TAYLOR-DUNN®

Commercial and Industrial Vehicles Since 1949

Operator's Manual

Model R-380 Curtis DC System

The best way to go about your business

Serial Number Range:
Starting: 207315
Ending: See Introduction Chapter

Use with Model Numbers:
R0-380-36

⚠WARNING

READ AND UNDERSTAND THIS MANUAL BEFORE OPERATION OR PERFORMING MAINTENANCE.

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

My Vehicle information

Serial Number: _____.

Date Purchased: _____.

Date Delivered: _____.

Dealer Purchased From: _____.

Salesman Name: _____.

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

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

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

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(FAX) (714) 956-0504

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

CONTACT INFORMATION

Service, Parts, Sales:

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

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

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

01 (714) 956-4040

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

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

The Taylor-Dunn Corporation:

Leading Provider of Commercial & Industrial Vehicles since 1949

Taylor-Dunn Manufacturing:

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

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

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

Tiger Tractor:

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

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









Table of Contents

Introduction

Who Should Read This Manual

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

About This Manual

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

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

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

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

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

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

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

Included in this manual are:

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

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

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

⚠WARNING

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

GLOSSARY OF TERMS

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

Approved Operator Position 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.
Electrolyte	The fluid inside of a battery.
Fault	A "fault" is something that happens when the motor speed control system detects a problem with the vehicle. Some faults will prevent operation of the vehicle.
FLA battery	Flooded Lead Acid Battery. A battery that requires regular maintenance of electrolyte level.
FS-1	Switch inside of the throttle module that starts the vehicle moving.
High/Low	High speed, Low speed.
HPD	High Pedal Disable: Motor control system is disabled if the throttle is pressed before controller is turned on.
LOBB	Lift Out Battery Box, a type of removable battery.
Moderate injury	An injury treatable by first aid and/or follow up treatment by a doctor or other professional medical personnel.
Notice (signal word)	Refer to Signal Words and Their Definitions.
OPS	"Operator Protective Structure": Steel cab or cage around the occupants.
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 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.

⚠WARNING

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

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


Safety alert symbol (see above).


High voltage hazard.


Explosion hazard.


Corrosive chemical hazard.


Fire hazard.


Poisonous chemical hazard.

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


Read the operators manual.


Read the maintenance manual.


Keep arms and legs inside the vehicle.


Parking brake ON.


Parking brake OFF.


Do not get wet.


Do not spray wash.

RESPONSIBILITIES

Of the Owner...

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

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

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

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

Of the Operator...

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

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

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

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

Of the Passengers ...

The passengers are responsible to remain fully seated, keeping their hands, arms, and legs inside the vehicle at all times. Each passenger should be fully aware of the vehicle's operation. All forms of recklessness are to be avoided.

Of the Service Personnel...

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

⚠ WARNING

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

Personnel performing service and repair should have knowledge of:

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

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

VEHICLE MODIFICATIONS

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

ANSI/ITSDF 56.8-2006 Personnel and Burden Carriers

Paragraph 8.2q:

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

Paragraph 8.2r:

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

ANSI/ITSDF 56.9 – 2007 Safety Standard for Operator Controlled Industrial Tow Tractors

Paragraph 6.2.14:

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

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

1910.178(a)(4)

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

1910.178(q)(6)

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

REPLACEMENT PARTS

⚠WARNING

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

Do not modify your vehicle:

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

Using Non-OEM Replacement Components

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

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

Electrical Components

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

Mechanical Components

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

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

About Your Vehicle

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

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

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

⚠WARNING

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

Licensing Requirements

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

Vehicle compliance

This model conforms to one or more of the following:

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

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

Burden carriers

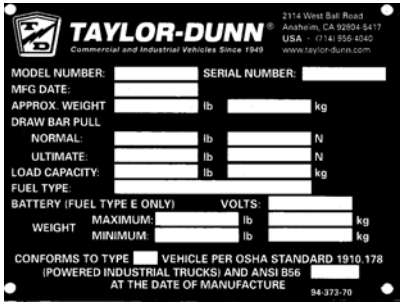
This vehicle is designed for operation in various applications including both indoor[1] and outdoor operation on paved, improved or groomed road surfaces. This vehicle should not be operated in off road areas such as a rocky environment, soft sand, or dirt roads with ruts or uneven road surfaces exceeding 4 inches.

1 *Vehicles with internal combustion engines give off various fumes, gases, and soot while running, including carbon monoxide. Do not start or run the engine in a closed or poorly ventilated building where the exhaust gases can accumulate. Breathing these gases may result severe personal injury or death. LP fuel is recommended when operating indoors but does not negate the hazards listed above.*

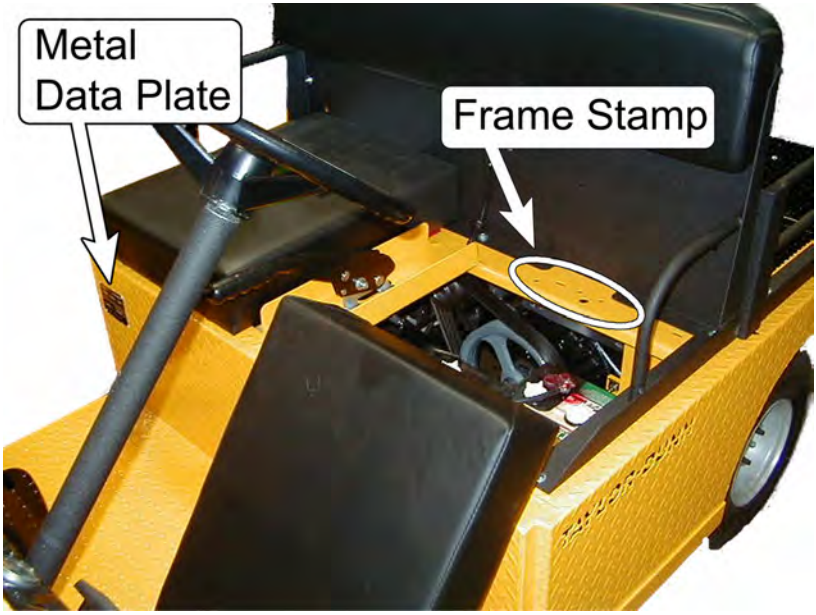
HOW TO IDENTIFY YOUR VEHICLE

Data Plate

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



Where to Find Data Plate and Serial Number



Taking Delivery

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

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

NOTICE

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

Check the operation of each of the following controls:

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

WHAT TO DO IF A PROBLEM IS FOUND

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

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

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

⚠WARNING

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

Operator Training

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

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

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

The Operator Training program shall include the following:

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

Driver Qualifications

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

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

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

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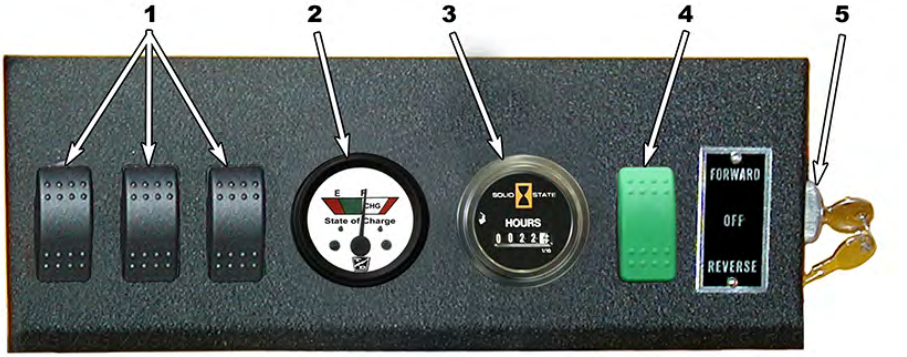
Vehicle Controls



1:Accessory Switches

These will control various accessories that may have been equipped on your vehicle.

