



Owner's Manual Slim Rack Bunk Lift System with Control Box 1510000199

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Owner's Manual Dual Planetary Gearmotor Bunk Lift System (Slim Rack)

Introduction

SYSTEM DESCRIPTION:

The Power Gear Slim Rack Bunk Lift System is a rack and pinion design operated by a pair of 12 Volt DC electric motors. The system is designed to move a bunk of no more than 100 pounds vertically. Bunk Lift systems rated for higher weight or longer strokes can be obtained. Please contact Power Gear for application assistance.

MAJOR COMPONENTS:

- Touchpad with indicator LED's that mounts to the wall. The touchpad communicates with the control to allow bunk movement and provides end user feedback via LED's. (See Figure 1)
 - "UP" and "DOWN" buttons move the bunk lift in the corresponding direction when button is pressed. Push and hold until bunk reaches pre-programmed stop point.
 - "ENGAGE PARK BRAKE" will light red if park brake is not engaged when trying to operate the bunk lift.
 - "LOW VOLTAGE" LED will light red when the voltage is below the operating threshold of the control.
 - "FAULT CODE" LED will flash red a certain number of times to alert user of specific fault conditions. (See Figure 5, page 4)
 - "BUNK LIFT MOVEMENT" LED will flash green when the bunk lift is moving.

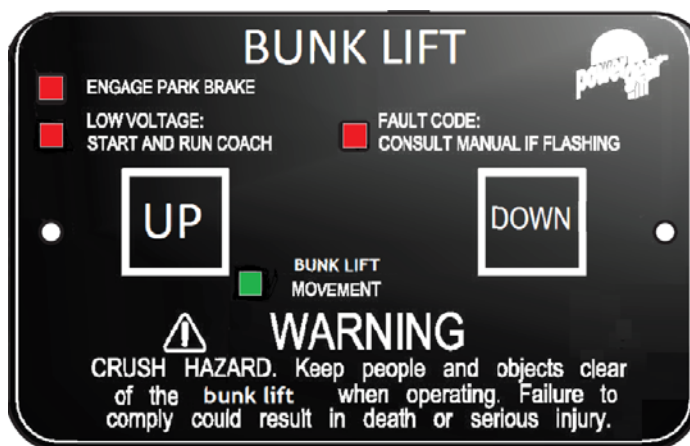


Figure 1 Touchpad

- A specially designed control that gives the user full control of the bunk movement, up or down. The control has programmed stops that control the motor when the bunk is fully raised or lowered, and the ability to detect faults for ease in troubleshooting. (See Figure 2)
- Two to four vertical channels with 12V DC gear motors which mount to the bunk, and gear rack arms that mount to the vertical structure. (See Figure 2)
- Harnesses to connect touchpad and motors to control box. (Not shown)



! WARNING

- Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk lift.
- Always keep away from the gear racks when the bunk lift is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.
- Do not operate bunk lift with anyone physically lying or sitting in the bunk

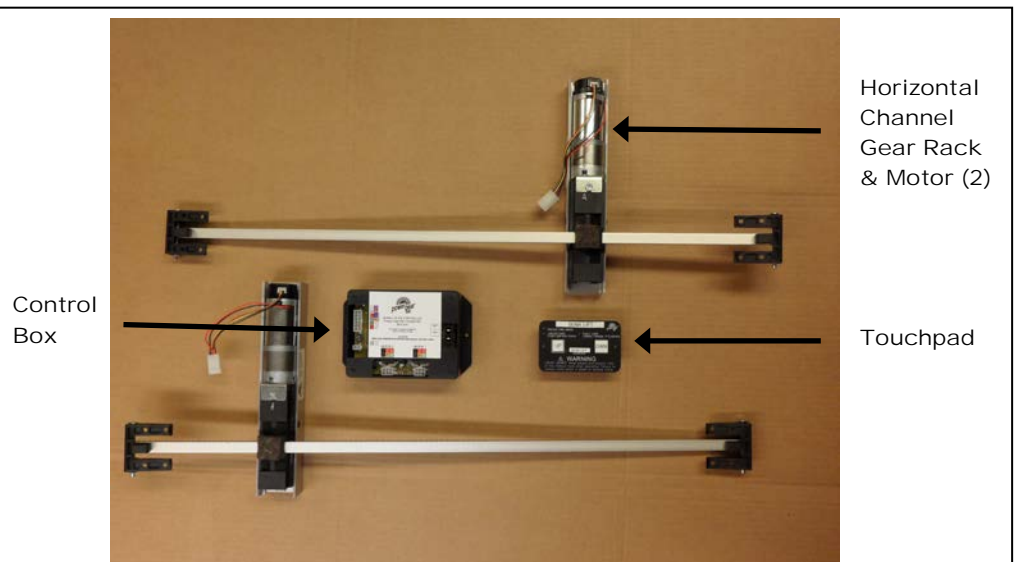


Figure 2 Bunk Lift System Components

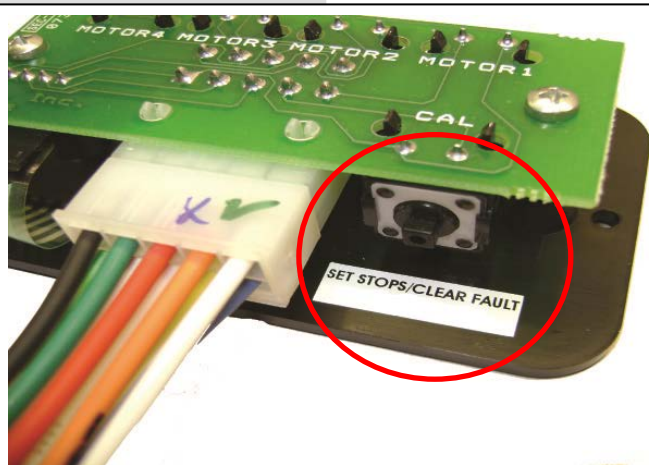


Figure 3 Set Stops/Clear Fault Button (Back bottom of touch pad shown)

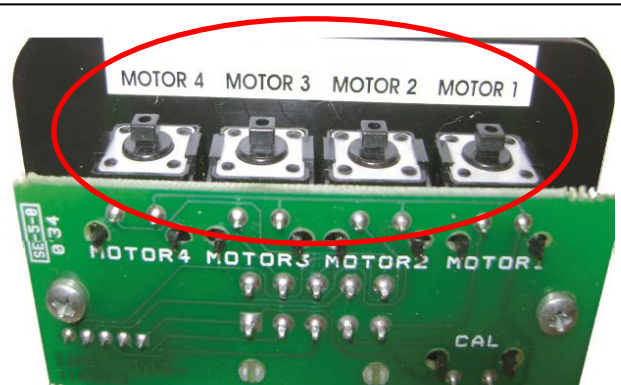


Figure 4 Bunk Lift Motor Buttons (Back top of touch pad shown)

Operation Mode

Please note:

- The bunk lift system will not function until the stops are properly programmed, or faults are cleared. **OEM coach manufacturer will complete programming during installation.**
- The **GREEN LED (FIGURE 1 page 1)** indicates the system operation.
 - A solid **GREEN LED** indicates bunk movement.
- The **RED LED (FIGURE 1, page 1)** indicates a fault or a problem with the system. Refer to the **FAULT DIAGNOSTICS/TROUBLESHOOTING (page 3)** for additional information.

WARNING

- Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk lift.
- Always keep away from the gear racks when the bunk lift is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

Operation Mode (Continued)

Lowering the bunk:

1. The engine or generator must be running, or plugged into shore power.
2. Transmission must be in PARK or NEUTRAL.(if equipped)
3. Level the unit. (if equipped)
4. Remove the locking pins. (if equipped) (**Contact OEM for details**)
5. Turn "on" the on/off switch or key. (if equipped) (**Contact OEM for details**)
6. Press and hold the **DOWN** button (**FIGURE 1, page 1**). A slight delay is normal before the bunk begins to move.
7. Release the button when the bunk is fully lowered and stops moving.
8. Turn "off" the on/off switch or key. (if equipped) (**Contact OEM for details**)

Raising the bunk:

1. The engine or generator must be running, or plugged into shore power.
2. Transmission must be in PARK or NEUTRAL.(if equipped)
3. Remove locking pins. (if equipped) (**Contact OEM for details**)
4. Turn "on" the on/off switch or key. (if equipped) (**Contact OEM for details**)
5. Press and hold the **UP** button (**FIGURE 1, page 1**). A slight delay is normal before the bunk begins to move.
6. Release the button when the bunk is fully raised and stops moving.
7. Turn "off" the on/off switch or key. (if equipped)
8. Install the locking pins. (if equipped) (**Contact OEM for details**)

Preventative Maintenance

Your Power Gear bunk lift system has been designed to require very little maintenance. To ensure the long life of your bunk lift system, read and follow these few simple procedures:

- When the bunk is in the down position, visually inspect the gear rack assemblies. Check for excess build up of dirt or other foreign material; remove any debris items that may be present.
- If the system squeaks or makes any noises, blow out any debris from the gear rack arms and apply a non-silicone based dry lubricant to prevent and/or stop squeaking.

If you have any problems or questions, please see the contact tab on our website at www.powergearus.com

Fault Diagnostics/Troubleshooting

This control has the ability to detect and display several faults. When a fault is detected, the bunk movement will stop and two (2) different LED's will flash in a pattern.

- The **FAULT CODE** LED (**FIGURE 1, page 1**) on the touchpad will flash **RED** a number of times corresponding to a specific fault code. Refer to the **TROUBLESHOOTING** chart (**Figure 5, page 4**) to best determine what caused the fault.
- The **BUNK MOVEMENT** LED (**FIGURE 1, page 1**) on the touchpad will flash **GREEN** a number of times corresponding to which motor had the associated fault.
 - For example: if you are seeing four (4) **RED** flashes and two (2) **GREEN** flashes, it means that there is a motor fault on motor 2.

There are two (2) types of faults, **MINOR** and **MAJOR**, and fault must be cleared in order for the bunk to operate.

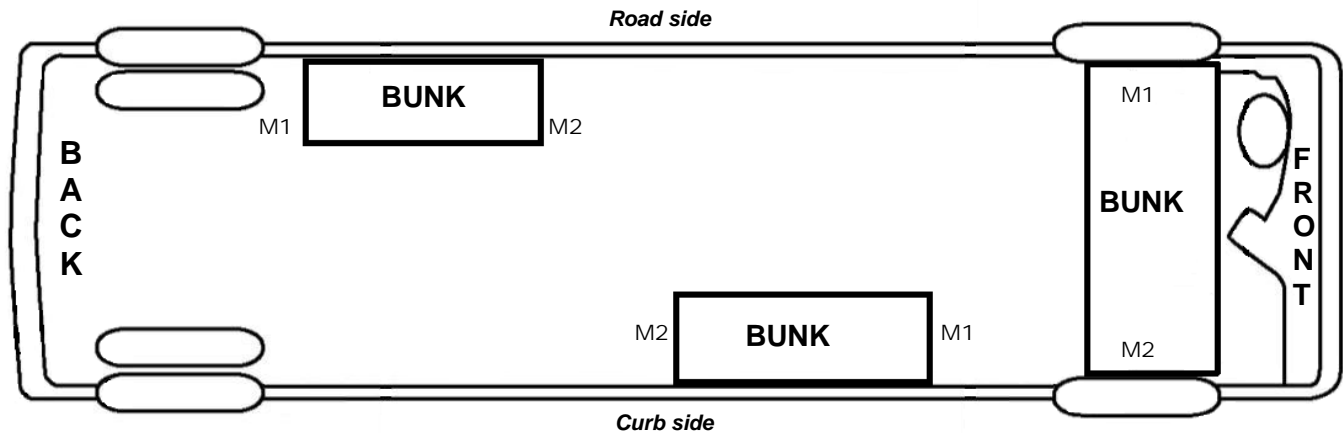
- **MINOR** faults can be cleared by pushing and releasing the **UP** or **DOWN** buttons on the bunk lift touchpad (**FIGURE 1, page 1**).
- After the problem has been repaired, **MAJOR** faults must be cleared by pushing and releasing the **SET STOPS/CLEAR FAULTS** button located the back of the bunk lift touchpad (**FIGURE 3, page 2**).

