



CUSHMAN®

LET'S WORK.®

Owner's Guide



628808-G

ISSUED OCTOBER 2012

REVISED JULY 2018

WELCOME

Thank you for purchasing this vehicle. Before driving the vehicle, we ask you to spend some time reading this Owner's Guide. This guide contains the information that will assist you in maintaining this highly reliable vehicle. Some illustrations may show items that are optional for your vehicle. This guide covers the operation of several vehicles; therefore, some illustrations may not represent your vehicle. Physical differences in controls will be illustrated.

Most of the service procedures in this guide can be accomplished using common, automotive hand tools. Contact your service representative on servicing the vehicle in accordance with the Periodic Service Schedule.

Repair or replacement parts are available through your CUSHMAN retailer or Genuine CUSHMAN Service Parts.

The following information is needed when contacting CUSHMAN concerning service or parts for your vehicle:

Vehicle Model _____

VIN or Serial Number _____

California Proposition 65



WARNING

Operating, servicing and maintaining a passenger vehicle or off-road vehicle can expose you to chemicals including phthalates and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, wear gloves and wash your hands frequently when servicing your vehicle.

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

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

OWNER'S GUIDE ELECTRIC POWERED VEHICLE

MINUTE MISER

STARTING MODEL YEAR 2013

Never modify the vehicle in any way that will alter the weight distribution of the vehicle, decrease its stability or increase the speed beyond the factory specifications. Such modifications can cause serious personal injury or death. E-Z-GO Division of Textron Inc. prohibits and disclaims responsibility for any such modifications or any other alteration which would adversely affect the safety of the vehicle.

E-Z-GO Division of Textron Inc. reserves the right to incorporate engineering and design changes to products in this manual, without obligation to include these changes on units sold previously.

The information contained in this manual may be revised periodically by E-Z-GO, and therefore is subject to change without notice.

E-Z-GO DISCLAIMS LIABILITY FOR ERRORS IN THIS MANUAL, and SPECIFICALLY DISCLAIMS LIABILITY FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES resulting from the use of the information and materials in this Manual.

These are the original instructions as defined by 2006/42/EC.

TO CONTACT US

CUSHMAN

1451 Marvin Griffin Road.

Augusta, Georgia, 30906-3852

USA

E-mail: Cushmancomm@textron.com

North America:

Technical Assistance & Warranty PHONE: 1-800-774-3946 FAX: 1-800-448-8124

Service Parts PHONE: 1-888-438-3946 FAX: 1-800-752-6175

International:

PHONE: 001-706-798-4311 FAX: 001-706-771-4609

FOREWORD

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

The use of non-Original Equipment Manufacturer (OEM) approved parts may void the warranty.

Failure to properly maintain batteries may void the warranty. Refer to the battery manual for instructions on the proper maintenance and care of the batteries.

BATTERY PROLONGED STORAGE

All batteries will self-discharge over time. The rate of self-discharge varies depending on the ambient temperature, the age and condition of the batteries.

A fully charged battery will not freeze in winter temperatures unless the temperature falls below -75°F (-60°C).

For winter storage, the batteries must be clean, fully charged and disconnected from any source of electrical drain.

The battery charger may be left connected to the vehicle to maintain a full charge on the batteries, provided the charger is plugged into an active electrical source. If power to the electrical source is disconnected or interrupted the battery charger will continue to check the charge on the battery pack, this will draw power from the battery pack and eventually drain the batteries if power is not restored in a timely manner.

As with all electric vehicles, the batteries must be checked and recharged as required or at a minimum of 30 day intervals.

Remember to check and maintain the proper fluid level in all battery cells during the storage period; proper fluid level is required for maximum battery performance.

BATTERY DISPOSAL

Lead-acid batteries are recyclable. Return whole scrap batteries to distributor, manufacturer or lead smelter for recycling. For neutralized spills, place residue in acid-resistant containers with absorbent material, sand or earth and dispose of in accordance with local, state and federal regulations for acid and lead compounds. Contact local and/or state environmental officials regarding disposal information.

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SAFETY

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

1

GENERAL

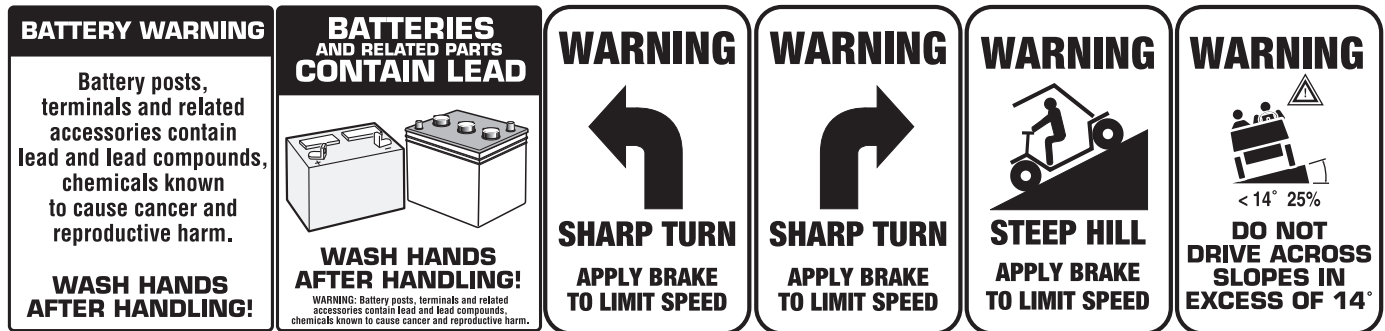
For any questions on material contained in this manual, contact an authorized representative for clarification.

Read all labels located on the vehicle. Always replace any damaged or missing labels.

On steep hills it is possible for vehicles to coast at greater speeds. To prevent loss of vehicle control and possible serious injury, speeds should be limited to no more than the maximum speed on level ground. See GENERAL SPECIFICATIONS. Limit speed by applying the service brake.

Catastrophic damage to the drivetrain components due to excessive speed may result from driving the vehicle above specified speed. Damage caused by excessive speed may cause a loss of vehicle control, is costly, is considered abuse and will not be covered under warranty.

Use extra caution when towing the vehicle. Do not tow a single vehicle at speeds in excess of 12 mph (19 kph). If the vehicle is to be used in a commercial environment, signs similar to the ones illustrated should be used to warn of situations that could result in an unsafe condition.



NOTICES, CAUTIONS, WARNINGS, AND DANGERS

Throughout this guide **NOTICE**, **CAUTION**, **WARNING**, and **DANGER** will be used. Please observe these **NOTICES**, **CAUTIONS**, **WARNINGS**, and **DANGERS**; be aware that servicing a vehicle requires mechanical skill and a regard for conditions that could be hazardous. Improper service or repair may damage the vehicle or render it unsafe.

NOTICE

Address practices not related to personal injury.



CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

This manual has been designed to assist in maintaining the vehicle in accordance with procedures developed by the manufacturer. Adherence to these procedures and troubleshooting tips will ensure the best possible service from the product. To reduce the chance of personal injury or property damage, the following must be carefully observed:



CAUTION

Certain replacement parts can be used independently and/or in combination with other accessories to modify an E-Z-GO-manufactured vehicle to permit the vehicle to operate at or in excess of 20 mph. When an E-Z-GO-manufac-

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tered vehicle is modified in any way by the Distributor, Dealer or customer to operate at or in excess of 20mph, UNDER FEDERAL LAW the modified product will be a Low Speed Vehicle (LSV) subject to the strictures and requirements of Federal Motor Vehicle Safety Standard 571.500. In these instances, pursuant to Federal law the Distributor or Dealer MUST equip the product with headlights, rear lights, turn signals, seat belts, top, horn and all other modifications for LSV's mandated in FMVSS 571.500, and affix a Vehicle Identification Number to the product in accordance with the requirements of FMVSS 571.565. Pursuant to FMVSS 571.500, and in accordance with the State laws applicable in the places of sale and use of the product, the Distributor, Dealer or customer modifying the vehicle also will be the Final Vehicle Manufacturer for the LSV, and required to title or register the vehicle as mandated by State law.

E-Z-GO will NOT approve Distributor, Dealer or customer modifications converting E-Z-GO products into LSV's.

The Company recommends that all E-Z-GO products sold as personal transportation vehicles BE OPERATED ONLY BY PERSONS WITH VALID DRIVERS LICENSES, AND IN ACCORDANCE WITH APPLICABLE STATE REQUIREMENTS. This restriction is important to the SAFE USE AND OPERATION of the product.

All customers should adhere to this SAFETY RESTRICTION, in connection with the use of all E-Z-GO products, new and used, the Distributor or Dealer has reason to believe may be operated in personal transportation applications.

Information on FMVSS 571.500 can be obtained at Title 49 of the Code of Federal Regulations, section 571.500, or through the Internet at the web site for the U.S. Department of Transportation - at Dockets and Regulation, then to Title 49 of the Code of Federal Regulations (Transportation).

All vehicles can be used for a variety of tasks beyond the original intended use of the vehicle; therefore, it is impossible to anticipate and warn against every possible combination of circumstances that may occur. No warning can take place good common sense and prudent driving practices.

Good common sense and prudent driving practices do more to prevent accidents and injury than all of the warnings and instructions combined. E-Z-GO strongly suggests that all users and maintenance personnel read this entire manual paying particular attention to the CAUTIONS, WARNINGS and DANGERS contained therein.

If you have any questions regarding this vehicle, contact your E-Z-GO/CUSHMAN dealer or write to the address on the back cover of this publication, Attention: Customer Care Department.

E-Z-GO reserves the right to make design changes without obligation to make these changes on units previously sold. The information contained in this manual is subject to change without notice.

E-Z-GO IS NOT LIABLE FOR ERRORS IN THIS MANUAL. E-Z-GO IS NOT LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES THAT RESULT FROM THE USE OF THE MATERIAL IN THIS MANUAL.

This vehicle conforms to the current applicable standard(s) for safety and performance requirements.

These vehicles are designed and manufactured for off-road use. They DO NOT conform to Federal Motor Vehicle Safety Standards of the United States of America (USA) and are not equipped for operation on public streets. Some communities may permit these vehicles to be operated on their streets on a limited basis and in accordance with local ordinances.

With electric powered vehicles, be sure that all electrical accessories are grounded directly to the battery (-) post.

Never use the chassis or body as a ground connection.

Refer to GENERAL SPECIFICATIONS for vehicle seating capacity.



WARNING

Never modify the vehicle in any way that will alter the weight distribution of the vehicle, decrease its stability, or increase the speed or extend the stopping distance beyond the factory specification. Such modifications can result in serious personal injury or death.

Do not make any such modifications or changes. E-Z-GO prohibits and disclaims responsibility for all such modifications or alterations which would adversely affect the safety of the vehicle.

Some models may be certified as a Type E or Type EE vehicle from the factory, any modification to one of these vehicles may void the certification.

Vehicles that are capable of higher speeds must limit their speed to no more than the speed of other vehicles when used in a golf course environment. Additionally, speed should be further moderated by the environmental conditions, terrain and common sense.

Operation of the vehicle is limited to persons above the height of 59 inches (150 cm).

SAFETY

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

1

GENERAL OPERATION

Read the following warnings before attempting to operate the vehicle.



WARNING

To prevent personal injury or death, observe the following:

When vehicle is to be left unattended, turn key to OFF position AND REMOVE KEY.

Drive vehicle only as fast as terrain and safety considerations allow. Consider the terrain and traffic conditions. Consider environmental factors which affect the terrain and the ability to control the vehicle.

Avoid driving fast downhill. Sudden stops or change of direction may result in a loss of control. Use brake to control speed when traveling down an incline.

Use extra care and reduced speed when driving in poor conditions or on poor surfaces.

Stay in designated areas where provided and avoid steep slopes.

Keep feet, legs, hands, and arms inside vehicle at all times.

Avoid extremely rough terrain.

Check area behind the vehicle before operating in reverse.

Make sure the direction selector is in correct position before depressing the accelerator pedal.

Slow down before and during turns.

Always bring vehicle to a complete stop before shifting the direction selector.

See GENERAL SPECIFICATIONS for vehicle load and seating capacity.

NOTICE

Read the following text and warnings before attempting to service vehicle.

In any product, components may eventually fail to perform properly as the result of normal use, age, wear, or abuse.

It is impossible to anticipate all possible component failures or the manner in which each component may fail.

A vehicle requiring repair is no longer functioning as designed and therefore could be potentially hazardous. Therefore, use extreme care when working on any vehicle. When diagnosing, removing, or replacing any components that are not operating correctly, take time to consider the safety of yourself and others around you.

Some components are heavy, spring-loaded, highly corrosive, explosive, may produce high amperage, or reach high temperatures. Exposure to battery acid and hydrogen gas could result in serious bodily injury. Be careful to protect hands, face, feet, and body from injury.

Always use the appropriate tools listed in the tool list and wear approved safety equipment.



WARNING

Before working on the vehicle, remove all jewelry.

Be sure no loose clothing or hair can contact moving parts.

Use care not to touch hot objects.

Wear eye protection when working on or around the vehicle. In particular, use care when working around batteries, using solvents or compressed air.

Hydrogen gas is formed when charging batteries. Do not charge batteries without adequate ventilation.

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Do not permit open flame or anyone to smoke in an area that is being used for charging batteries.

Do not charge the vehicle batteries in a hazardous location or atmosphere. Refer to NFPA 505 for definitions of hazardous and non-hazardous locations.

ALWAYS:

- use the vehicle in a responsible manner and maintain the vehicle in safe operating condition
- read and observe all warnings and operation instruction labels affixed to the vehicle
- follow all safety rules established in the area where the vehicle is being operated
- leave the vehicle when there is a risk of lightning.
- reduce speed to compensate for poor terrain or conditions
- apply service brake to control speed on steep grades
- maintain adequate distance between vehicles
- reduce speed in wet areas
- use extreme caution when approaching sharp or blind turns
- use extreme caution when driving over loose terrain
- use extreme caution in areas where pedestrians are present

MAINTENANCE

ALWAYS:

- replace damaged or missing warning, caution or information labels
- maintain the vehicle in accordance with the manufacturer's periodic service schedule
- ensure that repairs are performed by trained and qualified personnel
- follow the manufacturer's maintenance procedures
- insulate any tools used within the battery area in order to prevent sparks or battery explosion
- check the polarity of each battery terminal and be sure to rewire the batteries correctly
- use specified replacement parts, NEVER use replacement parts of lesser quality
- use recommended tools
- determine that tools and procedures not specifically recommended by the manufacturer will not compromise the safety of personnel nor jeopardize the safe operation of the vehicle
- support the vehicle using wheel chocks and jack stands, NEVER get under a vehicle that is supported by a jack, lift the vehicle in accordance with the manufacturer's instructions
- maintain the vehicle in an area away from exposed flame or persons who are smoking
- be aware that a vehicle that is not performing as designed is a potential hazard and must not be operated
- test drive the vehicle after any repairs or maintenance in a safe area that is free of both vehicular and pedestrian traffic
- keep complete records of the maintenance history of the vehicle

SAFETY

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1

VENTILATION

ALWAYS:

- charge the vehicle in a well-ventilated, non-hazardous area
- charge in an area free of flammable liquids and items
- charge a vehicle in an area that is free from flame or spark, pay particular attention to natural gas or propane water heaters and furnaces
- use a dedicated 15-amp circuit for each battery charger, DO NOT permit other appliances to be plugged into the receptacle when the charger is in operation
- operate the charger in accordance with manufacturers recommendations or applicable electrical code

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LABELS AND PICTOGRAMS



SAFETY

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1 Notes:

