LIPPERT COMPONENTS

Formerly Atwood Mobile Products

LITERATURE NUMBER 66552
CCD-0002293

LEVELEGS™ w/SENSOR TECHNOLOGY

Installation • Operation • Maintenance

ENGLISH

Rev: 10.05.18
Effective 12/8/10

Table of Contents

SAFETY ALERT SYMBOLS

Safety Symbols alerting you to potential personal safety hazards. Obey all safety messages following these symbols.

⚠ WARNING	⚠ CAUTION
avoid possible injury or death	avoid possible injury and/or property damage

FOR YOUR SAFETY READ ALL INSTRUCTIONS BEFORE INSTALLATION AND OPERATION

Installer: Provide these instructions to the consumer.
Consumer: Keep documents for future reference.

Atwood Levelegs™ Levelers are intended for use on recreation vehicle motorhomes and trailers, any other use is strictly prohibited.

⚠ WARNING

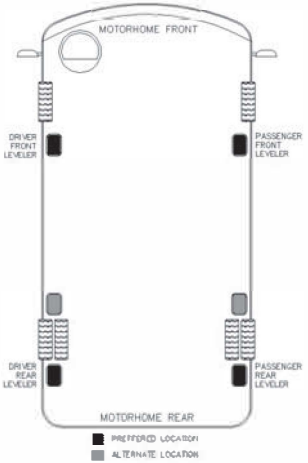
VEHICLE CAN MOVE OR COLLAPSE

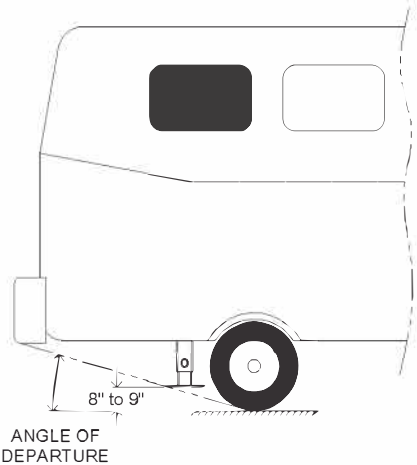
- Never exceed the rated capacity of the leveler as stated on its label.
- Levelers are not designed to be used as jacks. Do not use levelers to lift the vehicle during tire changes, axle work or other servicing. **The tires must stay on the ground.**

INSTALLATION

LEVELER LEG

1. Install levelers as close to the front and rear wheels as possible in a rectangular formation. If the levelers are installed unevenly, the effectiveness of the system will be compromised.



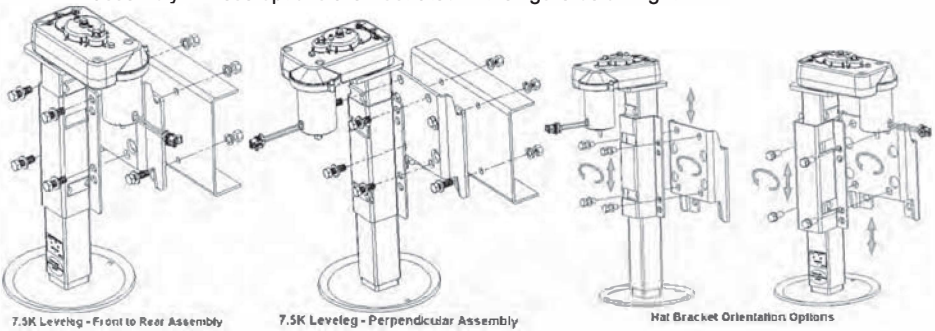


2. Position leveler vertically against frame so base of foot has 8-9" minimum ground clearance when vehicle is loaded to its maximum GVW (Gross Vehicle Weight) (NOTE: the clearance of a raw rail is different than the clearance of a fully completed unit). Make sure the levelers clear all structures when air bags are filled and deflated.

3. For all Leveleg installations, refer to the diagram with the correct configuration.

   A. **7.5K Levelegs™** There are different ways to mount the 7.5K Levelegs. The hat bracket shown below left attaches the Leveleg oriented to the front or rear of the coach, and the hat bracket shown below middle attaches the Leveleg oriented perpendicular to the frame.
      i. For the bolt-on assembly, attach the frame bracket to frame using 4 sets of 1/2" - 13 grade 5 nuts and bolts and 1/2" flat and locking washers. This bracket can also be welded to the frame on some units.
      ii. Fit the hat bracket around the Leveleg and attach to the frame bracket using 4 sets of 1/2" - 13 grade 5 bolts and 1/2" flat washers.

      NOTE: The hat brackets used for the 7.5K Levelegs can be oriented in multiple ways to best fit the coach. The hat bracket can be rotated 180° to bolt the Leveleg higher or lower to the frame bracket. Also the top tab of the Leveleg can either fit through the slot of the hat bracket, or rest on the top of the hat bracket in order to offer more options for assembly. These options are illustrated in the figure below right.

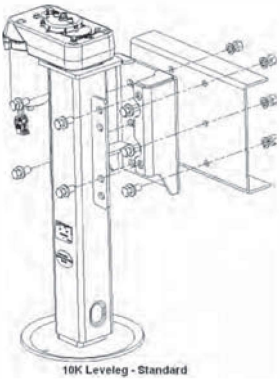


7.5K Leveleg - Front to Rear Assembly

7.5K Leveleg - Perpendicular Assembly

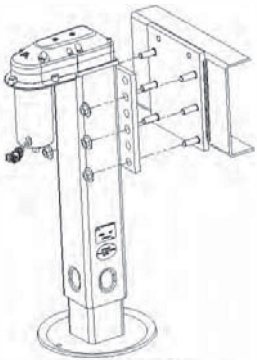
Hat Bracket Orientation Options

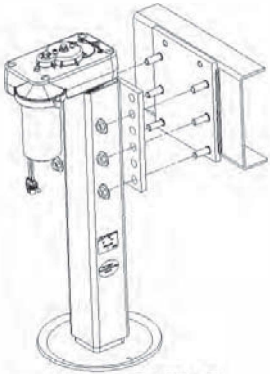
   B. **10K Levelegs™** There are two different types of 10K Levelegs. For the standard 10K Levelegs (right) follow the directions below. For 10K Levelegs with special brackets, refer to part C.
      i. Attach the frame bracket to frame using 6 sets of 1/2" - 13 grade 5 nuts and bolts and 1/2" flat and locking washers. This bracket can also be welded to the frame on some units.
      ii. Attach the Leveleg to the frame bracket using 4 sets of 1/2" - 13 grade 5 nuts and bolts and 1/2" flat and locking washers.