Note: For major faults, the control must be overridden by following the **EMERGENCY BUNK MOVEMENT** in the **OVERRIDE MODES** section on starting on **page 4**. The control will then have to be re-programmed by an O.E.M authorized dealer when the problem is repaired.

FIGURE 5**FAULT CODES**

Fault Code	Fault Type	Description	Possible Cause	Possible Solutions
1	Major	Stops not programmed	<ul style="list-style-type: none"> Stops have not been set Stops were cleared Stops were improperly set 	Stops need to be programmed.
2	Minor	System Fault	<ul style="list-style-type: none"> Obstruction present Excessive system drag 	Run bunk lift in opposite direction. If bunk continues to move in the opposite direction, remove obstruction, excessive weight in bunk or repair of damaged component. If bunk stops moving in opposite direction, observe fault code and refer to this chart.
4	Major	Motor Fault	<ul style="list-style-type: none"> Bad wire connection Bad motor 	Refer to TIP Sheet 82-S0518 for troubleshooting.*
6	Minor	Excessive Battery Voltage	Supply voltage to control is 17 V DC or greater.	Consult manufacturer of unit charging system for troubleshooting assistance.

*This tip sheet and other updated troubleshooting information can be found on our website at www.powergearus.com.

Possible Bunk Lift Locations

Proper designation of motor locations

M1 = Motor 1
M2 = Motor 2

! WARNING

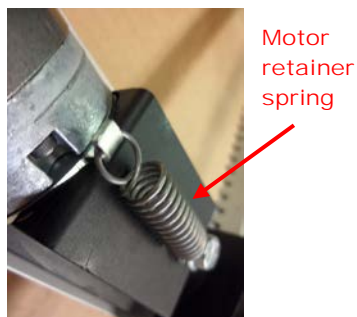
- Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk.
- Always keep away from the gear racks when the bunk lift is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

# of RED flashes	# of GREEN flashes

Figure 6



Figure 7



Override Modes (continued)

In the event of component failure or loss of system power, your bunk can be manually overridden and bunk moved for travel.

Note: At any time during the override procedure, the unit will exit this mode if the bunk has not been moved for two (2) minutes or if a fault is detected during bunk movement. The **FAULT CODE** and **BUNK MOVEMENT** LED's will flash rapidly for 10 seconds to indicate that the override procedure failed. After the 10 seconds of flashing, the control will automatically default to **FAULT CODE 1** (see **FAULT CODES, FIGURE 5**) and programming must be restarted.

Note: The bunk control will need to be re-programmed by an authorized dealer after the system has been overridden.

A. EMERGENCY BUNK MOVEMENT TO UP POSITION:

Use this procedure when there is **NO** loss of power or electrical problem with the system.

1. Remove the touchpad (**FIGURE 1, page 1**) from the wall.
2. Prior to clearing the MAJOR fault, record the number of RED and GREEN flashes (**FIGURE 6**) observed on the touchpad. This information will help your dealer/service center in troubleshooting the bunk lift system.
3. Press and hold the **SET STOPS/CLEAR FAULTS** button (**FIGURE 3, page 2**) on the back for the touchpad for five (5) seconds. Both **RED** and **GREEN** LED's will be on solid while this button is pressed. After five (5) seconds, the **GREEN** LED will begin flashing and the **RED** LED will remain lit.
4. The unit is now ready to raise the bunk. Press and hold the **BUNK LIFT MOTOR** buttons 1 and 2 on the back of the **TOUCHPAD (FIGURE 4, page 2)**.

a. **Caution:** It is very important to note that during this procedure, the bunk lift control has **NO** stop locations. Damage to the bunk lift can occur if the bunk is raised or lowered too far.

5. Press the UP button on the front of the wall touchpad until the bunk is fully raised position. If one side of the of the bunk needs to be raised further in order to fully raise, press and hold the motor button corresponding to only the motor you want to move. Press the UP button on the front of the touchpad to raise the bunk the remainder of the way. Install lock pins. (if equipped)
6. Re-install the wall touchpad.
7. Take the unit to a O.E.M authorized dealer for repairs.

B. MANUAL EMERGENCY BUNK MOVEMENT TO UP POSITION.

Use this procedure when the above procedures do not work.

In the event that power is lost to the bunk motor(s) or **OVERRIDE MODE "A"** (page 4) will not work, the bunk can be manually raised by following these steps:

1. Use a voltmeter and check to see if power is being delivered to the control module.
2. If no DC power is being delivered from coach, use another 12 VDC battery power source to power the module and retract the bunk using the **UP** button on the touchpad.
3. If power source is not available, then use the following steps:
 - a. **Gain access to channel assemblies on each side of the bunk by first contacting the OEM manufacturer for access details.**
 - b. Once access is gained, remove the top cover plate of each channel assembly.
 - c. Loosen motor retainer screw or unhook spring, do not remove screw. (**FIGURE 7**)
 - d. Remove each motor from the channel assembly. Bunk will drop if in the raised position.
 - e. Disconnect motor connectors and place motors in a safe location. They will be needed when bunk lift is serviced.
 - f. Manually push up bunk lift.
4. When bunk in fully raised position, install pins to keep it in place. (**Contact OEM for details**)

Note: The bunk lift will have to be inspected at a certified dealer for troubleshooting and repairs. The bunk control will need to be re-programmed by an authorized dealer after the system has been overridden.

Additional Reference publications located at www.powergearus.com

3010002675	Installation and service manual slim rack bunk lift system with control box 1510000199
82-S0530	Trouble shooting Bunk Lift control box 1510000199 for In-Wall Slim Rack Systems
82-S0531	Encoder Test 1 Dual Planetary Gear Motor Sync with Control Box 1510000199
82-S0532	Encoder Test 2 Dual Planetary Gear Motor Sync with Control Box 1510000199

Power Gear Limited Warranty

Power Gear warrants its manufacturer installed Power Gear and Kwikkee brand products to be free of material and workmanship defects for two (2) years from the date of the original sale of the motor vehicle/recreation vehicle (RV) in which they are installed, provided that these products are installed and operated according to the purpose for which they were intended, designed and specified. This warranty does not cover product that is incorrectly installed, or upon examination has been misused or abused by the vehicle owner.

Warranty coverage includes:

- Repair or replacement of the defective component(s) of the malfunctioning system. Entire systems are not replaced unless either the faulty component is not replaceable or all components comprising the system are defective.
- Labor costs for the diagnosis and repair work associated with the repair or replacement of the defective component(s) by a licensed servicing center.

This warranty does not include payment or reimbursement of:

- Normal system maintenance and preventive maintenance.
- Mobile service or towing expenses related to field repairs and/or the transportation of the vehicle to a repair facility.
- Living or travel related expenses incurred in the repair of the vehicle.

By filing a warranty claim in accordance with Power Gear's Warranty Administration Procedure, service providers agree that the replacement part(s) will be provided to the vehicle owner at no cost and that the total labor charges for the completion of warranty repairs will be billed to Power Gear. Accordingly, under no circumstances will Power Gear reimburse the vehicle owner directly for costs covered under this warranty policy.

Warranty coverage runs concurrently with any vehicle warranty period provided by the manufacturer, and is transfer-able to subsequent owners. Proof of original date of purchase of vehicle, and if applicable subsequent owner's proof of purchase, is required to confirm coverage.

Power Gear reserves the right to change the terms of our warranty policy at any time. For the most current information on product warranty and our warranty claim procedure, visit our website at www.powergearus.com.



Installation & Service Manual Slim Rack Bunk Lift System with Control Box 1510000199

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Figure 1

Installation and Service Manual Dual Planetary Gearmotor Slim Rack Bunk Lift System

Introduction

SYSTEM DESCRIPTION:

The Power Gear Slim Rack Bunk Lift System is a rack and pinion design operated by a 12 Volt DC electric Motor. The system is designed to move a bunk of no more than 100 pounds vertically. Bunk Lift systems rated for higher weight or longer strokes can be obtained. Please contact Power Gear for application assistance.

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NOTE

Bunk lift systems are engineered to provide years of trouble free service. Changes to weight, stroke, weight distribution, rail position, controller, power supply, seals, etc, all have an effect on the performance of the system. In order to secure warranty coverage, each new application or changes to existing applications must be audited and approved by Power Gear with a signed document. Audits can be arranged by contacting your account representative.

MAJOR COMPONENTS:

- Touchpad control that mounts to the wall. It allows bunk movement and provides end user feedback.
- A specially designed control that gives the user full control of bunk movement, up or down. The control has programmable stops that stop the motor when the bunk is fully raised or lowered and the ability to detect faults for ease in troubleshooting.
- Vertical channel (two to four) with 12V DC gear motor which mounts to bunk, and gear rack arms that mount to the vertical structure.
- Harnesses to connect touchpad and motors to control box (sold separately).
- Bunk Lift Systems are equipped with a manual override that allows you to raise/lower the bunk in the event of a loss of power.

Installation

GENERAL REQUIREMENTS:

- Power input and wiring size must be such that there are **no less than 10.5 running volts** supplied at the motor leads under maximum load.
- To ensure long, trouble free life of the bunk lift system, a maximum amp draw per motor should be less than 40% of motor stall. The system will operate at higher loads/amp draws but system component life will be reduced as the amp draw per motor is increased above the rating. Contact Power Gear with motor part number for more information on stall specs.
- Bunk lift system controls must be supplied from Power Gear. Controls supplied by other companies will void warranty.
- Voltage supply must come from a 12VDC automotive/RV type battery.



Power Gear Bunk Lift System Components

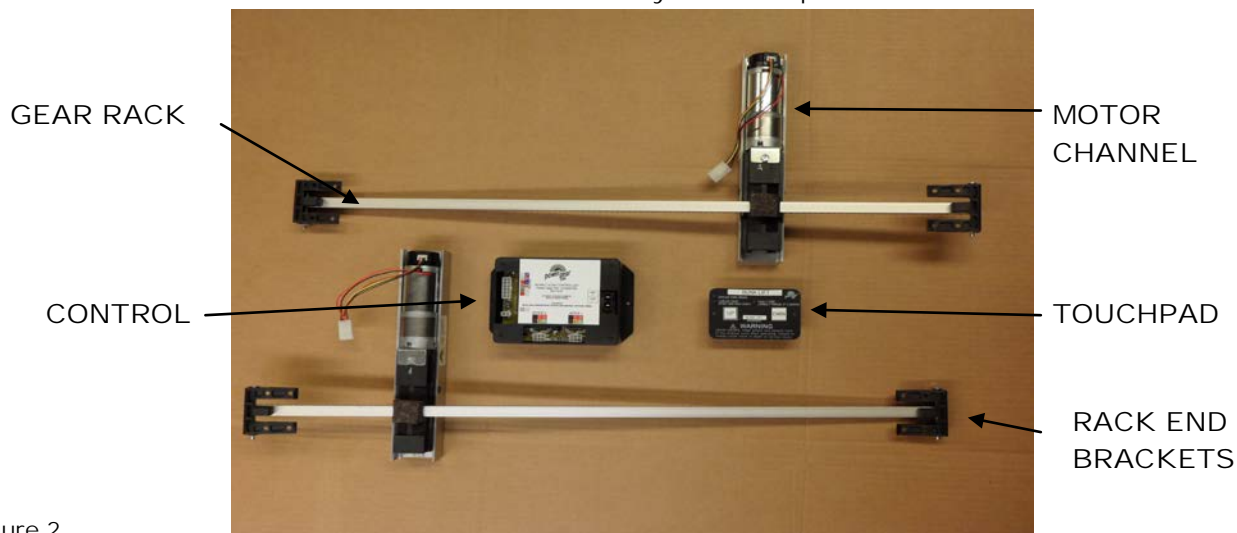


Figure 2

*Installation (Continued)***Mechanical Components:**

1. See **Figure 2** above for components of the bunk lift system. Harnesses not shown.
2. Secure bunk lift motor channel assembly to O.E.M supplied bed frame assembly.
3. Position bunk rack assembly against vertical structure, makes sure the gear rack is vertically positioned, and use a builder's level against gear rack to ensure gear rack is plumb.
4. Secure top rack/end brackets to a vertical structure. NOTE: Secure using four (4) flat head #10 screws (See **FIGURE 3** below) into a structure that can support the weight of the bunk and sleeping occupants.
5. Using the builder's level make the gear rack is plumb, secure the bottom rack /end brackets to the vertical structure. Use four (4) flat head #10 screws.
6. Repeat steps 2-5 for attaching motor channel assembly and rack/end bracket assembly to other end of the bunk.



