



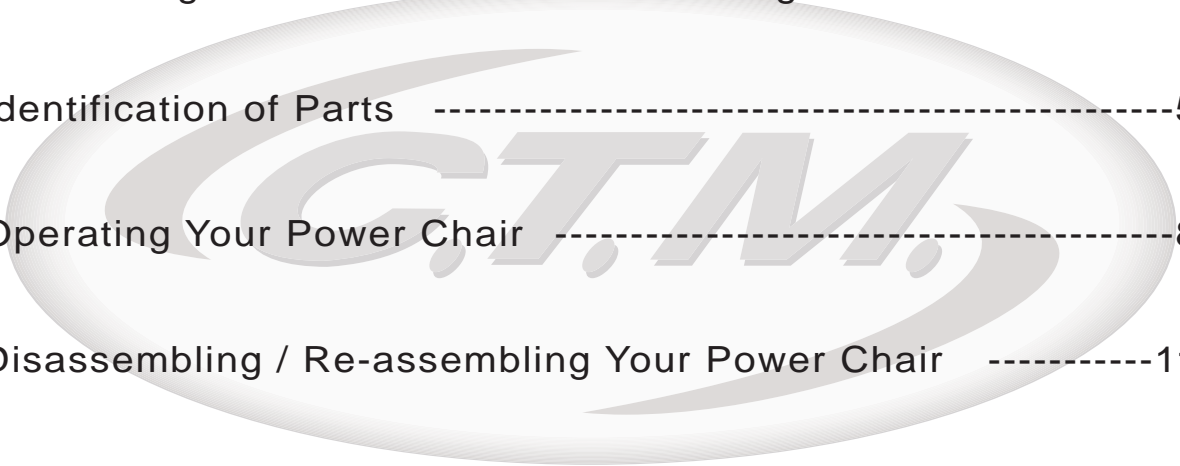
# C.T.M. Power Chair

HS-1500 User's Manual



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## INTRODUCTION

**Thank you and congratulations on purchasing your new C.T.M. Power Chair. It is designed to provide you with transportation indoors and outdoors.**

Chien Ti Enterprise Co., Ltd. is the manufacturer for the C.T.M. mobility power chair. We pride ourselves on providing safe and comfortable products. Our goal is to ensure your complete satisfaction with our product. We are certain that you will enjoy your C.T.M. power chair.

Please read and observe all warnings and instructions given in the owner's manual before operating this power chair. Also, retain this booklet for future reference.

**If you have any questions, please contact your local dealer or:**

**CHIEN TI ENTERPRISE CO., LTD.**

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**or your local dealer:**

## IMPORTANT PRECAUTIONS

Only one person at a time can ride a C.T.M. Power chair.

Maximum load is 115 kg/250 lbs.

Turn off the power before getting on or off your power chair.

Always drive carefully with your feet on the footplate and be aware of others in your area.

Always use pedestrian crossings where possible. Take extreme care crossing roads.

Do not drive on slopes exceeding 6 degrees, and take extreme care when turning on slopes.

Do not use full power when turning sharp corners.

Take great care and use low speeds for backing up, riding downhill, over uneven surfaces and curb climbing.

The power chair may not operate well in high humidity.

Never put your power chair in neutral on slopes.

Follow all traffic laws when you ride in the vicinity of public roads.

## ELECTROMAGNETIC INTERFERENCE AND WARNINGS

**CAUTION: It is very important that you read this information regarding the possible effects of Electromagnetic Interference on your power chair.**

Powered wheelchairs and motorized scooters may be susceptible to electromagnetic interference (EMI), which is interfering electromagnetic energy (EM) emitted from sources such as radio stations, TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones. The interference (from radio wave sources) can cause the power chair to release its brakes, move by itself, or move in unintended directions. It can also permanently damage the power chair control system. The intensity of the interfering EM energy can be measured in volts per meter (V/m). Each power chair can resist EMI up to a certain intensity. This is called its "immunity level." The higher the immunity level, the greater the protection will be. At this time, current technology is capable of achieving at least a 20 V/m immunity level, which would provide useful protection from the more common sources of radiated EMI. The immunity level of this product is 20 (V/m).

