set the parking brake.
5. Remove the key from the Start switch. The driver should keep the key in his/her possession.

*Note: Block the wheels if parking this vehicle on an incline.*

## Loading Cargo

**⚠WARNING**

**DO NOT transport or load cargo on the operator platform. Cargo placed on the operator platform area may interfere with the driver causing loss of control of the vehicle and result in a collision or accident with severe injury.**

**⚠WARNING**

**The standard configuration for this vehicle is not designed or intended to carry cargo. DO NOT carry cargo on this vehicle unless equipped with an optional Taylor-Dunn approved cargo storage area.**

**Transporting cargo on, or in an unapproved cargo storage area may result in cargo falling from the vehicle, damage to the vehicle, and/or loss of control of the vehicle causing severe bodily injury and/or property damage.**

**⚠WARNING**

**NO PASSENGERS are to be transported on this vehicle. Operator ONLY in the approved operator position.**

- This vehicle is a tow tractor and its standard configuration is not designed or intended to carry cargo. DO NOT carry cargo on this vehicle unless it is equipped with Taylor-Dunn approved cargo storage areas.
- Before loading or unloading cargo:
  1. Place the Direction Control switch in the center OFF position.
  2. Turn the start switch OFF
  3. Set the park brake.
- Do not transport cargo that is wider than the vehicle.
- Do not load cargo in the passenger compartments.
- Use only Taylor-Dunn approved cargo accessories.
- Do not exceed the load capacity of the vehicle.
- Cargo shall only be transported in the designated cargo area of the vehicle and evenly distributed with the center of gravity close to the center of the designated cargo area.
- All cargo shall be secured to prevent falling from the vehicle, falling into a operator or passenger compartment, or shifting position while the vehicle is in motion.
- Cargo consisting of fluid in tanks shall have fluid baffles in the tank to help reduce sloshing and shifting load weight.

# TOWING

## ⚠WARNING

**Use caution when towing trailers wider than the tow tractor allowing for additional isle clearance and corner cutting of the trailers.**

**Not allowing for additional clearance may result in collision with severe bodily injury and/or property damage.**

## Towing a Trailer

*Note: Towing up or down grades will significantly reduce the capacity of the vehicle.*

When towing trailers:

- Do not exceed the DBP towing capacity of the vehicle. See Specifications and DBP definition.
- Only use Taylor-Dunn approved trailer hitches.
- Do not exceed the capacity of the trailer hitch installed on the vehicle.
- Do not exceed the load capacity of the trailer. Refer to documentation supplied with your trailer for information regarding load capacity of the trailer.
- Make sure all loads are securely tied down. Refer to documentation supplied with your trailer for information regarding attaching loads to the trailer.
- Cargo consisting of fluid in tanks shall have fluid baffles in the tank to help reduce shifting load weight.
- Do not back up when towing more than one trailer.
- Drive slowly when towing loads with a high center of gravity.
- When turning, be sure to allow for “corner cutting” of the trailer.
- Allow for longer stopping distances when towing heavy loads.
- Allow for longer stopping distances when driving down a grade.
- Block the trailer wheels before disconnecting from the vehicle.
- Do not disconnect a trailer while parked on a grade.

## Draw Bar Pull (DBP), Definition

DBP is a measure of pulling force required to move a load. The load may be a trailing load or a pushed load. It is normally expressed in pounds or Newtons.

The DBP of a tow tractor is the horizontal force exerted on a load at its coupler while towing or pushing a load. To measure the DBP, a scale would be connected in line with the tractor coupler and the load. The scale will directly read the DBP as the tractor tows the load.

Tow tractor DBP specifications, definition:

- Normal DBP: Highest DBP that can be sustained for a given duty cycle.
- Ultimate DBP: Also referred to a Maximum DBP. Highest DBP achieved while traveling at a minimum speed of approximately 0.5 mph (0.8 kph) for a minimum of 30 seconds. This specification is used in calculations for getting a load moving.

Notes:
Tow tractor DBP specifications are based on:

- Road surface consisting of level dry clean asphalt, brushed concrete or equivalent.
- Maximum battery weight installed per tow tractor battery specification.

Towing a load up any grade will significantly increase the DBP required.

Most paved roads and parking lots have a drainage grade to allow water to run off. When operating a tow tractor at or near its maximum capacity, this drainage grade will significantly affect DBP required to pull the load and may result in exceeding the tractor specifications.

