powergear®

Advanced Actuation Solutions

by Lippert Components®

ELECTRO-HYDRAULIC LEVELING

TROUBLESHOOTING AND SERVICE MANUAL (82-L0506)

TABLE OF CONTENTS

Introduction

NOTE: This information was obtained from PowerGear® manual 82-L0506 Rev 0C dated November 2012. This manual does not apply and should not be used as reference to previous versions of the PowerGear leveling system.

The PowerGear leveling system on your coach is designed and built to give you years of trouble-free leveling and stabilizing operation. The PowerGear system reflects state-of-the-art technology in both hydraulic and electric components.

System Description

The PowerGear automatic electro-hydraulic leveling system consists of the following major components:

1. PowerGear supplies spring return jacks rated at a lifting capacity appropriate for he unit. Each jack has a large diameter shoe for maximum surface area on soft surfaces.
2. Each jack is powered from a central 12V DC motor/pump assembly, which also includes the hydraulic oil reservoir tank, control valve manifold and solenoid valves.
3. The system is controlled by the solid state touchpad located near the driver's seat and a dual axis bubble level centrally located in the coach.

Safety Information

Read and understand all instructions before starting any procedures stated in this manual. Adhere to all safety labels to prevent personal injury and/or product damage. Failure to follow instructions and safety labels may void product warranty.

⚠WARNING

The "WARNING" symbol above is a sign that an installation procedure has a safety risk involved and may cause death, serious personal injury or severe product or property damage if not performed safely and within the parameters set forth in this manual.

⚠WARNING

Do not use leveling jacks (or air suspension) to support vehicle while under coach or changing tires. The hydraulic leveling system is designed as a leveling system only. Do not use as a jack or in conjunction with a jack. It is highly recommended that, should a tire change be required, a knowledgable and trained professional perform it. Attempts to change tires while supporting the vehicle with the hydraulic system could result in damage to the motor home and risk causing serious personal injury or death.

⚠CAUTION

Check that potential jack contact locations are clear of obstructions or depressions before operation.

⚠CAUTION

Keep people clear of coach prior to turning the leveling system on and while leveling system is in use.

⚠CAUTION

Never expose hands or other parts of the body near hydraulic leaks. High pressure oil leaks may cut and penetrate the skin causing serious injury.

⚠CAUTION

Park coach on a reasonably solid surface or the jacks may sink into the ground. On extremely soft surfaces, use load distribution pads under each jack.

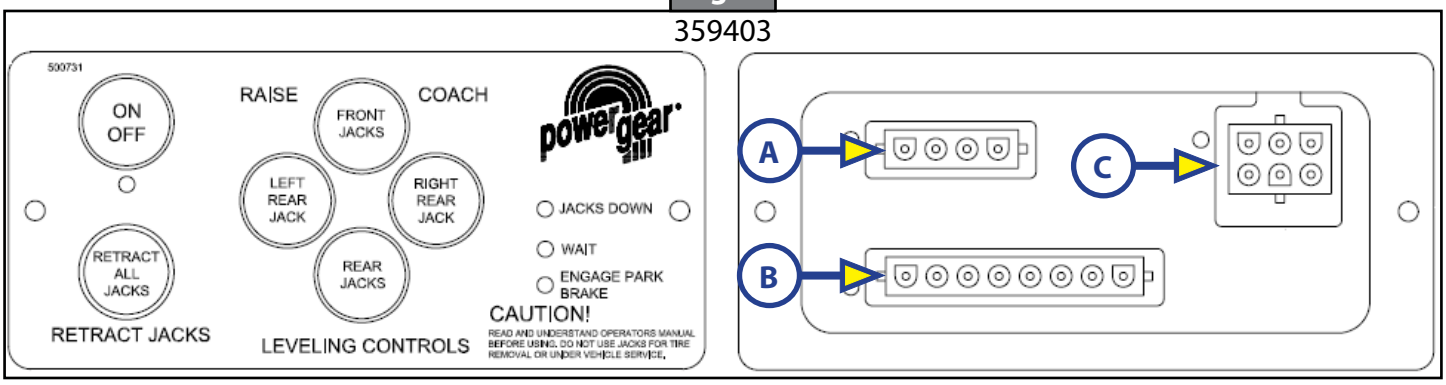
⚠CAUTION

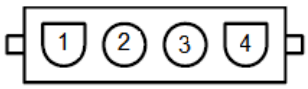
Never lift the wheels off the ground to level the coach. Doing so may create an unstable condition, which may result in personal injury, product and/or property damage.

Manual Touchpad Harness (2004-Present)

Fig. 1

359403





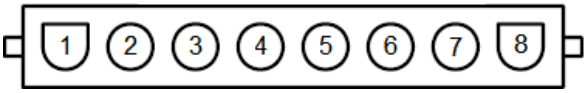
Airbag Connector (Fig. 1A)

Pin #1: Fill output to the airbag valve. Energized with +12V DC to fill airbags.

Pin #2: Fill output to the airbag valve. Ground to fill airbags.

Pin #3: Dump output to the airbag valve. Energized with +12V DC to dump airbags.

Pin #4: Dump output to airbag valve. Ground to dump airbags.



Jack Leg Connector (Fig. 1B)

Pin #1: Ground input.

Pin #2: Float switch input.

Pin #3: Output to motor starter solenoid. Energized with +12V DC when the front/rear/left/right button(s) are pushed.

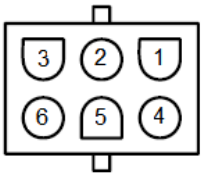
Pin #4: Output to dump valve. Energized with +12V DC when the RETRACT ALL JACKS button is pushed.

Pin #5: Output to roadside rear leg valve. Energized with +12V DC when LEFT REAR JACK, REAR JACKS or RETRACT ALL JACKS buttons are pushed.

Pin #6: Output to curbside rear leg valve. Energized with +12V DC when RIGHT REAR JACK, REAR JACKS or RETRACT ALL JACKS buttons are pushed.

Pin #7: Output to front jack leg valve. Energized with +12V DC when FRONT JACKS or RETRACT ALL JACKS buttons are pushed.

Pin #8: Input from motor starter solenoid. Energized with +12V DC to supply power to the touchpad control.



Safety Switch Connector (Fig. 1C)

Pin #1: Input from park brake. Has continuity to ground when the park brake is engaged.

Pin #2: Input from neutral safety switch. Can measure as either +12V DC or ground.

Pin #3: Not used.

