COLUMBIA

Chariot

Owner and Operator Manual

PN 709642-06

Preface

Welcome, and congratulations on your choice of vehicle from Columbia Vehicle Group! Your vehicle has been designed and manufactured to conform to applicable sections of ANSI B56.8. Your safe use and operation of your vehicle is important to us. Any alteration of your Columbia vehicle that results in the vehicle being in noncompliance with applicable ANSI standards is strictly prohibited. Columbia Vehicle Group is not responsible or liable for any damage that results from any such alteration, and all warranties for any such altered vehicles are null and void.

These vehicles are not designed for over-the-road use. They do not conform to Federal Motor Vehicle Safety Standards or EPA regulations, and are not equipped for operation on public streets, roads, or highways.

To the best knowledge of Columbia Vehicle Group, the material contained herein is accurate as of the date this publication was approved for printing. Columbia Vehicle Group is not liable for errors in this manual or for incidental or consequential damages that result from the use of the material in this manual. Columbia Vehicle Group reserves the right to change specifications, equipment or designs at any time without notice and without incurring obligation.

CHANGE HISTORY		
DATE	**DESCRIPTION**	**BY**

This manual provides important safety information, operating instructions, model specifications and maintenance instructions for the Chariot.

The information in this manual is limited to care and maintenance information only. Information covering repairs and technical service is provided in detailed service manuals available from Columbia Dealers. These activities require the attention of a skilled technician and the use of special tools and equipment. Your Columbia Dealer has the facilities, experience and genuine Columbia vehicle parts and accessories to properly service Columbia vehicles.

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***NOTICE*: In an effort to streamline product support, please ensure your vehicle is properly registered with Columbia Vehicle Group. Registration allows for more effective product support including product updates and warranty processing. Please consult with your servicing dealer to verify or complete the registration process.**

SAFETY MESSAGES

Safety messages and other information in this manual are preceded by the words **DANGER, WARNING, CAUTION or *NOTICE***. They are printed in bold face, and are very important. We recommend you take special notice of this information.

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

***NOTICE*: Notices are messages not related to personal injury. They will provide key information to prevent property damage and to assure procedures are more easily understood or implemented.**

VEHICLE DESCRIPTION

The Chariot is a single passenger vehicle involving stand-up operation. This vehicle is designed to be driven on smooth surfaces in and around industrial plants, warehousing, institutions, motels, mobile home parks, and resorts.

This vehicle is not designed to be driven on public highways. It is designed to conform to requirements for Type E vehicles as described in O.S.H.A. Standard Section 1910.178 (Powered Industrial Trucks) and with all applicable portions of the American National Standard for Personnel and Burden Carriers (ANSI B56.8 1993 Part III).

VEHICLE IDENTIFICATION NUMBER (VIN)

Each vehicle is assigned a unique Vehicle Identification Number (VIN). The VIN describes facts and features of the vehicle and contains thirteen (13) digits. The VIN can be found in two locations.

The VIN is recorded on the vehicle nameplate which is located on the left side of the operator's position.

The VIN is also stamped on the metal cross bar located under the foot treadle platform.

The nameplate also has other important information such as vehicle weights and capacity. Do not exceed this capacity. This rated capacity includes cargo and operator.

To ensure prompt service when repairs or adjustments are required, your Columbia Dealer must have the VIN.

***NOTICE*: Always provide the complete VIN when contacting your dealer for technical assistance or maintenance and repair parts.**

For your own personal reference, fill in the VIN in the space provided below:

_____

VIN MATRIX - 13 DIGIT VIN

(Model)	(Chariot)
Digit 4 = Power System	A = Series, Resistor
Digit 5 = System Voltage	1 = 12V
Digit 6 = VIN Spacer	- = normal
	# = Special Product
Digit 7= Controller Amperage	0 = Not Applicable
Digit 8 = Axle/Brake System	Z = Rear Mechanical
Digit 9 = Build Year	Q = 2016, R = 2017, S = 2018 etc. (Letters I & O not used)*
Digit 10 Thru 13 – Build Sequence	1234

VEHICLE SPECIFICATIONS

Passenger Capacity	1
Max. Speed (MPH)	9
Turning – Curb to Curb (in)	79
Turning –Intersecting Aisle (in)	41
Overall Length (in)	52
Overall Width (in)	29.5
Overall Height (in)	44
Wheelbase (in)	36
Load Bed Height (in)	24
Load Bed – LxW (in)	18x16
Tires	4.80x8, Pneumatic, 6 ply, Load Range C 4.80x8, Foam Filled, 6 ply, Load Range C

GETTING STARTED

For personal safety before operating the vehicle, it is the operator's responsibility to read, understand and follow the basic rules of operation and maintenance instructions in this manual. If you are responsible for the use of the vehicle, it is your responsibility to inform the person or persons using the vehicle about the following basic rules of operation for their personal safety.

It is Columbia Vehicle Group's specific recommendation that the following warnings must be observed at all times. Not all are repeated throughout this manual, but the recommendations included must be observed whenever these subjects (vehicle operation hazards, battery hazards, etc.) are encountered.

Please be a safe operator. Electric vehicles are only as safe as the person who is at the controls. If accidents are to be prevented, operators must accept their full measure of responsibility. While the designer, the manufacturer, the dealer and the safety engineer can help minimize the possibility of an accident, their combined efforts can be erased by a single careless act.