GENERAL SPECIFICATIONS

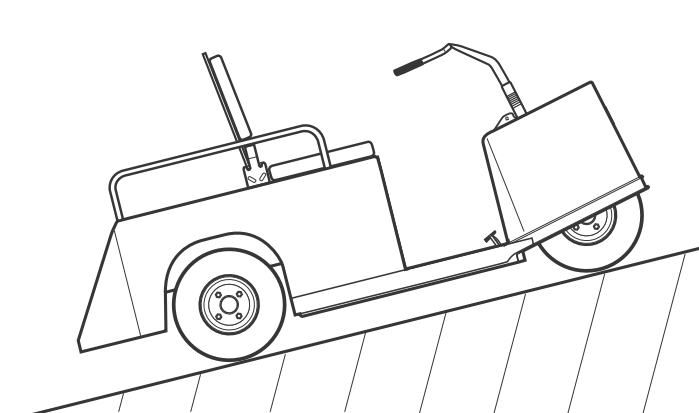
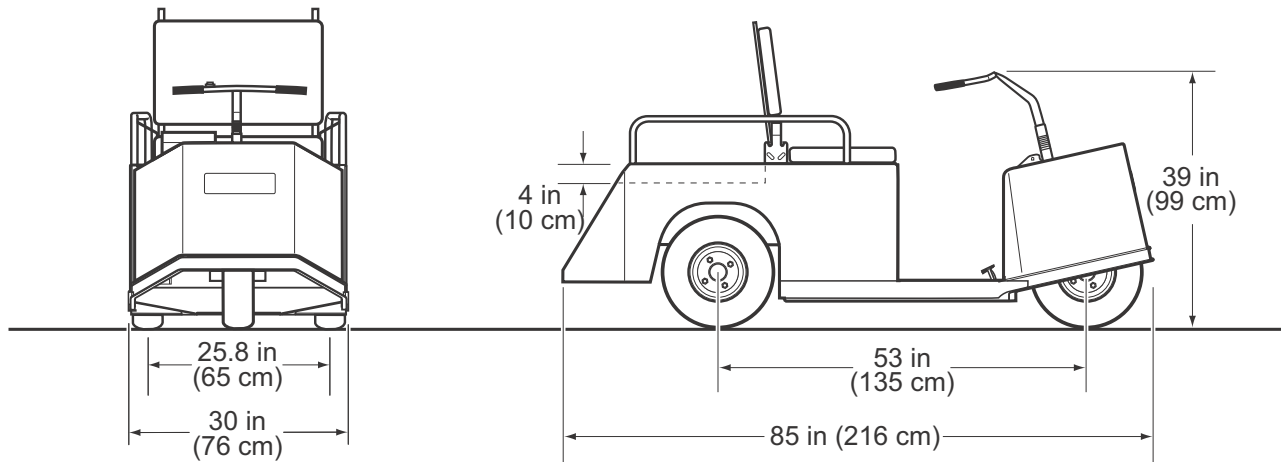
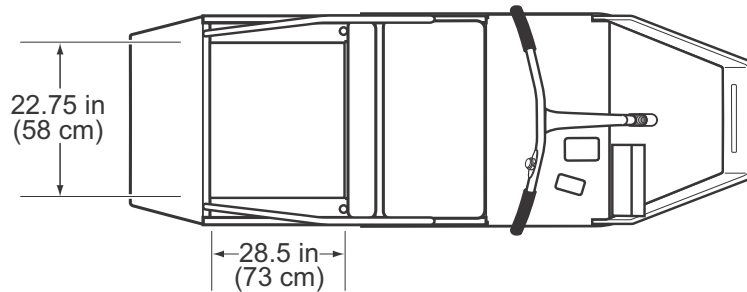
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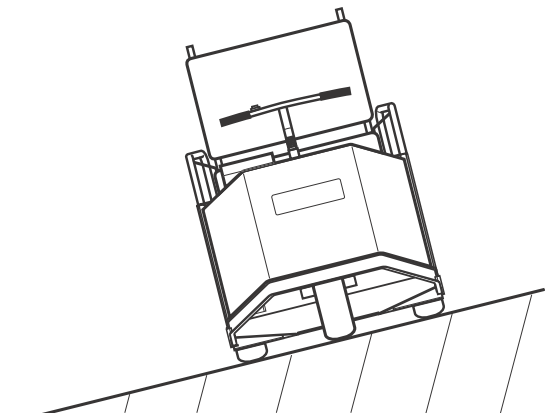
GENERAL SPECIFICATIONS

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2



RECOMMENDED MAXIMUM RAMP GRADE
25% or 14° MAXIMUM
FOR VEHICLE STABILITY

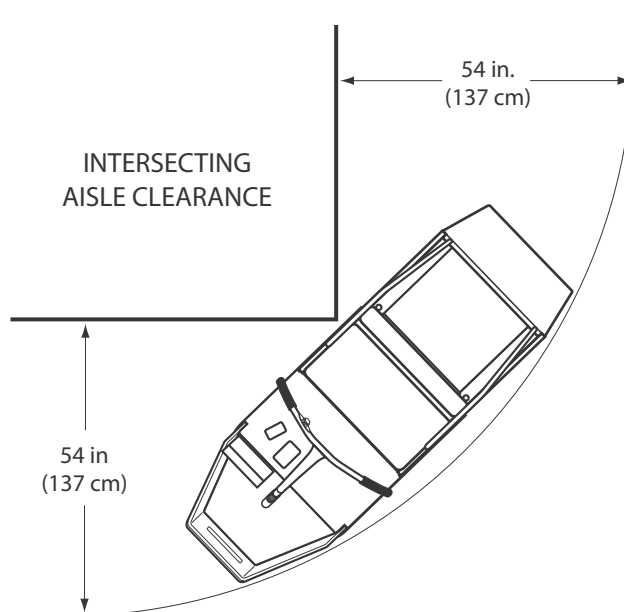
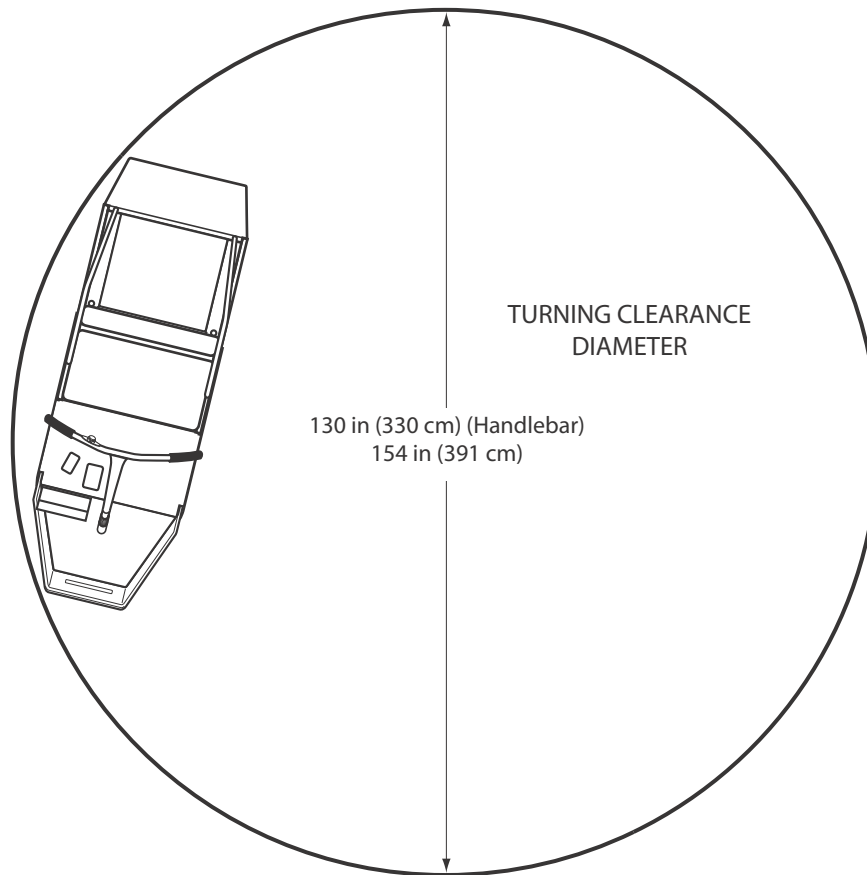


RECOMMENDED MAXIMUM SIDE TILT
25% or 14° MAXIMUM
FOR VEHICLE STABILITY

GENERAL SPECIFICATIONS

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2



GENERAL SPECIFICATIONS

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CUSHMAN

2

MODEL: MINUTE MISER

TYPE: 3 WHEEL ELECTRIC POWERED TRUCK

MODEL YEAR: 2013

Part No: 628520



PRODUCT SPECIFICATION

CONFIGURATION HIGHLIGHTS

Speed Control: Solid State 250 amp controller

● **Direction Selector:** Dash mounted (Forward-Neutral-Reverse)

● **Batteries:** Four, Six Volt Deep Cycle

Battery Charger: 24 Volt On-Board. Fully Automatic line compensating. Underwriters Laboratories (U.L.) Recognized, and CE Marked

● **Input:** 100 – 240 Volt, 50/60 Hz, 12/6A

● **Output:** 24 Volt, 25A, 20A@100V

Motor: 24 Volt DC series wound, brazed armature, solid copper armature. 8.25 hp (6.15 kW) @ 1570 rpm

Drive Train: Direct motor shaft connected to transaxle pinion shaft

Electrical System: 24 Volt DC, four, 6 volt deep cycle batteries (115 minute minimum, 225 amp-hour @ 20 hr. discharge rate)

Transaxle: Differential with helical gears

Brakes: Dual rear wheel mechanical drum brakes. Integrated park brake

Convenience: Seat back folds down to accommodate single rear facing passenger

Steering: Steering tiller. Optional steering wheel

PRODUCT OVERVIEW

Dimensions

Overall Length	85.0 in (216 cm)
Overall Width	30.0 in (76 cm)
Overall Height (Tiller)	39.0 in (99 cm)
Overall Height (Steering Whl)	46.0 in (117 cm)
Wheel Base	48.0 in (122 cm)
Front Wheel Track	N/A
Rear Wheel Track	25.5 in (65 cm)
Gnd Clearance @ Differential	4.0 in (10 cm)
Cargo Deck Width	23.0 in (58 cm)
Cargo Deck Length	29.0 in (73 cm)
Cargo Deck Depth	4.0 in (10 cm)
Cargo Deck Material	Plywood

Vehicle Power

Power Source	24 Volts DC
Motor Type	Series Wound
Max. Horsepower (kW)	8.25 hp (6.15 kW) @ 1570 rpm
Electrical System	24 Volt
Batteries (Qty, Type)	Four, 6 Volt Deep Cycle
Key or Pedal Start	Pedal Start
Battery Charger	24 VDC, 100-240 VAC On-Board, UL & CE
Speed Controller	Solid State 250 Amp Rated
Drive Train	Motor Shaft Direct Drive
Transaxle	Differential with Helical Gears
Gear Selection	Dash Mounted Forward-Neutral-Reverse
Rear Axle Ratio	14.78:1

Performance

Capacity	2 Persons (Seat Back Down)
Dry Weight	440.0 lb (200 kg) (Without Batteries)
Curb Weight	690.0 lb (314 kg)
Cargo Deck Load Capacity	300 lb (140 kg)
Vehicle load capacity	550 lb (250 kg)
Outside Clearance Circle	10.8 ft (3.3 m)
Intersecting Aisle Clearance	54.0 in (137 cm)
Speed (Level Ground)	10 mph \pm 0.5 mph (14 kph \pm 0.8 kph)

Steering & Suspension

Steering	Direct Handlebar to Front Fork
Front Suspension	Torque Block
Rear Suspension	Coil Springs & Single Shock Absorber
Service Brake	Rear Wheel Mechanical Drum
Parking Brake	Single Point Latch
Front Tire	4.80 x 8 (Load Range B)
Rear Tires	4.80 x 8 (Load Range B)

Body & Chassis

Frame & Body	Welded steel with DuraShield™ powder coat
Body & Finish	Diamond plate pattern. Polyester primer/Acrylic
Standard Color	Safety Yellow

Noise & Vibration

Noise	Sound pressure; continued A-weighted equal to or less than 70 db(A)
Vibration, WBV	Highest RMS value of weighted acceleration is less than 2.5 m/s
Vibration, HAV	Highest RMS value of weighted acceleration is less than 2.5 m/s

The uncertainty of measurement is 0.12 m/s

Measurement methods were applied per the ISO 2631 and ISO 5349 standards under conditions of typical vehicle surfaces.

Approved Type E and EE vehicles are certified for 5% grade max.

Some items shown may be optional equipment

GENERAL SPECIFICATIONS

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Notes:

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2

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INTRODUCTION

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

OPERATOR CONTROLS AND FEATURES

1. Key Switch

Located on the control panel, this switch enables the basic electrical system of the vehicle to be turned on and off by turning the key. To prevent inadvertent operation of the vehicle when left unattended, the key should be turned to the OFF position and removed.

2. Direction Selector

Located on the control panel, this switch permits the selection of either Forward, Reverse or Neutral (the position between forward and reverse). Vehicle should be left in neutral with the parking brake set and the key removed when unattended.

3. Headlight Switch

Located next to the key switch, this switch will turn the headlights and tail light on or off.

4. State of Charge Meter

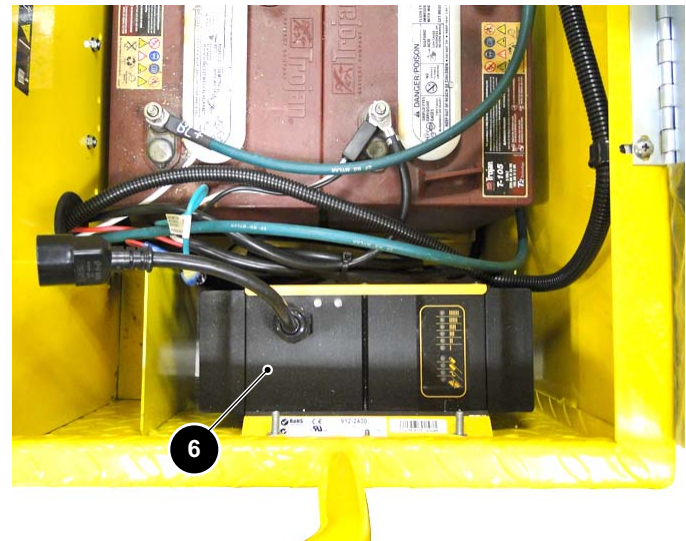
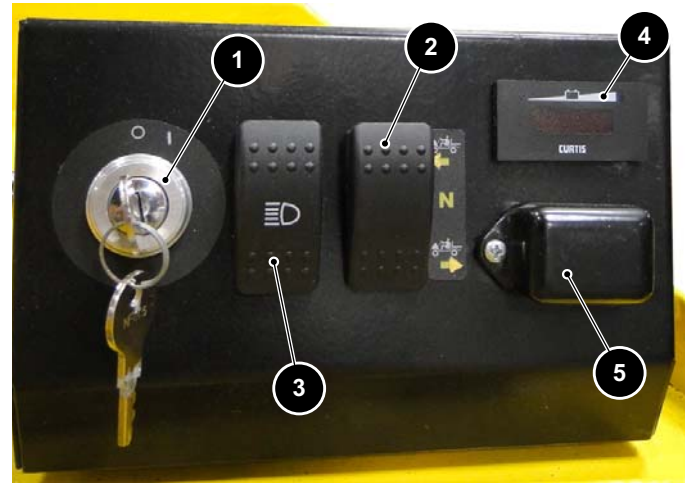
The vehicle is equipped with a state of charge meter located in the control panel. The state of charge meter indicates the amount of usable power in the batteries, with 'F' indicating a full charge on the battery pack and 'E' indicating the battery pack needs to be charged.

5. Fuse Panel

To access the vehicle fuses, remove phillips head screw and pivot door open. Always replace a blown fuse with the specified size.

6. On-Board Charger

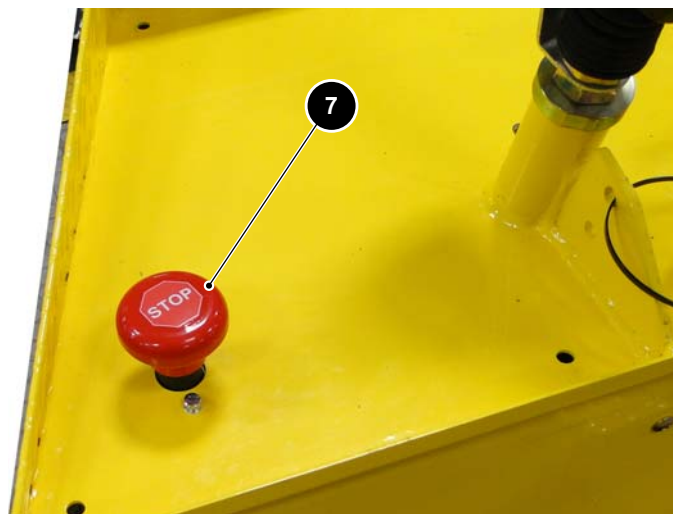
The on-board charger is located under the seat. Refer to the On-Board Charger section in the Operating Procedures section of this manual. There is a cord storage area next to the on board charger for the AC power cord.



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7. Emergency Stop Switch (CE Vehicles ONLY)

The emergency stop switch is located on the front deck panel to the left of the handlebar. Pushing in on this switch will disconnect all electrical power to the vehicle motor.

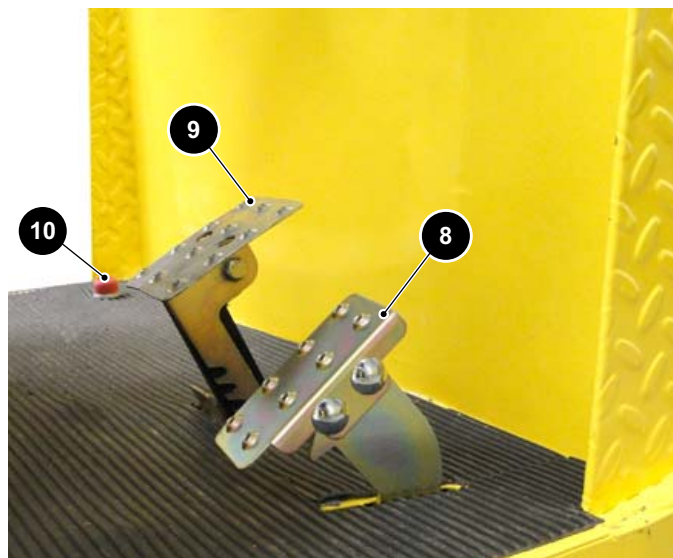


8. Accelerator Pedal

The accelerator pedal is used to control the speed of the vehicle.

