GROUND CONTROL®
4-POINT AND 6 POINT
OEM INSTALLATION MANUAL

(For systems installed after June 1, 2018)

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Introduction

The Ground Control® 4-Point and 6-Point systems are leveling systems for 5th Wheel type recreational vehicles. Utilizing level sensing electronics and a series of heavy duty jacks with individual drive motors, the Ground Control System is capable of leveling 5th Wheels throughout the weight spectrum.
This manual is for systems installed after June 1, 2018.

NOTE: If the Gross Vehicle Weight Rating (GVWR) is 15,500 lbs or greater, consult Lippert Engineering prior to installation.

For additional information on this product go to: https://support.lci1.com/ground-control-leveling-lcd-touch-pad

NOTE: Images used in this document are for reference only when assembling, installing and/or operating this product. Actual appearance of provided and/or purchased parts and assemblies may differ.

System Component Storage

Components **MUST** be stored inside, or undercover out of the weather to prevent moisture intrusion.

Safety

Read and understand all instructions before installing or operating this product. Adhere to all safety labels. This manual provides general instructions. Many variables can change the circumstances of the instructions, i.e., the degree of difficulty, operation and ability of the individual performing the instructions. This manual cannot begin to plot out instructions for every possibility, but provides the general instructions, as necessary, for effectively interfacing with the device, product or system. Failure to correctly follow the provided instructions may result in death, serious personal injury, severe product and/or property damage, including voiding of the Lippert limited warranty.

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

Failure to act in accordance with the following may result in death or serious personal injury. The use of the Ground Control® leveling system to support the 5th Wheel for any reason other than which it is intended is prohibited by Lippert's limited warranty. The Lippert leveling system is designed as a "leveling" system only and should not be used to provide service for any reason under the 5th Wheel such as changing tires or servicing the leveling system. Any attempts to change tires or perform other service while 5th Wheel is supported by the Ground Control® leveling system could result in damage to the 5th Wheel and/or cause death or serious personal injury.

Do NOT exceed GVWR. Severe damage to product or property may occur.

The "CAUTION" symbol above is a sign that a safety risk is involved and may cause personal injury and/or product or property damage if not safely adhered to and within the parameters set forth in this manual.

Always wear eye protection when performing service, maintenance or installation procedures. Other safety equipment to consider would be hearing protection, gloves and possibly a full face shield, depending on the nature of the task.

Moving parts can pinch, crush or cut. Keep clear and use caution.

All electrical wiring harnesses shall be loomed and secured to prevent possible damage and installed in accordance with RVIA electrical standards.

Preparation

1. Analyze the 5th Wheel. Determine where the rear jack brackets, controller and touchpad will be mounted on the 5th Wheel. The rear jack brackets should be mounted approximately 1' behind the rear axle hanger and be aligned with each other. Jack brackets may already be pre-installed by Lippert. The controller should be mounted in an under-floor compartment, as far forward as possible, in the center of the 5th Wheel (if possible), and in compliance with RVIA Gas Codes, as the controller connections are not spark-proof. The touchpad should be mounted in a compartment on the side of the 5th Wheel so that the operator will have a view of the hitch pin while using the touchpad. The touchpad **MUST** also be protected from the elements.

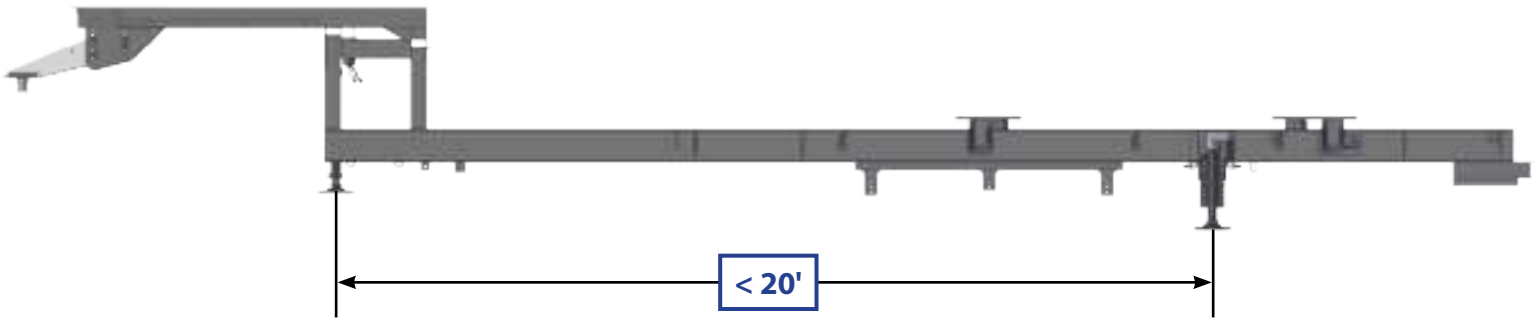
NOTE: The landing gear will be installed to the frame of the 5th Wheel by Lippert.

Criteria for Determining Use of Ground Control® 4-Point or 6 Point System

4-Point Application

Use the 4-Point application if the distance between the center of the landing gear footpad and the center of the rear jack footpad will be less than 20' (Fig. 1).

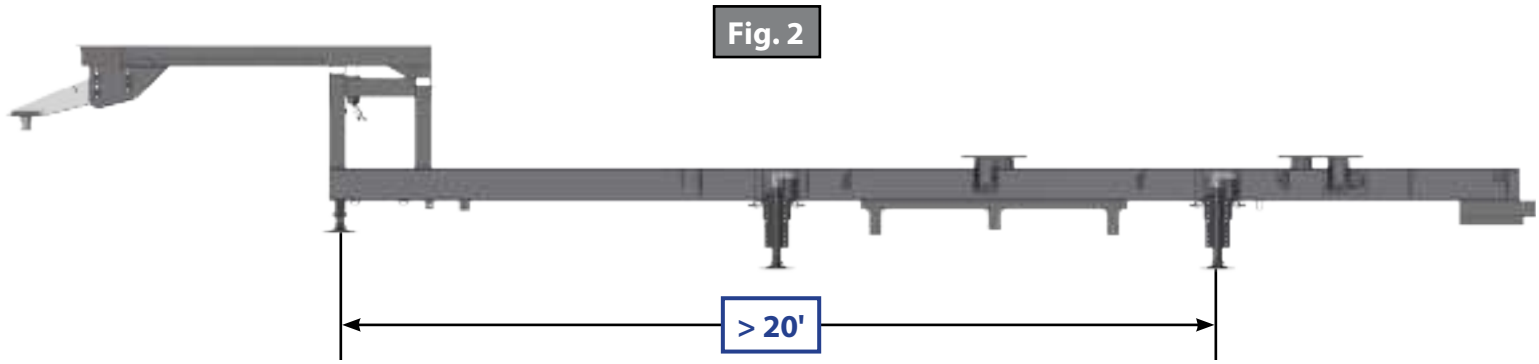
Fig. 1



6 Point Application

Use the 6 Point application if the distance between the center of the landing gear footpad and the center of the rear jack footpad will be 20' or greater (Fig. 2).

Fig. 2



NOTE: If the GVWR is 15,500 lbs or greater, consult Lippert Engineering prior to installation.

Determining the Mounting Position of the Controller and Rear Sensor

Controller

The controller has a limited mounting area for proper performance. At the center of the frame (signified by the blue dotted line in figure 3) and at the center of the landing gear (signified by the black dotted line) is a center point. From this center point the controller can be mounted 12" out on either side and up to 3' in front of or behind the center point, while still being inside the compartment. This area is signified by the green dotted box labeled Section A in figure 3.