SAFETY GUIDELINES

Observe the following guidelines for safe operation.

- Define where vehicles may be driven.
- Define who should be allowed to drive the vehicle.
- Instruct first-time drivers.
- Maintain vehicles in a safe driving condition.
- Enforce safe-operating rules.

VEHICLE SAFETY STATEMENTS

⚠ DANGER

This vehicle will not provide protection from lightning, flying objects, or other storm related hazards. If driving the vehicle in a storm, leave the vehicle and take shelter as per safety guidelines for your location.

Any modifications or changes to the vehicle that affect the stability, steering or result in increased speed beyond factory specifications could result in vehicle damage, severe personnel injury or death.

⚠ CAUTION

When replacement parts are required, use only genuine Columbia vehicle parts.

No modifications or additions, which affect the mechanical or electrical integrity and the safe operation of the unit, shall be made without the written approval of the manufacturer. If in doubt about any modification, contact your local Columbia Dealer or Columbia Vehicle Group Customer Service.

⚠WARNING

Only trained service professionals should repair or service this vehicle. Persons doing even simple repairs or maintenance should have working knowledge and experience in general electrical and mechanical repair.

Follow all procedures exactly and observe all safety messages stated in this manual. Working on vehicles without following proper procedures and using proper equipment may result in vehicle damage or personal injury.

Moving parts hazard! When operating any vehicle in a stationary position, avoid components which could snag clothing or cause sever injury to body parts. A running vehicle must be worked on with the greatest care.

Failure to maintain vehicle properly could result in decreased vehicle performance, reliability or cause severe personal injury.

Always wear safety glasses or approved eye protection while performing vehicle maintenance.

This vehicle is not Federal or State DOT approved and is not equipped to be operated on public roads or highways.

Do not exceed the rated vehicle speed. Exceeding this speed may result in steering difficulty, motor damage, and/or loss of control and injury.

Never exceed the capacity ratings of the vehicle. Exceeding these limits may endanger occupant or cause vehicle damage.

Completely stop vehicle before stepping off.

If vehicle is to be left unattended, turn keyswitch to "OFF" and remove key.

Drive slowly in turns and up and down grades. Do not make turns on steep hills or inclines.

Do not operate while under the influence of alcohol or drugs.

To avoid the risk of injury or vehicle damage, operate at maximum speed only on smooth flat surfaces.

Allow additional stopping distance when traveling at higher speeds.

Do not drive this vehicle in hazardous areas unless this vehicle is approved and labeled for such operation.

ADDITIONAL OPERATION SAFETY CONCERNS

It is recommended that the operator and owner or renter of this vehicle comply with the OSHA requirements as stated in the Code of Federal Regulations, Section 29, 1910.178, Powered Industrial Truck Training Standard and the ANSI requirements as stated in Personnel and Burden Carriers ANSI B56.8.

As a minimum every operator should, in addition to the above requirements found in the standards noted above:

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

Every owner or renter of this vehicle must, at a minimum:

- Define where the vehicles should and should not be driven and utilized.
- Ensure all proper warnings as to driving hazards are properly displayed and visible.
- Install safety signage concerning hills, speed bumps, ramps, turns, blind crossings, intersections, etc.
- Define who should and who should not drive the vehicles.
- Enforce safe driving and operating rules.
- Provide driver training for first time operators and review safe operating recommendations regularly.
- Maintain vehicles in a safe operating condition and maintain a schedule for daily, weekly, monthly, quarterly, semi-annually and annual vehicle inspections.
- Determine who, when, and how should pre-operation inspections be conducted.
- Notify operators what should be done if an unsafe condition or operating problem is discovered.

IMPORTANT FIRST STEP

Upon initial delivery, it is very important that the battery pack is properly charged. This is required if the vehicle is to be stored for later use or is to be used immediately.

- Check that the batteries are not damaged or leaking and that connections are tight.

***NOTICE*: The following information does NOT apply to sealed batteries.**

- Remove the battery vent caps and inspect each cell for proper electrolyte level. The battery manifold assemblies on vehicles with a single point watering system will require a ¼ counterclockwise turn to be removed for this inspection.
- If the electrolyte level is below the plates add only enough water to cover the plates.

***NOTICE*: Do not overfill a cell. Electrolyte expands and can overflow during charging.**

- With the electrolyte level correct, use the on board charger to charge the batteries. Charging is complete when the remote LED is steady green.
- Vehicles without a single point watering system, after charging, refill cells to below the bottom of each cell vent.

INSPECTING THE VEHICLE

Upon receipt of vehicle, perform a pre-delivery inspection of the vehicle. Also, before using the vehicle, there are checks that must be performed to ensure that it is in safe proper working order.

NOTICE: **Vehicle should be inspected immediately after delivery. Use the following guidelines to make sure there are no obvious problems.**

Examine the contents of all packages and accessories that may have come in separate packages with this vehicle. Make sure everything listed on the packing slip is there. Items should not be broken or damaged.

Examine any visible wiring for obvious signs of damage. Check that all connections are secure. Check that battery connections are tight and all cells are filled to above plates. Check for damaged or leaking batteries.

Inspect the tires for obvious wear or damage. Check for proper tire inflation. Refer to manufactures recommendation imprinted on tire sidewall. Make sure that all wheel lugs are secure.

