



WHEN SERVICE ON A POWER WHEELCHAIR IS REQUESTED ...

# WHAT TO ASK

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- MED provides Supply Partners access to these market-leading Members to impact revenue and improve supplier efficiencies in sales, marketing and ordering/operations.
- MED Referral Partners gain access to MED National Network of HME Providers, using **GOMEEDGE™** technology to process referral activity through the web.

MED's national headquarters is located in Lubbock, Texas. For more information about MED: [www.medgroup.com](http://www.medgroup.com)

The purpose of this guide is to help the Customer Service Representative “CSR” ask the right questions when a power chair customer calls and requests repair. The goal is to fix the chair in a single service call. Please get as much information as possible from the customer...make and model of chair, and also ask about conditions when problem occurred (in rain, running hard on a hot day, driving through the grass, etc.) Getting the right information at the beginning will help us respond with the right parts loaded in the van. And sometimes, the solution may not require a service call.

## **Power Chair Does Not Run**

### **Do LEDs light up?**

#### **1. Yes (LEDs light up)**

##### **a. How many bars (LEDS) are illuminated?**

- i. If just one or two, low voltage. Try recharging.
  1. If problem continues, ask when batteries were last replaced and who replaced them. If over 1½ years, probably simply need new batteries. If customer replaced batteries, they may not have used automotive batteries and they will fail. Will require a technician.
  2. Is battery charger connected to outlet controlled by wall switch? (Customer may be turning off charger without even knowing it.)
  3. Loose or poor battery connections. Will require a technician.
  4. Faulty battery charger
- ii. If ONE red LED is flashing, recharge batteries.
  1. If problem continues, ask when batteries were last replaced and who replaced them. If over 1 ½ years, probably simply need new batteries. If customer replaced batteries, they may not have used automotive batteries and they will fail. Will require a technician.
  2. Is battery charger connected to outlet controlled by wall switch? (Customer may be turning off charger without knowing it.)
  3. Loose or poor battery connections. Will require a technician.
  4. Faulty battery charger
- iii. If SIX flashing LEDs (most systems):
  1. “Inhibit” has been activated. Is battery charger connected?
- iv. If SEVEN flashing LEDs:
  1. Try turning it on again, making sure joystick is in neutral.
  2. If this problem continues and joystick is in neutral, joystick is probably damaged and needs to be replaced.
- v. The following flash codes require technician:
  1. TWO or THREE flashing LEDs: Left motor
  2. FOUR or FIVE flashing LEDs: Right motor
  3. EIGHT flashing LEDs: Controller
  4. NINE flashing LEDs: Motor parking brake
  5. TEN flashing LEDs: Excessive battery voltage (possible faulty charger)

##### **b. If it has seating system, is it tilted or reclined? It may be inhibiting the drive function.**

#### **2. NO (LEDs do not come on)**

##### **a. Is joystick cable connected?**

- i. If no, plug it in and try again
- ii. If yes:
  1. Try recharging batteries (may be below minimum threshold to allow chair to turn on)

2. If the batteries don't recharge:
  - a. Faulty battery connections (need technician)
  - b. Faulty batteries (need technician)
  - c. Faulty charger or connector (need technician)
  - d. Circuit breaker open (reset circuit breaker)

**b. Is joystick cable damaged?**

- i. If yes, will need technician

**c. Is on/off switch damaged?**

- i. If yes, will need technician

**d. Is circuit breaker open?**

- i. If customer can, have him reset circuit breaker. If it trips again, will need a technician to repair (locate and correct short circuit).

**e. Have any electrical accessories (lights, horn, etc.) been installed?**

**Power chair Runs, but...**

**1. Does not hold battery charge**

**a. When were batteries last replaced, and who replaced them?**

- i. If over 1 ½ years, probably need new batteries
- ii. If batteries replaced by someone other than a reliable HME provider, suspect possibility of incorrect batteries being installed

**b. Has any kind of electrical accessory been installed?**

- i. Often, accessories are wired to a single battery, pulling voltage down in one battery causing a battery-mismatched condition, reducing driving range

**c. Corroded battery cables.**

**d. Motors may be drawing excessive amps.**

**e. All of above require technician to repair.**

**2. Charge does not charge batteries**

**a. Make sure that charger is not connected to a wall outlet that is controlled by a wall switch (power to charger may be turned off when turning out lights)**

**b. Make sure charger cable is correctly plugged in to charger port on chair**

**c. Is it an on-board or stand-alone charger?**

**3. Power chair is noisy when driven**

**a. First questions to ask:**

- i. Is it coming from the right side, left side, or can't tell?
- ii. Does it seem to be a motor noise?

