



Operation Guide



Operation Guide

[Hydraulic Leveling Systems #2000, #2010, #3000, and #30130](#)

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.

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.



Products Company, Inc.

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.

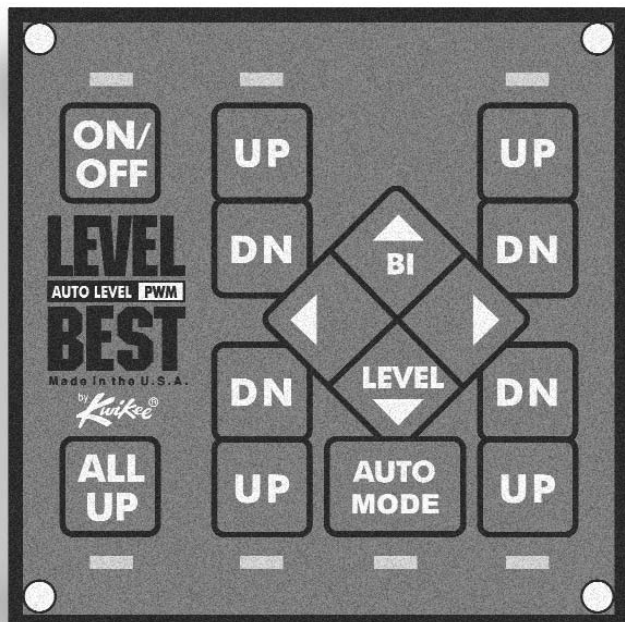
SITE SELECTION

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.

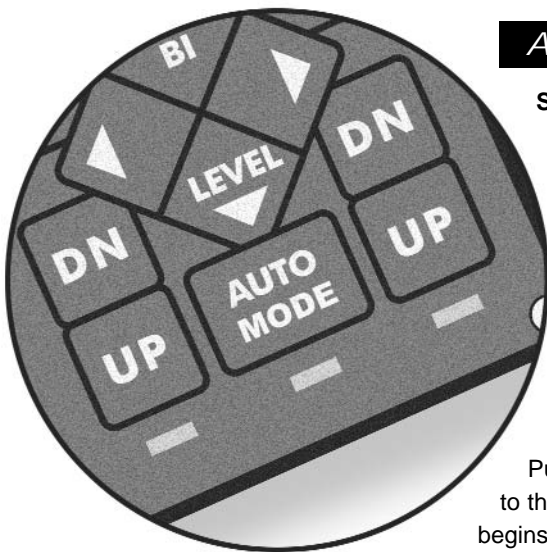
The diamond shaped BI-LEVEL switch, located in the center of the panel, activates the extension of the leveling jacks in pairs. Use of this switch greatly simplifies the leveling process and significantly reduces the amount of stress created by the leveling process on the motor home. Operation of this 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.

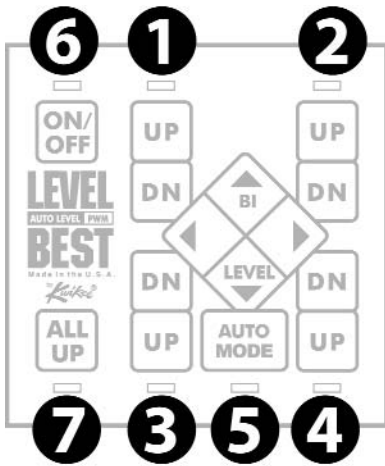
When the warm up cycle is complete, turn off the control by pressing the ON/OFF button. With the coach in a level attitude press and hold the ALL UP, BI-LEVEL FRONT and BI-LEVEL REAR buttons simultaneously. You should hear an audible beep. Turn the control back 'on' and all four indicator lights should 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**

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.

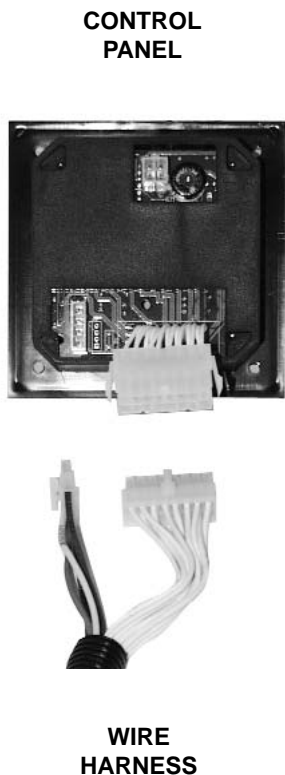
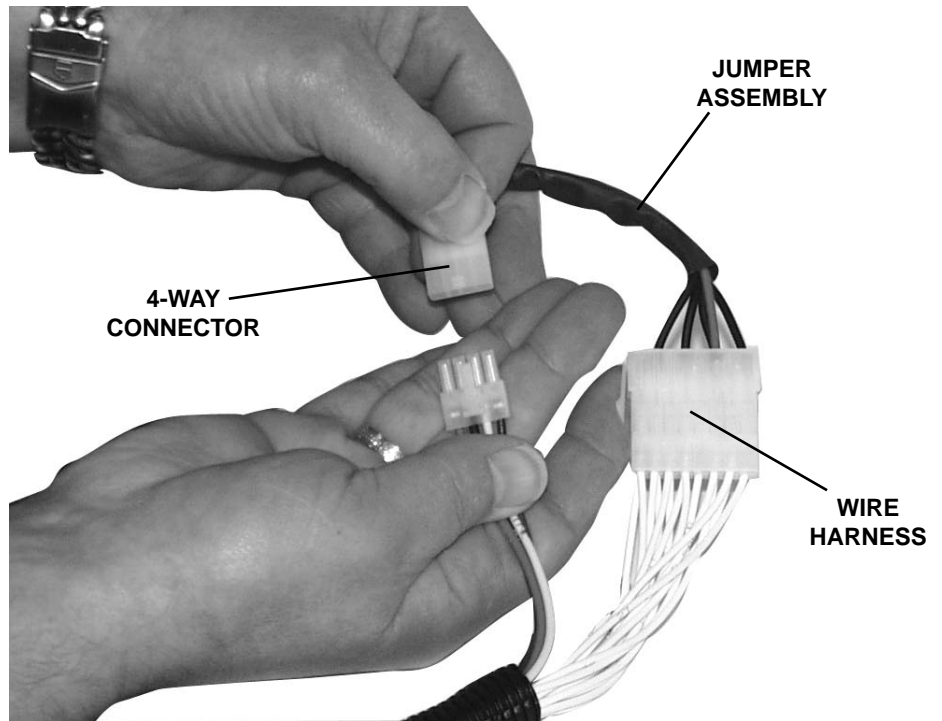


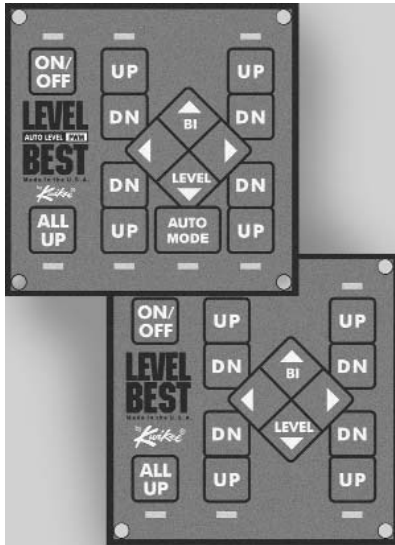
Figure 3: Attach the Jumper Assembly to the Wire Harness.



