



Operation Guide



Operation Guide

Hydraulic Leveling Systems #2000, #2010, #3000, and #30130

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Introduction

The Level Best leveling and stabilizing system is an electronically controlled/hydraulically operated unit that consists of a 12 volt DC powered motor/pump/manifold assembly with fluid reservoir, hydraulic hoses, four hydraulically operated jacks, a control unit with switch panel, and optional level sensor unit and pressure sensor. It is designed to meet the varying requirements of vehicles ranging from class "C" motorhomes to the large class "A" motorhome.

If, after thoroughly reading this manual, you still have questions in regard to the operation and maintenance of the Level Best system, please contact the Lippert Components Customer Service Department at 1-574-537-8900.

WARNINGS



Do not use the Level Best system as a lift for changing tires or working under the vehicle.

Never check for hydraulic fluid leaks using your hands and/or any other body part. The leaking fluid is under pressure and is capable of cutting and penetrating your skin resulting in severe injury.

When extending the rear stabilizers, do not lift the wheels beyond ground contact. This overrides the braking effect of both the transmission park and parking brake. Without this braking, it is possible for the vehicle to roll unexpectedly forward (or backward) off the jacks. This could cause severe injury or even death.

Holding a control switch in the "extend" or "retract" position for a time period longer than necessary to fully extend or retract the hydraulic cylinders, can cause overheating and damage to the pump motor as well as the electrical components.

Do not use the leveler as an emergency brake, They are not designed for any type of vehicle braking purpose.

Do not use the levelers on icy or slick surfaces on which the foot pads may slip.



IN THE EVENT OF ACCIDENTAL EXTENSION

1. Bring the vehicle to a safe and complete stop as soon as possible.
2. Turn the leveling systems power switch on and press the all up switch.
3. Visually inspect the vehicle undercarriage for any problems.



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NOTE: To prevent improper operation of the leveling system, which could result in damage to the levelers and/or the vehicle itself, read the operating instructions carefully before using the leveling jacks.

Operation

The Level Best system performs the dual function of leveling the vehicle and, once a level plane has been achieved, stabilizing the vehicle. When leveling the vehicle, it may not be necessary to use all of the leveling jacks however, to stabilize the vehicle, all jacks should be extended to contact the ground.

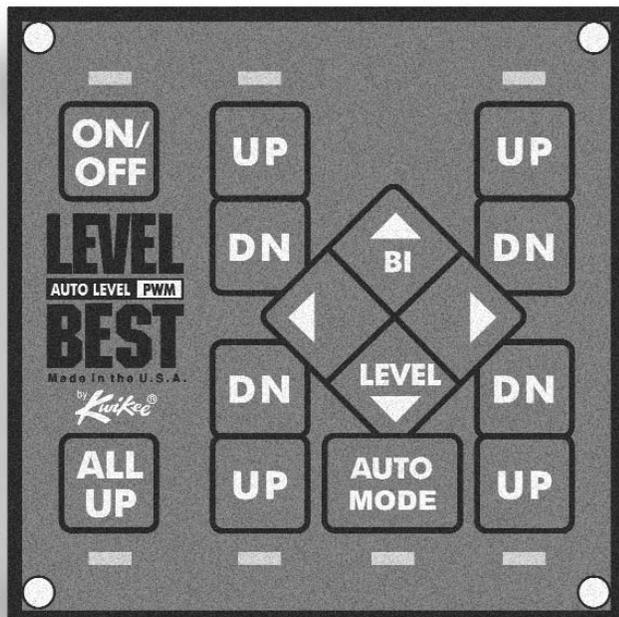
SITE SELECTION

1. When selecting a site for parking the vehicle, choose a spot that is as flat as possible - this will minimize the extent of leveling.
2. Check that the area under the vehicle is free from any obstacles that might interfere with the operation of the levelers. Check the ground surface to assure the leveler feet have a flat solid surface for contact. When parking on grass, soft dirt and/or uneven terrain, it is advisable to extend the surface area of the leveler feet by using pads. These pads can be from 3/4" plywood, cut into 12" squares.

NOTE: In occasional adverse driving conditions, it is possible for mud, ice and other debris to accumulate around the leveler units. This debris may interfere with the operation and should be cleaned off prior to using the system.

CAUTION: Do not compensate for uneven terrain by using pads that are thicker than 3". Pads that are thicker than the leveler's vertical ground clearance can prevent breaking contact with the ground when retracting. This can result in damage to both the levelers and the vehicle.

Figure 1: Fully-automatic touchpad control panel shown.



The control panel consists of switches and light emitting diode indicators (**Figure 1**).