There are a number of sources of relatively intense electromagnetic fields in the everyday environment. Some of these sources are obvious and easy to avoid. Others are not apparent and exposure is unavoidable. However, we believe that by following the warnings listed below, your risk to EMI will be minimized.

### **Electromagnetic Interference and Warnings :**

The sources of radiated EMI can be broadly classified into three types:

1. Hand-held portable transceivers (transmitters-receivers) with the antenna mounted directly on the transmitting unit. Examples include: citizens band (CB) radios, "walkie talkie," security, fire, and police transceivers, cellular telephones, and other personal communication devices.



**Some cellular telephones and similar devices transmit signals while they are ON, even when not being used.**

2. Medium-range mobile transceivers, such as those used in police cars, fire trucks, ambulances, and taxis. These usually have the antenna mounted on the outside of the vehicle.

3. Long-range transmitters and transceivers such as commercial broadcast transmitters (radio and TV broadcast antenna towers) and amateur (HAM) radios.



Other types of hand-held devices, such as cordless phones, laptop computers, AM/FM radios, TV sets, CD players, and cassette players, and small appliances, such as electric shavers and hair dryers, so far as we know, are not likely to cause EMI problems to your power chair.

#### **Power Chair Electromagnetic Interference :**

Because EM energy rapidly becomes more intense as one moves closer to the transmitting antenna (source), the EM fields from hand-held radio wave sources (transceivers) are of special concern. It is possible to unintentionally bring high levels of EM energy very close to the power chair control system while using these devices. This can affect power chair movement and braking. Therefore, the warnings listed below are recommended to prevent possible interference with the control system of the power chair.

#### **Electromagnetic Interference and Warnings :**

##### Warnings

Electromagnetic interference (EMI) from sources such as radio and TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones can affect the power chair. Following the warnings listed below should reduce the chance of unintended brake release or power chair movement, which could result in serious injury.

1. Do not operate hand-held transceivers (transmitters-receivers), such as citizens band (CB) radios, or turn ON personal communication devices, such as cellular phones, while the power chair is turned ON;
2. Be aware of nearby transmitters, such as radio or TV stations, and try to avoid coming close to them;
3. If unintended movement or brake release occurs, turn the power chair OFF as soon as it is safe;
4. Be aware that adding accessories or components, or modifying the power chair, may make it more susceptible to EMI; and
5. Report all incidents of unintended movement or brake release to the distributor listed on the inside front cover of this manual. Note whether there is a source of EMI nearby.

##### Important Information

1. 20 volts per meter (V/m) is a generally achievable and useful immunity level against EMI (as of May 1994). The higher the level, the greater the protection.
2. The immunity level of this product is 20 (V/m).

## IDENTIFICATION OF PARTS

Before attempting to drive this power chair on your own, it is important that you familiarize yourself with the controls and how they operate.



Figure 1 - HS-1500 Power Chair Front View

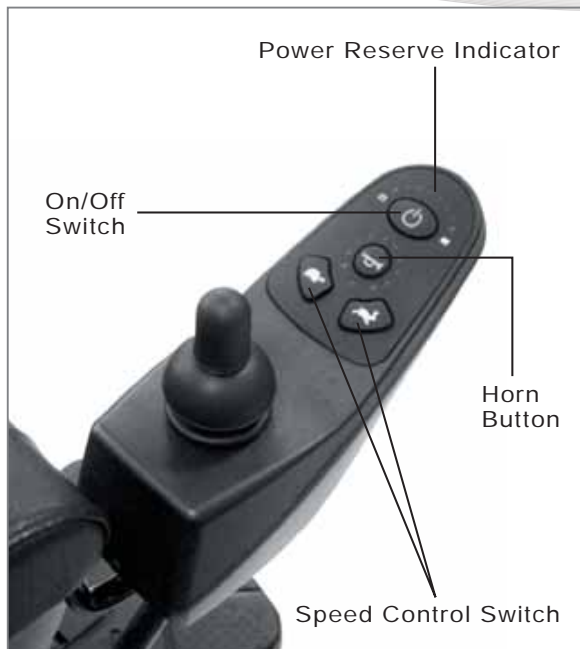


Figure 2 - HS-1500 Joystick



Figure 3 - HS-1500 Power Chair Rear View

**Joystick :****Speed Control Switch**

By pressing the right switch, you can increase the speed. Pressing the left switch will decrease the speed.