Figure 3

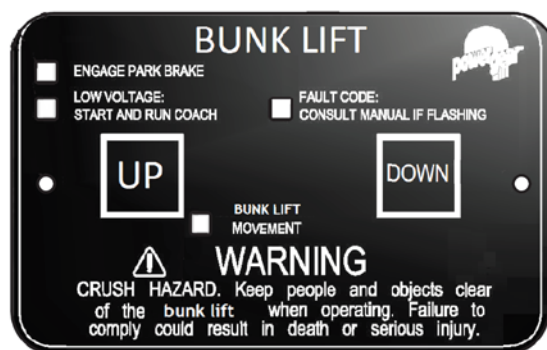


Figure 4 Touchpad



Figure 5 Touchpad Harness assemblies

*Installation (Continued)***Electrical Components:**

1. Mount the **CONTROL BOX (FIGURE 1, page 1)** in a clean and dry, weather tight location that will keep it from being damaged, but is easily accessible for service. **The control is not waterproof.**
2. Reference page 9 (**FIGURES 14, 15, 16, 17, & 18**) for wiring details.
3. Determine location to mount **TOUCHPAD (FIGURE 4, page 2)**. Location needs to be in view of bunk lift and have minimum depth of 1" inside the wall. Cut a 3 1/8" wide by 2" high rectangular opening in the wall paneling to mount the touchpad.
4. Route and attach the touchpad harness (**FIGURE 5**) to the touchpad where the touchpad will be mounted. After system has been programmed (see **PROGRAM MODE, page 4**), mount **TOUCHPAD (FIGURE 4)** with two (2) screws.
5. Route the motor/sensor harnesses from the bunk lift motors to the control box. Mark the motor leads at both ends to aid in connections after routing harness.

Note: It is important that the bunk lift motors be plugged in to the proper receptacle at the control box. Please see the **FIGURE 7** below for proper bunk lift motor designation. Failure to properly connect the motors to the control will result in programming issues (see **FAULT DIAGNOSIS/TROUBLESHOOTING, page 6**).

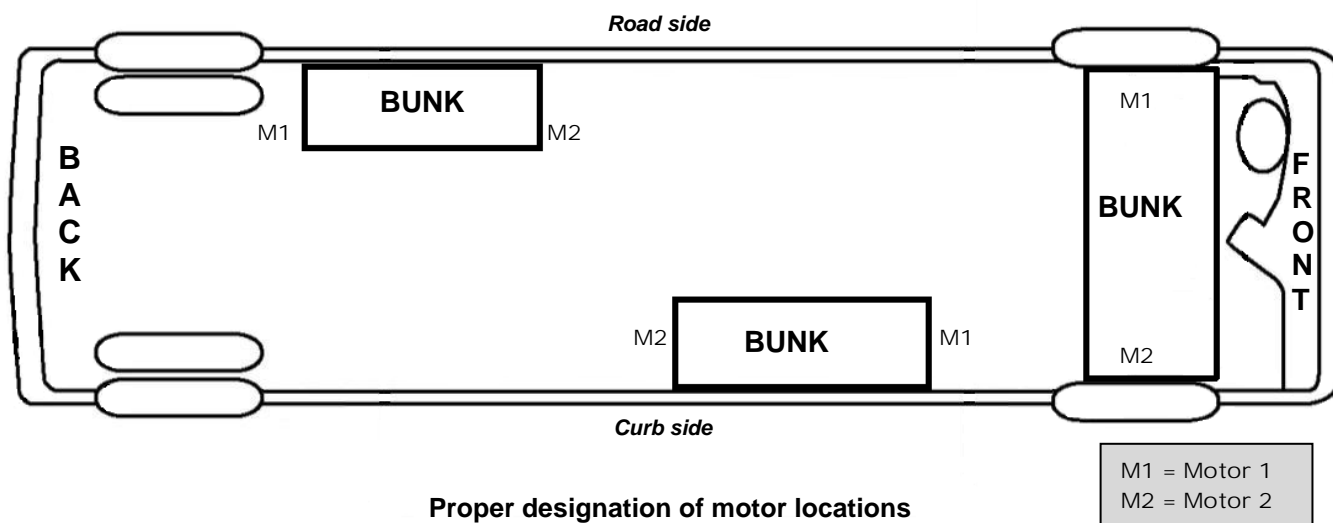
5. Route and attach the **proper gauge wires (FIGURE 6)** from the control to the 12V DC battery using a 30A fuse or circuit breaker.

Installation of the bunk lift is now complete. You are now ready to program the up and down stops (see **PROGRAM MODE, page 4**).

Wire Gauge	Maximum Length
16	10 feet
14	15 feet
12	25 feet
10	40 feet

Wire must be sized so that a minimum of 12.5 VDC is measured at the control while under a load.

Figure 6 Information is given as reference only

Figure 7**Possible Bunk Lift Locations**

! WARNING

- Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk.
- Always keep away from the gear racks when the bunk is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

Program Mode

Use this procedure to initially set the UP and DOWN stops or to change the current stop settings.

Note: At any time during the program procedure, the unit will exit program mode if the bunk has not been moved for two (2) minutes or if a fault is detected during programming. The **FAULT CODE** and **BUNK LIFT MOVEMENT LED's** will flash rapidly for 10 seconds to indicate that the programming procedure failed. After the 10 seconds of flashing, the control will automatically default to **FAULT CODE 1** (see **FAULT CODES, page 7**) and programming must be restarted.

1. If the **TOUCHPAD (FIGURE 4)** is mounted to the wall, remove it to access the buttons (**FIGURES 8 & 9**) on the back side.
2. Press and hold the **SET STOPS/CLEAR FAULT (FIGURE 8)** button on the back of the bunk lift touchpad for five (5) seconds. The **FAULT CODE** and **BUNK LIFT MOVEMENT LED's** will light while the button is held down.
 - After five (5) seconds, the **GREEN LED** will begin flashing and the **RED LED** will remain lit (**FIGURE 10**).
3. You are now ready to set the **UP** stop. **The UP stop must be programmed first.**
 - a. Press and hold the bunk lift motor buttons (**MOTOR 1 and MOTOR 2, FIGURE 9**) on the back of the bunk lift **TOUCHPAD (FIGURE 4)** that correspond to the bunk lift motors you want to move. These buttons correspond to the bunk lift motors.
 - b. Press the **UP** button on the front of the bunk lift **TOUCHPAD**.
 - c. Move the bunk lift to the fully raised position. Release buttons. Press and release the **SET STOPS/CLEAR FAULT (FIGURE 9)** button on the back of the bunk lift touchpad to program the UP stop position. The **RED LED** will now start to flash and the **GREEN LED (FIGURE 10)** will remain lit.

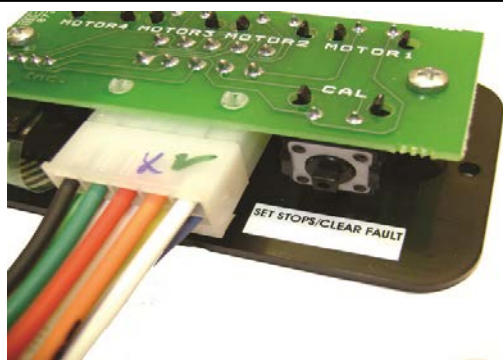


Figure 8 Set Stops/Clear Fault Button



Figure 9 *Bunk Lift Motor Buttons*

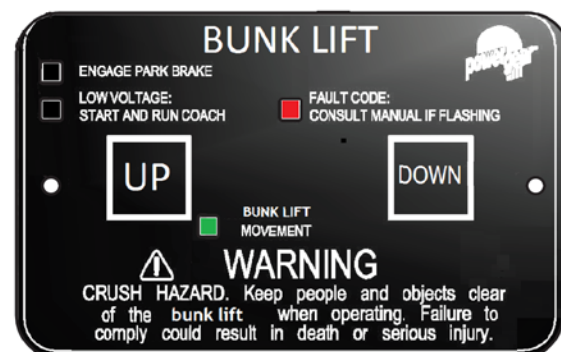


Figure 10 *Bunk Lift Touchpad Programming Lights*

WARNING

- Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk lift.
- Always keep away from the gear racks when the bunk lift is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

Program Mode (Continued)

- You are now ready to set the **DOWN** stop.
 - Press and hold the same bunk lift motor buttons (**MOTOR 1 and MOTOR 2**) as you did in **STEP 3a, page 4**.
 - Press the **DOWN** button on the front of the wall **TOUCHPAD (FIGURE 10, page 4)**.
 - Move the bunk to the fully lowered position. Release the buttons.
 - Press and release the SET **STOPS/CLEAR FAULT (FIGURE 8, page 4)** button on the back of the bunk lift touchpad to program the down stop position.
 - If both LED's flash rapidly for one (1) second and then shut off, the control has been programmed correctly and is now in normal operation mode.
 - If both LED's flash rapidly for 10 seconds, the control has **NOT** been programmed correctly or the system is wired incorrectly. The **TOUCHPAD (FIGURE 4, page 2)** will flash the fault code that occurred during programming. Refer to the **FAULT DIAGNOSTICS/TROUBLESHOOTING** section (**page 6**), repair the fault, and repeat the **PROGRAM MODE** procedure starting with **STEP 1, page 4**.
 - The control must be programmed correctly before it will operate in normal mode. *NOTE: The **UP** stop must be programmed before the **DOWN** stop.*
- Re-install the bunk lift **TOUCHPAD (FIGURE 4, page 2)**. Programming of the control is now complete.

Installation Issues

The control is equipped to help troubleshoot the system during installation. Count the number of LED flashes and refer to the **FAULT DIAGNOSTICS/TROUBLESHOOTING** section starting on **page 6** of this manual.

If you are still having difficulties programming the system (and prior to replacing the control), verify that the system has been wired correctly and that the **UP** stop location was programmed before the **DOWN** stop location. See **FIGURE 7, page 3** for proper connection of the motors to the bunk lift control.

Operation Mode

Please note:

- The bunk lift system will not function until the stops are properly set or faults are cleared.
- The **GREEN LED (FIGURE 11, page 4)** indicates the system operation.
 - A solid **GREEN** LED indicates bunk movement.
- The **RED LED (FIGURE 11, page 4)** indicates a fault or a problem with the system. Refer to the **FAULT DIAGNOSTICS/TROUBLESHOOTING (page 6)** for additional information.

Prior to moving the bunk lift:

- Make sure the engine or generator is running to ensure ample voltage is being supplied to the bunk lift system motors.
- Make sure bunk path is clear of obstructions.

Lowering the bunk:

- The engine or generator must be running, or plugged into shore power.
- Transmission must be in PARK or NEUTRAL. (If applicable).
- Level the unit.
- Remove the locking pins. (If applicable).
- Turn "on" the on/off switch or key. (If applicable).
- Press and hold the **DOWN** button (**FIGURE 10, page 4**). There will be a slight delay before the bunk will begin to move, this is normal.
- Release the button when the bunk is fully lowered and stops moving.
- Turn "off" the on/off switch or key. (If applicable).

WARNING

- Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk lift.
- Always keep away from the gear racks when the bunk lift is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

Operation Mode (continued)

Raising the bunk:

1. The engine or generator must be running, or plugged into shore power.
2. Transmission must be in PARK or NEUTRAL. (If applicable).
3. Level the unit.
4. Turn "on" the on/off switch or key. (If applicable).
5. Press and hold the "in" button (**FIGURE 10, page 4**).
6. Release the button when the bunk is fully in raised position.
7. Turn "off" the on/off switch or key. (If applicable).
8. Install the locking pins. (If applicable).

