



**TAYLOR-DUNN®**  
Commercial and Industrial Vehicles Since 1949

## Operator's Manual TT-416



*Shown with optional  
front push bar*

*The best way to go about your business*

Serial Number Range:  
Starting: 214286  
Ending: See Introduction Chapter

Use with Model Numbers:  
TT-416-36AC



FIAT CHRYSLER AUTOMOBILES

### **⚠ WARNING**

**READ 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 out #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](http://www.taylor-dunn.com), for a dealer lookup application.

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## ***CONTACT INFORMATION***

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### **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](http://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:

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Attn: Tech Writer

2114 West Ball Road

Anaheim, CA 92804

Email: [contact@taylor-dunn.com](mailto:contact@taylor-dunn.com)



# ***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:***



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# 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](http://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.

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 vehicles systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicles 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 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 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.
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.
DTC	Diagnostic Trouble Code
Electrolyte	The fluid inside of a battery.
ESS	Emergency Stop Switch
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.
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	<ul style="list-style-type: none"> <li>• "Operator Protective Structure": Steel cab or cage around the occupants.</li> <li>• "Operator Presence Switch": A switch that validates the operator is in the approved operator position</li> </ul>
Regen	Short term for Regenerative Braking. "Regen" is the braking action provided by the motor. Similar to downshifting in an automobile. Energy created during regen is returned to the battery.



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 approximately 20 inches on a bench seat.
Sequence Fault	A type of fault that disables the vehicle. Occurs when the switches require to operate the vehicle are not operated in the correct order.
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.


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.

### **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.**

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


 Safety alert symbol (see above).

 High voltage hazard.

 Explosion hazard.

 Corrosive chemical hazard.

 Fire hazard.

 Poisonous chemical hazard.



Read the operators manual.



Read the maintenance manual.



Keep arms and legs inside the vehicle.



Parking brake ON (switch DOWN).



Parking brake OFF (switch UP).



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.

The owner may have additional legal responsibilities as defined by federal, state, and/or local laws such as OSHA.

## 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 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.

Personnel performing service and repair should have knowledge of:

- Basic standard automotive repair procedures
- Basic DC and AC electrical theory
- AC 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.



## **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 vehicles systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicles warranty.**

# VEHICLE MODIFICATIONS

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

## **ANSI/ITSDF 56.8 – 2019 Personnel and Burden Carriers**

Full text can be obtained at: <http://www.itsdf.org/>

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 56.9 – 2019 Safety Standard for Operator Controlled Industrial Tow Tractors**

Full text can be obtained at: <http://www.itsdf.org/>

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)**

Full text can be obtained at: <https://www.osha.gov/laws-regs/regulations/standardnumber>

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.

## **Motor Speed Control Programming**

Taylor-Dunn programmable motor speed controls are programmed at the factory for optimum safe, efficient, and smooth operation of the vehicle. The program settings are based on many factors including but not limited to: Vehicle Model, Maximum Safe Speed, System Voltage, Drive Axle Configuration, Vehicle Configuration.

Some of the parameters can be changed in the field Using PC software or handsets.

Contact the factory for information regarding available alternate program settings.

Taylor-Dunn will only authorize the use of settings obtained from the factory for a specific vehicle. Any other alterations to the programming ARE NOT AUTHORIZED and are at your own risk.

DO NOT interchange program settings from different vehicle models or models with different configurations.



## **WARNING**

**Improper programming may cause unexpected operation of the vehicle and/or damage the electrical components. This could result in severe bodily injury and/or property damage**

## **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 affect 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.

### **Purchasing Parts**

Contact your dealer to order replacement parts for you vehicle. Refer to our web site, [www.taylor-dunn.com](http://www.taylor-dunn.com), for a dealer lookup application.

### **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 vehicles 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.

### **Component Installation**

Components must be installed properly. Incorrect installation of any part may have an undesirable affect on the operation of the vehicle, result in additional frame stress, or stress on other components resulting in premature failure or an unsafe condition.

# About Your Vehicle

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 defined as a motor vehicle and **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
- O.S.H.A. Standard Section 1910.178, Powered Industrial Trucks Type E
- O.S.H.A. Standard Section 1910.178, Powered Industrial Trucks Type EE (see below)

The vehicle data plate 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.

The illustration of the data plate to the right is a typical plate but contents and layout of the plate will vary.

**TAYLOR-DUNN**  
Commercial and Industrial Vehicles Since 1949

2314 West Bell Road  
Anaheim, CA 92804-5417  
USA • (714) 955-4050  
www.taylor-dunn.com

MODEL NUMBER:			SERIAL NUMBER:		
MFG DATE:					
APPROX. WEIGHT		lb		kg	
DRAW BAR PULL					
NORMAL:		lb		N	
ULTIMATE:		lb		N	
LOAD CAPACITY:		lb		kg	
FUEL TYPE:					
BATTERY (FUEL TYPE E ONLY)			VOLTS:		
WEIGHT	MAXIMUM:		lb		kg
	MINIMUM:		lb		kg
CONFORMS TO TYPE <input type="text"/> VEHICLE PER OSHA STANDARD 1910.178 (POWERED INDUSTRIAL TRUCKS) AND ANSI B56 <input type="text"/> AT THE DATE OF MANUFACTURE					

94 373-79

## 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:**

- |                            |                            |
|----------------------------|----------------------------|
| • Treadle                  | • Steering Wheel           |
| • Parking Brake            | • Horn                     |
| • Start Switch             | • Emergency Stop Switches  |
| • Direction Control Switch | • Operator Presence Switch |
| • Reverse Warning Beeper   | • Battery door switches    |
| • All lights               |                            |

## **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 1 working day 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 vehicles systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicles warranty.**



# Driver 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 – 2019 Personnel and Burden Carriers: Part II, Paragraph 6.2a.
- ANSI/ITSDF 56.9 – 2019 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 (I).
- 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.
- Any locally imposed training requirements by local government agencies or the company or facility where the vehicle will be operated.