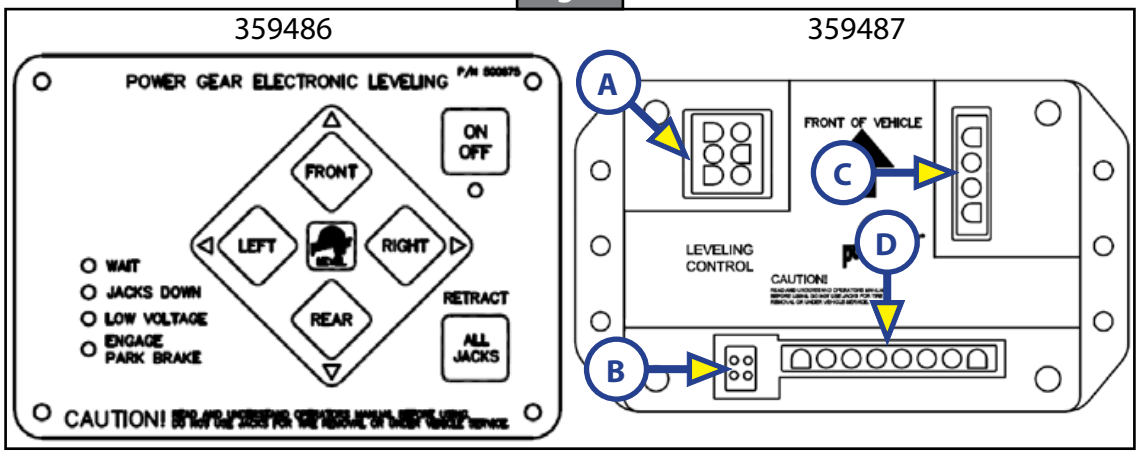
Pin #4: Not used.

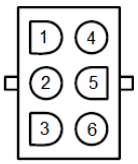
Pin #5: Input from ignition. Energized with +12V DC when the coach is running.

Pin #6: Input from neutral safety switch. Can measure as either +12V DC or ground.

Semi-Automatic Touchpad & Control Harness (2002-2005)

Fig. 2





Safety Switch Connector (Fig. 2A)

Pin #1: Input from park brake. Has continuity to ground when the park brake is engaged.

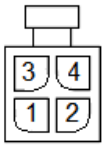
Pin #2: Input from neutral safety switch. Can measure as either +12V DC or ground.

Pin #3: Not used.

Pin #4: Not used.

Pin #5: Input from ignition. Energized with +12V DC when the coach is running.

Pin #6: Input from neutral safety switch. Can measure as either +12V DC or ground.



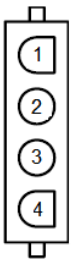
Touchpad Connector (Fig. 2B)

Pin #1: Output to the touchpad. Transmit signal 5-7V DC.

Pin #2: Input from the touchpad. Receive signal 5-7V DC.

Pin #3: Power (+12V DC) output to the touchpad.

Pin #4: Ground output to the touchpad.



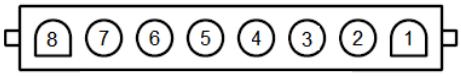
Airbag Connector (Fig. 2C)

Pin #1: Fill output to the airbag valve. Energized with +12V DC to fill airbags.

Pin #2: Fill output to the airbag valve. Ground to fill airbags.

Pin #3: Dump output to the airbag valve. Energized with +12V DC to dump airbags.

Pin #4: Dump output to the airbag valve. Ground to dump airbags.



Jack Leg Connector (Fig. 2D)

Pin #1: Ground input.

Pin #2: Float switch input.

Pin #3: Output to motor starter solenoid. Energized with +12V DC when the FRONT/REAR/LEFT/RIGHT button(s) are pushed.

Pin #4: Output to dump valve. Energized with +12V DC when the RETRACT/ALL JACKS button is pushed.

Pin #5: Output to roadside rear leg valve. Energized with +12V DC when LEFT, REAR or RETRACT button is pushed.

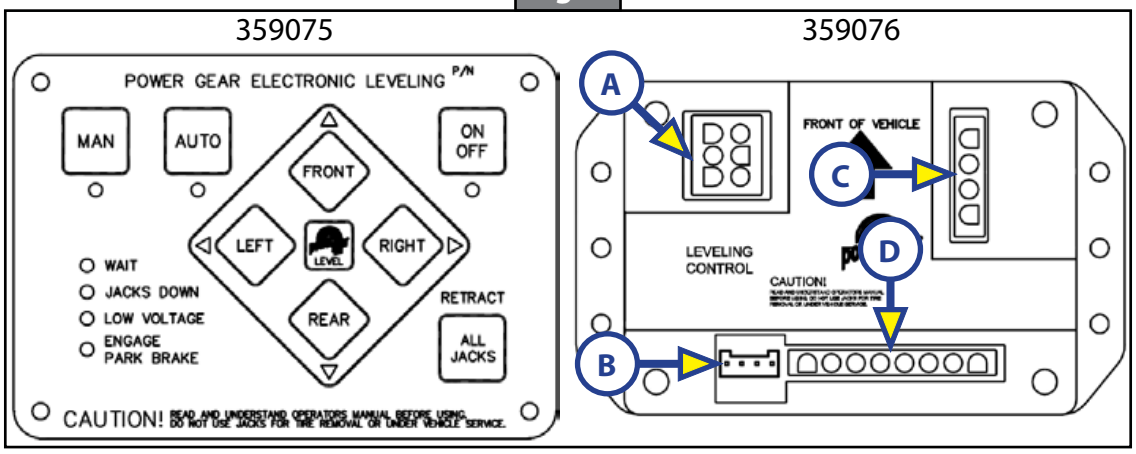
Pin #6: Output to curbside rear leg valve. Energized with +12V DC when RIGHT, REAR or RETRACT button is pushed.

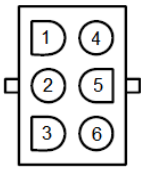
Pin #7: Output to front jack leg valve. Energized with +12V DC when FRONT or RETRACT button is pushed.

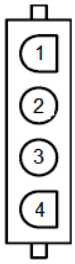
Pin #8: Input from motor starter solenoid. Energized with +12V DC to supply power to the touchpad control.

Semi-Automatic Touchpad & Control Harness (2006-Present)

Fig. 3







Safety Switch Connector (Fig. 3A)

Pin #1: Input from park brake. Has continuity to ground when the park brake is engaged.

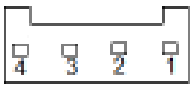
Pin #2: Input from neutral safety switch. Can measure as either +12V DC or ground.

Pin #3: Not used.

Pin #4: Not used.

Pin #5: Input from ignition. Energized with +12V DC when the coach is running.

Pin #6: Input from neutral safety switch. Can measure as either +12V DC or ground.



Touchpad Connector (Fig. 3B)

Pin #1: Output to the touchpad. Transmit signal 5-7V DC.

Pin #2: Input from the touchpad. Receive signal 5-7V DC.

Pin #3: Power (+12V DC) output to the touchpad.

Pin #4: Ground output to the touchpad.

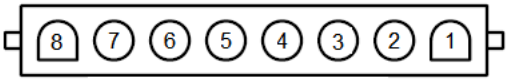
Airbag Connector (Fig. 3C)

Pin #1: Fill output to the airbag valve. Energized with +12V DC to fill airbags.

Pin #2: Fill output to the airbag valve. Ground to fill airbags.