## Towing the Vehicle

*Note: If at all possible, this vehicle should be placed on a carrier, rather than towing.*

**⚠WARNING**

**ALWAYS use another driver to steer this vehicle while it is being towed.**

**DO NOT block or otherwise tie the treadle down to release the brake. Blocking the treadle down may result in uncontrolled movement of the vehicle causing severe bodily injury and/or property damage.**

**⚠WARNING**

**DO NOT tow a vehicle with a tow strap if the vehicle brakes are not working properly. Using a strap to tow a vehicle with no brakes may result in loss of control of both vehicles causing severe bodily injury and/or property damage.**

**⚠WARNING**

**DO NOT tow the vehicle faster than 5 mph (8 kph) or its maximum designed speed, whichever is lower.**

**Towing the vehicle faster than 5 mph may result in one or more of the following:**

- **Loss of control of both vehicles causing severe bodily injury and/or property damage.**
- **Damage to the towed vehicle drive train components and/or motor.**

**⚠WARNING**

**Use extreme caution if towing a vehicle backwards and it is recommended ONLY to tow a short distance until able to connect to the front tow bar and tow forwards.**

**If towed backwards, the towed vehicle may swing wide turning turns resulting in loss of control of both vehicles causing severe bodily injury and/or property damage**

1. Attach a tow strap to the front bumper tow-bar.
2. Turn the start switch off and place the direction control switch in the center off position.
3. Use another driver to steer this vehicle while it is being towed.
4. Press the front of the treadle while being towed and use the rear of the treadle to brake when the towing vehicle slows or stops.
   - Do not tow the vehicle faster than 5 m.p.h. or its maximum designed speed, whichever is lower.

# Charging Your Vehicle

## *GENERIC SAFETY GUIDELINES*

### ⚠DANGER

**The charger must be connected to a properly grounded AC receptacle. Improper connection will increase the risk of electric shock and can cause severe personal injury or death.**

### ⚠WARNING

- **Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge a battery in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.**
- **DO NOT disassemble the charger. There are no user serviceable components in the charger. Refer all repairs to a qualified technician. Incorrect repair or reassembly of the charger can result in an explosion, electric shock, or fire.**
- **Use of extension cords is not recommended. Improper use of an extension cord may result in fire.**
- **Do not attempt to operate the vehicle while charging the battery. Operating the charger and vehicle at the same time may lead to damage to the charger and/or the vehicle resulting in personal injury and/or property damage.**
- **Do not charge any battery that is, or is suspected to be frozen. Charging a frozen battery may result in explosive rupturing of the case due to a build up of internal pressure. This may causing severe bodily injury and will cause property damage.**
- **The charger should not be used by children or any personnel with mental or sensory disabilities. Incorrect usage due to inability to understand operation may cause severe personal injury and/or property damage.**

### NOTICE

**The Start switch must be in the "OFF" position when charging the batteries. Failure to turn the Start switch "OFF" may result in damage to the vehicle's electrical system.**

### NOTICE

**Check battery electrolyte before charging. Do not charge batteries with low electrolyte level. Charging with low electrolyte level will result in premature failure of the battery.**

**NOTICE**

**The charger originally supplied with the vehicle is for use with the batteries originally supplied with the vehicle. If installing a different charger or batteries, consult the charger and/or battery manufacturer to confirm that the charger used is compatible with the batteries. Use of an incorrect charger will result in damage and premature failure of the batteries.**

## Charging Time

**NOTICE**

**Charging batteries emit hydrogen. Hydrogen is known to cause false alarms in carbon monoxide detectors.**

Average charging time is typically 8 to 10 hours. The time required to fully charge your batteries will vary depending on:

- Capacity of the batteries: Higher capacity battery requires longer charge time.
- Output of the charger: Higher charger output requires less charge time.
- Depth of discharge: The deeper a battery is discharged, the longer it takes to charge.
- Temperature: Low temperatures require longer charge time.

It is not unusual for charge times to exceed 15-hours, especially with new batteries.

## To Obtain the Maximum Battery Life

Charge the battery only after it reaches a normal discharge (20%) as indicated on the Battery Status Indicator (BSI). Failure to follow this guideline could result in the battery entering an overcharge state, which will reduce the life of the battery. If you find it necessary to charge the battery before it is completely discharged, we recommend waiting until it is discharged a minimum of 30% to reduce the possibility of overcharging. Refer to Vehicle Controls in this section for information on how to read the BSI.