Additional training is required for applications that involve towing trailers or carts. The level or type of training may vary depending on the facility where the vehicle is operated and/or the type of trailers or carts being towed.

Consult the facilities safety training requirements and manufacturer of the trailer or cart being towed.

## **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 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.

# Vehicle Controls

## 1: 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.

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

BEFORE leaving the approved operator position, turn the start switch OFF and place the direction control switch in the center OFF position.

## 2: Directional Control Switch

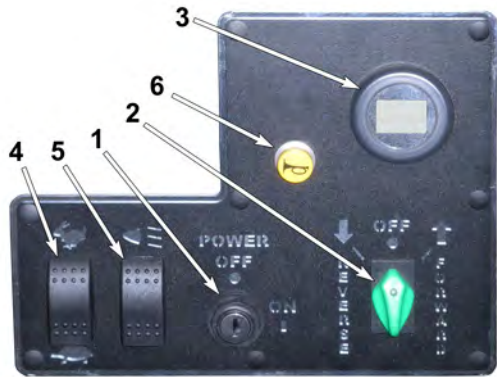
This switch determines the direction of travel and has an indicator light on the switch. The switch has three positions:

- **FORWARD:** Rotate the switch clockwise to travel forward: Light will be GREEN.
- **REVERSE:** Rotate the switch counterclockwise to travel reverse: Light will be RED.
- **OFF:** There is a center position between forward and reverse, this is the "direction" OFF position: Light will be OFF. 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.*

## 3: Combination Display

The gauge on the dash has many functions. The display will cycle through the functions while the vehicle is in operation. Some functions may not be displayed depending on the current situation of the vehicle. More detail is provided on the following pages.



## 4: Hi-Low Speed Switch

Push on top of the High/Low switch (rabbit) for normal speed. Push on the bottom of the switch (turtle) for slow speed.

## 5: Light Switch

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

## 6: Horn Switch

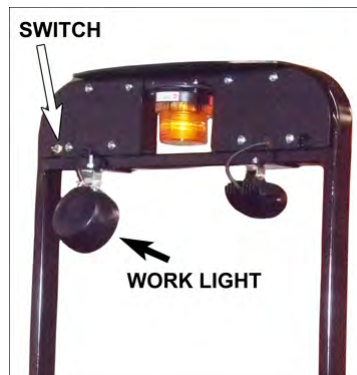
Press the horn switch to sound the horn, release it to turn it off.

## Work Light

The optional overhead light bar is available with a rear facing work light.

The switch for the work light is located on the light bar; top right facing forward. Toggle the switch up to turn it on and down to turn it off.

The light should be left off while vehicle is in operation unless being used to assist in connecting a trailer or cart..





### **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.

### **Tilt Steering**

The steering wheel angle can be adjusted. Push the locking lever to release and then move the steering wheel to desired angle and release the lever.

### **Throttle/Brake Treadle**

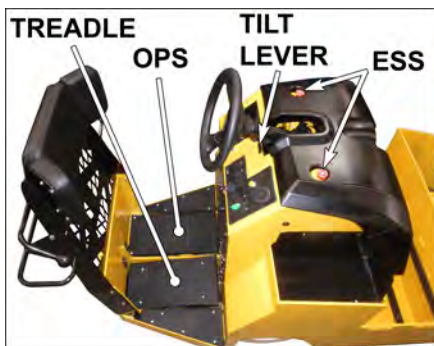
The treadle located on the right side of the operator platform is both the brake and throttle. It is operated by the driver's right foot.

Press the rear of the treadle with your heel to apply the brake.

Press forward on the treadle to accelerate. The brake will be released when accelerating.

### **Operator Presence Switch (OPS)**

A switch located under the operator platform disables the power to the vehicle when the driver exits the vehicle. The driver must be in the approved operator position for the vehicle to operate.



### **Emergency Stop Switch (ESS)**

#### **⚠ CAUTION**

Unless in an emergency, do not activate an Emergency Stop Switch while the vehicle is in motion. This vehicle is equipped with an automatic electric parking brake. Activating the Emergency Stop Switch will immediately apply the brake and abruptly stop the vehicle. This may result in injury to the occupants and/or upsetting the load being carried or towed.

Pushing on an Emergency Stop Switch knob will immediately and abruptly stop the vehicle. Rotate the knob clockwise to reset and continue normal vehicle operation.

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.

*Note: Operating the switch while in motion will result in accelerated wear and premature failure of the parking brake.*

#### **⚠ WARNING**

**DO NOT** use the Emergency Stop Switch knob as a post to hang any item such as a purse or backpack.

Using the knob as a hanging hook may interfere with operation of the knob or cause the Emergency Stop Switch to be activated by accident; Both may result in severe bodily injury and/or property damage.

## **Parking Brake**

This vehicle is equipped with an automatically actuated electromagnetic parking brake.

During normal operation, the parking brake will be applied when the treadle is released and the motor comes to a stop. The brake will release again when the treadle is pressed for travel.

Unless in an emergency, do not turn the start switch OFF while the vehicle is in motion. Turning the start switch OFF will immediately apply the parking brake, stopping the vehicle and result in accelerated wear of the brake.