Pin #3: Dump output to the airbag valve. Energized with +12V DC to dump airbags.

Pin #4: Dump output to the airbag valve. Ground to dump airbags.



Jack Leg Connector (Fig. 3D)

Pin #1: Ground input.

Pin #2: Float switch input.

Pin #3: Output to motor starter solenoid. Energized with +12V DC when the FRONT/REAR/LEFT/RIGHT button(s) are pushed.

Pin #4: Output to dump valve. Energized with +12V DC when the RETRACT/ALL JACKS button is pushed.

Pin #5: Output to roadside rear leg valve. Energized with +12V DC when LEFT, REAR or RETRACT button is pushed.

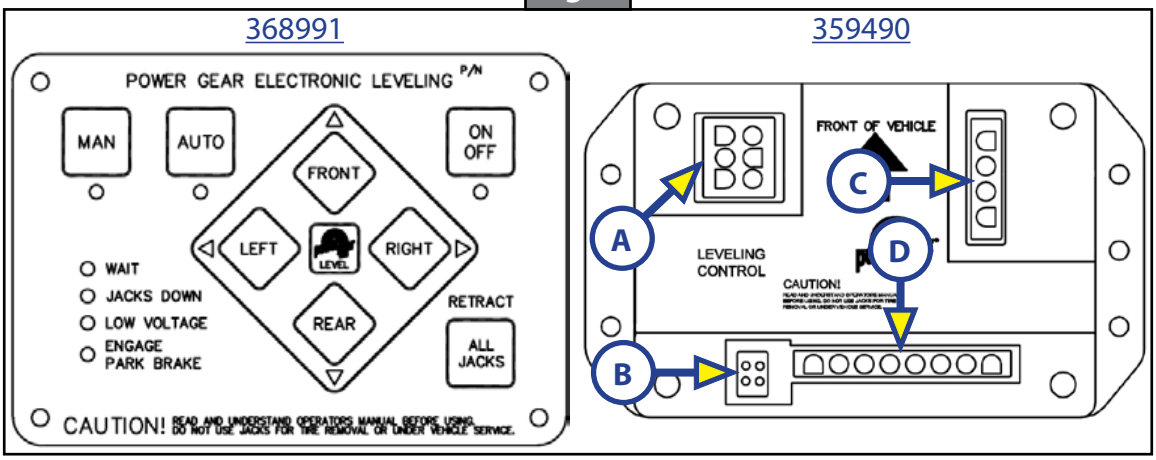
Pin #6: Output to curbside rear leg valve. Energized with +12V DC when RIGHT, REAR or RETRACT button is pushed.

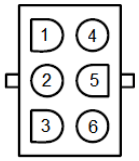
Pin #7: Output to front jack leg valve. Energized with +12V DC when FRONT or RETRACT button is pushed.

Pin #8: Input from motor starter solenoid. Energized with +12V DC to supply power to the touchpad control.

Automatic Touchpad & Control Harness (2002-2005)

Fig. 4





Safety Switch Connector (Fig. 4A)

Pin #1: Input from park brake. Has continuity to ground when the park brake is engaged.

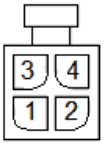
Pin #2: Input from neutral safety switch. Can measure as either +12V DC or ground.

Pin #3: Not used.

Pin #4: Not used.

Pin #5: Input from ignition. Energized with +12V DC when the coach is running.

Pin #6: Input from neutral safety switch. Can measure as either +12V DC or ground.



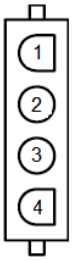
Touchpad Connector (Fig. 4B)

Pin #1: Output to the touchpad. Transmit signal 5-7V DC.

Pin #2: Input from the touch pad. Receive signal 5-7V DC.

Pin #3: Power (+12V DC) output to the touchpad.

Pin #4: Ground output to the touchpad.



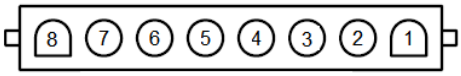
Airbag Connector (Fig. 4C)

Pin #1: Fill output to the airbag valve. Energized with +12V DC to fill airbags.

Pin #2: Fill output to the airbag valve. Ground to fill airbags.

Pin #3: Dump output to the airbag valve. Energized with +12V DC to dump airbags.

Pin #4: Dump output to the airbag valve. Ground to dump airbags.



Jack Leg Connector (Fig. 4D)

Pin #1: Ground input.

Pin #2: Float switch input.

Pin #3: Output to motor starter solenoid. Energized with +12V DC when the FRONT/REAR/LEFT/RIGHT button(s) are pushed.

Pin #4: Output to dump valve. Energized with +12V DC when the RETRACT/ALL JACKS button is pushed.

Pin #5: Output to roadside rear leg valve. Energized with +12V DC when LEFT, REAR or RETRACT button is pushed.

Pin #6: Output to curbside rear leg valve. Energized with +12V DC when RIGHT, REAR or RETRACT button is pushed.

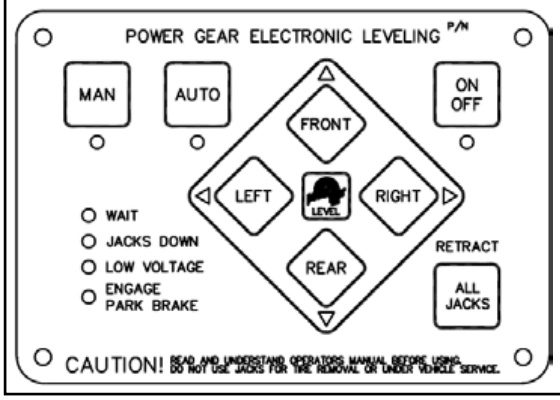
Pin #7: Output to front jack leg valve. Energized with +12V DC when FRONT or RETRACT button is pushed.

Pin #8: Input from motor starter solenoid. Energized with +12V DC to supply power to the touchpad control.

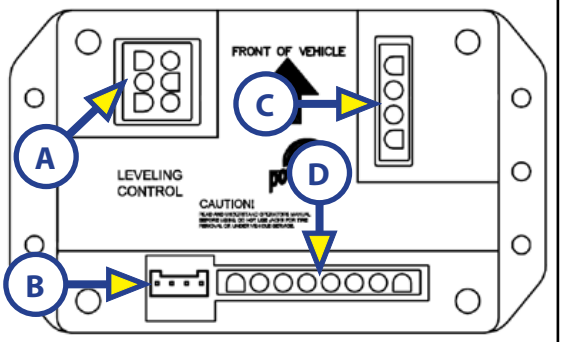
Automatic Touchpad & Control Harness (2005-Present)

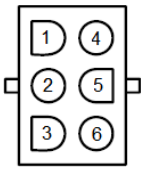
Fig. 5

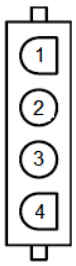
359080



359079/365295







Safety Switch Connector (Fig. 5A)

Pin #1: Input from park brake. Has continuity to ground when the park brake is engaged.

