Ground Control 3.0
4 Point and 6 point

SERVICE MANUAL

LIPPERT COMPONENTS™

TABLE OF CONTENTS

System and Safety Information

⚠WARNING

Failure to act in accordance with the following may result in death or serious personal injury. The use of the Ground Control 3.0 leveling system to support the unit 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 coach such as changing tires or servicing the leveling system. Any attempts to change tires or perform other service while unit is supported by the Ground Control 3.0 leveling system could result in damage to the 5th wheel and/or cause death or serious injury.

⚠WARNING

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

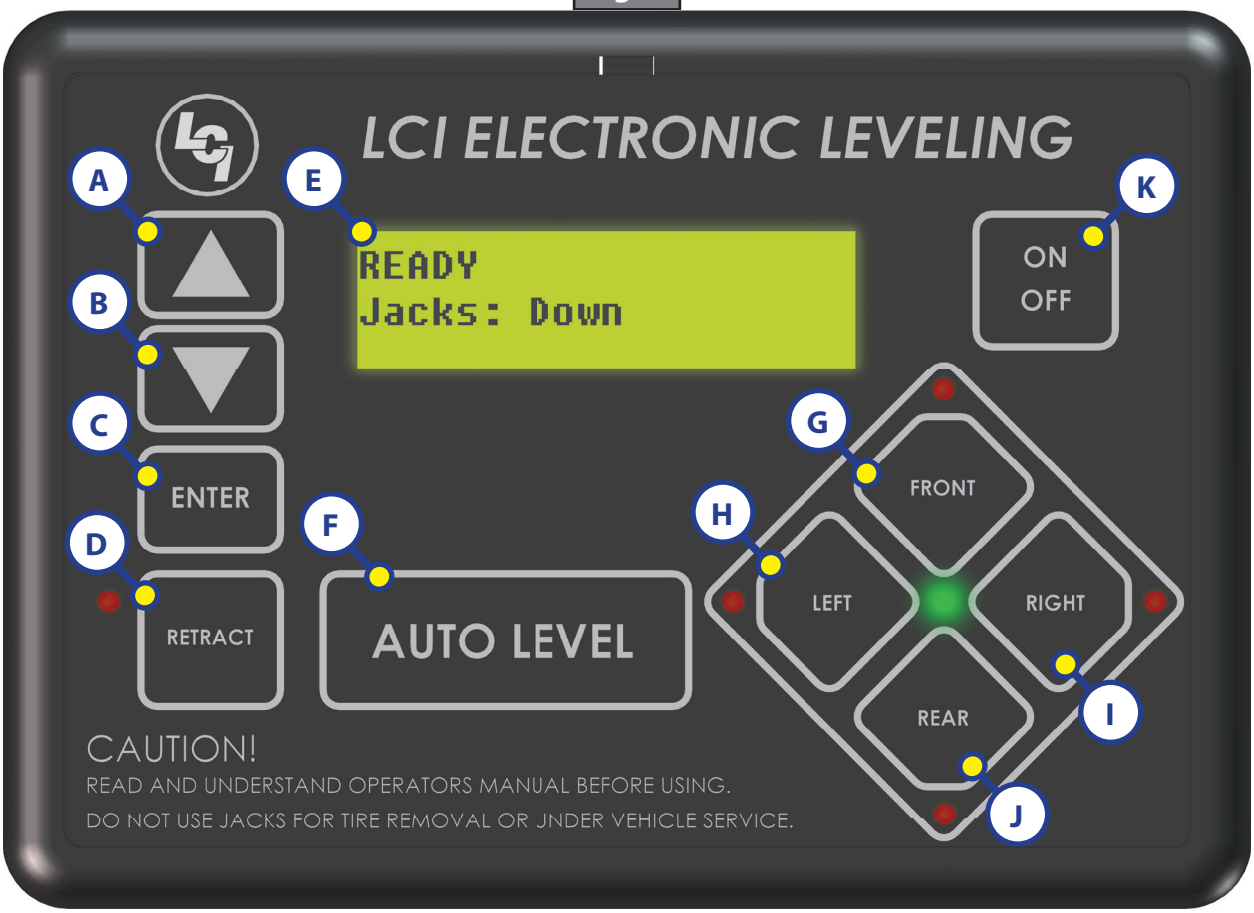
Prior to Operation

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

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

Touch Pad Diagram

Fig. 1



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.

Operation

Basic Jack Operation

Landing gear jacks can be operated any time the system is “ON”. By pushing the “FRONT” button (Fig. 1G), both front or landing gear jacks can be extended. By pushing either the "FRONT" and “LEFT” (Fig. 1H) or "FRONT" and “RIGHT” (Fig. 1I) buttons, the individual front jacks can be extended. If the touch pad is put in the retract mode, indicated by the orange illuminated LED next to the “RETRACT” button (Fig. 1D), the front jacks can be retracted together by pushing the “FRONT” button (Fig. 1G) or individually by pressing “LEFT” (Fig. 1H) or “RIGHT” (Fig. 1I) buttons, while simultaneously pressing the “FRONT” button (Fig. 1G).

NOTE: Middle jacks can only be operated in error mode. In order to engage middle jacks, press "LEFT" and "RIGHT" buttons simultaneously.

The rear jacks can only be extended when the touch pad is in the manual mode. Once system is in manual mode, pressing the “REAR” button (Fig. 1J) will extend both rear jacks at the same time. To extend individual rear jacks, press the “LEFT” (Fig. 1H) or “RIGHT” (Fig. 1I) buttons while simultaneously pressing the “REAR” button (Fig. 1J), depending on which jack needs to be operated. If the touch pad is put in the retract mode, indicated by the orange illuminated LED next to the “RETRACT” button (Fig. 1D), the rear jacks can be retracted together by pushing the “REAR” button (Fig. 1J) or individually by pressing either the “LEFT” (Fig. 1H) or “RIGHT” (Fig. 1I) buttons, while simultaneously pressing the “REAR” button (Fig. 1J).

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 unit.

Unhitching from a Tow Vehicle

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

1. Extend the inner legs of both landing gear 4-5 inches by pulling on the quick release pins.
2. Push “ON/OFF” (Fig. 1K). LCD Screen will light up and display “READY JACKS: UP” (Fig. 2A).
3. Push the “UP” arrow (Fig. 1A) to scroll to “Drop Front Jacks” option on LCD screen.
4. Red indicator lights (Fig. 2B) may come on, indicating the current disposition of the unit. In this case, the front and right sides of the unit are low.
5. Push “ENTER” (Fig. 1C). Both front landing gear jacks will go to ground and stop.
6. Push the “FRONT” button (Fig. 1G) extending the front landing gear to a sufficient height, which raises the front of the unit off of the tow vehicle’s 5th wheel hitch plate.
7. Pull tow vehicle away and park at a safe distance.

Fig. 2

Auto Level

1. After unhitching from tow vehicle and parking the vehicle at a safe distance away from the unit, press the "ON/OFF" button (Fig. 1K) and then press "AUTO LEVEL" (Fig. 1F).

NOTE: Once the automatic leveling cycle has been started, it is important that there is no movement in the coach until the unit 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 unit above level.

Auto Level Sequence

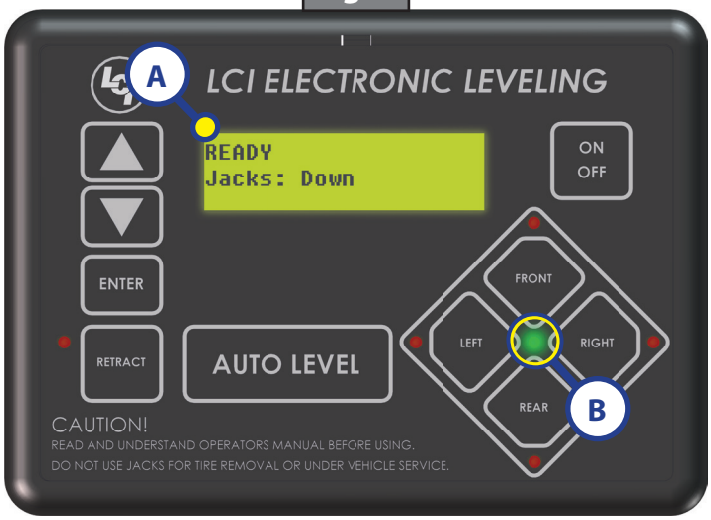
1. When Auto Level Sequence begins, the front of the unit will lower slightly to a point below level. The coach will then stop and raise up to the point where it is level from front to rear.
2. Rear leveling jacks are grounded.
3. A side to side leveling sequence occurs.

NOTE: At this point on the 6-point system, the two middle jacks are grounded to stabilize the unit. These two jacks do not level the unit.

4. Each jack will perform a final grounding touch.
5. LCD will read "AUTO LEVEL SUCCESS" (Fig. 3).
6. LCD will then read "READY Jacks: Down" (Fig. 4A), and the green LED at the center of the four jack buttons will be illuminated (Fig. 4B).

Fig. 3

Fig. 4



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

Hitch Recognition

1. Turn on touch pad.
2. Press the left and right buttons simultaneously (Fig. 1H/I).
3. All leveling jacks will retract first, then the landing gear will extend to raise the unit to the height where the auto level sequence was started.

NOTE: If the auto level sequence was started with the front of the unit in a below-level condition, the Hitch Recognition will not function and the LCD will display "Feature Disabled." In order for hitch recognition feature to function, the auto level sequence **MUST** be started with the front of the unit above level.

Homing Jacks

1. Introduce an error - disconnect one of the hall effect sensor wires at the controller.
2. Attempt to operate the jack that is associated with the sensor wire that was disconnected. The touch pad screen will display an error for that jack.
3. Reconnect the hall effect sensor wire. Manually extend all jacks down a minimum of 6 inches.
4. 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.
5. The jacks are now "homed."