Do not discharge the battery beyond a normal discharge as indicated on the BSI. Discharging your battery too deep will result in premature failure of the battery. Refer to Vehicle Controls in this section for information on how to read the BSI.

Check the battery electrolyte level once a week. Do not charge the battery if the battery electrolyte is low. Charging when the electrolyte is low will damage the batteries and shorten the life-span of the battery. Only authorized personnel should perform battery maintenance including maintaining the battery electrolyte level. Refer to the Battery Maintenance Section for battery maintenance information.

It is not recommended to interrupt the charging cycle. Allow the charger to turn off before disconnecting the AC plug. Interrupting the charging cycle could lead to overcharging or discharging the batteries too deep. Both circumstances will result in premature failure of the battery.

## New Battery Break In

New batteries require a break in period of up to 40-cycles. The batteries will not have their full capacity during this break in period and may result in longer charging times.

## AC Power Source

**⚠WARNING**

**Use of extension cords is not recommended. Improper use of an extension cord may result in fire.**

The AC power source required by the charger will vary depending on the charger installed in the vehicle. Refer to the specifications printed on the charger for details.

Use of extension cords is not recommended. If you find it necessary to use an extension cord, make sure the extension cord power rating exceeds the power requirements of the charger.

The United States Federal, State or local regulations may require the use of a Ground Fault Interrupter (GFI) cable or AC outlet equipped with a GFI for charging your vehicle. A charger cord with an integral GFI is available through your Taylor-Dunn dealer.

# Storing and Returning to Service

Both storing your vehicle and returning it to service should only be performed by authorized personnel.

## Storing Your Vehicle

- Clean the batteries, then fill and charge before putting the vehicle in storage. Do not store batteries in a discharged condition.
- Lube all grease fittings.
- Clean, dry, and check all exposed electrical connections.
- Inflate the tires to proper pressure (if applicable).
- For extended storage, the vehicle should be elevated so that the tires are not touching the ground.

**NOTICE**

**Storing batteries that are discharged or allowing stored batteries to discharge while in storage causes sulphation of the battery plates. This will result in reduced capacity and premature failure of the batteries.**

If stored for a prolonged period, the batteries should be charged as follows:

| Storage Temperature (F) | Charging Interval (months) |
|---|---|
| Over 60 | 1 |
| Between 40 and 60 | 2 |
| Below 40 | 6 |

## Returning to Service

- Check the battery state of charge and charge if required.
- Perform all applicable maintenance checks in the Maintenance Schedule.
- Remove any blocks from the vehicle and/or place the vehicle down on to the ground.
- Test drive before putting into normal service.

# Vehicle Maintenance

## Daily Inspection

The following items should be inspected once every day before the vehicle is put into service:

- External frame damage (body).
- Operation of all lights, warning alarms.
- Inspect for leaking fluids or grease.
- Tire tread or sidewall damage.
- Smooth and proper operation of all controls such as but not limited to:
  - Throttle/brake treadle
  - Steering
  - Horn
  - Parking brake
  - Etc.
- Proper operation of all locking devices such as but not limited to:
  - Removable battery trays
  - Etc.
- Proper operation of all interlocking switches such as but not limited to:
  - Start switch
  - Operator presence switch
  - Etc.

## Pre-Operation Inspection

The following items should be inspected every time before the vehicle is driven:

- Rear and side view mirror adjustments.
- Steering operation.
- Brake operation (service and park brake).
- Trailer hitch operation, latch, and wear.

# *INTERLOCK SWITCH INSPECTION*

The interlock switches should disable vehicle operation when activated. Perform the following to confirm proper operation. If any one test fails, then immediately remove the vehicle from service and refer repair to a qualified technician.

## ⚠WARNING

**These procedures may result in unexpected vehicle movement.**

- **All procedures shall be performed in an area that allows for possible movement of the vehicle and room to safely stop the vehicle if it moves.**
- **DO NOT allow any personnel to stand in front or behind the vehicle while performing these procedures.**

**Failure to follow the above instructions may result in severe personal injury and/or property damage.**

**DO NOT bypass, modify, or disable any interlock switch. Doing so could result in unexpected movement of the vehicle causing severe bodily injury and/or property damage.**

If equipped with a battery disconnect switch, make sure it is in the run position before performing procedures.

### Start Switch

Stand in the approved operator position, turn the start switch OFF and select a direction, then slowly press the treadle.