Pin #2: Input from neutral safety switch. Can measure as either +12V DC or ground.

Pin #3: Not used.

Pin #4: Not used.

Pin #5: Input from ignition. Energized with +12V DC when the coach is running.

Pin #6: Input from neutral safety switch. Can measure as either +12V DC or ground.

Touchpad Connector (Fig. 5B)

Pin #1: Output to the touchpad. Transmit signal 5-7V DC.

Pin #2: Input from the touchpad. Receive signal 5-7V DC.

Pin #3: Power (+12V DC) output to the touchpad.

Pin #4: Ground output to the touchpad.

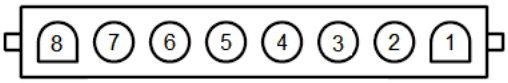
Airbag Connector (Fig. 5C)

Pin #1: Fill output to the airbag valve. Energized with +12V DC to fill airbags.

Pin #2: Fill output to the airbag valve. Ground to fill airbags.

Pin #3: Dump output to the airbag valve. Energized with +12V DC to dump airbags.

Pin #4: Dump output to the airbag valve. Ground to dump airbags.



Jack Leg Connector (Fig. 5D)

Pin #1: Ground input.

Pin #2: Float switch input.

Pin #3: Output to motor starter solenoid. Energized with +12V DC when the FRONT/REAR/LEFT/RIGHT button(s) are pushed.

Pin #4: Output to dump valve. Energized with +12V DC when the RETRACT/ALL JACKS button is pushed.

Pin #5: Output to roadside rear leg valve. Energized with +12V DC when LEFT, REAR or RETRACT button is pushed.

Pin #6: Output to curbside rear leg valve. Energized with +12V DC when RIGHT, REAR or RETRACT button is pushed.

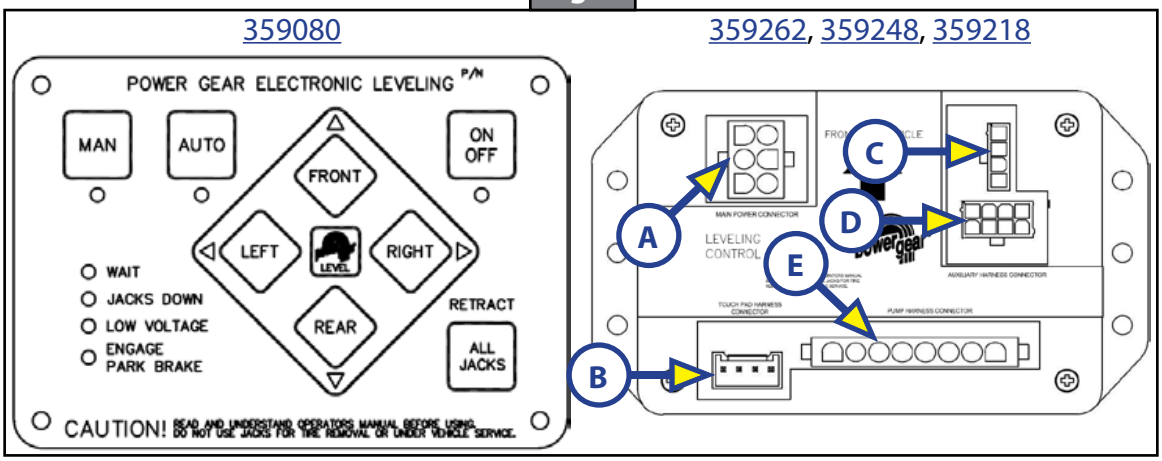
Pin #7: Output to front jack leg valve. Energized with +12V DC when FRONT or RETRACT button is pushed.

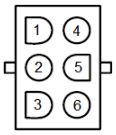
Pin #8: Input from motor starter solenoid. Energized with +12V DC to supply power to the touchpad control.

Automatic Touchpad & Control Harness (2005-Present)

Fig. 6

359080 | 359262, 359248, 359218





Safety Switch Connector (Fig. 6A)

Pin #1: Input from park brake. Has continuity to ground when the park brake is engaged.

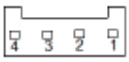
Pin #2: Input from neutral safety switch. Can measure as either +12V DC or ground.

Pin #3: Not used.

Pin #4: Not used.

Pin #5: Input from ignition. Energized with +12V DC when the coach is running.

Pin #6: Input from neutral safety switch. Can measure as either +12V DC or ground.



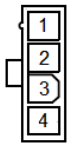
Touchpad Connector (Fig. 6B)

Pin #1: Output to the touchpad. Transmit signal 5-7V DC.

Pin #2: Input from the touchpad. Receive signal 5-7V DC.

Pin #3: Power (+12V DC) output to the touchpad.

Pin #4: Ground output to the touchpad.



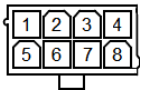
Rocker Switch Connector (Fig. 6C)

Pin #1: Ignition accessory +12V DC lights rocker switch.

Pin #2: No connection (open)

Pin #3: No connection (open)

Pin #4: No connection (open)



Airbag Connector (Fig. 6D)

Pin #1: Remote status +12V DC output.

Pin #2: Remote status ground output.

Pin #3: Dash light +12V DC output.

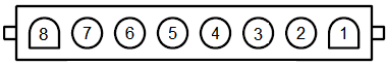
Pin #4: Dash light ground output.

Pin #5: External auto.

Pin #6: External retract.

Pin #7: Air dump output +12V DC.

Pin #8: Air fill output +12V DC.



Jack Leg Connector (Fig. 6E)

Pin #1: Ground input.

Pin #2: Float switch input.

Pin #3: Output to motor starter solenoid. Energized with +12V DC when the FRONT/REAR/LEFT/RIGHT button(s) are pushed.

Pin #4: Output to dump valve. Energized with +12V DC when the RETRACT ALL JACKS button is pushed.

Pin #5: Output to roadside rear leg valve. Energized with +12V DC when LEFT, REAR or RETRACT button is pushed.