Preventative Maintenance

Your Power Gear bunk lift system has been designed to require very little maintenance. To ensure the long life of your bunk lift system, read and follow these few simple procedures:

- When the bunk is in the down position, visually inspect the gear rack assemblies. Check for excess build up of dirt or other foreign material; remove any debris items that may be present.
- If the system squeaks or makes any noises, blow out any debris from the gear rack arms and apply a dry lubricant to prevent and/or stop squeaking.

If you have any problems or questions, please see the contact tab on our website at www.powergearus.com

Fault Diagnostics/Troubleshooting

This control has the ability to detect and display several faults. When a fault is detected, the bunk movement will stop and two (2) different LED's will flash in a pattern.

- The **FAULT CODE LED (FIGURE 10, page 4)** will flash **RED** a number of times corresponding to a specific fault code. Refer to the **TROUBLESHOOTING** chart on **page 7** to best determine what caused the fault.
- The **BUNK MOVEMENT LED (FIGURE 10, page 4)** will flash **GREEN** a number of times corresponding to which motor had the associated fault.
 - For example: if you are seeing four (4) **RED** flashes and two (2) **GREEN** flashes, it means that there is a motor fault on motor 2.

There are two (2) types of faults, **MINOR** and **MAJOR**, and fault must be cleared in order for the bunk to operate.

- **MINOR** faults can be cleared by pushing and releasing the **UP** or **DOWN** buttons on the bunk lift touchpad (**FIGURE 10, page 4**).
- After the problem has been repaired, **MAJOR** faults must be cleared by pushing and releasing the **SET STOPS/CLEAR FAULTS** button located the back of the bunk lift touchpad (**FIGURE 8, page 4**).

Note: For major faults, the control must be overridden by following the **EMERGENCY BUNK MOVEMENT** in the **OVERRIDE MODES** section on starting on **page 7**. The control will then have to be re-programmed by the O.E.M authorized dealer when the problem is repaired.

A listing of **FAULT CODES** including probable causes and possible solutions begins on page 7.

Fault Diagnostics/Troubleshooting (continued)**FIGURE 11****FAULT CODES**

Fault Code	Fault Type	Description	Possible Cause	Possible Solutions
1	Major	Stops not programmed	<ul style="list-style-type: none"> Stops have not been set Stops were cleared Stops were improperly set 	Stops need to be programmed according to the PROGRAM MODE instructions starting on page 3.
2	Minor	System Fault	<ul style="list-style-type: none"> Obstruction present Excessive system drag 	Run bunk lift in opposite direction. If bunk continues to move in the opposite direction, remove obstruction, excessive weight in bunk or repair of damaged component. If bunk stops moving in opposite direction, observe fault code and refer to this chart.
4	Major	Motor Fault	<ul style="list-style-type: none"> Bad wire connection Bad motor 	Refer to TIP Sheet 82-S0518 for troubleshooting.*
6	Minor	Excessive Battery Voltage	Supply voltage to control is 17 V DC or greater.	Consult manufacturer of unit charging system for troubleshooting assistance.

*This tip sheet and other updated troubleshooting information can be found on our website at www.powergearus.com.

Override Modes

In the event of component failure or loss of system power, your bunk can be manually overridden and bunk moved for travel.

Note: At any time during the override procedure, the unit will exit this mode if the bunk has not been moved for two (2) minutes or if a fault is detected during bunk movement. The **FAULT CODE** and **BUNK MOVEMENT LED's** will flash rapidly for 10 seconds to indicate that the override procedure failed. After the 10 seconds of flashing, the control will automatically default to **FAULT CODE 1** (see **FAULT CODES, FIGURE 11**) and programming must be restarted.

Note: The bunk control will need to be re-programmed by an authorized dealer after the system has been overridden.

A. EMERGENCY BUNK MOVEMENT TO UP POSITION:

Use this procedure when there is **NO** loss of power or electrical problem with the system.

# of RED flashes	# of GREEN flashes

Figure 12

- Remove the touchpad (**FIGURE 4, page 2**) from the wall.
- Prior to clearing the MAJOR fault, record the number of RED and GREEN flashes (**FIGURE 12**) observed on the touchpad. This information will help your dealer/service center in troubleshooting the bunk lift system.
- Press and hold the **SET STOPS/CLEAR FAULTS** button (**FIGURE 8, page 4**) on the back of the touchpad for five (5) seconds. Both **RED** and **GREEN LED's** will be on solid while this button is pressed. After five (5) seconds, the **GREEN LED** will begin flashing and the **RED LED** will remain lit.
- The unit is now ready to raise the bunk. Press and hold the **BUNK LIFT MOTOR** buttons 1 and 2 on the back of the **TOUCHPAD (FIGURE 9, page 4)**.

Caution: It is very important to note that during this procedure, the bunk lift control has **NO** stop locations. Damage to the bunk lift can occur if the bunk is raised or lowered too far.

- Press the UP button on the front of the wall touchpad until the bunk is fully raised position. If one side of the of the bunk needs to be raised further in order to fully raise, press and hold the motor button corresponding to only the motor you want to move. Press the UP button on the front of the touchpad to raise the bunk the remainder of the way. Install lock pins

Step 6 continued on page 8

! WARNING

- Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk.
- Always keep away from the gear racks when the bunk lift is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

Override Modes (continued)

6. Re-install the wall touchpad.
7. Take the unit to a coach manufacturer dealer for repairs.

B. MANUAL EMERGENCY BUNK MOVEMENT TO UP POSITION.

Use this procedure when the above procedures do not work.

In the event that power is lost to the bunk motor(s) or **OVERRIDE MODE "A"** (page 7) will not work, the bunk can be manually raised by following these steps:

1. Use a voltmeter and check to see if power is being delivered to the control module.
2. If no DC power is being delivered from coach, use another 12 VDC battery power source to power the module and retract the bunk using the **UP** button on the touchpad.
3. If power source is not available, then use the following steps:
 - a. Gain access to motor channel on each side of the O.E.M bunk frame by first removing the mattress.
 - b. Remove the O.E.M top cover plate of each bunk frame channel assembly.
 - c. Loosen motor retainer screw or motor retainer spring. Do not remove the screw. (FIGURE 13)
 - d. Remove each motor from the channel assembly. Bunk will drop if in the raised position.
 - e. Disconnect motor connectors and place motors in a safe location. They will be needed when bunk lift is serviced.
 - f. Manually push up bunk lift.
4. When bunk in fully raised position, install pins to keep it in place.

Note: *The bunk lift will have to be inspected at a coach manufacturer dealer for troubleshooting and repairs. The bunk control will need to be re-programmed by a coach manufacturer dealer after the system has been overridden.*



Motor
retainer
spring

Figure 13



Motor
retainer
screw

Figure 13

Wiring Information

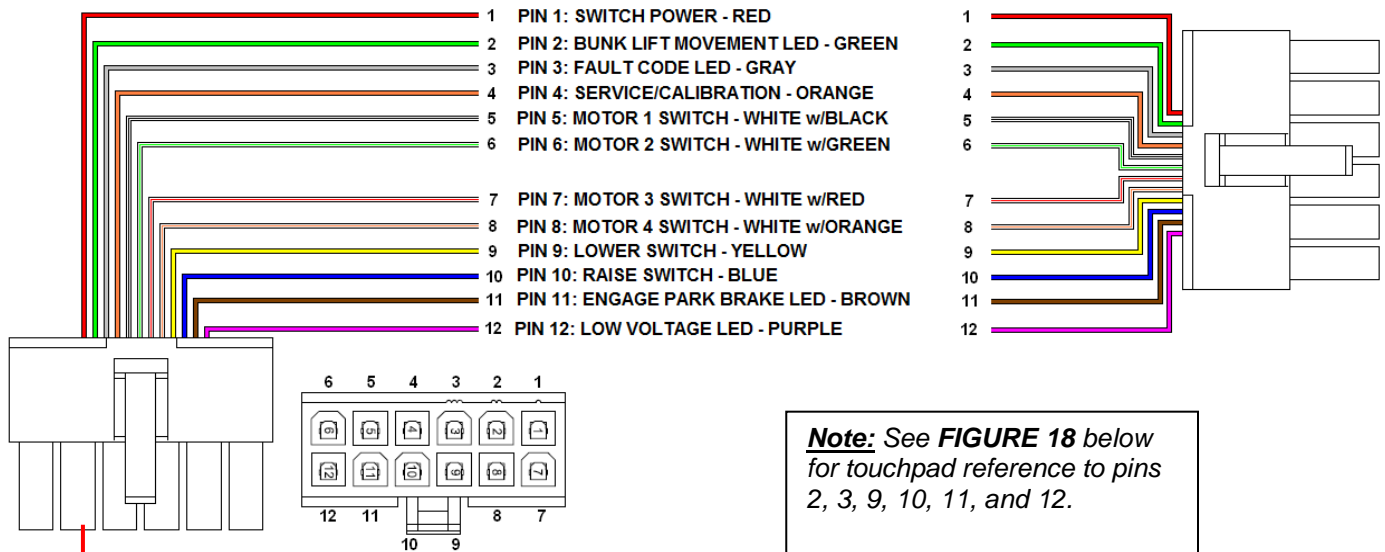


Figure 14 1510000195 Control to touchpad harness



Figure 17 Control Box 1510000199

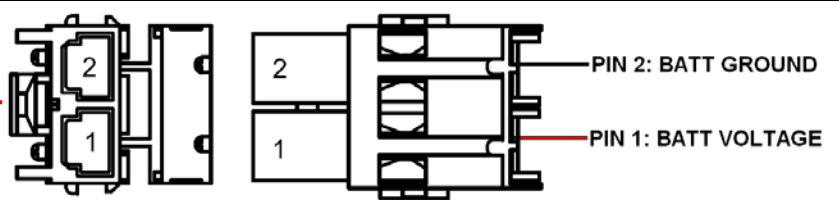


Figure 15 Power harness- Molex Minifit Sr. PN: 42816-0212

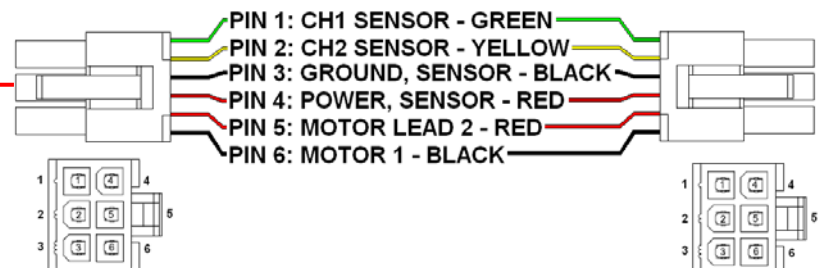
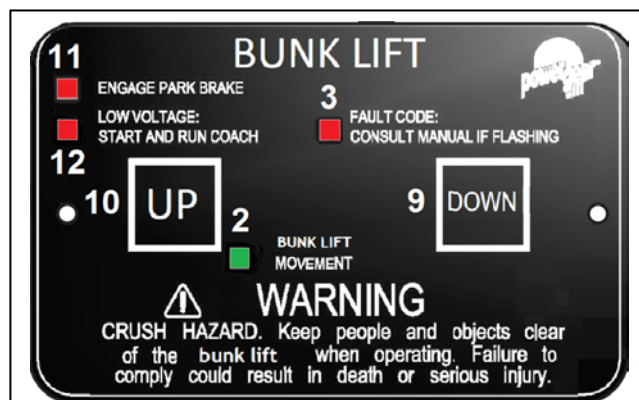


Figure 16 1510000194 control to motor harness

Figure 18 Touchpad. Reference of pins 2, 3, 9, 10, 11, and 12 from **FIGURE 14** above.