**b. Does the noise get worse going over rough terrain or bumps?**

- i. If YES, motor mounts may be loose. Will need technician to check it.
- ii. If NO, continue with following questions

**c. Is it a clicking or thumping noise? If YES, then:**

- i. Is the noise matched to wheel speed (does it click faster as you speed up)?
  1. If YES, ask customer (if able) to check tires for:
    - a. Pebble/debris stuck in tread
    - b. Cut in tire
    - c. Other possibilities (these require a technician): motor problem, loose axle bolts/nuts, cracked wheel, tire problem

ii. Is the clicking random?

1. If NO, then most likely problems will require a technician (wheel problem, frame cracked/broken, frame bolts loose/missing, cracked wheel, loose axle nut, worn hub and/or key)

d. Is it a squealing noise that gets louder as you go faster? If YES, then:

i. These problems are usually motor brushes or bearings and require a technician to correct

**e. Is it a grinding noise? If YES, then:**

i. If the noise seems to be coming from the motor, it is probably a gearbox or bearing problem and will require a technician.

ii. If the noise seems to be coming from somewhere other than the motors, a technician will need to inspect.

**4. Runs slow when hot**

**a. Does Power chair run OK after cooling down?**

i. If YES, then may be normal IF:

1. Chair is being driven in high-load conditions (running hard outdoors, hills, irregular or rough terrain, etc.)

2. Outdoors on hot day, especially if being driven over black asphalt

3. If either or both conditions above are present, then “thermal-rollback” is most likely what is happening

a. Thermal-rollback is designed to protect the motors and electronics from damage. The controller senses high heat and/or extreme load, lowers the power temporarily to give the electronics and motors a change to cool down.

b. Ask customer to let chair cool down WITH POWER SWITCH LEFT ON. Try 30 minutes, if that does not work, try an additional 30 minutes.

**b. If NO, then may need programming or perhaps a motor problem may be present.**

**5. Always run too slow**

**a. Is there a speed adjustment on the joystick?**

i. Make sure it is set correctly, sometimes customers forget that they have this feature and it could have been turned down by accident.

**b. If chair runs too slowly and cannot be adjusted with joystick to go quickly enough, then:**

i. Is this a new problem, that is, had the chair run quicker before? If YES, then:

1. If YES, then chair may simply need to be reprogrammed, but more likely, there is something more seriously wrong (possibly a motor problem) that caused the maximum speed to change.

2. If NO, then:

a. That is as fast as the chair is designed to go

b. More speed may be had by reprogramming (check with RTS first, some customers need to have the slower-than-requested speed limits for their own safety)

**c. Has power chair been reprogrammed recently?**

i. If YES, system may need to be reprogrammed for more speed (check with RTS first, some customers need to have slower-than-requested speed limits for their own safety).

1. If NO, then:

a. That is as fast as the chair is designed to go

b. More speed may be had by reprogramming (check with RTS first, some customers need to have slower-than-requested speed limits for their own safety)

**6. Power chair veers**

**a. Are tire pressures correct, and set the same right to left?**

i. If NO, inflate tires properly

ii. If YES, go to next question

**b. Is tire wear even (right to left)?**

- i. If NO, replace worn tires
- ii. If YES, go to next question

**c. Has anything changed with the way customer sits in chair (especially leaning to one side)?**

- i. If YES, chair should be inspected for user fit and positioning, preferably by RTS. Reprogramming may be necessary, but seating system adjustments may also be required to center the weight left-to-right.
- ii. If NO, go to next question

**d. Has there been any kind of impact that might have damaged the frame or alignment?**

- i. If any possibility of frame damage, chair needs inspection
- ii. If NO, go to next question

**e. Does the motor make a noise?**

- i. If YES, then noisy motor may be the cause
- ii. If NO, it is still possible to have a faulty motor causing the chair to veer. Ask which direction the chair veers, the direction of veer is the suspect motor.