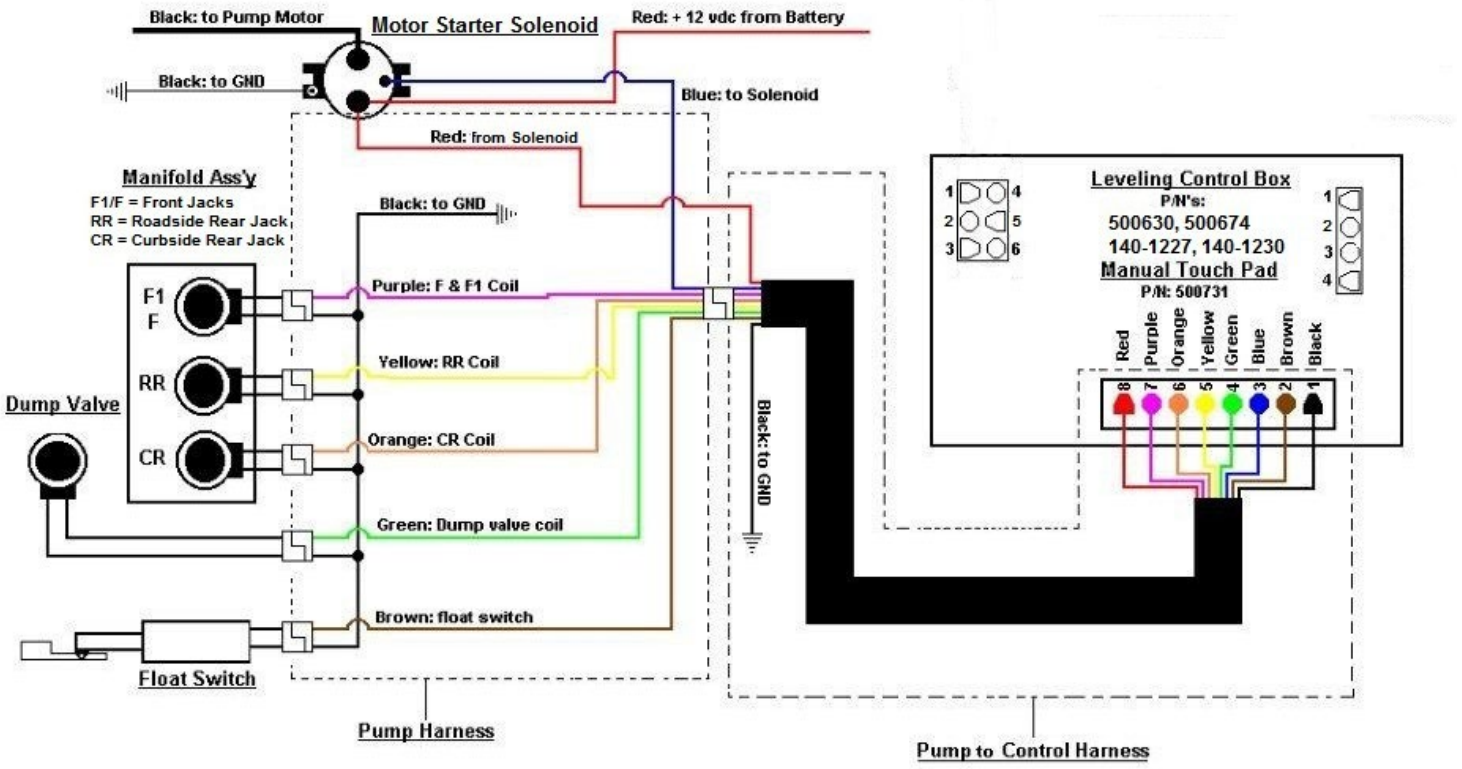
Pin #6: Output to curbside rear leg valve. Energized with +12V DC when RIGHT, REAR or RETRACT button is pushed.

Pin #7: Ouput to front jack leg valve. Energized with +12V DC when FRONT or RETRACT button is pushed.

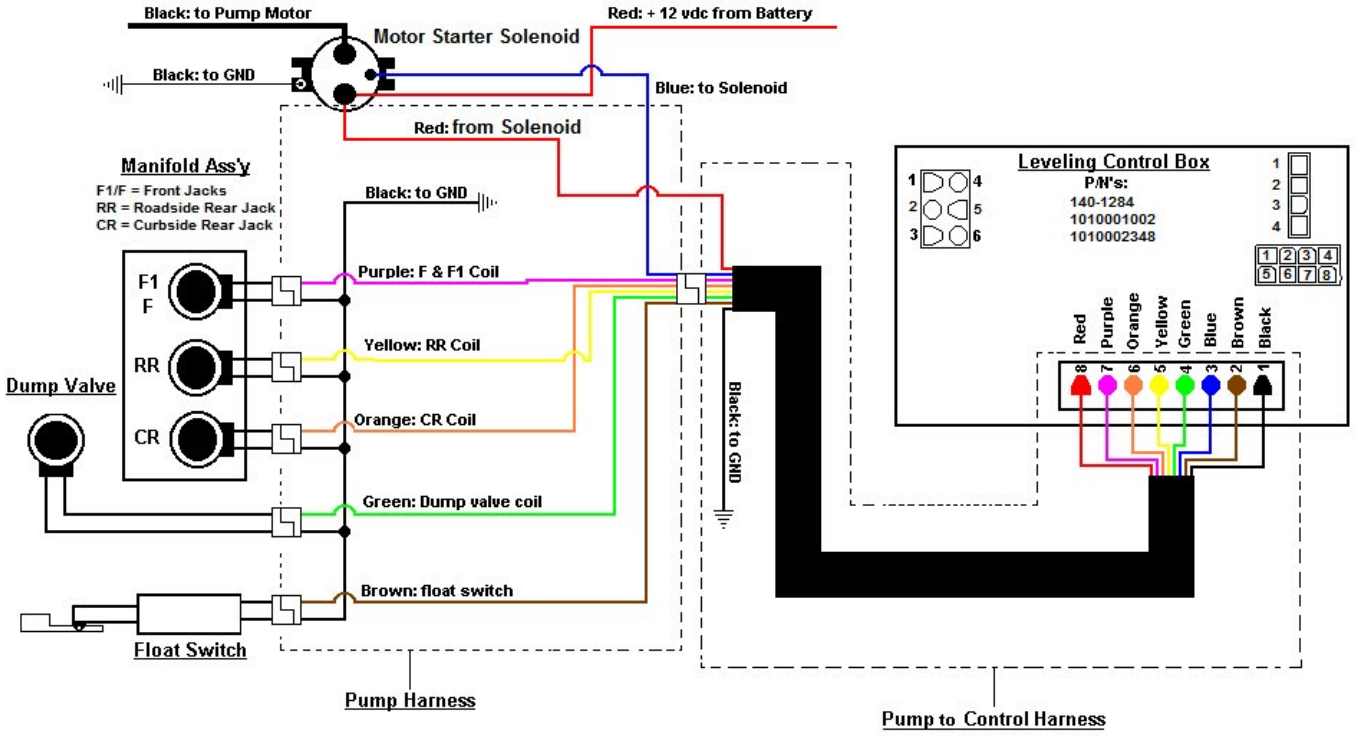
Pin #8: Input from motor starter solenoid. Energized with +12V DC to supply power to the touchpad control.