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

2: Battery Status Indicator

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

3: Hour Meter

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

4: Direction Control Switch

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

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

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

5: Start Switch

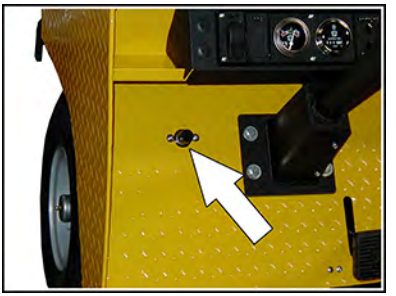
The Start switch turns the vehicle electrical control system ON. This switch may or may not require a key to operate. Rotate the switch clockwise to turn the vehicle system "ON" and counterclockwise to turn the vehicle system "OFF". The vehicle will not run when in the OFF position.

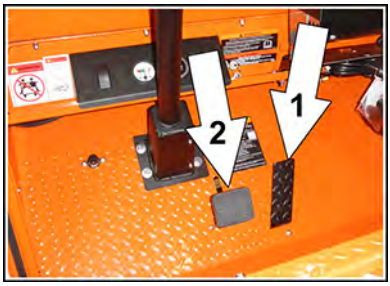
The switch should be in the "OFF" position whenever the operator leaves the driver's seat.

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

Horn Switch

Press the horn switch with your left foot to sound the horn, release it to turn it off.





1: Throttle Pedal

The throttle pedal is located to the right of the brake pedal. It controls the speed of the vehicle and operates similar to the throttle pedal in an automobile. Press the pedal to increase speed and release the pedal to decrease speed.

2: Foot Brake Pedal

The foot brake pedal is located to the left of the throttle pedal. This pedal is designed for operation with the drivers right foot. It works similar to the brake in an automobile. Applying pressure to the brake pedal slows the vehicle according to the amount of pressure applied. Relieving pressure from the pedal releases the braking action.

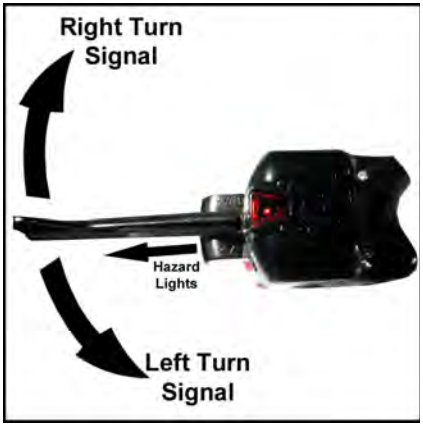
Parking Brake

The parking brake is actuated with a hand lever, which is located to the right of the driver. To set the parking brake, push down on the brake pedal and pull the lever up and back until it locks. To release the park brake, press the foot brake pedal and push the brake lever forward and all of the way down.

Note: The parking brake can be adjusted by rotating the knob on the end of the handle.

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.



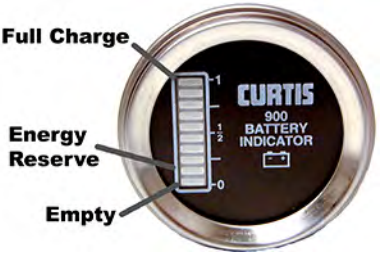
Turn Signal Switch

Optional. The turn signal switch lever is located on the left side of the steering column. Push the lever forward to activate the right turn signal and pull the lever back to activate the left turn signal. The switch is not self canceling. You must return the switch to the center, off position after the turn is completed.

Hazard Light Switch

The hazard light switch is located on the Turn Signal Switch. The switch is a small tab or knob under the turn signal lever. To activate the hazard lights, pull the tab out. To turn the hazard lights off, push the turn signal lever forward or back.

Battery Status Indicator: Bar Graph



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

Battery Status Indicator: Analog

This gauge went into production July, 2015.

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

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

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

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

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

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

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

Note: Accuracy of the gauge at full scale is ±4% at 77°F (25°C).

Interlocks

Operator Presence: A switch located under the driver's seat disables the power to the vehicle when the driver leaves the seat. The driver must be seated 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.

Built in Charger: If equipped with a built in charger, the charger interlock is designed to disable the vehicle from being driven while the AC charger cord is plugged into a functioning power source. This interlock is located inside the charger cabinet.

Battery Door: Two switches located on the inner left and right side panels disables power to the vehicle whenever the battery doors are removed or not properly installed.

Vehicle Operation

General Safety Guidelines

⚠WARNING

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

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

⚠WARNING

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

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

⚠WARNING

When leaving the approved operating position ALWAYS:

1) Firmly set the park brake.

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

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

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

- Only qualified and trained operators with no physical, mental, or sensory disabilities shall operate this vehicle or any of its components..
- 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.
- All occupants shall remain seated while the vehicle is in motion, one passenger per seating position. No passengers are allowed to be transported in the cargo area of the vehicle.
- The operator shall confirm that all passengers 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 transport small children. This vehicle is not designed to accommodate child seats.
- Do not leave children unattended in the vehicle.
- Keep a clear view ahead at all times.
- Keep the vehicle under control at all times.
- Observe all traffic regulations and speed limits.
- The vehicle shall be equipped with head and tail lights if operated at night.
- This vehicle may overturn if turned sharply when driven at high speeds.

- Drive slowly when making a turn, especially if the ground is wet or when driving on an incline.
- Yield right of way to pedestrians, ambulances, fire trucks, or other emergency vehicles.
- Sound your horn when approaching pedestrians. DO NOT assume the pedestrian is aware of your presence; before passing, slow down and allow sufficient clearance between the vehicle and pedestrian.
- Do not overtake another vehicle at intersections, blind spots, narrow isles, or other dangerous locations.
- Stop and sound horn at all intersections regardless if it is posted with a stop sign.
- Do not operate this vehicle in areas at risk to falling objects.
- Do not drive over loose objects, holes, or bumps.
- Do not drive under any object that is less than 80 inches (203 cm) from the ground.
- Do not drive off of curbs or other steep drop-offs more than 2 inches high.
- Stay in your driving lane under normal conditions, maintaining a safe following distance from other vehicles.
- If equipped with doors, the doors must remain closed and latched while vehicle is in motion.
- Driving through water or mud may affect brake performance. ALWAYS test brakes by pressing the brake pedal after driving through water or mud.

⚠WARNING

When leaving the approved operating position ALWAYS:

1) Firmly set the park brake.

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

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

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

Collisions or Accidents

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

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

Tip Over

In the event of a tip over AND the vehicle is equipped with OPS, stay inside the confines of the vehicle. Exit the vehicle after the vehicle has come to a complete stop.

In the event of a tip over and the vehicle IS NOT equipped with OPS, Quickly exit the vehicle and quickly move out of its path.

Seat Belts (optional)

Your vehicle may be equipped with safety seat belts. The requirement for the use of safety seat belts is to be determined by the application where the vehicle is operated.

Safety seat belts should only be installed on vehicles equipped with Taylor-Dunn approved Operator Protective Structure (OPS) such as a steel cab or cage. Fiberglass cabs or sun tops do not qualify as an OPS.

The use of safety seat belts helps to restrain you and your passengers in case of a collision.

Safety belts provide the best restraint when:

- The occupant is sitting upright (not slouched)
- The lap belt is snug and low on the hips
- The shoulder belt is snug against the chest
- The knees are straight forward

Refer to the following pages for directions on how to properly use safety belts.

⚠WARNING

In the event of a vehicle tip over, studies have indicated that it is safer to be able to move away from the vehicle unless the vehicle is equipped with an OPS.