Additional Reference publications located at www.powergearus.com

3010002678	Owner's manual slim rack bunk lift system with control box 1510000199
82-S0530	Trouble shooting Bunk Lift control box 1510000199 for In-Wall Slim Rack Systems
82-S0531	Encoder Test 1 Dual Planetary Gear Motor Sync with Control Box 1510000199
82-S0532	Encoder Test 2 Dual Planetary Gear Motor Sync with Control Box 1510000199

Power Gear Limited Warranty

Power Gear Limited Warranty Policy (Original equipment)

Power Gear warrants its manufacturer installed Power Gear and Kwikkee brand products to be free of material and workmanship defects for two (2) years from the date of the original sale of the motor vehicle/recreation vehicle (RV) in which they are installed, provided that these products are installed and operated according to the purpose for which they were intended, designed and specified. This warranty does not cover product that is incorrectly installed, or upon examination has been misused or abused by the vehicle owner.

Warranty coverage includes:

- Repair or replacement of the defective component(s) of the malfunctioning system. Entire systems are not replaced unless either the faulty component is not replaceable or all components comprising the system are defective.
- Labor costs for the diagnosis and repair work associated with the repair or replacement of the defective component(s) by a licensed servicing center.

This warranty does not include payment or reimbursement of:

- Normal system maintenance and preventive maintenance.
- Mobile service or towing expenses related to field repairs and/or the transportation of the vehicle to a repair facility.
- Living or travel related expenses incurred in the repair of the vehicle.

By filing a warranty claim in accordance with Power Gear's Warranty Administration Procedure, service providers agree that the replacement part(s) will be provided to the vehicle owner at no cost and that the total labor charges for the completion of warranty repairs will be billed to Power Gear. Accordingly, under no circumstances will Power Gear reimburse the vehicle owner directly for costs covered under this warranty policy.

Warranty coverage runs concurrently with any vehicle warranty period provided by the manufacturer, and is transfer-able to subsequent owners. Proof of original date of purchase of vehicle, and if applicable subsequent owner's proof of purchase, is required to confirm coverage.

Power Gear reserves the right to change the terms of our warranty policy at any time. For the most current information on product warranty and our warranty claim procedure, visit our website at www.powergearus.com.



Trouble Shooting Bunk Lift Control Box 1510000199 For In-wall Slim Rack Systems

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#82-S0530, Rev. OA

Read, understand and follow all instructions in Installation and Service Manual 3010002675 before starting. This trouble shooting is for the In-wall Slim Rack Bunk Lift with control box part number 1510000199.



WARNING

Always make sure that the bunk path is clear of people and objects before and during operation of the bunk lift. Always keep away from the bunk lift rails when bunk is being operated. The gear assembly may pinch or catch on loose clothing.

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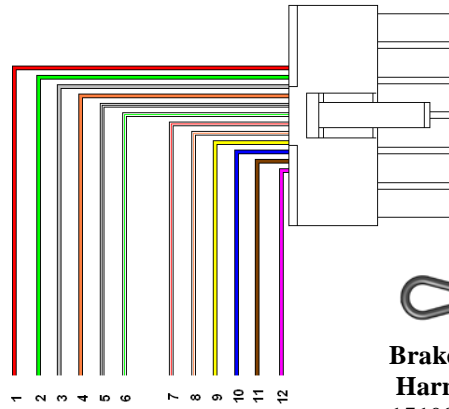
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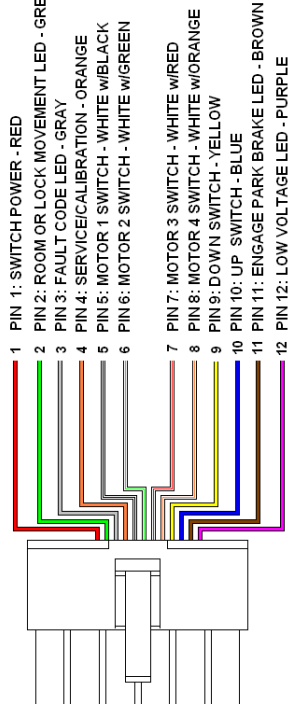


Wiring Diagram

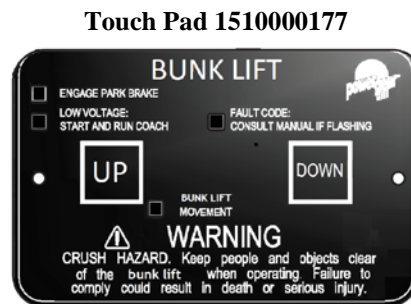
Bunk Lift Control Box 1510000199



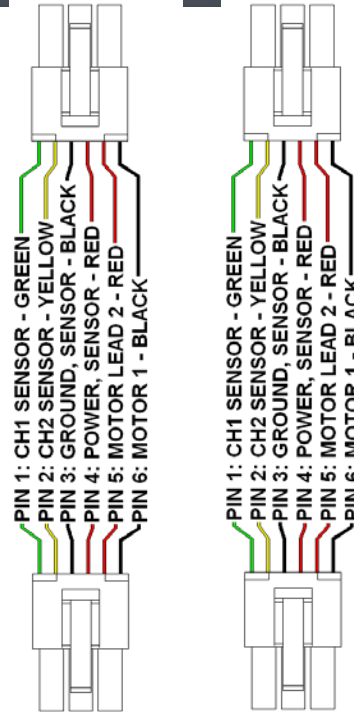
**Brake Jumper
Harness
1510000237-00**



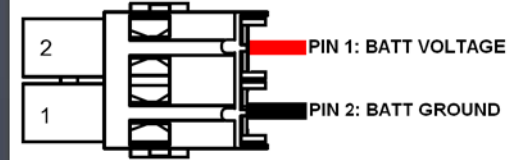
**Control to Touch Pad
Harness 1510000195**



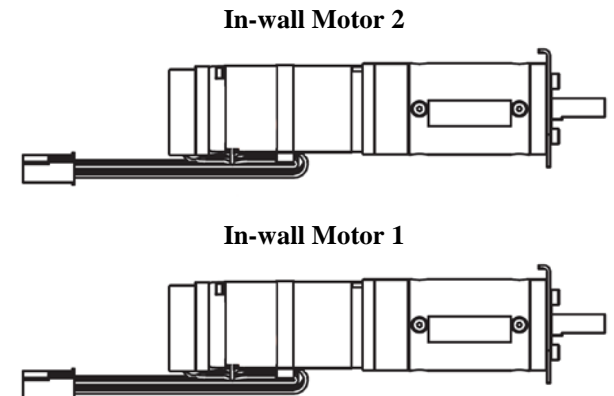
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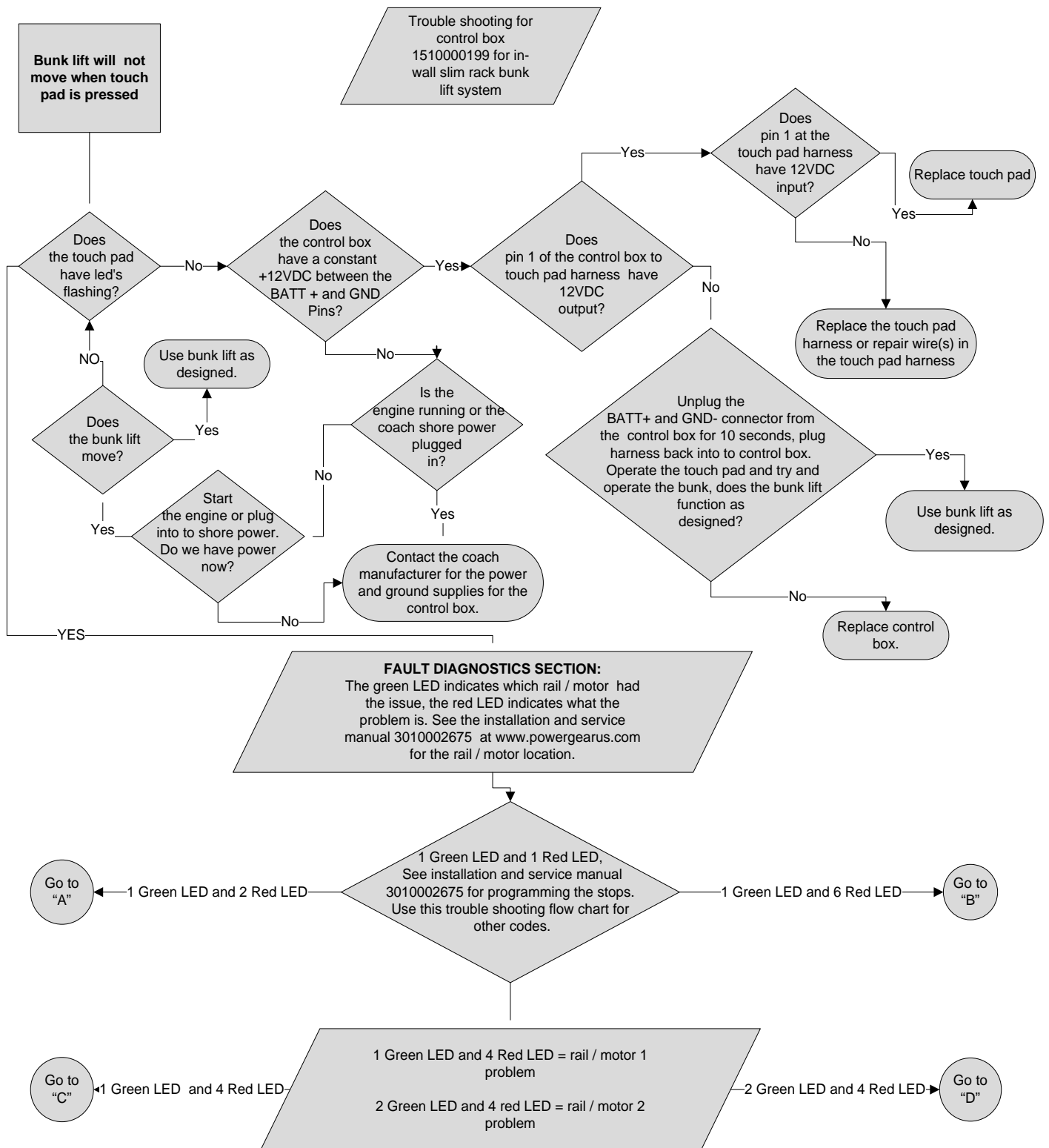