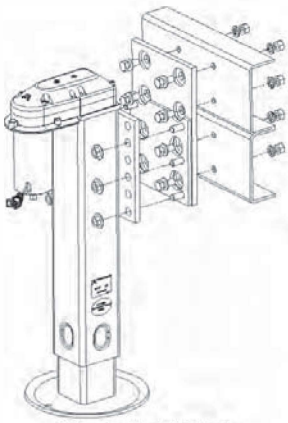
10K Leveleg - Standard

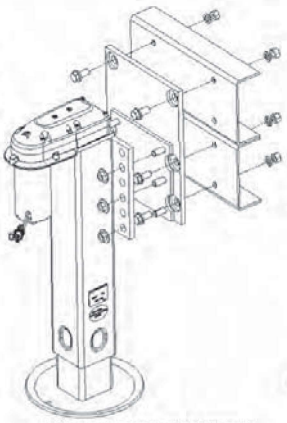
C. **15K Levelegs™** The same mounting process is used for the standard 15K Leveler (below left) as the 10K Leveler with special brackets (below right).
   i. Weld the frame bracket to the frame.
   ii. Attach Leveleg to the frame bracket using six 1/2" - 13 grade 5 flange nuts

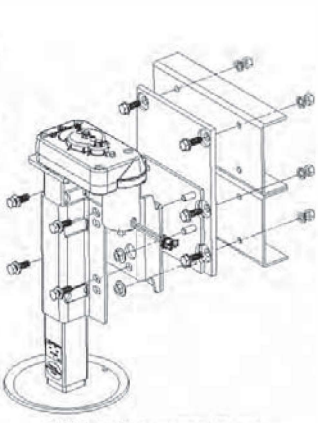

15K Leveleg - Standard


10K Leveleg - Special Bracket

D. **Special Leveleg Configurations** These mounting kits are not currently in production, so these configurations may require extra lead time to order.
   i. Attach the base bracket using 1/2" - 13 grade 5 nuts and bolts and 1/2" flat and locking washers. For the Blue Bird chassis (below left), use 8 sets and for the Powerglide chassis (below center, right) use 6 sets.
   ii. To attach 15K Levelegs, refer to part C., ii. To attach 7.5K Levelegs, refer to part A.


15K Leveleg - Blue Bird Chassis


15K Leveleg - Powerglide Chassis


7.5K Leveleg - Powerglide Chassis

4. For all Levelegs, lubricate the bolts and torque to 65 ft-lbs.

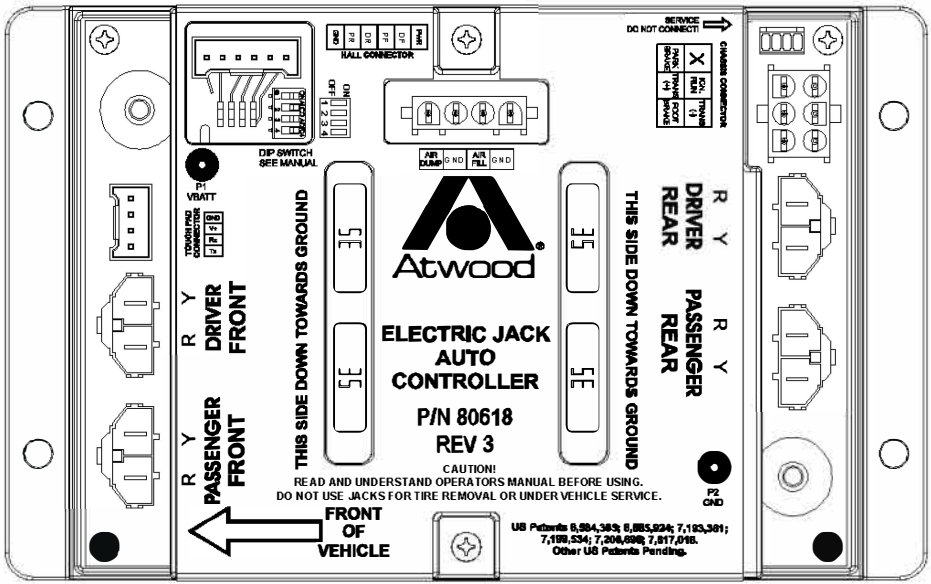
CONTROLS

Relay Pack Controller

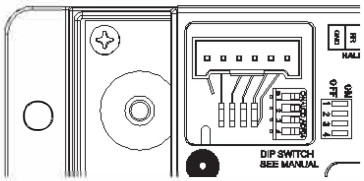
⚠ WARNING

EXPLOSION

- Controller is not ignition protected. DO NOT install in areas that require ignition protected devices (such as battery or propane tank storage compartments).



Dip Switch Configuration

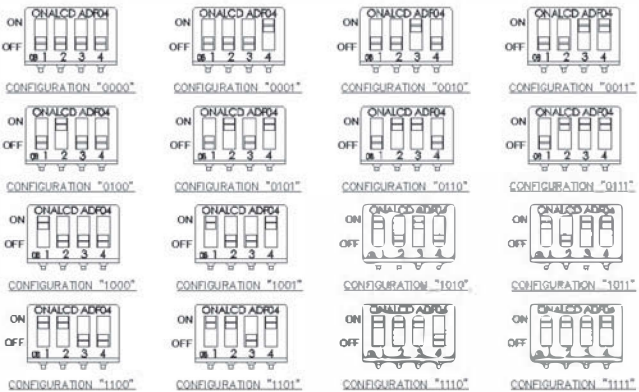


- In order to accommodate as many units as possible, there is a set of four small "dip switches" on the control board that must be configured. Refer to the following table and figure for the required configuration for your coach.

NOTE: If any of the blank configurations are used (noted by "DEAD POSITION" in the table below), the Controller will not work. In this case, the Control Pad Leveler position LEDs will flash left to right.

Configurations	Rear Levelers	Rear Levelers Stroke Length	Front Levelers	Front Levelers Stroke Length
0000	7.5K or 10K	15" of travel	7.5K or 10K	15" of travel
0001	15K Standard	15" of travel	15K Standard	15" of travel
0010	15K Standard	15" of travel	7.5K or 10K	13" of travel
*0011	7.5K or 10K	15" of travel (Special)	7.5K or 10K	15" of travel (Special)
0100	15K Standard	15" of travel	7.5K or 10K	15" of travel
0101	DEAD POSITION			
0110	DEAD POSITION			
0111	7.5K or 10K	13" of travel	7.5K or 10K	13" of travel
1000	7.5K or 10K	15" of travel	7.5K or 10K	13" of travel
1001	15K 2nd Gen.	15" of travel	15K 2nd Gen.	15" of travel
1010	15K 2nd Gen.	15" of travel	7.5K or 10K	13" of travel
1011	DEAD POSITION			
1100	15K 2nd Gen.	15" of travel	7.5K or 10K	15" of travel
1101	DEAD POSITION			
1110	DEAD POSITION			
1111	DEAD POSITION			

***THIS VERSION HAS AN EXTENDED FILL NOT USED BY MOST CUSTOMERS.**



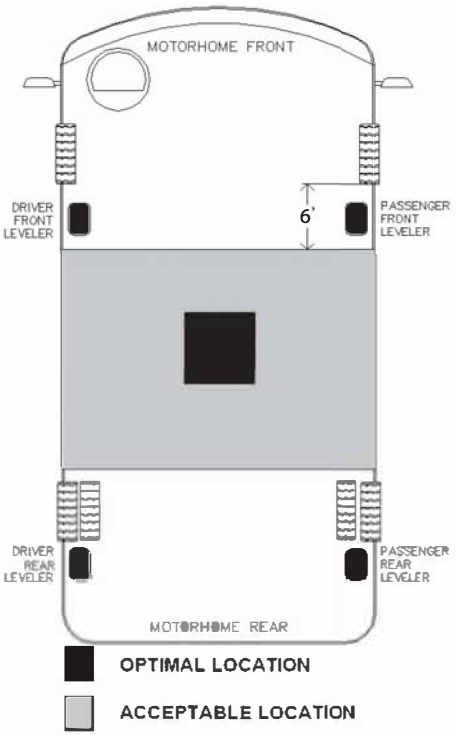
DIP SWITCH CONFIGURATIONS

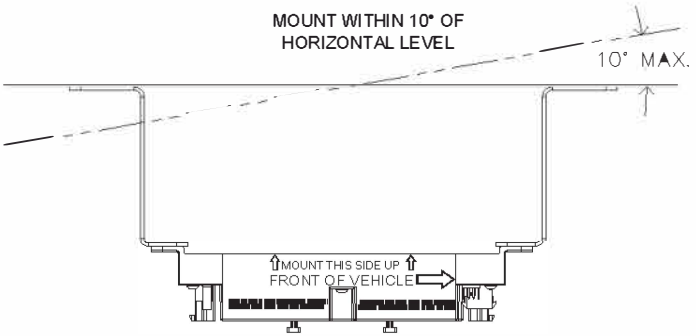
NOTE: These switches MUST be configured correctly. Incorrect configuration can result in poor performance or damage to the system.