Do not use seat belts unless the vehicle is equipped with an OPS. Using seat belts in a vehicle without OPS may result in occupants being crushed while restrained in the vehicle.

⚠WARNING

- **Do Not use seat belts in a vehicle that is not equipped with roll over protection.**
- **Make sure you (the driver) and all passengers are properly seated in approved seating positions and wearing seat belts. Improper sitting and/or failure to wear seat belts may result in severe bodily injury in a collision or other vehicle accident.**
- **If equipped with a shoulder belt, do not wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder.**
- **Never use a single belt for more than one person or across more than one seating position.**
- **Do not allow a passenger to hold a child while the vehicle is moving. The passenger cannot protect a child in a collision and the child may be severely injured.**
- **Failure to follow these rules will increase the risk of injury in a collision or other vehicle accident.**
- **All seat belts and seat belt hardware should be inspected by a qualified technician after any collision. Failure to confirm proper operation of seat belt assemblies may result in failure of the seat belt in another collision leading to severe bodily injury.**

⚠WARNING

Doors (optional) on this vehicle are designed for protection against the weather. Do not rely on the doors to keep the occupants contained within the vehicle or to protect against injury in an accident.

All Seat Belt Types

Refer to additional information below for details applying to different types of seat belts.

Before fastening the seat belt:

- If equipped with adjustable seats, adjust the seat to the position that suits you best.
- Make sure the shoulder and/or lap belt is not twisted and freely passes through any guides.

To unfasten the belt, Push the release button in the buckle.

Combination Lap and Shoulder Belts

While your vehicle is in motion, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, corner hard or if your vehicle receives an impact of 5 mph (8 kph) or more, the lap and shoulder belt locks and helps reduce your forward movement. The retractor can also be made to lock by rapidly pulling on the belt.

To fasten the belt, pull the lap/shoulder belt from the retractor so that the shoulder portion of the belt crosses your shoulder and chest. Insert the belt tongue into the proper buckle until you hear a snap and feel it latch.

To unfasten the belt, Push the release button on in the buckle. This allows the tongue to unlatch from the buckle. Guide the tongue to its stowed position while the belt retracts. If you do not guide the tongue, it may strike you or part of the vehicle.

Lap Belts Only

With Auto Retractor: To fasten the belt, pull the belt from the retractor and insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Make sure the tongue is securely fastened in the buckle.

When unfastening the belt, guide the belt tongue to its stowed position. If you do not guide the tongue, it may strike you or part of the vehicle.

Without Auto Retractor: To fasten the belt, insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Pull the belt adjustor strap until the belt is snug against your lap.

After unfastening the belt, stow the belt in a position so that it cannot fall out of the vehicle while the vehicle is in motion and the belt is not in use.

Seat Belts While Pregnant

If equipped with seat belts, always wear a seat belt. Wearing your seat belt protects you and your baby from injury or death in the event of a collision. You should wear a seat belt no matter where you sit in the vehicle.

Be sure to wear your seat belt correctly. The lap strap should go under your belly, across your hips and as high as possible on your thighs. The shoulder strap should go between your breasts and off to the side of your belly. Seat belt straps should never go directly across your stomach. The seat belt should fit snugly.

Safety Belt Maintenance

Check the safety belt systems periodically to make sure that they work properly and are not damaged.

All safety belt assemblies, including retractors, buckles, front seat belt buckle support assemblies and attaching hardware, should be inspected by a qualified technician after any collision.

Taylor-Dunn recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Starting

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

Note: This vehicle is equipped with a charger interlock which is designed to disable the vehicle from being driven while the AC charger cord is plugged into a functioning power source.

⚠WARNING

DO NOT transport passengers in the cargo area. All passengers must be seated in the available seats, one passenger per seating position.

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

⚠WARNING

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

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

DO NOT place or store any object on the driver or passenger seats. Any object placed on the driver seat may turn on the operator presence switch; Any object placed on the passenger seat may fall onto the driver seat and 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 passenger seat or front floorboard. Objects may interfere with vehicle operation causing severe bodily injury and/or property damage.

1. Make sure all occupants are properly seated and prepared for vehicle movement.
2. Sit in the approved operator position and press the service brake pedal.
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 throttle pedal 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 not turn the Start switch OFF while the vehicle is in motion unless the vehicle must be stopped due to an emergency. This vehicle may be 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.

⚠WARNING

DO NOT "ride the brakes" or drive with your left foot resting on the brake pedal.

Riding the brakes will cause excessive heat build up and rapid wear in the brake system and could result in brake failure causing a collision or accident with severe injury.

Selecting Direction of Travel

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

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

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

Note: The alarm will only sound while the throttle pedal is pressed.

Changing Direction of Travel

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

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

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

Driving in Forward

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

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

Driving in Reverse

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

Emergency Stop Switch

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

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

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

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.

Release the throttle pedal and use your right foot to press the brake pedal. The amount of force required to stop the vehicle will vary depending on the environment and load on the vehicle.

Unless in an emergency, do not turn the start witch OFF until the vehicle has come to a complete stop. This vehicle may be equipped with an optional electromagnetic park brake. Turning the start switch OFF will immediately engage the brake and abruptly stop the vehicle. If this is done while is still in motion then it will result in accelerated wear of the park brake.

Parking

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

Note: If parking this vehicle on an incline, turn the wheels to the curb, or block the wheels.

Transporting Pets

Pets should only be transported in a pet carrier that is securely tied down on the rear cargo deck.

Loading Cargo

⚠WARNING

DO NOT transport or load cargo in the front passenger area or leave loose items on the front floorboard. Cargo placed in the front passenger area may interfere with the driver causing loss of control of the vehicle and result in a collision or accident with severe injury.

- Before loading or unloading cargo:
  1. Place the Direction Control switch in the center OFF position.
  2. Turn the start switch OFF
  3. Set the park brake.
- Do not transport cargo that is wider than the vehicle.

⚠WARNING

DO NOT transport passengers in the cargo area. All passengers must be seated in the available seats, one passenger per seating position.

- Do not load cargo in the passenger compartments.
- Use only Taylor-Dunn approved cargo accessories.
- Do not exceed the load capacity of the vehicle.
- The standard designated cargo area is the rear deck. Only load cargo on the deck unless the vehicle has been equipped with Taylor-Dunn approved alternative cargo storage areas.
- Cargo shall only be transported in the designated cargo area of the vehicle and evenly distributed with the center of gravity close to the center of the designated cargo area.
- All cargo shall be secured to prevent falling from the vehicle, falling into a operator or passenger compartment, or shifting position while the vehicle is in motion.
- Our deck enclosures and covers such as cabs, fiberglass tops, surrey tops, cargo boxes, and similar structures are not designed to carry cargo or accessories unless equipped from the factory. Mounting additional weight on these structures may result in sudden failure of the cover and/or cover supports causing severe personal injury.
- Cargo consisting of fluid in tanks shall have fluid baffles in the tank to help reduce sloshing and shifting load weight.

Vehicle Load Capacity, Definition

The rated maximum load capacity of a vehicle is the load carrying capacity of the ***standard*** model. The maximum load is on the vehicle's data plate.

Occupants and optional equipment added to the vehicle at time of manufacture or installed after delivery by the dealer or user reduces the capacity.

Example: Standard Load Capacity = 3,000 pounds:
3,000 - Driver (200) - Steel Cab/Doors Option (300) - Cargo Box (400) = 2,100 pounds maximum load on deck. Add a passenger and the maximum load is reduced to 1,900 pounds.

The definition of maximum load is the maximum weight than can be carried on a vehicle under ideal conditions. There are many conditions that will reduce the maximum safe load a vehicle can carry.