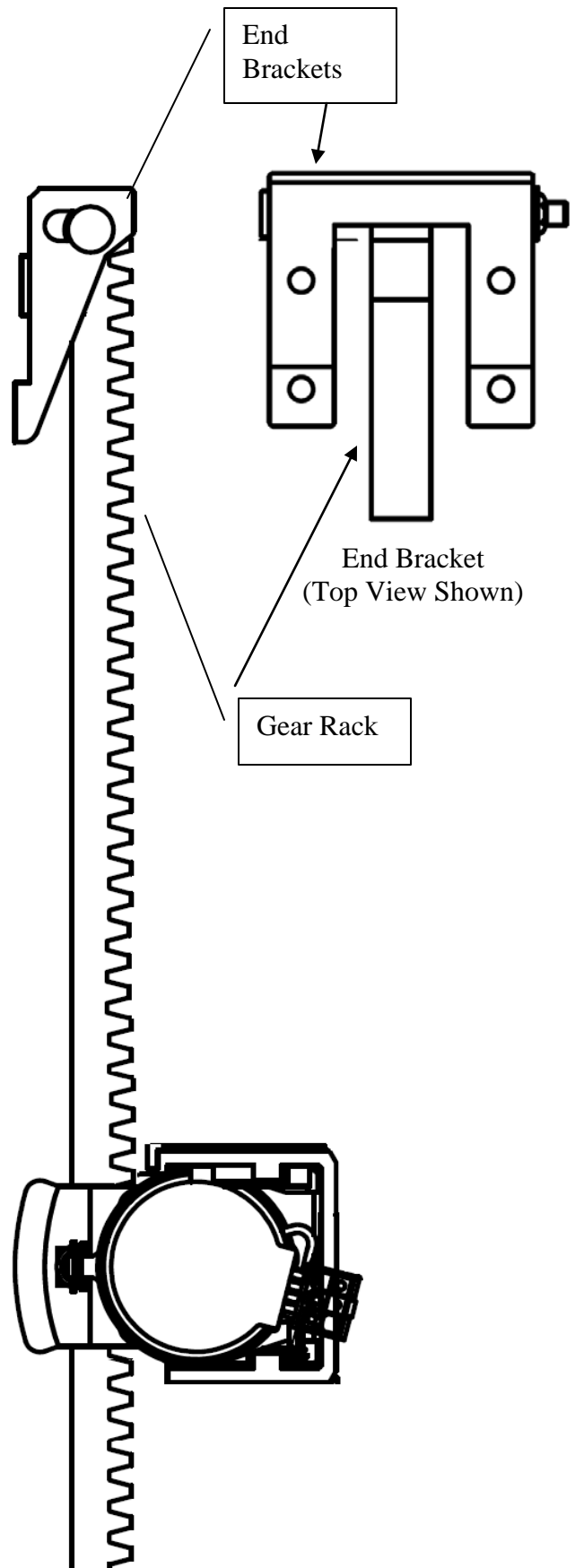
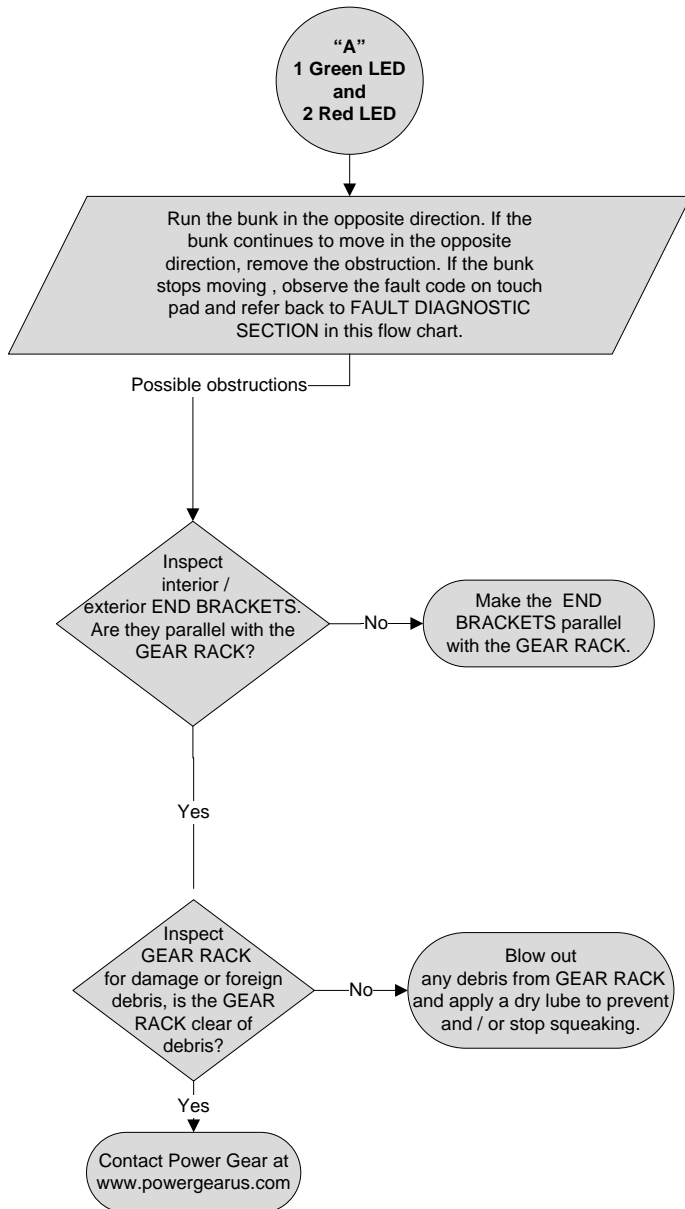
**Control to Motor Harnesses
1510000194**