Controller Location

1. To optimize the effectiveness of the Controller, it should be mounted as close to the center of the vehicle as possible. There is an optimal zone and an acceptable zone to install the Controller as shown to the right. Any other place will compromise the operation of the Controller.
2. Install Controller in a clean, dry interior area protected from moisture. Use corner holes of unit to fasten base horizontally to mounting surface, using appropriate hardware for surface.
3. Install the AUTO POSITION Controller so the forward arrow points toward the front of the motor home. The controller must be hung upside down to match the arrows on the side of the Controller, within 10° of horizontal level (parallel with mounting surface) as shown below. Sufficient space below the board must be provided for the wires to be connected.

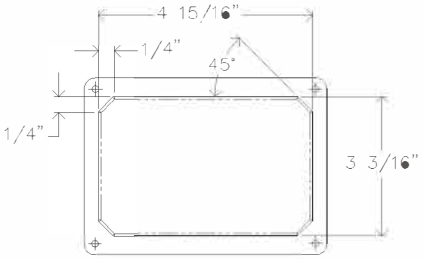
NOTE: Any control board installed outside the acceptable area (defined to the right) will void warranty





Auto Position Control Pads

1. Provide a space with the dimensions shown in the figure to the right for the control pad at desired location. NOTE: Reference control pad when making cutout; there is tight clearance. Also to ensure the longevity of the product, mount control pad away from potential sources of moisture: windows, cup holders, etc.
2. Use the corner holes to fasten control pad to mounting surface using appropriate hardware for surface.
3. Connect control pad wire harness to control pad.
4. Route the control pad wire harness to controller and connect the two.

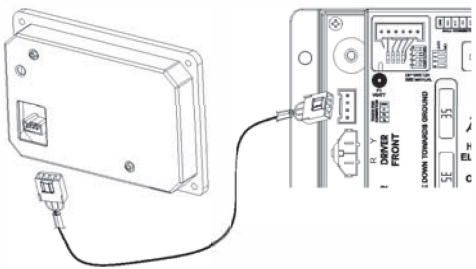


Control Pad Template

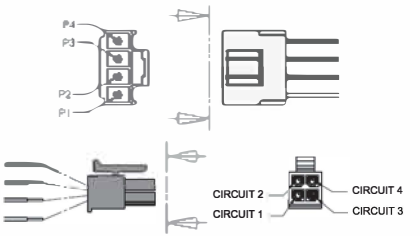
⚠ CAUTION
PRODUCT DAMAGE

- Secure the wire harnesses in a safe area where they will not become damaged by heat, friction or moving parts.
- Failure to do so could cause damage to and hinder the function of the leveling system.

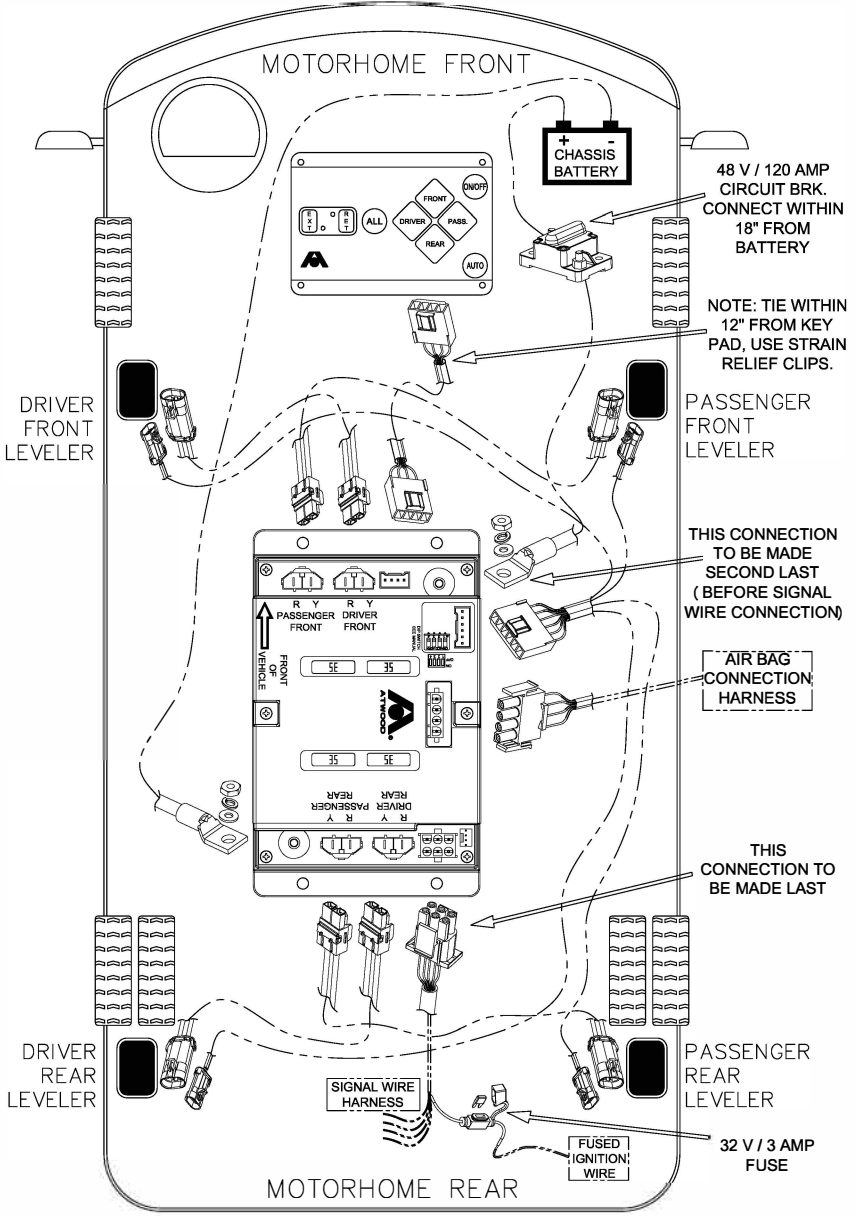
5. Fasten a strain relief clamp within 12" of the control pad. This is to prevent the wire harness connection from being damaged at the control pad.



CONTROL PAD WIRE HARNESS			
PIN # (LEFT SIDE)	DESCRIPTION	COLOR	PIN # (RIGHT SIDE)
P1	OUT TX (Touch pad RX)	WHITE	CIRCUIT 1
P2	OUT RX (Touch pad TX)	GREEN	CIRCUIT 2
P3	POWER	RED	CIRCUIT 3
P4	GND	BLACK	CIRCUIT 4



NOTE: Terminal to the Control Pad may be different than the one shown above. For alternate pin-outs, refer to the Harness Index page 25 under "OLD TOUCH PAD HARNESS".