Some of these conditions are, but not limited to:

- Uneven road surface.
- Tall loads.
- Wide loads.
- Long loads.
- Liquid loads (sloshing).
- Traveling up or down grades.
- Traveling across grades.

The rated capacity assumes the load has a low center of gravity and is centered on the deck. As example: A 20 foot tall, 3,000 pound statue on the deck of a 3,000 pound capacity vehicle is not approved.

Liquid loads sloshing around in a tank will shift the center of gravity and may result in stability and braking issues. Liquid loads must be secured and have fluid baffles in the tank to help reduce shifting load weight due to sloshing.

TOWING

⚠WARNING

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

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

Towing a Trailer

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

When towing trailers:

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

Draw Bar Pull (DBP), Definition

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

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

Tow tractor DBP specifications, definition:

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

Notes:
Tow tractor DBP specifications are based on:

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

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

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

The load capacity and towing capacity of a burden carrier cannot be combined. The towing capacity is reduced as weight is added to the burden carrier. This weight includes the passengers and optional equipment as well as the load on the deck.

The formula for calculating reduced towing capacity DBP is:

Reduced DBP = DBP - Vl * (DBP/Vc) where:

- Vc = Vehicle Rated Capacity
- DBP = Normal Draw Bar Pull specification
- Vl = Vehicle Load (includes passengers and options)

The weight that the vehicle can pull can be calculated based on the DBP. This capacity would be for a single standard 4-wheel trailer with a front steer axle and includes the weight of the trailer.

- Level Surface: Towed Weight = DBP * 50
- Up a grade: Towed Weight = DBP/(2 + %g) * 100 where %g = the percent of grade

Towing the Vehicle

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

⚠WARNING

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

⚠WARNING

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

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

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

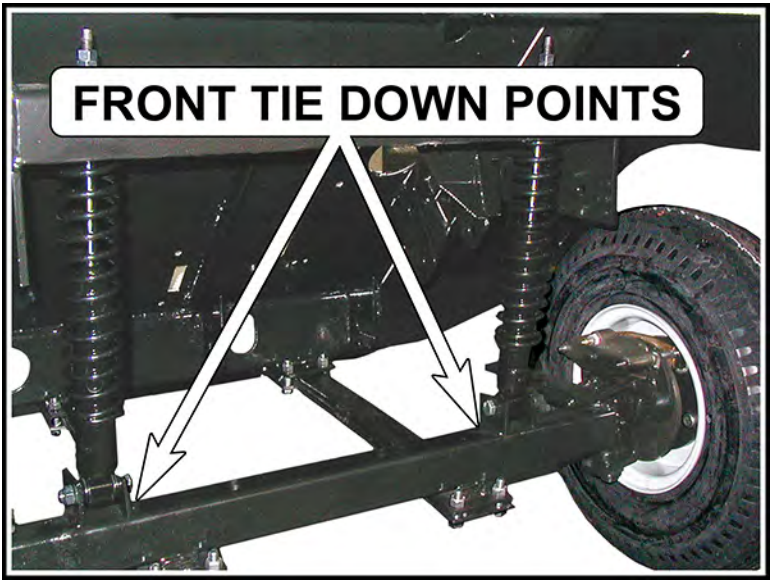
⚠WARNING

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

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

1. Attach a tow strap to the front bumper tow-bar.
2. Turn the start switch off and place the direction control switch in the center off position.
3. Use another driver to steer this vehicle while it is being towed. Be sure the driver uses the brakes 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.

Tie Downs for Transportation



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.**
- **The Signet, Lester, and Delta-Q chargers are for lead acid batteries only. Charging other types of batteries may cause the battery to burst or explode causing severe personal injury and/or property damage.**
- **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.**
- **This charger requires a standard household 15 Amp electrical circuit. Before plugging the charger in, confirm that your charging station is configured correctly. DO NOT attempt to charge two vehicles on one standard household 15A circuit. Failure to confirm the proper charging station configuration or attempting to charge two vehicles may result in fire.**
- **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.

Delta-Q QuiQ Charger

Description of Operation

NOTICE

Confirm the chargers active profile is the same type as the batteries installed in the vehicle. Charging with an incorrect profile will result in premature failure of the batteries.

The Delta-Q QuiQ is designed as an automatic charger. It is available with charging profiles for SLA and FLA batteries. The charger turns itself on when it is plugged into the wall outlet and turns off when the batteries are fully charged. The charger continues to monitor the battery voltage and if the battery voltage drops below a threshold value, the charger will turn on again for a short cycle to keep the batteries topped off.

The charger face plate has a series of lamps to enable monitoring of the charging cycle. More details of the lamp's operation are shown later in this section.

Charging with the QuiQ Charger

⚠WARNING

Refer to grouped safety warnings and information at the start of this chapter.

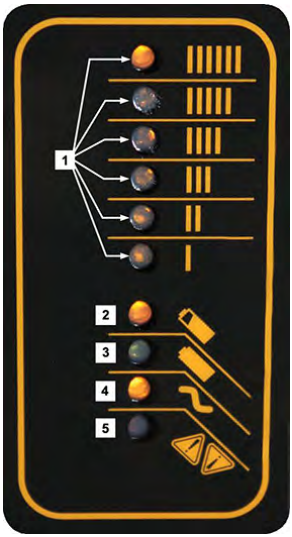
Note: Opportunity charging is not recommended. For maximum battery life, it is recommended that the batteries be discharged a minimum of 30% (7 bars showing on the BSI) before starting a charging cycle.

This charger requires a standard household electrical circuit rated at a minimum of 15 Amps. Consult an authorized electrician if you do not know the configuration of your circuits.

1. Park the vehicle at an authorized charging station. Refer to Parking in the Driving section.
2. Connect the charging cord to the vehicle charging port and then plug the cord into the AC power receptacle.
3. The charger status LEDs will flash in sequence as the charger performs a self-diagnosis and systems check.
4. The charger will start the charging cycle only after it has determined that all systems are OK.

Note: It is recommended that the charging cycle be allowed to complete normally before disconnecting the AC power cord.

There is a status light panel on the charger faceplate that displays the current status of the charger.



1) Ammeter

- **Solid**: Displays scale of output during bulk phase.
- **Flashing**: Output has been reduced due to high internal charger temperature.
- **No battery connected**: Displays charge profiles 1-6.

2) Bulk Charge Indicator

- **Solid**: Bulk charge phase completed (80% charged) and is in absorption phase.
- **Flashing**: Displays charge profile number if no battery is connected.

3) Charge Completion Indicator

- **Solid**: Charging complete and maintenance mode is active.
- **Flashing**: Absorption phase completed and is in finishing phase.

4) AC Indicator

- **Solid**: AC power is present.
- **Flashing**: Low AC voltage. Refer to qualified technician.

5) Fault Indicator

- Charger fault. Refer to troubleshooting information below.

Troubleshooting Instructions

If a fault occurs, count the number of flashes between pauses and refer to the table below.

Note: If there is no discernible pause then it is an indication of fault code 1.

Code	CAUSE	SOLUTION
1	High battery voltage	Check battery size and condition. Fault will clear automatically once the condition has been corrected.
2	Low battery voltage	Check battery size and condition. Fault will clear automatically once the condition has been corrected.
3	Charge time out caused by battery pack not reaching required voltage or charger output reduced due to high temperatures.	Check battery connections. Confirm that the battery type matches selected charge profile Operate the charger at a lower ambient temperature. Reset the charger by interrupting AC power for 15+ seconds.
4	Battery could not be trickle charged up to minimum voltage.	Check for shorted or damaged cells. Reset the charger by interrupting power for 15+ seconds.
5	Charger shutdown due to high internal temperature.	Ensure sufficient cooling airflow. Reset the charger by interrupting AC power for 15+ seconds.
6	Internal charger fault	Reset the charger by interrupting AC power for 15+ seconds. Refer to qualified technician if fault persists.