## **! WARNING**

**The park brake should be disabled for servicing or towing procedures only. Do not operate the vehicle while the automatic park brake is disabled. Operating the vehicle with the automatic park brake disabled could lead to severe bodily injury and/or property damage.**

Some motor control system faults will result in parking brake application or failure of the brake to release. Should this occur, there is a brake bypass switch that will release the brake and allow the vehicle to be moved. For more information, Refer to Towing This Vehicle later in this manual.

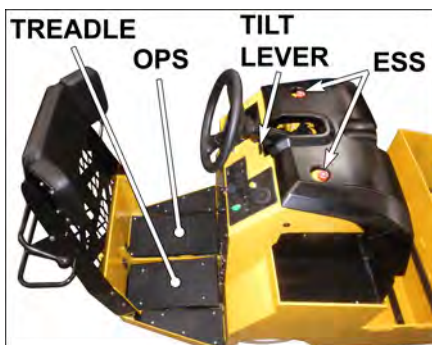
The brake bypass switch will not function if the batteries are disconnected or there is a failure in the vehicle power supply. Should this occur and the vehicle must be moved then the drive wheels must be placed on a towing dolly or the brake removed from the motor.

## **Interlocks**

**Operator Presence:** OPS: A switch located under the operator platform disables the power to the vehicle when the driver exit the vehicle. The driver must be in the approved operator position for the vehicle to operate.

Whenever the driver leaves the vehicle, the driver should turn the key-switch "OFF", place the forward-off-reverse switch in the center "OFF" position.

**Battery Door:** Two switches located on the left and right to the rear of the battery compartment disables power to the vehicle whenever the battery doors are removed or not properly installed.



## **Combination Dash Display**

Assuming there are no active faults detected (Diagnostic Trouble Code or DTC), on start up, the display will show the current battery charge status and total accumulated hours of operation. If there are active faults, then the display will scroll through all detected faults.

*Note: Some single events will result in more than one DTC generated.*

The following is a explanation of the different modes of the display depending on the current operating conditions.

### **Direction Indicator**

The display will indicate direction selected for about 2 seconds after the direction is selected then switch to the BSI/Speed mode (see below).

### **Forward Selected**



### **DTC Code**



### **DTC Message**

### **Fault Messages (DTC)**

This display will be in this mode any time the system detects a fault condition.

It will show the DTC (Diagnostic Trouble Code) as well as a brief description of the fault. IF there are multiple fault, the display will flash each fault for about 2 seconds.

Shown here is DTC F59 which is a type of SRO fault.

It will be in this mode until all fault conditions are resolved.

A code table is provided in the "Troubleshooting" section in this manual.

### **Battery Status / Hour Meter**

This mode will be active only when the direction control switch is in the center OFF position.

At 15% charge remaining, the vehicle speed will be limited and "BDI CUT" will be displayed.

### **Battery Status**



### **Hour Meter**

### **Speed**



### **BSI / Speed**

This is the mode shown during operation of the vehicle.

*Note: The speed is software selectable for MPH or KPH and can be changed by your dealer.*

# 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) Confirm park brake is applied.
- 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 that would affect the ability to safely operate the vehicle shall operate this vehicle or any of its components.
- 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.
- No passengers are allowed to be transported on this vehicle.
- The operator shall confirm that all passengers in towed personnel trailers are physically able to secure themselves while being transported in this vehicle.
- Occupants shall not exit the vehicle until the vehicle has come to a complete stop.
- Do not leave children unattended in the vehicle or attached trailers.
- 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, in poorly lit areas, or if required by the facility where being operated.
- 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 the 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 if equipped with light bar or 80 inches (203 cm) from the ground without light bar.
- Do not drive off of curbs or other steep drop-offs more than 1 inch (25 mm) high.
- Stay in your driving lane under normal conditions, maintaining a safe following distance from other vehicles.
- Driving through water or mud may affect brake performance. ALWAYS test brakes by pressing the brake pedal after driving through water or mud.
- Observe all operation rules and guidelines as mandated by the facility where the vehicle is operated.

### **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, Press one of the emergency stop switches, 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, seat back, and optional light bar.





## 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 confirm park brake is applied 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.

**DO NOT** transport any objects on the operator platform. Objects may interfere with vehicle operation causing severe bodily injury and/or property damage.

1. If pulling a personnel carrier; make sure all occupants are properly seated and prepared for vehicle movement.
2. Stand in the approved operator position and press back on the treadle to apply the brake.
3. Place the Direction Control switch in the center OFF position.
4. Place the Start switch on the ON position and wait 1 second.
5. Select a direction of travel.
6. Slowly press the front of 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.

## CAUTION

**DO NOT** turn the Start switch OFF while the vehicle is in motion unless the vehicle must be stopped due to an emergency. This vehicle is equipped with an automatic electric parking brake. Turning the Start switch OFF will immediately apply the brake, abruptly stopping the vehicle. This may result in injury to the occupants of the vehicle and will result in accelerated wear and premature failure of the parking brake.



## **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 **after** the Start switch is turned ON. If a direction is selected before the Start switch is turned ON, then a sequence fault will occur. If the sequence fault occurs, you can clear the fault by placing the Direction Control switch in the center OFF position and then re-selecting the desired direction of travel.

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

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

## **Changing Direction of Travel**

The direction selected by the Direction Control switch can be changed at any time. If the vehicle is in motion when the direction is changed, the motor control system will regen to a stop and then continue in the new direction selected.

## **Driving in Forward**

1. Stand in the approved operator position and press back on the treadle to apply the brake.
2. Turn the start switch ON, then select FORWARD using the Direction Control switch.
3. Slowly press the front of the treadle to accelerate to the desired speed.