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

NOTE: In order to "home" jacks, middle jacks **MUST** also be extended. Refer to Basic Jack Operation for middle jack operation.

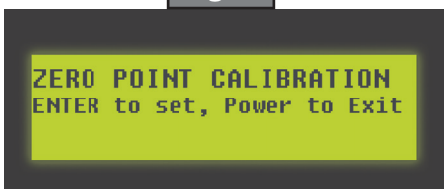
Zero Point Calibration

The "Zero Point" is the programmed point that the unit will return to each time the Auto Level feature is used. The "Zero Point" **MUST** be programmed prior to using the Auto Level feature to ensure the proper operation of the system.

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

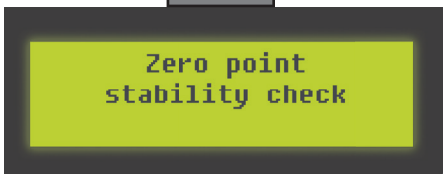
1. Manually run the jacks to level the unit. This is best achieved by placing a level in the center of the unit and leveling it both front to back and then side to side. (See "Basic Jack Operation" for instructions on how to manually operate the system).
2. Once the unit is level, turn off the touch pad.
3. With the touch pad off, press and release the "FRONT" button (Fig. 1G) five (5) times and then press and release the "REAR" button (Fig. 1J) five (5) times.
4. The touch pad will flash and beep and the display will read "ZERO POINT CALIBRATION ENTER to set, Power to Exit" (Fig. 5).
5. To set the current position as the zero point, press the "ENTER" button (Fig. 1C).

Fig. 5



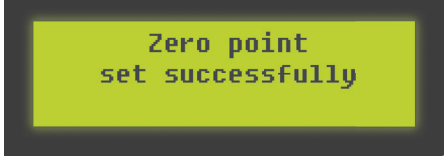
6. LCD display will read "Zero Point stability check" (Fig. 6).

Fig. 6



7. LCD display will read "Zero point set successfully" once process is complete (Fig. 7).

Fig. 7



8. The system will set this point as its level state and the touch pad will turn off.

Manual Override - Top of Jack Motor

NOTE: Use of a 12V-18V cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform the override procedure, as this may damage the motor.

If manual override is necessary on any jack in the system, there are two options. The following process will describe how to use the top override. See next page for the bottom override.

Tools needed: ⅜" drive ratchet and extension (no socket).

1. Find the port on the top of the jack motor (Fig. 8A).
2. Remove the rubber plug (Fig. 9).

Fig. 8

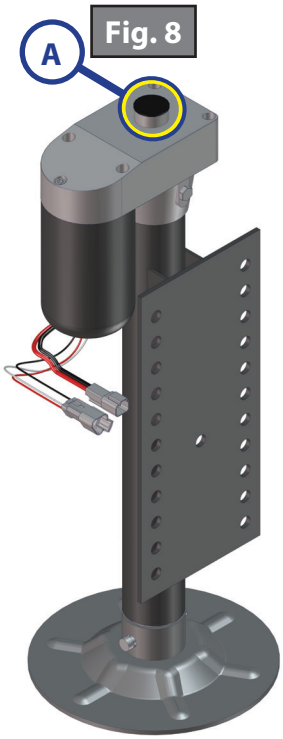


Fig. 9

3. Insert the ⅜" drive into the port (Fig. 10).
4. Turn override until the jack extends or retracts to desired position (Fig. 11).

Fig. 10

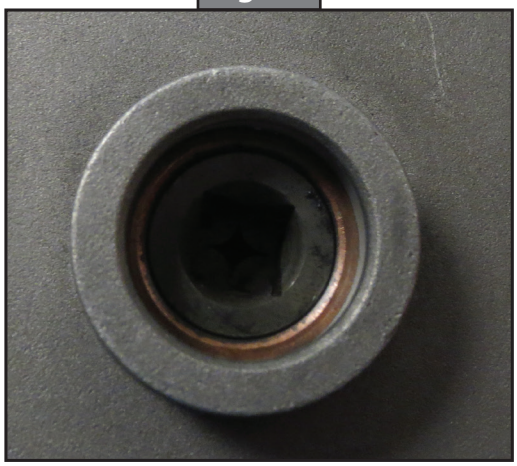
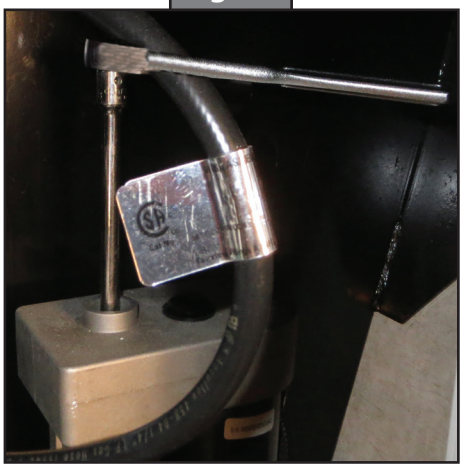


Fig. 11



Manual Override - Bottom of Jack Motor

NOTE: Use of a 12V-18V cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform the override procedure, as this may damage the motor.

If manual override is necessary on any jack in the system, there are two options. The following process will describe how to use the bottom override. See previous page for the top override.

Tools needed: ⅜" drive ratchet and extension, 5⁄16" socket.

1. Find the port on the bottom of the jack motor (Fig. 12A).
2. Remove the rubber plug (Fig. 13).

Fig. 12

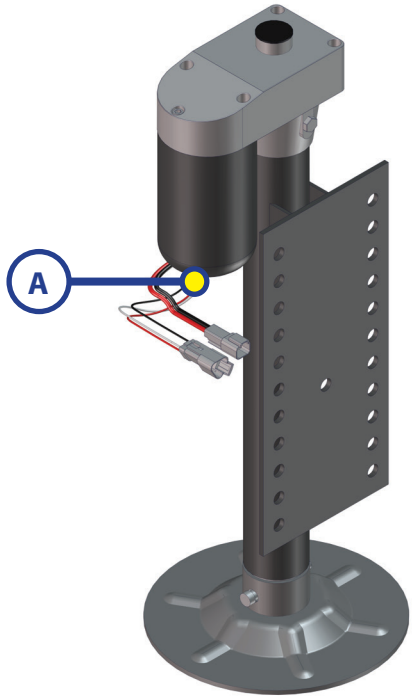


Fig. 13

3. Insert the 5⁄16" socket into the port (Fig. 14).
4. Turn override until the jack extends or retracts to desired position (Fig. 15).

Fig. 14

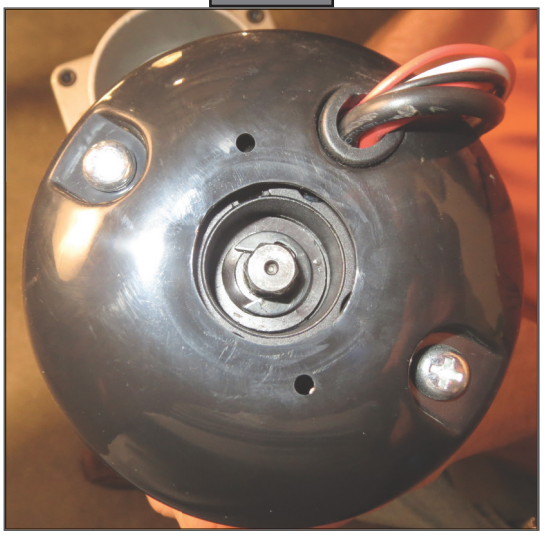


Fig. 15

Preventive Maintenance

1. Remove dirt and road debris from jacks and stabilizer struts (if equipped) as needed.
2. If jacks are down for extended periods, it is recommended to spray exposed leveling jack tubes with a spray lubricant every 3 months for protection. If the coach is located in a salty environment, it is recommended to spray the rods every month.

⚠WARNING

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

Troubleshooting - Touch Pad

Special Jack Error Codes

To clear one of these errors:

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

NOTE: Extend all of the jacks at least six (6) inches, then press and hold the "RETRACT" button on the touch pad until the jacks begin retracting. Refer to Basic Jack Operation for middle jack extension procedure.

2. All of the jacks will retract fully to clear the error.

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 rear, right rear). Hall signal issue (open, short, malfunction).	Check harness connections at controller and at jack. Check harness for damage. Repair or replace as necessary.
	Unexpected high amp current stall.	

Touch Pad Error Codes

NOTE: To clear an error from the touch pad, 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 coach.
****ERROR**** Excessive Angle	Controller not properly secured.	Check and secure controller placement.
	Excessive angle reached during auto operation.	Relocate the coach.
****ERROR**** Feature Disabled	Front of coach below level when starting Auto Level process (only when trying to initiate Hitch Recognition).	Raise front of coach above level and restart Auto Level process
	Touch pad power not cycled between consecutive leveling operations.	Turn touch pad off and then back on to reset the system.
	Zero point not set.	Set zero point.

LCD Message	What's Happening?	What Should Be Done?
****ERROR**** Low Voltage	Battery voltage dropped below 10.8V.	Check wiring for loose connection.
		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 coach.
****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 coach.
	Unable to auto level due to zero point being set incorrectly.	Reset zero point.
****ERROR**** Bad Calibration	Sensor calibration values are out of range.	Reset zero point.
****ERROR**** Internal Sensor	Internal sensor problem.	Replace controller.
PANIC STOP Function Aborted	The user pressed a button on the touch pad during an automatic operation.	Restart automatic operation and then refrain from pressing any buttons on the touch pad.

Component Replacement

NOTE: After replacing any of these components, you will need to "home" the jacks. See the corresponding sections for instructions.