MOTORHOME FRONT
+ CHASSIS BATTERY -
48 V / 120 AMP CIRCUIT BRK. CONNECT WITHIN 18" FROM BATTERY
NOTE: TIE WITHIN 12" FROM KEY PAD, USE STRAIN RELIEF CLIPS.
ON/OFF
FRONT
ALL
DRIVER
PASS.
REAR
AUTO
DRIVER FRONT LEVELER
PASSENGER FRONT LEVELER
THIS CONNECTION TO BE MADE SECOND LAST (BEFORE SIGNAL WIRE CONNECTION)
R Y PASSENGER FRONT
R Y DRIVER FRONT
FRONT OF VEHICLE
AIR BAG CONNECTION HARNESS
R Y PASSENGER REAR
R Y DRIVER REAR
THIS CONNECTION TO BE MADE LAST
DRIVER REAR LEVELER
PASSENGER REAR LEVELER
SIGNAL WIRE HARNESS
FUSED IGNITION WIRE
32 V / 3 AMP FUSE
MOTORHOME REAR

CONTROLLER WIRING

All information below pertains to the diagram on the opposite page
NOTE: Atwood recommends using the Plug n' Play harness kit

- If modifications to the harnesses must be made, please mimic the Atwood harnesses, and follow the guidelines provided by the manufacturer of the harness terminals. Be sure any wire crimps are strong enough as defined by the manufacturer. Poor connections can hurt system function. Refer to the wire harness index for the pin outs of each harness. Do not make any wires longer than specified below.
- For any extra wire after installing a harness, fold end to end (do not coil) and tie as shown. (see right)
- Atwood does not guarantee wiring functionality if wires are modified and/or new or different harnesses are made.

⚠ WARNING
FIRE

- Secure 10 gauge leveler wires so that they do not run close to the nut on the bottom of the motor.
- This nut rotates hundreds of revolutions per second, and could cut the insulation on the wires. This could cause sparks and fire, damage to the controller, leveler, and wire harness.

⚠ CAUTION
PRODUCT DAMAGE

- Secure the wire harnesses in a safe area where they will not become damaged by heat, friction or moving parts.
- Failure to do so could cause damage to and hinder the function of the leveling system.

NOTE: For all wires, use strain relief clamps to reduce damage to the terminals.

Please connect wires in the following order:
Leveler Power Connections

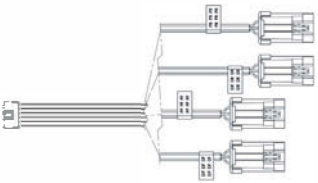
- Use the 10 AWG connectors (red and yellow wire) to connect the leveler motors to the control board.

NOTE: Wires cannot run any longer than 30' to the front, and no longer than 20' to the rear.

1. Plug in the four harnesses into the power terminal on each leveler motor.
2. Run the four harnesses from each of the levelers to the control board compartment.
3. Secure the harnesses underneath the coach.
4. Plug in the harnesses to the control board. Verify that the correct harness is plugged into the correct terminal.

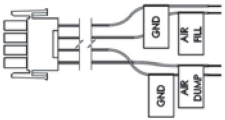
Leveler Sensor Connections

- Use the 22 AWG connector (four harnesses feeding back to a single terminal at the control board) to connect the leveler signals to the control board.
    1. Plug in the harness (six pin terminal) to the control board.
    2. Run the four harnesses from the control board compartment to each of the levelers.
    3. Plug in the four harnesses into the sensor terminal on each leveler motor.
    4. Secure the harnesses underneath the coach.



Air Bag Harness

- This harness is for coaches with Air Bag suspension capabilities. If your coach does not have Air Bags, skip this step.
    1. Plug in the harness (large four pin terminal) into the control board.
    2. Attach the proper chassis locations to these leads: Air Dump, Air Fill, GND.



Power Connections

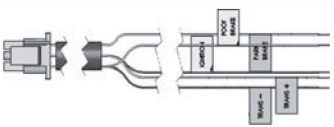
1. Connect the controller to the chassis 12V DC battery through the manual reset circuit breaker (see page 9). This connection must be made within 18" of the battery or power source.
2. Connect the controller to the battery through 2 AWG wire.
3. Terminate 2 AWG wire power wire to controller through a 2 AWG ¼" ID ring terminal.
4. Attach ring terminal to controller with following components as shown on the opposite page: #10 conductive washer, #10 lock conductive washer, 10-32 conductive nut.

NOTE: Torque nut (see page 9) to 5-10 in/lbs. Excessive torque could damage the control board.

Signal Wire Harness

NOTE: It is important for this harness to be plugged in after all other wires are installed.

- This harness provides the following information to the control board from the chassis.
    1. Ignition Run
    2. Footbrake
    3. Parking Brake
    4. Either:
        i. Transmission + (High output signal when transmission is in PARK/NEUTRAL)
        ii. Transmission – (Low output signal when transmission is in PARK/NEUTRAL)



1. Connect four of the five wires to the correct locations. These locations will be defined by the chassis manufacturer. Tape off the unused transmission wire.
2. Run the harness to the control board and plug in to the correct terminal.

OPERATION

BEFORE OPERATING THE LEVELERS

⚠ CAUTION

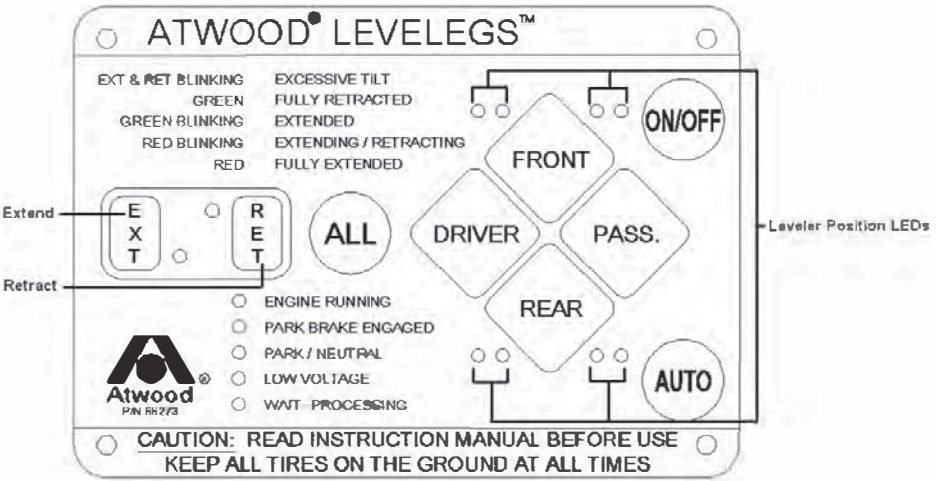
PERSONAL INJURY

- Stand clear of the vehicle.

⚠ WARNING

VEHICLE CAN TIP

- Levelers must be on firm solid ground or surface prior to operation. Soft/spongy ground may allow levelers to sink.
- Area below and around leveler must be clear of obstructions.
- Do not place blocks under the leveler for additional ground clearance.
- Operating the system on an excessive slope can be dangerous.
- Tires must stay on the ground at all times.



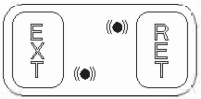
LEDs in all images will be represented in this format:

ON	●
OFF	○
BLINKING	((●))

Before operating the levelers, you must do the following:

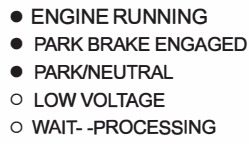
1. Park the vehicle on as level a site as possible. Check for rocks, holes, or other obstructions. Warn all persons to stand clear of vehicle.