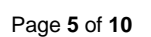


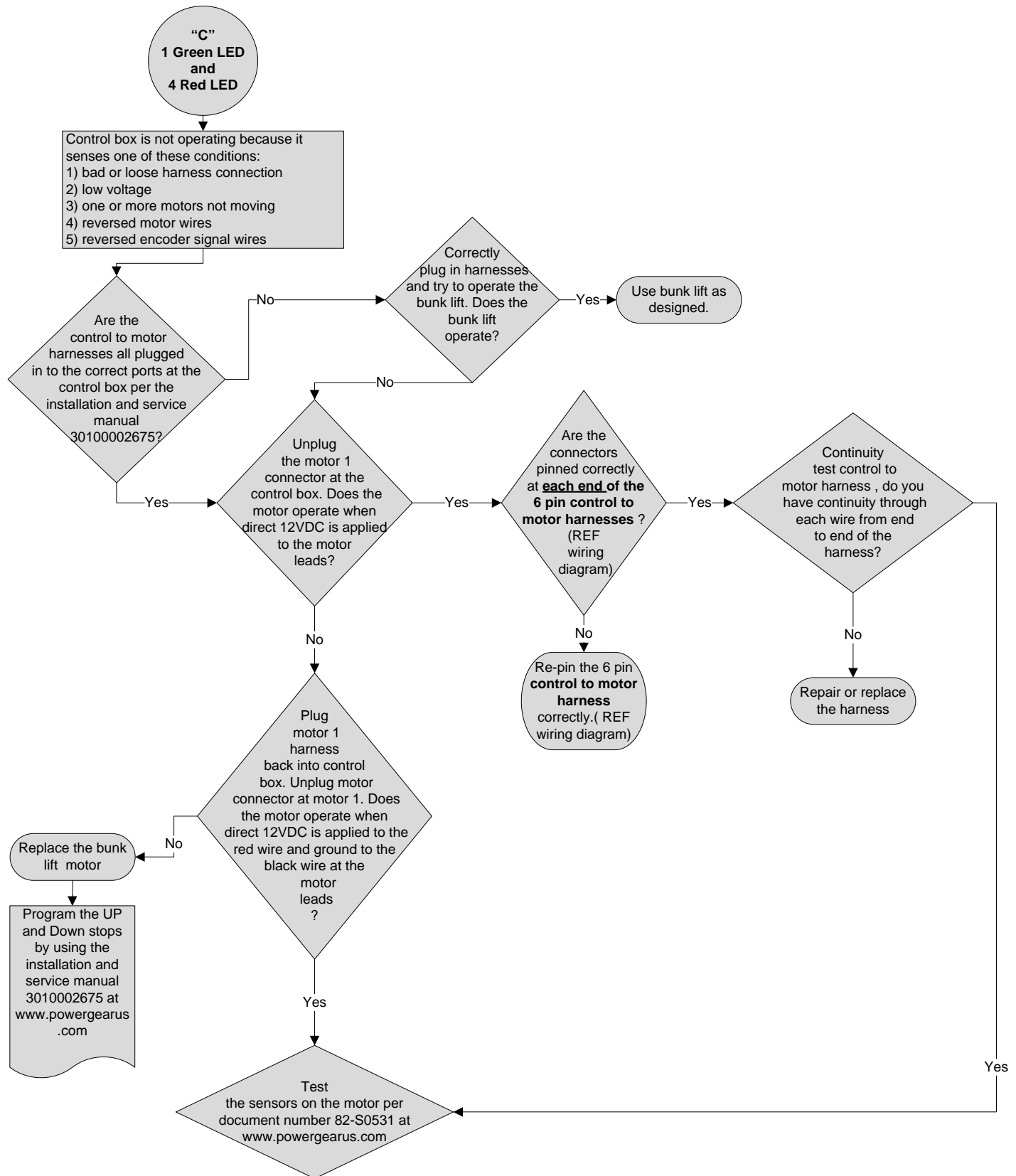
Power Harness 1510000233

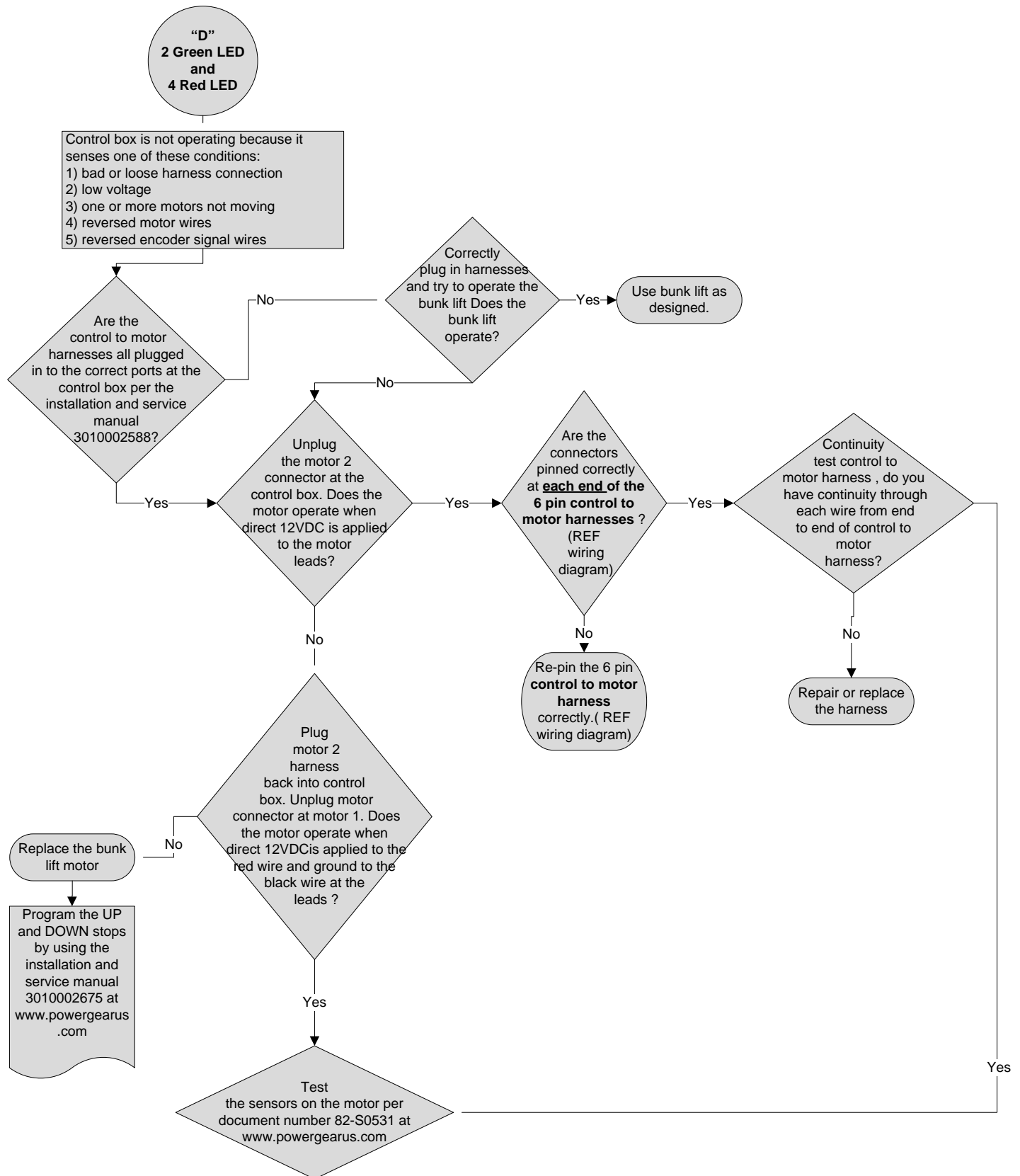


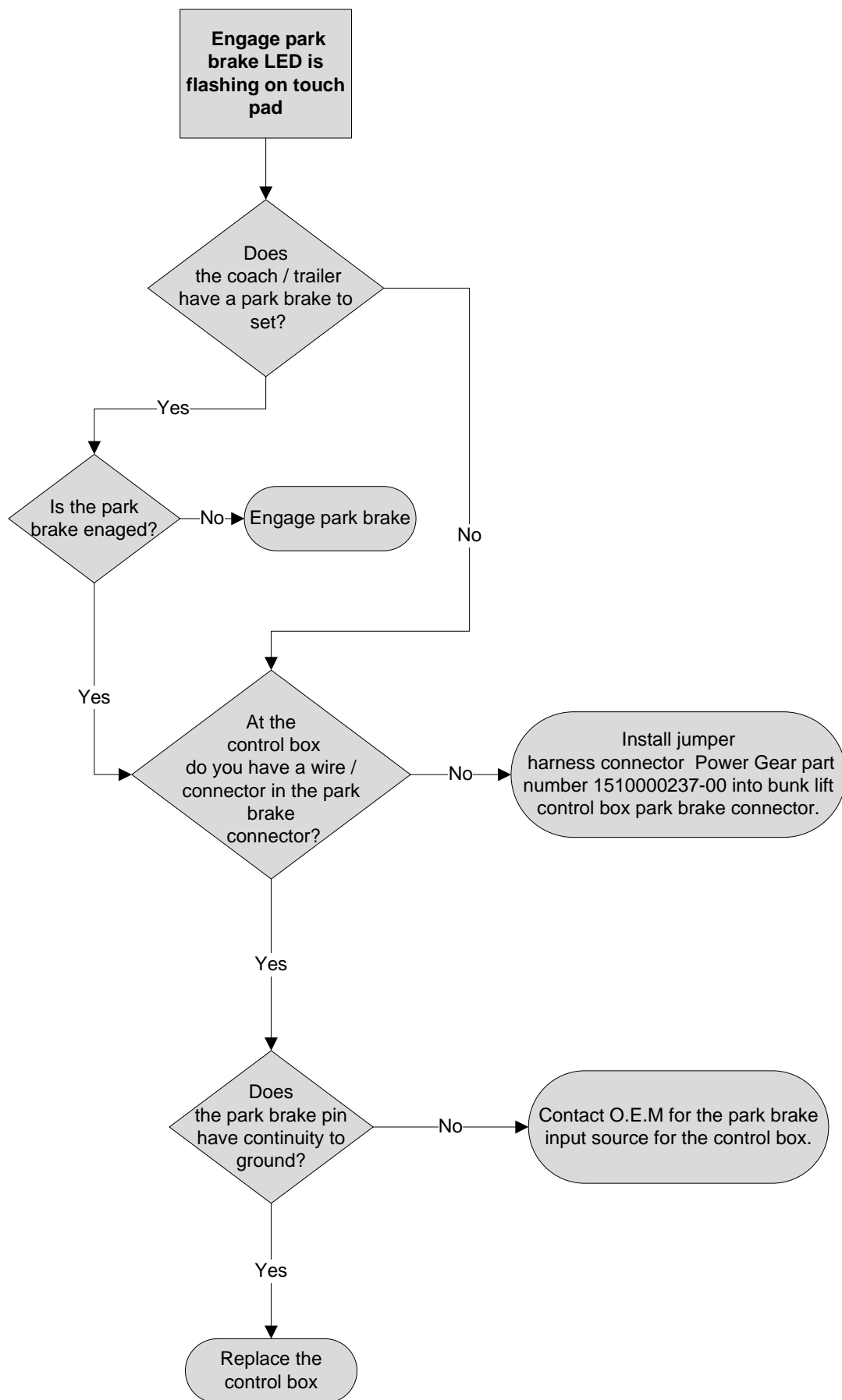


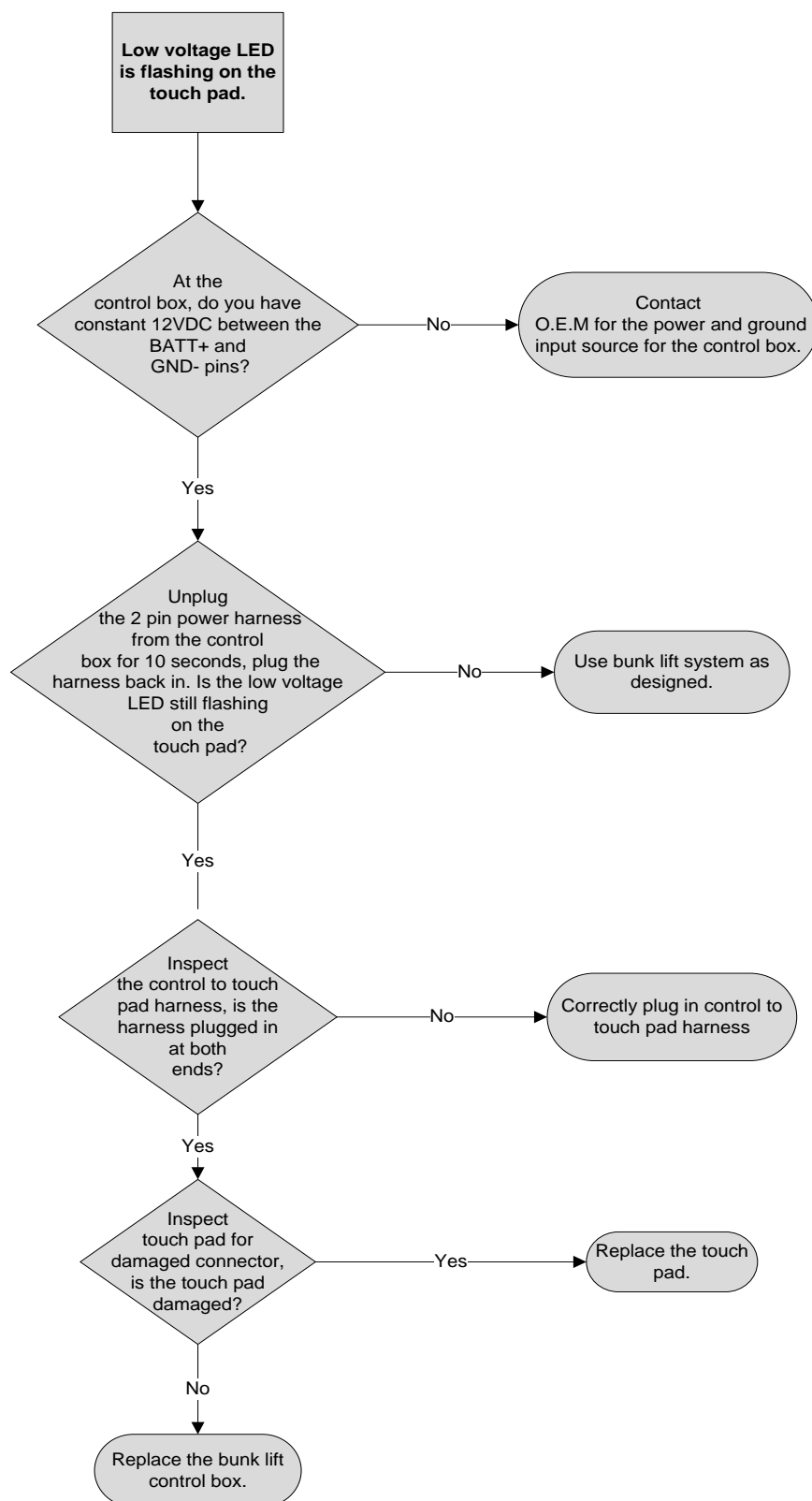












Additional Reference Documents Located At www.powergearus.com.

<u>Document #</u>	<u>Description</u>
3010002678	Owner's manual slim rack in-wall bunk lift system control box part number 1510000199
3010002675	Installation & service manual slim rack in-wall bunk lift system control box part number 1510000199
82-S0531	Encoder test 1 Dual planetary gear motor sync with control box 1510000199
82-S0532	Encoder test 2 Dual planetary gear motor sync with control box 1510000199



Encoder Test 1

Dual Planetary Gear Motor Sync
with Control Box 1510000199

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#82-S0531, Rev. 0B

Bunk Lift In-wall Encoder Testing

Read, understand, and follow all instructions in this test before starting.

Test 1: Use this test only if the slide out room can be moved while in override mode (see manual #3010002675). **To enter Override mode:**

1. Write down the number of flashes indicated by the red and green led's on the touch pad for reference later.
2. Remove the touch pad from the wall.
3. Press and hold the "sets stops/clear fault" button on the back of the touch pad for 5 seconds. Both led's will come on solid, after 5 seconds the Green LED will flash and Red will stay solid.
4. Press and hold **all** the motor buttons on the back of the touch pad. Press the UP or DOWN button on the front of the touch pad until the room moves at least 12" in either direction. Once the room is moved 12", release the UP or DOWN button. **The Bunk Lift Control box times out after 2 minutes of no movement. If it times out, start process over beginning with step 3.**

5. If the room will not operate in override mode, proceed to Test 2 (document number 82-S0532), or contact Power Gear at www.powergearus.com.

Note: All the harnesses need to stay plugged in during this test.

! WARNING

Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk lift. Always keep away from the bunk lift rails when room is being operated. The gear assembly may pinch or catch on loose clothing

! CAUTION

During override mode the control has no stop locations. Damage to the bunk can occur during over travel of the bunk lift rails. Do not allow rails to become too far out of sync with each other. This will cause the bunk to bind and may cause damage to the bunk lift rail.

! WARNING

If the bunk was moved while the encoder was unplugged, the bunk stops will need to be reset. Consult the correct manual or TIP Sheet for the proper procedure.



! NOTE

Note: All the harnesses need to stay plugged in during this test.

! CAUTION

During override mode the control has no stop locations. Damage to the bunk can occur during over travel of the bunk lift rails. Do not allow rails to become too far out of sync with each other. This will cause the bunk to bind and may cause damage to the bunk lift rail.

! WARNING

If the bunk was moved while the encoder was unplugged, the bunk stops will need to be reset. Consult the correct manual or TIP Sheet for the proper procedure

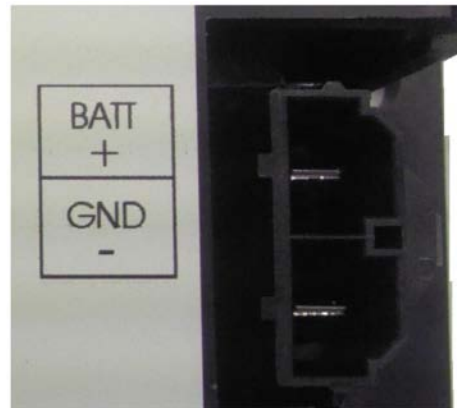
Step 1: Verifying incoming voltage and ground to the control box.

The slide out control main power connector needs a minimum of +12 VDC and a good ground to operate correctly. **This requires the coach engine to be running.** See note to left.

To test the 1510000199 control, back probe the power connector using a multi-meter and check for a minimum of +12 VDC at the main power connection. probe between the "BATT +" and "GND -" See Figure 1

If no power or ground or less than 12 DC Volts is measured between the pins, contact the OEM for the power and ground sources.

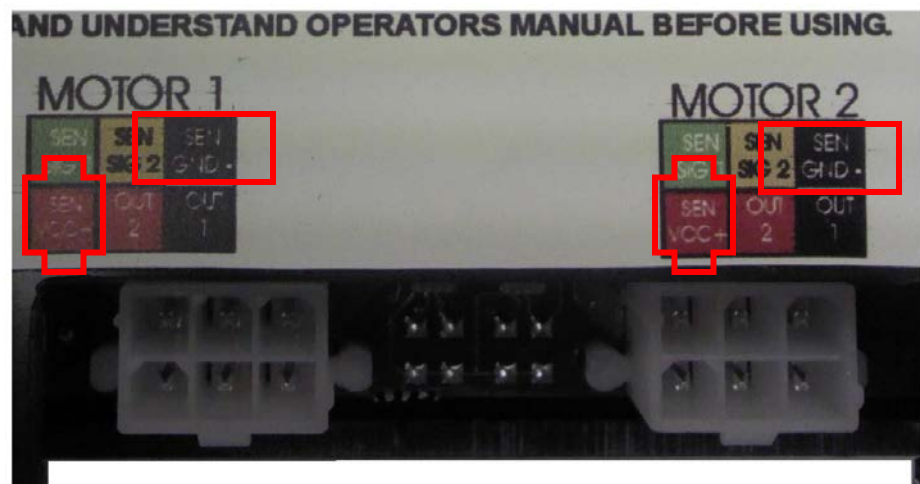
Figure 1



Step 2: Verifying the control box is sending power and ground to the encoder. See note to left.