Check the body and other parts for obvious damage. Look for body damage, jagged edges etc. that may cause personal injury.

Operate each of the following controls before turning on the power keyswitch.

- Foot Treadle
- Steering Handle Bar

NOTICE**: Each control should operate smoothly and easily without sticking or requiring excessive effort.**

Check that the horn sounds and that the key can only be removed when keyswitch is in the "OFF" position.

WHAT TO DO IF YOU HAVE A PROBLEM

If vehicle has just been delivered, report any physical damage or missing items to the shipping company and your local Columbia Dealer.

Report any service issue problems to the individual(s) responsible for correction and/or repair or contact your local Columbia Dealer for service.

⚠ DANGER

If any problems are found, Do not operate vehicle until repairs are made. Failure to make necessary repairs could result in fire, severe personal injury, property damage or death. Consult your local Columbia Dealer for professional service.

OPERATIONS AND CONTROLS

KEYSWITCH

The keyswitch energizes the vehicle. Rotate the key to the right from vertical to turn the vehicle on, return to vertical to turn the vehicle off.

If equipped, the keyswitch can also have a reverse direction. Rotate the key to the left from vertical to move in reverse (REV).

The keyswitch should be in the vertical OFF position whenever the operator leaves the vehicle. The switch is also designed to secure and disable the vehicle. You can remove the key only when the key switch is in the OFF position.

HORN BUTTON

The horn button is located on the left inside body panel and may be sounded by applying lateral pressure with the operator's left leg.

BATTERY STATE OF CHARGE METER

The battery state of charge meter is an analog gauge with an indicating needle and a colored background. It is a continuously reading meter. At rest with fully charged batteries the meter should read in the right white region.

When accelerating quickly, the needle will move to the left green region near the very far left red region. This is normal. If the needle continues past the green region into the very far left red region, it indicates that the batteries need recharging as soon as possible to avoid a shut-down of the vehicle.

CHARGER RECEPTACLE

The charger receptacle is for battery charging using the supplied AC cord.

LOW BATTERY RESET SWITCH

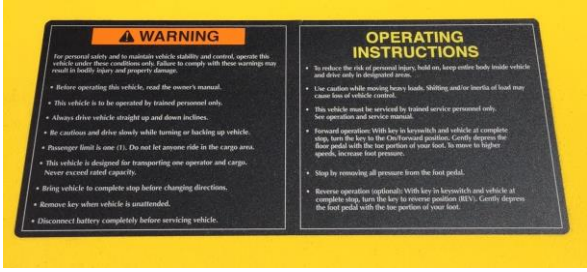
The Low Battery Reset Switch is used if the battery is heavily over discharged. Press and hold until battery charge indicator turns on.

CHARGING STATUS LIGHTS

These lights indicate the battery charging status.

WARNING LABEL and OPERATING INSTRUCTION

Read the warning label and operating instruction information carefully before operating the vehicle.



FOOT TREADLE PLATFORM

The foot treadle platform controls acceleration and braking. By slowly tilting the treadle forward (weight on toes) the accelerator is engaged and vehicle moves forward. By tilting the treadle backward (weight on heels) the brake is applied.

The parking brake is spring loaded to set automatically when leaving the vehicle and is automatically disengaged by tilting the treadle forward.

PRE-OPERATION CHECKLIST

⚠CAUTION

Before operating the vehicle always inspect the items listed in the following checklist. Should any item malfunction or need adjustment. Do not operate vehicle until the problem has been corrected.

ITEM	PROCEDURE
Batteries	Fully charged or adequately charged to provide power for duration of operations.
	The AC cord is disconnected from the vehicle.
	Electrolyte level in each cell covers the top of cell plates.
	Batteries are secure and free of corrosion.
	All terminals and connections are tight.
Tire Pressure	Inflated to the specifications labeled on the tire sidewall.
Horn	Press horn button to sound horn.
Treadle	Operates smoothly
Labels	All warning and operation labels in place.
Steering	Responsiveness and the absence of excessive free play.
Cargo	Secured to the bed platform.
	Load is balanced and not top heavy.
Obstacles	Path of intended travel is free for obstructions.

VEHICLE OPERATING INSTRUCTIONS

DRIVING THE VEHICLE

- Do not operate vehicle unless you are a qualified and trained operator.
- Keep the vehicle under control at all times.
- Drive only on level surfaces or on surfaces having an incline of no more than 10%.
- Drive slowly when making a turn, especially if the ground is wet, slippery or when driving on an incline.
- Do not drive this vehicle in hazardous areas unless this vehicle is approved and labeled for such operation.
- Do not drive over loose objects, holes or bumps.
- Observe all traffic regulations and speed limits.
- Keep to the right of traffic under normal conditions.
- Maintain a safe distance from all objects and other vehicles.
- Yield right of way to pedestrians, ambulances, fire trucks or other vehicles in emergencies.
- Do not overtake another vehicle at intersections, blind spots or other dangerous locations.
- Keep a clear view ahead at all times. Slow and sound the horn when approaching a corner or other blind intersection.
- Immediately report any accident or vehicle problem to your supervisor.
- Do not load cargo that can easily fall off this vehicle.
- Do not exceed the cargo load capacity of this vehicle.