Landing Gear Replacement

1. Remove existing landing gear from the unit by removing the carriage bolts and nuts in the brackets that are holding the landing gear in place.
2. Using the new carriage bolts and nuts, mount the new landing gear in the brackets so that the tabs on the new landing gear are positioned between the mounting brackets as shown in Figs. 16 and 17. Tighten the nuts on the carriage bolts until the bracket opening is less than 2 ½".
3. Connect the wire harnesses to the landing gear motor wires and run the harnesses to the compartment where the controller will be mounted.

NOTE: LCI recommends zip-tying the harnesses tight against the landing gear motors to prevent damage to the harnesses.

Fig. 16

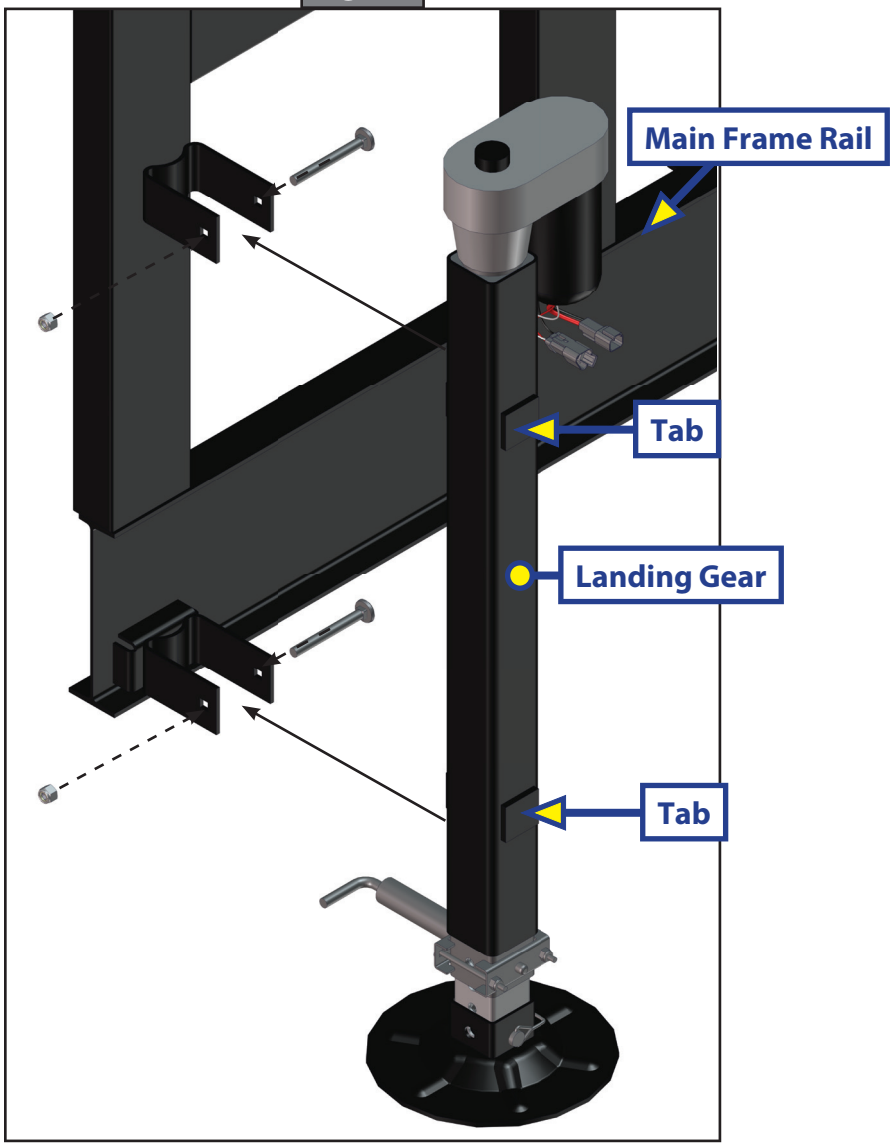
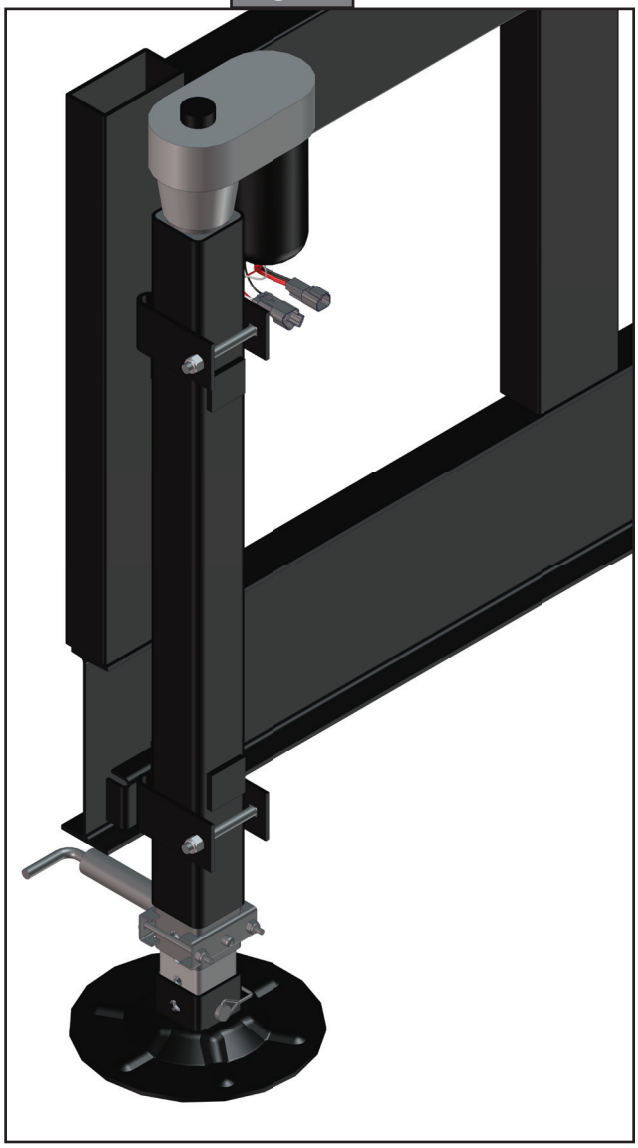


Fig. 17

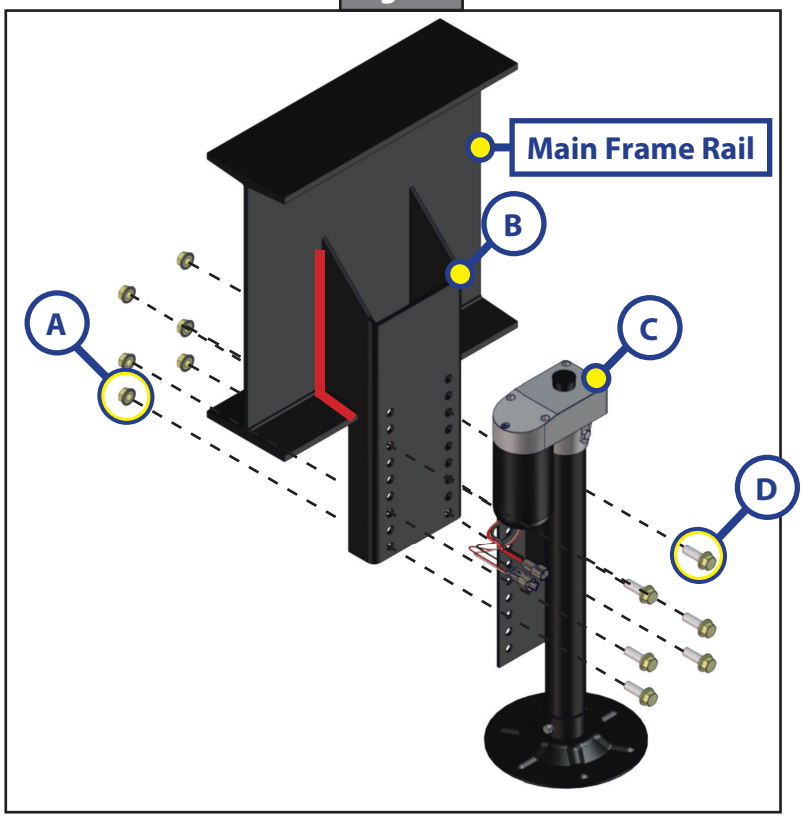


Rear Jack Replacement

1. Unbolt the jack from mounting bracket.
2. Bolt the new rear jack (Fig. 18C) to the mounting bracket (Fig. 18B) using six bolts (Fig. 18D) and nuts (Fig. 18A) per jack. Tighten the bolts to 90 lb.-ft. of torque.
3. Connect the wire harnesses to the rear jack motor wires.

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

Fig. 18



Rear Sensor Replacement

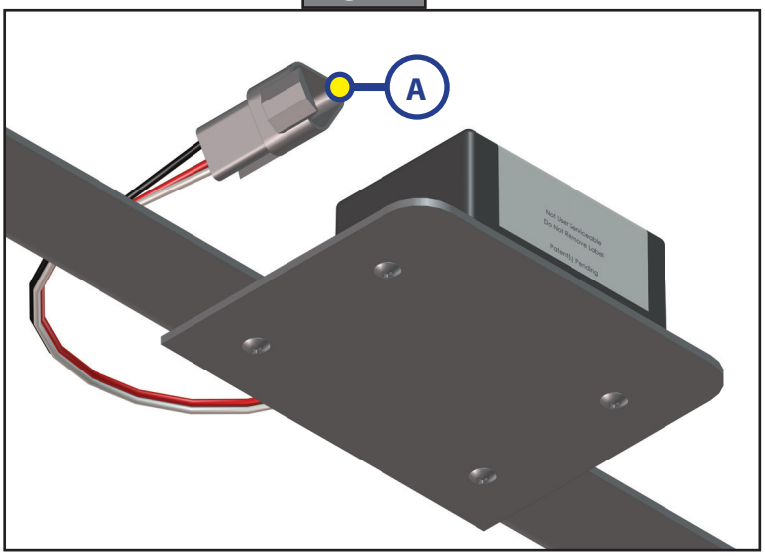
1. Locate the rear sensor in the underbelly of the coach.
2. Cut an access panel in the underbelly using a knife. The rear sensor should be installed on the crossmember to the rear of the back axle, centered curbside to roadside on the unit.