*Note: This vehicle is equipped with an operator presence switch under the left floorboard. The system will be disabled unless the driver is in the approved operator position. The operator presence switch must be activated before a direction is selected.*

## **Driving in Reverse**

1. Stand in the approved operator position and press back on the treadle to apply the brake.
2. Check and confirm that there are no obstacles behind the vehicle before backing up.
3. Turn the start switch ON, then select REVERSE using the Direction Control switch.
4. Slowly press the front of the treadle to accelerate to the desired speed.

*Note: The maximum reverse speed will be slower than the forward speed.*

## **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. Confirm the park brake is applied.
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.*

**Stopping****⚠ 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.**

**⚠ CAUTION**

**DO NOT not turn the Start switch OFF while the vehicle is in motion unless the vehicle must be stopped due to an emergency. This vehicle is equipped with an automatic electric parking brake. Turning the Start switch OFF will immediately apply the brake, abruptly stopping the vehicle. This may result in injury to the occupants of the vehicle and will result in accelerated wear and premature failure of the parking brake.**

**⚠ WARNING**

**DO NOT exit the vehicle until the vehicle has come to a full stop.**

- **Exiting a vehicle that is in motion could result in being run over by the vehicle, loss of control of the vehicle, or stumbling during exit resulting in severe bodily injury and/or property damage.**
- **Exiting a vehicle that is in motion will result in the vehicle control system executing an emergency stop procedure and rapidly slowing the vehicle to a stop. The rapid slowing may be unanticipated by the operator and result in impact between the vehicle and operator or upsetting the towed load causing severe bodily injury and/or property damage.**

Press the rear of the treadle with your heel to apply the brake. The amount of force required to stop the vehicle will vary depending on the environment and load on the vehicle.

This vehicle is equipped with regenerative (regen) braking. Regen braking uses the stored energy of the moving vehicle to generate electricity. The generation of electricity slows the vehicle down and the power generated is put back into the batteries increasing the driving time of your vehicle. Do not turn the start switch off until the vehicle has come to a complete stop. Turning the start switch off will disable the regen braking and abruptly apply the park brake.

There is more than one regenerative braking mode. The mode activated depends on the driving conditions as follows:

- **While Coasting:** When you release the treadle, the Neutral Regen mode is activated and gradually slows the vehicle. Only a small amount of power is generated.
- **Changing Direction:** The Direction Regen mode is activated when the direction of the vehicle is changed while the vehicle is in motion. In this mode the motor is reversed and slows the vehicle to a stop and then continues in the opposite direction.

## **WARNING**

**DO NOT** transport or load cargo on the operator platform. Cargo placed in the operator platform 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**

**DO NOT** use the Emergency Stop Switch knob as a post to hang any item such as a purse or backpack.

Using the knob as a hanging hook may interfere with operation of the knob or cause the Emergency Stop Switch to be activated by accident; Both may result in severe bodily injury and/or property damage.

### **Loading Cargo**

- 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.
- This vehicle is equipped with two small storage compartments on the left and right side. The load limit for each side compartment is 10 pounds (4.5 kg). Items placed in the compartments should be small enough so that there is no risk of falling out while vehicle is in operation.

## **WARNING**

**DO NOT** place any object in the cup holder than may fall out onto the operator platform or interfere with steering the vehicle.

Objects that are too tall may fall out and/or interfere with steering resulting in loss of control of the vehicle with severe bodily injury and/or property damage.

- There is an optional cup holder. The cup holder should only be used for carrying drinkable liquid containers. The cup holder has a drain: Do not place any solid object in the cup holder than may fall through or plug the drain.

### **Transporting Pets**

Pets shall not transported on this vehicle.

# TOWING TRAILERS

## WARNING

**Use caution when towing trailers wider than the vehicle 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; also included on the data plate.
- 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 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 towing vehicle coupler and the load. The scale will directly read the DBP as the load is towed.

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:

DBP specifications are based on:

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

## Hitch Release

### WARNING

**Do not operate the hitch release lever while on a grade or while the vehicle is in motion.**

- **Decoupling a trailer while in motion may result in unexpected movement of the vehicle and/or loss of control of the trailer.**
- **Decoupling a trailer while on a grade will result in loss of control of the trailer.**

**The above actions may result in severe personal injury and/or property damage.**

The hitch release lever is on the right side of the seat back. Pull the lever up to raise the hitch pin. When fully raised the lever will remain in the raised position.

Rotate the lever a few degrees to the front to lower the hitch pin.

### NOTICE

**Hold the release lever and slowly lower to close the hitch pin. Releasing the lever and allowing it to freely fall may cause premature wear to the release mechanism.**

#### HITCH RELEASE LEVER



#### HITCH RELEASE LEVER



## 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. Place the park brake bypass switch in the bypass position.
  - If the park brake does not release then the brake must be removed from the motor or mechanically disabled; Refer to a qualified technician.
2. Attach a tow strap to the front cowl tie points (next page).
3. Turn the start switch off and place the direction control switch in the center off position.
4. Use another driver to steer this vehicle while it is being towed.
5. 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.

## **Park Brake Bypass Switch**

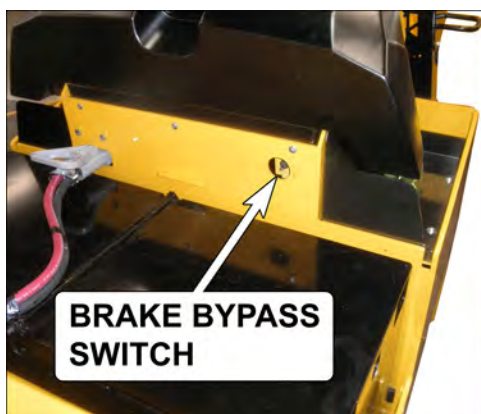
### **NOTICE**

**The bypass switch should not be left ON for more than 10 minutes. Leaving the switch ON will discharge the batteries and may overheat and damage the brake and/or control system.**

This vehicle is equipped with an automatically applied electric parking brake. Under normal driving conditions, the parking brake will be applied when the start switch is turned off or the operator leaves the driver seat. It will also be applied if the control system loses power such as when the emergency stop switch is activated.