STEERING

The steering system is designed to operate as a bicycle does. The vehicle will turn to the same direction as the handle bar.

⚠CAUTION

Be sure to have both hands on the handlebars at all times. Do not turn the vehicle sharply at high speeds.

PARKING

- If you will be away from this vehicle turn off the keyswitch, remove the key and take the key with you.
- If you park this vehicle on an incline, block the wheels.
- Do not block fire aisles, fire equipment, or stairways.

ELECTRICAL SYSTEM

The type of battery used in a Columbia vehicle has a service requirement which is quite different from that of an automotive battery.

The electric vehicle battery supplies all of the power to drive the vehicle. During operation the power stored in the batteries is expended. While the amperage drain rate can vary greatly depending on the type of service, the duration of use and the number of "starts" and "stops" made during a day, the batteries nevertheless progress through each duty cycle from "fully charged" to an almost depleted state. This type of service is known as "deep cycle" service and electric vehicle batteries are specifically designed to handle this type of service.

Proper performance of your Columbia Vehicle can only be obtained from specified deep cycle, electric vehicle batteries.

PLEASE REVIEW IMPORTANT DANGER STATEMENTS WHEN WORKING NEAR BATTERIES AND CHARGING SYSTEMS!

⚠ DANGER

Battery acid is poisonous and can cause severe burns. Avoid contact with skin, eyes, or clothing.

ANTIDOTES:

EXTERNAL: Flush with water. Call a physician immediately.

INTERNAL: Drink large quantities of milk or water. Follow with milk of magnesia or vegetable oil. Call a physician immediately.

EYES: Flush with water for fifteen minutes. Call physician immediately.

⚠ DANGER

Always remove key and disconnect battery pack before servicing or repairing the vehicle. See BATTERY DISCONNECT METHOD.

Always wear full-face shield when working on or near batteries.

All batteries used in electric vehicles can explode! Batteries produce explosive hydrogen gas at all times, especially, during charging or discharging. Ventilate area when charging batteries.

Do not attempt to charge a battery if it is frozen, or if the case is bulged excessively. Frozen batteries can explode! Properly dispose of the battery.

Do not smoke around batteries. Keep sparks and flames away from batteries and the charging area. Use care to prevent an accidental arc which could cause an explosion. Use only approved insulated tools, remove jewelry such as rings, watches, chains etc. and place an insulating material (wood, plastic, rubber etc.) over all battery connections.

Never add acid to a battery.

⚠WARNING

To reduce the risk of electrical shock or injury:

Do not use an ungrounded two to three-prong adapter to connect the charger to a two-prong outlet or extension cord.

The battery charger must be properly grounded. Use a three prong No. 12 AWG heavy duty power cord no more than 50 feet long.

Locate all cords so that they will not be stepped on, tripped on, or otherwise damaged. Immediately replace worn, cut, or damaged power cords or wires.

Do not connect the power cord near fuels, grain dust, solvents, thinners, or other flammables. The spark can ignite flammable materials and vapors

***NOTICE:* Automotive batteries should never be used for "deep cycle" application, as their useful life will be very short.**

Damaged or corroded battery terminals should be replaced or cleaned as necessary. Failure to do so may cause overheating during operation. Torque connections to 100 in. lbs.

Do not attempt to recharge batteries with a charger not designed for your vehicle.

Only trained technicians should service the charger. Contact your Columbia Dealer for assistance.

***NOTICE*: Install surge arrestors on incoming AC power lines. Surge arrestors will help protect electrical/electronic components in the charger and vehicle from all but direct or "close proximity" lightning strikes.**

BATTERY INSPECTION & MAINTENANCE

1. Be sure battery hold downs are properly tightened. A loose hold down may allow the battery to become damaged from vibration or jarring. A hold down that is too tight may buckle or crack the battery case.
2. Weekly inspect battery posts, clamps and cables for breakage, loose connections and corrosion. Replace any that are damaged. Batteries and connections must be clean and dry. Torque connections to 100 in. lbs.
3. Weekly an equalization charge is to be applied to the battery pack. This process balances the electrical charge in the battery pack and will extend battery life. The following procedure is used to complete this.

- Charge the battery pack allowing the charger to go to green 100% charge.
- Once the green LED lights unplug the power cord.
- Wait approximately 30 seconds. Reconnect the power cord and allow the charger to complete a second charge cycle.
- If the vehicle is not to be used, leave power cord connected. The on-board charger can test and recharge as needed.

NOTICE: **Automotive batteries should never be used for "deep cycle" application, as their useful life will be very short.**

Install surge arrestors on incoming AC power lines. Surge arrestors will help protect electrical/electronic components in the charger and vehicle from all but direct or "close proximity" lightning strikes.

Damaged or corroded battery terminals should be replaced or cleaned as necessary. Failure to do so may cause overheating during operation.

Do not attempt to recharge batteries with a charger not designed for your vehicle.

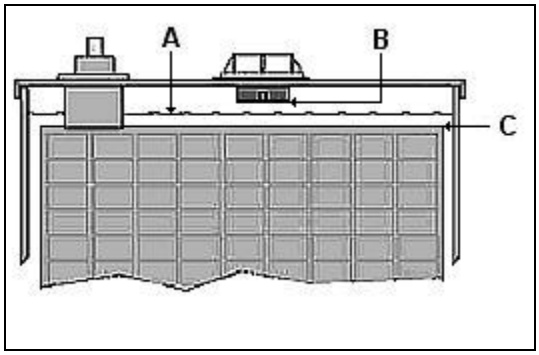
Only trained technicians should service the charger. Contact your Columbia Dealer for assistance.