**Power Reserve Indicator**

There are LED Power Reserve lights on the joystick. When all LED lights are on, the batteries are fully charged. When a few of the lights are lit, the batteries need to be recharged.

These lights also act as Self Diagnostic Warning Lights. When they flash, there is a problem with the power chair. See page 16 for more information.

**Joystick Length Extension Knob**

Loosen the knob to adjust the joystick length.

**Charging Socket**

When charging your power chair, use the power cord provided. To correctly charge your power chair, connect one end to the power chair charging socket and the other end to a wall outlet. See Charging the Batteries, page 13 for further instructions.

**Armrest :****Armrest Width Adjustment Thumbscrews**

Loosen the two thumbscrews to adjust the armrest width; tighten again to lock in the desired position.





**Power Base :****Free-Wheeling Lever**

When the lever is in the N (Neutral) position, the power chair can be moved without power. When the lever is in the D (Drive) position, the power chair can be driven. Normal position is D.



Free-Wheeling Levers

**Circuit Breaker**

This is to protect your power chair from any excess current within the electrical parts. If the power chair suddenly stops, pushing the circuit breaker back in will help resolve this problem.

**Anti-Tip Wheels**

Added safety feature to keep chair from tipping over.

**Below Seat :****Seat Rotation Lever**

Pull the seat rotation lever up to adjust seat's turning angle, also can lift up the seat. Do not turn the seat more the 180 degree due to length of joystick cable.

**Seat Lock Knob & Pin**

Turn seat lock knob counterclockwise to loose. Turn it clockwise to lock seat in position. Remove the battery pack to locate the seat lock pin. There are three holes on seat post to adjust seat height. Be sure lock pin is fully inserted at its new height and knob is tightened if adjusted.



Seat Lock Knob

Seat Lock Pin

Figure 7

## OPERATING YOUR POWER CHAIR

Before beginning your journey with your new power chair, make sure that the power chair is on a level surface and clear of any obstacles. Although your power chair is able to climb slopes it is safer to practice on a level surface.

1. Before operating your power chair, check the following:

freewheeling lever is on D.

speed control switch is at the lowest speed (repeatedly pressed left switch).

2. Sit on the chair and fasten the seatbelt.

3. When turning on the button on the joystick, all power reserve LED lights should be lit.

All power reserve lights should not be flashing.

4. While resting your arms on the armrests, the joystick should be within reach. By pushing the joystick slightly forward, the power chair will move forward slowly. Pushing the joystick fully forward, it will move at normal speed. Adjusting the speed control switch will also decrease and increase the speed. Also, with the joystick you are able to turn the chair 360°. When the joystick is released and back in the neutral position, the chair will stop.

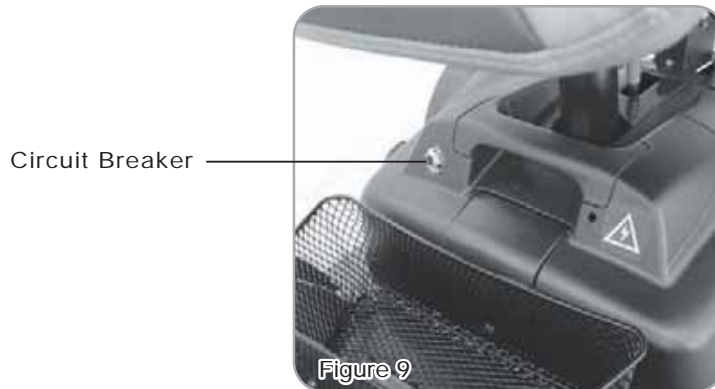


Figure 8

5. Practice driving where there are no obstacles. Start at the slowest speed and move forward and backward; make some turns. As you get more comfortable you can increase the speed by pressing the speed control switch repeatedly.

6. When the power reserve Indicator is lit in only a few sections, you should plan to recharge the batteries very soon.

7.If the power chair suddenly stops and does not function, locate the circuit breaker at the rear of the power chair. Push it in and try the power chair again.