⚠ CAUTION

Be sure not to cut any hoses or wires that may be under the underbelly.

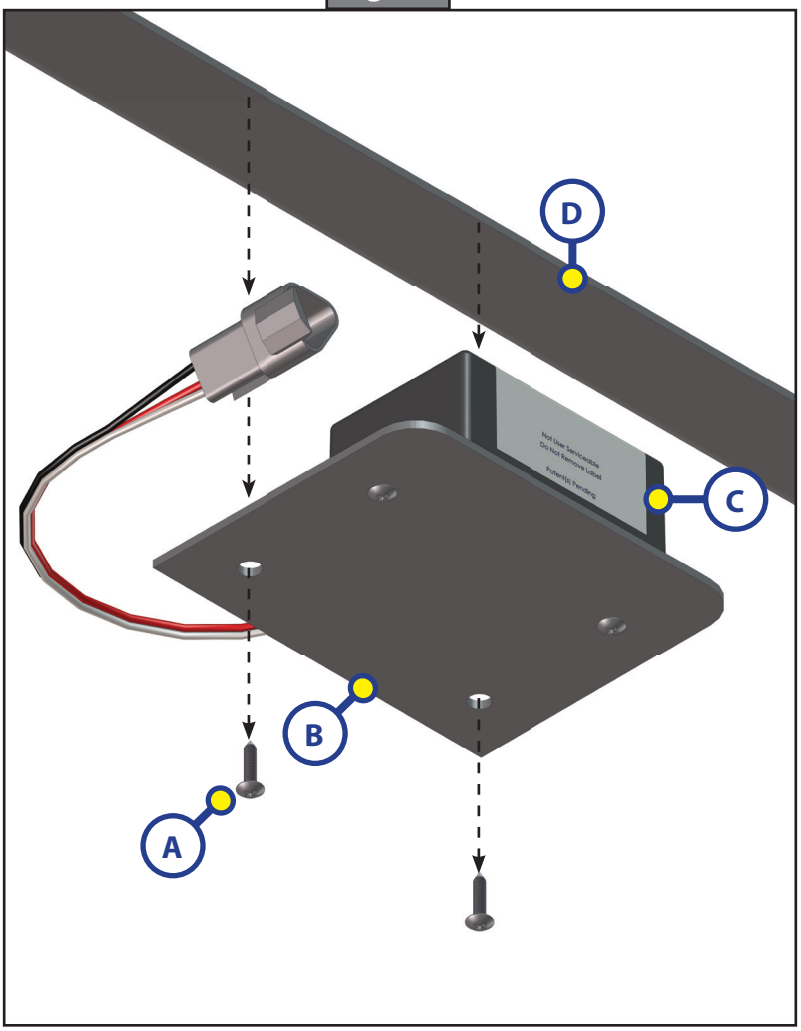
3. Disconnect the rear sensor harness from the connector on the rear sensor (Fig. 19A).

Fig. 19



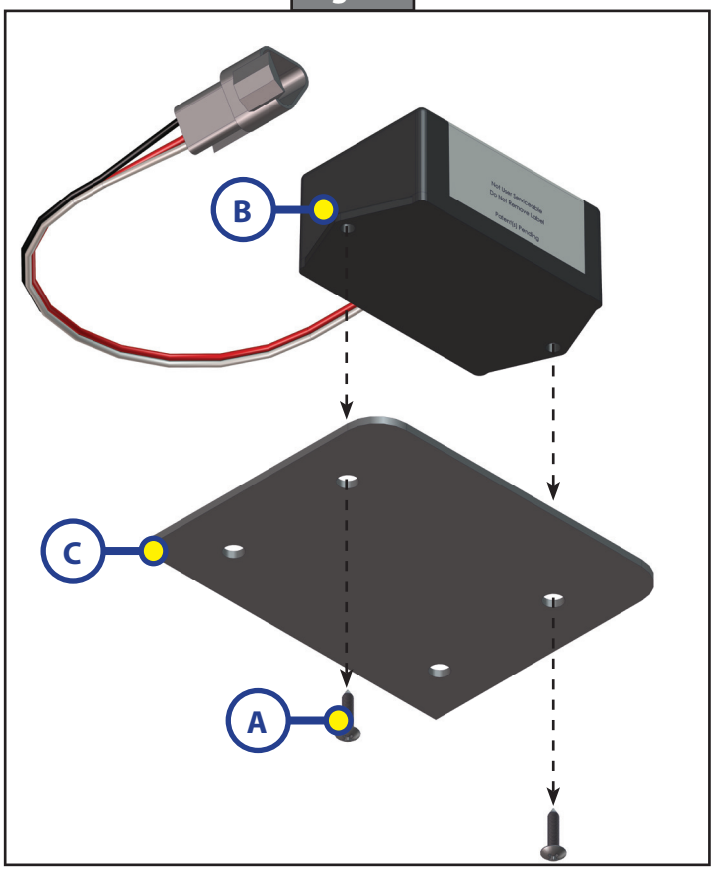
4. Remove the screws (Fig. 20A), mounting plate (Fig. 20B) and sensor (Fig. 20C) assembly from the crossmember (Fig. 20D).

Fig. 20



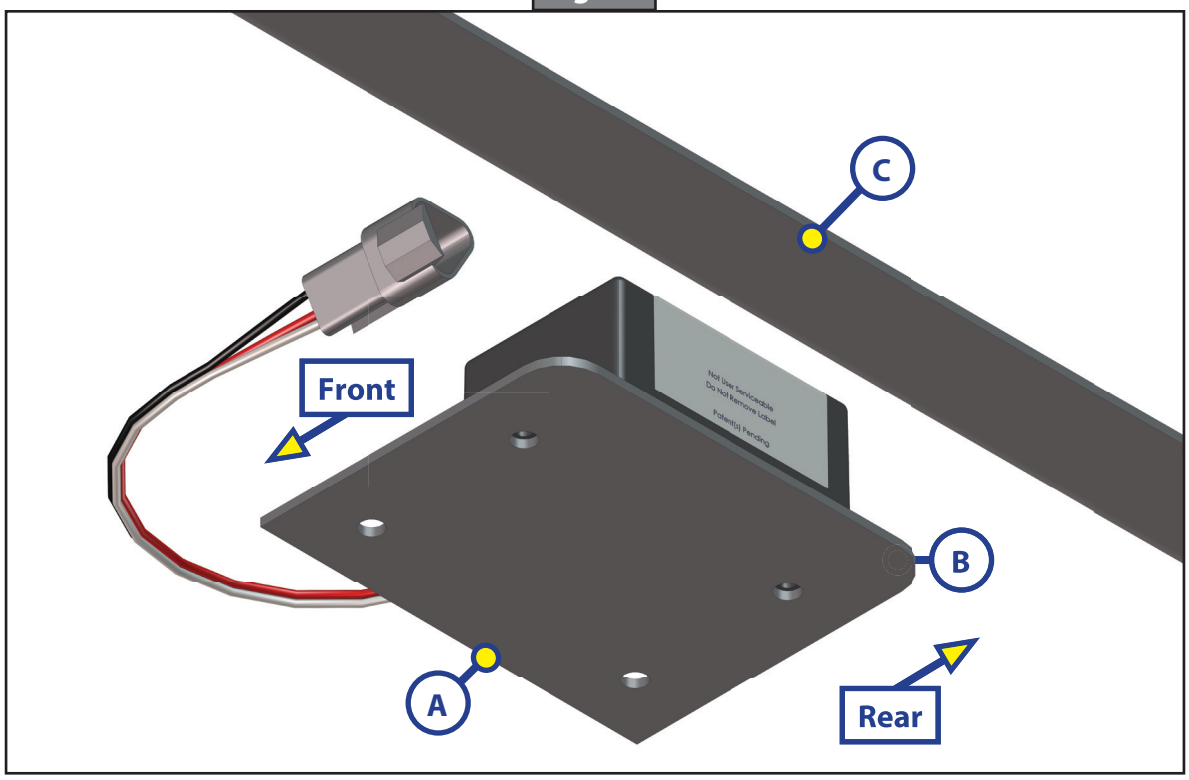
5. Remove the screws (Fig. 21A) from the rear sensor (Fig. 21B) and mounting plate (Fig. 21C) and remove the sensor from the plate.

Fig. 21



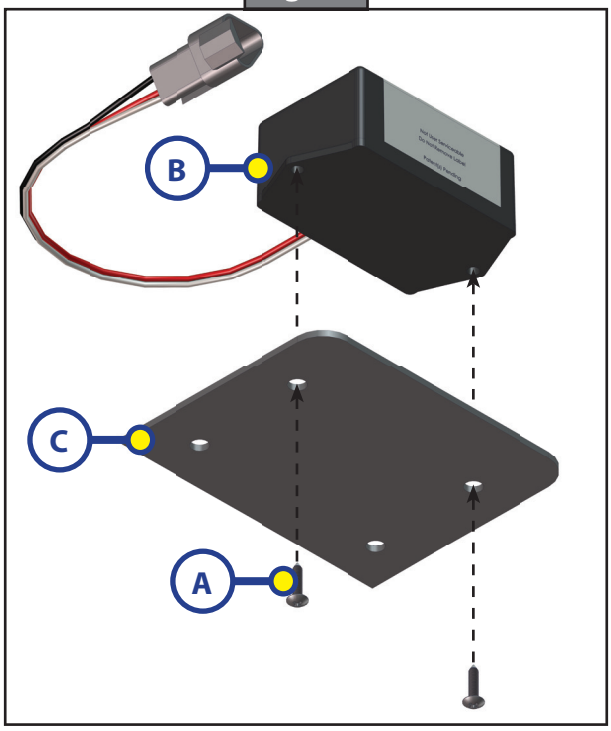
6. Dry fit the mounting plate (Fig. 22A) and the replacement rear sensor (Fig. 22B) to the crossmember (Fig. 22C). The pre-drilled holes in the plate are for mounting the rear sensor to the plate. Mark on the plate where the rear sensor will set. Space between the sensor and the crossmember **MUST** be left so the wire harness will not be pinched.