Wiring Diagrams

Controller Part Numbers: 359403, 359487, 359076, 359490, 359079, 365295



Controller Part Numbers: 359262, 359218, 359248



Troubleshooting

What Is Happening?	Why?	What Should Be Done?
Touchpad will not turn on, ON/OFF LED does not light.	Coach ignition not in run position.	Turn ignition to run position and have engine running.
	Touchpad has been left on for more than 4 minutes, auto-shutoff has occurred.	Push ON/OFF button until LED is lit on touchpad.
	No voltage at the touchpad.	Check harness at the touchpad on the 4-pin connector: Check between pin #3 (black power wire) and pin #4 (blue or green ground wire). There should be 10-12V DC between the pins.
	No voltage out of control box to the touchpad.	Check power out of control box at the 4-pin connector: Check between pin #3 (black power wire) and pin #4 (blue or green ground wire). There should be 10-12V DC between the pins.
	No power to control box on ignition input signal.	On the control box at the 6-pin connector: Check incoming voltage between pin #5 (ignition) and pin #1 (ground) of the 8-pin connector. There should be +12V DC between the pins. If low or no voltage is found, contact LCI Customer Service for further troubleshooting.
	Damaged or broken touchpad harness.	Check connectors and wires for damage or broken wires. Fix accordingly.
	Ground wire disconnected or shorted at control box.	Pin 1 of the 8-pin connector is the main ground. Test from pin 1 to chassis ground, there should be continuity with ground. If none is found, repair or replace ground wire.
	Neutral safety switch wires shorted or broken at control box.	On the control box at the 6-pin connector: Check for voltage at pin #6. If it has +12V DC verify pin #2 at the 6-pin connector also has +12V DC. If pin #2 is ground, ground pin #6. If the control then operates, repair or replace wires or neutral safety switch.
	Parking brake wire not grounded, or faulty parking brake switch.	On the control box, check for continuity between pin #1 of the 6-pin connector and ground. If there is no continuity, the switch is bad, the parking brake is not set, or the wires to the switch are bad.
	Faulty touchpad.	If all previous causes and actions do not apply, replace touchpad.
Jacks will not extend and the pump is not running.	Coach ignition not in run position.	Turn ignition to run position and have engine running.
	Touchpad as been left on for more than four minutes, auto-shutoff has occurred.	Push ON/OFF button until LED is lit on touchpad.
	No power from battery to pump.	Check for +12V DC at the large battery terminal of the motor solenoid; if no voltage or if voltage is less than +12V DC, recharge battery or replace power cable.
	Bad ground to pump assembly.	Inspect/clean surface of star washers around mounting bolt holes of pump assembly. The bolts lock into the pump block assembly through the pump mounting plate. Add a new ground from chassis to pump motor bolts.
	Motor starter solenoid blue wire defective (see wiring diagram).	Check for +12V DC at the blue signal wire at the motor starter solenoid when the FRONT or REAR button is pushed. If no voltage, check blue wire at pin #3 of the 8-pin connector for +12V DC when the FRONT or REAR button is pushed. If no voltage is present, remove blue wire from starter solenoid and check again at pin #3 for +12V DC while FRONT or REAR button is pushed. If there is +12V DC, check the blue wire for continuity; if no continuity, replace or repair blue wire. If no voltage is present at pin #3, contact LCI Customer Service.
	Motor starter solenoid defective.	Check for +12V DC at the blue signal wire at the motor starter solenoid when the FRONT or REAR button is pushed. If no voltage, check blue wire at pin #3 of the 8-pin connector for +12V DC when the FRONT or REAR button is pushed. If voltage is present, connect +12V DC to motor side terminal of starter solenoid; if motor runs, replace starter solenoid.

What Is Happening?	Why?	What Should Be Done?
Jacks will not extend and the pump is not running.	Pump motor defective.	Check for continuity between the motor and ground. Connect +12V DC to motor side terminal of motor starter solenoid; if motor does not run, replace pump motor. See Replacing The Hydraulic Pump Motor sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_TIP_SHEET_216.pdf
One or more jacks will not extend and the pump is running.	Coach ignition not in run position.	Turn ignition to run position and have engine running.
	Fluid level low; pump cavitating.	Fill tank to proper level with automatic transmission fluid. See Maintenance section or TI-188 at https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf
	No power at control box to energize valve coils (see wiring diagram).	Check for +12V DC at the control box between pin #8 (power) and pin #1 (ground) of the 8-pin connector. If there is no voltage present, see wiring diagram for power and ground inputs.
	Dump valve stuck open or defective valve.	Remove the dump valve assembly and bench test it by applying power and ground to the coil (not polarity sensitive). The valve should click as power and ground is applied. The pin should be moving in the end of the valve. If the valve clicks, but there is no pin movement, replace dump valve. **NOTE:** If there still is no pressure after replacing the valves, the pump may be faulty. See Hydraulic Leveling Pump Problem Diagnosis sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_TIP_Sheet_215.pdf
	Leg valve wires damaged.	Check for +12V DC at leg valve wires (see wiring diagram) at the pump assembly while pushing the FRONT button or the REAR button depending on which jack leg valve is being tested. If no +12V DC signal, check for continuity on each wire between coil and controller. Check for ground at the black wire or red wire for each leg valve at the pump assembly. Repair if necessary.
	Valve coil miswired.	Check wiring diagram for correct location of wiring to the leg valve assemblies.
	Leg valve coil defective.	Check coil for continuity. If there is none, replace valve coil.
	Leg valve defective.	Swap jack leg valve with one of the working jack leg valves and extend jack. If jack extends, then replace cartridge valve.
	Pump harness defective.	Check for ground at the black or red wire for each leg valve at pump assembly harness. If there is none, repair the wire.
		While pushing the button to extend the jacks, check for +12V DC at the purple, orange and yellow wires at the leg valves. If no voltage is measured check for +12V DC at the 8-pin connector on pin #7 (purple), pin #6 (orange) and pin #5 (yellow) at the control box. If voltage is present, repair the wires.
		If no voltage is present, check the touchpad for trouble codes. See Leveling Control Error Codes for 500630 and 500674 at https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0359_T.pdf If there are no trouble codes, check for proper signals on the 6-pin harness (see first troubleshooting concern, "Touchpad will not turn on, ON/OFF LED does not light."). If proper signals are present, replace the controller.