Lester Summit Charger

Description of Operation

The Summit charger is designed as an automatic charger. It is available with charging profiles for SLA and FLA batteries. Refer to the spec plate on the charger for the type of battery it is configured for. Use of different batteries not listed on the spec plate may result in premature failure of the batteries.

The charger turns itself on when it is plugged into the wall outlet and turns off when the batteries are fully charged. The charger continues to monitor the battery voltage and if the battery voltage drops below a threshold value, then the charger will turn on again for a short cycle to keep the batteries topped off.

There are three lamps on the charger used to indicate the active charging status and if any faults occurred during the charging cycle.

Status Lamps

Charging with the Summit Charger

⚠WARNING

Refer to grouped safety warnings and information at the start of this chapter.

Note: Opportunity charging is not recommended. For maximum battery life, it is recommended that the batteries be discharged a minimum of 30% (7 bars showing on the BSI) before starting a charging cycle.

This charger requires a standard household electrical circuit rated at minimum of 15 Amps. Consult an authorized electrician if you do not know the configuration of your circuits.

1. Park the vehicle at an authorized charging station. Refer to Parking in the Driving section.
2. Connect the charging cord to the AC power receptacle.
3. The charger will start the charging cycle after it has determined that all systems are OK. This will be indicated by the Status lamp flashing slowly (≈1/second).

Note: It is recommended that the charging cycle be allowed to complete normally before disconnecting the AC power cord.

The Charge Status lamp (yellow) will indicate the active charging phase as follows:

- **Slow flash**: Charge cycle is ON and is in constant current mode.
- **Rapid flash**: Charge cycle is ON and is in constant voltage mode.
- **Solid**: Charge cycle is in finish mode.

The Charge Complete lamp (green) will indicate the charging status as follows:

- **Slow flash:** Charge cycle is complete and is in post charging phase.
- **Rapid flash:** Normal cycle is complete and now in equalizing phase.
- **Solid:** Charge cycle is complete.

The FAULT lamp will turn ON solid or flash only if an abnormal charging condition has occurred. All three lamps are used to indicate a fault condition. Refer to the following fault code table for more information.

Fault lamp	Status lamp	Complete lamp	Fault Description
Slow flash	OFF	ON	Charger overheated
Slow flash	ON	OFF	Battery voltage below 10 volts
Slow flash	OFF	OFF	AC power interrupted. This fault will only display for 1 minute and then clear.
Slow flash	ON	Slow flash	Charger internal fault
Slow flash	Slow flash	OFF	Charger internal fault
Slow flash	Slow flash	ON	Charger internal fault
Fast flash	-	-	Charger internal fault
The following conditions are an indication of battery problems			
ON	OFF	OFF	Time out: One or more charging phases exceeded a time limit
ON	OFF	Slow flash	Battery voltage exceeded threshold indicating one or more faulty batteries
ON	OFF	ON	Battery voltage too low indicating one or more faulty batteries
ON	Slow flash	OFF	Time out: Possible too large AH battery installed.
ON	Slow flash	Slow flash	Time out: Total charging time exceeded a time limit indicating one or more faulty batteries

NOTICE

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

Charging Time

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

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

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

NOTICE

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

To Obtain the Maximum Battery Life

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

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

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

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

New Battery Break In

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

AC Power Source

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

⚠WARNING

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

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

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

Signet Model HBS Charger

NOTICE

This charger is rated for 115 VAC or 230 VAC operation (nominal). When switching from one input voltage to the other, wait until all LED's are off. Switching voltage when any of the LED's are on will result in damage to the charger.

⚠WARNING

This charger requires a standard household 15 Amp electrical circuit. Before plugging the charger in, confirm that your charging station is configured correctly.

DO NOT attempt to charge two vehicles on one standard household 15A circuit.

Failure to confirm the proper charging station configuration or attempting to charge two vehicles may result in fire.

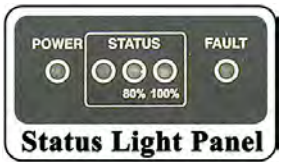
NOTICE

Sealed Lead Acid batteries (SLA) must be charged with a charger configured for SLA batteries. Use of any other charger will result in damage and premature failure of the batteries.

Description of Operation

The Signet model HBS charger is designed as an automatic charger. It is available with charging profiles for SLA and FLA batteries. The charger turns itself on when it is plugged into the wall outlet and turns off when the batteries are fully charged. The charger continues to monitor the battery voltage and if the battery voltage drops below a threshold value, then the charger will turn on again for a short cycle to keep the batteries topped off.

The charger face plate has a series of lamps to enable monitoring of the charging cycle. More detail of the lamp operation is later in this section.



Charging with the Signet Model HBS Charger

⚠WARNING

Refer to grouped safety warnings and information at the start of this chapter.

Note: Opportunity charging is not recommended. For maximum battery life, it is recommended that the batteries be discharged a minimum of 30% (7 bars showing on the BSI) before starting a charging cycle.

This charger requires a standard household electrical circuit rated at minimum of 15 Amps. Consult an authorized electrician if you do not know the configuration of your circuits.

1. Park the vehicle at an authorized charging station. Refer to Parking in the Driving section.
2. Connect the charging cord to the AC power receptacle.
3. The charger status LED's will flash in sequence as the charger performs a self diagnosis and systems check.
4. The charger will start the charging cycle only after it has determined that all systems are OK.

Note: It is recommended that the charging cycle be allowed to complete normally before disconnect the AC power cord.

A beeping noise from the charger is an indication of a fault during the charging cycle. Refer below for fault information.

There is a status light panel on the charger faceplate that displays the current status of the charger. The first light on the left (POWER) should be ON when the AC cord is connected to a working AC power source.

The three STATUS LED lights will indicate the current charging condition as follows:

- **Left**: Charge cycle is ON and is in constant current mode.
- **Left & Middle** (80%): Charge cycle is ON and is in constant voltage mode.
- **Right** (100%): Charge cycle completed.

The FAULT light will turn ON and flash a fault code only if an abnormal charging condition has occurred. Refer to the following fault code table for more information.

Note: Critical faults will be accompanied with an audible beeping.

Fault Code	Description	Action Required
1 (no flash)	Time out	The charging cycle did not complete when expected. This could be due to too deep of a discharge or faulty batteries. If the fault reoccurs, have the batteries tested by a qualified technician.
2*	Open circuit or reverse polarity to the battery	Check the charger connections to the battery.
3*	Battery voltage too high	Wrong charger installed. Confirm that the charger voltage matches the battery voltage.
4	Charger overheated	Check for dirt, mud, or other debris on the charger cooling fins and clean as needed.
5*	AC line voltage out of range	**Check the input AC line voltage. The voltage must be within 85-135 VAC or 170-264 VAC
6	Low battery voltage	Battery discharged too deep, faulty battery, or incorrectly wired battery. The charger will operate in low current mode until the battery voltage is up to a normal level then resume normal charging. If this fault does not reset, have the battery tested by a qualified technician and check the battery wiring.
*	These faults will be accompanied with an audible beep and indicates that the charging cycle was terminated prematurely.	
**	Only a qualified electrician should check the AC line voltage	

Signet Model HB Charger

NOTICE

This charger is rated for 115 VAC or 230 VAC operation (nominal). When switching from one input voltage to the other, wait until all LED's are off. Switching voltage when any of the LED's are on will result in damage to the charger.