Fig. 22



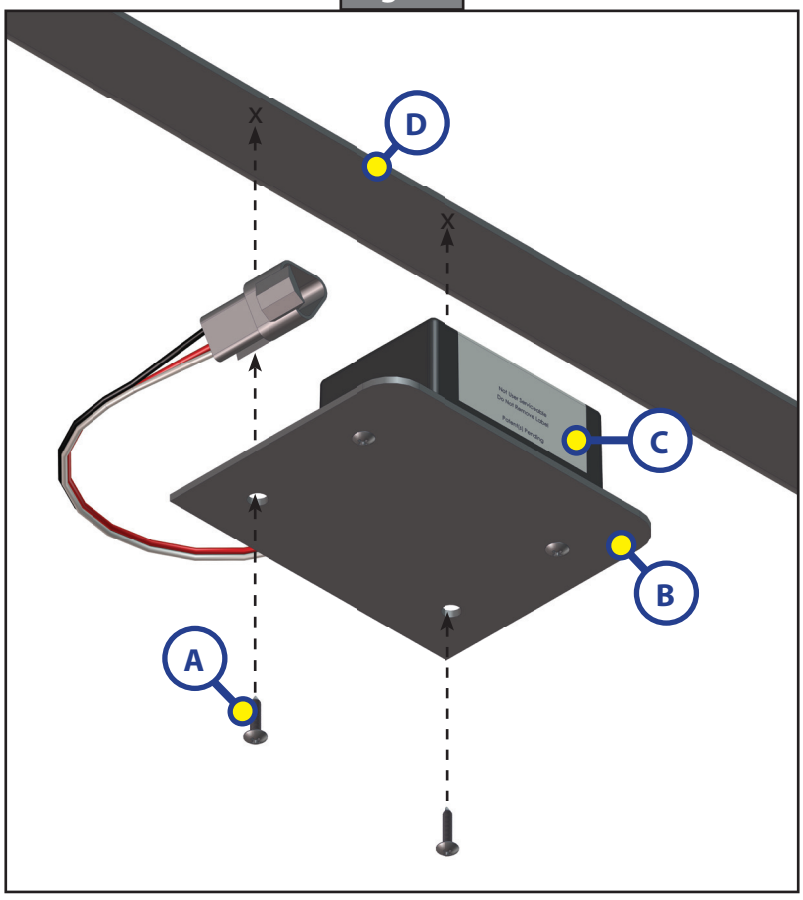
7. Attach the replacement rear sensor (Fig. 23B) to the mounting plate (Fig. 23C) using two ⅜" hex head self tapping screws (Fig. 23A). Orientation is imperative for the correct operation of the leveling system.

Fig. 23



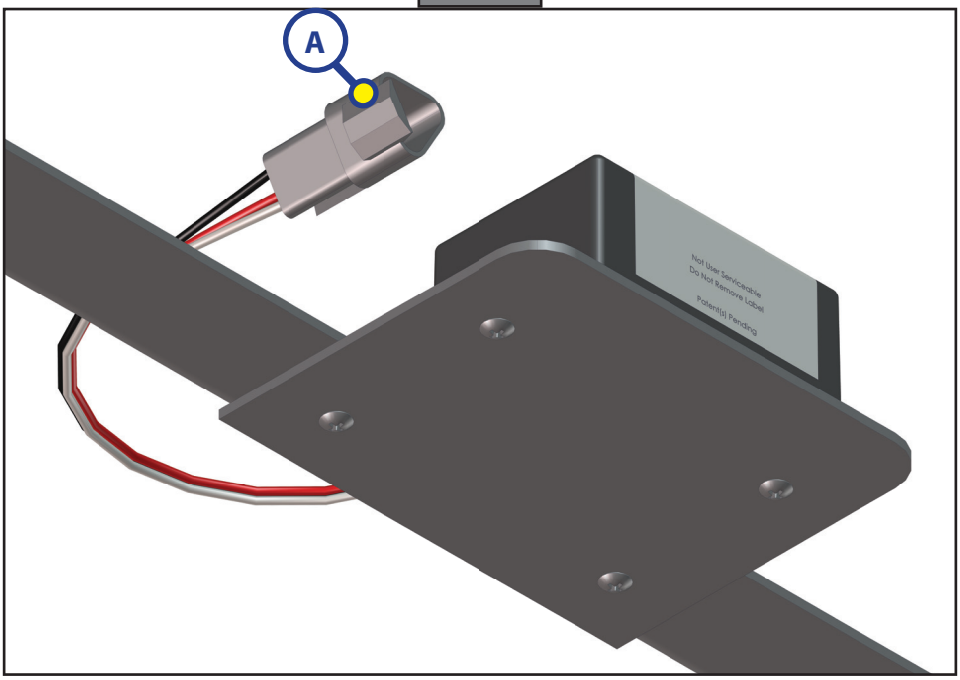
8. Attach the mounting plate (Fig. 24B) and replacement sensor (Fig. 24C) assembly to the crossmember (Fig. 24D) using two ⅜" hex head self tapping screws (Fig. 24A). Ensure that the plate is centered side to side on the frame and that the sensor is oriented properly (Fig. 24).

Fig. 24



9. Connect the rear sensor harness to the connector on the rear sensor (Fig. 25A) and run the harness through the frame and up to the compartment where the controller will be mounted.

Fig. 25



Controller Replacement

1. Disconnect all jack harnesses from the connectors on the controller.
2. Remove the power and ground harness from the controller.
3. Remove the controller (Fig. 26A) from the ceiling of the compartment.
4. Using four #8 x 1" wood screws (Fig. 26B), attach the replacement controller (Fig. 26A) to the ceiling of the compartment, in the same position as the removed controller.

NOTE: The controller should be positioned directly in the center of the unit with the arrow on the label of the controller facing the front of the coach (Fig. 27).

NOTE: Some 6-point controllers do not have orientation arrows for the front of the unit. When installing those controllers, ensure that the port labeled "LEFT FRONT" is pointing to the left-hand front of the unit. This will ensure proper orientation and function of the controller. Attach the power and ground harness to the corresponding posts on the replacement controller and then connect them to the correct posts on the house battery.

5. Connect all jack harnesses to the appropriate connectors on the replacement controller.

Fig. 26

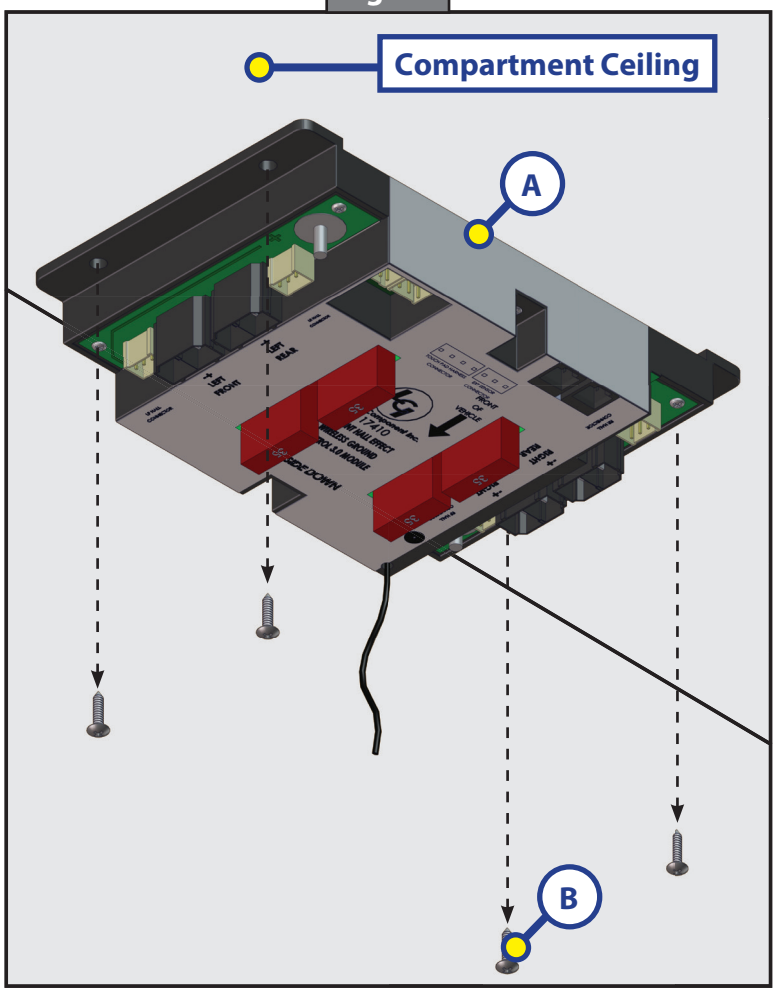
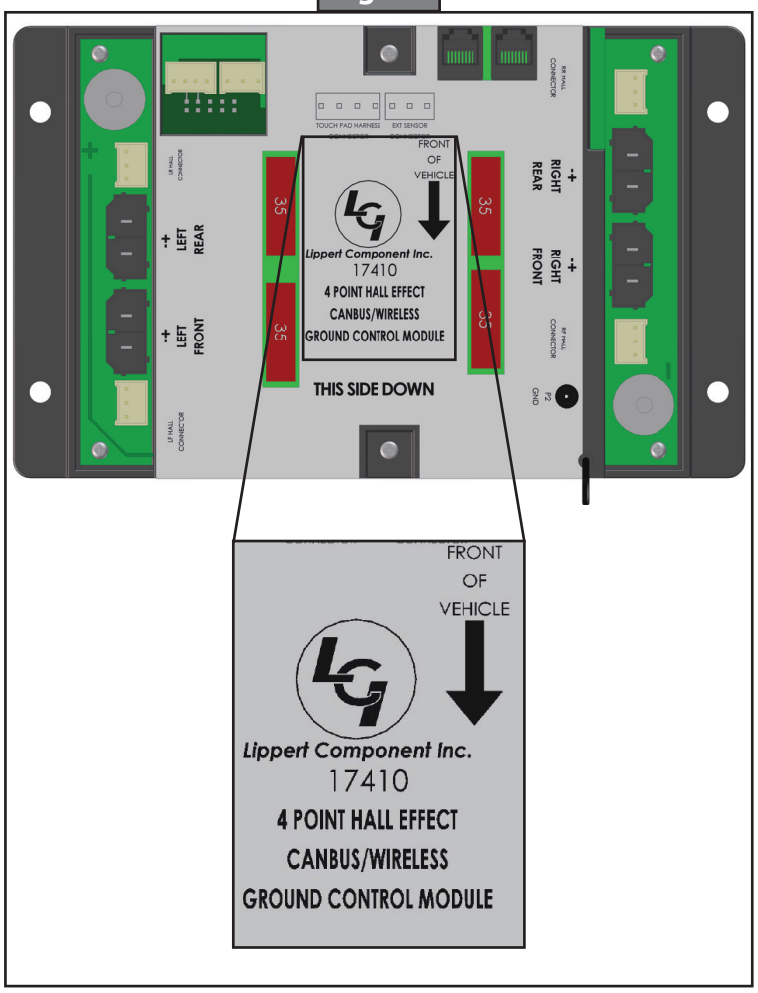