The switches include main power ON/OFF, all jacks retract (ALL UP), a diamond shaped switch for bi-lateral leveling (BI-LEVEL), and four (UP/DN) switches for independent extension and retraction of the jack legs. The position of the UP/DN switches correspond to the position of the jack legs on your motor home, with the front of the vehicle indicated by the top of the panel.

The AUTO LEVEL switch only appears on motor homes equipped with fully-automatic leveling.

Control Panel Functions

The ON/OFF switch, located in the upper left hand corner, controls the supply of power for all panel functions, activation of this switch is indicated by its green LED.

The ALL UP (leg retract) switch is located in the lower left hand corner of the control panel. Activation of this switch causes all legs to retract to the travel position. When the retract sequence is completed the ALL UP LED will turn green to indicate that it is now safe to move the motor home.

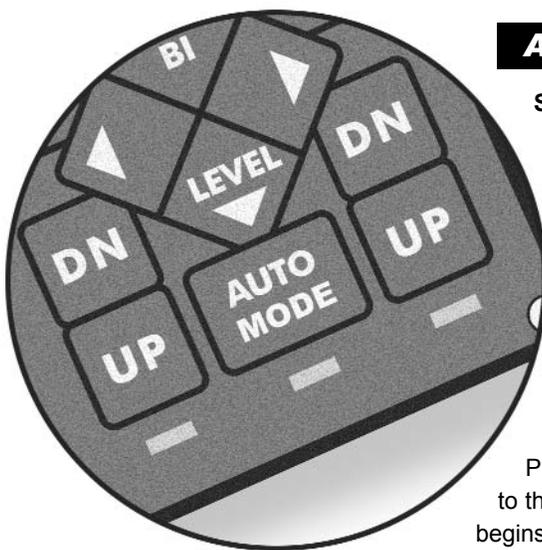
The diamond shaped BI-LEVEL switch, located in the center of the panel, activates the extension of the leveling jacks in pairs. Use of this switch greatly simplifies the leveling process and significantly reduces the amount of stress created by the leveling process on the motor home. Operation of this switch illuminates the yellow LED's corresponding to the jacks that are being activated. The LED will illuminate in manual version only.

The four UP/DOWN switches control the leveling jacks independently. Pushing these switches operates the corresponding jack causing it to retract (UP) or extend (DN). Operation of this switch lights the yellow LED corresponding with the jack activated. The LED will illuminate in manual version only.

Manual Leveling

To stabilize the vehicle once it has been leveled, any unused leveler must be extended into firm contact with the ground. Accomplish this by using the appropriate individual leg leveling switch so as not to affect the level of the coach.

CAUTION: Overextending the levelers during stabilizing will cause the vehicle to become unlevel and result in a loss of stability. If a leveler has been overextended, press the 'up' portion of the respective switch until the vehicle lowers into the level plane again. Do not attempt to use the other levelers to raise the vehicle to a higher level plane.



Automatic Leveling

SEMI-AUTOMATIC FUNCTION When an AUTO MODE sensor is connected to a manual control, the jack indicator lights act as an indicator of the level condition of the coach. A light that is 'on' indicates the high corner of the coach. Push the BI-LEVEL pair button corresponding to the end of the coach you would like to raise. When the light comes 'on', stop the action of that button. In this way the jack indicator lights act as a bubble-level, indicating the level condition of the coach.

FULLY-AUTOMATIC FUNCTION Coaches equipped with AUTO MODE can be operated the same as manual or semi-automatic versions. The fully-automatic unit functions the same until the AUTO MODE switch is pressed. Pushing the AUTO MODE switch causes the system to extend a pair of jack legs to the ground. Next the other pair of legs is extended to the ground and the system begins the auto level sequence. During the auto level sequence the system will run one to three of the jacks depending on the level condition of the coach. On completion, the system will check the level condition of the coach and either re-run the sequence or display a green LED light under the AUTO MODE button to indicate that the sequence is complete. Typical coach level capability is 0.3 degrees from side to side and front to rear.

NOTE: To prevent the possibility of damaging the levelers and/or vehicle, it is good common sense to confirm the retracted position by visual inspection.

Stabilizing

Observing the precautions set forth on the previous pages of this manual, you are now ready to begin leveling your motor home. With the vehicle engine running, place the transmission in park and set the parking brake. Securely block the wheels using wheel chocks.

Locate the "ON/OFF" button on the upper left of the control panel. Momentarily depress this switch to activate the leveling system. The LED will light up and be a steady green indicating that the system is ready. If the LED lights up and is flashing, it is an indication that the parking brake is not completely engaged or the transmission is not in park.