NOTICE

Sealed Lead Acid batteries (SLA) must be charged with a charger configured for SLA batteries. Use of any other charger will result in damage and premature failure of the batteries.

⚠WARNING

This charger requires a standard household 15 Amp electrical circuit. Before plugging the charger in, confirm that your charging station is configured correctly.

DO NOT attempt to charge two vehicles on one standard household 15A circuit.

Failure to confirm the proper charging station configuration or attempting to charge two vehicles may result in fire.

The Signet® HB series chargers use a semi-automatic charging system. The charger will turn itself ON when the AC power cord is connected to the AC power source and turn itself OFF when the batteries are fully charged. Refer to the data plate on the charger for the voltage and type power required for the charger.

There is a series of LED's on the faceplate of the charger that serve two functions:

1. Status of charge. The LED's will display an approximate percent of charge during the charging cycle. Refer to the table below.
2. Error condition. All three LED's flashing is an indication of a charging problem (charger will also be beeping). Refer to the Charger Troubleshooting section for information on error codes.

Charging State	LED1	LED2	LED3
0 to 50%	Blinking	OFF	OFF
50% to 75%	ON	Blinking	OFF
75% to 100%	ON	ON	Blinking
Cycle complete	ON	ON	ON

Typical Charger Data Plate
(your data plate may vary)

Charging with the Signet Model HB Charger

⚠WARNING

Refer to grouped safety warnings and information at the start of this chapter.

Note: Opportunity charging is not recommended. For maximum battery life, it is recommended that the batteries be discharged a minimum of 30% (7 bars showing on the BSI) before starting a charging cycle.

This charger requires a standard household electrical circuit rated at minimum of 15 Amps. Consult an authorized electrician if you do not know the configuration of your circuits.

1. Park the vehicle at an authorized charging station. Refer to Parking in the Driving section.
2. Connect the charging cord to the AC power receptacle.
3. The charger status LED's will flash in sequence as the charger performs a self diagnosis and systems check.
4. The charger will start the charging cycle only after it has determined that all systems are OK.

Note: It is recommended that the charging cycle be allowed to complete normally before disconnecting the AC power cord.

A beeping noise from the charger is an indication of a fault during the charging cycle. Refer below for fault information.

There is a status light panel on the charger faceplate that displays the current status of the charger. The first light on the left (POWER) should be ON when the AC cord is connected to a working AC power source.

The three STATUS LED lights will indicate the current charging condition as follows:

- **Left**: Charge cycle is ON and is in constant current mode.
- **Left & Middle** (80%): Charge cycle is ON and is in constant voltage mode.
- **Right** (100%): Charge cycle completed.

All three lights flashing at the same time indicates that an abnormal charging condition has occurred. Refer to the following fault code table for more information.

Note: Critical faults will be accompanied with an audible beeping.

Error Code	Description	Action Required
1*	Reverse polarity or open circuit to the batteries	Check wiring for corrosion, loose connections, broken wires and proper connection to the batteries
2	AC line voltage too high or too low	Check the input voltage. It must be within 96-132VAC or 196-266VAC
3	Charger overheated	Wait for charger to cool, the charger will automatically restart. Inspect for dirt or debris on the charger cooling fins and clean as required.
4	Input or Output over current	Charger will automatically correct for this condition and restart

* - In many cases fault 1 will only be displayed for a short amount of time and then the charger will attempt to restart. Typically, the fault will repeat 8 times and then the charger will start the boot up process with the 50% light on. If the charger cannot restart then the fault loop will start again, repeating the fault 1.

This fault could be a result of an open connection between the charger and batteries, an open connection on one or more of the battery cables, or an open connection internal of the charger.

Before replacing the charger, confirm all battery wiring is good.

X-Series Charger

NOTICE

This charger is available for 115 VAC or 230 VAC operation (nominal). Confirm the charger installed is correct for the AC voltage power source before connecting the charger. Connecting to improper voltage will damage the charger.

NOTICE

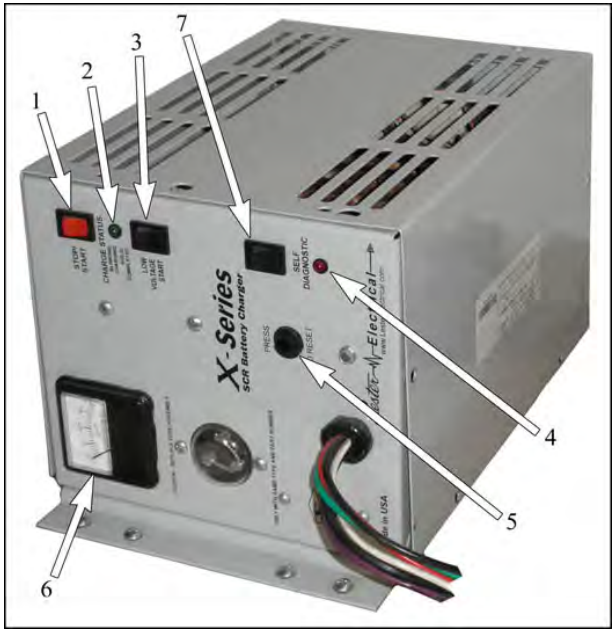
Sealed Lead Acid batteries (SLA) must be charged with a charger configured for SLA batteries. Use of any other charger will result in damage and premature failure of the batteries.

Description of Operation

The X-Series chargers are designed as automatic chargers. The charger turns itself on when it is plugged into the wall outlet and turns off when the batteries are fully charged.

There is a user interface on the charger. The interface consists of the following:

1. Start/stop switch: When pressed, the charging cycle will be terminated or restarted.
2. Charging status light: Indicates the current status of the charging cycle. The light will start flashing when the charging cycle is started. It will stop flashing and remain ON when the cycle has completed. Also used for fault indication along with the fault light (4).
3. Low voltage start switch: When pressed, will start the charge cycle if the battery voltage is too low for an automatic start.
4. Fault light: Along with the status light (2), displays faults after self diagnosis is completed.
5. AC Circuit breaker: If circuit breaker trips, push it back in to reset. If it trips again, contact qualified repair technician.
6. Ammeter: Indicates the current flowing into the battery during the charging cycle.
7. Self diagnostic switch: Starts the charger self diagnosis procedure (details later in this section).



Charging with the X-Series Charger

⚠WARNING

Refer to grouped safety warnings and information at the start of this chapter.

Note: Opportunity charging is not recommended. For maximum battery life, it is recommended that the batteries be discharged a minimum of 30% (7 bars showing on the BSI) before starting a charging cycle.

This charger requires a standard household electrical circuit rated at minimum of 15 Amps. Consult an authorized electrician if you do not know the configuration of your circuits.

1. Park the vehicle at an authorized charging station. Refer to Parking in the Driving section.
2. Connect the charging cord to the AC power receptacle.
3. The charger should start automatically.
   If the charger does not start, then press and hold the “Low Voltage Start” switch for about 10-seconds. If the charger does not remain ON after releasing the switch, then try again. If the charger refuses to start, then have the batteries and charger tested by an qualified technician.

Self Diagnosis Procedure

If you suspect a battery charging problem press the self diagnostic switch to start the charger self diagnostic procedure. Any faults found by the procedure will be displayed by the two LED’s. Refer to the table below for the fault codes.

Note: To run this procedure, a battery that is not severely discharged must be connected to the charger.