The bypass switch is located on the left side of the forward facing panel just above the battery. A beeper will sound when in the bypass mode.

The parking brake is powered by the vehicle battery. It will be applied whenever the batteries are disconnected or one of the emergency stop switches are activated. It may be applied if the batteries are severely discharged.



## **Vehicle Tie Down Points**



**FRONT COWL TIE POINTS**



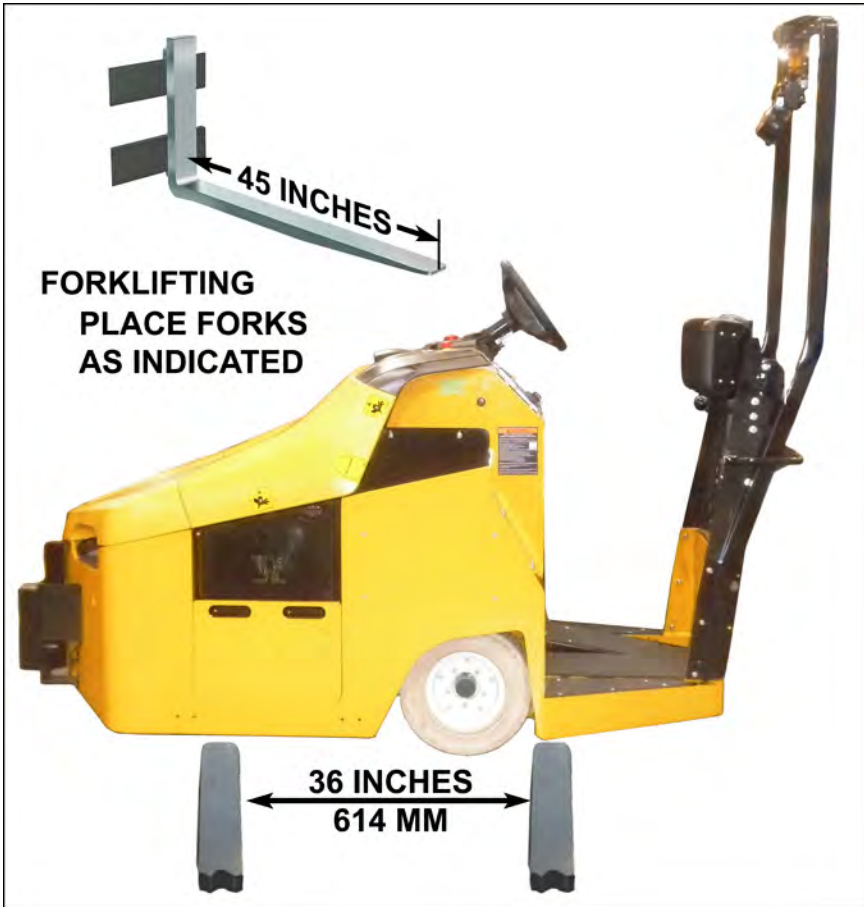
**REAR TIE POINTS**

## **Forklifting**

A forklift may be used to move the vehicle but is not recommended for long distance transportation. Before lifting, confirm the forklift rating is sufficient to lift the vehicle + battery if the battery is installed. The length of the forks must be minimum 45 inches long (1143 mm) and able to be positioned at 36 inches (614 mm) wide.

Position one fork directly behind the rear wheel and make sure both forks extend beyond the far side of the vehicle.

Strap the vehicle to the forks so that the vehicle cannot shift sideways or off the end of the forks. Lift just high enough to move the vehicle.





# 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.

## **Charging Time**

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

- Capacity of the battery: 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 charger AC plug or disconnecting the battery. 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**

The AC power source required by the charger will vary depending on the charger used. Refer to the specifications provided with 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.



## **WARNING**

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

## **Charger Operation**

There are many types of industrial chargers that may be used with this vehicle. Refer to the documentation provided with your charger for charger operation.

# 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 cause 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.



# Troubleshooting

This is a summary troubleshooting guide to determine possible cause and resolution of operator correctable issues.

This is not an all inclusive guide and does not include repair items to performed by a qualified 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 vehicles systems which could lead to an unsafe condition resulting in severe bodily injury and/or property damage. Unauthorized repairs may also void the vehicles warranty.**

### Not Running

- If the dash display is off:
  - Confirm the start switch is turned to the run position.
  - Confirm all emergency stop switches are in the run position.
  - Confirm the battery connector is properly engaged.
  - If problem not corrected, then refer repair to a qualified technician.
- If the dash display is on:
  - Confirm battery doors are properly installed.
  - Confirm there is no debris under the left floorboard on the operator platform.
  - Confirm battery has sufficient charge.
  - If problem not corrected, then refer repair to a qualified technician.

### Running Slow

- Confirm battery is charged.
- Confirm High/Low speed switch is in the normal speed (rabbit) position.
- If problem not corrected, then refer repair to a qualified technician.

### Runs Only in One Direction

- Refer repair to a qualified technician.

### Hard to Steer

- Confirm start switch is in run position.
- Refer repair to a qualified technician.

## DIAGNOSTIC TROUBLE CODES (DTC)

Only shown are the DTC's (faults) caused by the operator or correctable by the operator.

There are many other codes: Codes not listed here cannot be corrected by the operator and must be referred to a qualified technician.