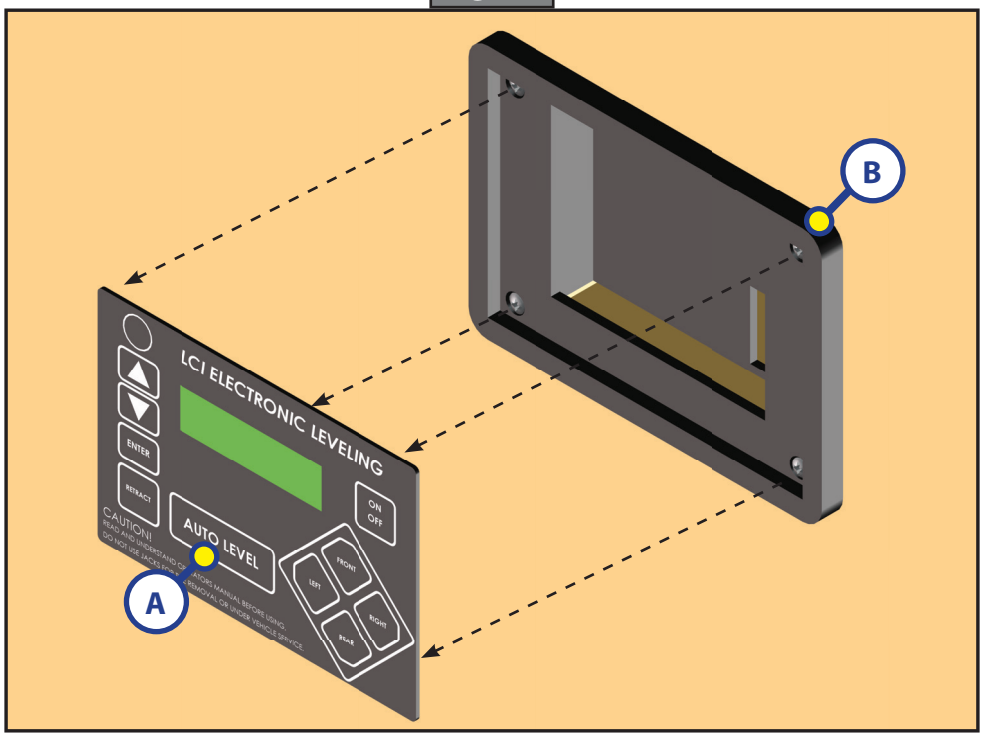
Fig. 27



Touch Pad Replacement

1. Remove the face plate of the touch pad (Fig. 28A) from the mounting bezel (Fig. 28B).
2. Unplug the harness from the connector on the back of the face plate.
3. Plug the touch pad harness into the connector on the back of the replacement touch pad face plate and snap the face plate into the bezel.

Fig. 28



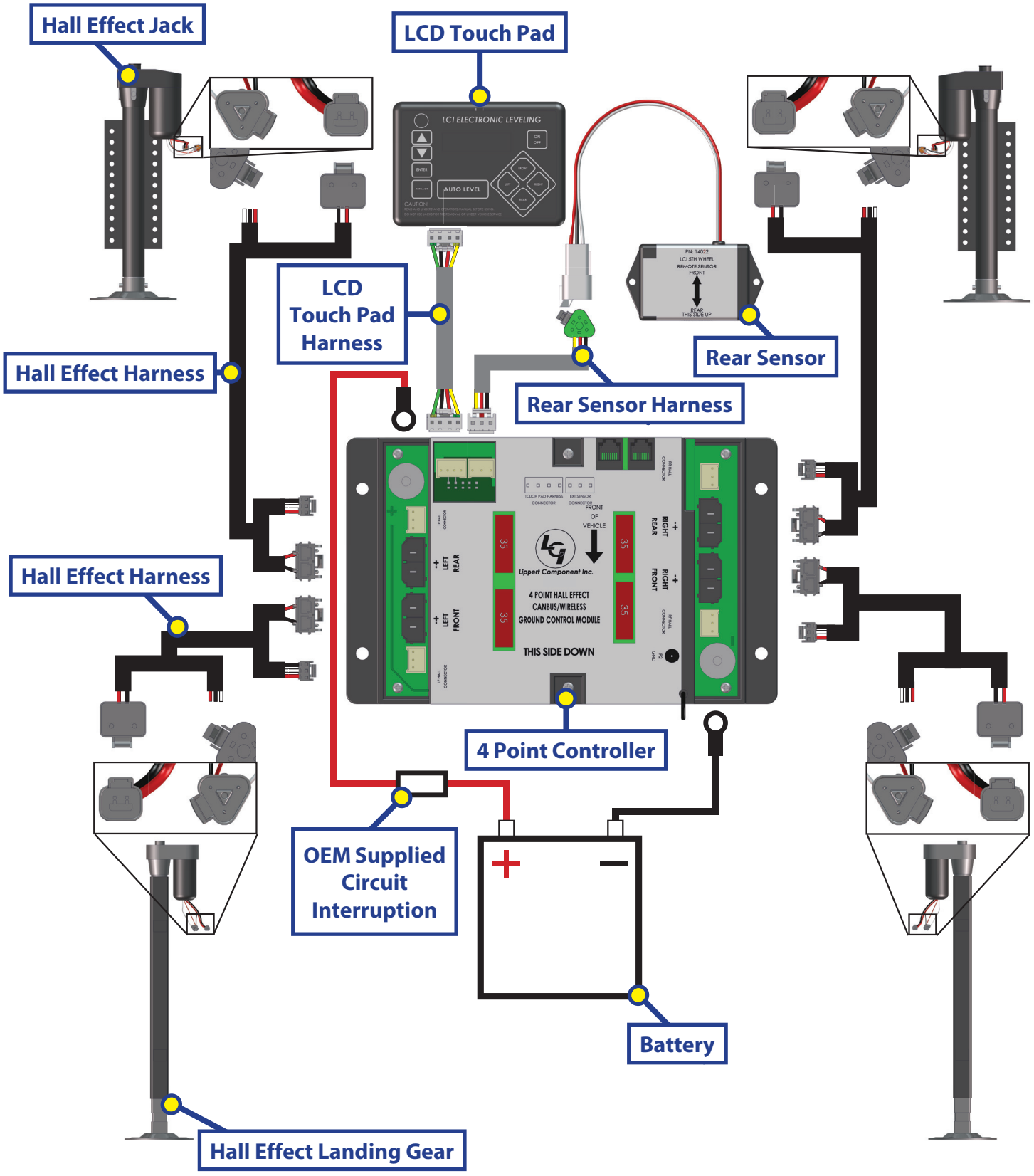
Jack Motor Replacement

1. Using a ½" socket or wrench, remove the two motor retention bolts from the jack (Fig. 29).
2. Remove the faulty motor from the top of the jack (Fig. 30).
3. Gently position the replacement motor into the coupler found inside the jack.
4. Replace and tighten motor retention bolts.