NOTE: The system will recognize excessive slope from front to rear only (greater than 4°). A slope of 4-6° will be identified by flashing the yellow EXT and RET LEDs on the control pad slowly. A slope greater than 6° will be identified by flashing the EXT and RET LEDs quickly. The AUTO feature will not function if the slope is greater than 6°.



2. Before operation,
   - Put the vehicle transmission in PARK.
   - Engage the vehicle PARKING BRAKE.
   - Have the vehicle engine running.

   NOTE: The vertical signal lights will be illuminated as shown to the right.

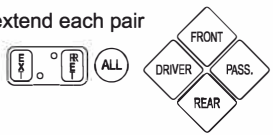


3. It is recommended not to extend any slide outs until coach is level.

CONTROL BOARD INSTALLATION AND OPERATION

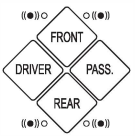
TO SET HOME POSITION

- If all Leveler lights are blinking green and red at the same time, HOME position must be programmed. To proceed, do the following:
  1. Press the ON/OFF button. (ON/OFF)
  2. Simultaneously Press the EXT button and a directional button to extend each pair of levelers at least 2" from fully retracted position. This should take about 30 seconds for each pair of levelers.

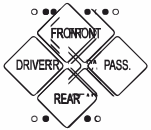


  3. Complete a successful ALL RETRACT as defined below

     i. Ensure slideout rooms are fully retracted (in their inboard position).
     ii. Simultaneously press the ALL button and RETRACT buttons and release. Levelers will retract automatically to their fully retracted position. The leveler indicator LEDs will blink red when the levelers are moving.



     iii. Once levelers are fully retracted, leveler indicator LED will be solid green. Visually verify that all levelers are fully retracted.



NOTE: If any of the levelers were not extended more than 1" before an ALL RETRACT was completed, the system will go into error signaled by the red and green LED's by the discrepant leveler flashing while an error tone is sounded.

- If an error occurs, repeat steps 1-3. If still unsuccessful, go to the troubleshooting section.

TO SET AUTO POSITION

NOTE: This same process can be used to reprogram AUTO position

1. Press the ON/OFF button to activate the system. (ON/OFF)
2. Simultaneously press the EXT and ALL buttons. This will extend all levelers to be in contact with the ground. Leveler position LEDs will blink red when moving and will blink green when the levelers have contacted the ground and stopped.

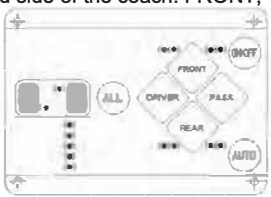
NOTE: Do not move around the inside of the coach while levelers are operating. This could throw off the balance of the coach and affect the system's ability to function correctly.

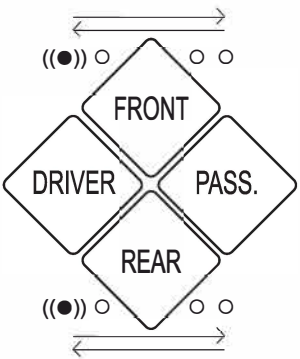
3. Press the EXT button. This will activate the system to extend levelers in pairs. The yellow EXT LED will stay illuminated.

4. Press and hold one of the directional buttons to raise the desired side of the coach: FRONT, REAR, DRIVER, PASS.
5. Repeat step 4 until the coach has reached the desired position.
6. If during this process any levelers are extended further than desired, any pair of levelers can be retracted to compensate. To perform this procedure, press the RET button. The yellow RET LED will stay illuminated.

NOTE: Levelers cannot be manually retracted past the point of initial ground contact.

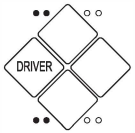
7. Press and hold one of the directional buttons to lower the desired side of the coach: FRONT, REAR, DRIVER, PASS.
8. Press the ON/OFF button to turn controls off.
9. Press EXT button five (5) times.
10. Press RET button five (5) times.
11. Unit will respond by blinking all LEDs slowly.
12. Press ALL button three (3) times. (ALL)
13. If Air Dump has not been configured yet, the unit will respond by blinking the LEDs left-to-right and back again, signaling that the system is in AIR DUMP Install mode. The following section will define the procedure for setting AIR DUMP.



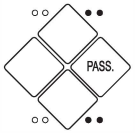


TO SET AIR DUMP MODE

- **If the system is in install mode,** LEDs will blink left-to-right and back again signaling that the AIR DUMP feature can be enabled or disabled.



a. **To enable Air Dump**, press the DRIVER button three (3) times. The driver side LEDs will illuminate for 3 seconds and shut off. Press ON/OFF, then simultaneously press RET and ALL to retract all Levelegs.



b. **To disable Air Dump**, press the PASSENGER button three (3) times. The passenger side LEDs will illuminate for 3 seconds and shut off. Press ON/OFF, then simultaneously press RET and ALL to retract all Levelegs.

c. If the Air Dump feature is not set or has never been configured, the system will wait for 30 seconds (Rev. 3 boards will be 5 min.). It will default to "Disabled" and the passenger side LEDs will illuminate for 3 seconds and shut off.

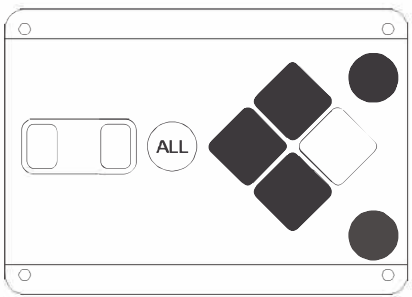
- To change Air Dump from enabled to disabled or vice versa, have the engine running, the park brake engaged and the transmission in PARK/NEUTRAL.
  d. Press ON/OFF to turn the controls off. No LEDs will be illuminated. 

  e. Press the EXT button ten (10) times.
  f. Press the RET button ten (10) times. 

  g. The LEDs will blink left-to-right and back again. Go up to step 1 above and follow the directions to either enable (step a) or disable (step b) the Air Dump feature.
  h. To check the status of the Air Dump, wait 30 seconds and see which LEDs illuminate. If the air dump is enabled, the driver side LEDs will illuminate and if the air dump is disabled, the passenger side LEDs will illuminate.

TO MANUALLY DUMP THE AIR BAGS

a. Engine must be running.
b. Levelers must be fully retracted.
c. Footbrake must be engaged.
d. Transmission must be OUT of Park/Neutral.
e. Parking brake must NOT be engaged.
f. Atwood Levelegs control pad is NOT on. NO LEDs will be illuminated.
g. Simultaneously press and hold the FRONT + REAR + ALL buttons to dump air from air bags.
h. Air bags will begin to dump.
i. When any of the three buttons are released, a delay of 60 seconds will start. (Air bags may continue to deflate during this delay.)
j. After this delay, the air bags will automatically start to refill.



TO LEVEL

Leveling using the AUTO function

If the Auto position is already set or programmed:

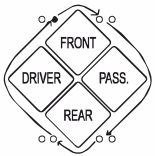
1. Press the ON/OFF button to activate the system. (ON/OFF)
2. Press the AUTO button. (AUTO)
3. The levelers will extend to the ground and automatically adjust to reach the pre-set position. During this process, the leveler position LEDs will illuminate as stated on the control pad.

EXT & RET BLINKING	EXCESSIVE TILT
GREEN	FULLY RETRACTED
GREEN BLINKING	EXTENDED
RED BLINKING	EXTENDED / RETRACTING
RED	FULLY EXTENDED

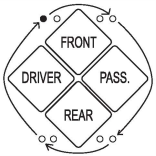
- ● ENGINE RUNNING
- ● PARK BRAKE ENGAGED
- ● PARK/NEUTRAL
- ○ LOW VOLTAGE
- ((●)) WAIT- -PROCESSING

NOTE: If any button is pressed during this sequence, the levelers will stop. The only available feature after this is Retract All.