Rear Sensor

The rear sensor must be in line with or behind the rear leveling jacks, as signified by Section B in figure 3. The rear sensor must also be mounted in line with the center of the frame, as signified by the dotted blue line in figure 3.

Measuring Departure and Approach Angle

Departure and approach angles are measured by running a string line from the meeting point of the tire and ground up at an angle to the lowest point on the front or rear of the 5th Wheel. These string lines are shown as dotted lines (Fig. 4).

Fig. 3

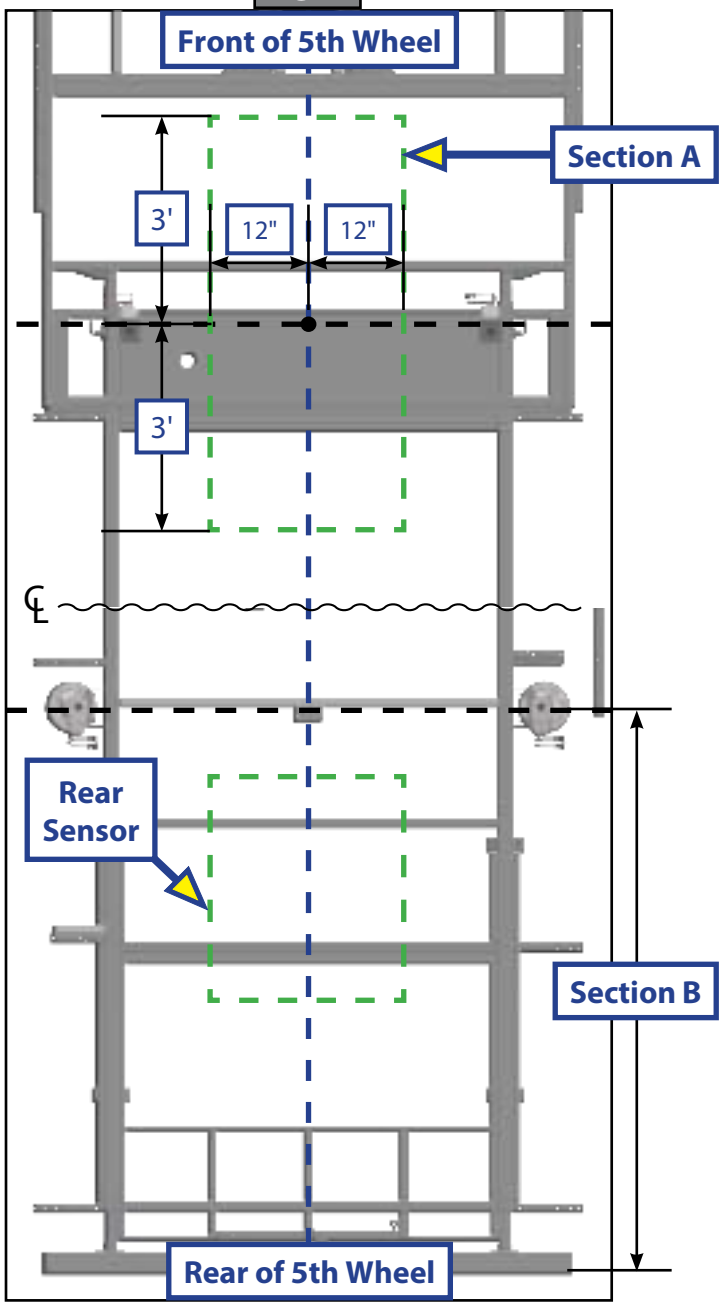
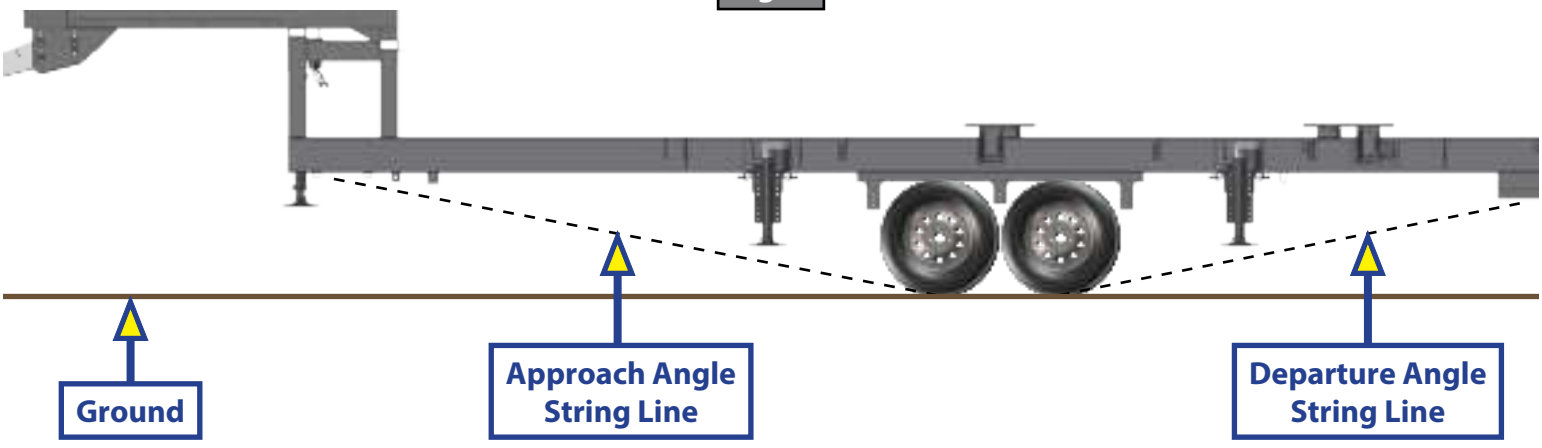


Fig. 4



Installation

Rear Jacks

1. Determine position and ground clearance requirements for the rear jacks (Fig. 6D). The rear jack brackets (Fig. 6B) should be mounted approximately 1' behind the rear axle hanger and be aligned with each other.

NOTE: When fully retracted, the rear jacks should be mounted to achieve a ground clearance equal to the departure angle or a minimum of 7" to enable maximum level correction (Fig. 5). Any additional ground clearance added to the jack location will decrease the amount of level correction available to the system.

2. Mark jack mounting bracket (Fig. 6B) locations on the main frame rail.
3. Clamp the bracket to the main frame rail (Fig. 6A) in the marked position.
4. Weld the bracket to the main frame rail (Fig. 6A).

NOTE: Jack brackets may already be pre-installed by Lippert.

5. Bolt the rear jacks (Fig. 6D) to the mounting brackets (Fig. 6B) using a minimum of 4 bolts (Fig. 6E) and nuts (Fig. 6C) per jack. Tighten the bolts to 90 ft-lb. of torque.
6. Connect the wire harnesses to the rear jack motor wires and run the harnesses to the compartment where the controller will be mounted.

NOTE: Lippert recommends zip-tying the harnesses tight against the rear jack motors to prevent damage to the harnesses.