BATTERY CLEANING

Acid-soaked debris on the battery terminal connections will cause current leakage, reduces battery efficiency, and battery life.

Hose wash battery terminal connections periodically with clean low-pressure water to keep them free of acid spillage, dirt, and other debris. Do not hose wash electronic controllers, switches, solenoids and other electrical control devices. Cover as necessary to prevent splashing. Clean battery terminal connections with baking soda (sodium bicarbonate) and water solution. Mix 5 teaspoons baking soda per quart of water. Use a stiff bristle brush, rinse with clean water and dry with a clean cloth. Torque connections to 100 in. lbs

***NOTICE*: The following information does NOT apply to sealed batteries.**



1. Check the electrolyte level on new batteries before they are put into service, and, at a minimum, once a week thereafter. Water use increases as batteries age. If the vehicle is equipped with a Single Point Battery Watering System see the information on this in this section.
2. Never allow the electrolyte level (A) to fall below the top of the plates (C). If the plates are exposed, add only enough to cover the plates before charging.
3. After batteries are fully charged, fill cells to just below the bottom of the cell vents (B), approximately 1/8" to 1/4". Electrolyte level should not touch the bottom of the cell vents.
4. Do not overfill batteries. Electrolyte expands and can overflow during charging. Water added to replace the spillage dilutes the electrolyte and reduces its specific gravity.

BATTERY CLEANING (Continued)

5. Use only distilled water. Vehicle batteries may use up to 16 quarts of water during their useful life and non-distilled water may contain harmful minerals which will have a cumulative adverse effect on battery performance and life.
6. Check to see that battery cap vent holes are clear. Plugged vent holes will not permit gas to escape from the cell and could result in battery damage. Check that all vent caps are tightly in place. Do not allow water or cleaning solution to enter cap vent holes.

NOTICE: **Follow local ordinances and codes for proper disposal of battery cleaning waste.**

CONDITIONS WHICH AFFECT CHARGING

Always schedule enough charging time so the charger attains the 100% level. Charging time is affected by age and battery condition, state of discharge, electrolyte temperature, AC line voltage, and other variables. Correct charging methods extend battery life and vehicle range between charges. If vehicle is used only occasionally, a refresher charge should be given prior to using.

New batteries need up to four hours more charging than “mature” batteries. Before the first use, completely charge new batteries. Charging time will vary based on conditions noted above but will probably be 12 hours.

Limit new batteries use between charges for the first 25 – 50 cycles. New batteries have less capacity than seasoned batteries. New batteries should not be discharged more the 20 – 30% before recharging. This will prevent premature battery failure.

Battery efficiency is affected by temperature. If the temperature of the outside air and/or batteries is below 60º F, battery capacity is reduced. Batteries will require more frequent and longer charge periods in early spring, fall and winter.

As batteries age, they finish charge at progressively higher charge rates and tend to use more distilled water. At this point in battery age, charger will automatically begin reducing charge time.

Batteries found defective must be replaced. All batteries in a vehicle should be matched according to age, capacity and brand.

BATTERY CHARGING

The built-in battery charger is custom made for Columbia vehicle CR-10 Models. Its operation is totally automatic. When connected to a 110 - 120 Volt AC power source, the charger's electronic timer will turn the charger on. It determines and provides the energy necessary to return batteries to a fully charged state, automatically shutting off when the batteries are fully charged. This occurs when each cell reaches approximately 2.5 volts.

CHARGER OPERATING INSTRUCTIONS

Plug 120 volt AC supply cord into charger receptacle on charger panel. After a short time delay of approximately 5 to 6 seconds, a RED light comes on indicating battery charging.

When the solid state circuitry senses that the batteries are fully charged, the RED light turns off and the GREEN light turns on indicating that charging is complete.

The GREEN light will remain on until the AC cord is disconnected. At that point the light will turn off and the charger will reset itself for the next charging cycle.

LOW BATTERY RESET SWITCH

This is used if the batteries are heavily over discharged. When the AC cord is connected, the RED light will turn on but will shortly turn off. To reactivate the charger, push the reset button for 10 seconds. This will restart the charger. Release the button and the charger will continue to charge.

BATTERY CHARGING TROUBLE SHOOTING CHART

Symptom	Repair or Replace
No transformer hum	AC Fuse
	AC Input Cord
	Loose wires on auto-start control
	Primary of transformer
	Auto-start control
Transformer hums, but no ammeter deflection	DC fuse
	DC connector shorted or open diode
	Defective ammeter
AC fuse keeps blowing	Shorted AC cord
	Shorted primary of transformer
Charger output low or battery not getting charged	Defective capacitor
	Resonant of transformer
	Open diode
Charger not shutting off	Loose wires on auto-start
	Defective auto-start

SPECIFIC GRAVITY TEST

It is possible to determine a battery's ability to perform by measuring the specific gravity (sp. gr.) of each cell with a hydrometer. This is the best method to determine a defective battery.

The hydrometer readings indicate two things:

- State of Charge - The amount of electrical power stored in the battery.
- Condition - The ability of battery to store and deliver power.