- The vehicle should not operate.

Release the treadle and place the direction control switch in the center OFF position.

Turn the start switch ON, select a direction and slowly press the treadle.

- The vehicle should operate normally.

### High Pedal Disable (HPD)

Stand in the approved operator position, turn the start switch ON.

Press and hold the treadle full forward.

Select a direction:

- The vehicle should not move

Release the treadle and press again.

- The vehicle should operate normally.

### Operator Presence Switch

Stand in the approved operator position, turn the start switch ON, select a direction, and slowly press the treadle forward.

- The vehicle should operate normally.

Release the treadle, lift your foot up off the left side floorboard and again slowly press the treadle.

- The vehicle should not operate.

## Maintenance Schedule

Most of these items should only be performed by a qualified technician. Details regarding the service procedures can be found in the vehicle service manual.

Problems found during an inspection should be repaired before the vehicle is put back into service.

### Every Week

- All daily items plus the following:
  - Battery electrolyte level (all cells).
  - Check all tires tread for debris.
  - Check rear tire pressure.
  - Check all interlocks.
  - Operation of throttle/brake treadle.
  - Operation of lights and horn.
  - Operation of steering.
  - Operation of operator presence switch.
  - Check for fluid leaks.

### First 20 hours

- Re-torque the wheel nuts.

### Every Month or 100 hours

- All weekly items plus the following:
  - Check all safety warning labels.
  - Clean battery terminals.
  - Inspect front wheel bearings.
  - Inspect fork collar bearings.
  - Inspect steering chain tension.
  - Inspect hitch.

### Every 3 Months or 300 hours

- All monthly items plus the following Inspect and adjust brake.
  - Clean battery compartment.
  - Inspect all hardware for tightness (first 300 hours then every 1,200 hours).
  - Lubricate the vehicle per lubrication schedule.
  - Re-torque wheel nuts.
  - Tighten all electrical connections.
  - Clean drive motor exterior.

### Every 6 Months or 600 hours

- All monthly items plus the following:
  - Inspect all electrical connections of signs of overheating.
  - Inspect all wiring for cracks, fraying, or wear.
  - Inspect steering column and bell crank bearings.
  - Inspect frame for damage.
  - Test battery.
  - Inspect brake band and drum.

### Every Year or 1,200 hours)

- All 6 month items plus the following:
  - Clean and repack front wheel bearings.
  - Inspect and tighten all hardware.
  - Inspect motor brushes and blow out carbon.
  - Rotate rear tires.
  - Inspect rear wheel bearings.

### Every 2 Years or 2,000 hours

- All yearly items plus the following:
  - Flush and replace the transaxle oil.

### Maintenance Guidelines for Severe Duty Applications

The above maintenance schedule is based on the average typical application. If the vehicle is operated under “severe conditions”, service procedures should be conducted more frequently than specified. The frequency of service under severe conditions is determined by the use of the vehicle. The owner/operator must evaluate the operating environment to determine the increase in maintenance frequency.

In addition, the entire vehicle should be inspected monthly for signs of damage.

The following list is meant as a guide and is not all-inclusive of a “severe duty” application.

- Operation in excess of 100 hours per month.
- Extreme temperature.
- Bumpy, dusty, or ill maintained roads.
- Excessively wet areas.
- Corrosive or contaminated areas.
- Frequent loading of the vehicle at/near capacity.

# BATTERY MAINTENANCE

## ⚠WARNING

**High Voltage is present in the battery compartment. DO NOT touch the battery terminals during servicing of the battery as this may result in severe electric shock and/or death.**

## ⚠DANGER

- **Battery electrolyte is poisonous and corrosive. It contains sulfuric acid. Avoid contact with skin, eyes, or clothing. Wear rubber gloves and face safety shield while servicing batteries. DO NOT INGEST! This will result in severe bodily injury.**
- **Wear a full face shield when working on or around batteries. A full face shield will help protect your eyes from battery electrolyte. If battery electrolyte gets in your eyes, immediately flush your eyes with large amounts of water and seek medical attention.**
- **Wear heavy duty long rubber gloves when working on or around batteries. If battery electrolyte gets on your skin, immediately flush with large amounts of water to prevent chemical burns.**
- **Explosive mixtures of Hydrogen gas are present within battery cells at all times. Do not work with or charge batteries in an area where open flames (including gas furnace or water heater pilots), sparks, cigarettes, or any other sources of combustion are present. Always provide ample ventilation in rooms where batteries are being charged. Failure to do so may result in severe bodily injury and/or property damage.**
- **Lead is poisonous. Batteries and battery terminals contain lead and lead components. Avoid touching the battery terminals and always thoroughly wash hands after servicing the batteries.**
- **A battery is a live electrical source. It cannot be disconnected or neutralized. Do not drop any tool or conductive object onto the battery. A conductive object that comes in contact with the battery terminals will initiate a short circuit of the battery. This could cause the battery to explode resulting in severe bodily injury and/or property damage.**