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.



Installation Instructions



Installation Instructions

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

Introduction

The Level Best 2000, 2010, 3000, 3010 leveling and stabilizing systems are electronically controlled, hydraulically operated units that consist of a 12-volt DC powered motor/pump/manifold assembly with fluid reservoir, hydraulic hoses, four hydraulically operated jacks, and a motor control unit and switch panel. The systems are designed to meet the varying requirements of class 'A' to class 'C' motorhomes.

The configuration of chassis and vehicular components can vary greatly from one manufacturer to another. The installation procedures outlined in this instruction sheet represent a generalized approach. Your installation application may vary.

Pre-Installation Planning

Prior to beginning the actual installation, examine the vehicle and visualize the mounting position of each of the systems main components:

- Motor/pump/manifold assembly
- Four hydraulic cylinders (for LB2000 and LB2010, 2 left hand/driver side, 2 right hand/passenger side)
- Control panel



Keep the lengths of hoses and wiring, as well as the physical dimensions of each piece in mind and plan accordingly. Locate the component pieces within the range of the hose lengths. Allow adequate clearance around each component to connect wiring and hoses and provide easy access for performing routine maintenance. See **Figure 1** for general physical references.

Motor / Pump / Manifold Assembly

MOTOR / PUMP / MANIFOLD ASSEMBLY LOCATION

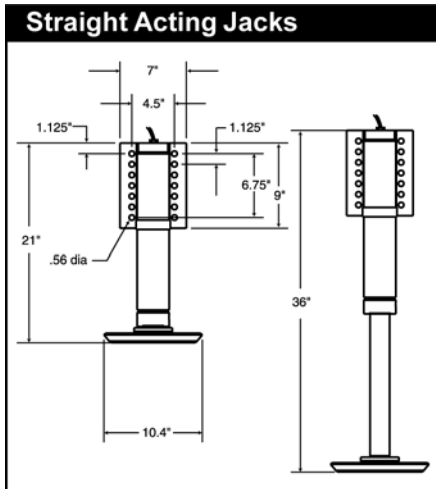
An ideal location for mounting the motor/pump/manifold assembly is immediately forward and below the engine radiator. Be sure not to restrict ventilation to the radiator cooling surfaces. This position should provide easy access to the vehicle battery and offer an accessible area for attaching the hydraulic hoses, making wiring connections and performing routine maintenance. Close proximity to the chassis battery is preferred.

JACK LOCATION

Examine the under carriage of the vehicle. You will notice that the construction of the chassis super structure includes two parallel frame rails extending almost the entire length of the vehicle. The ideal location for the rear hydraulic cylinders (or rear jacks) is along the exterior side of the frame rail and behind the rear axle, as close as possible and no more than 12" behind the rear spring hanger.

The ideal location for the front jacks is along the exterior side of the frame rail, behind the front axle.

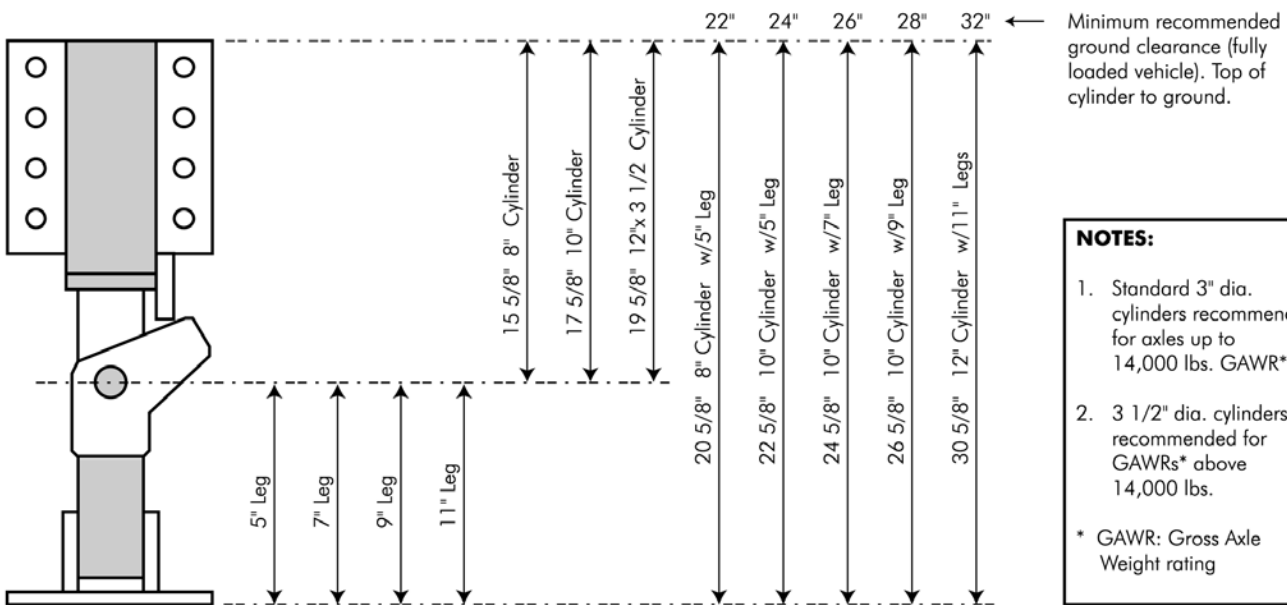
For Knee-acting Jacks: The pivot direction is toward the rear of the vehicle. Be certain the the jacks have adequate space to swing up and allow adequate space for the leg and footpad in the stowed position. (See **Figure 1**)



For Straight-acting Jacks: For lighter-duty chassis, Kwiikee recommends that jacks be positioned as close to the chassis cross member as possible (see **Figure 1**) If no cross member is near the selected jack location, a cross member can be attached between the frame rails to help strengthen the chassis. (Kwiikee can supply cross members for this purpose.)