NOTICE: **Batteries should be fully charged before performing specific gravity tests to determine battery condition. Hydrometer tests of batteries not fully charged are misleading and inconclusive.**

There are different type hydrometers. Carefully read and follow the instructions supplied with your hydrometer.

TIPS FOR PROLONGING BATTERY LIFE

NOTICE: **A common misconception is Deep Cycle Batteries develop a memory, lose capacity, or must be discharged until the BDI warning flashes and then recharged. Deep Cycle Wet Lead Acid Batteries are not like cell phone NiCad Batteries. Deep Cycle Batteries benefit from frequent charging and being maintained at as close as possible to a 100% state of charge. Plugging in the on-board charger overnight or when the vehicle is not in use for 3-5 or more days is encouraged.**

- Recharge batteries as soon as they become 20% or more discharged (less than 1.238 sp. gr.).
- Make it a regular habit to plug in the charger when the vehicle is not in use. Batteries may be recharged if vehicle has been driven 15 minutes or more since the previous charge.
- Make sure your electrical outlet is operational.
- Never go below 20% state of charge (or 80% discharged) without recharging immediately. Allow 14 – 16 hours of charging.
- Batteries will provide a longer life if not deeply discharged. Batteries that are regularly deeply discharged will require more work by the charger and will have a shorter life.
- For non-sealed batteries, make it a regular habit to check (and water) your batteries after charging. Always add water after charging. This will reduce the chance for overflow due to expanding water.
- Weekly equalize the battery pack.
- If the vehicle is not operated daily the Power keyswitch should be turned off. This will power down the traction control system and reduces power loss on the batteries.
- Batteries in storage may self discharge and should be recharged when the specific gravity falls below 1.238 sp. gr. or individual battery voltage is less than 5.25 volts for three cells (10.5 volts for six cells).

BATTERY DISCONNECT METHODS

Disconnect both leads before performing any maintenance.

BATTERY REMOVAL AND INSTALLATION

- Remove battery negative (-) cable.
- Remove battery positive (+) cable.
- Remove battery hold down.
- Remove batteries from vehicle.
- To install batteries, reverse the removal procedure with the negative (-) cable being attached last.

VEHICLE TROUBLESHOOTING

PROBLEM	CHECK
Will not move	Keyswitch on. Keyswitch is in desired direction. Keyswitch for loose wires or faulty switch.
	Batteries for loose terminals, corrosion, electrolyte level or state of charge.
	Motor for loose wires, open circuits.
Runs slow	Batteries for loose terminals, corrosion, electrolyte level or state of charge.
	Brakes dragging
	Under inflated or flat tires.
	Wheels for binding, do not spin freely.
If these test procedures do not resolve your vehicle problem, contact your Columbia Dealer for service.	

SERVICING YOUR VEHICLE

To ensure that the vehicle is kept in a safe and correct operating condition, it must be inspected and maintained on a regular basis. Proper lubrication, electrical control adjustments, safety feature checks, etc. performed at recommended intervals will help prevent damage or failure of the unit while providing optimum performance.

Follow the guidelines below to assure proper maintenance.

- Allow only trained maintenance personnel to maintain, repair, and inspect the vehicle.
- Before starting any repairs or maintenance, immobilize the vehicle by turning the power keyswitch off and removing the key.
- Disconnect both of the main battery pack leads before working on or disconnecting any electrical component or wire.
- Block the chassis with jack stands before working under a raised vehicle.
- Conduct vehicle performance checks in an authorized area where a safe clearance exists.
- Before starting the vehicle, follow the recommended safety procedures in Chapter 2, (SAFETY).
- Avoid fire hazards and have fire protection equipment present in the work area.
- Do not use flammable fluids for cleaning parts.
- Work in a properly ventilated work area.
- Regularly inspect and maintain in safe working condition the brakes, steering mechanisms, speed and directional control mechanisms, warning devices, guards and safety devices.
- Keep the vehicle in a clean condition to minimize fire hazards and facilitate detection of loose or defective parts.

BRAKE SYSTEM

PLATFORM HEIGHT

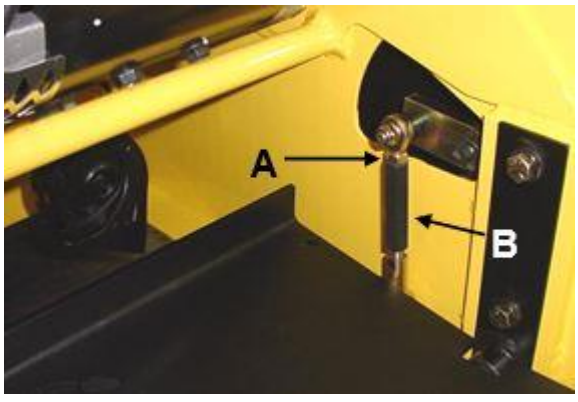
The mechanical brakes consist of two rear drum brakes. With no force applied to the treadle, brakes are properly adjusted when the back edge the treadle is approximately even with the top edge of the rear frame crossbar.

ADJUSTMENT

- Loosen jam nut (Arrow A) on upper end of the treadle to brake linkage.
- Turn (lengthen) upper brake linkage (Arrow B) and check adjustment.

Once properly adjusted and tighten the jam nut.