Reference you're leveling tool to determine which corner of the motor home is lowest. Using one of the "BI-LEVEL" switches which represent the front and rear of the motor home. Use the switch that corresponds to the low end of the motor home. Depress and hold the switch to raise the sides of the motor home until level. Now find and depress the "BI-LEVEL" switch which represents the low side of the motor home, and hold it until the front and rear of the motor home are level.

Your motor home should now be in a level plane. If the coach has settled slightly, you should fine-tune your position by using the individual leg leveling switches. Push the "DN" portion of the switch to raise the vehicle and the "UP" portion to lower the vehicle.

Retracting the Levelers

1. Start the chassis engine and turn the control panel power switch on. If any levelers are extended, the control panel will emit a warning beep and the red "ALL UP" LED will light up and flash.
2. To retract all levelers simultaneously, press the "ALL UP" switch. To retract each leveler individually, press and hold the "UP" side of the respective leg switch. Using the "ALL UP" switch is the recommended method of retracting the levelers to assure even retraction at all four leveler locations and eliminate the possibility of twisting the chassis frame.
3. When all leveler legs retract to the travel position, the red "ALL UP" LED will turn green, and the pump will shut off. You can now turn off the power switch and the vehicle is ready to travel.

NOTE: During periods of vehicle inactivity and/or storage, the leveling system should be activated and cycled through the leveling/retracting procedures on a monthly basis to keep the levelers in good operating condition.

Setting Level Sensor (if so equipped)

Turn on the coach ignition and press the ON/OFF button on the control. The two top indicator lights above the right and left front jack buttons will start flashing. The lights indicate the warm up cycle of the level sensor. After the warm up cycle the lights will stop flashing. The cycle usually lasts between 2 and 10 minutes depending on outside temperatures and whether it was previously run. The control will time-out every 60 seconds but the level sensor will continue to go through the warm up cycle anytime the ignition of the coach is on.

When the warm up cycle is complete, turn off the control by pressing the ON/OFF button. With the coach in a level attitude press and hold the ALL UP, BI-LEVEL FRONT and BI-LEVEL REAR buttons simultaneously. You should hear an audible beep. Turn the control back 'on' and all four indicator lights should now be lit indicating the level sensor is showing the coach to be level. If all four LEDs are not illuminated, repeat last 2 steps.

Care and Maintenance

The Level Best hydraulic leveling system should be routinely checked as part of a regular vehicle maintenance program. KwikEE recommends checking the system twice a year: in the spring prior to the heavy travel season and in the winter, prior to storage. The following checklist has been provided as a guideline for maintenance.

1. Be sure the leveling jacks are in the retracted position. Remove the breather cap on the reservoir and check the fluid level in the reservoir. The fluid level should be approximately 1" below the top of the reservoir. This standard provides an adequate amount of fluid for the levelers to operate efficiently. If the fluid is below this level, add a sufficient amount to bring the level up to the operating standard. When filling the reservoir, use transmission fluid only. We recommend Dexron III. Do not mix fluids.
2. Check wire connections at motor and valve manifold; should be tight and secure.
3. Check the valve manifold for any evidence of hydraulic fluid leakage. Replace any seals as needed.
4. Examine the hydraulic hoses for damage and/or leakage. Replace and resecure as needed.
5. Check hydraulic cylinders and leg assemblies for damage and/or leakage. Replace and/or repair as needed. Verify that all mounting bolts have been tightened to 80ft/lbs.

LED Positions



Standard Operating Codes

LED 7 green.

- *Jacks retracted fully.*

LED 7 red. Audible beep for approximately 8 seconds.

- *Jacks deployed.*

LED 6 green.

- *Unit turned 'on'.*

LED 6 flashes.

- *Park brake not set.*

LEDs 1 and 2 flash.

- *Level sensor in warm-up cycle.*

LED 5 green and audible beep.

- *Auto level sequence completed satisfactorily.*

Auto Level Error Codes

Alternating LEDs 1 and 2 'on', then 3 and 4 'on' etc.

- *Coach tilted too far front to back to level.*

Alternating LEDs 1 and 3 'on', then 2 and 4 'on' etc.

- *Coach tilted too far side to side level.*

LED 5 flashes red.

- *Jacks are out of stroke.*

LED 5 flashes green/red.

- *Lost communication with Auto Level Sensor.*

Troubleshooting

1. Panel does not function (buttons and lights do not work/system does not respond.)
 - *Ignition needs to be on with engine running*
 - *Transmission needs to be in park and parking brake applied.*
2. Red indicator light will not go out when legs are retracted.
 - *Reed switch(es) not grounded or reed switch is defective.*
3. The action of one cylinder will not operate in one direction (i.e., it will go down, but not up, or vice versa).
 - *Hydraulic hoses and/or wiring connections are crossed*
 - *Valve not operating.*
4. Jacks won't extend after they had been working previously.
 - *Directional valve is not shifting positions - possibly due to foreign object obstructing the valve itself, or the solenoid is not working properly.*
5. Pump continues to run after switch is released.
 - *Pump motor solenoid is stuck - tap solenoid to unstick it or replace the solenoid.*
6. To retract jacks with a control failure, see **Control Panel Jumper Instructions** on Page 7.