NOTE: On a gasoline-powered chassis do not mount the rear jacks more than 12" behind the rear spring hanger.

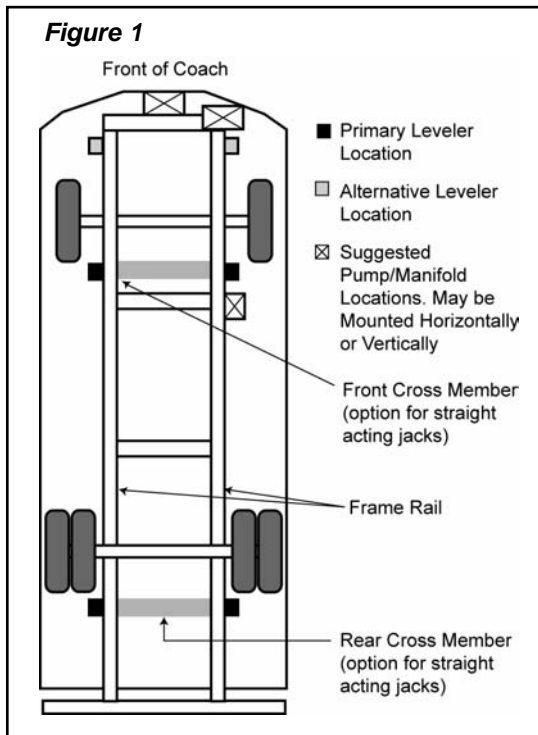
Application Guide: Knee Acting Jacks, LB2000 & LB210



NOTES:

- Standard 3" dia. cylinders recommended for axles up to 14,000 lbs. GAWR*
- 3 1/2" dia. cylinders recommended for GAWRs* above 14,000 lbs.

* GAWR: Gross Axle Weight rating

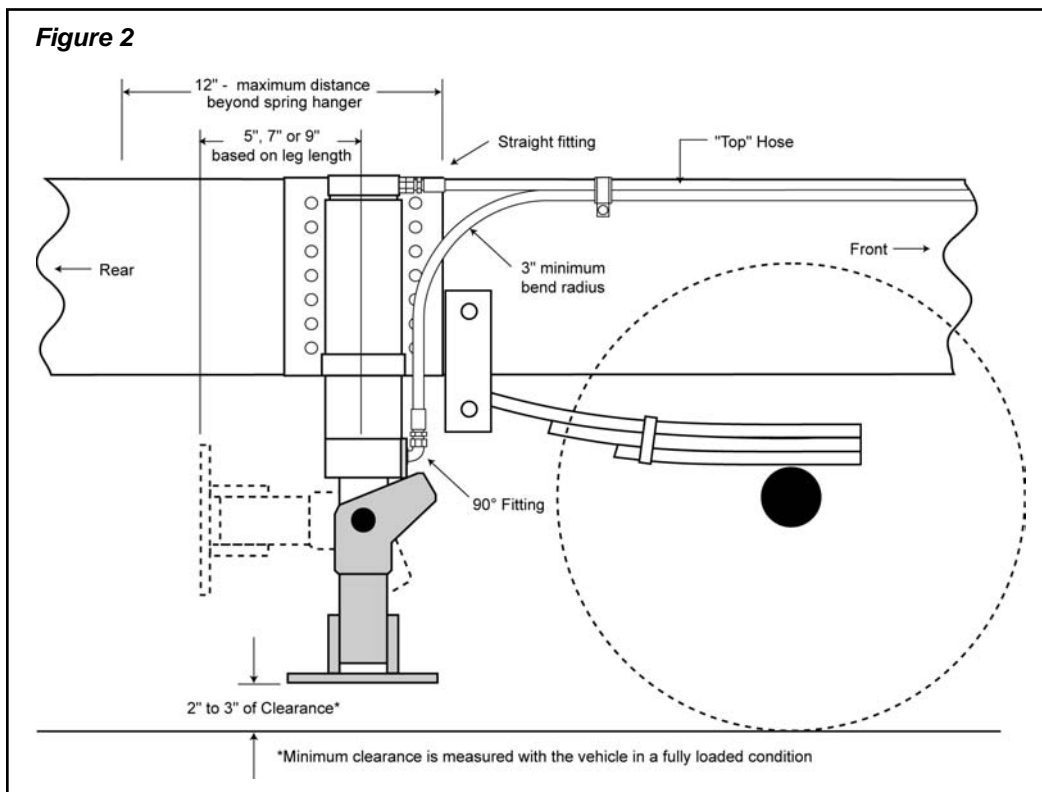


CONTROL PANEL LOCATION

In most applications, the control panel is situated either below or, if space is available, in the driver's instrument panel (dash board) or side panel. Access to these positions provides easy system operation and installation.

NOTE: Prior to initiating any installation/mounting procedure, read and understand the following important precautions:

- Read the entire installation procedure before beginning.
- Do not connect the power source (battery) until the installation of all components is complete.
- In many of the installation procedures, the initial fastening and securing of components is temporary. Later in the installation process, the components will be securely fastened.
- When routing and securing the hydraulic hoses and wiring, be sure that they are not exposed to engine exhaust or any other high temperature component of the vehicle. Any hose or wiring should be situated a minimum of 12 inches away from any heat source. If 12 inches of separation is not possible, it will be necessary to fabricate a heat shield/baffle to protect hoses and wiring. The heat shield should be composed of an appropriate, nonflammable, heat resistant material.
- Do not mount jack assemblies on 'Mor-Ride' suspension system components except when suspension is supplied with jack mounting plates.
- FOR KNEE-ACTING JACKS: During retraction, the pivot cam makes contact with the lifter plate which causes the leg/footpad assembly to pivot upward. Keep this area designed for stowing the jack leg clear of all obstructions.



Use only the hoses and fittings supplied by Kwiikee as part of the installation kit -- use of any other hoses and/or fittings will void the warranty.

NOTE: When the control panel has been installed and the wires have been routed, seal any holes you may have drilled from the interior to the exterior of the vehicle with a silicone sealant.



Control Panel Installation

One method of installing the control panel uses the mounting bracket to install it below the driver's instrument panel. If there is enough space, flush mounting the control panel into the vehicle instrument panel is another option.

First determine where the wires are to be routed. Look for any pre-existing holes that can be used to route the control panel wiring from the pump manifold to the control panel location. If no hole can be found, drill a 1 1/2" hole through the fire wall near the selected installation site. Route the wire through the hole to the control panel location.