9. Combination Brake and Parking Brake Pedal

The pedal functions as a service brake to slow or stop the vehicle. Once the vehicle has stopped, the parking brake can be engaged by pressing on the front edge of the pedal, a catch plate beneath the floor will latch into a notch on the pedal. To release the parking brake, press the whole brake pedal.



10. Horn

To sound the horn, step on the red button located on the floor.

11. Fold Down Seat Back

The seat back folds down to allow the transport of a single rear facing passenger. Lift upwards on the seat back and pivot the cushion downward until the support bars rest on the rear body. When returning the seat back to the upright position ensure that the catch pins drop into the latch slots.

12. Cargo Bed Tie Down Holes

There are four holes located in the frame of the cargo bed, two along each side, these holes are for use with cargo straps with hooks on each end or cargo nets with hooks used for securing items to the deck during transport.

13. Headlight (if equipped)

A halogen headlight is available as an option or standard on the Type EE Vehicles.

14. Tail Light

The tail light is connected to the light switch on the control panel.



INTRODUCTION

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15. Operator Present Switch

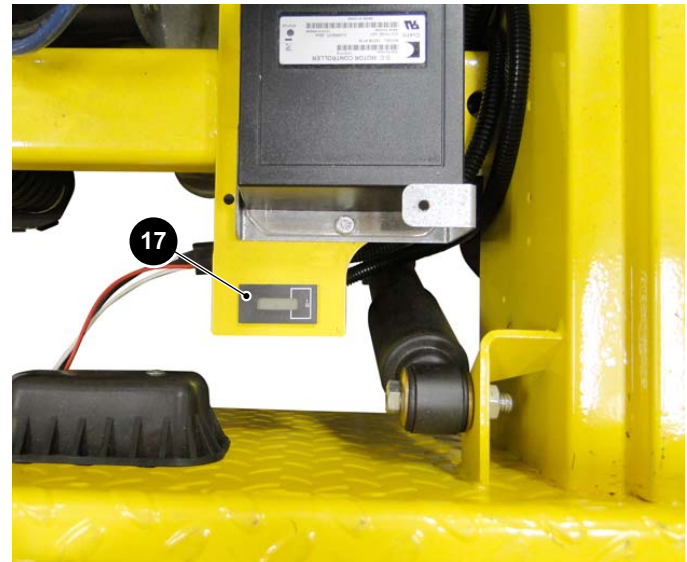
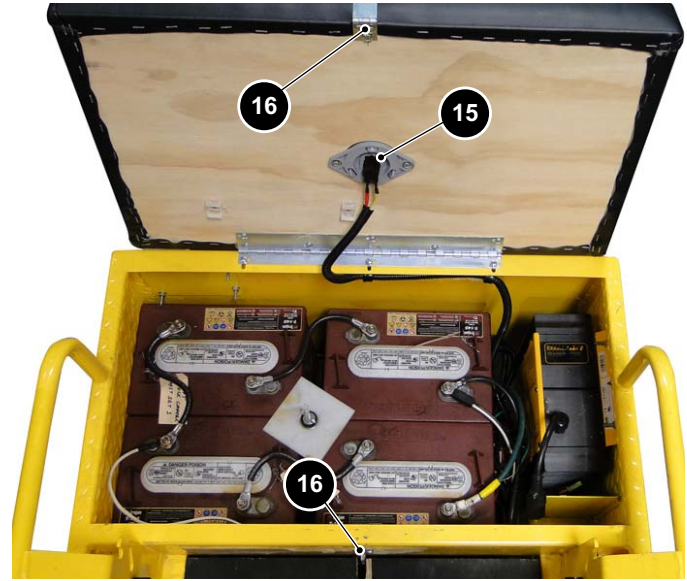
The operator present switch is located under the seat, attached to the seat bottom. This switch allows the operation of the vehicle only when the operator is properly seated. Should the operator stand or leave the seat during operation, the vehicle will stop. If the vehicle is shut down by the switch the operator will need to reset the direction selector to Neutral before pressing the accelerator.

16. Seat and Cargo Bed Lock (Type EE Vehicles)

Type EE vehicles have a hasp installed on the seat bottom that closes over a staple attached the body below the seat. The hasp may be secured by a user padlock to restrict access to the batteries and drive train by unauthorized personnel. When a padlock is installed the cargo bed deck board is locked in place along with the seat.

17. Hour Meter (if equipped)

The hour meter is located in the motor compartment behind the speed controller, the meter records the number of hours the vehicle has been operated.



Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Notes:

INTRODUCTION

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Notes:

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OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

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OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

SERIAL NUMBER LOCATION

There are serial number labels in several locations on the vehicle. Design changes take place on an ongoing basis. In order to obtain correct components for the vehicle, the manufacture date code, serial number and vehicle model must be provided when ordering parts.

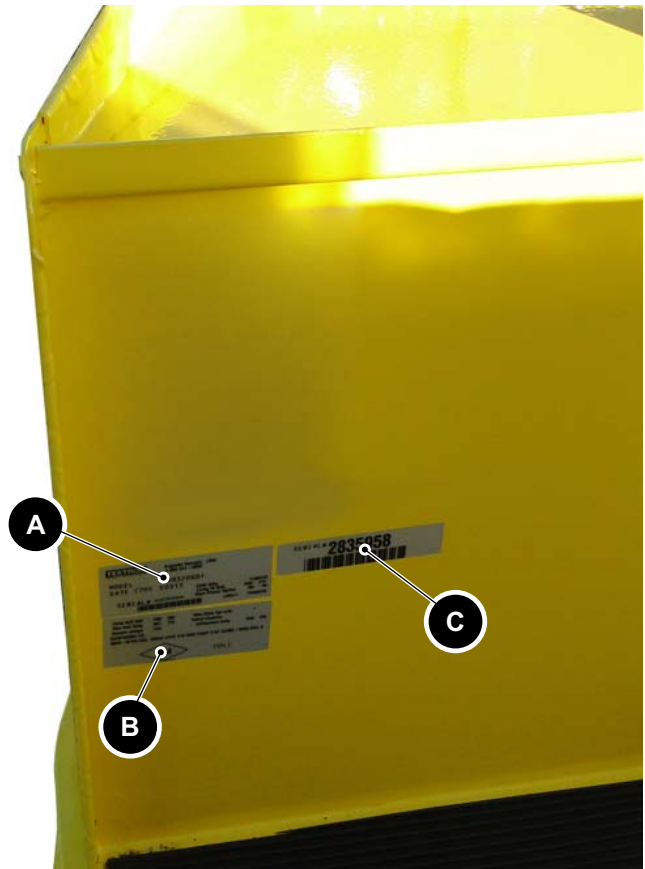
Serial and Manufacturing Number Label

4 Part A of the Supplemental Information Label is located on the lower front panel on the driver's left side. This label contains the vehicle type if applicable, the Model, Date Code, Serial Number, Gross Vehicle Weight (GVW), Vehicle Weight with Batteries and Horse Power.

Part B of the Supplemental Information Label is located just below Part A. This label contains the Rated Capacity With Operator, Vehicle Weight Without Batteries, Maximum Battery Weight, System Voltage, Maximum Draw Bar Weight and UL, FM or CE certification mark, if applicable.

Serial Number Bar Code Label

Part C is the smaller label containing the Serial Number and a Bar Code is located on the front panel.



TYPE EE VEHICLES

This vehicle is available as Type EE. Type EE vehicles meet all requirements of Type E and provide additional safeguards against inherent fire and electrical hazards as specified per U.L. 583.

Additional components on Type EE vehicles are:

- Headlight
- Terminal boots on battery, motor, solenoid and circuit breaker connections
- Ground strap
- Hasp and staple for padlock on seat and deck
- EE decal, one on each side of the vehicle body

BEFORE INITIAL USE

Read the Owner's Guide for this vehicle, pay particular attention to the CAUTIONS, WARNINGS and DANGERS shown in this manual. Read and follow the safety label on the instrument panel. Be sure you understand how to operate the vehicle, its equipment as well as how to use it safely. Maintaining good, safe performance depends to a large extent on the operator.



WARNING

Hydrogen gas is generated as a natural part of the lead acid battery charging process. A 4% concentration of hydrogen gas is explosive and could cause severe injury or death. Charging must take place in an area that is adequately ventilated (minimum of 5 air exchanges per hour).

To reduce the chance of battery explosion that could result in severe injury or death, never smoke around or charge batteries in an area that has open flame or electrical equipment that could cause an electrical arc.

OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Hydrogen gas is generated in the charging cycle of batteries and is explosive in concentrations as low as 4%. Because hydrogen gas is lighter than air, it will collect in the ceiling of buildings necessitating proper ventilation. Five air exchanges per hour is considered the minimum requirement.

Never charge a vehicle in a hazardous area or area that is subject to flame or spark. Pay particular attention to natural gas or propane gas water heaters and furnaces.

Before a new vehicle is put into operation, the items shown in the **INITIAL SERVICE CHART** must be performed.

The vehicle batteries must be fully charged before initial use.

Check for leaks that could have developed in shipment from the factory.

Check for correct tire inflation. See GENERAL SPECIFICATIONS.

Check the operation of the vehicle brakes, including the parking brake, make adjustments if necessary.

Remove the protective clear plastic from the seat bottom and back rest before placing the vehicle in service

ITEM	SERVICE OPERATION
Batteries	Charge batteries
Backrest	Remove protective plastic covering
Brakes	Check operation and adjust if necessary
Tires	Check air pressure (see SPECIFICATIONS)

4

ON-BOARD CHARGER

DANGER

Risk of electric shock. Connect charger power cord to an outlet that has been properly installed and grounded in accordance with all local codes and ordinances. A grounded outlet is required to reduce risk of electric shock – do not use ground adapters or modify plug. Do not touch uninsulated battery terminal.

Do not open or disassemble charger. Do not operate charger if the AC supply cord is damaged or if the charger has received a sharp blow, or otherwise damaged in any way – refer all repair work to qualified personnel. Not for use by children.

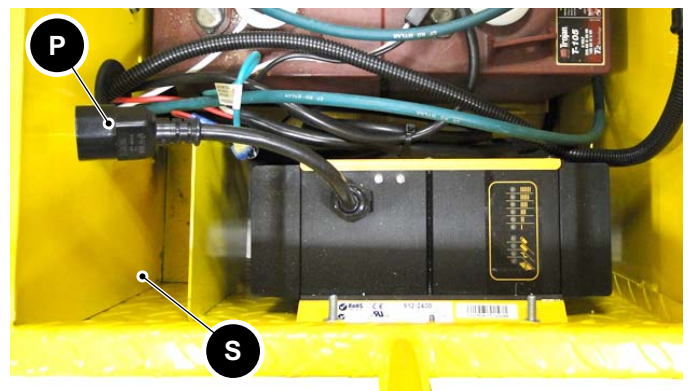
WARNING

To prevent a physical hazard that could result in an electrical shock or electrocution, be sure that the charger plug is not damaged and is inserted fully into a grounded receptacle.

The power (AC) cord is equipped with a grounded plug. Do not attempt to pull out, cut or bend the ground post.

The on-board charger is located under the seat, it is wired directly to the batteries. Before charging the batteries park the vehicle in a well ventilated area, set the parking brake, turn the key switch to OFF and remove the key. Pull charger pigtail (P) out, connect the AC charging cord to the pigtail and plug into a dedicated 15 amp AC outlet to start the charger.

When the charging cycle is complete, disconnect the AC cord and replace the pigtail and the AC charging cord in the storage area (S) provided.



OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

OPERATING THE VEHICLE



CAUTION

Improper use of the vehicle or the lack of proper maintenance may result in decreased performance or damage to the vehicle.

Read the following warnings before attempting to operate the vehicle.



WARNING

To reduce the possibility of severe injury or death resulting from loss of vehicle control, the following warnings must be observed:

When driving vehicle, consider the terrain, traffic conditions and the environmental factors which effect the terrain and the ability to control the vehicle.

Use extra care and reduced speed when driving on poor surfaces, such as loose dirt, wet grass, gravel, etc.

Avoid extremely rough terrain.

Maintain a safe speed when driving down hill. Use service brake to control speed when traveling down an incline. A sudden stop or change of direction may result in loss of control.

To prevent loss of control, do not move the direction selector of a vehicle while the vehicle is in motion. Moving the selector will result in a sudden slowing of the vehicle and the beeping of a warning device.

Slow down before and during turns. All turns should be made at reduced speed.

All travel should be directly up or down hills.

Use extra care when driving the vehicle across any incline.



WARNING

Stay in designated areas and avoid steep slopes. To reduce the possibility of severe injury or death resulting from improper vehicle operation, the following warnings must be observed:

Refer to GENERAL SPECIFICATIONS for seating capacity.

Make sure that the direction selector is in correct position before attempting to start the vehicle.

Do not take vehicle out of gear by moving the direction selector to Neutral while in motion (coasting).

Check the area behind vehicle before operating in reverse.

Always bring vehicle to a complete stop before shifting the direction selector.

Always remain seated and hold on while vehicle is in motion. Keep feet, legs, hands and arms inside vehicle at all times. NEVER allow a passenger to stand on the rear deck while vehicle is in motion.

NEVER use the vehicle in or near an area where there is explosive dust or fumes.

Cargo must be secured. Position cargo loads carefully, avoid shifting or top heavy loads.

To prevent inadvertent movement when vehicle is left unattended, engage the parking brake, move direction selector to neutral, turn key to OFF and remove the key.

Keep all labels (decals) and instructional literature legible and intact. Replacement labels

OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

(decals) and literature are available from your authorized dealer or from service parts.

STARTING AND DRIVING

WARNING

To reduce the possibility of roll - back which could result in severe injury or vehicle damage, do not release the service brake until motor has started.

All vehicles are equipped with an *interlock system* that disables the controller and prevents the vehicle from being operated or moved while the charger is connected. Disconnect the AC charger cord from the vehicle charger pigtail and properly store the cord prior to moving the vehicle.

To operate the vehicle:

- Operator is to be properly seated facing forward with feet on the floor.
- Apply the pressure to the brake pedal, place the key in the key switch and turn it to the ON position.
- Move the direction selector to the direction desired.
- Release the park brake.
- Slowly depress the accelerator pedal to start the motor. Release the brake pedal when the motor starts.
- When the accelerator pedal is released, the motor controls the deceleration. To stop the vehicle more quickly, depress the **service brake pedal**.

NOTICE

When the direction selector is in the reverse position, a warning signal will sound to indicate that the vehicle is ready to run in reverse.

Starting Vehicle On A Hill

WARNING

To reduce the possibility of roll-back which could result in severe injury or vehicle damage, do not release the service brake until motor has started

CAUTION

Do not hold vehicle on hill by using accelerator and motor. Leaving motor in a stalled condition for more than 3 - 4 seconds will cause permanent damage to motor.

To reduce the possibility of permanent damage to the drive system, it is important to prevent excessive roll-back when starting the vehicle on a hill.

Place left foot on brake pedal and release the park brake. Depress accelerator with right foot and release the brake pedal by lifting the left foot.

Coasting

WARNING

To reduce the possibility of severe injury or death from coasting at above recommended speeds, limit speed with service brake.

On steep hills or ramps it is possible for vehicles to coast at faster than normal speeds encountered on a flat surface. To prevent loss of vehicle control, speeds should be limited to no more than the maximum speed on level ground. limit speed by releasing the accelerator pedal and applying pressure to the brake pedal. Severe damage to the drive train components due to excessive speed may result from driving the vehicle above specified top speed. Damage

OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

caused by excessive speed may cause a loss of control, is costly, is considered abuse and will not be covered under warranty.

LABELS AND PICTOGRAMS

Vehicles may be labeled with pictograms as a method of conveying information or warnings. The SAFETY Section of this manual explains the labels that are used on this vehicle. Maintain vehicle labels and decals in legible condition. Replacement labels and decals are available from an authorized dealer or through service parts.

4 TOWING



WARNING

This vehicle is not designed to be towed.

It is recommended that this vehicle be moved by placing the entire vehicle on a trailer, flatbed truck or other suitable transport.

OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Notes:

OPERATING PROCEDURES

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

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Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

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Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

VEHICLE CLEANING AND CARE

Vehicle Cleaning



WARNING

To reduce the possibility of severe injury or vehicle damage, read and understand all instructions supplied by manufacturer of pressure washer.



CAUTION

When pressure washing exterior of vehicle, do not use pressure in excess of 700 psi (4800 kPa). To reduce the possibility of cosmetic damage, do not use any abrasive or reactive solvents to clean plastic parts.

It is important that proper techniques and cleaning materials be used. Using excessive water pressure may cause severe injury to operator or bystander, damage to seals, plastics, seat material, body finish or electrical system. Do not use pressure in excess of 700 psi (4800 kPa) to wash exterior of vehicle.

Normal cleaning of vinyl seats and plastic or rubber trim requires the use of a mild soap solution applied with a sponge or soft brush and wipe with a damp cloth.