Fig. 5

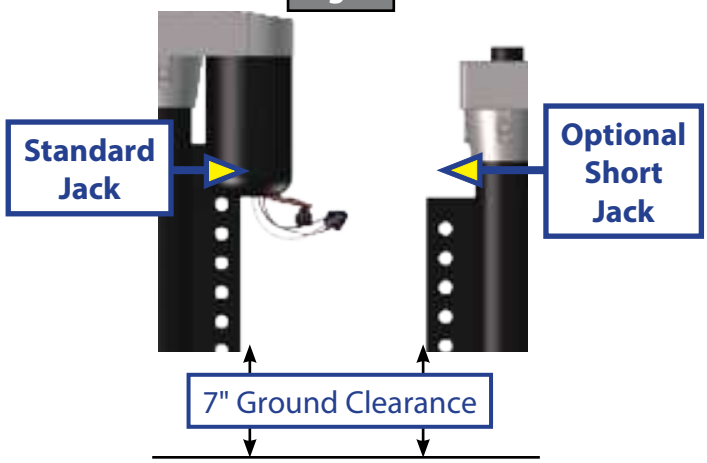
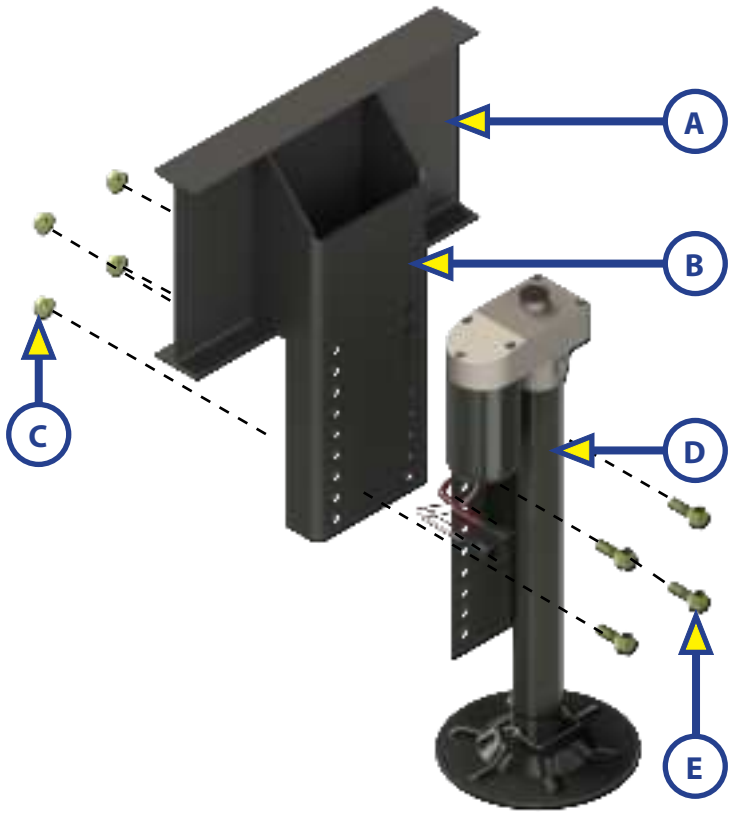


Fig. 6



Rear Sensor

The rear sensor (Fig. 7A) must be installed on a crossmember in line with or behind the rear jacks, centered curbside to roadside on the 5th Wheel with the arrows on the top of the sensor pointing the correct direction (Fig. 7 Detail).

Fig. 7

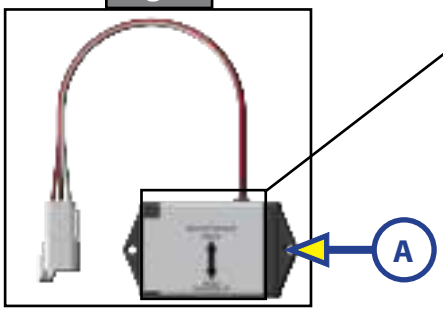
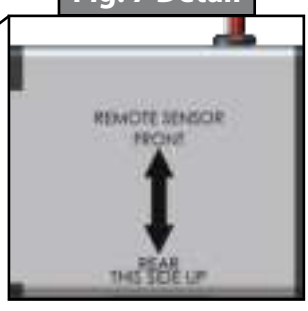


Fig. 7 Detail



NOTE: Leveling sensor mounting plate may already be pre-installed by Lippert.

1. Dry fit the mounting plate (Fig. 8C) and the leveling sensor (Fig. 8B) to the crossmember (Fig. 8A). The pre-drilled holes in the plate are for mounting the sensor to the plate. Mark on the plate where the sensor will set.

NOTE: Space between the sensor and crossmember **MUST** be maintained so the wire harness will not be pinched.

NOTE: The wire harness **MUST** be oriented towards the front of the 5th Wheel. Orientation is imperative for the correct operation of the leveling system.

2. Attach the sensor (Fig. 9A) to the mounting plate (Fig. 9B) using two #12 - 14 x 1" hex head self-tapping screws (Fig. 9C).
3. Attach the mounting plate and sensor assembly (Fig. 10B) to the crossmember (Fig. 10A) using two #12 - 14 x 1" hex head self-tapping screws (Fig. 10C). Ensure that the plate is centered side to side on the frame and that the sensor is oriented properly. See figure 3 Sections A and B for location clarification.
4. Connect the sensor harness to the connector on the sensor (Fig. 11A) and run the harness through the frame and up to the compartment where the controller will be mounted.