Bracket mounting

Flush Panel Mounting Application (not shown)

Inspect the location for flush mounting the control panel and ensure that there is adequate space for the box portion of the control panel and the multi-wire cable connections. Using the template in **Appendix A**, layout and cut the opening. Route multi-wire cable through the opening in the dash and insert the connectors into the receptacles on the back of the control panel. The control panel should fit snugly into this opening. Remember, it is easier to cut the opening too small and enlarge it to fit than it is to cut it too large and have to fill the opening back in.

NOTE: Hydraulic lines will be routed to the top of the manifold. Be sure there is adequate working space above the manifold for making the hose connections.

NOTE: To prevent debris from entering the hydraulic system and damaging valve seals, the hose ends have been sealed with removable soft plastic plugs. Do not remove these plugs until you are ready to attach the hydraulic lines.

Mounting the Motor | Pump | Manifold Assembly

The motor/pump/manifold assembly requires an area 26" long x 12" x 12" deep for installation. See **Figure 3**.

The bottom of the pump has been tapped for mounting with two 3/8"-16 x 1 bolts. The assembly can be mounted horizontally or vertically. See **Figure 4**.

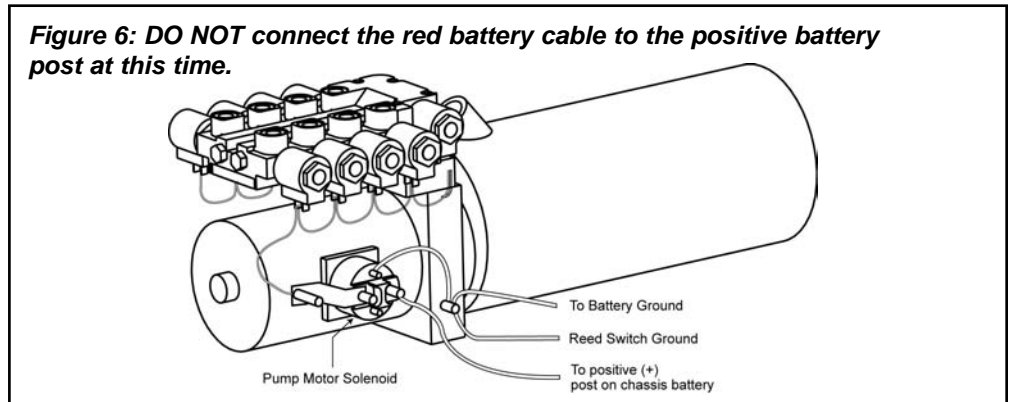
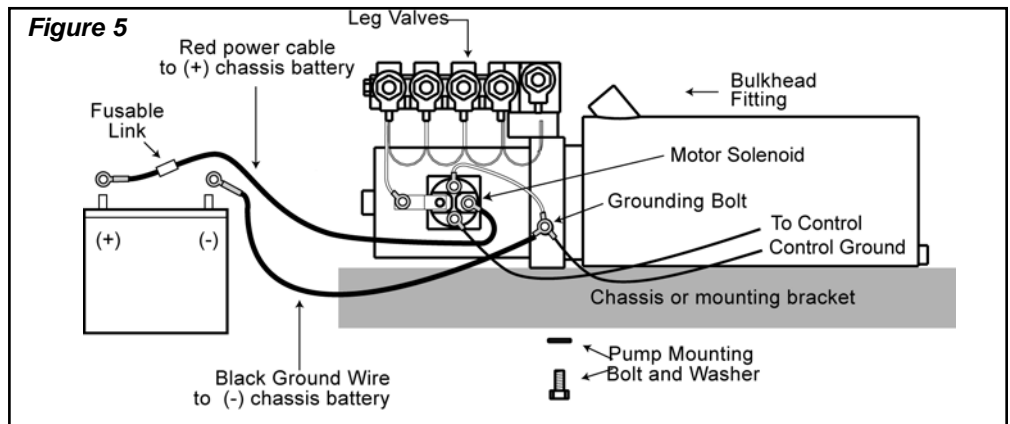
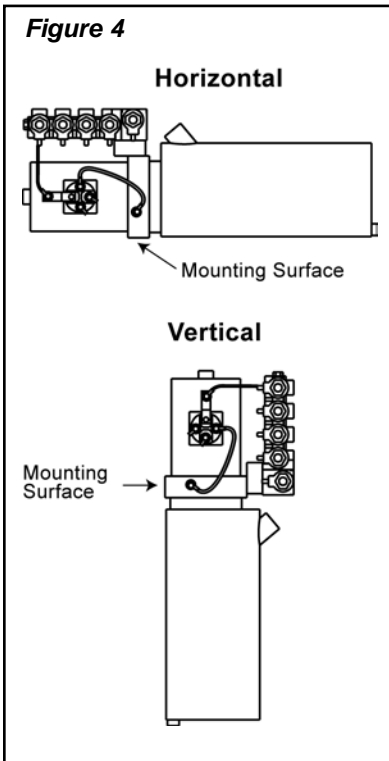
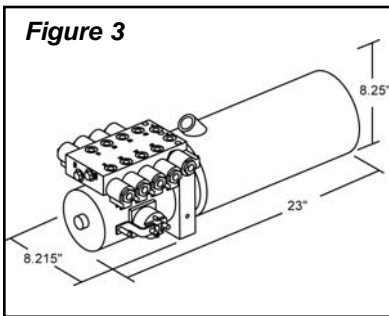
On a work bench, install the 45° hydraulic fittings into the manifold prior to mounting. Determine which direction the hoses will be routed and point the fittings in the appropriate directions.

For some applications the pump assembly can be mounted to an existing chassis cross member in front of, below, or beside the radiator. The location of the pump assembly should not block or restrict the flow of air to the radiator. Be sure there is sufficient clearance around the assembly to connect the hoses and wiring, as well as room for checking and filling the reservoir.

Once a position satisfying these conditions has been determined, align and drill two 1/2" diameter mounting holes, centered 3 1/4" apart. Position the pump/motor assembly over the mounting holes and secure it in place using the two 3/8"-16 x 1 bolts and lock washers. Attach the ground cable using the 5/16" bolt in the side of the motor mounting block. See **Figure 5**.

Next, route the other end of the black ground cable to the chassis battery and connect it to the negative (-) battery post. Connect the 8-foot long #4 red battery cable to the stud on the pump motor solenoid and route it to the chassis battery of the RV. The end of the cable with the fusible link should end at the battery. See **Figures 5 and 6**.

NOTE: Do not connect red battery cable to the battery post at this time.



Mounting Cylinder Assembly with Weld-on Brackets

CAUTION: When welding to the chassis rail use care to avoid damaging any of the chassis equipment. This equipment includes wiring, fuel, brake, hydraulic and/or compressed air lines. Always check the opposite side of the welding surface for anything that could be damaged by the heat from the weld.