Removal of oil, tar, asphalt, shoe polish, etc. will require the use of a commercially available vinyl/rubber cleaner.

The painted surfaces of the vehicle provide attractive appearance and durable protection. Frequent washing with lukewarm or cold water and mild detergent is required to preserve the painted surfaces.

Occasional cleaning and waxing with non-abrasive products designed for 'clear coat' automotive finishes will enhance the appearance and durability of the painted surfaces.

Corrosive materials used as fertilizers or for dust control can collect on the underbody of the vehicle. These materials will cause corrosion of underbody parts unless flushed occasionally with plain water. Thoroughly clean any areas where mud or other debris can collect. Sediment packed in closed areas should be loosened to ease its removal, taking care not to chip or otherwise damage paint.

MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

SERVICE AND REPAIR

Servicing the Electric Vehicle

WARNING

To prevent severe injury or death, resulting from improper servicing techniques, observe the following Warnings:

Do not attempt any type of servicing operations before reading and understanding all notes, cautions and warnings in this manual.

Any servicing requiring adjustments to be made to the powertrain while the motor is running must be made with the entire vehicle raised.



Wear eye protection when working on the vehicle. In particular, use care when working around batteries, or using solvents or compressed air.

To reduce the possibility of causing an electrical arc, which could result in a battery explosion, turn off all electrical loads from the batteries before removing any heavy gauge battery wires.

To prevent the possibility of motor disintegration, never operate vehicle at full throttle for more than 4 - 5 seconds while vehicle is in a "no load" condition.

Battery posts, terminals and related accessories contain lead and lead compounds. Wash hands after handling.

It is in the best interest of both vehicle owner and servicing dealer to carefully follow the procedures recommended in this manual. Adequate preventative maintenance, applied at regular intervals, is the best guarantee for keeping the vehicle both dependable and economical.

Some servicing operations may require the front wheels, the rear wheels, or the entire vehicle to be raised.

WARNING

To reduce the possibility of severe injury or death from a vehicle falling from a jack:

Be sure the vehicle is on a firm and level surface.

Never get under a vehicle while it is supported by a jack.

Use jack stands and test the stability of the vehicle on the stands.

Always place chocks in front and behind the wheels not being raised.

Use extreme care since the vehicle is extremely unstable during the lifting process.

Never attempt to raise the rear wheels of a three wheel vehicle without first raising the front of the vehicle and supporting on jack stands.

CAUTION

When lifting the vehicle, position the jacks and jack stands at the areas indicated only.

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Lifting The Vehicle

Tool List	Qty.
Floor Jack	1
Jack Stands	4
Wheel Chocks	4
Chain hoist	1

Remove payload from vehicle before lifting. No person(s) should be in or on the vehicle while lifting.

Due to the low ground clearance and short wheel base, the vehicle should only be raised enough to remove the front axle or the rear wheels. Servicing that requires access to the underside of the vehicle should be accomplished by raising the front of the vehicle with a chain hoist attached to the front frame members. Always use an additional safety chain to prevent injury should the hoist malfunction.

WHEELS AND TIRES

! WARNING

A tire explosion can cause severe injury or death. Never exceed the inflation pressure rating on the tire sidewall.

To reduce the possibility of tire explosion, pressurize tire with small amounts of air applied intermittently to seat beads. Due to the low volume of the small tires, overinflation can occur in seconds. Never exceed the tire manufacturer’s recommendation when seating a bead. Protect face and eyes from escaping air when removing a valve core.

To reduce the possibility of severe injury caused by a broken socket when removing wheels, use only sockets designed for impact wrench use.

Use caution when inflating tires. Overinflation could cause the tire to separate from the wheel or cause the tire to explode, either of which could cause severe injury.

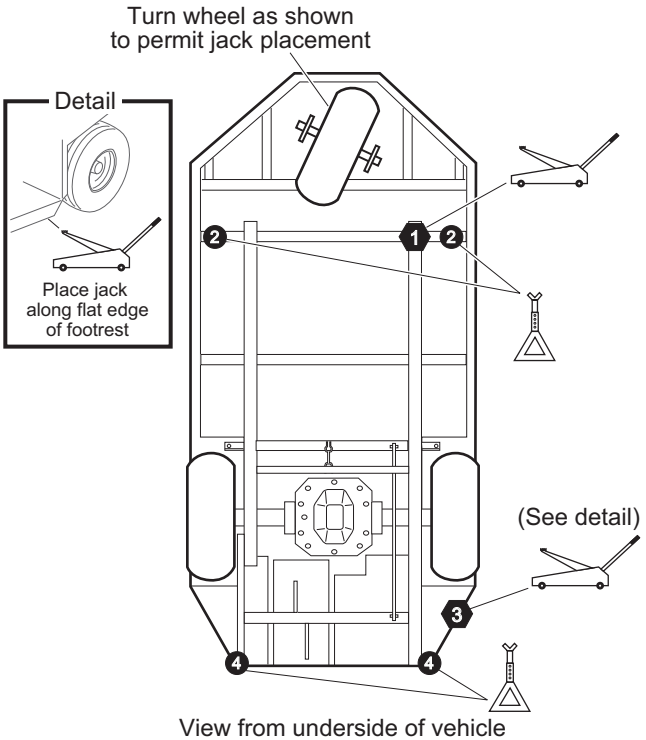
Tire Repair

Tool List	Qty.	Tool List	Qty.
Lug Wrench, 3/4”	1	Impact Socket, 3/4”	1
Impact Wrench	1	Torque Wrench, ft. lbs.	1

Use caution when inflating tires. Due to the low volume of the small tires, overinflation can occur in seconds. Overinflation could cause the tire to separate from the wheel or cause the tire to explode.

Tire inflation should be determined by the condition of the terrain. See GENERAL SPECIFICATIONS section for recommended tire inflation pressure. For outdoor applications with major use on grassy areas, the following should be considered. On hard turf, it is desirable to have a **slightly** higher inflation pressure. On very soft turf, a lower pressure reduces the possibility of tires cutting into the turf. For vehicles being used on paved or hard surfaces, tire inflation pressure should be in the higher allowable range, but under no condition should inflation pressure be higher than recommended on tire sidewall. **All three tires** should have the same pressure for optimum handling characteristics. Be sure to install the valve stem dust cap after checking or inflating.

The vehicle is fitted with low pressure tubeless tires mounted on one piece rims; therefore, the most cost effective way to repair a puncture in the tread is to use a commercial tire plug.



MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

NOTICE

Tire plug tools and plugs are available at most automotive parts outlets and have the advantage of not requiring the tire be removed from the wheel.

If the tire is flat, remove the wheel and inflate the tire to the maximum recommended pressure for the tire. Immerse the tire in water to locate the leak and mark with chalk. Insert tire plug in accordance with manufacturer's instructions.

WARNING

To reduce the possibility of severe injury, be sure the mounting/demounting machine is anchored to floor. Wear OSHA approved safety equipment when mounting/demounting tires.

5

If the tire is to be removed or mounted, the tire changing machine manufacturer's recommendations must be followed in order to reduce possibility of severe injury.

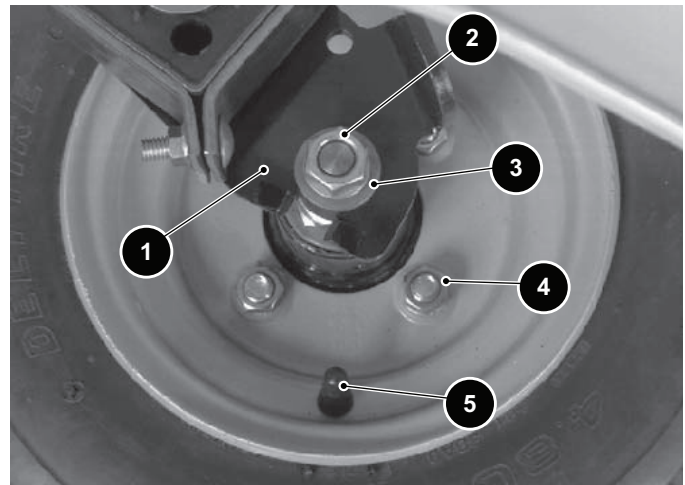
Front Wheel Removal and Installation

Position a jack in the location indicated and carefully raise the front of the vehicle. Position the jack stands as shown. Use care not to place the jack or stands where they could interfere with wiring or linkages. Slowly lower the jack and test the stability of the vehicle.

Loosen the axle nuts (2) and lower the entire wheel, hub and axle assembly from the front fork. Remove the four lug nuts (4) and remove tire and wheel assembly from the front hub.

Replace the tire and wheel assembly on the front hub with the valve stem (5) to the outside. Install the four lug nuts (4) and tighten in the Cross Sequence pattern shown below to 70 - 80 ft. lbs. (95 - 108 Nm) of torque.

Position the front hub and wheel assembly in the front fork, install the flat washers (3) on the outside of the wheel lock (1), tighten the axle nuts (2) to 100 - 120 ft. lbs. (130 - 156 Nm) of torque.



Rear Wheel Removal and Installation

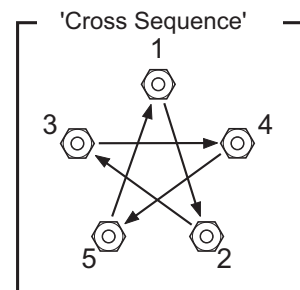
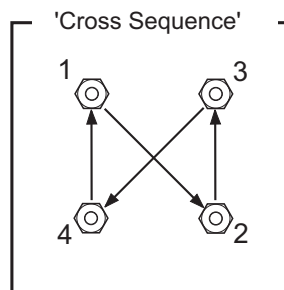
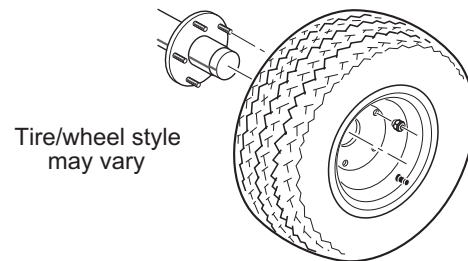
CAUTION

To reduce the possibility of component damage, do not tighten lug nuts to more than 85 ft. lbs. (115 Nm) torque.

NOTICE

It is important to follow the 'cross sequence' pattern when installing lug nuts. This will assure even seating of the wheel against the hub.

To raise the rear of the vehicle, first raise the front of the vehicle as previously described and support on jack stands. Then position the jack in the position shown at the rear of the vehicle. Carefully raise the rear of the vehicle with the jack and place two jack stands in the position shown. Slowly lower the jack and check that the vehicle is securely supported by the jack stands before proceeding.



Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

With the valve stem to the outside, mount the wheel onto the hub with lug nuts. Finger tighten the lug nuts (1) in a 'cross sequence' pattern. Tighten the lug nuts to 50 to 85 ft. lbs. (68 to 115 Nm) torque in 20 ft. lbs. (27 Nm) increments following the 'cross sequence' pattern.

Lower the vehicle by reversing the lifting sequence.

LIGHT BULB REPLACEMENT



CAUTION

To reduce the possibility of premature bulb failure, do not touch new bulbs with bare fingers. Use clean, dry tissue or paper towel to handle the glass portion of the bulb.

Headlight

Tool List	Qty.	Tool List	Qty.
Torx Driver, T-20	1	Clean Cloth	1

Loosen four torx head screws, back them out until the light bezel is free, remove bezel with screws captured in it. Pull headlight out away from recess, locate the retaining clip on the back of the housing. Squeeze clip wires together until free of latch edges and pivot out of the way and remove bulb housing from the lens, set lens aside.

Remove old bulb and replace with new 12V/55W, H3 bulb, be sure to use clean, oil free cloth to hold the new bulb, never touch the bulb with bare hands.

Replace bulb and housing in the lens, latch retaining clip wires, making sure that wires are not caught between the clip and the lens.

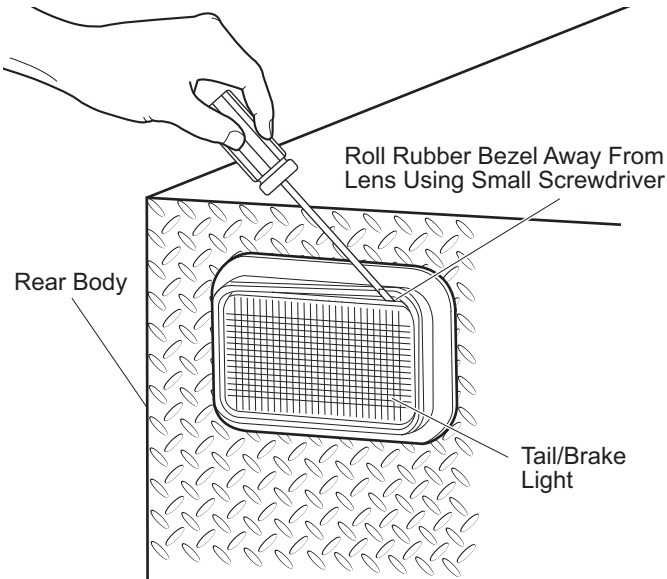
Place the bezel with the captured screws over the lens, with the word TOP located at the upper edge. Align lens and bezel with the housing and start all four screws. Tighten screws alternately, making sure that the bezel is seated against the housing.

Tail/Brake Light

Tool List	Qty.
Flat Screwdriver	1
Clean Cloth	1

Wipe the tail light with a clean cloth to remove dust and dirt.

To replace the tail and brake light bulb, insert a small screwdriver between the rubber bezel and the taillight lens. Roll the rubber bezel from around the edge of the lens and remove. Install replacement bulb and replace lens.



MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

FUSES AND CIRCUIT BREAKER

Thermal Circuit Breaker

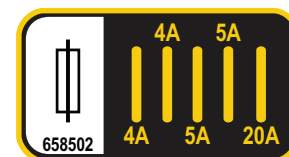
The thermal circuit breaker prevents overloading of the drive motor. The breaker automatically resets after approximately 20 seconds, an audible click will sound when the breaker resets. Should the vehicle be stopped by the opening of the circuit breaker, turn the vehicle off to avoid an accidental start when the breaker resets.

WARNING

If the circuit breaker should open while driving on an incline, immediately apply the service and parking brake to prevent loss of vehicle control.

5 Fuses

Fuses on this vehicle are located behind the door on the control panel. To access the fuses, remove the phillips head screw that secures the door to the control panel and pivot the door away from the control panel. Replace blown fuse with specified size only.



FUSE #	SIZE	FOR	LOCATION	PART NUMBER
1	4AMP 58V	Key Switch	Fuse block in the control panel.	629104
2	4AMP 58V	State of Charge Meter	Fuse block in the control panel.	629104
3	5AMP 58V	Brake, Turn and Tail Light	Fuse block in the control panel.	628081
4	5AMP 58V	Reverse Warning Indicator	Fuse block in the control panel.	628081

TRANSPORTING VEHICLE

Towing

WARNING

This vehicle is NOT designed to be towed.

It is recommended that the vehicle be moved by placing the entire vehicle on a trailer, flat bed truck or other suitable transport.

Hauling

WARNING

To reduce the possibility of severe injury or death while transporting the vehicle:

Secure the vehicle and contents.

Never ride on the vehicle being transported.

Always check that the vehicle and contents are adequately secured before transporting. The rated capacity of the trailer or truck must exceed the weight of the vehicle (see GENERAL SPECIFICATIONS for vehicle weight) and load plus 400 lbs. (181 kg). Set the park brake and secure the vehicle using ratchet tie downs.

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

SERVICE AND MAINTENANCE

WARNING

To reduce the possibility of severe injury or death from improper servicing techniques:

DO NOT attempt any type of servicing operations before reading all notes, cautions and warnings in this manual.

Any servicing requiring adjustments to be made to the powertrain while the motor is running must be made with both drive wheels raised and vehicle properly supported on jack stands.

To reduce the possibility of motor damage, never operate vehicle at full throttle for more than 4 - 5 seconds while vehicle is in a 'no load' condition.

Reduce the possibility of accidental starting by disconnecting battery at negative terminal before servicing.



Wear eye protection when working on the vehicle. Use extra care when working around batteries, or using solvents or compressed air.

To reduce the possibility of causing an electrical arc, which could result in a battery explosion, turn off all electrical loads from the battery before removing battery wires.



Wrap wrenches with vinyl tape to reduce the possibility of a dropped wrench 'shorting out' a battery, which could result in an explosion.

The electrolyte in a battery is an acid solution which can cause severe burns to the skin and eyes. Treat all electrolyte spills to the body and eyes with extended flushing with clear water. Contact a physician immediately.

Any electrolyte spills should be neutralized with a solution of 2 teaspoons (10 ml) sodium bicarbonate (baking soda) dissolved in 1 quart (1 liters) of water and flushed with water.

Aerosol containers of battery terminal protectant must be used with extreme care. Insulate metal container to reduce the possibility of can contacting battery terminals which could result in an explosion.

It is in the best interest of both vehicle owner and service technician to carefully follow the procedures recommended in this manual. Preventative maintenance, applied at recommended intervals, is the best guarantee for keeping the vehicle both dependable and economical.