## NOTICE

- **Battery electrolyte will stain and corrode most surfaces. Immediately and thoroughly clean any surface outside of the battery that the battery electrolyte comes in contact with. Failure to clean may result in property damage.**
- **When torquing battery hardware, use a backup wrench on the battery bolt and tighten the nut. Failure to use a backup wrench may damage the battery post.**
- **DO NOT remove the caps on a maintenance free battery. Removing the caps will damage or destroy the battery seals resulting in premature battery failure.**
- **Do not operate or charge a vehicle equipped with moist charged batteries until the batteries have been filled with electrolyte. Operating or charging moist charged batteries before filling with electrolyte will damage the batteries resulting in premature failure of the batteries.**

## Cleaning

**⚠WARNING**

1) **Refer to battery warnings at the start of this chapter.**
2) **Place the Direction Control switch in the center "OFF" position (neutral).**
3) **Turn the Start switch OFF.**
4) **Place blocks under the front or rear wheels to prevent vehicle movement.**
5) **Disconnect the main battery plug.**

6. Dry dirt can be readily blown off with low-pressure air or brushed off.
7. Wetness or wet dirt on the battery indicates battery acid. Using a nonmetallic brush with flexible bristles, wash the battery off with a strong solution of baking soda and hot water (one pound of soda to a gallon of water). Continue until all fizzing stops, which indicates that the acid has been neutralized. Then rinse thoroughly with clear water. DO NOT get any of the solution into the battery cells.
8. Remove the blocks from the wheels and test drive.

## Watering

Non-maintenance free batteries only.

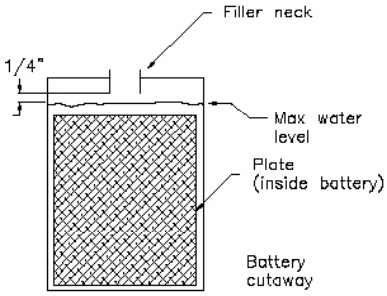
**⚠CAUTION**

**Do not overfill the batteries. Overfilling the batteries may cause the batteries to boil over and result in chemical burns and/or property damage.**

*Note: The electrolyte level in a battery rises while charging and will be close to its highest level after the end of a charging cycle. It is recommended to fill the battery at the end of a charging cycle. If the electrolyte is below the top of the battery plates then fill just enough to cover the plates and then top off when the charging cycle is complete.*

**⚠WARNING**

1) **Refer to battery warnings at the start of this chapter.**
2) **Place the Direction Control switch in the center "OFF" position (neutral).**
3) **Turn the Start switch OFF.**
4) **Place blocks under the front or rear wheels to prevent vehicle movement.**
5) **Disconnect the main battery plug.**




6. Clean the battery. Refer to Cleaning section for information on cleaning the battery.
7. Check the electrolyte level in all battery cells. If low, fill to the correct level with distilled water using part number 77-201-00 battery filler. Never add additional battery electrolyte to the batteries.
8. Remove the blocks from the wheels and test drive.

# REMOVABLE BATTERIES

Removable batteries can consist of a single large industrial battery or a pack of smaller batteries assembled on a removable tray.

The removable battery can be of a type that slides or rolls out of the side of the vehicle (ROBB) or lifted out of the vehicle from above (LOBB).