4. The system will check each Leveler to insure its foot is in contact with ground. During this time, the control board "WAIT" LED will be on.
5. The system will signal a successful or unsuccessful "auto position" sequence by:



A. Successful: The four green leveler position LEDs will illuminate in a rotating circle for 5 seconds before the control pad shuts off completely.



B. Unsuccessful: The four red leveler position LEDs will illuminate in a rotating circle for 5 minutes or until the ON/OFF button is pressed. If this occurs, see troubleshooting section under "AUTO POSITION DOES NOT LEVEL THE COACH".

NOTE: Do not move around the inside of the coach while levelers are operating. This will reduce system effectiveness.

Leveling Manually

1. Press the ON/OFF button to activate the system. (ON/OFF)
2. Press the EXT and ALL buttons simultaneously. This will extend all levelers to be in contact with the ground.

3. Press the EXT button. This will activate the system to extend levelers in pairs. The yellow EXT LED will stay illuminated.

4. Press the and hold the correct button to raise the desired side of the coach: FRONT, REAR, DRIVER, PASS.
5. Repeat step 4 until the coach has reached the desired position.

6. If during this process any levelers are extended further than desired, any pair of levelers can be retracted to compensate. To perform this procedure, press the RET button. The yellow RET LED will stay illuminated.

7. Press and hold the correct button to lower the desired side of the coach: FRONT, REAR, DRIVER, PASS.

NOTE: Levelers cannot be manually retracted past the point of initial ground contact.

8. Control pad may be turned off at this time by pressing the ON/OFF button, or will turn off automatically after 5 minutes.

TO RETRACT

1. Ensure slideout rooms are fully retracted (in their inboard position).
2. Press the ON/OFF button. (ON/OFF)
3. Simultaneously press the ALL and RET buttons and release. Levelers will retract automatically to their fully retracted position. The Levelers will not all start or finish retracting at the same time.
   - If Air Bags are enabled on your unit, there will be a 50 second delay to fill the air bags before leveler movement will occur. The RET and WAIT-PROCESSING lights will blink during this delay. The leveler indicator LEDs will blink red when the levelers are moving.

- ENGINE RUNNING
- PARK BRAKE ENGAGED
- PARK/NEUTRAL
- LOW VOLTAGE
- WAIT- -PROCESSING

4. Once levelers are fully retracted, level indicator LED will be solid green.

NOTE: After operating levelers, the position LEDS for all the levelers must be solid green before the vehicle is moved. A visual examination of all the levelers outside the motor home is recommended to insure levelers are fully retracted.

⚠ CAUTION

PRODUCT DAMAGE

- Do not move vehicle until levelers are fully retracted.
- Damage can occur to levelers, coach and surrounding property if the levelers are not fully retracted prior to vehicle being moved.

5. Control pad may be turned off at this time by pressing the ON/OFF button, or will turn off automatically after 5 minutes. Revision 2 boards will turn off after 30 seconds.

These controls have the following features to facilitate leveling:

- **OPTIMIZING STROKE**
  A mathematical calculation using the percentage of currently available stroke determines when to extend and when to retract levelers during the AUTO feature to maximize use of total stroke, enabling the system to level more efficiently and effectively.
- **FULL EXTENSION**
  If a leveler is fully extended, its corresponding LED will indicate this and further operation of that pair of levelers in the extend direction is prevented. If the switch is held on, the second leveler of the pair will operate with its alternate pair partner leveler. (i.e., if the front two levelers are extending and the left front leveler becomes fully extended, the right front leveler will continue to operate and the right rear leveler will start to extend.) This is to keep the frame from twisting.
- **LOAD COMPENSATION**
  If one leveler becomes disproportionally more loaded than its pair partner, power will shut off to the first leveler. The second leveler will continue to operate until the load is more balanced between the pair of levelers. Power to the first leveler will then resume.
- **KISS THE GROUND**
  After AUTO positioning is complete, the system will briefly run each leveler one at a time to confirm contact with the ground and improve coach stability.

SYSTEM PROTECTION FEATURES

Emergency Retract

- Anytime the engine is on, if the vehicle brake is depressed and transmission is taken out of PARK/NEUTRAL, the levelers will fully retract automatically.
- During emergency retraction, an alarm will sound and all LEDs will blink on and off.

Nine Cycle Maximum

- The controls will shut off for about 15 minutes any time nine (9) RET ALL commands are completed in less than 30 minutes.
- When this occurs, all vertical signal lights blink off and on.
- This sequence can be overruled by turning the ignition off and disconnecting power from the control board for one minute, then reconnect power.

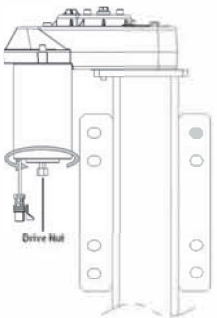
((•)) ENGINE RUNNING
((•)) PARK BRAKE ENGAGED
((•)) PARK/NEUTRAL
((•)) LOW VOLTAGE
((•)) WAIT- -PROCESSING

Low Voltage Protection

- The system will not allow any operation to begin unless battery voltage is above 12.5V DC. The low voltage LED will flash to indicate this.
- If the voltage falls below 10V DC during any operation, leveler operation will cease and the low voltage LED will flash.
- Controls will be inoperable until battery voltage climbs above 12.5V DC, at which time leveling functions will resume.

Manual Override

- To Manually Extend or Retract Leveler, use a ½" socket to drive the nut on the end of the motor.
- Rotate nut clockwise (looking from bottom end of nut) to extend the 15K levelers, and counter clockwise to extend the 7.5K or 10K levelers. (see leveler index p. 24 to identify levelers)
  A. It takes approximately 500 revolutions of nut to extend/retract leveler 1".



NOTE: If levelers are ever operated in this way, HOME position must be reset. To do this, refer to the TROUBLESHOOTING section under "RET ALL DOES NOT FULLY RETRACT LEVELERS".

⚠ CAUTION

PERSONAL INJURY/PRODUCT DAMAGE

- Battery operated drills, 9.6V to 18V, are powerful. Hold drill with both hands to protect your wrist. Keep loose clothing and body parts away from drill as the reaction torque from the drill may cause it to kick back.
- Refer to your drill manufacturer's operation manual.
- Do not over extend or over retract levelers. Each leveler has built in stops. Excessive force applied against the stops will cause damage.
- When manually overriding the leveler do not use pneumatic tools to operate any leveler. They can over-extend or over-retract the leveler.
- If the motor will not extend/retract the leveler and the motor is making a ratcheting sound (clutch slipping), do not use the manual override. Immediately contact an Atwood Service Center and have leveler replaced. Do not use the leveler until replaced.

MAINTENANCE

1. Internal parts of leveler are permanently lubricated at the factory and do not require any further lubrication.
2. If it is not possible to get levelers to operate freely, replace leveler.
3. Should problems or questions arise, contact your dealer, camper manufacturer, or the Lippert Components Consumer Service Department at (574) 537-8900.

This document has been modified from the original Atwood Rev. 0 DEC10 release. All former references to the Atwood warranty and contact information were removed.