8.When you are finished driving your power chair, turn the power off before getting out. It is recommended that you lift the armrest and get out to the side, for safety.



**Caution:** While standing up, avoiding standing on the footplate as it may cause injury.

9.If you are finished riding for the day, immediately recharge the batteries. See **CHARGING THE BATTERIES** on page 13.

**Keep in mind these rules :**

- Use your power chair only where it would be safe to walk.
- Use low speeds for reverse, downhill, ramps, curbs, or uneven surfaces.

**Other Operating Information :**

**Hill climbing:** You may need to use a higher speed. For a higher speed, press the right speed control switch repeatedly.

**Down slopes:** To proceed down steep slopes slowly, press the left speed control switch. This enables driver control when the speed is set at a slower motion. However, your power chair will not self accelerate down hills due to the automatic braking taking effect should you attempt to drive too fast.

Curb climbing: Approach slowly at right angles to the curb. A direct approach is needed.

Do not attempt curb climbing greater than a 0.9" curb.

If the Self-Diagnostic Warning Lights start to flash, identify the problem from the chart on page 16 and take action.

If the power chair breaks down and must be moved aside, please follow these directions:

1. Get off the power chair.
2. Push the free-wheeling lever to N.
3. Move the power chair slowly to a safe location.
4. Put the free-wheeling lever back to D.



## DISASSEMBLING / RE-ASSEMBLING YOUR POWER CHAIR

Taking apart your power chair enables you to save space when keeping it in storage or to carry it along in your vehicle when going away from home. Having the power chair disassembled is easier than ever since no tools are required. To ensure your safety, please have the freewheeling lever to D to engage the motor.

### Disassembling :

Unplug the Joystick Cable Connector (A) at the rear of the power chair. (See Fig. 11)  
Pull the Seat Rotation Lever (B) underneath the front part of the seat to unlock. Lift Seat (C) up to remove. (See Fig. 12)

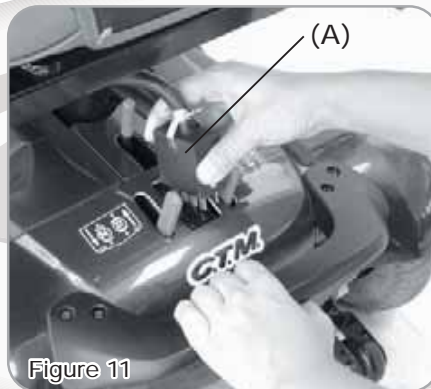


Figure 11

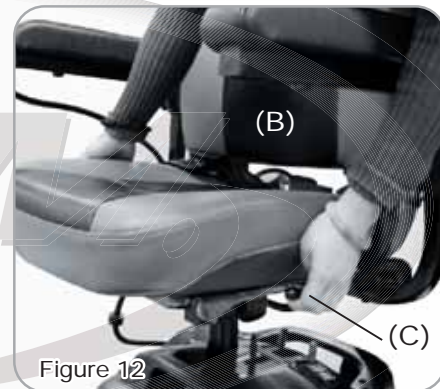


Figure 12

Remove the Basket by turning and removing the center Rivet (D). (See Fig. 13)  
Remove the Battery Pack (E) by holding the Battery Pack with one hand and the other hand pushing the Release Lever (F) to the rear of the chair. (See Fig. 14)