What Is Happening?	Why?	What Should Be Done?
One or more jacks will not extend and the pump is running.	Pump itself is damaged.	See Hydraulic Leveling Pump Problem Diagnosis sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_TIP_Sheet_215.pdf Remove tank and disassemble pump for visual inspection.
Jack(s) will not retract or will not retract fully.	Lubricate the jack(s).	While the jacks are extended down, spray the chrome rod with silicone spray. If the jacks have a zerk fitting in the bottom collar of the jack assembly, apply all purpose lithium grease. Three pumps with a manual grease gun are recommended. Retract the jacks and then extend the jacks. Lubricate the jacks again as above. Repeat this process two more times.
	Obstructions in jack pad.	Remove any rocks or foreign material out of the footpad before retracting the jacks.
	Broken jack spring(s).	Replace jack spring.
	Jack rod guide is rusted or dirty.	Clean the chrome rod and grease rod guide if equipped with grease fittings. Otherwise, lubricate with silicone fluid as previously described. It may be necessary to reseal jack or replace.
	System overfilled with hydraulic fluid.	Drain fluid to the recommended level. See Maintenance section or TI-188 at: https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf
	Dump valve wires damaged.	While pushing RETRACT ALL JACKS button, check for +12V DC on the green wire at the dump valve. If no +12V DC, check for continuity on green wire between coil and controller. Check for ground on the black wire at the dump valve. Repair if necessary.
	Jacks down light not lit on touchpad.	Check the float switch for operation. Check the float switch for proper orientation (see label on tank of pump assembly for orientation—vertical tanks only). For fluid sensor and float switch ID chart, use Hydraulic Leveling Float Switch/Fluid Sensor ID Chart sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0512.pdf For testing of horizontal fluid sensors or float switches, use Testing Float Switches/Fluid Sensors in Horizontal Tanks sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0511_.pdf For testing of vertical fluid sensor or float switches, use Testing Float Switches/Fluid Sensors sheet or Testing Vertical Float Switches/Fluid Sensor 14-1136, 14-1137 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0509_.pdf or https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0510_.pdf, respectively. Check for continuity on brown wire from float switch to control. Check for ground to float on black wire.
	Dump valve coil defective	Check coil for continuity, if none replace valve.
	Dump valve defective.	Replace valve.
	Jack leg valve wire defective.	While pushing the front or rear buttons check for +12V DC on the 8-pin connector at pin #5 (yellow), pin #6 (orange) and pin #7 (purple). See wiring diagram for jack leg valve designations.
		Check for continuity from control box to jack coil. If there is none, replace wire.

What Is Happening?	Why?	What Should Be Done?
Jack(s) will not retract or will not retract fully.	Jack leg valve ground wire defective.	Check for ground at the coil terminal (black or red wire), and repair if necessary.
	Jack leg valve coil defective.	Check coil for continuity. If there is none, replace leg valve.
	Jack valve faulty.	Swap with another jack valve that is working correctly and test. Replace cartridge valve, if necessary.
	Shunt valve clogged.	Remove corresponding hose fitting on manifold to gain access to shunt valve. Clean valve passages with solvent and compressed air.
	Shunt valve spring damaged.	Replace spring.
	Hose damaged.	Replace kinked or damaged hose (damage may not be externally visible).
Any jack retracts very slowly.	Lubricate the jack.	While the jacks are extended down, spray the chrome rod with silicone spray. If the jacks have a zerk fitting in the bottom collar of the jack assembly, apply all purpose lithium grease. Three pumps with a manual grease gun are recommended. Retract the jacks and then extend the jacks. Lubricate the jacks again as previously described. Repeat this process two more times.
	Jack rod guide is rusted or dirty.	Clean the chrome rod and grease rod guide if equipped with grease fittings. Otherwise, lubricate with silicone fluid as previously described. It may be necessary to reseal jack or replace.
	Broken jack spring(s).	Replace jack spring.
	Shunt valve clogged.	Remove corresponding hose fitting on manifold to gain access to shunt valve. Clean valve passages with solvent and compressed air.
	Shunt valve spring damaged.	Replace spring.
	Hose damaged.	Remove corresponding hose fitting on manifold to gain access to shunt valve. Clean valve passages with solvent and compressed air.
	Internal failure within jack.	Rebuild / replace components of jack as necessary.
Any jack retracts with no power, with possible popping sound.	Air in system.	Check for vertical coil in hoses. Remove the vertical coil if present then fully extend all the jacks and retract fully. Repeat this for four cycles, waiting a few minutes between cycles. Check fluid level between cycles. Refill tank as necessary. See Maintenance section or TI-188 at: https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf
	Lubricate the jack.	While the jacks are extended down, spray the chrome rod with silicone spray. If the jacks have a zerk fitting in the bottom collar of the jack assembly, apply all purpose lithium grease. Three pumps with a manual grease gun are recommended. Retract the jacks and then extend the jacks. Lubricate the jacks again as above. Repeat this process two more times.
	Jack legs create popping sound.	Due to changes in temperature, expanding and contracting of fluid will magnify the problem of popping jacks; see the recommended hydraulic fluid for cold operating weather.
	Contaminated fluid.	Replace fluid. See Fluid Recommendation section or TI-188 at: https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf
	Leg valves stuck open.	Remove leg valve, clean or replace.
	Dump valve contaminated.	Remove dump valve, clean or replace.
	Dump valve stuck open.	Replace valve.
	All leg valves and dump valve stuck open.	Replace all the valves.

What Is Happening?	Why?	What Should Be Done?
JACKS DOWN light on touchpad will not light with jacks extended.	Fluid sensor faulty.	To identify the float sensor and float switch, refer to Hydraulic Leveling Float Switch/Fluid Sensor ID Chart sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0512.pdf To test horizontal fluid sensors or float switches, use Testing Float Switches/Fluid Sensors In Horizontal Tanks sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0511_.pdf To test vertical fluid sensor or float switches, use Testing Float Switches/Fluid Sensors sheet or Testing Vertical Float Switches /Fluid Sensor 14-1136, 14-1137 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0509_.pdf or https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0510_.pdf, respectively.
	Harness wire faulty.	Check for ground at fluid sensor wires. The brown wire to pin #2 at controller should read ground when jacks are down. The other fluid sensor wire should read ground at all times.
	Fluid sensor misadjusted.	Readjust fluid sensor.
	Open circuit on the brown sensor wire.	Check for continuity on the brown wire between the float sensor and pin #2 of the 8-pin connector at controller. If none replace wire.
	Defective light on touchpad.	Apply +12V DC to pin #2 of the 8-pin connector with the key on. Turn on touch pad, if no light then replace the touch pad.
JACKS DOWN light on touchpad will not extinguish with jacks retracted.	Low fluid level.	Fill tank with automatic transmission fluid. See Fluid Recommendation section or TI-188 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf
	Fluid sensor misadjusted.	Readjust fluid sensor.
	Fluid sensor faulty.	To identify the float sensor and float switch, refer to Hydraulic Leveling Float Switch/Fluid Sensor ID Chart sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0512.pdf To test horizontal fluid sensors or float switches, use Testing Float Switches/Fluid Sensors In Horizontal Tanks sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0511_.pdf To test vertical fluid sensor or float switches, use Testing Float Switches/Fluid Sensors sheet or Testing Vertical Float Switches /Fluid Sensor 14-1136, 14-1137 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0509_.pdf or https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0510_.pdf, respectively.
	Open circuit on the brown sensor wire.	Check for continuity on the brown wire between the float sensor and pin #2 of the 8-pin connector at controller. If none replace wire.
JACKS DOWN light and alarm will go on while driving with jacks retracted.	Low fluid level.	Fill tank with automatic transmission fluid. See Fluid Recommendation section or TI-188 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf
	Fluid sensor misadjusted.	Readjust fluid sensor.