Set multi-meter to DC volts, and back probe at the "motor 1" and "motor 2" connectors. To test motor 1 encoder, probe between "SEN-VCC" (power) and "SEN-GND" (ground) at motor 1 connector. To test motor 2 encoder, probe between "SEN-VCC" (power) and "SEN-GND" (ground) at motor 2 connector. This voltage should read 10-12VDC. See Figure 2

Figure 2



! NOTE

Note: All the harnesses need to stay plugged in during this test.

! CAUTION

During emergency retract mode the control has no stop locations. Damage to the bunk can occur during over travel of the bunk lift rails. Do not allow rails to become too far out of sync with each other. This will cause the bunk to bind and may cause damage to the slide out rail.

! WARNING

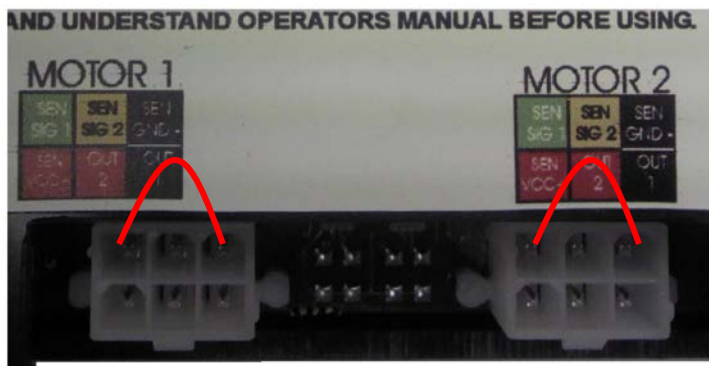
If the bunk was moved while the encoder was unplugged, the room stops will need to be reset. Consult the correct manual or TIP Sheet for the proper procedure

Step 3: Checking the first encoder signal. There are 2 signal wires per encoder. See note to left.

Set multi-meter to AC Volts, and while the room (use override mode) is moving back probe at the controller sensor connection. For the motor 1 encoder, probe between the "SEN-GND" and "SEN SIG 1" at motor 1 connector. For the motor 2 encoder probe between the "SEN -GND" and "SEN SIG 1" at motor 2 connector.

See Figure 3. This should be a steady AC signal. If there is a steady AC Voltage, proceed to step 5.

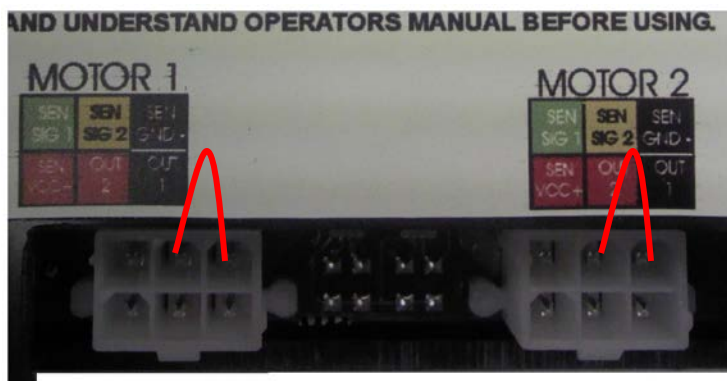
Figure 3



Step 3 Continued: Checking for the second encoder signal.

Set multi-meter to AC Volts, and while the room (use override mode) is moving, back probe at the controller sensor connection. For motor 1 encoder probe between the "SEN-GND" and "SEN SIG 2" at motor 1 connector. For motor 2 encoder, probe between the "SEN-GND" and "SEN SIG 2" at motor 2 connector. See Figure 4. This should be a steady AC signal. If there is a steady AC Voltage, proceed to step 5.

Figure 4



Step 4: Checking the harness continuity and all connections.

If there is no voltage reading from the encoder or the AC Voltage reading was **NOT** steady, check the following:

A: Check the continuity of the harness between the control box encoder pins and the motor encoder pins. If the harness does not have continuity, then replace the bad wire, or the harness. The harness can also be checked from pin to pin for continuity, and from each pin to ground. There should not be continuity to ground, or pin to pin.

B: Check the connections at the motor and control box. Repair any loose connections or loose pins. If the continuity of all the harness wires tests good, and connections are good, then replace the motor assembly. See the motor label for the Power Gear part number for replacement.

Step 5: If the tests in step 3 show a steady AC Voltage at the controller sensor connection, please contact Power Gear at www.powergearus.com for further diagnostic.



Additional Reference Information located At www.powergearus.com

<u>Document #</u>	<u>Description</u>
3010002678	Owner's manual Slim Rack Bunk Lift system with control box part number 1510000199
3010002675	Installation and service manual Slim Rack Bunk Lift system with control box 1510000199
82-S0530	Trouble shooting bunk lift control box 1510000199 for in-wall slim rack systems
82-S0532	Encoder test 2 dual planetary gear motor sync with control box 1510000199



Encoder Test 2

Dual Planetary Gear Motor Sync with Control Box 1510000199

© Copyright Power Gear January 2013

Tip Sheet # 82-S0532, Rev. OA

! WARNING

Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk lift. Always keep away from the bunk lift rails when the bunk is being operated. The gear assembly may pinch or catch on loose clothing.

When the encoder is unplugged and the motor shafts moving, the bunk stops will need to be reset. Consult the correct manual or TIP sheet for the proper procedure.

! NOTE

Power Gear will not be liable for excessive labor time required to gain access to Power Gear components.

! Warning

12 volt automotive batteries contain sulfuric acid which can cause severe burns. Avoid contact with the skin, eyes and clothing. 12 volt automotive batteries produce hydrogen gas which is explosive; keep cigarettes, open flames and sparks away from the battery at all times.

1217 E. 7th St.
Mishawaka, IN 46544
www.powergearus.com

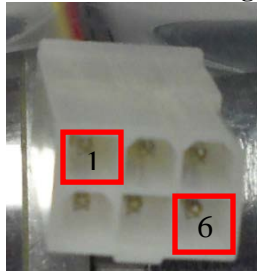


Bunk Lift In-wall Encoder Testing

Read, understand, and follow all instructions in this test before starting.

Test 2: This is to be used when the bunk lift will not operate normally with the touch pad or if the bunk is already retracted up and the override mode (see owner's manual # 3010002675 for override mode) cannot be performed. If the bunk will operate with the touch pad or the bunk is down and the override mode can be performed, proceed to Test 1 (Document # 82-S0531), available on our website at www.powergearus.com.

Motor / Encoder Plug



Complete Motor Assembly



Figure 1

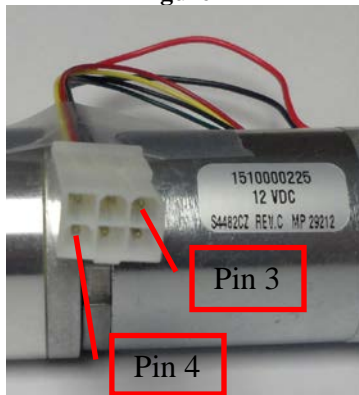
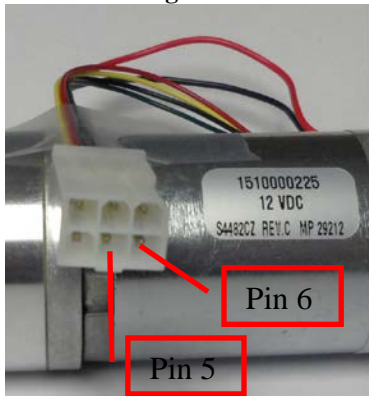


Figure 2



Fault Code: **Code 4 on control 1510000199** **4 Wire Internal Encoder Testing**

Indicates bad or loose connection on motor to control harness, defective motor to control harness, open or shorted slide out motor, or open or shorted slide out motor encoder. On the touch pad, the Green LED flashes to identify which motor encoder is in fault (see owner's manual 3010002679).

STEP 1: Removing the Motor/Encoder Assembly from the rail assembly.

NOTE: Depending on the accessibility, it may be necessary to remove the interior motor cover. The motor is located near the gear rack on the wall.

For questions on supporting the bunk or accessing the rail assembly, contact the OEM.

STEP 2: Applying 12VDC and Ground to the Motor / Encoder Plug.

Using a fully charged +12VDC battery:
Apply 12VDC to the motor / encoder plug pin 4 (red thinner gauge wire).

Apply a good ground to the motor / encoder plug pin 3 (black thinner gauge wire).

See Figure 1. This will provide power to the encoder.

Using a multi-meter, back probe between Pin 4 and Pin 3 at the motor / encoder plug to verify there is 12VDC and Ground going to the encoder. **See Figure 1.**

Apply 12VDC to the motor / encoder connector on the red wire pin 5. Apply a good Ground to the motor / encoder connector on the black wire. This will provide power to the motor and will cause it to operate. **See figure 2**

Caution: The motor shaft will turn when the motor is operating.

! WARNING

Always make sure that the bunk lift path is clear of people and objects before and during operation of the bunk lift. Always keep away from the bunk lift rails when the bunk is being operated. The gear assembly may pinch or catch on loose clothing.

! NOTE

Power Gear will not be liable for excessive labor time required to gain access to Power Gear components.

! Warning

12 volt automotive batteries contain sulfuric acid which can cause severe burns. Avoid contact with the skin, eyes and clothing. 12 volt automotive batteries produce hydrogen gas which is explosive; keep cigarettes, open flames and sparks away from the battery at all times.

STEP 3: Checking for the encoder signal.

Using a multi-meter set on AC Volts, back probe between pin 3 and pin 1 at the Encoder Connector. **See Figure 3** Check for a steady AC voltage reading.

Using a multi-meter set on AC Volts, back probe between pin 3 and pin 2 at the Encoder Connector. **See Figure 4** Check for a steady AC voltage reading.

If there is a steady AC voltage, proceed to **Step 4**.

If there is NOT a steady AC voltage reading, or there is no voltage reading, replace the motor assembly. See the motor label or the rail assembly label for the Power Gear part number for replacement.

Figure 3

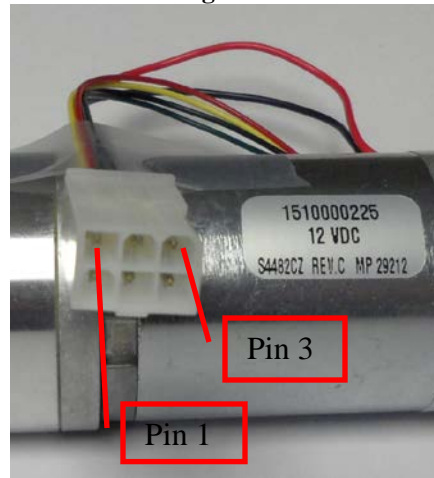
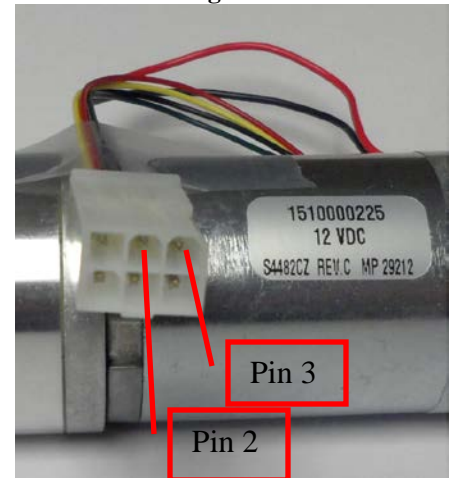


Figure 4



Step 4: If the test in STEP 3 showed a steady AC Voltage at the Encoder Connector, contact Power Gear Technical Serviced at www.powergearus.com for further diagnostic before proceeding.

Additional Reference Information located At www.powergearus.com

Document #	Description:
3010002678	Owner's manual slim rack in-wall bunk lift control 1510000199
3010002675	Installation and service manual slim rack bunk lift 1510000199
82-S0530	Trouble shooting slide out control box 1510000199 bunk lift
82-S0531	Encoder test 1 dual planetary motor sync control 1510000199