DTC Code	Cause	Resolution
12	Overloaded	Reduce load on vehicle
16	Control overheated	Allow controller to cool
17	Battery low (severe)	Charge battery
18	High Battery Voltage	Possible due to coasting down grade with full battery charge. Use brakes to control speed down hill.
21	Too Cold	Operating with temperatures below -25°C result in power cutback
22	Overheating	Reduce load
23	Battery low	Charge battery
24	High Battery Voltage	Possible due to coasting down grade with full battery charge. Use brakes to control speed down hill.
28	Motor overheating	Reduce load
47	Operator sequence error	Operate switches in correct order
51	Throttle and Brake pedals pressed at same time	Release brake pedal
52	<ul style="list-style-type: none"> <li>Battery door off</li> <li>OPS not engaged</li> </ul>	<ul style="list-style-type: none"> <li>Confirm battery doors properly installed</li> <li>Stand in approved operator position</li> </ul>
54	Maintenance due soon	Have vehicle serviced
55	Maintenance due now	Have vehicle serviced
58	Throttle pressed before direction selected	Operate switches in correct order
59	Throttle pressed before OPS closed	Operate switches in correct order
64	Charger connected	Disconnect the charger
73	Motor stalled	Reduce load



# Vehicle Maintenance

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## **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:
  - Treadle
  - Steering
  - Horn
  - Parking brake
  - Hitch release
  - Park brake
  - Direction control switch
  - High-Low speed switch
- Proper operation of all locking devices:
  - Battery doors
  - Tilt steering
- Proper operation of all interlocking switches:
  - Start switch
  - Operator presence switch
  - Battery door switches

## **Pre-Operation Inspection**

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

- Steering operation.
- Brake operation (service and park brake).
- Visual inspection of tire pressure (pneumatic tires only).



## **WARNING**

**Remove cargo before raising or servicing vehicle. Failure to remove the cargo may result in cargo falling from the vehicle causing severe personal injury and/or property damage.**

# 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.**

### Start Switch

Turn start switch OFF.

Stand in the approved operator position.

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.

### Operator Presence Switch (OPS)

Stand in the approved operator position.

Place direction control switch in the center OFF position then 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.

### Battery Door Switch

Remove all battery access doors.

Stand in the approved operator position.

Place direction control switch in the center OFF position then turn the start switch ON, select a direction, and slowly press the treadle forward.

- The vehicle should not operate.

Replace one door at a time and attempt to operate the vehicle after each door is installed.

- The vehicle should not operate until the last door is installed, then it should operate normally.

## **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.

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

## **Maintenance Guidelines for Severe Duty Applications**

The maintenance schedule is based on the typical application. If the vehicle is operated under "severe conditions", then 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 a guide and is not all-inclusive of a "severe duty" application.

- Operation in excess of 160 hours per month.
- Extreme high or low temperatures (<40°F - 90°F> / <4°C - 32°>).
- Bumpy, dusty, or ill maintained surfaces.
- Excessively wet areas.
- Corrosive or contaminated areas.
- Frequent operating of the vehicle at/near full capacity.

---

### **Every Week**

- Check tire air pressure (pneumatic tires)
- Inspect tires for damage
- Check tire tread for debris
- Check battery electrolyte level

### **First 20 hours**

- Re-torque the wheel nuts (front/rear).

### **Every Month or 160 hours**

- All weekly items plus the following:
  - Inspect for existence and readability of all safety labels
  - Inspect for fluid leaks
  - Inspect steering chains
  - Inspect steering hardware
  - Inspect master cylinder fluid level
  - Wash battery and clean terminals
  - Clean drive motor exterior
  - Blow out park brake
  - Clean motor compartment ventilation fan
  - Check tire tread wear
  - Check all electrical interlocks for proper operation
  - Inspect wheel bearings for play and noise
  - Inspect front fork collar bearings for play and noise
  - Lube hitch release mechanism

### **Every 3 Months or 500 Hours**

- All monthly items plus the following:
  - Inspect and tighten all hardware (first 160 hours only, then 500 hours and every 500 hours)
  - Inspect and tighten all hardware
  - Clean battery compartment
  - Clean motor control panel
  - Inspect all electrical connections for signs of overheating
  - Re-torque wheel nuts
  - Lubricate the vehicle
  - Inspect park brake for wear
  - Adjust steering chains
  - Tighten all electrical connections
  - Inspect all wiring for cracks, fraying or wear
  - Adjust front wheel bearings

### **Every 6 Months or 1000 Hours**

- All quarterly items plus the following:
  - Rotate tires
  - Clean and lubricate motor coupler
  - Test battery
  - Inspect suspension bushings (spring and shock)
  - Inspect frame for damage



**Every Year or 2000 hours**

- All 6 month items plus the following:
  - Flush hydraulic brake system
  - Clean and repack front wheel bearings, replace grease seals
  - Clean and lube steering chains
  - Replace treadle return spring
  - Replace OPS springs
  - Inspect brakes for wear

**Every 2 years or 4000 hours**

- All yearly items plus the following:
  - Replace fork collar bearings
  - Change transaxle oil



# BATTERY MAINTENANCE

## 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.

## WARNING

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.

Inspect and confirm all plastic insulating caps are installed on each cell jumper. Contact battery manufacturer for replacements of damaged or missing caps.

## 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.

## **WARNING**

**Batteries contain highly corrosive chemicals. Always wear proper protecting equipment when working with batteries.**

- Full face shield
- Goggles
- Long sleeve shirt
- Long rubber gloves
- Acid resistant apron

**Observe all safety procedures as mandated by the facility where the vehicle is operated.**

### **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) Confirm park brake is applied.
- 5) Place blocks under the front or rear wheels to prevent vehicle movement.
- 6) Disconnect the battery.