Fault LED	Status LED	Action Required
OFF	OFF	• No faults found.
Flashing	Flashing	• Battery voltage either too high or too low. Confirm that the correct battery and charger is installed in the vehicle. • Faulty battery, will not accept a charge. • Battery installed is too large (Amp Hours).
ON	ON or Dim	• *Faulty charger
Flashing	ON	• *Faulty charger
ON	Flashing	• **AC input voltage is out of range. Confirm that the AC outlet has the correct voltage for the charger. • *Charger circuit breaker tripped. Reset the breaker by pushing the button. If the fault reoccurs, then it indicates a faulty charger.
ON	ON	• *Faulty charger.
Flashing	OFF	• ***Charger programmed incorrectly
*	Refer charger repair to a qualified technician	
**	Only a qualified electrician should check the AC line voltage	
***	Continued use of the charger may damage your batteries. Refer charger repair to a qualified technician	

Lestronic II Charger

NOTICE

This charger is available for 115 VAC or 230 VAC operation (nominal). Confirm the charger installed is correct for the AC voltage power source before connecting the charger. Connecting to improper voltage will damage the charger.

NOTICE

Sealed Lead Acid batteries (SLA) must be charged with a charger configured for SLA batteries. Use of any other charger will result in damage and premature failure of the batteries.

Description of Operation

The Lestronic II charger is a semi-automatic charging system. The charger will turn itself ON when the AC power cord is connected to the AC power source and turn itself OFF when the batteries are fully charged.

Charging with the Lestronic II Charger

Note: Opportunity charging is not recommended. For maximum battery life, it is recommended that the batteries be discharged a minimum of 50% before starting a charging cycle.

This charger requires a standard household electrical circuit rated at minimum of 15 Amps. Consult an authorized electrician if you do not know the configuration of your circuits.

1. Park the vehicle at an authorized charging station. Refer to Parking in the Driving section.
2. Connect the charging cord to the AC power receptacle.
3. The charger should start automatically.

When plugged in, the charger assumes that the batteries require charging and will charge for a minimum of approximately 4-hours. This charger should not be plugged in until the batteries are discharged beyond 50% or the batteries may be overcharged.

Storing and Returning to Service

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

Storing Your Vehicle

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

NOTICE

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

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

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

Returning to Service

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

Vehicle Maintenance

Daily Inspection

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

- External frame damage (body).
- Operation of all lights, warning alarms.
- Smooth and proper operation of seat belts (if equipped).
- Inspect for leaking fluids or grease.
- Tire tread or sidewall damage.
- Smooth and proper operation of all controls such as but not limited to:
  - Throttle pedal
  - Brake pedal
  - Steering
  - Horn
  - Parking brake
  - Including other special order controls.
- Proper operation of all locking devices such as but not limited to:
  - Tool box
  - Removable battery trays
  - Battery lid (seat frame)
  - Cargo box
  - Cab doors
  - Including other special order locking devices.
- Proper operation of all interlocking switches such as but not limited to:
  - Start switch
  - Operator presence switch
  - Charger interlock switch
  - Including other special order interlocking switches.

Pre-Operation Inspection

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

- Confirm all removable seat cushions are correctly installed and secured in position. .
- Rear and side view mirror adjustments.
- Steering operation.
- Brake operation (service and park brake).
- Tire pressure (visual inspection only).
- Trailer hitch operation, latch, and wear.

⚠WARNING

Remove cargo before raising the vehicle, raising or removing the deckboard, or servicing the 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.

All procedures shall be performed with the charger disconnected from its power source except for the procedure testing the charger interlock. If using a portable charger, disconnect the charger cable from the vehicle.

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

Start Switch

Sit in the approved operator position, turn the start switch OFF and select a direction, then slowly press the throttle pedal.

- The vehicle should not operate.

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

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

- The vehicle should operate normally.

High Pedal Disable (HPD)

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

Press and hold the throttle pedal to the floor.

Select a direction:

- The vehicle should not move

Release the throttle pedal and press again.

- The vehicle should operate normally.

Operator Presence Switch

Sit in the approved operator position, turn the start switch ON, select a direction, and slowly press the throttle pedal.

- The vehicle should operate normally.

Release the throttle pedal, lift up off the driver seat and again slowly press the pedal.

- The vehicle should not operate.

Charger Interlock Switch

Connect the charger to its power source. If using a portable charger, connect the charger cable to the vehicle.

Sit in the approved operator position, turn the start switch ON, select a direction, and slowly press the throttle pedal.

- The vehicle should not operate.

Disconnect the charger and wait 1 minute.

Sit in the operator position, turn the start switch ON, select a direction, and slowly press the throttle pedal.

- The vehicle 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.

Every Week

- All daily items plus the following:
  - Battery electrolyte level
  - Check tire tread for debris
  - Inspect tire wear or damage
  - Check tire pressure
  - Check all electrical interlocks for proper operation
  - Smooth and proper operation throttle/ brake treadle
  - Operation of Horn
  - Check all lights
  - Operation of parking brake
  - Operation of steering
  - Operation of operator presence switch
  - Re-torque wheel nuts. First 20 hours then every 300 hours
  - Inspect for fluid leaks

First 20 hours

- Re-torque the wheel nuts.
- Inspect all hardware for tightness.

Every Month or 100 hours

- All weekly items plus the following:
  - Inspect for existence and readability of all safety labels
  - Clean battery terminals
  - Inspect front wheel bearings for play and noise
  - Inspect king pins for play
  - Check ball joints for play
  - Trailer hitch (operation, latch, wear)

Every 3 Months or 300 hours

- All monthly items plus the following:
  - Inspect/adjust brake
  - Clean battery compartment
  - Inspect and tighten all hardware (first 300 hours only, then 1200 hours and every 1200 hours)
  - Lubricate the vehicle
  - Re-torque wheel nuts
  - Tighten all electrical connections
  - Clean drive motor exterior

Every 6 Months or 600 hours

- All monthly items plus the following:
  - Inspect all electrical connections for signs of overheating
  - Inspect bushing in steering column
  - Inspect all wiring for cracks, fraying or wear
  - Inspect frame for damage
  - Test batteries
  - Inspect brake pads and rotors or shoes and drums

Every Year or 1,200 hours)

- All 6 month items plus the following:
  - Clean and repack front wheel bearings, replace grease seals
  - Inspect and tighten all hardware
  - Inspect motor brushes and blow out carbon
  - Rotate rear tires
  - Inspect rear wheel bearings for noise

Every 2 Years or 2,000 hours

- All yearly items plus the following:
  - Change rear axle oil

Maintenance Guidelines for Severe Duty Applications

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

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

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

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

BATTERY MAINTENANCE

⚠WARNING

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

⚠DANGER

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

NOTICE

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

Cleaning

⚠WARNING

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

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

Watering

Non-maintenance free batteries only.

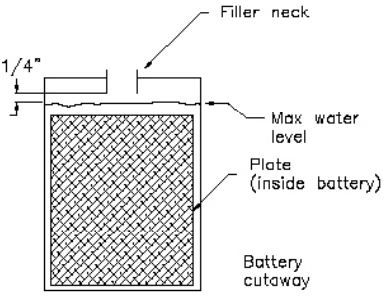
⚠CAUTION

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

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

⚠WARNING

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



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

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

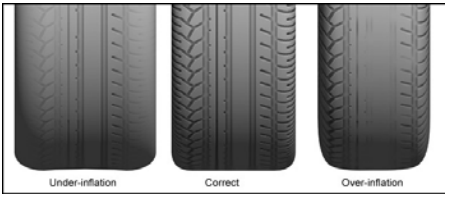
Maintaining the correct tire pressure is important to the safe operation of the vehicle as well as ensuring long tread life.

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.
- Premature tread wear.



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. The tire pressure shall only be adjusted when cold (i.e., “cold” is defined as the tires’ internal temperature matches the ambient temperature before the vehicle has been driven). Note: The front and rear tires may have a different tire pressure specification.

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

⚠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.