Fig. 8

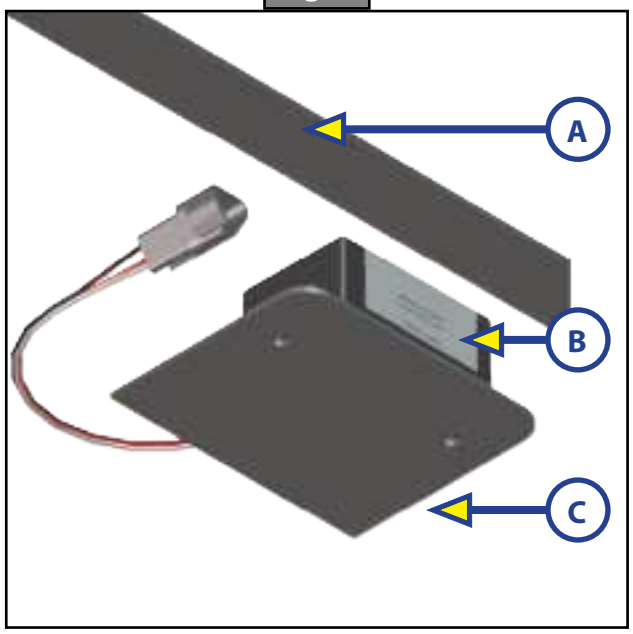


Fig. 9

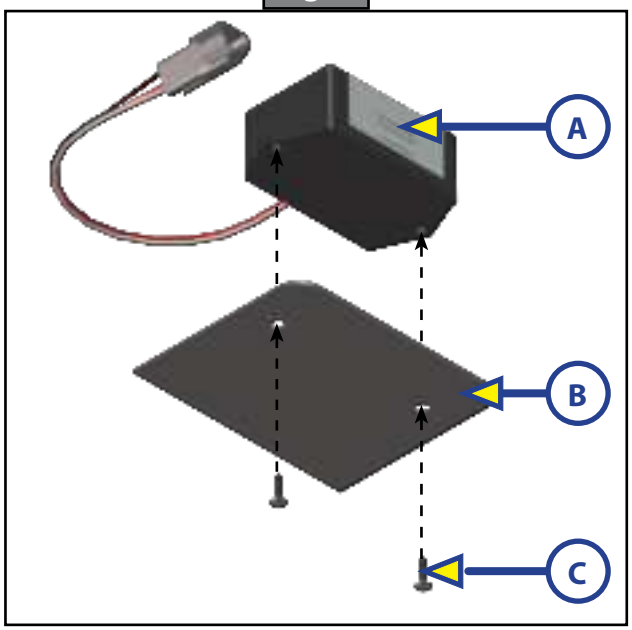


Fig. 10

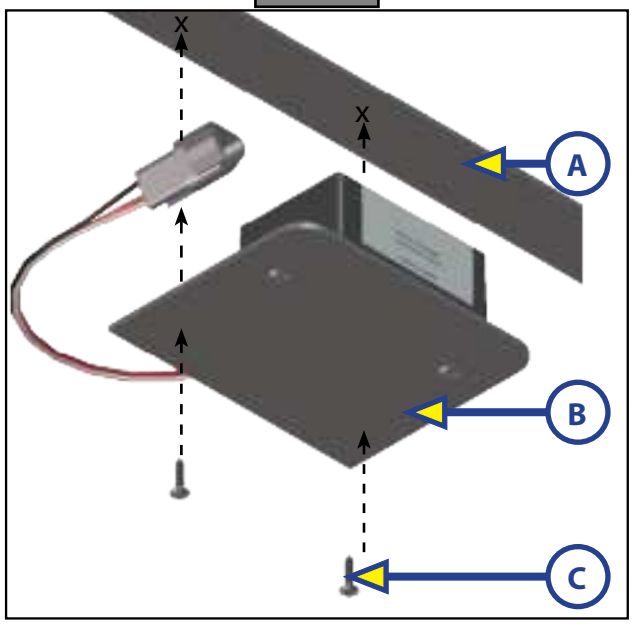
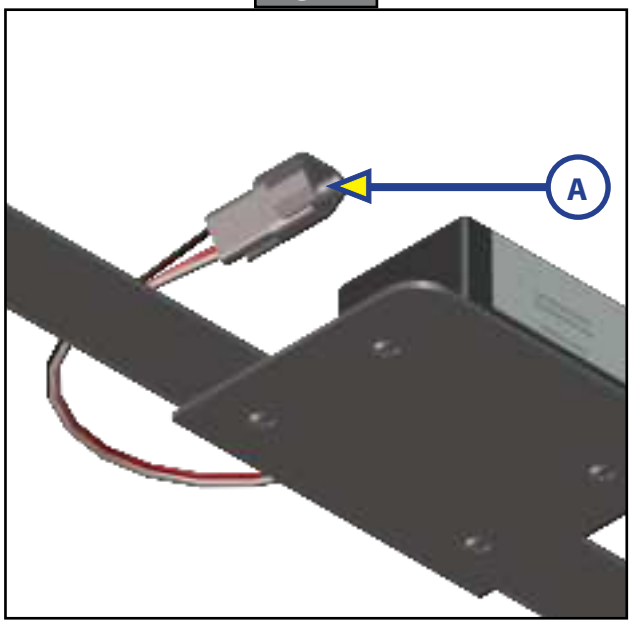


Fig. 11



Controller

Prior to starting this portion of the installation, double check that all of the harnesses are properly and securely connected to the rear jacks, landing gear, and rear sensor.

The compartment where the controller will be installed should be as far forward on the 5th Wheel as is possible and the controller must be installed in compliance with RVIA Gas Codes, as the controller connections are not spark-proof.

For optimal performance, the controller should be positioned directly in the center of the 5th Wheel, but may be offset if necessary. The arrow on the label of the controller must point to the front of the 5th Wheel (Fig. 12).