CAUTION: Prior to welding on the chassis frame, any microprocessor controlled electronics such as engine monitoring devices and Kwikiee electric entry steps should be disconnected -- both power feed and ground connections.

Failure to disconnect any of these components can cause damage to the devices and void the warranty.

The standard bracket kit (Kwikiee part #9069480) will work with Chevrolet, Freightliner, Spartan, Ford and light-duty Ford chassis.

On newer Freightliner chassis, use of the factory Freightliner bracket is recommended.

On the Oshkosh and the F53 Ford chassis with the V-10 engine, it will be necessary to use a set of mounting brackets (Kwikiee part #906950000.) These brackets are required when the levelers are mounted over the leaf springs. These brackets space the levelers out from the frame rail so that during the extension of knee-acting jacks, the footpads will not contact the leaf springs when they swing down.

See **Appendix A** for additional mounting options.

Each cylinder assembly includes a mounting flange, hydraulic cylinder, leg assembly, and lifter plate (knee-acting jacks only.)

Knee-acting Jacks: Position the cylinder assembly to allow adequate space for the motion of the jack leg (5", 7", or 9" from the center of the cylinder depending on the length of the leg being used.)

For all Level Best systems: When using the mounting bracket, the top of the bracket should be flush with the top of the chassis. Placing the bracket flush with the top of the chassis will allow for maximum ground clearance. With these conditions satisfied, clamp and weld the mounting bracket in place.

With all four mounting positions prepared on the chassis frame, the next step is to partially assemble the hydraulic cylinder components.

On a work bench, install the 90° hydraulic fitting into the opening closest to the bottom of the cylinder. See **Figure 7**. Insert the nontapered end with the self-sealing 'O' ring into the cylinder. With the nipple pointing up, tighten the fitting in a range of 50-150 in./lb. Install the straight hydraulic fitting in the upper threaded opening and tighten to a maximum of 150 in./lb.

Return to the undercarriage with the cylinder assemblies. Place the cylinders onto the mounting brackets. On knee-acting jacks locate the assembly so that the legs pivot to the rear of the coach. Install and tighten the top two mounting bolts just enough to hold the cylinders in place.

From the uppermost position on the mounting bracket, hydraulic cylinders can be adjusted downward a maximum of 3" and maintain an adequate mount. This cylinder mounting adjustment range allows for fine tuning the system. When the cylinder is in its final mounting position, secure the mounting bolts to 80 ft/lb. Now install the middle and lower sets of bolts and tighten to 80 ft./lb.

Install the jack leg position sensor wiring. The jack leg position sensors are to be wired in series. Attach the yellow 16 gauge wire to TD1/jack reed switch wire located at the pump manifold harness. Use heat shrink butt connectors when making all of these connections. Run the yellow wire to the first jack leg sensor and attach the wire to one of the two sensor wires. Attach another yellow wire to the remaining wire at the sensor and run this wire to the next jack leg and sensor. Continue this process until all four sensors are connected. At the last sensor, attach the yellow wire to the remaining sensor wire. Run the other end of the yellow wire to the grounding bolt on the pump and connect with a 5/16" ring terminal. See **Figure 8**.

Figure 7: Use adequate hose lengths and observe recommended radius bends (3" minimum) to avoid kinks, flattened hose, and restricted flow capabilities.

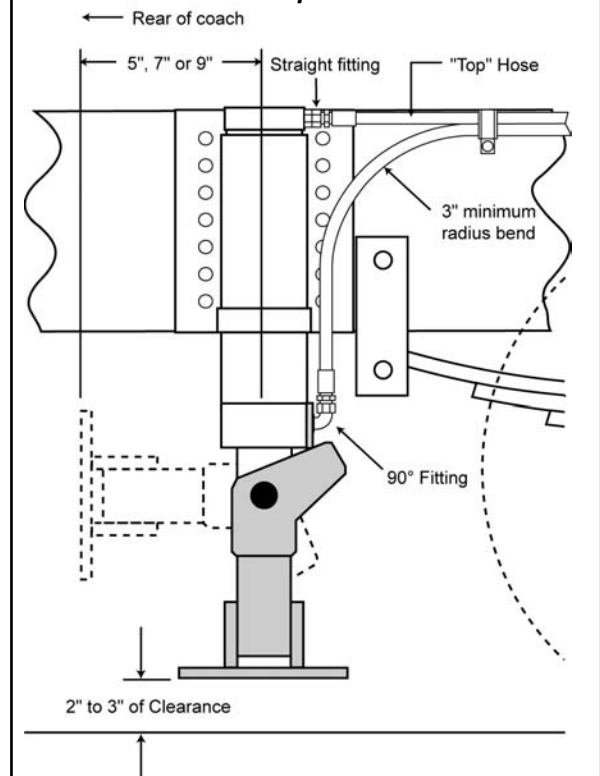
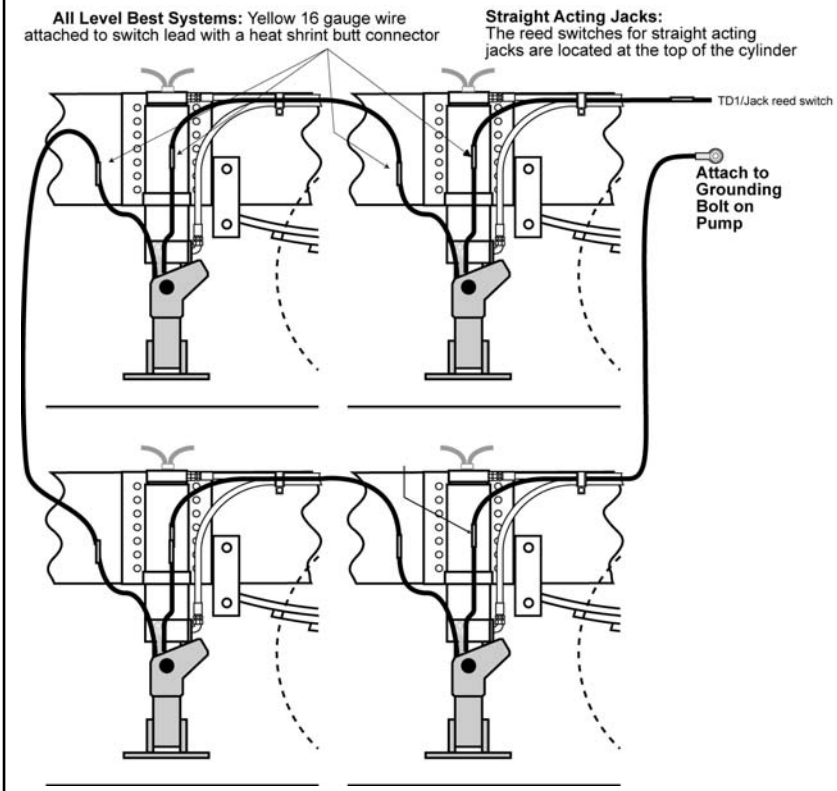


Figure 8



Attaching Hydraulic Lines

The leveling system comes with eight factory hydraulic lines. Each hose is labeled on one end to correspond to a port on the manifold. See **Figure 10**.