## ⚠ WARNING

- **Use the proper equipment when handling and transporting removable batteries. Equipment that is used to lift and support removable batteries should be rated at a minimum of 1.5 times the total battery weight.**
- **Keep all body parts out from underneath any battery that is not installed and latched in the vehicle.**

**Failure to follow these rules may result in severe bodily injury and/or property damage.**

## ⚠ WARNING

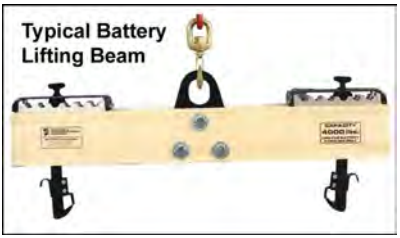
**Before removing a battery pack or industrial battery:**

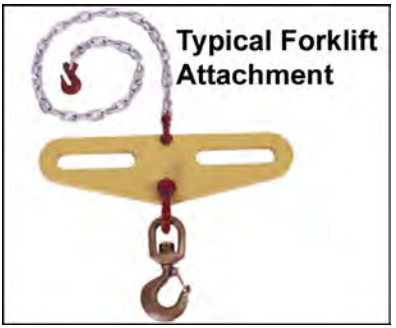
1) **Park the vehicle on a level surface. If removing a ROBB, the vehicle should be positioned as close as possible to the platform where the battery will be stored.**
2) **Place the Direction Control switch in the center OFF position.**
3) **Make sure the Start switch is in the OFF position.**
4) **Set the park brake.**

### Lift Out Battery Box (LOBB) or Industrial Battery

Removing the LOBB will require an overhead hoist or forklift attachment not included with the vehicle. Refer to the manufacturer of the hoist or attachment for proper operation.

1. Unplug the battery connector.
2. Attach the hook from the hoist or forklift attachment to the lifting eye on the battery box.
3. Lift the LOBB until it is clear of the frame.
4. Place the battery on the ground or battery storage platform.
5. If the battery is to be moved away from the vehicle, then it should first be lowered as close as practical to the ground before transporting.



## Changing a Tire/Wheel assembly

**⚠WARNING**

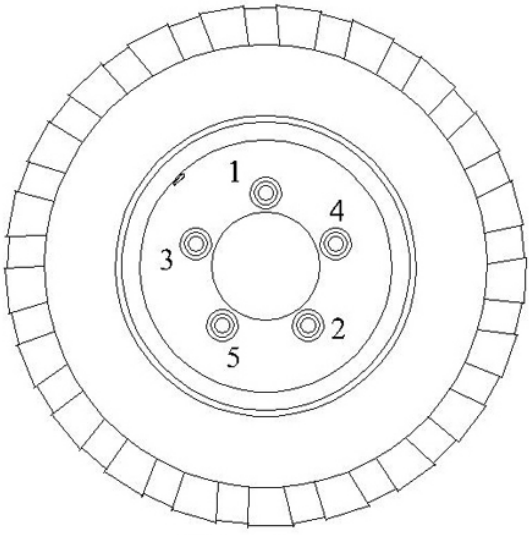
**1) Park the vehicle on a hard level surface off of any main road or highway.**
**2) Make sure the Start switch is in the OFF position, then remove the key.**
**3) Place the Direction Control switch in the center OFF position.**
**4) Set the park brake.**
**5) Block the wheels on the opposite side of the tire to be changed.**

**⚠WARNING**

**When lifting the vehicle, always use a hoist with lifting strap, or a jack of adequate capacity. Use jack stands to support the vehicle before starting any repairs. Failure to use lifting and support devices of rated load capacity may result in severe bodily injury.**

*Note: A spare tire, jack, or lug wrench is not attached to the vehicle.*

6. Loosen the wheel nuts (do not remove) before raising the tire off of the ground.
7. Raise the tire to be changed off of the ground and support with a jack stand.
8. Remove the wheel nuts and tire/wheel assembly.
9. Install the replacement tire/wheel assembly.
10. Install the wheel nuts and cross tighten per illustration below to 85 foot pounds (115 Nm).
11. Check the tire for proper inflation.
12. Lower the vehicle to the ground and remove the blocks from the wheels.
***13. Wheel nuts should be checked for tightness after first 20 hours of operation.***




5-Bolt Pattern

## Replacing a Tire

**⚠WARNING**

**Tire replacement should only be performed by an qualified technician trained in tire replacement.**

**Improper tools or procedures can result in explosion of the tire/wheel assembly causing severe bodily injury or death.**

**⚠WARNING**

**Never mix tire types, tire sizes, speed ratings, or load capacity.**

**Only use the tire types and sizes approved for use on this model. Contact your authorized Taylor-Dunn dealer to confirm approved tire types and sizes.**

**Mixing tires or installing a tire that is not approved may:**

- **Cause handling problems with the vehicle.**
- **Cause sudden tire failure due to mechanical interference.**
- **Accelerated tire wear and premature failure.**

**Any of the above may cause loss of control of the vehicle resulting in a collision or accident with severe bodily injury.**

# CLEANING

## Backrest Cushion

Clean your seats with any standard automotive vinyl cleaner.