NOTICE: **Minimum brake shoe lining thickness is .080 inches.**



LIFTING INSTRUCTIONS

⚠WARNING

Use extreme caution lifting or working on or around lifted vehicle. Vehicle should be on a flat, hard and level surface.

When lifting the vehicle for service, remove key and use a sturdy lifting device such as a hoist or floor jack placed under the Chariot body. Always block wheels to prevent it from rolling. After the body is lifted 4 to 6 inches from the floor, place a suitable device under vehicle frame to support vehicle weight. An example is a 4" x 6" wooden block.

⚠CAUTION

If vehicle is raised while loaded, check that the load is secured before lifting. Failure to do so could cause damage to the vehicle, the load or cause personal injury.

CLEANING

Wash underside to remove all dirt and debris. Do not direct high pressure water at the speed switch or tops of the batteries.

Wash body and seat with a mild detergent. Do not use abrasives (bodies are painted). Frequent washings with mild soap will preserve the finish of your vehicle. For stubborn and imbedded dirt, a soft bristle brush may be used. Tar, asphalt, creosote and the like should be removed immediately to prevent staining of paint.

NOTICE: **Do not use harsh detergents, abrasives or cleaning solvents that contain ammonia, aromatic solvents or alkaline material to clean cab.**

MAINTENANCE SCHEDULE - OWNER/OPERATOR

Item	Operation	Weekly	Monthly	Semi-Annual
Tires	Lug nuts tight.		*	
	Check tire pressure, wear, damage. Dented rims.		*	
Electrical	Check electrolyte level.	*		
	As required, clean battery terminals and wash cases.	*		
	Check the general condition of the electrical system (connections, frayed/broken cables).		*	
Brakes	Adjust.		*	
Body and Frame	Inspect for loose hardware (bolts & nuts).	*		
	Clean body and seats, Wash as needed.	*		
	Wash engine/motor compartment and undercarriage.	*		
Lube	Oil movement points (body hinges, brake mechanisms and linkage, leaf spring bushings etc.).			*

MAINTENANCE SCHEDULE - QUALIFIED TECHNICIAN

It is recommended that the following be performed by a trained qualified technician or your Columbia Dealer

Item	Operation	Weekly	Monthly	Quarterly	Semi-Annual	Annual
Drive	Check treadle adjustment, motor mounting hardware, and drive chain adjustment			*		
Electrical	Test batteries				*	
	Inspect motor condition and operation.					*
Brakes	Inspect brakes – clean, adjust, replace as needed			*		
	Adjust brakes			*		
Control Speed	Lubricate			*		
	Check contact bars for wear, spring tension			*		
Lube	Rear wheel bearings, grease or replace			*		
	Repack front wheel bearings					*
Steering	Check front wheel bearing adjustment			*		
	Check fork spindle bearing adjustment			*		

BATTERY PREPARATION FOR VEHICLE STORAGE

Before storage make sure batteries are fully charged, for non-sealed batteries make sure the electrolyte is full in all cells. Clean the batteries and connections as described earlier.

The charger has the capability to test and recharge batteries during storage. Leave the batteries connected and the charger plugged into a reliable AC source.

If the on-board charger is not used the batteries will "self-discharge" during storage and recharging will be necessary. Below is the recommended frequency for recharging.

STORAGE TEMPERATURE	CHARGE AT
Below 4^0 C (40^0 F)	Every 6 months
4^0 C - 16^0 C (40^0 – 60^0 F)	Every 2 months
Above 16^0 C (60^0 F)	Once a month

The voltage or specific gravity of the electrolyte should be checked every 6 to 8 weeks using a voltmeter or hydrometer.

After charging, disconnect the batteries.

NOTICE: **Batteries in a low state of charge will freeze at higher temperatures than fully charged batteries. Do not attempt to charge a battery that is frozen or if battery case is excessively bulged. Properly dispose of battery, because frozen batteries can explode.**

The table below indicates freezing points of batteries at different specific gravities.

SPECIFIC GRAVITY	FREEZE POINT ^{0}F/^{0}C
1.260	-70/-57
1.230	-39/-38
1.200	-16/-26
1.117	-2/-19
1.110	+17/-8

Notice: **Specific gravity readings are at 80^0 F. Values need adjustment for electrolyte temperature. Reduce .004 for every 10^0 F below 80^0 F. Increase by that amount for every 10^0 F above**

Quarterly during storage check water levels for non-sealed batteries.

VEHICLE PREPARATION FOR STORAGE

Store the vehicle in a cool place.

Maintain tire pressure at recommended PSI.

Grease suspension and continue quarterly lubrication during storage period.

Clean vehicle body, seats, battery compartment and vehicle underside.

Do not engage park brake. Block wheels to prevent movement.

***NOTICE:* Make sure power keyswitch is in the OFF position.**

RETURNING VEHICLE TO SERVICE

- **If necessary, connect the battery pack and fully recharge batteries.**
- **Check tire pressure and readjust if necessary.**
- **Perform Pre-Operational Checklist.**

For vehicles with a single point watering system:

- After the batteries have been fully charged, connect the system to its water supply for 3-5 seconds then disconnect regardless of whether or not the batteries are completely full.
- Return the vehicle to its regular service.
- Place the vehicle back into its regular watering schedule (waiting at least 1 week until next watering).