NOTE: To prevent debris from entering the hydraulic system and damaging the valve seals, the hose ends have been sealed with removable plastic plugs. Do not remove these plugs until you are ready to attach the hydraulic lines.

Starting at the right rear cylinder, attach the RR4B hose end to the bottom fitting on the cylinder and tighten to 50-150 in./lbs.

Attach the hose end labeled RR4T to the upper fitting on the cylinder and tighten to 50-150 in./lb. See **Figure 7**. Using the remaining hoses, repeat this procedure for the other cylinders.

Continue by routing and loosely securing the hydraulic lines and yellow reed switch wires along the vehicle undercarriage to the pump/manifold. As you route these lines forward to the pump/manifold. Use wire ties to loosely secure them to the frame rail. Use a sufficient number of straps so that when the lines are finally secured, they will not sag or sway when the vehicle is in motion. Do not strap the hydraulic lines to any moving or heat-producing parts of the vehicle.

All fittings should be connected to the manifold and tightened to 50-150 in./lb. Connect the swivel fitting of each hydraulic line to its corresponding valve port fitting as labeled on the manifold. Tighten to 50-150 in./lb. See **Figure 10**.

Figure 9

NOTE: This illustration has been included as a general reference for routing the hydraulic lines and does not represent the actual routing of the lines. It is recommended that the hydraulic lines to routed along the outside of the chassis frame rails.



CAUTION: Be sure the hoses are not exposed to high temperature vehicle components like the engine and exhaust manifold/tailpipe. Avoid routing or stretching lines over or around any sharp surface. Do not secure the lines to any moving parts. If a 12" minimum separation is not available, use of a heat shield is required.

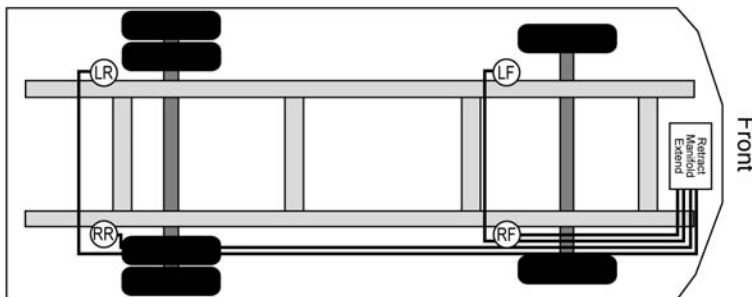
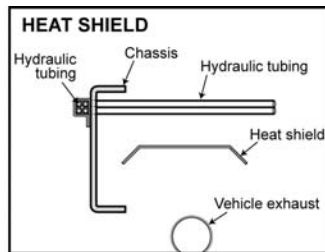


Figure 10

LABEL	VALUE PORT
LF1T	1T
LF1B	1B
RF2T	2T
RF2B	2B
LR3T	3T
LR3B	3B
RR4T	4T
RR4B	4B

INSTALLER NOTE: For Level Best kits sold in the aftermarket, hose labels will be supplied loose in the hose kit box. Labels should be applied to the hoses as they are routed during installation.

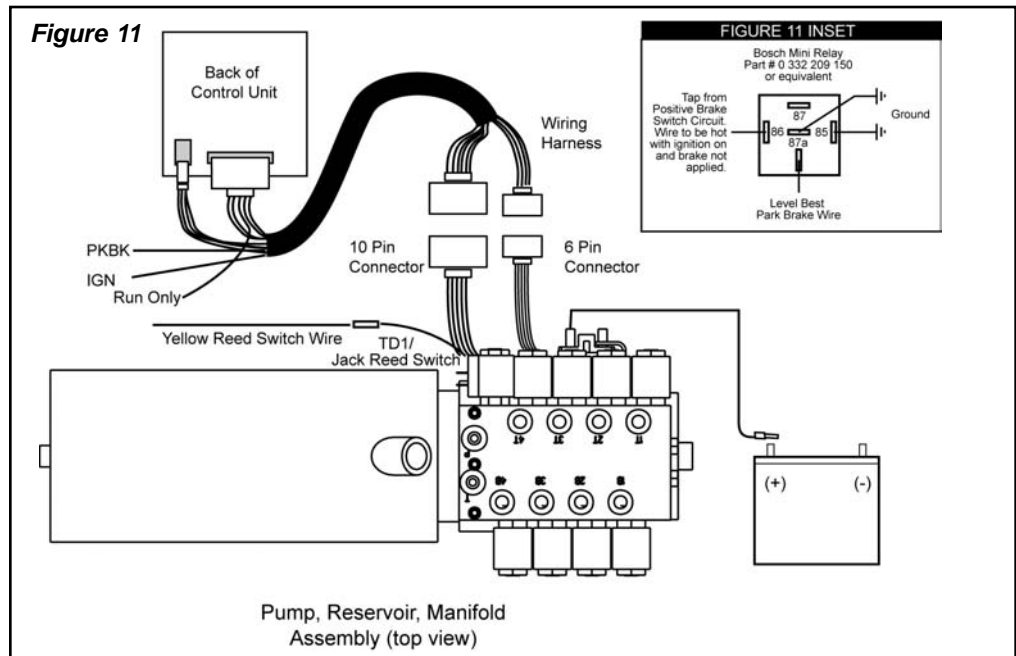
NOTE: Most new class 'A' motor home chassis are equipped with an automatically applied park brake system. These systems automatically apply the parking brake when the transmission is shifted into 'park.'

In the chassis wiring harness you will need to identify the park brake signal wire. This wire will carry a positive (+) 12-volt or ground signal. A signal wire can generally be found in one of the following places:

- Steering column just below the head and rim at the upper adjustment point or at the base just above the floor line.
- Front bulkhead wiring connector - located on the driver side of the vehicle and accessible either under the dash or under the hood.
- At the slave cylinder actuator of the park brake.
- Possibly in the transmission wiring harness.

Once you have located the appropriate wire, determine the type of signal by using a volt-ohm meter while engaging the park brake. If a positive signal is present, the use of a relay is required. See Figure 11 Inset. Splice a pigtail into this wire as explained in instructions.