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

This guide is only intended for use on Atwood products by service technicians who have successfully completed Atwood training. This guide should be used in conjunction with the appropriate Instruction Manual provided with the product and any applicable Industry Standards. This is not intended to be a complete list. Please direct questions concerning service of this product to the Lippert Components Customer Service department at 574-537-890 0 .

⚠ WARNING

PERSONAL INJURY AND/OR PRODUCT DAMAGE

- If any of the following conditions develop, the RV must not be used until proper corrective action is taken.

CAUSE WITH SOLUTIONS

CONTROL PAD WILL NOT TURN ON

- No power to control pad
  1. Insure vehicle engine is running, transmission is in PARK and park brake is set.
  2. Turn off ignition for 30 seconds, then turn back on. If this does not work:
     i. Check wiring between control pad and control board.
     ii. Compare the terminals to the diagram of the Control Pad wire harness on page 25. If the power or ground wires are switched, the control pad or board could be damaged.
     iii. Turn off ignition, disconnect power on the control board (labeled P1 VBATT towards the front of the vehicle) for one minute and then reconnect. Make sure to connect power before turning on ignition.
  3. If the control pad still does not turn on, then change the dip-switch configuration to a "DEAD POSITION" setting. Refer to page 6 for a diagram of these configurations.
  4. The control pad leveler position lights should scroll left to right.
  5. If the lights do not scroll, then check the fuse to the ignition terminal at the control board.

SCROLLING LIGHTS ON CONTROL PAD

- Communication between control pad and control board lost.
  Check wiring between control pad and control board.

RED AND GREEN LIGHTS COME ON FOR LEVELERS DURING INSTALL PROCEDURE

- Incorrect wiring
  1. Press EXT and the two directional buttons that make up the position of that leveler. If the leveler moves for about 0. 25-0.5 seconds and then stops, the wiring could be incorrect.
     i. Check that the correct leveler moves when EXT and the two directional buttons that make up the position of that leveler are pressed.
  2. Check that the power wires for the levelers are connected to the correct terminals on the control board.
  3. Check that each of the SENSOR CONNECTOR wires are connected to the correct terminal at the control board.

LEVELER CONTINUES TO "CLUTCH"

- Leveler replaced or operated separate from control pad (manually operating nut or supplying direct power to the leveler)
- If the system does not beep an "error mode"
  1. Put system in error mode by disconnecting one leveler from power and pressing RET and ALL.
  2. Reconnect leveler to power.
  3. Manually extend levelers for 30 seconds by either:
     i. Simultaneously pressing the EXT button and the two directional buttons that make up the position of a single leveler.
     ii. Simultaneously pressing the EXT button and one directional button in order to move the two levelers on that side. Levelers will stop moving if a button is released.
  4. Listen to insure all levelers move when manually activated.
  5. Press RET and ALL to retract all levelers.
- If the system beeps an "error mode"
  1. Press ON. This will shut the warning alarm off.
  2. Make sure all levelers are at least 2" extended from full retraction. Manually extend the levelers for 30 seconds as shown in step 3 above if they are not.
  3. Press the RET and ALL buttons. Wait until all four leveler indicator LEDs are solid green. The system is now out of error mode and ready for normal operations.

RED AND GREEN LIGHTS COME ON FOR A SPECIFIC LEVELER LOCATION

Loss of power or signal to leveler

1. Manually extend the individual leveler by holding down the EXT button and the two directional buttons that make up the location of that leveler. Listen to insure all levelers move when manually activated. Press RET and ALL to retract all levelers.
2. If levelers do not move, inspect wiring at levelers and at control board to insure proper connection.
3. If levelers briefly move (0.5 seconds) and then stop, inspect signal wiring at levelers (smaller wires at the top of the motor and at control board) to insure proper connection.

- Overcurrent due to binding moment
  1. If the system has not been used in a substantial amount of time (more than two weeks), a binding moment in one of the levelers could develop.
  2. To proceed, manually operate the discrepant leveler for 15 seconds by holding down either the EXT button (if leveler is in a retracted position) or the RET button (if the leveler is in an extended position) and the two directional buttons that make up the location of that leveler. Insure that levelers move when activated.
  3. Simultaneously press RET and ALL to retract all levelers. This should reset the system.

ALL VERTICAL SIGNAL LIGHTS BLINK ON AND OFF

- Nine cycle protection: If nine RET ALL sequences are completed within 30 minutes, the system will lock out for 15 minutes. To resolve, either:
  i. Wait 15 minutes until the system becomes unlocked, or
  ii. Turn off ignition, then disconnect power from the control board for 1 minute. Make sure to reconnect power to the control board before restarting ignition.

LEVELERS WILL NOT MOVE

- No power or signal to levelers
  1. Insure vehicle engine is running, transmission is in park and park brake is set.
  2. If emergency stop was activated by pressing any control pad button, (the four control pad lights should be blinking green) press RE T and ALL to reset legs.
  3. The system will never let you manually retract levelers past the point where they originally touched the ground. Try manually extending pairs of levelers by pressing EXT and then the directional button of the side of the coach that needs to be lifted.

- Emergency stop of AUTO sequence
  1. If any button was pressed during the Auto Position sequence, movement of all levelers will immediately stop.
  2. To resolve, simultaneously press RET and ALL. This will reset the system.

AUTO POSITION DOES NOT LEVEL THE COACH

- If the control pad gives a signal that an unsuccessful level sequence was completed (rotating red circle of lights).
  1. Turn off the control pad by pressing the ON/OFF button. Press the ON/OFF button again to turn the control pad back on. If one of the lights is solid red, a leveler has reached its limit, meaning:
     i. The ground is too uneven. Find a more level spot and try again. The EXT and RET lights will blink together if the ground is too sloped.
- If the control pad gives a signal that a successful leveling sequence was completed (rotating green circle of lights for 5 seconds), but the coach is still not level:
  1. The last position in memory was not level. Leveler System always returns to the position in memory.
  2. Press the AUTO button again.
  3. If no levelers move, check the orientation of the control board. The control board must be mounted horizontally, on a solid fixed surface and can not be more than 10 degrees out of level.
  4. Manually set coach to desired position and program position into memory, following the steps on page 14.

NO LEVELERS MOVE WHEN AUTO IS PRESSED

- An Auto Position is not set (control pad lights will blink)
  Set the Auto Position, referring to page 14.
- Excessive tilt
  1. The yellow EXT and RET lights will blink together if the chassis is located on sufficiently sloped ground.
     i. The EXT and RET lights will blink slowly as a warning if the chassis is more than 4° out of level
     ii. The EXT and RET lights will blink quickly if the chassis is more than 6° out of level. The system will not run an AUTO sequence in this case. To proceed, do one of the following:
        a. Move the unit to more level ground and try again.
        b. Simultaneously press EXT and ALL to get the levelers on the ground, then manually level the unit as defined on page 16.

PANEL LIGHTS BLINK "ON" AND "OFF"

- An Auto Position is not set
  Set the Auto Position, referring to page 14.

TRANSMISSION LIGHT WILL NOT COME ON

- Transmission light will not come on if the Low Voltage light is blinking.
- Chassis wiring fuse problem.
  Check fuse on chassis fuse box.

FALSE RET (FULL RETRACTION) ERROR MODE

- Every 50 cycles, the levelers will relearn where the fully retracted position is. If this is more than 4" different than before, the following occurs:
  1. Warning alarm will sound.
  2. Power is removed from the control box disabling normal operations. (This is done to encourage operator to do a visual inspection of levelers prior to further leveling operations.)
  3. The red and green LED's for the particular leveler will blink on and off to indicate the system is in an error mode.
- To proceed:
  1. Press "ON". This will shut the warning alarm off.
  2. Visually inspect the leveler.
  3. If it is required, activate levelers to correct problem. Simultaneously press the EXT or RET mode button along with the adjacent two (2) leveler buttons common to the lit LED's. In error mode, any leveler can be activated in this manner.
  4. Complete an ALL RETRACT operation and system is now out of error mode and ready for normal operations. Make sure that all levelers are at least 2" extended before retracting.