CAUTION

To prolong vehicle life, some maintenance items must be serviced more frequently on vehicles used under severe driving conditions such as extreme temperatures, extreme dust/debris conditions, frequent use with maximum load.

To access powertrain for routine maintenance, lift and remove load deck. For major repair, refer to appropriate Technician's Repair and Service Manual.

Some service procedures may require the vehicle to be lifted. Refer to LIFTING THE VEHICLE for proper lifting procedure and safety information.

MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

ROUTINE MAINTENANCE



CAUTION

To prolong vehicle life, some maintenance items must be serviced more frequently on vehicles used under severe driving conditions such as extreme temperatures, extreme dust/debris conditions, or frequent use with maximum load.

To access the powertrain for routine maintenance, remove the load bed. For major repair, refer to the appropriate Technician's Repair and Service Manual.

Some service procedures may require the vehicle to be lifted. Refer to LIFTING THE VEHICLE for proper lifting procedure and safety information.

5 Lubrication Points



CAUTION

Use maximum of three pumps of grease for each grease fitting - Over greasing may damage grease seals.

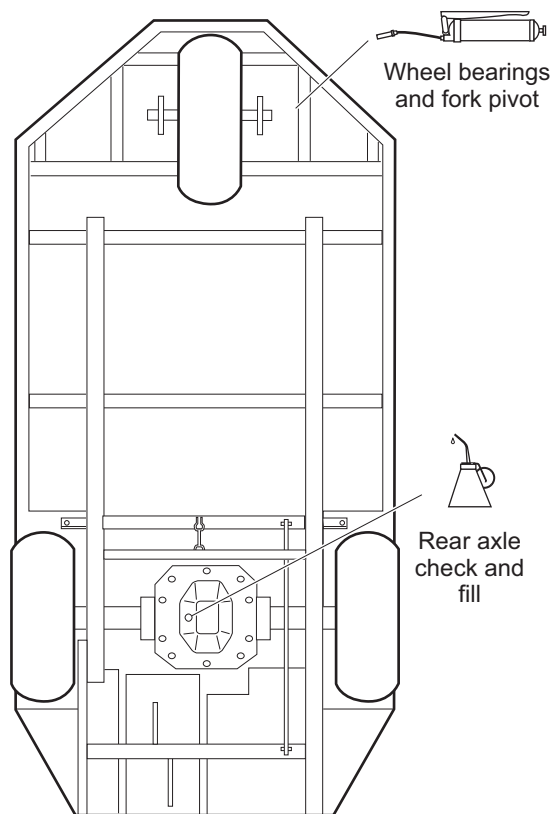
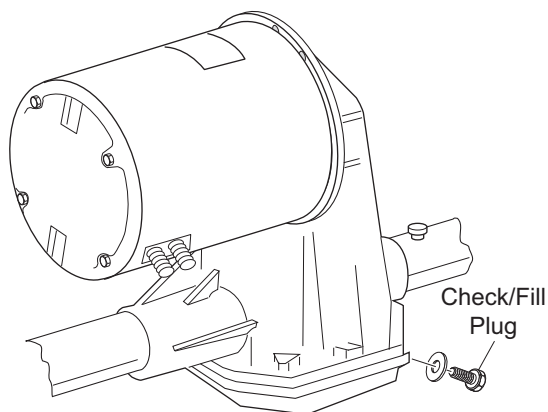
Putting more than three pumps of grease in a grease fitting could damage grease seals and cause premature bearing failure.

Tire Inspection

Tire condition should be inspected per the Periodic Service Schedule. Inflation pressures should be checked when the tires are cool. Be sure to install the valve dust cap after checking or inflating.

REAR AXLE

The only maintenance required for the first five years is the periodic inspection of the rear axle for lubricant leakage. Unless leakage is evident, the lubricant need only be replaced after five years. Refer to the Service and Repair Manual for the fluid replacement procedure.



View from underside of vehicle

Checking The Lubricant Level

With the vehicle on level ground, clean the area around the check/fill plug and remove plug. The correct lubricant level is just below the bottom of the threaded hole. If lubricant is low, add as required. Add lubricant slowly until lubricant starts to seep from the hole. Install the check/fill plug. In the event that the lubricant is to be replaced, the vehicle must be elevated and the oil pan removed or the oil siphoned out through the check/fill hole.

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

BRAKES

WARNING

To reduce the possibility of severe injury or death, always evaluate pedal travel before operating a vehicle to verify some braking function is present.

All driving brake tests must be done in a safe location with regard for the safety of all personnel.

NOTICE

Over time, a subtle loss of performance may take place; therefore, it is important to establish the standard with a new vehicle.

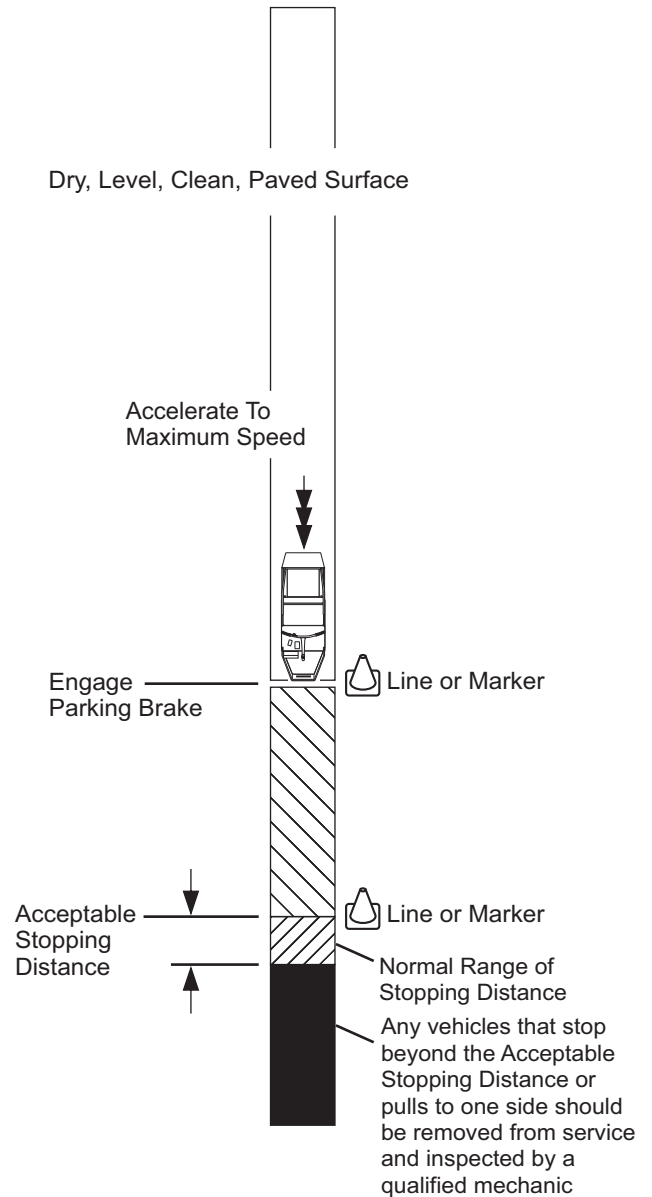
Service brakes in accordance with the Periodic Service Schedule. The Periodic Brake Performance Test should be performed regularly as an evaluation of braking system performance; it is useful as a method of identifying subtle loss of performance over time.

After the vehicles has been put into service, it is recommended that the brakes be checked by performing the following test:

Periodic Brake Test

Determine the braking performance of the vehicle by engaging the parking brake at a common point on a flat, dry, clean paved surface while traveling at maximum speed. Observe the vehicle stopping location. If the vehicle stops in a significantly greater distance than normal or pulls to one side, it should be tested again.

If the vehicle fails the second test, it should immediately be removed from service. The vehicle needs to be inspected by a qualified mechanic and repairs performed before vehicle is returned to service.









MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

HARDWARE

Generally, three classes of standard hardware and two classes of metric hardware are used in the vehicle. Grade 5 hardware can be identified by the three marks on the hexagonal head and grade 8 hardware is identified by 6 marks on the head. Metric hardware is marked on the head with 8.8 or 10.9. Unmarked hardware is Grade 2.

Periodically, the vehicle should be inspected for loose fasteners. Fasteners should be tightened with care and in accordance with the Torque Specifications table or as specified in the Repair and Service Manual for this vehicle.

ALL TORQUE FIGURES ARE IN FT. LBS. (Nm)										
Unless otherwise noted in text, tighten all hardware in accordance with this chart.										
This chart specifies 'lubricated' torque figures. Fasteners that are plated or lubricated when installed are considered 'wet' and require approximately 80% of the torque required for 'dry' fasteners.										
BOLT SIZE	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"
Grade 2 	4 (5)	8 (11)	15 (20)	24 (33)	35 (47)	55 (75)	75 (102)	130 (176)	125 (169)	190 (258)
Grade 5 	6 (8)	13 (18)	23 (31)	35 (47)	55 (75)	80 (108)	110 (149)	200 (271)	320 (434)	480 (651)
Grade 8 	6 (8)	18 (24)	35 (47)	55 (75)	80 (108)	110 (149)	170 (230)	280 (380)	460 (624)	680 (922)
BOLT SIZE	M4	M5	M6	M8	M10	M12	M14			
Class 5.8 (Grade 2) 	1 (2)	2 (3)	4 (6)	10 (14)	20 (27)	35 (47)	55 (76.4)			
Class 8.8 (Grade 5) 	2 (3)	4 (6)	7 (10)	18 (24)	35 (47)	61 (83)	97 (131)			
Class 10.9 (Grade 8) 	3 (4)	6 (8)	10 (14)	25 (34)	49 (66)	86 (117)	136 (184)			

Torque Specifications and Bolt Grades

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

PERIODIC SERVICE SCHEDULE

✓ - CHECK C&A - CHECK & ADJUST CL - CLEAN R - REPLACE

REMARKS	before each use DAILY	WEEKLY	100 miles/160 kms MONTHLY	300 miles/500 kms QUARTERLY	600 miles/1000 kms SEMI-ANNUAL	1200 miles/2000 kms ANNUAL	5 YEARS
Tires - pressure, condition of tires & rims	✓	✓	✓	✓	✓	✓	
Hardware - loose or missing	✓	✓	✓	✓	✓	✓	
Reverse Warning Indicator	✓	✓	✓	✓	✓	✓	
Horn operation (if equipped), Forward Motion Indicator (if equipped)	✓	✓	✓	✓	✓	✓	
Brake/Tail Lights, Headlights (if equipped) all lights operational	✓	✓	✓	✓	✓	✓	
Overall Vehicle Condition	✓	✓	✓	✓	✓	✓	
Battery Pack - state of charge, condition, loose terminals, corrosion, hold down & hardware	✓	✓	CL	CL	CL	CL	
Brake Pedal - smooth operation	✓	✓	✓	✓	✓	✓	
Brakes - aggressive stop test			C&A	C&A	C&A	C&A	
Park Brake - operation, does it hold on a hill	✓	✓	C&A	C&A	C&A	C&A	
Accelerator - smooth operation	✓	✓	✓	✓	✓	✓	
Charger - inspect charger AC cord, plug, receptacle at each charge	✓	✓	✓	✓	✓	✓	
Wiring - loose connections, broken or missing insulation			✓	✓	✓	✓	
Steering Assembly - excessive play, loose or missing hardware			✓	✓	✓	✓	
Tie Rods - excessive play, bent rods, loose or missing hardware			✓	✓	✓	✓	
Rear Axle - fluid level, oil leakage, noise, loose or missing hardware			✓	✓	✓	✓	
Rear Axle - drain & replace fluid							R
Rear Suspension - shock oil leakage, worn bushings, loose or missing hardware				✓	✓	✓	
Front Fork and Front Wheel Bearings - adjust and repack with bearing grease					✓	✓	
Front Wheel Alignment - unusual tire wear				C&A	C&A	C&A	

NOTE: Some maintenance items must be serviced more frequently on vehicles used under severe driving conditions.

MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

BATTERY CHARGING AND MAINTENANCE

Safety

Always observe the following warnings when working on or near batteries.

WARNING

To prevent battery explosion that could result in severe personal injury or death, keep all smoking materials, open flames or sparks away from the batteries.

Hydrogen gas is formed when charging batteries. Do not charge batteries without adequate ventilation. A 4% concentration of hydrogen gas is explosive.

5 *Be sure that the key switch is off and all electrical accessories are turned off before starting work on the vehicle.*

Never disconnect a circuit under load at a battery terminal.

SAFETY FIRST



**BEND KNEES
WHEN
LIFTING**

Batteries are heavy. Use proper lifting techniques when moving them. Always lift the battery with a commercially available battery lifting device. Use care not to tip batteries when removing or installing them; spilled electrolyte can cause burns and damage.

The electrolyte in a storage battery is an acid solution which can cause severe burns to the skin and eyes. Treat all electrolyte spills to the body and eyes with extended flushing with clear water. Contact a physician immediately.

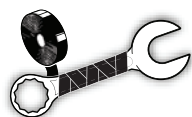


Always wear a safety shield or approved safety goggles when adding water or charging batteries.

Any electrolyte spills should be neutralized with a solution of 1/4 cup (60 ml) sodium bicarbonate (baking soda) dissolved in 1 1/2 gallons (6 liters) of water and flushed with water.

Overfilling batteries may result in electrolyte being spilled from the battery during the charge cycle. Expelled electrolyte may cause damage to the vehicle and storage facility.

Aerosol containers of battery terminal protectant must be used with extreme care. Insulate metal container to prevent can from contacting battery terminals which could result in an explosion.



Wrap wrenches with vinyl tape to prevent the possibility of a dropped wrench from shorting out a battery, which could result in an explosion and severe personal injury or death.

Never charge a vehicle in a hazardous location or atmosphere. Reference NFPA 505 for definitions of hazardous and non-hazardous locations.

Battery Disposal

Lead-acid batteries are recyclable. Return whole scrap batteries to distributor, manufacturer or lead smelter for recycling. For neutralized spills, place residue in acid-resistant containers with absorbent material, sand or earth and dispose of in accordance with local, state and federal regulations for acid and lead compounds. Contact local and/or state environmental officials regarding disposal information.

Battery

A battery is defined as two dissimilar metals immersed in an acid. If the acid is absent or if the metals are not dissimilar, a battery has not been created. The batteries most commonly used in these vehicles are lead acid.

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

A battery does not store electricity, but is able to produce electricity as the result of a chemical reaction which releases stored chemical energy in the form of electrical energy. The chemical reaction takes place faster in warm conditions and slower in cold conditions. Temperature is important when conducting tests on a battery and test results must be corrected to compensate for temperature differences.

As a battery ages, it still performs adequately except that its **capacity** is diminished. Capacity describes the time that a battery can continue to provide its design amperes from a full charge.

A battery has a maximum life, therefore good maintenance is designed to maximize the **available** life and reduce the factors that can reduce the life of the battery.

Battery Maintenance

Tool List	Qty.	
Insulated Wrench, 9/16"	1	Battery Carrier..... 1
Hydrometer	1	Battery Maintenance Kit P/N 25587-G01..... 1
Battery Protective Spray	1	Torque Wrench, in. lbs
Socket, 9/16"	1	1

At Each Charging Cycle



To reduce the possibility of fire, never attach a battery charger to a vehicle that is to be unattended beyond the normal charging cycle. Overcharging could cause damage to the vehicle batteries and result in extreme overheating. The charger should be checked after 24 hours and unplugged after the charge cycle is complete.

Before charging the batteries, inspect the cord of the battery charger for missing or cracked insulation, inspect the plug to be sure the grounding prong is intact.

Charge the batteries after each day’s use.

Monthly

- Inspect all wiring for fraying, loose terminations, corrosion or deterioration of insulation.
- Check that the electrolyte level is correct and add suitable water as required.
- Clean the batteries and wire terminations.
- Coat battery terminals with commercially available protectant.

Electrolyte Level and Water

The correct level of the electrolyte is 1/2" (13 mm) above the plates in each cell.

This level will leave approximately 1/4" - 3/8" (6 - 10 mm) of space between the electrolyte and the vent tube. The electrolyte level is important since any portion of the plates exposed to air will be ruined beyond repair. Also avoid filling with too much water, which will result in electrolyte being forced out of the battery due to gassing and a decrease in volume of the electrolyte that results from the charging cycle.



DO NOT overfill batteries. The charging cycle will expel electrolyte and result in component damage.