Completing the Wiring Connections



With the wiring from the Control Panel routed to the pump manifold, complete the wire connections. Refer to **Figure 11** for wire connection information.

1. Check that all system ground harness connections are firmly attached.
2. Use a heat shrink butt connector to attach the yellow wire from the leg position reed switches to the white wire labeled 'TD1/Jack Reed Switch' on the pump manifold wiring harness. See **Figure 12**.

Attach the ground wire from the reed switches to the ground bolt on the pump. See **Figure 6**.

3. Locate the vehicle fuse box and attach the yellow ignition sense wire (IGN) to an ignition activated circuit (circuit to be fused at a maximum of 7.5 amps.)

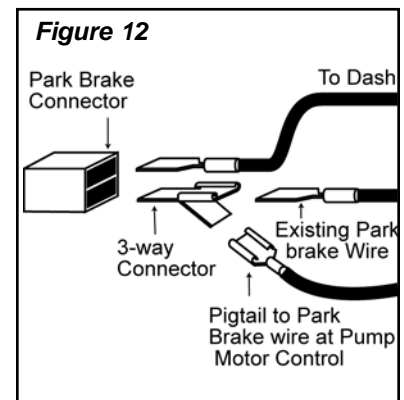
NOTE: The positive battery cable should still be disconnected at this point.

4. Level Best systems are equipped with a park brake interlock. The interlock is designed to allow operation of the system only when the vehicle parking brake is set.

In the chassis wiring harness, identify the park brake signal wire. The park brake switch and signal wire will usually be found on, or near the park brake pedal assembly. This wire will show ground or 12-volts positive when the park brake is applied. The type of signal will vary from one type chassis to another. Once you have located the appropriate wire, determine the type of signal by using a volt-ohm meter while engaging the park brake. If a positive signal is present the use of a relay is required. See **Figure 11 Inset**.

Next, splice the blue park brake wire (PKBK) from the control unit into the signal wire.

5. The 'Run Only' wire (**Figure 11**) at the control is used for special applications and should be ignored.
6. The final connection is the 8 ft. red #4 cable from the pump motor solenoid to the positive (+) terminal of the chassis battery.



NOTE: When filling and bleeding the system, use transmission fluid only. KwikEE recommends using Dextron III. Do not mix fluids. When checking the fluid level in the reservoir, all levelers must be in the retracted (ALL UP) position.



CAUTION: Do not run the pump without fluid as damage to the pump may occur. Do not engage the pump motor for periods greater than 30 seconds as motor damage may occur.



WARNING: During the retracting of the jacks, the cam on the upper portion of the leg will make contact with lift plate and cause the leg assembly to swing upward; failure to stay clear of the levelers when the system is being operated can result in severe injury.

Bleeding the Hydraulic System

Prior to initiating the bleeding process, verify that all the fittings on the cylinders and the manifold have been tightened to 50-150 in./lb. Also check that all the swaged hose couplers are tightened to the fittings at 50-150 in./lb. The entire system must be filled with hydraulic fluid during the bleeding process. It is recommended that the reservoir be filled with 1 1/4 gallons of fluid to start the process. The hoses and cylinders hold approximately 2-2.5 gallons of fluid, therefore it will be necessary to refill the reservoir several times during the bleeding process.

With the reservoir filled and the fittings checked, turn the system on by starting the coach and pressing the power button on the control panel. Begin extending one of the rear cylinders. Initially, the system contains mostly air, which prevents the manifold valves from sealing and causes all cylinders to extend erratically. As the hydraulic fluid begins to fill the lines and cylinders, the manifold valves will seal and each cylinder will begin to act independently.

When the reservoir begins to run low on fluid, the resistance of the fluid within the pump lessens and the sound of the pump increases in pitch. Retract the legs completely and replenish the fluid in the reservoir.

Continue to extend the cylinder until it reaches the end of its stroke, then retract all cylinders. With air in the lines, the cylinders will emit squeaking and humming noises and move in a jumpy manner. As air is purged from the system, the cylinders will move in a smoother, quieter manner. It may be necessary to extend and retract each cylinder several times to completely purge the lines of air.

When the system has been bled, retract all levelers and check the fluid level in the reservoir. With all cylinders fully retracted, the fluid level in the reservoir should be just visible in the filler fitting.

Manually Bleeding the Cylinders

Most cylinders will bleed themselves. However, if you have difficulty with a particular cylinder during the bleeding process, it is possible to manually bleed a cylinder. Extend the cylinder until it touches the ground.



CAUTION: Do not lift the coach.

Loosen the top hose fitting on the cylinder. You will hear air escaping. Do not remove the fitting from the cylinder to vent this air. Tighten the fitting again when air ceases to vent and only fluid is escaping. Operate the cylinder in and out several times to check for smooth operation. Repeat manual bleeding process as necessary.

Hydraulic System and Electrical Connections

Be sure that:

- All hydraulic fittings on the cylinders and manifold assembly have been tightened to 50-150 in./lb.
- All hydraulic hose connections have been tightened to the fittings at 50-150 in./lb.
- All cylinder mounting bolts have been tightened to 80 ft./lb.
- All electrical power delivery and ground connections are securely fastened.
- There are no leaks.

NOTE: Be sure that any holes from interior to exterior of vehicle made during the installation process have been completely sealed with a silicone sealant.

WARNINGS: Do not use the Level Best systems 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 the parking brake and makes it possible for the vehicle to roll unexpectedly forward or backward off the jacks. This could cause severe injury or even death.

Holding a control panel button switch in the 'UP' or 'DN' 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 levelers as an emergency brake. They are not designed for any type of vehicle breaking purpose.