NOTE: There are 4 different options for the controller, depending on whether a 4-point or 6-point system is being used and ...whether the controller has a Bluetooth connectivity option: 803280 - 4 point w/o Bluetooth, 2021018954 - 4 point w/ Bluetooth, 803279 - 6 point w/o Bluetooth and 2021018951 - 6 point w/ Bluetooth

1. Measure the ceiling of the compartment where the controller will be placed and mark the center point on the ceiling.
2. Using four #8 x 1" wood screws (Fig. 13B), attach the controller (Fig. 13A) to the ceiling of the compartment, centered over the marked centerline of the compartment, if possible.
3. Attach the power and ground harnesses to the corresponding posts on the controller and then connect them to the correct posts on the house battery.
4. Connect all jack harnesses to the appropriate connectors on the controller.

Fig. 12

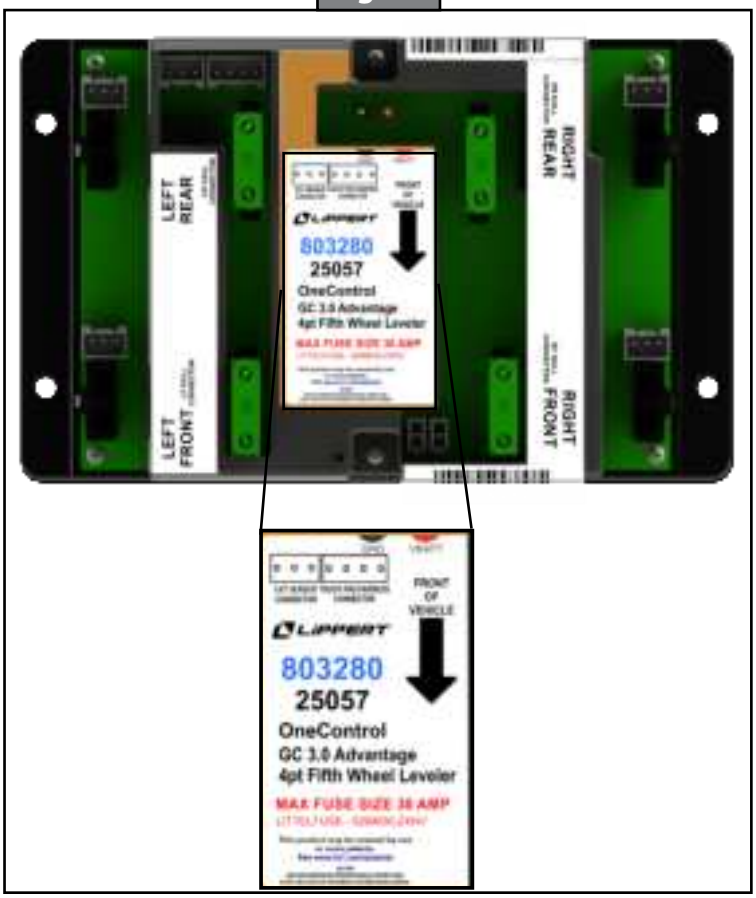
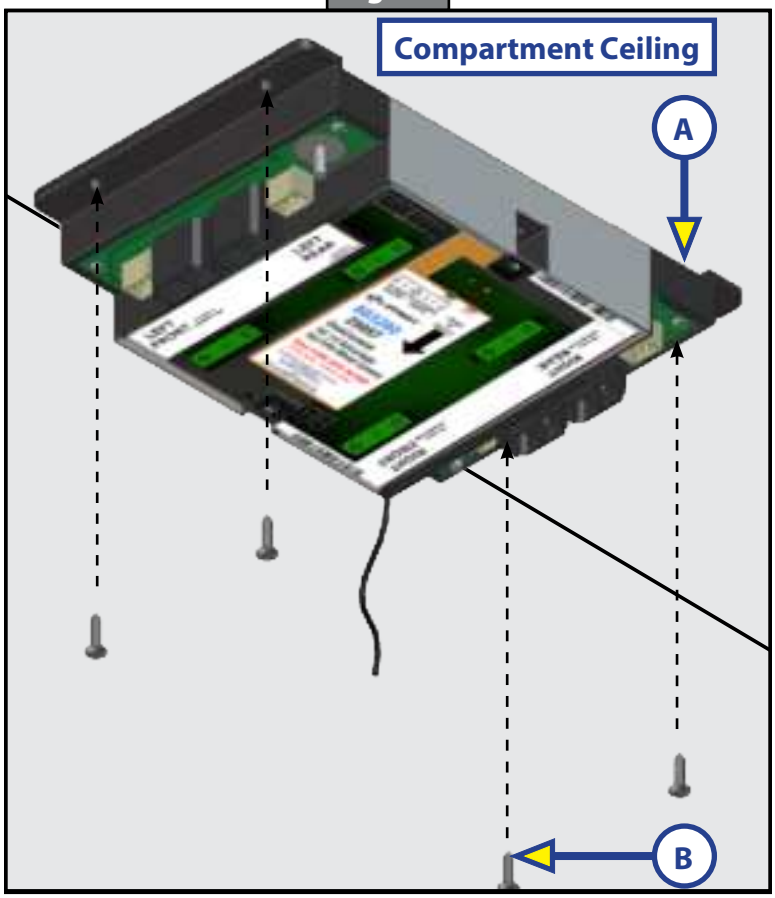