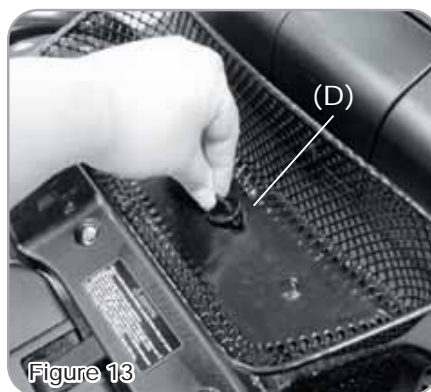


Figure 13

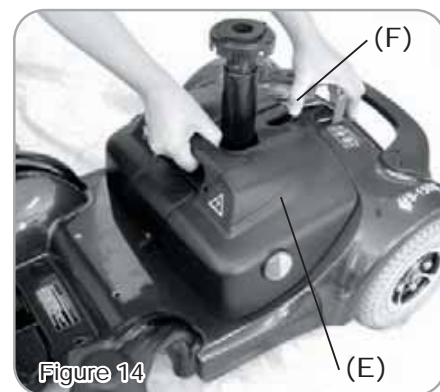
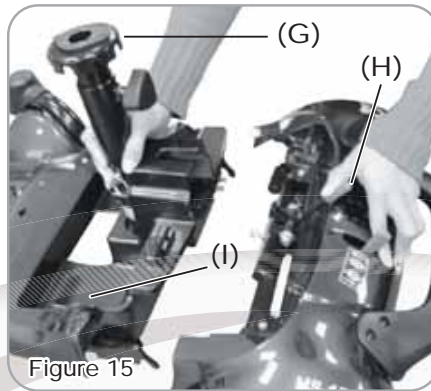


Figure 14

Detach the chair frame by holding the Seat Post (G) with one hand, the other hand pushing the Release Lever to the rear of the chair. Lift the seat post to separate the Front Frame Assembly (H) from the Rear Frame Assembly (I). (See Fig. 15)

Once all the parts have been disassembled, you are now able to put the pieces in storage or in a vehicle for transportation. (See Fig. 16)



**Re-assemble :**

To re-assemble your power chair, you can repeat the disassembly directions in reverse.

## CHARGING THE BATTERIES

Your C.T.M. power chair is equipped with two, service free 12V 14Ah rechargeable batteries and one 24V/2A on-board charger. Batteries must be charged before using the power chair for the first time and recommended to be charged up to 8 - 14 hours after each day's use. Be sure the power switch is in the OFF position and the free-wheeling lever is in the "D" position.

1. Insert the battery charger cord into the charging socket on the joystick.



Figure 17

2. Plug the other end of the power cable into a standard electrical wall outlet.
3. Once the batteries are fully charged, the light on the charger will change to green, please unplug the power cord from the wall outlet and the power chair. The power cord should be stored in a safe and dry location until it will be used again.
4. If after charging your power chair over 8 - 14 hours and it does not function, please check:
  - fuse is not burned out
  - the power chair is turned off
  - circuit breaker is pushed inif none of these is a problem, contact your authorized dealer.



**The time needed to recharge will vary depending on the depletion of the batteries. Charging for longer than necessary will not harm the batteries. They cannot be overcharged.**

### **Keep in mind these rules :**

Fully charge batteries at least once a month, more if you use the power chair regularly. Charge after each trip exceeding 3 kilometers / 1.86 miles.

If storing your power chair for some time (one month or more) make sure that the batteries are fully charged, and on returning, charge them again before using the power chair.

Batteries will only give the maximum performance after the power chair has been used, and the batteries have been recharged up to 10 times.

For safety, please follow the guidelines below.

1. DO NOT use the charger if the power cord is damaged.
2. DO NOT use an extension cord when charging your batteries. A risk of fire and/or electric shock could be encountered.
3. DO NOT take apart the charger, as this will void the warranty.

## CARE AND MAINTENANCE

Taking care of your power chair will keep it in top-notch condition. It is recommended that you have your dealer provide preventative maintenance service of your power chair on a regularly basis. Here are a few maintenance guidelines:

### BODY COVER:

If your power chair is dirty, use a damp or lightly soapy cloth to wipe it down. Do not use running water to wash or rinse the power chair in order to protect the electrical parts. Polish with an automotive liquid polish.

### SEAT AND ARMRESTS:

The seat material used by C.T.M. is a product of high quality and will remain in good condition for many years if treated responsibly. Using a damp cloth helps clean the upholstery greatly. Please note that using the power chair outdoors can lead to sun damage of the upholstery material. Since this is a normal wear and tear condition, it is not covered under the warranty.

### SEAT BELT:

A damp cloth with mild soapsuds should only be used to clean the seat belts. Wipe the seat belts gently removing any debris on it. Do not use any chemical products to clean the seat belts as the fabric will be weakened.