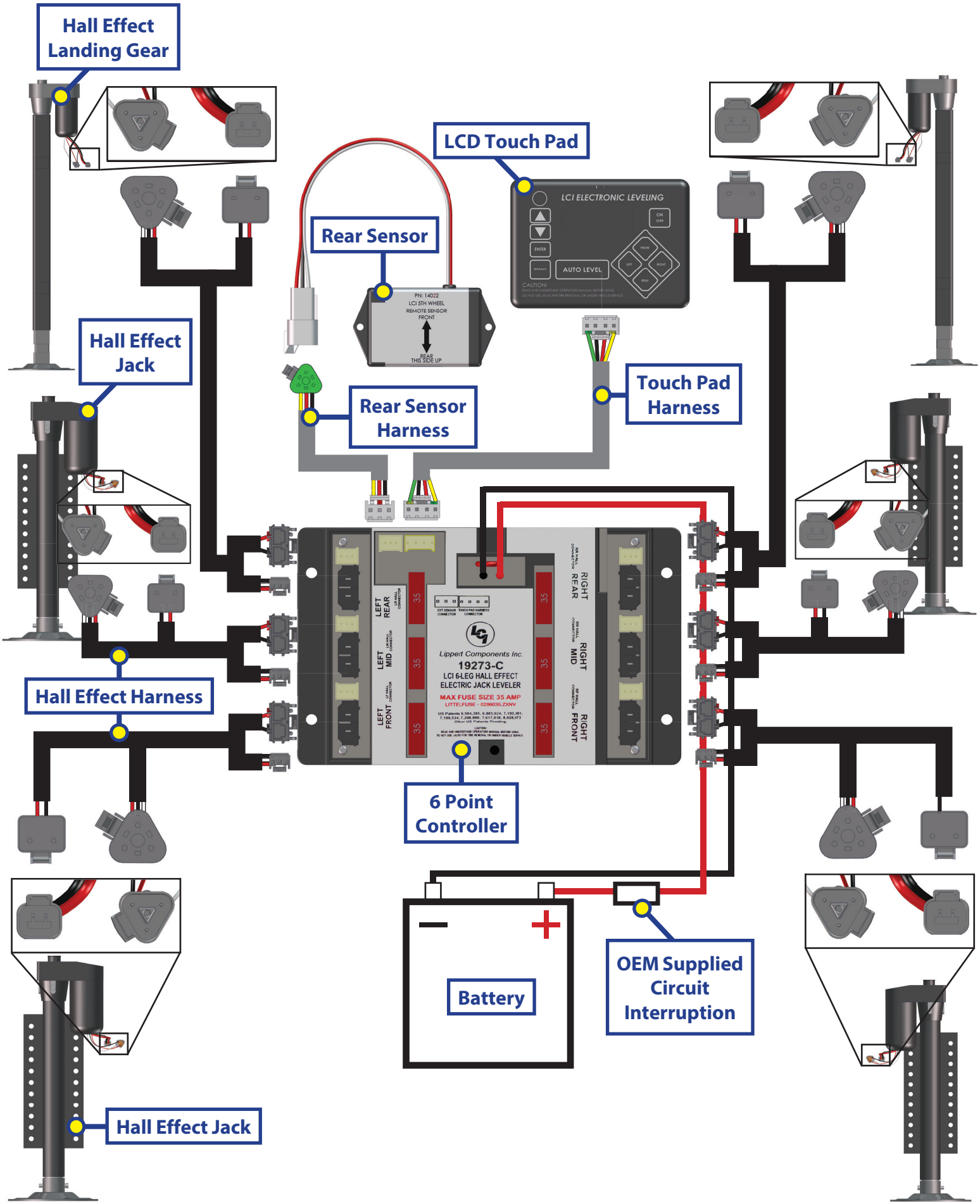
Fig. 29

Fig. 30

4 - Point Wiring Diagram

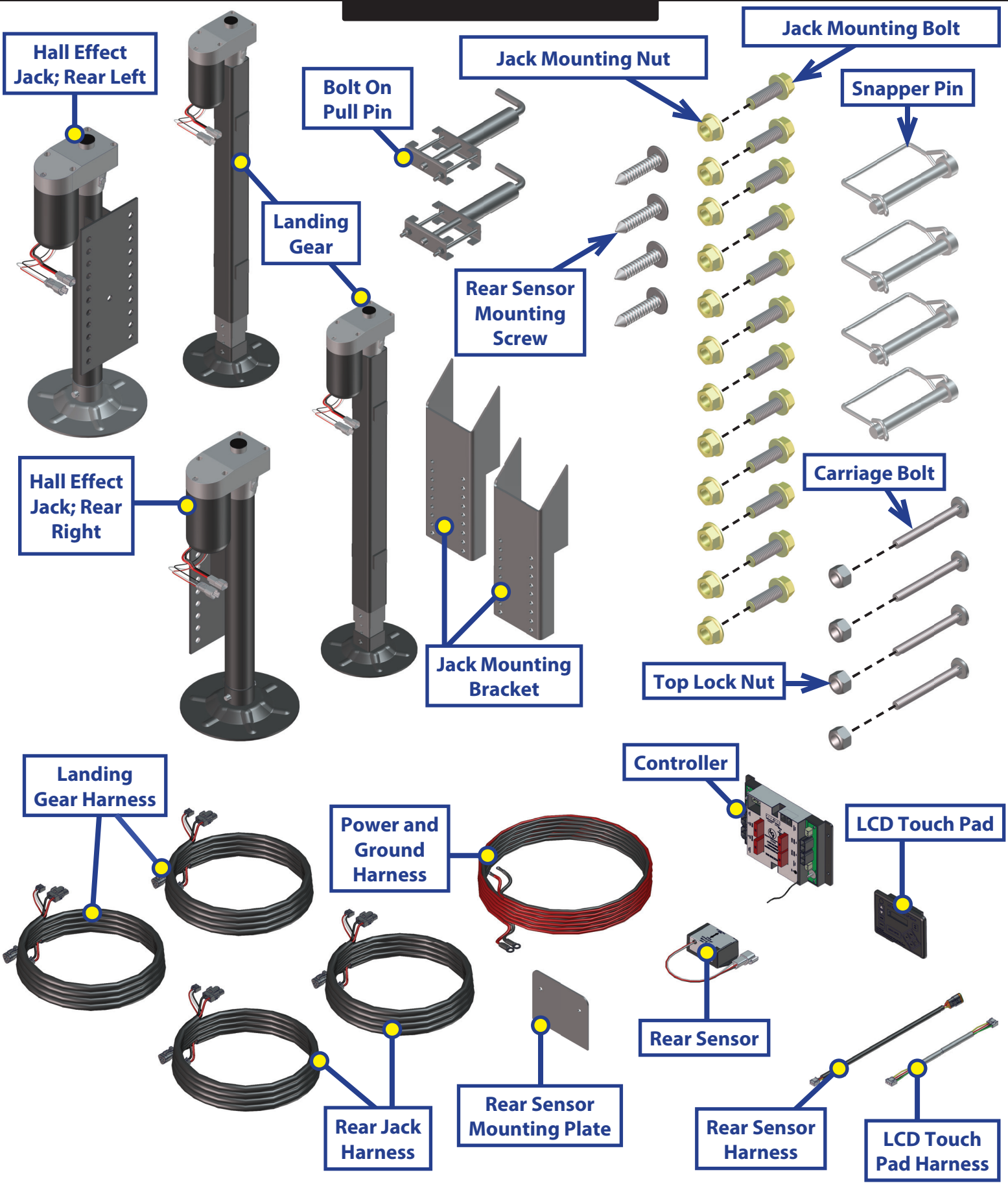


6 - Point Wiring Diagram



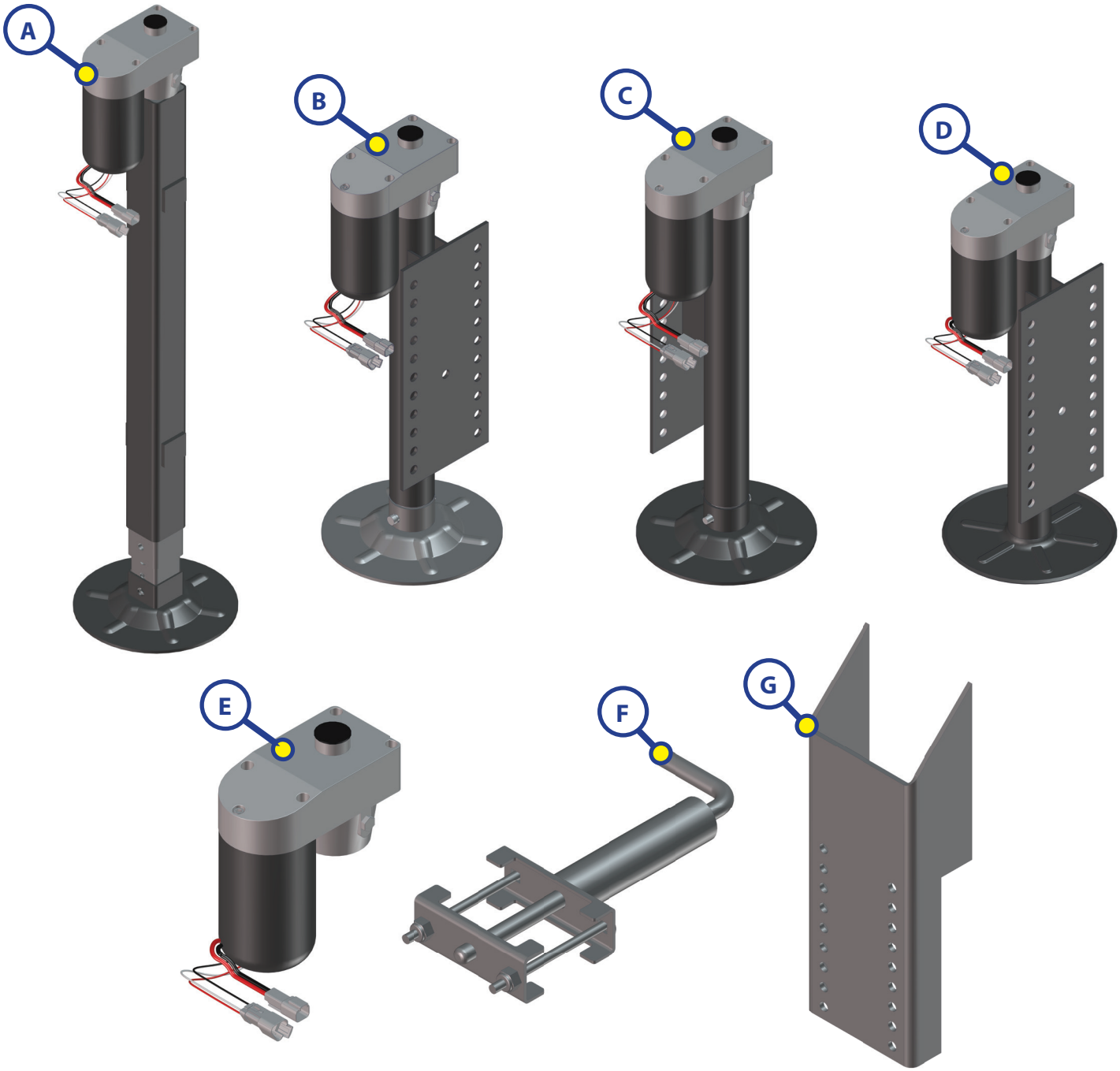
GROUND CONTROL 3.0 OEM ASSEMBLY

LEVELING AND STABILIZATION



GROUND CONTROL 3.0 COMPONENTS

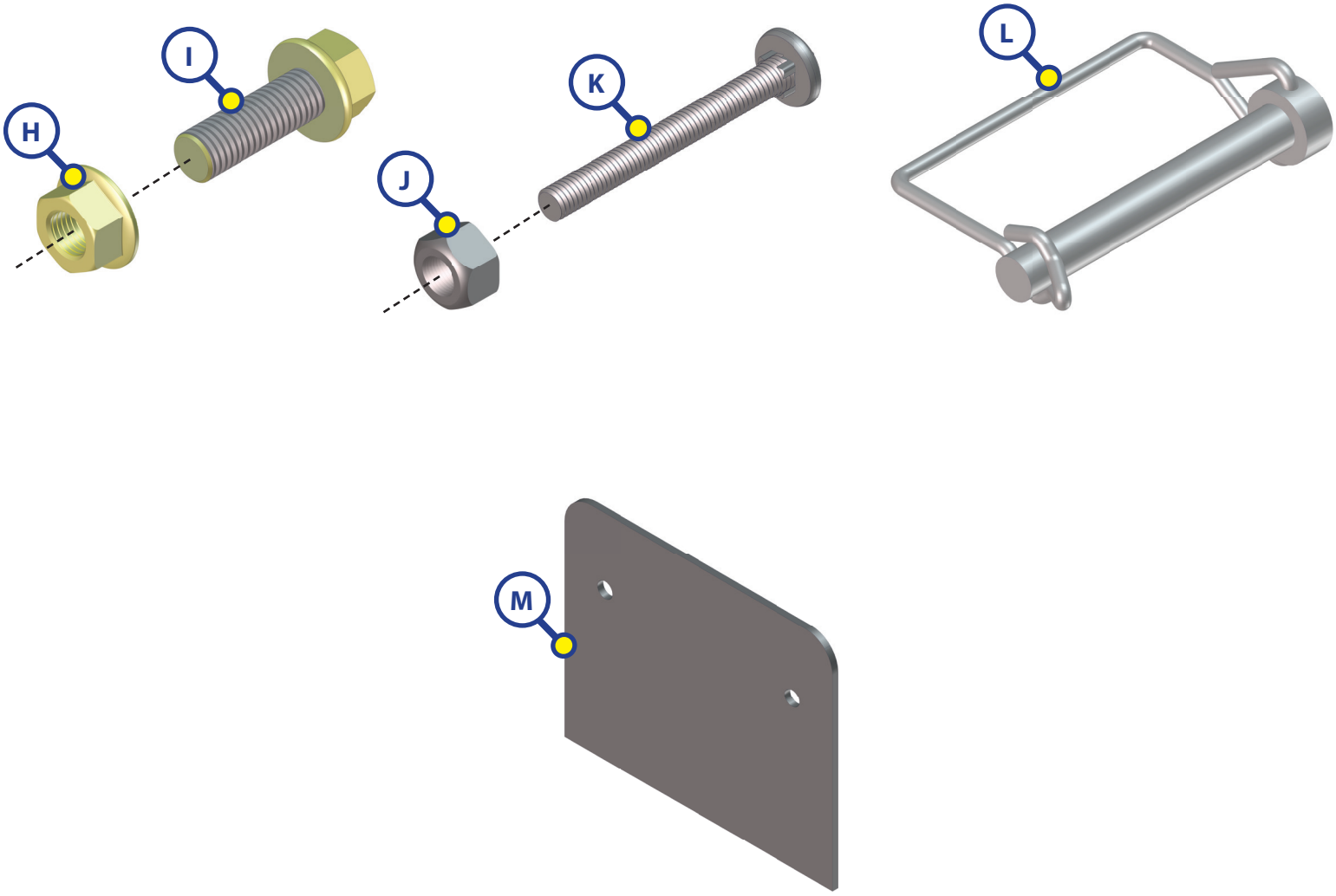
LEVELING AND STABILIZATION



Callout	Part #	Description
A	305340	Hall Effect Landing Gear; Front Stroke 19.8125"
B	305339	Hall Effect Jack; Rear Left 12.5" Stroke
C	344792	Hall Effect Jack; Rear Right 12.5" Stroke
D	342610	Hall Effect Jack; Rear Short 10.5" Stroke