Fig. 13



Touchpad

1. Determine where to mount the touchpad. The touchpad should be mounted in a compartment on the side of the 5th Wheel so the operator will have a view of the coupler while using the touchpad.
2. Remove the faceplate of the touchpad (Fig. 14A) from the mounting bezel (Fig. 14B).
3. Cut a hole in the wall of the compartment 3 ⅜" wide by 2 ¾" high (Fig. 15) so the top and bottom horizontal cuts are parallel to the floor of the compartment.
4. Feed the touchpad harness through this hole and run it to the compartment where the controller is mounted. Plug the harness into the appropriate connector on the controller.
5. Insert the touchpad bezel (Fig. 16A) into the cutout and attach it with four #8 x 1" wood screws (Fig. 16B) with sufficient length to thread into the compartment wall.
6. Plug the touchpad harness into the connector on the back of the touchpad faceplate and snap the faceplate into the bezel (Fig. 17).

Fig. 14

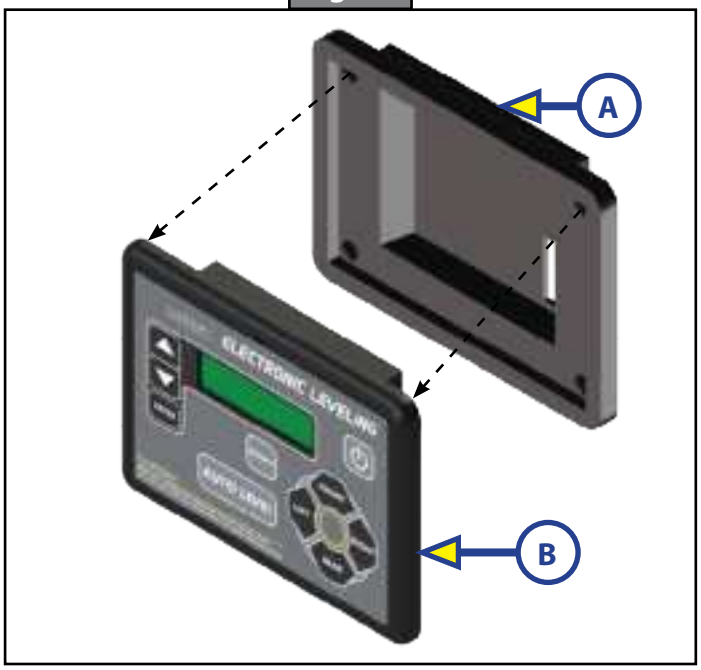


Fig. 15

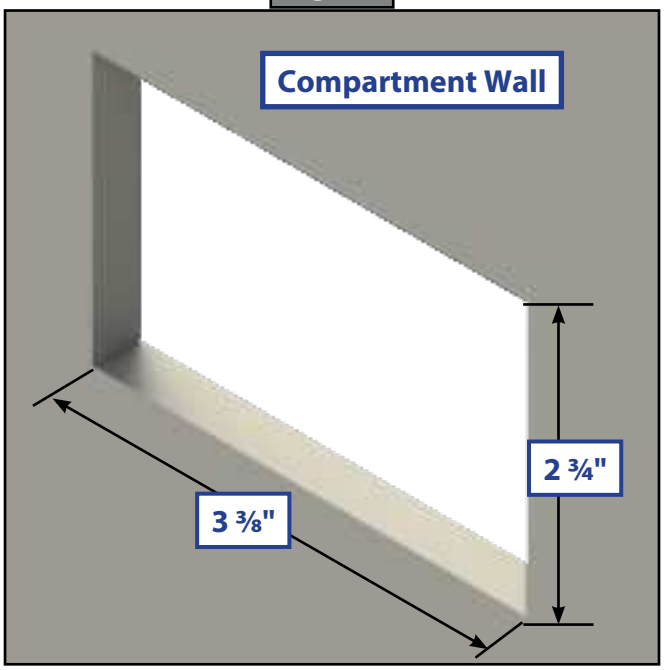


Fig. 16

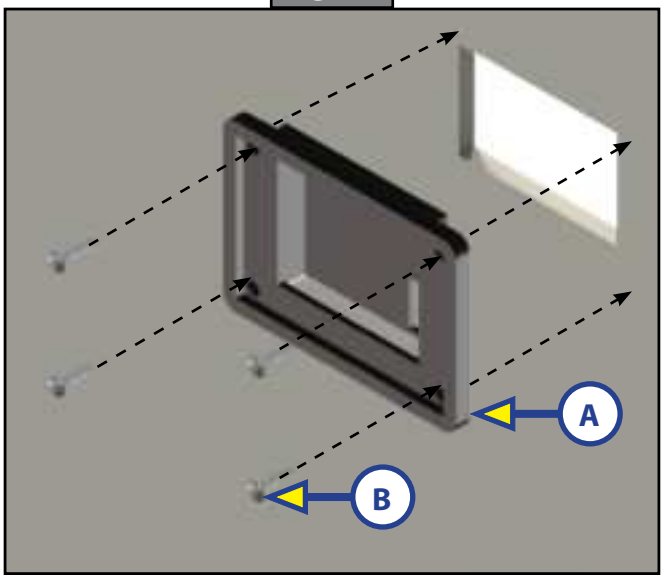
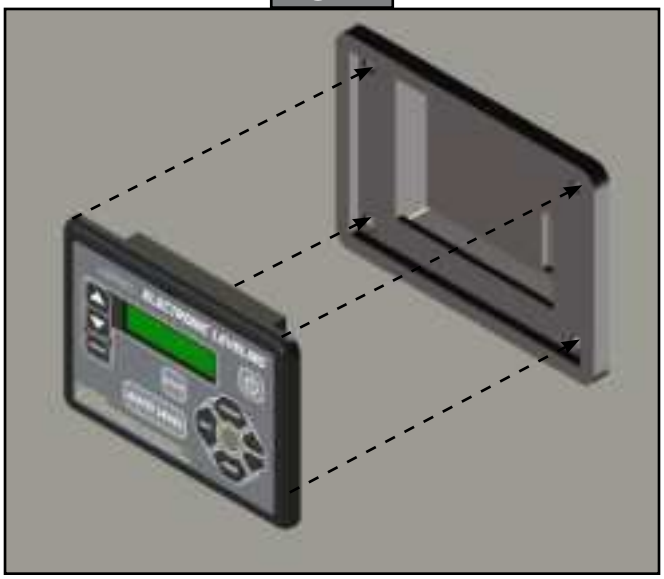
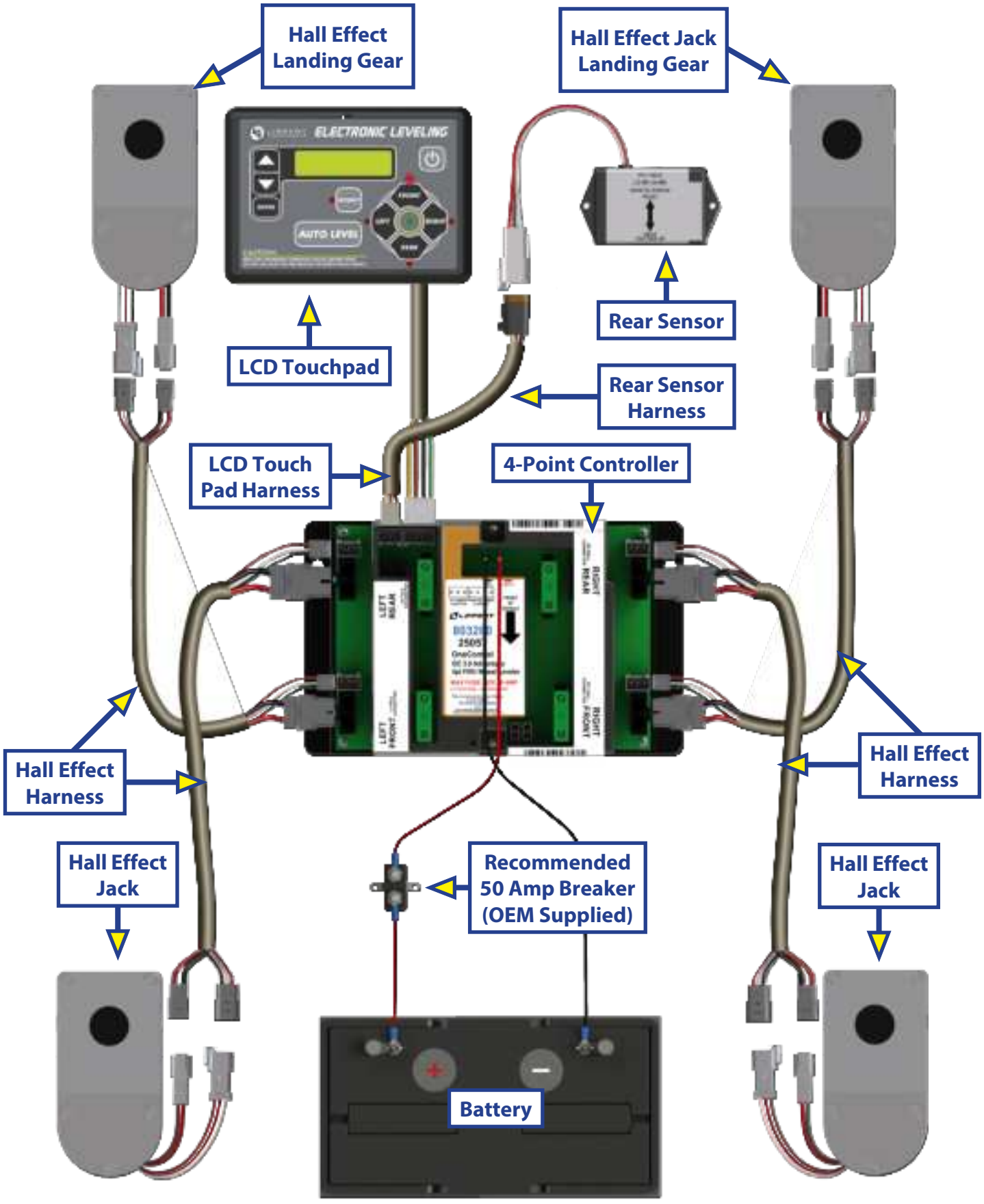