VEHICLE WARRANTY

We warrant to the original consumer purchaser or lessee that our electric Industrial and Commercial vehicles as well as our electric passenger vehicles used in an industrial or commercial application / environment will be free from defects in factory materials and workmanship under normal use and service for the period stated below from date of sale subject to the terms and provisions contained herein.

1. 12 MONTHS – PARTS AND LABOR ON COMPONENTS:
Columbia Vehicle Group (Columbia) warrants parts and labor to repair defective components both on electric Industrial and Commercial vehicles for twelve (12) months from date of purchase, subject to the following terms and conditions.

2. EXCLUDED COMPONENTS:
Batteries and tires are excluded from this warranty as they are warranted by their respective manufacturers. Your authorized Columbia dealer will assist in processing these warranties, if necessary. Consequential damage caused by defective batteries or tires are also excluded from this warranty.

3. ADDITIONAL CONDITIONS:
Columbia will warrant all Columbia replacement parts provided under this warranty. All Columbia parts replaced under warranty become the property of Columbia and, if requested by Columbia, must be returned to the factory for inspection.

(a) Any other expense incurred in obtaining warranty repairs, including transportation and labor, are the responsibility of the purchaser, unless otherwise stated in this warranty.
(b) To qualify for warranty coverage, you and the selling dealer must complete the warranty registration process within ten (10) days after purchase or lease. If this information is not on file with Columbia, purchaser must provide proof of date of purchase with any warranty claim.
(c) To obtain warranty service, you must return your vehicle during the warranty period to any authorized Columbia vehicle repair facility. Dealers are able to provide service during their normal business hours and within a reasonable time. Further information regarding warranty service may be obtained from Columbia calling (800) 222-4653 or by writing our Customer Service Department, Columbia Vehicle Group., 1115 Commercial Ave., Reedsburg, WI 53959.
(d) Any subsequent changes in vehicle design and equipment shall not apply to vehicles previously manufactured or purchased.

4. THIS WARRANTY SHALL NOT APPLY TO DAMAGE OR COST CAUSED BY:
(a) Failure to operate, maintain and service vehicle, as specified in the applicable Owner's Manual.
(b) Abuse, misuse, neglect, accident, collision and operation at other than specified design speed or rated capacity.
(c) Alteration or repair outside of factory specifications.
(d) Use of components, including lubricant or batteries, not specified in the applicable Owner's Manual, or avoidable with the proper use of specified Columbia components.
(e) Fading, deterioration or weathering of seats, fabric enclosures, floormats, bag racks, bag straps, body parts, paint or chrome caused by ordinary wear and tear or exposure.
(f) Charges incurred to transport any vehicle to and from an authorized dealer for warranty service. Travel charges incurred by an authorized dealer to or from the vehicle location to perform warranty service.

5. WARRANTY DOES NOT APPLY TO:
Normal maintenance shown in the Owner's Manual which the purchaser is expected to perform or arrange for including, but not limited to, brake adjustment, battery maintenance (cleaning, maintaining proper fluid levels and battery charge), lubricant replacement in differential assemblies.. Wear items such as brake shoes, brake pads, bearings, etc… are also not warrantable.

6. USE OF NON-GENUINE PARTS:
Columbia dealers are independently owned and operated, and may sell products other than those provided by Columbia. Therefore, you should understand that COLUMBIA IS NOT, AND CANNOT, BE RESPONSIBLE FOR THE QUALITY, SUITABILITY OR SAFETY OF ANY NON-GENUINE COLUMBIA PART, ACCESSORY OR DESIGN MODIFICATION, INCLUDING LABOR, WHICH MAY BE SOLD AND/OR INSTALLED BY DEALERS OR DAMAGE CAUSED THEREBY.

7. SOLE REMEDY, NO OTHER WARRANTY:
The purchaser and Columbia expressly agree that the remedy of replacement or repair of the defective vehicle or component thereof, is the exclusive and sole remedy of the purchaser. Columbia makes no other representation or warranty of any kind, and no representative, employee, distributor or dealer of Columbia has the authority to make or imply any representation, promise or agreement which in any way varies from the terms of this warranty.

THERE ARE NO OTHER EXPRESS WARRANTIES ON YOUR VEHICLE BEYOND THOSE SET FORTH HEREIN AND NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS. TO THE FULLEST EXTENT ALLOWED BY LAW, COLUMBIA AND ITS DEALERS SHALL NOT BE LIABLE FOR LOSS OF USE, INCONVIENCE, LOST TIME, COMERCIAL LOSS OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES OR ECOMOMIC LOSS.

8. VEHICLES SOLD OUTSIDE OF THE UNITED STATES:
In the case of vehicles sold outside the U.S.A., defective parts must be returned to the selling dealer and transportation charges prepaid by the purchaser. The dealer will then replace all parts which his inspection shall show to be defective under the warranty. Columbia assumes no liability for the dealer's labor charges, if any, or any other expenses. For further information concerning export, please contact Columbia Vehicle Group, 1115 Commercial Ave., Reedsburg, WI 53959 U.S.A. Attn: Customer Service Department, (608) 524-8888. FAX (608) 524-8380.

9. STATE SPECIFIC RIGHTS:
Some states do not allow the exclusion or limitation of incidental, consequential or other damages, or limitation on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

COLUMBIA

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