This list represents a cross section of some possible problems and the corresponding solutions. After reviewing the manual, if you still have problems or questions, please contact the Lippert Components Customer Service Department at 1-574-537-8900.

Control Panel Jumper Instructions

To be used in the event of a control failure.

1. Remove the control panel from the bezel and disconnect the wire harness. (See **Figure 2**.)
2. Make sure the area around and below the motorhome is clear of all obstructions and that no personnel are under the vehicle.
3. Plug the large connector of the jumper assembly into the wire harness (Figure 3.)
4. Plug the 4-way connector into the wire harness. **CAUTION: Pump will start immediately and the jacks will begin to retract.** (See **Figure 3**.)
5. After jacks have been fully retracted, immediately disconnect the 4-way connector on the jumper assembly from the wire harness to shut off the pump (**Figure 3**.) **Failure to immediately remove the 4-way connector can cause over-heating of the pump motor and permanent damage to the system.**
6. Remove the large connector of the jumper assembly from the wire harness.
7. Have jack system serviced at a qualified service center prior to using the jack system.

Figure 2: Disconnect the wire harness from the back of the control panel.

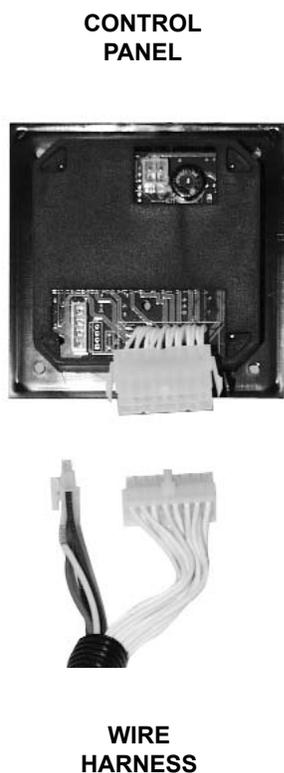
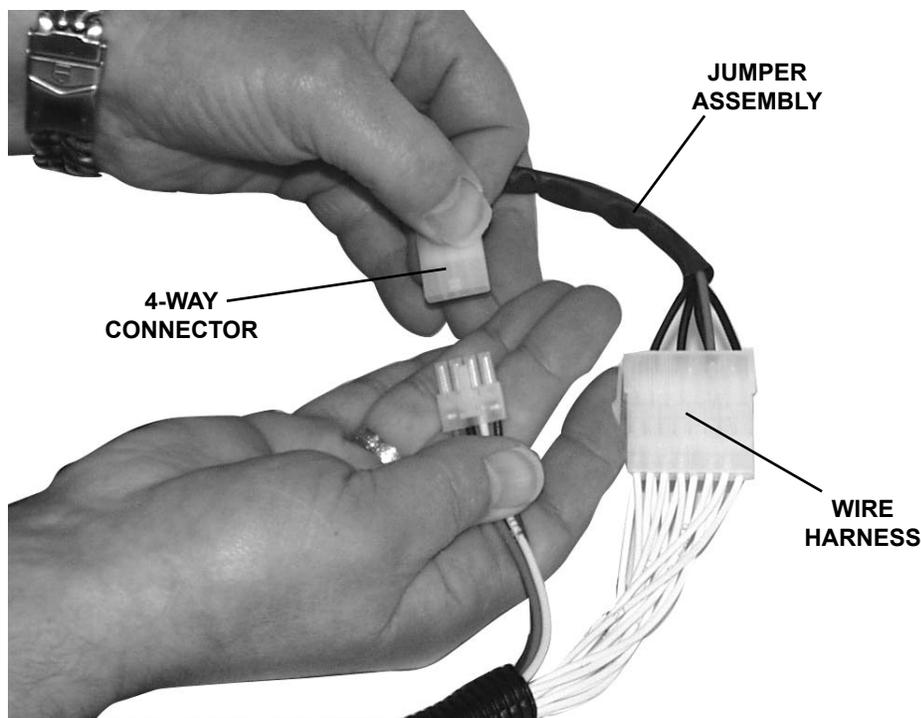


Figure 3: Attach the Jumper Assembly to the Wire Harness.



NOTE: Immediately disconnect the 4-way connector after the jacks are fully retracted. Failure to immediately remove the 4-way connector can cause over-heating of the pump motor and permanent damage to the system.