Fig. 17



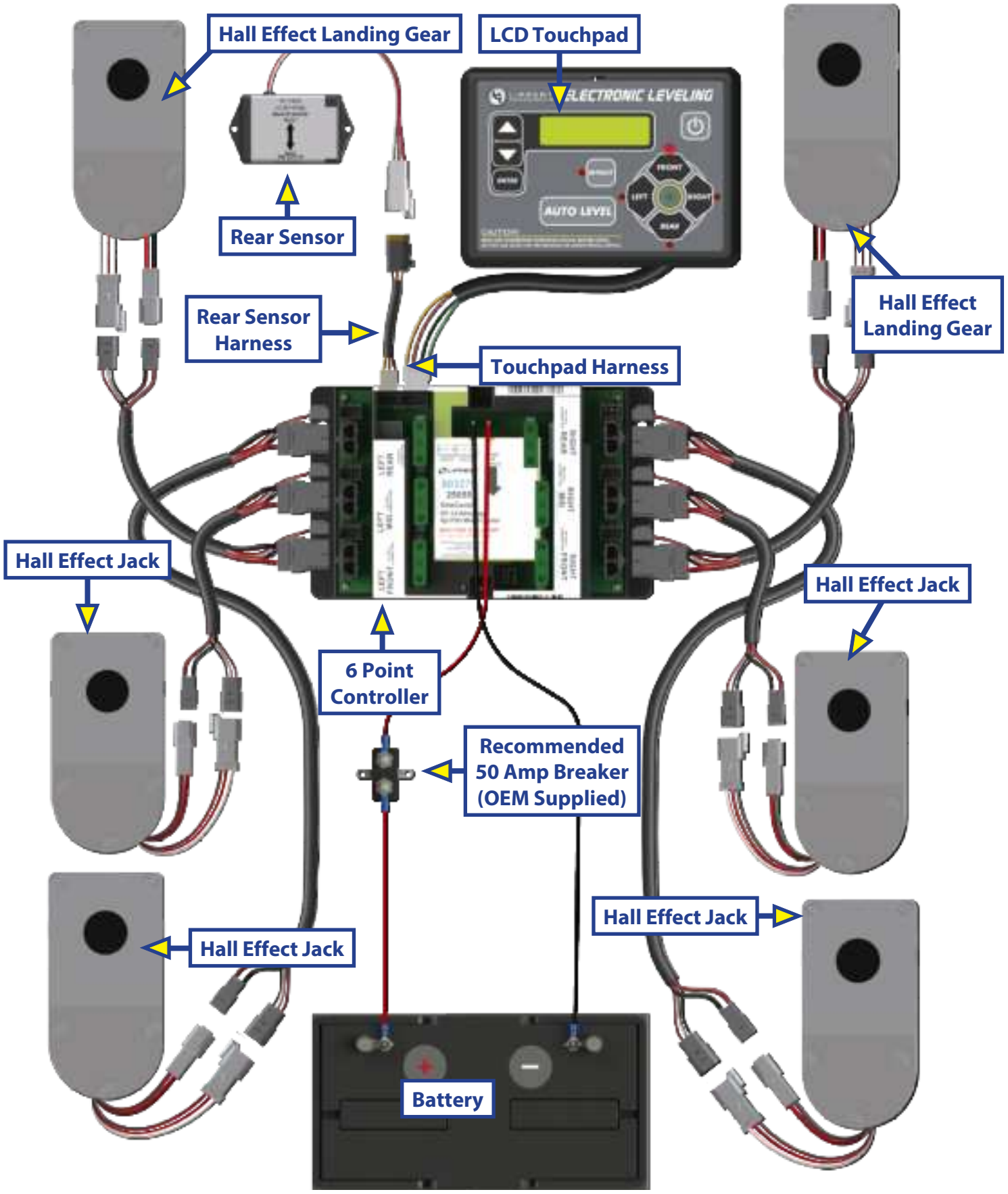
Wiring Diagram - 4-Point

NOTE: All electrical wiring harnesses shall be loomed and secured to prevent possible damage and installed in accordance with RVIA electrical standards. Lippert recommends zip-tying the harnesses tight against the rear jack motors to prevent damage to the harnesses. Electrical wire length and gage shall be in accordance with RVIA standards for a 50 Amp breaker.



Wiring Diagram - 6-Point

NOTE: All electrical wiring harnesses shall be loomed and secured to prevent possible damage and installed in accordance with RVIA electrical standards. Lippert recommends zip-tying the harnesses tight against the rear jack motors to prevent damage to the harnesses. Electrical wire length and gage shall be in accordance with RVIA standards for a 50 Amp breaker.



Prior to Operation

The leveling system should only be operated under the following conditions:

1. The 5th Wheel is parked on a reasonably level surface.
2. Be sure all persons, pets, and property are clear of the 5th Wheel while the leveling system is in operation.
3. Make sure battery(ies) are fully charged and test at 12V DC under load.

Touchpad Diagram

Fig. 18

Callout	Description
A	Up Arrow - Scrolls up through the menu on LCD.
B	Down Arrow - Scrolls down through the menu on LCD.
C	Enter - Activates modes and procedures indicated on LCD.
D	Retract - Places leveling system into retract mode. - Press and hold down for 1 second to initiate Auto Retract.
E	LCD Display - Displays procedures and results.
F	Auto Level - Places leveling system into auto level mode.
G	Front Jack Button - Activates front jacks in manual mode.
H	Left Jack Button - Activates left jacks in manual mode.
I	Right Jack Button - Activates right jacks in manual mode.
J	Rear Jack Button - Activates rear jacks in manual mode.
K	Power Button - Turns leveling system on and off.

Basic Jack Operation

⚠WARNING

Be sure to park the 5th Wheel on solid, level ground. Clear all jack landing locations of debris and obstructions. Locations should also be free of depressions. When parking the 5th Wheel on extremely soft surfaces, utilize load distribution pads under each jack. People and pets should be clear of 5th Wheel while operating leveling system. Never lift the 5th Wheel completely off the ground. Lifting the 5th Wheel so the wheels are not touching the ground will create an unstable and unsafe condition.

Landing gear (front jacks) can be operated any time the system is “ON”. By pushing the “FRONT” button (Fig. 18G), both front jacks can be extended. By pushing either the "FRONT" and “LEFT” (Fig. 18H) or "FRONT" and “RIGHT” (Fig. 18I) buttons, the individual front jacks can be extended. If the touchpad is put in the retract mode, indicated by the orange illuminated LED next to the “RETRACT” button (Fig. 18D), the front jacks can be retracted together by pushing the “FRONT” button (Fig. 18G) or individually by pressing “LEFT” (Fig. 18H) or “RIGHT” (Fig. 18I) buttons, while simultaneously pressing the “FRONT” button (Fig. 18G).

Middle jacks, if equipped, can not be extended or retracted in standard mode or manual mode. Middle jacks can only be operated in the special jack code error mode. In order to operate the middle jacks press "LEFT" (Fig. 18H) and "RIGHT" (Fig. 18I) buttons simultaneously.

The rear jacks can only be extended when the touchpad is in the manual mode. Once system is in manual mode, pressing the “REAR” button (Fig. 18J) will extend both rear jacks at the same time. To extend individual rear jacks, press the “LEFT” (Fig. 18H) or “RIGHT” (Fig. 18I) buttons while simultaneously pressing the “REAR” button (Fig. 18J), depending on which jack needs to be operated. If the touchpad is put in the retract mode, indicated by the orange illuminated LED next to the “RETRACT” button (Fig. 18D), the rear jacks can be retracted together by pushing the “REAR” button (Fig. 18J) or individually by pressing either the “LEFT” (Fig. 18H) or “RIGHT” (Fig. 18I) buttons, while simultaneously pressing the “REAR” button (Fig. 18J).

NOTE: If the rear jacks will not operate individually using the method described above, but they operate properly when Auto Level is performed, the Twist Prevention Protection system has locked out the operation to prevent damage to the frame of the 5th Wheel.

System Settings

Homing Jacks

1. When components are added or replaced the system will need to be homed. Run the system by pressing "FRONT" (Fig. 18G). A special jack error code should occur. If not, introduce the special jack error code.

NOTE: To introduce an error, disconnect 1 of the hall effect sensor wires from the controller. After attempting to operate the disconnected jack, the touchpad screen will display an error. Reconnect the hall effect sensor wire.

NOTE: In order to clear the special jack error code the jacks need to be "homed." In order to "home" jacks, each jack **MUST** be able to retract a minimum of 6".

2. Extend all jacks to reach the 6" of minimum retract needed.
   - **A.** Press "FRONT" (Fig. 18G) to extend the front jacks (if required).
   - **B.** Press "REAR" (Fig. 18J) to extend the rear jacks (if required).
   - **C.** Press "LEFT" and "RIGHT" (Figs. 18H and Fig. 18I) simultaneously to extend the middle jacks (if equipped and required).
3. Press and hold the retract button until all of the jacks begin to retract. The jacks will retract until they reach the hard current limit.
4. The jacks are now “homed” and the special jack error code will be cleared.

NOTE: If the jacks do not retract, an error should display on the touchpad screen. This is typically caused by wiring interruption.

Zero Point Calibration

The “Zero Point” is the programmed point that the 5th Wheel will return to each time the Auto Level feature is used.

NOTE: Prior to starting this procedure, double check all connections on the controller, jacks, and touchpad.

1. In manual mode, run the jacks to level the 5th Wheel. This is best achieved by placing a level in the center of the 5th Wheel and leveling it both front to back and then side to side. (See “Basic Jack Operation” for instructions on how to manually operate the system).
2. Once the 5th Wheel is level, turn off the touchpad.
3. With the touchpad off, press and release the “FRONT” button (Fig. 18G) 5 times and then press and release the “REAR” button (Fig. 18J) 5 times.
4. The touchpad will flash and beep and the display will read “ZERO POINT CALIBRATION ENTER to set, Power to Exit” (Fig. 19).
5. To set the current position as the zero point, press the “ENTER” button (Fig. 18C).
6. LCD display will read “Zero point stability check” (Fig. 20).
7. LCD display will read “Zero point set successfully” once process is complete (Fig. 21).
8. The system will set this point as its level state and the touchpad will turn off.