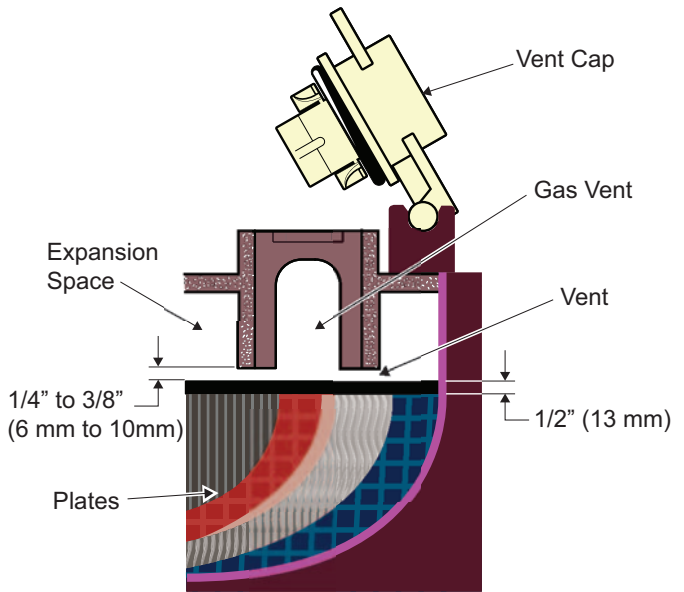
MAINTENANCE

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A battery being charged will 'gas' with the majority of the gassing taking place at the end of the charging cycle. This gas is hydrogen with is lighter than air. Water and sulphuric acid droplets will be carried out of the battery vents by the hydrogen gas, however, this loss is minimal. If the battery electrolyte level is too high, the electrolyte will block the vent tube and the gas will force it out of the vent tube and battery cap. The water will evaporate but the sulphuric acid will remain where it can damage vehicle components and the storage facility floor. Sulphuric acid loss will weaken the concentration of acid within the electrolyte and reduce the life of the battery.

5 Over the life of the battery, a considerable amount of water is consumed. It is important that the water used be pure and free of contaminants that could reduce the life of the battery by reducing the chemical reaction. The water must be distilled or purified by an efficient filtration system. Water that is not distilled should be analyzed and, if required, filtration installed to permit the water to meet the requirements of the water purity table.

Even if the water is colorless, odorless, tasteless and fit for drinking, the water should be analyzed to see that it does not exceed the impurity levels specified in the table.



Electrolyte level should be at least 1/2" (13mm) above the plates and 1/4" to 3/8" (6 to 10 mm) below vent

Correct Electrolyte Level

Impurity	Parts Per Million
Color	Clear
Suspended	Trace
Total Solids	100
Calcium & Magnesium Oxides	40
Iron	5
Ammonia	8
Organic & Volatile Matter	50
Nitrites	5
Nitrates	10
Chloride	5

Water Purity Table

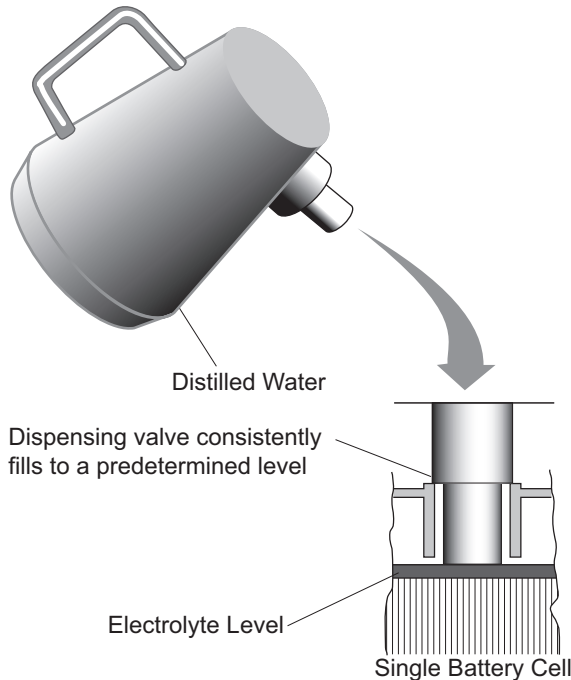
MAINTENANCE

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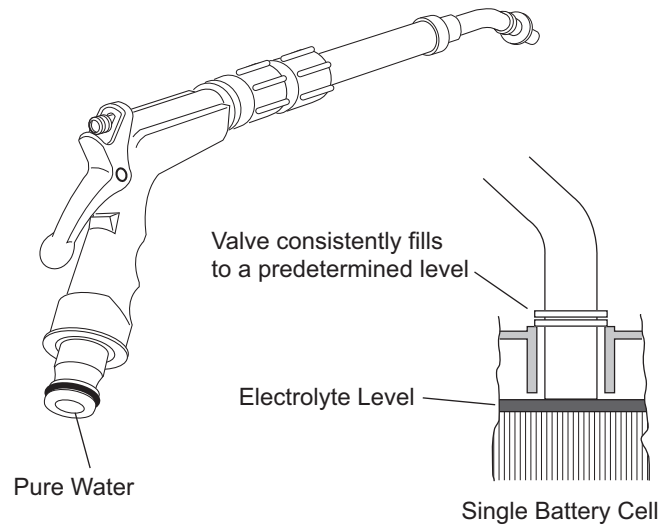
Automatic watering devices such as the one included in the Battery Maintenance Kit (P/N 25587-G01) can be used with an approved water source. These watering devices are accurate, easy to use and allow for rapid filling. They also maintain the correct electrolyte level within the battery cells.

NOTICE

The watering device should only be used if the electrolyte level is less than 1/2" (13 mm) above top of plates.



Hand Held Watering Device



Automatic Watering Gun

WARNING

The electrolyte in a storage battery is an acid solution which can cause severe burns to the skin and eyes. Treat all electrolyte spills to the body and eyes with extended flushing with clear water. Contact a physician immediately.



Any electrolyte spills should be neutralized with a solution of 1/4 cup (60 ml) sodium bicarbonate (baking soda) dissolved in 1 1/2 gallons (6 liters) of water and flushed with water.

Always wear a safety shield or approved safety goggles when adding water or charging batteries.

MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Battery Cleaning



CAUTION

To prevent battery damage, be sure that all battery caps are tightly installed.

To reduce the possibility of damage to vehicle or floor, neutralize acid before rinsing battery.

To reduce the possibility of damage to electrical components while cleaning, do not use a pressure washer.

Cleaning should take place per the Periodic Service Schedule.

When cleaning the outside of the batteries and terminals, do not use a water hose without first spraying the batteries with a solution of baking soda (sodium bicarbonate) and water to neutralize any acid deposits. Use of a water hose without first neutralizing the acid will move the acid from the top of the batteries to another area of the vehicle or storage facility, where it will attack the metal structure or the concrete/asphalt floor. After hosing down the batteries, a residue will be left on the batteries which is conductive and will contribute to the discharge of the batteries.

NOTICE

To reduce the possibility of battery explosion that could result in severe injury or death, do not use metallic spray wand to clean battery and keep all smoking materials, open flame or sparks away from the battery.

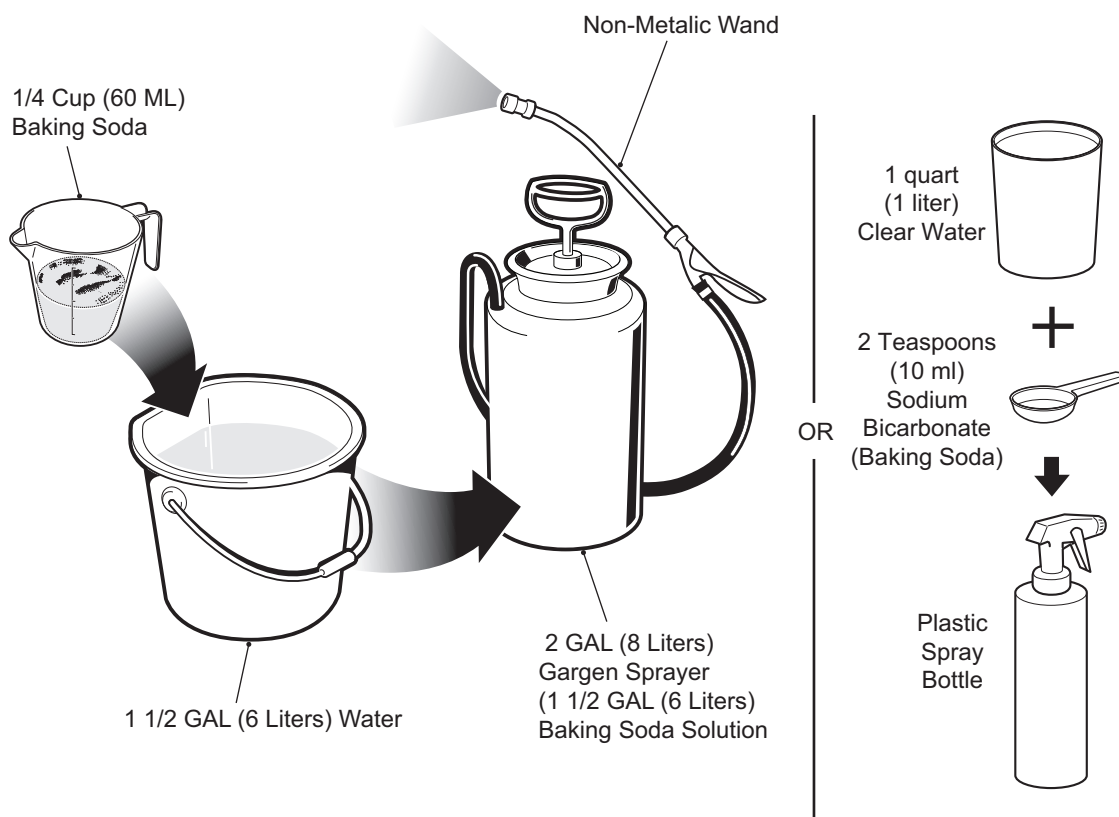
The correct cleaning technique is to spray the top and sides of the batteries with a solution of baking soda and water. This solution is best applied with a garden-type sprayer equipped with a non-metallic spray wand or plastic spray bottle. The solution should consist of 1/4 cup (60 ml) of baking soda mixed with 1 1/2 gallons (6 litres) of clear water. In addition to the batteries special attention should be paid to metallic components adjacent to the batteries, these should also be sprayed with the baking soda solution.

Allow the solution to set for at least three minutes; use a soft bristle brush or cloth to wipe the tops of the batteries in order to remove any residue that could cause the self-discharge of the battery. Rinse the entire area with low pressure clear water. All of the items required for complete battery cleaning and watering are contained in the Battery Maintenance Kit (P/N 25587-G01).

Cleaning should take place once a month or more often under extreme conditions.

After batteries are clean and dry, the terminals should be coated with a commercially available protectant.

Aerosol containers of battery terminal protectant must be used with extreme care. Insulate the metal container to prevent the can from contacting the battery terminals.



Preparing Acid Neutralizing Solution

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Battery Replacement

Remove battery hold downs and cables. Lift out batteries with a commercially available lifting device.

If the batteries have been cleaned and any acid in the battery rack area neutralized as recommended, no corrosion to the battery racks or surrounding area should be present. Any corrosion found should be immediately removed with a putty knife and a wire brush. The area should be washed with a solution of sodium bicarbonate (baking soda) and water and thoroughly dried before priming and painting with a corrosion resistant paint.

The batteries should be placed into the battery racks and the battery hold downs tightened to 45 - 55 in. lbs. (5 - 6 Nm) torque, to prevent movement but not tight enough to cause distortion of the battery cases.

Inspect all wires and terminals. Clean any corrosion from the battery terminals or the wire terminals with a solution of sodium bicarbonate (baking soda) and brush clean if required.

⚠ WARNING

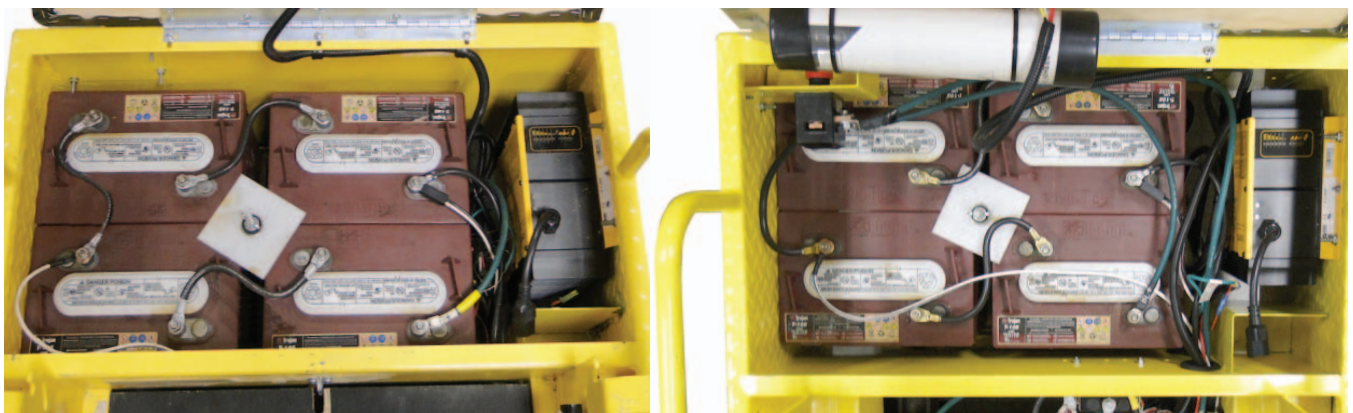
To prevent battery explosion that could result in severe personal injury or death, extreme care must be used with aerosol containers of battery terminal protectant. Insulate the metal container to prevent the metal can from contacting battery terminals which could result in an explosion.

Use care to connect the battery wires as shown.

Tighten the battery post hardware to 90 - 100 in. lbs. (6 -8 Nm) torque. Do not over-torque the terminal stud nut, this will cause a “mushroom” effect on the battery post which will prevent the terminal nut from being properly tightened. Protect the battery terminals and battery wire terminals with a commercially available coating.

Protect the battery terminals and battery wire terminals with a commercially available coating.

Battery Connections Front of Vehicle Battery Connections
CE Vehicles



Prolonged Storage

⚠ CAUTION

Battery charger, controller and other electronic devices need to be disconnected since they will contribute to the premature discharge of batteries.

During periods of storage, the batteries will need attention to keep them maintained and prevent discharge. In high temperatures the chemical reaction is faster, while low temperatures cause the chemical reaction to slow down. A vehicle that is stored at 90° F (32° C) will lose .002 of specific gravity each day. If a fully charged battery has a specific gravity of 1.275, and the battery is allowed to sit unused, it will become partially discharged. When it reaches 1.240, which it will do in less than twenty days, it should be recharged. If a battery is left in a discharged state, sulfating takes place on and within the plates. This condition is not reversible and will cause permanent damage to the

MAINTENANCE

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battery. In order to prevent damage, the battery should be recharged. A hydrometer can be used to determine the specific gravity and therefore the state of charge of a battery.

In winter conditions, the battery must be fully charged to prevent the possibility of freezing. A fully charged battery will not freeze in temperatures above -75° F (-60° C). Although the chemical reaction is slowed in cold temperatures, the battery must be stored fully charged, and disconnected from any circuit that could discharge the battery. For portable chargers, disconnect the charging plug from the vehicle receptacle. For on-board chargers, disconnect the charging harness from the batteries. The batteries must be cleaned and all deposits neutralized and removed from the battery case to prevent self discharge. The batteries should be tested or recharged at thirty day minimum intervals.

Battery Charging

The battery charger is designed to fully charge the battery set. If the batteries are severely deep cycled, some automatic battery chargers contain an electronic module that may not activate and the battery charger will not function. Automatic chargers will determine the correct duration of charge to the battery set and will shut off when the battery set is fully charged. Always refer to the instructions of the specific charger used.

Before charging, the following should be observed:



CAUTION

Do not overfill batteries. The charging cycle will expel electrolyte and result in component damage.

- The electrolyte level in all cells must be at the recommended level and cover the plates.
- The charging must take place in an area that is well ventilated and capable of removing the hydrogen gas that is generated by the charging process. A **minimum** of five air exchanges per hour is recommended.
- The charging connector components must be in good condition and free from dirt or debris.
- The charger connector must be fully inserted into the vehicle receptacle.
- The charger connector/cord set is protected from damage and is located in an area to prevent injury that may result from personnel running over or tripping over the cord set.
- The charger is automatically turned off during the connect/disconnect cycle and therefore no electrical arc is generated at the DC plug/receptacle contacts.

NOTICE

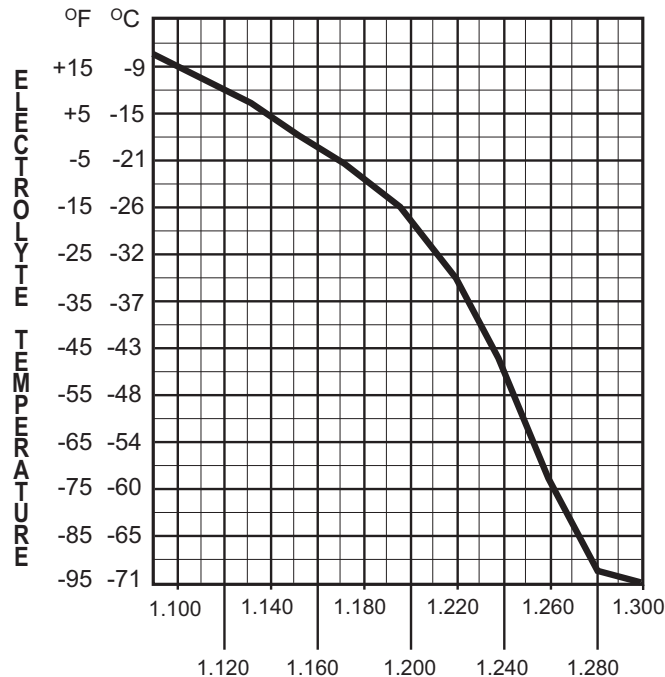
In some portable chargers, there will be a rattle present in the body of the charger DC plug. This rattle is caused by an internal magnet contained within the charger plug. The magnet is part of the interlock system that prevents the vehicle from being driven when the charger plug is inserted in the vehicle charging receptacle.