## Exterior Body

Use any standard automotive exterior car wash solution. Do not use any abrasive cloths or cleaners.

Finish with a quality automotive wax to preserve the finish of your vehicle.

## Under Carriage

For long life, it is important to keep the under carriage of the vehicle clean from caked on dirt, mud, or road salt. Any of these substances will cause accelerated corrosion of the frame and lead to premature failure.

When cleaning the under carriage, be careful not to get any cleaning solutions or excessive water into any electrical compartments.

## Batteries

Refer to the Battery Maintenance section.

## Control Panel

The electrical control panel is located in the compartment behind the battery This compartment is not sealed and requires periodic cleaning. Refer to your maintenance schedule for the recommended cleaning interval.

Remove the compartment cover and use compressed air to blow out any debris.

If the control panel has been contaminated with any chemicals, mud, excessive dirt, road salt, etc., then the panel should be removed from the vehicle and thoroughly cleaned by a qualified technician.

**NOTICE**

**DO NOT use an automated car wash facility of any type. This vehicle is not designed to fit in any automated car wash and it is likely that the vehicle will be damaged.**

**⚠DANGER**

**High Voltage is present in the control panel.**

- **DO NOT touch any wiring or components.**
- **DO NOT use any liquid cleaners.**

**Failure to follow these instructions will lead to severe electric shock and/or death.**

# Standard Specifications

| ITEM | Model | SPECIFICATION |
|---|---|---|
| Occupancy | | Driver only, no passengers<br>Max driver weight 250 pounds (113 kg) |
| Dimensions | E-451 | 58 L x 31.75 W x 55 H Inches<br>147 L x 81 W x 140 H Centimeters |
| | E-457 | 76 L x 31.75 W x 55 H Inches<br>193 L x 81 W x 140 H Centimeters |
| Turning Radius | E-451 | 49 Inches (124 Centimeters) |
| | E-457 | 67.5 Inches (171 Centimeters) |
| Weight (without batteries) | E-451 | 975 pounds (442 kg) |
| | E-457 | 1,267 pounds (575 kg) |
| Battery Compartment | | |
| | E-451 | 13.375L x 30.5W x 24H inches<br>34L x 77.4W x 61H Centimeters |
| | E-457 | 26.375L x 30.5W x 24H inches<br>67L x 77.4W x 61H Centimeters |
| Battery Specifications | | |
| Min/max battery weight | E-451 | 250 lbs to 1,020 lbs (113 kg to 463 kg) |
| | E-457 | 360 lbs to 1,800 lbs (163 kg to 816 kg) |
| Voltage | E-451 | 24 Volts |
| | E-457 | 36 Volts |
| Connector | | SB 175 Gray |
| Lead Length | | 30 Inches (76 Centimeters) |
| Position | | B |
| Cover | | YES |
| Maximum Towed Load, Draw bar Pull* | E-451 | 200 Pounds (90.7 kg) |
| | E-457 | 300 Pounds (136 kg) |
| Tongue weight | | 50 Pounds (22 kg) |
| Electrical System | | 400 Amp Series Wound |
| Transmission | | Automotive Type Hypoid Differential with chain primary reduction |
| Motor | E-451 | 5 kW, (6.7 hp) @ 935 RPM (5 min) |
| | E-457 | 7.45 kW, (10 hp) @ 1,400 RPM (5 min) |
| Maximum Speed | | 6 mph (9.7 kph) |
| Brakes | | Mechanical brake to rear differential to both rear wheels.<br>Brake operated by integrated accelerator and brake treadle.<br>Automatically applied Park Brake. |
| Steering | | Chain and Sprocket Reduction to Front Fork |
| Tires | Rear | 16 x 4 x 12.125 Solid Cushion |
| | Front E-451 | 8 x 2.5 Solid Cushion |
| | Front E-457 | 10 x 3.5 Solid Cushion (front) |
| Instrumentation | | Battery status indicator |

*Refer to towing section for definition of Draw Bar Pull.

Specifications subject to change without notice.

# Index

# ⚠WARNING

**Operating, servicing and maintaining a passenger vehicle or off-highway motor vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle.**

**For more information go to www.P65Warnings.ca.gov/passenger-vehicle.**

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