7. Dry dirt can be readily blown off with low-pressure air or brushed off.
8. 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.
9. Remove the blocks from the wheels and test drive.

## Watering

Flooded batteries, FLA (non-maintenance free batteries only.)

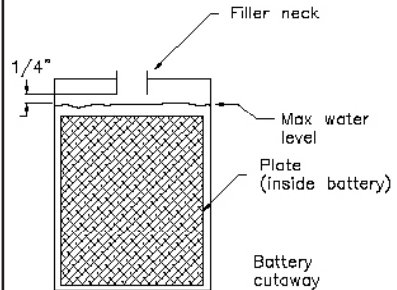
### CAUTION

**Do not overfill the batteries. Over filling 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) Confirm park brake is applied.
- 5) Place blocks under the front or rear wheels to prevent vehicle movement.
- 6) Disconnect the battery.



7. Clean the battery. Refer to Cleaning section for information on cleaning the battery.
8. 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.
9. Remove the blocks from the wheels and test drive.

# CHANGING THE BATTERY

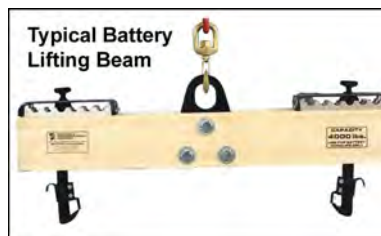
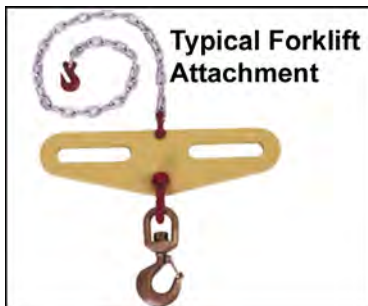
## Lift Out Battery

Removing the battery 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.

### WARNING

**Before removing the battery:**

- 1) Refer to battery warnings at the start of this chapter.
  - 2) Park the vehicle on a level surface.
  - 3) Position the vehicle as close as possible to where the battery will be stored.
  - 4) Place the Directional Control switch in the center OFF position.
  - 5) Confirm park brake is applied.
  - 6) Make sure the Start switch is in the OFF position.
  - 7) Block the wheels.
- 
8. Unplug the battery connector.
  9. Attach the hook from the hoist or forklift attachment to the lifting eye on the battery box.
  10. Lift the battery until it is clear of the frame.
  11. Place the battery on the ground or battery storage platform.
  12. 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.



## **Side Extract Battery**

### **Remove**

#### **⚠ WARNING**

**Before removing the battery:**

- 1) Refer to battery warnings at the start of this chapter.
  - 2) Park the vehicle on a level surface.
  - 3) Position the vehicle as close as possible to the platform where the battery will be stored.
  - 4) Place the Directional Control switch in the center OFF position.
  - 5) Make sure the Start switch is in the OFF position.
  - 6) Confirm park brake is applied.
  - 7) Block the wheels.
- 
8. Remove the battery door.
  9. Disconnect the battery cable.
  10. Using a winch or other powered device, pull the battery out of the vehicle and onto the battery storage platform.

### **Install**

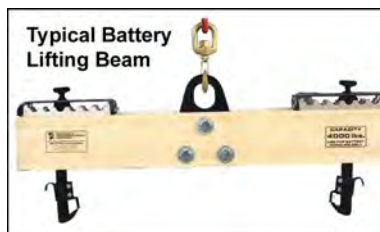
1. Confirm the start switch is OFF.
2. Ensure the vehicle is as close as possible to the battery storage platform.
3. Place battery next to vehicle on the platform.
4. Push the battery all the way into the compartment.
5. Install the battery door.
6. Connect the battery cable.

## **Transporting the Battery**

#### **⚠ WARNING**

- Refer to battery warnings at the start of this chapter.
- Use the proper equipment when handling and transporting batteries. Equipment that is used to lift and support 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.**



# TIRES

## WARNING

**Incorrect tire inflation can result in sudden failure of the tire and/or braking / steering problems leading to loss of control of the vehicle.**

**Never exceed the maximum pressure as indicated on the side wall of the tire. Exceeding the maximum pressure may cause explosive failure of the tire resulting in severe bodily injury.**

### Air pressure

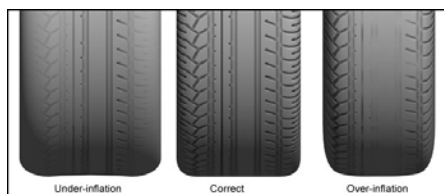
Maintaining the correct tire pressure is important to the safe operation of the vehicle as well as ensuring long tread life.

### Under inflated tires result in:

- Excessive tire side wall flexing that can result in sudden tire failure.
- Excessive tread wear resulting in shortened tire life.

### Over inflated tires result in:

- Tire explosion due to excessive pressure.
- Reduced road surface traction.
- Increased vibration from the road surface.
- Excessive tread wear resulting in shortened tire life.



### Unequal tire inflation may result in:

- Uneven braking and loss of control of the vehicle.
- Steering pulling to the left or right.

Only check the tire pressure when the tire is cold. When checking tire pressure, you must check all tires including your spare tire.

The correct tire size and pressure can be found in the specifications list in the manual.