AC Voltage

Battery charger output is directly related to the input voltage. If multiple vehicles are receiving an incomplete charge in a normally adequate time period, low AC voltage could be the cause and the power company should be consulted.

Troubleshooting

In general, troubleshooting will be done for two distinct reasons. First, a battery that performs poorly and is outside of the manufacturers specification should be identified in order to replace it under the terms of the manufacturer's warranty. Different manufacturers have different requirements. Consult the battery manufacturer or the manufacturer's representative for specific requirements.



SPECIFIC GRAVITY ELECTROLYTE FREEZING POINT

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

The second reason is to determine why a particular vehicle does not perform adequately. Performance problems may result in a vehicle that runs slowly or in a vehicle that is unable to operate for the time required.

A new battery must **mature** before it will develop its maximum capacity. Maturing may take up to 100 charge/discharge cycles. After the maturing phase, the older a battery gets, the lower the capacity. The only way to determine the capacity of a battery is to perform a load test using a discharge machine following manufacturer's recommendations.

A cost effective way to identify a poorly performing battery is to use a hydrometer to identify a battery in a set with a lower than normal specific gravity. Once the particular cell or cells that are the problem are identified, the suspect battery can be removed and replaced. At this point there is nothing that can be done to salvage the battery; however, the individual battery should be replaced with a good battery of the same brand, type and approximate age.

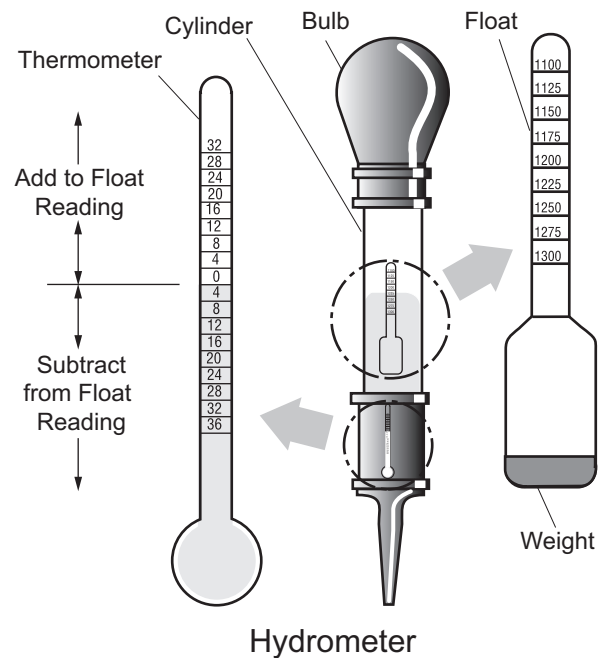
HYDROMETER

A hydrometer (P/N 50900-G1) is used to test the state of charge of a battery cell. This is performed by measuring the density of the electrolyte, which is accomplished by measuring the specific gravity of the electrolyte. The greater the concentration of sulfuric acid, the more dense the electrolyte becomes. The higher the density, the higher the state of charge.

WARNING

To prevent battery explosion that could result in severe personal injury or death, never insert a metal thermometer into a battery. Use a hydrometer with a built in thermometer that is designed for testing batteries.

Specific gravity is the measurement of a liquid that is compared to a baseline. The baseline is water which is assigned a base number of 1.000. The concentration of sulfuric acid to water in a new golf car battery is 1.280 which means that the electrolyte weighs 1.280 times the weight of the same volume of water. A fully charged battery will test at 1.275 - 1.280 while a discharged battery will read in the 1.140 range.



NOTICE

Do not perform a hydrometer test on a battery that has just been watered. The battery must go through at least one charge and discharge cycle in order to permit the water to adequately mix with the electrolyte.

The temperature of the **electrolyte** is important since the hydrometer reading must be corrected to 80° F (27° C). High quality hydrometers are equipped with an internal thermometer that will measure the temperature of the electrolyte and will include a conversion scale to correct the float reading. It is important to recognize that the electrolyte temperature is significantly different from the ambient temperature if the vehicle has been operated.

MAINTENANCE

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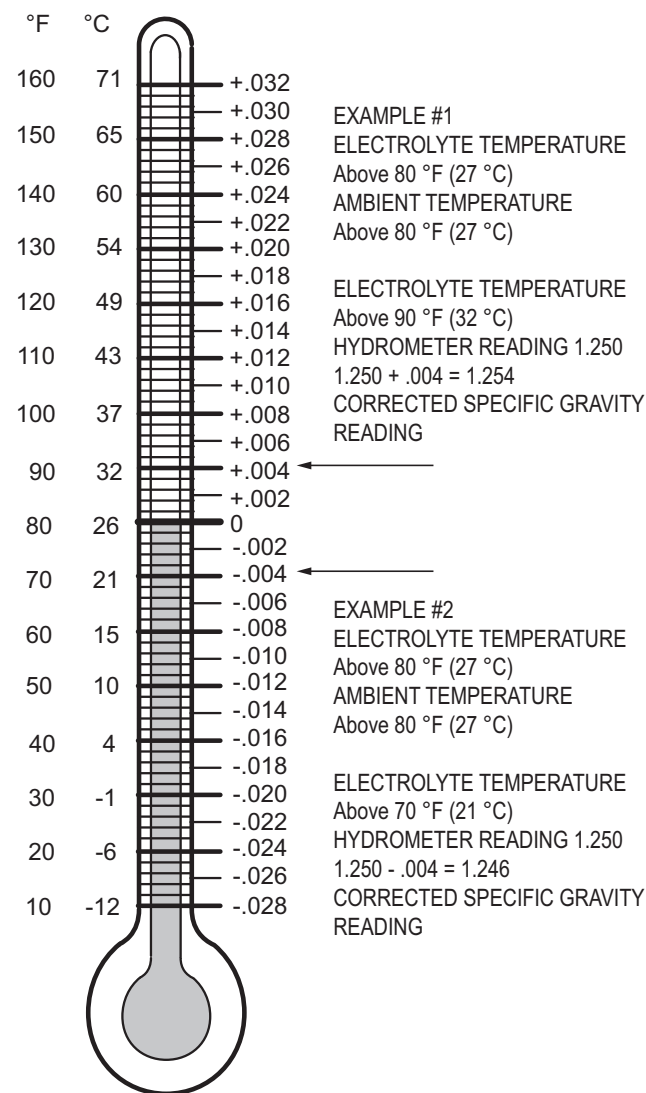
Using A Hydrometer

1. Draw electrolyte into the hydrometer several times to permit the thermometer to adjust to the electrolyte temperature and note the reading. Examine the color of the electrolyte. A brown or gray coloration indicates a problem with the battery and is a sign that the battery is nearing the end of its life.
2. Draw the minimum quantity of electrolyte into the hydrometer to permit the float to float freely without contacting the top or bottom of the cylinder.
3. Hold the hydrometer in a vertical position at eye level and note the reading where the electrolyte meets the scale on the float.
4. Add or subtract four points (.004) to the reading for every 10° F (6° C) the electrolyte temperature is above or below 80° F (27° C). Adjust the reading to conform with the electrolyte temperature, e.g., if the reading indicates a specific gravity of 1.250 and the electrolyte temperature is 90° F (32° C), add four points (.004) to the 1.250 which gives a corrected reading of 1.254. Similarly if the temperature was 70° F (21° C), subtract four points (.004) from the 1.250 to give a corrected reading of 1.246.
5. Test each cell and note the readings (corrected to 80° F or 27° C). A variation of fifty points between any two cell readings (example 1.250 - 1.200) indicates a problem with the low reading cell(s).

As a battery ages the specific gravity of the electrolyte will decrease at full charge. This is not a reason to replace the battery providing all cells are within fifty points of each other.

Since the hydrometer test is in response to a vehicle exhibiting a performance problem, the vehicle should be recharged and the test repeated. If the results indicate a weak cell, the battery or batteries should be removed and replaced with a good battery of the same brand, type and approximate age.

ELECTROLYTE TEMPERATURE



Hydrometer Temperature Correction

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Notes:

MAINTENANCE

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Notes:

5

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

TITLE	PAGE NO.
DELTA Q BATTERY CHARGER	A - 2

APPENDIX A

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.



User's Guide for:
912-2400, 912-3600-07, 912-4800-14



SAVE THESE IMPORTANT SAFETY INSTRUCTIONS



Battery Safety Information

This manual contains important safety, operating, and installation instructions – read before using charger.

Warning: Use charger only on battery systems with an algorithm selected that is appropriate to the specific battery type. Other usage may cause personal injury and damage. Lead acid batteries may generate explosive hydrogen gas during normal operation. Keep sparks, flames, and smoking materials away from batteries. Provide adequate ventilation during charging. Never charge a frozen battery. Study all battery manufacturers' specific precautions such as recommended rates of charge and removing or not removing cell caps while charging.

Electrical Safety Information

Danger: Risk of electric shock. Connect charger power cord to an outlet that has been properly installed and grounded in accordance with all local codes and ordinances. A grounded outlet is required to reduce risk of electric shock – do not use ground adapters or modify plug. Do not touch uninsulated portion of output connector or uninsulated battery terminal. Disconnect the AC supply before making or breaking the connections to the battery while charging. Do not open or disassemble charger. Do not operate charger if the AC supply cord is damaged or if the charger has received a sharp blow, been dropped, or otherwise damaged in any way – refer all repair work to qualified personnel. Not for use by children.

INFORMATIONS IMPORTANTES DE SÉCURITÉ

Conserver ces instructions. Ce manuel contient des instructions importantes concernant la sécurité et le fonctionnement.

Information de Sécurité de la Batterie

Attention: Utiliser seulement sur les systèmes batteries avec un algorithme approprié au type spécifique de batterie. D'autres types de batteries pourraient éclater et causer des blessures ou dommages. Les batteries peuvent produire des gaz explosifs en service normal. Ne jamais fumer près de la batterie et éviter toute étincelle ou flamme nue à proximité de ces derniers. Fournir la bonne ventilation lors du chargement. Ne jamais charger une batterie gelée. Prendre connaissance des mesures de précaution spécifiées par le fabricant de la batterie, p. ex., vérifier s'il faut enlever les bouchons des cellules lors du chargement de la batterie, et les taux de chargement recommandés.

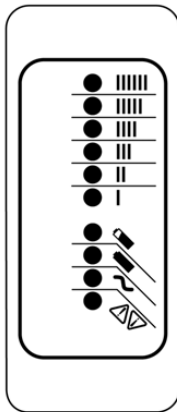
Information de Sécurité Électrique

Danger: Risque de chocs électriques. Ne pas toucher les parties non isolées du connecteur de sortie ou les bornes non isolées de la batterie. Toujours connecter le chargeur à une prise de courant mise à la terre. Ne pas ouvrir ni désassembler le chargeur – référer toute réparations aux personnes qualifiées. Pas à l'usage des enfants.

Operating Instructions

CAUTION: Charger enclosure may be hot during charging. Use hand protection if handling the charger while charging.

1. Extension cords must be 3-wire cord no longer than 30m(100') at 10AWG or 7.5m(25') at 16AWG per UL guidelines.
2. Only connect **ONE** QuiQ charger to a single 15A circuit or the circuit may become overloaded.
3. Charger 10-LED Display



LED indications following "Power-On Self Test" flashes:

Ammeter (Amber)		Solid:	Displays approximate scale of current output during charging.
		Flashing:	High internal temperature, current output reduced. Also displays algorithm #1-6 for 11 seconds if no battery is connected.
80% Charge (Amber)		Solid:	Bulk charge phase complete, 80% charged. In Absorption phase.
		Flashing:	With no battery connected, indicates algorithm # selected by number of flashes.
100% Charge (Green)		Solid:	Charging complete. Charger in Maintenance Mode.
		Flashing:	Absorption phase complete. In Finish phase
AC On (Amber)		Solid:	AC Power good
		Flashing:	Low AC Voltage, check voltage and extension cord length (see above for guidelines).
Fault (Red)		Flashing:	Charger error. Reset charger power and refer to Troubleshooting below.




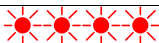


Maintenance Instructions

1. Do not expose charger to oil, dirt, mud or direct heavy water spray when cleaning vehicle.
2. The enclosure of the charger has been tested successfully to EN60529, meeting IP66. The AC supply inlet is rated to IP20, which is suitable for indoor use only. Keep all AC connections clean and dry.

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Troubleshooting Instructions

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

Red Flashes	Cause	Solution
	Charge Enable Fault or Battery Temperature Fault	Check connector contacts and retry. Check that battery temperature is between -10°C and +50°C.
	Battery Voltage Too Low or High	Check battery size and condition of batteries.
	Charge Timeout caused by battery pack not reaching required voltage.	Check for loose connections or corrosion.
	Charger output was reduced due to high temperatures.	Operate charger at a lower ambient temperature or increase cooling air flow.
	Check Battery: battery could not be trickle charged up to minimum voltage	Check for shorted or damaged cells.
	Over-Temperature: Charger shut down due to high internal temperature.	Ensure sufficient cooling air flow and reset charger (interrupt AC power for 15 seconds).
	Charger Internal Fault	Reset charger (interrupt AC power for 15 seconds). Return to qualified service depot if fault persists.

Specifications

DC Output – see Operating Instructions

QuiQ Model:	912-2400 628089	912-3600-07 628102	912-4800-14 624206
Voltage-nom (V)	24	36	48
Voltage-max (V)	34	51	67
Current-max (A)	25	21	18
Battery Type	Lead acid (Wet / AGM / GEL)		
Reverse Polarity	Electronic protection – auto-reset		
Short Circuit	Electronic current limit		

AC Input

All models	
Voltage-max (Vrms)	85 – 265
Frequency (Hz)	45 - 65
Current - max (Arms)	9.5A @ 120VAC 5A @ 230VAC
AC Power Factor	>0.99 at 120VAC >0.98 at 230VAC

Mechanical

All models	
Dimensions	28.0 x 24.5 x 11.0 cm (11 x 9.7 x 4.3")
Weight	<5 kg (11 lbs)
Environmental	Enclosure: IP66
Operating Temperature	-30°C to +50°C (-22°F to 122°F), derated above 30°C, below 0°C
Storage Temperature	-40°C to +70°C (-40°F to 158°F)
AC input connector	IEC320/C14 (require ≥1.8m localized cord)
DC output	OEM specific w/ 12AWG wire

Operation

All models	w/Default Algo 1
Battery Temperature Compensation	Automatic
Maintenance Mode	Auto-restart if V < 2.08V/cell or 30 days elapse

Regulatory

Safety	
EN 60335-2-29	Safety of Appliances/ Battery Chargers
UL2202 (1 st Ed.)	EV Charging System Equipment
UL1564 3rd Ed.	Industrial Battery Charger
CSA- 107.2	Battery Chargers- Industrial

Emissions	
FCC Part 15/ICES 003	Unintentional Radiators Class A
EN 55011	Radio disturbance characteristics (Class A)
EN 61000-3-2	Limits for harmonic current emissions
EN 61000-3-3	Limits of voltage fluctuations and flicker

Immunity	
EN 61000-4-2	Electrostatic discharge immunity
EN 61000-4-3	Radiated, radio-frequency, EMF immunity
EN 61000-4-4	Electrical fast transient/burst immunity
EN 61000-4-5	Surge immunity
EN 61000-4-6	Conducted Immunity
EN 61000-4-11	Voltage variations immunity

Product warranty is dependent on model - please contact dealer of original equipment for warranty service.

Note: This is a Class A product. In a domestic environment this product may cause radio interference, and the user may be required to take adequate measures.

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APPENDIX A

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

Notes:

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

TITLE	PAGE NO.
DECLARATION OF CONFORMITY	B - 2

APPENDIX B

Read all of this manual to become thoroughly familiar with this vehicle. Pay particular attention to all Notices, Cautions, Warnings, and Dangers.