Tire Tread Wear

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 main road or highway before attempting to change the tire. Attempting to change a tire on a main road or highway exposes you to extreme danger of being run over by other vehicles.

⚠WARNING

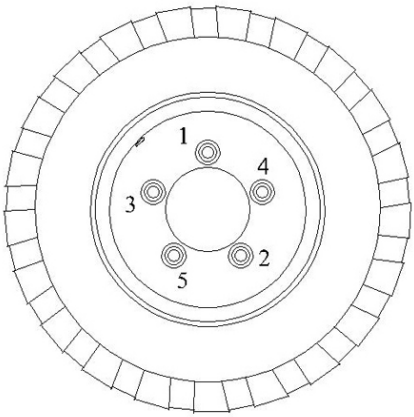
1) Park the vehicle on a hard level surface off of any main road or highway.
2) Make sure the Start switch is in the OFF position, then remove the key.
3) Place the Direction Control switch in the center OFF position.
4) Set the park brake.
5) Block the wheels on the opposite side of the tire to be changed.

⚠WARNING

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

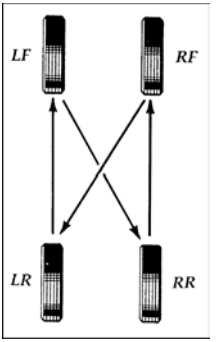
Note: A spare tire, jack, or lug wrench is not attached to the vehicle.

6. Loosen the wheel nuts (do not remove) before raising the tire off of the ground.
7. Raise the tire to be changed off of the ground and support with a jack stand.
8. Remove the wheel nuts and tire/wheel assembly.
9. Install the replacement tire/wheel assembly.
10. Install the wheel nuts and cross tighten per illustration below to 85 foot pounds (115 Nm).
11. Check the tire for proper inflation.
12. Lower the vehicle to the ground and remove the blocks from the wheels.
13. ***Wheel nuts should be checked for tightness after first 100 miles (20 hours of operation).***



5-Bolt Pattern

Tire Rotation

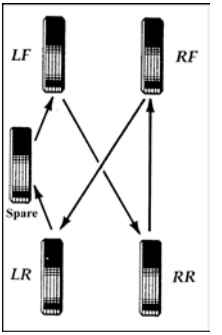


Front and rear tires as well as left and right tires can wear at different rates. It is important to periodically rotate your tires to extend your tire life. Refer to the maintenance schedule in this manual for the recommended interval.

Use the following pattern for a vehicle with no spare tire:

- Right Rear to Right Front
- Right Front to Left Rear
- Left Rear to Left Front
- Left Front to Right Rear

Use the following pattern for a vehicle with spare tire:



- Right Rear to Right Front
- Right Front to Left Rear
- Left Rear to Spare
- Spare to Left Front
- Left Front to Right Rear

Replacing a Tire

⚠WARNING

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

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

⚠WARNING

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

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

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

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

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

BRAKE FLUID LEVEL

⚠WARNING

- **Only use DOT 3 brake fluid from a new sealed container.**
- **DOT 3 brake fluid is corrosive and will damage paint finishes.**
- **Dispose of brake fluid in accordance with local state and federal regulations.**
- **Read and follow all warnings provided on the brake fluid container.**
- **Wear protective gloves when handling brake fluid and thoroughly wash hands after handling brake fluid.**
- **Before removing the master cylinder cap, thoroughly clean the area around the master cylinder cap. If any contaminates or debris enters the master cylinder then it may result in diminished and/or loss of braking power resulting in a collision or accident with severe bodily injury.**

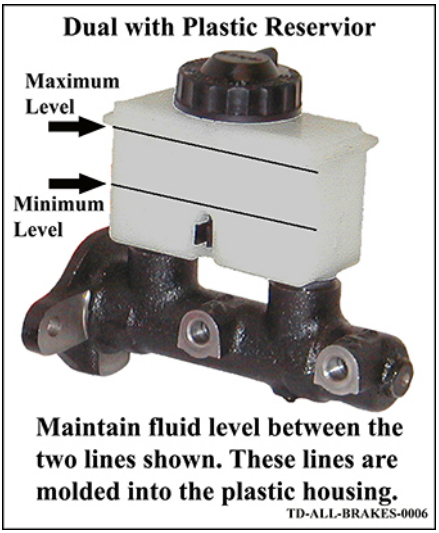
Periodically visually inspect the brake fluid level in the master cylinder. Low fluid level could result in diminished and/or loss of braking power.

Depending on the configuration of your vehicle, it may be equipped with one of two types of master cylinders. See illustrations.

The master cylinder is located underneath the front seats. Thoroughly clean the area around the master cylinder before removing the master cylinder cap.

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

Refer to illustrations for proper brake fluid level



CLEANING

Glass

The front, rear, and hard door windows are made of standard automotive glass and can be cleaned with any standard household glass cleaner.

Plastic Windows

The soft door windows are made of clear soft plastic that is easily scratched and can be damaged from some cleansers or solvents.

To remove any road tar or grease, Use a 70% isopropyl alcohol solution and soft cloth then wash with water and dry with a soft cloth.

- Do not use any abrasives or abrasive cleaners.
- Do not use any chemical cleaners or cleaning solvents.

Seats / Soft Doors

Clean your seats with any standard automotive vinyl cleaner.

Interior

NOTICE

DO NOT spray the interior with water. Large amounts of water may damage the electronics in the dash.

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

Cleaning the Seat Belts

Clean the safety belts with any mild soap solution that is recommended for cleaning upholstery or carpets. Do not bleach or dye the belt webbing because this may weaken it.

Battery Charger

The battery charger gets hot during normal operation and it is important that the cooling fins or vents are not caked with mud or dirt.

Refer to your maintenance schedule for the recommended cleaning interval.

Allow the charger to dry before starting a charging cycle.

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

⚠DANGER

High Voltage is present in the control panel.

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

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

The electrical control panel is located in the rear of the vehicle, under the deckboard. This compartment is not sealed and requires periodic cleaning. Refer to your maintenance schedule for the recommended cleaning interval.

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

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

Need motor

Standard Specifications

ITEM		SPECIFICATION
Occupancy		1 Driver, 1 Passenger Max occupant weight 250 pounds each (113 kg)
Dimensions		96 L x 44.25 W x 46.5 H Inches 244 L x 112 W x 118 H Centimeters
Deck Dimensions		43 x 31 Inches 109 L x 79 W Centimeters
Turning Radius		112 Inches (284 Centimeters)
Weight (without batteries)		1,100 pounds (499 kg)
Battery Weight		372 to 576 pounds (168 to 261 kg)
Maximum Load*		1,150 Pounds (522 kg)
Electrical System		36 or 48 Volts (traction) 12 Volts (accessories) 275 or 350 Amp Speed Control
Transmission		Helical Gear, Oil Bath Transaxle
Motor		? kW AC (60 min) ? kW (5 min)
Maximum Speed	2-wheel brakes 4-wheel brakes	12 mph (19.3 kph) 15 mph (24.1 kph)
Brakes	R0-380-36 R0-380-48	Rear Wheel Drum 4 wheel Hydraulic Disc
Steering		Automotive Ball Nut Worm Gear, 24:1
Tires Pressure Front and Rear		5.70 x 8 Load Range C 60 psi (620 kpa) Maximum
Frame and Cab		Steel Unitized Frame
Instrumentation		Battery Status, Key Switch, Horn Switch, Direction Control Switch
Lighting Accessories		Dual Brake Lights
Charger	R0-380-36 and R0-380-48	Multi AC voltage 100 to 230, 12A max 21 Amps DC

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

Specifications subject to change without notice.

Index


TAYLOR-DUNN MANUFACTURING
TAYLOR-DUNN

⚠WARNING

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

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

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