An authorized dealer should handle all maintenance and repair of your power chair that is associated with electronics, batteries, motor parts, and tires. Here are the guidelines that can be followed by the authorized dealer.

### FLAT SPOT (for solid tires only):

During the storage period, a flat spot may occur on solid tires. Weather conditions and storage period could determine the condition of flat spots. By driving the power chair 20 to 30 minutes, flat spots can be eliminated.



**TIRE PRESSURE** (for air-filled tires only):

The condition of the tires and maintenance of the specified tire pressures not only influence tire life but also road safety to a very considerable extent. Incorrect pressures are often a cause of tire problems and could result in an accident. The recommended tire pressure is 35 lbs.

**TIRE TREAD:**

Inspect the tires frequently for any signs of damage, unusual wear and sufficient tread depth. Thread depth should not be allowed to drop below 1 mm.

**ELECTRICAL CONNECTIONS:**

Verify the battery terminals and all plug connectors are secured and firmly attached. If the battery terminals are corroded, please contact your dealer for replacement.

**HARDWARE:**

Check that all hardware exist and are securely fastened. Replace any missing hardware by contacting your dealer for information of parts.

**Additional Information****STORING:**

Also between uses, your power chair is best stored in a dry location at room temperature.

## TROUBLESHOOTING

Here are some suggestions about solving problems you may have with your power chair. There are 10 LED Self-Diagnostic Warning Lights on the Control Panel. To check the Self-Diagnostic Warning Lights, turn the power chair on and count the number of flashes.

Flash Code	Description	Recommended Action
1	Motor Current Over Limit Fault	Motor current is over the controller set limit. Release the joystick to neutral and try again.
2	Battery Fault	Try charging the batteries. Batteries may require replacing. Check the batteries and cabling.
3	Left Motor Fault	Check the left motor, connections and cabling.
4	Right Motor Fault	Check the right motor, connections and cabling.
5	Left Park Brake Fault	Check the left park brake motor, connections and cabling.
6	Right Park Brake Fault	Check the right park brake motor, connections and cabling.
7	User Interface Fault	Display PCB Fault Consult a service agent.
8	Controller Fault	Consult a service agent.
9	A-Series Bus Communications Fault	Consult a service agent.

**Problem:** All LED lights on joystick flash constantly.

**Solution:** Both Right and Left motors are on Neutral.

If the programmable parameter, Motor Swap, has been changed, then left and right hand references in this table will need transposing.

**Other Problems :**

Power chair will not move when the power is turned on:

1. Check the Battery Level Indicator on the joystick. All the LED lights should be on.
2. Check the Self-Diagnostic Warning Light. It should be steady. If it is flashing, see the chart on page 16 for the problem identification.
3. Check all electrical connections to be sure they are tight.
4. Verify the batteries are connected correctly.
5. If none of these suggestions correct the problem, contact your authorized dealer.

If charging your power chair over 14 hours and the light on the charger does not change to green, then contact your authorized dealer.

Please note that your power chair is equipped with a controller that constantly checks the drive system for a safe and enjoyable ride. If an error occurs, the Battery Level Indicator will provide you an indication of the problem by way of flashing lights.

## SPECIFICATION

Overall Length	810 mm / 31.9"
Overall Width	600 mm / 23.6"
Overall Height	935 mm / 36.8"
Wheels: Front	130 mm / 5"
Wheels: Middle	N/A
Wheels: Rear	200 mm / 8"
Weight w/ Batteries	47.8 kg / 105.4 lbs
Max. Speed	6.5 kmph / 4 mph
Weight Capacity	115 kg / 250 lbs
Ground Clearance	40 mm / 1.6"
Grade Climbable	6 degree
Curb Climbing	23 mm / 0.9"
Turning Radius	695 mm / 27.4"
Brake	Electro-Mechanical
Seat Width	470 mm / 18.5"
Drive Train	2-Motor Rear-Wheel Drive
Battery Pack Weight	10.4 kg / 22.9 lbs
Motor Size	DC24V / 150W 2800r.p.m
Travel Range	8.4 km / 5.2 mile
Battery	14 Ah x 2
Charger	2A
Electronics	DA50
Seat Type	Light Weight Foldable Seat

\*Subject to change without notice.