DECLARATION OF CONFORMITY • ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ • PROHLÁŠENÍ O SHODĚ • OVERENSSTEMMELSESERKLÆRING • CONFORMITEITSVERKLARING • VASTAVUSDEKLARATSIOON • VAATIMUSTENMUKAISUUSVAKUUTUS • DECLARATION DE CONFORMITE • KONFORMITÄTSEKTLÄRUNG • ΔΗΛΩΣΗ ΣΥΜΜΟΡΦΩΣΗΣ • MEGFELELŐSÉGI NYILATKOZAT • DICHIARAZIONE DI CONFORMITÀ • ATBILSTĪBAS DEKLARĀCIJA • ATITIKTIES DEKLARACIJA • DIKJARAZZJONI TAL-KONFORMITÀ • DEKLARACJA ZGODNOŚCI • DECLARAÇÃO DE CONFORMIDADE • DECLARAȚIE DE CONFORMITATE • VYHLÁŠENIE O ZHODE • IZJAVA O SKLADNOSTI • DECLARACIÓN DE CONFORMIDAD • DEKLARATION OM ÖVERENSSTÄMMELSE • SAMRÆMISYFIRLÝSING • KONFORMITETSEKTLÆRING • 符合性声明 • SAMRÆMISYFIRLÝSING • 適合宣言 • 적합성 선언서 • UYGUNLUK BEYANI • ДЕКЛАРАЦІЯ ПРО ВІДПОВІДНІСТЬ

Business name and full address of the manufacturer • Търговско име и пълен адрес на производителя • Obchodní jméno a plná adresa výrobce • Producentens firmanavn og fulde adresse • Bedrijfsnaam en volledige adres van de fabrikant • Tootja ärinimi ja täielik aadress • Valmistajan toiminnin ja täydellinen osoite • Nom commercial et adresse complète du fabricant • Firmenname und vollständige Adresse des Herstellers • Εταιρική και ταχυδρομική διεύθυνση κατασκευαστή • A gyártó üzleti neve és teljes címe • Ragione sociale e indirizzo completo del fabbricante • Uzņēmuma nosaukums un pilna ražotāja adrese • Verslo pavadinimas ir pilnas gamintojo adresas • Isem kummercjali u indirizz shih tal-fabbrikant • Nazwa firmy i pełny adres producenta • Nome da empresa e endereço completo do fabricante • Denumirea comercială și adresa completă a producătorului • Obchodný názov a úplná adresa výrobcu • Naziv podjetja in polni naslov proizvajalca • Nombre de la empresa y dirección completa del fabricante • Tillverkarens företagsnamn och kompletta adress • Fyrirtækisheiti og fullt heimilisfang framleiðanda • Firmanavn og full adresse for produsenten • 製造商の商業名称和完整地址 • Naftn fyrirtækis og fullt heimilisfang framleiðanda • 商号およびメーカーの正式住所 • 제조사의 상호명 및 주소 • Imalatçının ticari ünvanı ve açık adresi • Фірмове найменування і повна адреса виробника	Textron Specialized Vehicles Inc. (aka E-Z-Go Div. of Textron Inc.) 1451 Marvin Griffin Road Augusta, GA 30906 USA
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Product Code • Код на продукта • Kód výrobku • Produktkode • Productcode • Toote kood • Tuotekoodi • Code produit • Produktcode • Κωδικός προϊόντος • Termékkód • Codice prodotto • Produkta kods • Produktu kods • Kodíci tal-Prodott • Kod produktu • Código do Produto • Cod produs • Kód výrobku • Oznaka proizvoda • Código de producto • Produktkod • Vörunúmer • Produktkode • 产品代码 • Framleiðslunúmer • 製品コード • 제품 코드 • Ürün Kodu • Код виробу	618566, 618569, 628518, 628520, 628521
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Machine Name • Наименование на машината • Název stroje • Maskinnavn • Machinenam • Masina nimi • Laitteen nimi • Nom de la machine • Maschinenbezeichnung • Ονομασία μηχανήματος • Gépnév • Denominazione della macchina • Iekārtas nosaukums • Mašinos pavadinimas • Isem tal-Magna • Nazwa urządzenia • Nome da Máquina • Numele echipamentului • Názov stroja • Naziv stroja • Nombre de la máquina • Maskinens namn • Heiti tækis • Maskinnavn • 机器名称 • Naftn vélar • 機械名 • 기기 명칭 • Makine Adı • Назва машины	Titan XD, TUG, TUG 8K, Minute Miser and Stock Chaser Electric Powered Industrial Vehicles
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Designation • Предназначение • Označení • Betegnelse • Benaming • Nimetus • Tyypimerkintä • Pažymėjimas • Bezeichnung • Χαρακτηρισμός • Megnevezés • Funzione • Apzīmējums • Lithuanian • Denominazzjoni • Oznaczenie • Designação • Specificație • Označenie • Namen stroja • Descripción • Beteckning • Merking • Konstruksjon • 名称 • Utnefning • 用途 • 지정 • Тапим • Позначення	Industrial Vehicles; Cushman or E-Z-GO brands
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Serial Number • Серийн номер • Sériové číslo • Seriennummer • Seriennummer • Seerianumber • Valmistusnumero • Numéro de série • Seriennummer • Σειριακός αριθμός • Sorozatszám • Numero di serie • Sērijas numurs • Serijos numeris • Numru Serjali • Numer serjiny • Número de Série • Număr de serie • Sériové číslo • Serijska številka • Número de serie • Seriennummer • Račnúmer • Seriennummer • 序列号 • Račnúmer • シリアル番号 • 일련 번호 • Seri Numarası • Серийный номер	2839700-3600000
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Conforms to Directives • В съответствие с директивите • Spilføje podminky směrníc • Er i overensstemmelse med direktiver • Voldoet aan de richtlijnen • Vastab direktiividele • Direktiivien mukainen • Conforme aux directives • Ακολουθεί τις Οδηγίες • Megfelel az irányelveknek • Conforme alle Direttive • Atbilst direktīvām • Atitinka direktyvų reikalavimus • Valutazzjoni tal-Konformità • Dyrektywę związane • Cumpre as Directivas • Respectă Directivile • Je v súlade so smernicami • Skladnost z direktivami • Cumple con las Directivas • Uppfyller direktiv • Samræmist tilskipunum • I samsvar med direktiv • 符合指令 • samræmi við reglugerðir • 適合指令 • 규격 준수 • Şu Yönergelere Uyumaktadır • Відповідає директиві	2006/42/EC 2004/108/EC
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Conformity Assessment • Оценка за съответствие • Hodnocení plnění podmínek • Overensstemmelsesvurdering • Conformiteitsbeoordeling • Vastavushindamine • Vaatimustenmukaisuuden arviointi • Evaluation de conformité • Konformitätsbeurteilung • Διαπίστωση Συμμόρφωσης • Megfelelőség-értékelés • Valutazione della conformità • Atbilstības novērtējums • Atitikties įvertinimas • Livell tal-Qawwa tal-Floss Imkejjel • Ocena zgodności • Avaliação de Conformidade • Evaluarea conformității • Vyhodnotenie zhodnosti • Ocena skladnosti • Evaluación de conformidad • Bedömning av överensstämmelse • Samræmistat • Konformitetsvurdering • 符合性评估 • Samræmistat • 適合性評価 • 적합성 평가 • Uygunluk Değerlendirilmesi • Оцінка відповідності	2006/42/EC Annex II
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Harmonised standards used • Използвани хармонизирани стандарти • Použité harmonizované normy • Brugte harmoniserede standarder • Gebruikte geharmoniseerde standaards • Kasutatud ühtlustatud standardid • Käytetyt yhdenmukaistetut standardit • Normes harmonisées utilisées • Angewandte harmonisierte Normen • Ενοποιησθέντα πρότυπα που χρησιμοποιήθηκαν • Harmonizált szabványok • Standard armonizzati applicati • Izmantotie saskaņotie standarti • Panaudoti suderinti standartai • Standars armonizzati usati • Normy spójne powiązane • Normas harmonizadas usadas • Standardele armonizate utilizate • Použité harmonizované normy • Uporabljene usklajeni standardi • Estándares armonizados utilizados • Harmoniserade standarder som används • 所采用的协调标准 • Samstilltir staðlar notaðir • 整合規格 • 적용되는 조화 표준 • Kullilan uyumlu standartlar • Використані гармонізовані стандарти	EN 61000-6-2:2005 EN 61000-6-4:2007: A1-2011 EN ISO 5349: 2001 EN ISO 11202: 2010 EN 1175-1:1998+A1:2010
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Technical standards and specifications used • Използвани технически стандарти и спецификации • Použité technické normy a specifikace • Brugte tekniske standarder og specifikationer • Gebruikte technische standaards en specificaties • Kasutatud tehnilised standardid ja spetsifikatsioonid • Käytetyt tekniset standardit ja eritelmät • Spécifications et normes techniques utilisées • Angewandte technische Normen und Spezifikationen • Τεχνικά πρότυπα και προδιαγραφές που χρησιμοποιήθηκαν • Műszaki szabványok és specifikációk • Standard tecnici e specifiche applicati • Izmantotie tehniskie standarti un specifikācijas • Panaudoti techniniai standartai ir techninė informacija • Standards u specifikacijonijiet technici užati • Normy i specyfikacje techniczne powiązane • Normas técnicas e especificações usadas • Standardele tehnice și specificațiile utilizate • Použité technické normy a špecifikácie • Uporabljene tehnični standardi in specifikacije • Estándares y especificaciones técnicas utilizadas • Tekniska standarder och specifikationer som används • Samræmdir staðlar sem notaðir eru • Benyttede harmoniserete standarder • 所采用的技术标准规范 • Tæknistaðlar og -kröfur notaðar • 技術規格および仕様書 • 적용되는 기술 표준 및 규격 • Kullilan teknik standartlar ve şartnameler • Місце укладення декларації	ISO 2631-1:2010 ISO 22915-2 ISO 6292: 2008
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The place and date of the declaration • Место и дата на декларацията • Misto a datum prohlášení • Sted og dato for erklæringen • Plaats en datum van de verklaring • Deklaratsiooni väljastamise koht ja kuupäev • Vakuutuksen paikka ja päivämäärä • Lieu et date de la déclaration • Ort und Datum der Erklärung • Τόπος και ημερομηνία δήλωσης • A nyilatkozat helye (hely és idő) • Luogo e data della dichiarazione • Deklarācijas vieta un datums • Deklaracijos vieta ir data • Il-post u d-data tad-dikjarazzjoni • Miejsce i data wystawienia deklaracji • Local e data da declaração • Locul și data declarației • Miesto a dátum vyhlásenia • Kraj in datum izjave • Lugar y fecha de la declaración • Plats och datum för deklarationen • Tæknistaðlar og tæknilysingar sem notaðar eru • Benyttede tekniske standarder og specifikationer • Staður og dagsetning yfirlýsingar • Sted og dato for erklæringen • 声明的地点与日期 • Staður og dagsetning yfirlýsingarinnar • 宣言場所および日付 • 선언 장소 및 일자 • Beyan yeri ve tarihi • Місце укладення декларації	Textron Specialized Vehicles Inc. (aka e-Z-Go Div. of Textron Inc.) 1451 Marvin Griffin Road Augusta, GA 30906 USA
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APPENDIX B

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<p>Signature of the person empowered to draw up the declaration on behalf of the manufacturer, holds the technical documentation and is authorised to compile the technical file, and who is established in the Community.</p> <p>Подпис на човека, упълномощен да състави декларацията от името на производителя, който поддържа техническата документация и е оторизиран да изготви техническия файл и е регистриран в общността.</p> <p>Podpis osoby oprávněné sestavit prohlášení jménem výrobce, držet technickou dokumentaci a osoby oprávněné sestavit technické soubory a založené v rámci Evropského společenství.</p> <p>Underskrift af personen, der har fuldmagt til at udarbejde erklæringen på vegne af producenten, der er indehaver af dokumentationen og er bemyndiget til at udarbejde den tekniske journal, og som er baseret i nærområdet.</p> <p>Handtekening van de persoon die bevoegd is de verklaring namens de fabrikant te tekenen, de technische documentatie bewaart en bevoegd is om het technische bestand samen te stellen, en die is gevestigd in het Woongebied.</p> <p>Ühenduse registrisse kantud isiku allkiri, kes on volitatud tootja nimel deklaratsiooni koostama, kes omab tehnilist dokumentatsiooni ja kellel on õigus koostada tehniline toimik.</p> <p>Sen henkilöön allekirjoitus, jolla on valmistajan valtuutus vakuutuksen laadintaan, jolla on hallussaan tekniset asiakirjat, joka on valtuutettu laatimaan tekniset asiakirjat ja joka on sijoitautunut yhteisöön.</p> <p>Signature de la personne habilitée à rédiger la déclaration au nom du fabricant, à détenir la documentation technique, à compiler les fichiers techniques et qui est implantée dans la Communauté.</p> <p>Unterschrift der Person, die berechtigt ist, die Erklärung im Namen des Herstellers abzugeben, die die technischen Unterlagen aufbewahrt und berechtigt ist, die technischen Unterlagen zusammenzustellen, und die in der Gemeinschaft niedergelassen ist.</p> <p>Υπογραφή ατόμου εξουσιοδοτημένου για την σύνταξη της δήλωσης εκ μέρους του κατασκευαστή, ο οποίος κατέχει την τεχνική έκθεση και έχει την εξουσιοδότηση να ταξινομήσει τον τεχνικό φάκελο και ο οποίος είναι διαπιστευμένος στην Κοινότητα.</p> <p>A gyártó nevében meghatalmazott személy, akinek jogában áll módosítani a nyilatkozatot, a műszaki dokumentációt őrizi, engedélyvel rendelkezik a műszaki fájel összeállításához, és aki a közösségen letelepedett személy.</p> <p>Firma della persona autorizzata a redigere la dichiarazione a nome del fabbricante, in possesso della documentazione tecnica ed autorizzata a costituire il fascicolo tecnico, che deve essere stabilita nella Comunità.</p> <p>Tās personas paraksts, kura ir pilnvarota deklarācijas sastādīšanai ražotāja vārdā, kurai ir tehniskā dokumentācija, kura ir pilnvarota sagatavot tehnisko reģistru un kura ir apstiprināta Kopienā.</p> <p>Asmuo, kuris yra gana žinomas, kuriam gamintojas suteikė įgaliojimus sudaryti šią deklaraciją, ir kuris ją pasirašė, turi visa techninę informaciją ir yra įgaliotas sudaryti technines informacijos dokumentą.</p> <p>Il-firma tal-persuna awtorizzata li fassall id-dikjarazzjoni fisem il-fabrikant, għandha d-dokumentazzjoni teknika u hija awtorizzata li tikkompila l-fajel tekniku u li hija stabbilita fil-Komunità.</p> <p>Podpis osoby upowaznionej do sporządzenia deklaracji w imieniu producenta, przechowującej dokumentację techniczną, upowaznioną do stworzenia dokumentacji technicznej oraz wyznaczonych ds. wspólnotowych.</p> <p>Assinatura da pessoa com poderes para emitir a declaração em nome do fabricante, que possui a documentação técnica, que está autorizada a compilar o processo técnico e que está estabelecida na Comunidade.</p> <p>Semnătura persoanei împuternicite să elaboreze declarația în numele producătorului, care deține documentația tehnică, este autorizată să compileze dosarul tehnic și este stabilită în Comunitate.</p> <p>Podpis osoby poverenej vystavením vyhlásenia v mene výrobcu, ktorá má technickú dokumentáciu a je oprávnená spracovať technické podklady a ktorá je umiestnená v Spoločenstve.</p> <p>Podpis osebe, pooblašene za izdelavo izjave v imenu proizvajalca, ki ima tehnično dokumentacijo in lahko sestavlja spis tehnične dokumentacije, ter ima sedež v Skupnosti.</p> <p>Firma de la persona responsable de la declaración en nombre del fabricante, que posee la documentación técnica y está autorizada para recopilar el archivo técnico y que está establecido en la Comunidad.</p> <p>Undertecknas av den som bemyndigad att upprätta deklarationen i tillverkarens vägnar, innehar den tekniska dokumentationen och är bemyndigad att sammanställa den tekniska informationen och som är etablerad i gemenskapen. Underskrift aðilans sem hefur umboð til að gera yfirlýsinguna fyrir hönd framleiðandans, hefur undir höndum tæknigögnin og hefur leyfi til að taka saman tækniskýrsluna, og er viðurkenndur innan evrópska efnahagssvæðisins.</p> <p>Signaturen til personen som har fulmakt til at udfærdige erklæringen på vegne af produsenten, er i besiddelse af den tekniske dokumentationen, har autorisasjon til at utarbeide den tekniske filen og som har tilhold i EU.</p> <p>獲得授權代表製造商起草聲明者的簽名。此人保留技術文檔并獲授權編譯技術文件。且是社區中獲得認可者。</p> <p>Underskrift starfsmanns sem hefur heimild til að rita yfirlýsinguna fyrir hendi framleiðandans, hefur umsjón með tæknigögnum og hefur heimild til að setja saman tæknilega skýrslu og sem er tengdur inn í samfélagið.</p> <p>メーカーを代表して宣言書を起草し、技術文書を保有し技術ファイルを編集する権限を有し、地域において確固たる地位を築いている人物の署名。</p> <p>개조자를 대신하여 선언서를 작성하고 기술문서를 보유하며 기술 파일을 편집할 권한을 가지고 있는 기업에 고정된 내에 속해 있습니다.</p>	<p>2006/42/EC Annex II 1A: 2 Chris Clifford Technical Director 14 July 2017 Ransomes Jacobsen Limited West Road, Ransomes Europark, Ipswich, England, IP3 9TT</p>  <p>2006/42/EC Annex II 1A: 10 Christopher W Spencer Vice President of Engineering Textron Specialized Vehicles Inc. 1451 Marvin Griffin Road Augusta, GA 30906 USA 14 July 2017 Signator</p>
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Notes:



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