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

Testing the System

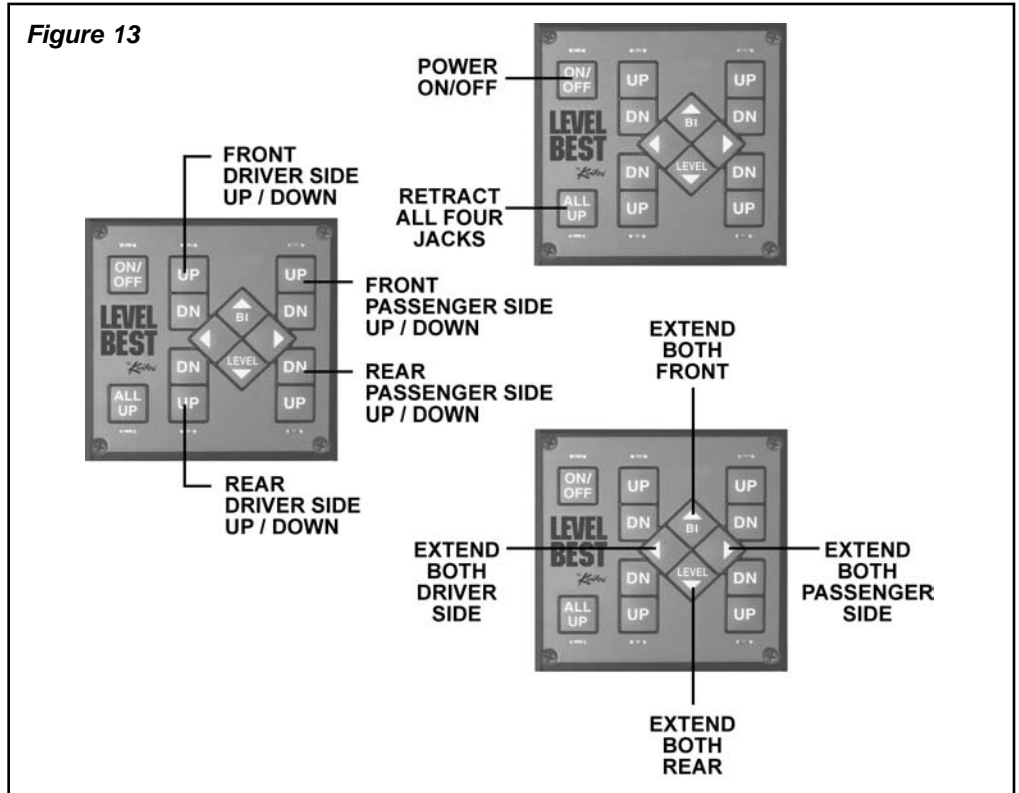
NOTE: The park brake must be set and the ignition on for the Level Best System to operate.

Once all the system components have been installed a system check is recommended to verify all Level Best functions are operational.

Operating Level Best is accomplished by using the buttons on the control panel. See **Figure 13**. The buttons are organized to represent the actual positions of the jacks on the coach.

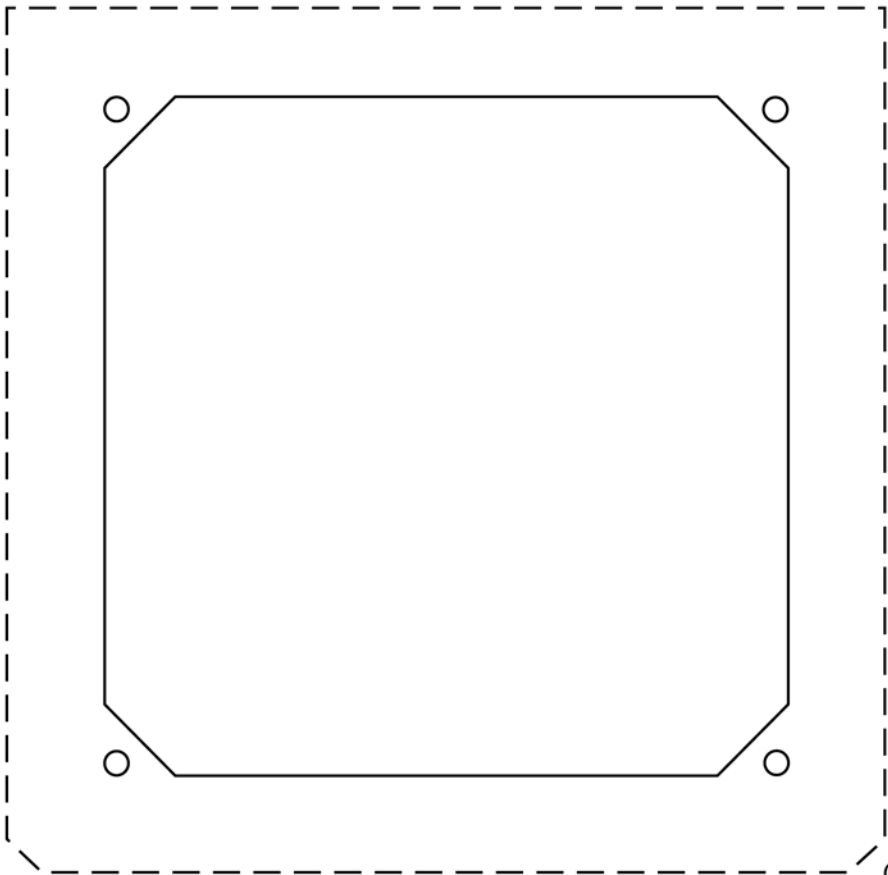
1. Using the four individual 'UP' / 'DN' (down) buttons, verify that each jack can be extended and retracted separately and that the associated yellow LED indicator lights during operation.
2. The 'Bi-Level' buttons, marked with triangles and arranged in a diamond pattern, operate pairs of jacks simultaneously. Press each of the buttons and verify that the appropriate pair of jacks can be extended together and that the associated pair of LED indicators light during operation.
3. After placing all jacks in the extended position, press the 'All Up' button and verify that all four jacks retract together into the travel position and that all four yellow LED indicators light during operation. The LED light under the 'All Up' should turn green and the pump will shut off automatically 2-5 seconds after all the jacks are fully retracted.

Figure 13



NOTE: If system is equipped with automatic leveling, see "Level Best Operation Guide" for information about 'AUTO MODE' operations.

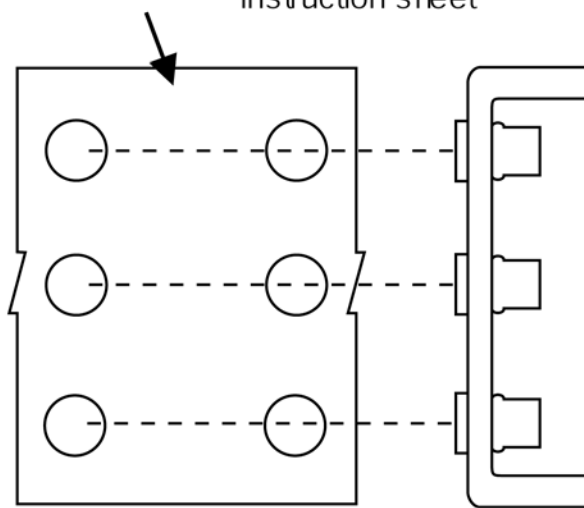
TEMPLATE FOR TOUCHPAD



TYPICAL INSERT APPLICATION

For insert installation see accompanying instruction sheet

Chassis



CHEVY P30 REAR

**Use long inserts at these locations.*

For insert installation see accompanying instruction sheet

Chassis