**7. Does not tilt or recline**

**a. Verify that customer is familiar with how to make the seating system operate...especially with elderly people, it can be confusing**

**b. Does the power chair still drive?**

- i. If NO, it could be that the batteries are seriously discharged and need to be replaced or recharged.
- ii. If YES, go to next question

**c. Are there any grinding or abnormal mechanical noises?**

- i. If YES, system needs to be inspected.
- ii. If NO, go to next question

**d. Are any wires disconnected? (You may not want all customers to go this far)**

- i. Whether YES or NO, system should be inspected. Simply reconnecting a cable may not be a reliable repair, as proper cable routing is critical to allow for movement of tilt/recline mechanism

**8. Runs rough at low speed**

**a. Is either motor noisy?**

- i. If YES, chair needs inspection by repair tech
- ii. If NO, go to next question

**b. If no unusual noises:**

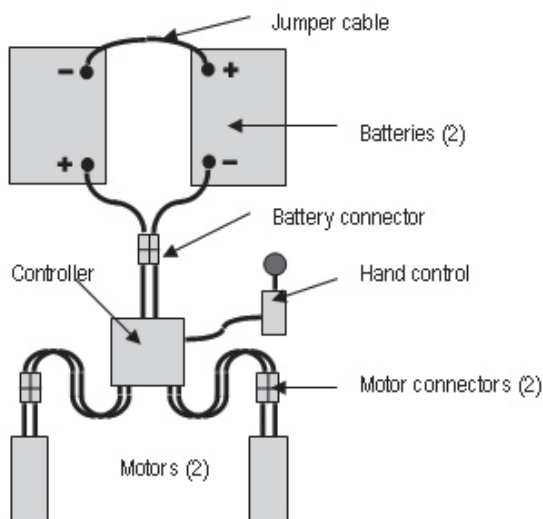
- i. Even if not noisy, still could have a motor problem (faulty commutator)
- ii. Have motors or controller been replaced recently?
  - 1. If YES, sometimes it is necessary to reprogram the controller (to match motor impedance, which can happen when substituting different motors from original equipment)
    - a. NOTE: Not all controllers can be reprogrammed for different motor impedance. In this case, replace components as required.
- iii. If NO, chair needs to be inspected by technician

## Power Wheelchair Basics

Here are the basic principles of how power wheelchairs function.

- Power comes from **batteries** (almost always two).
- Power wheelchairs have two **motors**. Each motor has its own channel or circuit. Each motor independently controls speed and “directional control” (turning and veering right and left). By varying the voltage to the motors, the wheelchair runs at different speeds.
- “Driving” a power wheelchair requires an **input device** (frequently a hand operated joystick) to select and control speed and direction.
- A **controller** interprets the driver’s commands, and sends just the right amount of power to the motors. A controller is essentially a computer.
- As the chair is driven, battery power is consumed. A battery charger connected to a wall outlet is used to recharge the batteries. The chair cannot be driven when being charged, and often takes eight hours or more to fully charge. For active users, this is usually done every night.

The batteries are reconnected by a jumper cable. It connects the positive post of one battery to the negative post of the other battery. Connected this way, the batteries are in **series**. “Connected in series” means that the positive terminal of one battery is connected to negative terminal of the other battery (This is just like a flashlight with two dry cell batteries.) In series, battery voltages are added together to come up to a total, or system, voltage. Most power chairs use two 12-volt batteries, connected in series for a 24-volt system.



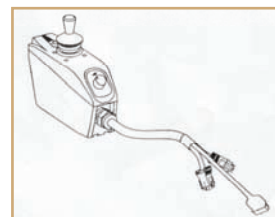
Notice that the cables for the motors go to the controller, and that the motors are not connected together. This is because the controller powers each motor independently, so that the chair goes in the direction selected by the position of the joystick. Only when the chair is going exactly straight (forward or reverse) will the two motors run at the same speed.

Some power chairs have an **integral controller**. See illustration below. An integral system has a joystick that shares the same box as the controller. The advantage of an integral system is the fact that it eliminates several connectors, which should improve reliability (connector problems are the source of many power wheelchair problems). However, mounting options are limited, which limits the use of specially mounted and designed controls.

Remote systems, where the input drive (typically a joystick) is separate from the controller, allow for more options for mounting location, and will often accept **specialty controls**.

### What are specialty controls?

Often, because of injuries or diseases that impact the use of the hands and arms, a standard joystick just won't work. This is when you use specialty controls, such as chin control, head control, sip and puff or head array as options to the “standard” joystick. Generally speaking, any input control other than a standard joystick is considered a “specialty control.”



**Integral Controller**



**Remote Hand Control and Controller**

For more information



[www.medgroup.com](http://www.medgroup.com)

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