Fig. 19

Fig. 20

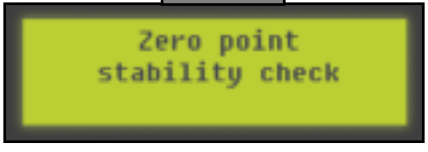
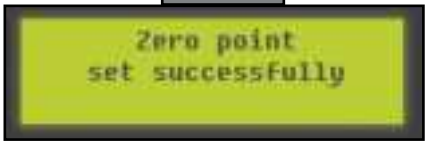


Fig. 21



Operation

Unhitching from a Tow Vehicle

NOTE: Prior to unhitching from the tow vehicle, ensure the 5th Wheel is parked on a level surface and be sure to chock the tires of the 5th Wheel.

1. Extend the inner legs of both landing gear (front jacks) to within 4-5" of the ground by pulling on the quick-release pins.
2. Push “ON/OFF” (Fig. 22K). LCD Screen will light up and display “READY JACKS: UP” (Fig. 22A).
3. Push the "FRONT” button (Fig. 22G) and lower the landing gear until the weight of the trailer is taken off of the 5th wheel plate..
4. Red indicator lights (Fig. 22D) may come on, indicating the current disposition of the 5th Wheel. In this case, the front and right side of the 5th Wheel are low.
5. Disconnect the 5th wheel latch.
6. Pull tow vehicle away and park at a safe distance.

Fig. 22

Auto Level

After unhitching from tow vehicle and parking the vehicle at a safe distance away from the 5th Wheel, press the "ON/OFF" button (Fig. 18K) and then press "AUTO LEVEL" (Fig. 18F).

NOTE: Once the automatic leveling cycle has been started, it is important that there is no movement in the 5th Wheel until the 5th Wheel has completed the leveling process. Failure to remain still during the leveling cycle could have an effect on the performance of the leveling system.

NOTE: In order for hitch recognition feature to function, the auto level sequence **MUST** be started with the front of the 5th Wheel above level.

Auto Level Sequence

1. When Auto Level Sequence begins, the front of the 5th Wheel will lower slightly to a point below level.
2. Rear jacks will be grounded.
3. A side-to-side leveling sequence occurs.

NOTE: At this point on the 6-Point System, the two middle jacks are grounded to stabilize the 5th Wheel. The two middle jacks do not level the 5th Wheel.

4. Each jack will perform a final grounding touch.
5. LCD will read "AUTO LEVEL SUCCESS" (Fig. 23).
6. LCD will then read "READY Jacks: Down" (Fig. 24A), and the green LED at the center of the four jack buttons will be illuminated (Fig. 24B).

Fig. 23

Fig. 24

NOTE: If the AUTO LEVEL sequence does not perform as described, place the system in manual mode and test that the jacks operate correctly by pushing their coordinating buttons on the touchpad; i.e. FRONT button operates only the front jacks.

Troubleshooting

⚠WARNING

Ensure the 5th Wheel is supported at both the front and rear with jack stands before performing any troubleshooting or service to the 5th Wheel. Failure to do so may result in death or serious personal injury.

Touchpad Error Codes

NOTE: To clear an error code from the touchpad, repair or otherwise correct the issue, then press "ENTER." If the error is still present, the message will be displayed again.

LCD Message	What's Happening?	What Should Be Done?
****ERROR**** Excess Angle	Controller not properly secured.	Check and secure controller placement.
	Excessive angle reached during auto operation.	Relocate the 5th Wheel.
****ERROR**** Excessive Angle	Controller not properly secured.	Check and secure controller placement.
	Excessive angle reached during manual operation.	Relocate the 5th Wheel.
****ERROR**** Feature Disabled	Front of 5th Wheel below level when starting Auto Level process (only when trying to initiate Hitch Recognition).	Using manual mode on the touchpad, retract rear jacks (which includes the middle, if equipped) and set landing gear (front jacks) to hitch height.
	Touchpad power not cycled between consecutive leveling operations.	Turn touchpad off and then back on to reset the system.
	Zero point not set.	Set zero point.
****ERROR**** Low Voltage	Battery voltage dropped below 10.8V.	Check wiring - repair or replace.
		Test battery voltage under load - charge or replace.
****ERROR**** Out Of Stroke	Jack has reached maximum stroke length and is unable to lift.	Check disposition of jacks. Relocate the 5th Wheel.
	Unexpected high amp current stall.	Check jacks in manual mode or perform manual override procedure. Repair or replace as needed.
		Check for bent or damaged jacks. Repair or replace as needed.
****ERROR**** External Sensor	Bad connection or wiring from the controller to the rear sensor.	Replace or repair connection to rear remote sensor.
****ERROR**** Jack Time Out	Time limit exceeded for the requested auto operation.	Check disposition of jacks.
****ERROR**** Auto Level Fail	Unable to auto level due to uneven ground.	Check disposition of jacks. Relocate the 5th Wheel.
	Unable to auto level due to zero point being set incorrectly.	Reset zero point.
****ERROR**** Comm Error	Communication between controller and touchpad has been lost.	Check harness for proper connections or damage. Replace if necessary.
****ERROR**** Bad Calibration	Sensor calibration values are out of range.	Replace controller
****ERROR**** Internal Sensor	Internal sensor problem.	Replace controller.
PANIC STOP Function Aborted	The user pressed a button on the touchpad during an automatic operation.	Restart automatic operation and then refrain from pressing any buttons on the touchpad.
****ERROR**** Hall Effect Short	Short circuit detected in one of the hall effect circuits.	Test for short and repair or replace.

Special Jack Error Codes

To clear 1 of the error codes listed below:

1. Correct or otherwise repair the issue (see the table below).

NOTE: In order to clear the special jack error code the jacks need to be "homed." In order to "home" jacks, each jack **MUST** be able to retract a minimum of 6".

2. Extend all jacks to reach the 6" of minimum retract needed.
   - **A.** Press "FRONT" (Fig. 18G) to extend the front jacks (if required).
   - **B.** Press "REAR" (Fig. 18J) to extend the rear jacks (if required).
   - **C.** Press "LEFT" and "RIGHT" (Fig. 18H and Fig. 18I) simultaneously to extend the middle jacks (if equipped and required).
3. Press and hold the retract button until all of the jacks begin to retract. The jacks will retract until they reach the hard current limit.
4. The jacks are now “homed” and the special jack error code will be cleared.

NOTE: If the jacks do not retract, an error should display on the touchpad screen. This is typically caused by wiring interruption.

LCD Message	What's Happening?	What Should Be Done?
ERROR LF Jack RF Jack LM Jack RM Jack LR Jack RR Jack	Error at a specific jack (left front, right front, left middle, right middle, left rear, right rear). Hall signal issue (open, short, malfunction or loss of communication); open or short circuit between controller and motor.	Check harness connections at controller and at jack. Check harness for damage. Check fuses at controller. Repair or replace as necessary.

Preventive Maintenance

1. For optimum performance, the system requires full battery current and voltage. The battery **MUST** be maintained at full capacity.
2. Check the terminals and other connections at the battery, the controller, and the jacks for corrosion, and loose or damaged connections.
3. Remove dirt and road debris from jacks as needed.
4. If jacks are down for extended periods, it is recommended to spray exposed leveling jack rods with a silicone lubricant every three months for protection. If the 5th Wheel is located in a salty environment, it is recommended to spray the rods every four to six weeks.

Notes

Please recycle all obsolete materials.

For all concerns or questions, please contact Lippert
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