What Is Happening?	Why?	What Should Be Done?
JACKS DOWN light and alarm will go on while driving with jacks retracted.	Float sensor faulty.	To identify the float sensor and float switch, refer to Hydraulic Leveling Float Switch/Fluid Sensor ID Chart sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0512.pdf To test horizontal fluid sensors or float switches, use Testing Float Switches/Fluid Sensors In Horizontal Tanks sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0511_.pdf To test vertical fluid sensor or float switches, use Testing Float Switches/Fluid Sensors sheet or Testing Vertical Float Switches /Fluid Sensor 14-1136, 14-1137 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0509_.pdf or https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0510_.pdf, respectively.
	Short in harness.	Check float switch wires for open circuit.
System levels, but retracts when key is turned off.	Improper wiring to 6-pin harness.	See 2003 Freightliner Diesel Chassis Control Hookup, 2004 Freightliner Diesel Chassis Control Hookup Wiring Diagram, 2003 Ford Chassis Hookup of PowerGear Controls, Hydraulic Leveling Set-Up Procedure for Manual Control #500731, Spartan Chassis Control Hookup Wiring Information for 500630 and 140-1227
System drops down slightly as key is shut off.	Improper wiring to 6-pin harness.	See 2003 Freightliner Diesel Chassis Control Hookup, 2004 Freightliner Diesel Chassis Control Hookup Wiring Diagram, 2003 Ford Chassis Hookup of PowerGear Controls, Hydraulic Leveling Set-Up Procedure for Manual Control #500731, Spartan Chassis Control Hookup Wiring Information for 500630 and 140-1227
Leveling system retracts when key is put into ACC position.	Improper wiring to 6-pin harness.	See 2003 Freightliner Diesel Chassis Control Hookup, 2004 Freightliner Diesel Chassis Control Hookup Wiring Diagram, 2003 Ford Chassis Hookup of PowerGear Controls, Hydraulic Leveling Set-Up Procedure for Manual Control #500731, Spartan Chassis Control Hookup Wiring Information for 500630 and 140-1227
System will not auto-retract when the unit is put into drive.	Improper wiring to 6-pin harness.	See 2003 Freightliner Diesel Chassis Control Hookup, 2004 Freightliner Diesel Chassis Control Hookup Wiring Diagram, 2003 Ford Chassis Hookup of PowerGear Controls, Hydraulic Leveling Set-Up Procedure for Manual Control #500731, Spartan Chassis Control Hookup Wiring Information for 500630 and 140-1227
	Neutral safety switch wires shorted.	At the 6-pin connector: Check for voltage at pin #6. If it has +12V DC, verify pin #2 at the 6-pin connector also has +12V DC. If pin #2 is ground, ground pin #6 at the 6-pin. If the control then operates, repair or replace wires or neutral safety switch.
System does not level to correct level position.	Controller needs to be recalibrated.	To level with the bubble level, see How To Level The Bubble Level sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0125_T.pdf See Instructions For Calibration Of Hydraulic Leveling Controls sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0316_T.pdf For control boxes with part number 101000102, see 12003 - Hydraulic Leveling Control Calibration Procedure For Control sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_12003.pdf

What Is Happening?	Why?	What Should Be Done?
System does not level to correct level position.	Controller needs to be recalibrated.	For control boxes with part number 1010001284, see 12004 - Instructions For Hydraulic Leveling Control Calibration Procedure sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_12004_Fleetwood_Hyd_Leveling_Calibration_Tip_Sheet.pdf
	Control box is not mounted in proper orientation.	Arrow on control box label must point forward. Mounting flange for control box must be on top, with wire harnesses coming out the bottom.
	Low voltage at control box.	Check between pin #8 (power) and pin #1 (ground) of the 8-pin connector. For specific voltage, see Low Voltage LED Indication for Hydraulic And Electric Leveling Controls sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_3010002151.pdf
	Hoses plumbed wrong at jacks.	Verify front hoses are plumbed from front jacks to F and F1 on manifold of hydraulic pump assembly. Verify curbside rear hose is plumbed to CR at manifold at pump assembly. Verify that roadside rear jack is plumbed to RR at manifold at pump assembly.
	Hoses plumbed wrong at pump assembly.	Check valve block to make sure that the front hoses are plumbed to F and F1, CR is to curbside rear hose connector and RR to roadside rear hose connector.
	Valve coils wired incorrectly.	See wiring diagram for part location and wire color.
	Harness pinned incorrectly.	See wiring diagram for pin location and wire color on harness.
	Faulty control.	If previous causes and actions do not apply, replace control.
Touchpad lights are flashing.	Possible trouble code being displayed.	See Leveling Control Error Codes for 500630 and 500674 at https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_82_L0359_T.pdf
	Jacks are still down partially.	Press the RETRACT ALL JACKS button to allow jacks to fully retract.
	Coach is in emergency retract mode.	Fluid low, see Fluid Recommendation section or TI-188 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf
		Fluid sensor is misadjusted. See Instructions For Fluid Sensor Replacement 1993-1994 sheet at: https://www.lci1.com/assets/content/support/technical-information-sheets/Power_Gear/Leveling/pg_81_1213.pdf
System turns on, but turns off as soon as a touchpad button is pushed.	Low system voltage.	Voltage must remain above 12V DC while in operation. Check battery condition and connections.
Touchpad LEDs are on solid.	Control box is defective.	Replace the control box.

Maintenance

Resources Required

- Dexron® III or Mercon® V Class "A" automatic transmission fluid (ATF)
- Electrical contact cleaner
- Lint-free cloth
- Zip ties

Procedure

1. Check fluid in reservoir every 12 months. If fluid is a clear red color, do not change. If fluid is milky, pink and murky and not clear red in color, drain reservoir and add new fluid. Hydrualic fluid in reservoir should be changed a minimum of every five years.

NOTE: Make sure that the hydraulic reservoir is properly filled. An incorrectly filled reservoir can lead to the float switch sending a false trigger to the emergency retract, due to the system not recognizing that the jacks are already retracted.

NOTE: Check the fluid only when all the jacks are fully retracted.

NOTE: When checking the hydraulic fluid, fill to the desired level indicated by the sticker on the system.

2. Inspect and clean all power unit electrical connections every 12 months. If corrosion is evident, spray power unit electrical connections with electrical contact cleaner.
3. Remove dirt and road debris from jacks as needed.
4. If jacks are down for extended periods, it is recommended to spray exposed jack rods with a silicone lubricant every three months for protection. If the unit is located in a salty environment, it is recommended to spray the rods every four to six weeks.

Fluid Recommendation

Automatic transmission fluid (ATF) with Dexron® III or Mercon® V or a blend of both is recommended by Lippert Components, Inc. For a list of approved fluid specifications, see TI-188. To obtain this Technical Information sheet on-line, go to https://www.lci1.com/assets/content/support/technical-information-sheets/Leveling%20and%20Stabilization/CCD_0002088.pdf.

NOTE: In colder temperatures (less than 10 °F) the jacks may extend and retract slowly due to the fluid's molecular nature. For cold weather operation, fluid specially formulated for low temperatures may be desirable.

Notes

LIPPERT COMPONENTS®

Please recycle all obsolete materials.

For all concerns or questions, please contact
Lippert Components, Inc.
Ph: (574) 537-8900 | Web: lci1.com | Email: customerservice@lci1.com