*Note: The front and rear tires may have a different tire pressure specification.*

### Tire Tread Wear

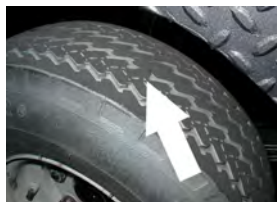
## WARNING

**DO NOT operate a vehicle if the cord is visible on any tire (see illustration). A tire in this condition may suddenly fail at any time resulting in loss of control of the vehicle.**

It is important to periodically inspect the tread on each tire for wear. Driving with inadequate tread increases the risk of losing control of the vehicle due to hydroplaning on a wet road surface. It also increases the risk of a flat tire due to road debris. Extreme tire wear can result in sudden tire failure and loss of control of the vehicle.

Refer to the maintenance schedule in this manual for the recommended tire inspection interval.

Minimum recommended tread depth is 1/16 inch (1.5 mm). There are a series of tread depth wear indicators around the circumference of the tire. They will appear as 1/2 inch (13 mm) bands across the tread as the tire approaches its wear limit (see illustration). The tire should be replaced if any tread depth indicator can be seen or any part of the tread depth is 1/16 inch or less.



## Changing a Tire/Wheel assembly

### WARNING

If you have a flat tire while driving your vehicle, it is highly recommended that you slowly and carefully drive the vehicle off of any lane of travel before attempting to change the tire. Attempting to change a tire on a lane of travel exposes you to extreme danger of being hit by other vehicles.

### NOTICE

The front axle must be removed to change the front wheel. This procedure shall only be performed by a qualified technician.

Improper installation of the front axle will result in premature failure of the front wheel bearings.

### WARNING

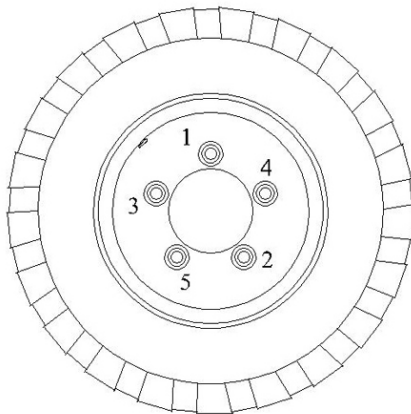
- 1) Park the vehicle on a hard level surface off of any lane of travel.
- 2) Make sure the Start switch is in the OFF position, then remove the key.
- 3) Disconnect the battery.
- 4) Confirm park brake is applied.
- 5) Place the Direction Control switch in the center OFF position.
- 6) Block the wheels 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.*

7. Loosen the wheel nuts (do not remove) before raising the tire off of the ground.
8. Raise the tire to be changed off of the ground and support with a jack stand.
9. Remove the wheel nuts and tire/wheel assembly.
10. Install the replacement tire/wheel assembly.
11. Install the wheel nuts and cross tighten per illustration below to 85 foot pounds (115 Nm).
12. Check the tire for proper inflation.
13. Lower the vehicle to the ground and remove the blocks from the wheels.
14. **Wheel nuts should be checked for tightness after first 10 Hours of operation (100 miles).**



5-Bolt Pattern



## **Replacing a Tire**

### **⚠ WARNING**

Tire replacement should only be performed by a 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**

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## **Cushions**

Clean your cushions with any standard automotive vinyl cleaner.

## **Interior**

Use a mild liquid detergent in warm water to wipe down the interior of your vehicle.

## **Exterior Body**

### **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.**

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

Finish painted surfaces 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 above the left rear wheel well.

This compartment is not sealed and requires periodic cleaning. Refer to your maintenance schedule for the recommended cleaning interval.

Remove the upper plastic 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, then the panel should be removed from the vehicle and thoroughly cleaned by a qualified technician.

# Standard Specifications

ITEM		SPECIFICATION
Occupancy		1 Driver, NO Passengers
Dimensions		86 L, 40 W x 60 H Inches
Height does not include light bar		218.4 x 101.6 x 152 cm
Ground Clearance		2.5 inches (63 mm)
Turning Radius		60 Inches (152 Centimeters)
Weight (without battery)		1900 pounds (862 kg)
Battery		36 Volts
Minimum battery height: 23.25		37.75 x 15.31 x 23.25 (95.9 x 38.9 x 59 cm)
		Lead position: B
		Lead length: 30 inches (76 cm)
		Cover
		Connector: SB350 Gray
		Max weight: 1620 pounds (734.8 kg)
		Min weight: 1320 pounds (598.7 kg)
Maximum Load		350 Pounds (159 kg)
Towing DBP*	7 mph option	280 pounds (127 kg) standard
	5 or 6 mph option	320 pounds (145 kg) standard
	All	1360 pounds (616.9 kg) ultimate
	Max Tongue Weight	50 pounds (23 kg)
Electrical System		36 Volts (traction) 12 Volts (accessories)
Transmission		Helical Gear, Oil Bath Transaxle
Motor		7.45 kW (60 minute) 3-phase AC
Maximum Speed		7 mph (11.26 kph)
Brakes		2-Wheel Hydraulic Disc + Motor Regen. Automatic Parking Brake
Steering		Electronic Power Assist, Tilt Steering Wheel
Tires	Front	4.00 x 8 Soft Solid, Non-Marking
	Rear	4.00 x 8 Soft Solid, Non-Marking
Frame		Steel Unitized Frame
Instrumentation		Combination Dash Display (Battery Status Indicator, Hour Meter, System Status Monitor), Start Switch, Horn Switch, Direction Control Switch, Light Switch
Lighting Accessories		Front Head Light, Rear Tail Light, Reverse Light, Brake Light

\*Maximum load weight specifications includes all occupants and optional items ordered with the vehicle. Load to be centered on the cargo deck.

\*\*See definition of Draw Bar Pull in Towing section of this manual

Specifications subject to change without notice.

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## **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](http://www.P65Warnings.ca.gov/passenger-vehicle).**

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