RET ALL DOES NOT FULLY RETRACT LEVELERS

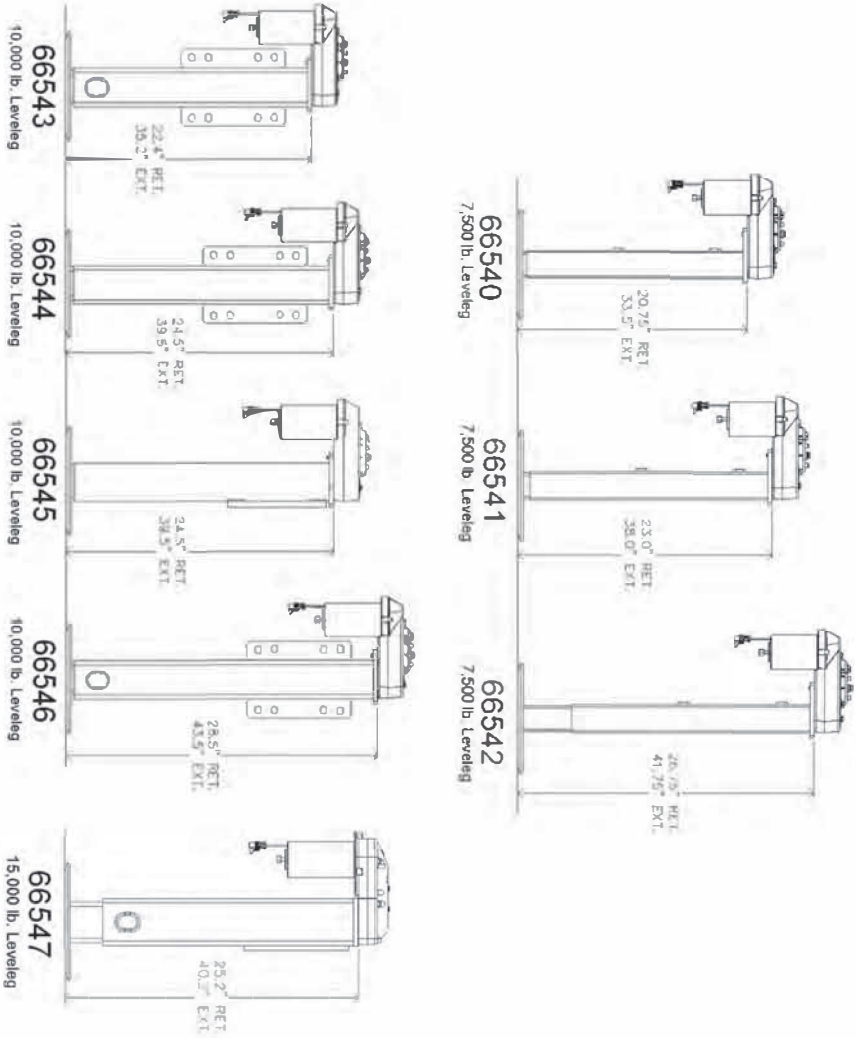
- If all leveler indicator lights are solid green, reprogramming the HOME position is necessary. To do this:
  1. Simultaneously press the EXT and ALL buttons. The leveler indicator lights will all blink green when this is finished.
  2. Disconnect power from one of the levelers.
  3. Simultaneously press the RET and ALL buttons. This will send the disconnected leveler into error. The leveler indicator lights will blink green and red, and an alarm will go off.
  4. Press ON/OFF to turn off the alarm and to turn on the control pad.
  5. Reconnect the leveler to power.
  6. Press the RET and ALL buttons simultaneously. Leveler indicator lights will blink red while moving. Wait until all leveler indicator lights are solid green. You may hear a brief clutch from each leveler. The new HOME positions should now be programmed.
  7. Visually confirm that the levelers have fully retracted.
- If any leveler indicator lights are blinking green, this means there was an emergency stop during the "retract all" process. To proceed:
  1. Press the RET and ALL buttons simultaneously. Leveler indicator lights will blink red while moving. Wait until all leveler indicator lights are solid green.
  2. Visually confirm that the levelers have fully retracted.

SYSTEM IS BEHAVING STRANGELY

- If levelers commonly clutch in extend or do not extend as far as they should be able to, the Dip Switches may have been configured incorrectly.
- Refer to page 6 and compare the unit's leveling system with the dip-switch configurations.

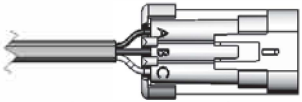
INDEX

Leveler Index

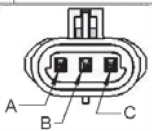


Harness Index

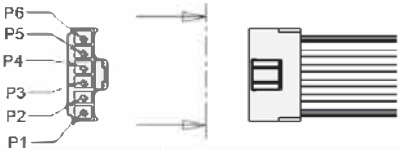
Sensor Harness



PIN #	COLOR	SIGNAL
A	BLACK	GROUND
B	RED	POWER
C	WHITE	PULSE



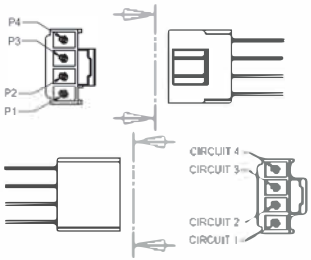
SENSOR CONNECTOR



PIN #	DESCRIPTION	COLOR
P1	POWER	RED - SAME ON ALL
P2	DRIVER FRONT	WHITE WITH (BLUE) TRACE COLOR
P3	PASSENGER FRONT	WHITE WITH (RED) TRACE COLOR
P4	DRIVER REAR	WHITE WITH (GREEN) TRACE COLOR
P5	PASSENGER REAR	WHITE WITH (BROWN) TRACE COLOR
P6	GND	BLACK - SAME ON ALL

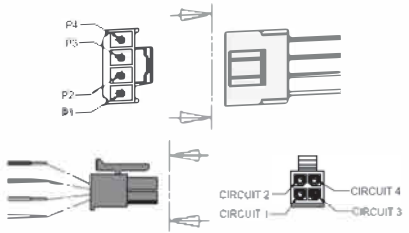
NEW TOUCH PAD HARNESS

CONTROL PAD WIRE HARNESS			
PIN # (LEFT SIDE)	DESCRIPTION	COLOR	PIN # (RIGHT SIDE)
P1	DUT TX (Touch pad RX)	WHITE	CIRCUIT 1
P2	DUT RX (Touch pad TX)	GREEN	CIRCUIT 2
P3	POWER	RED	CIRCUIT 3
P4	GND	BLACK	CIRCUIT 4



OLD TOUCH PAD HARNESS

CONTROL PAD WIRE HARNESS (ALTERNATE)			
PIN # (LEFT SIDE)	DESCRIPTION	COLOR	PIN # (RIGHT SIDE)
P1	DUT TX (Touch pad RX)	WHITE	CIRCUIT 1
P2	DUT RX (Touch pad TX)	GREEN	CIRCUIT 3
P3	POWER	RED	CIRCUIT 2
P4	GND	BLACK	CIRCUIT 4



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