E	343758	Hall Effect Jack Motor
F	119113	Bolt On Pull Pin
G	134989	Weld On Jack Mounting Bracket (OEM Only)

GROUND CONTROL 3.0 COMPONENTS

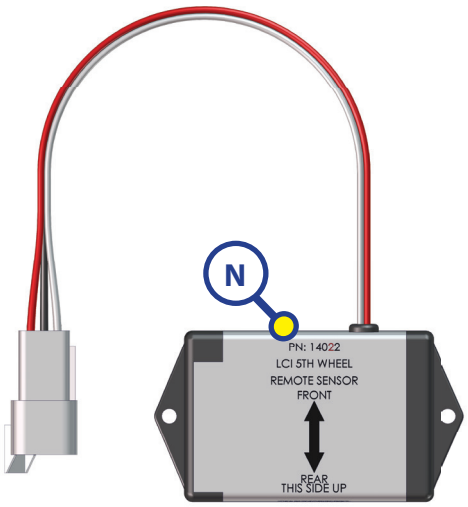
LEVELING AND STABILIZATION

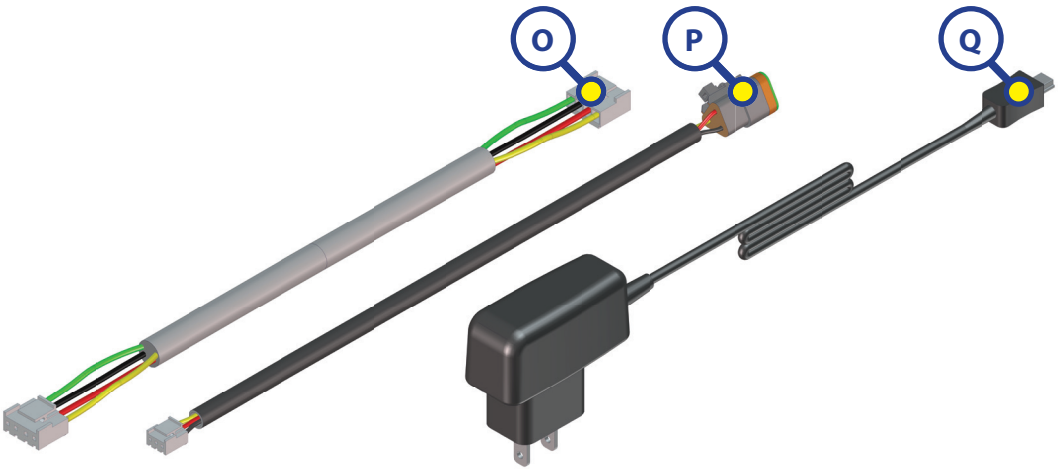


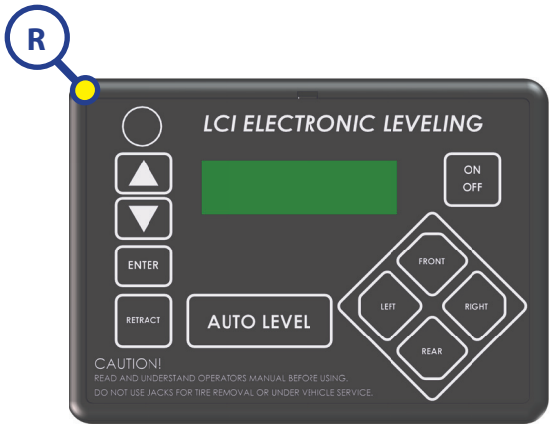
Callout	Part #	Description
H	178210	Jack Mounting Nut; ½" - 20
I	118076	Jack Mounting Bolt; ½" - 20 x 1 ½" Flange
J	119073	Top Lock Nut
K	125878	Carriage Bolt
L	225598	Snapper Pin; ⅜ x 3"
M	231775	Rear Sensor Mounting Plate

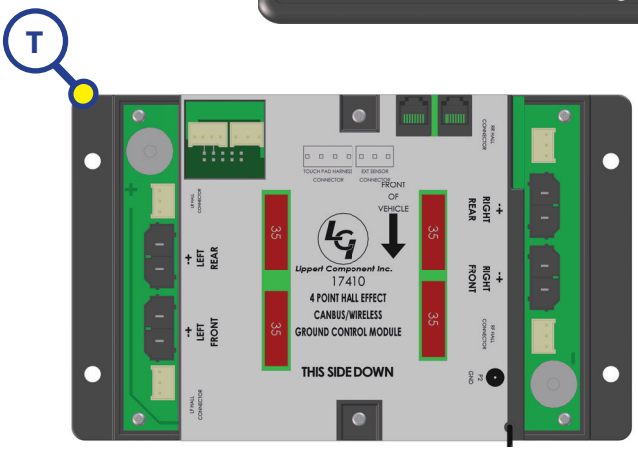
GROUND CONTROL 3.0 COMPONENTS

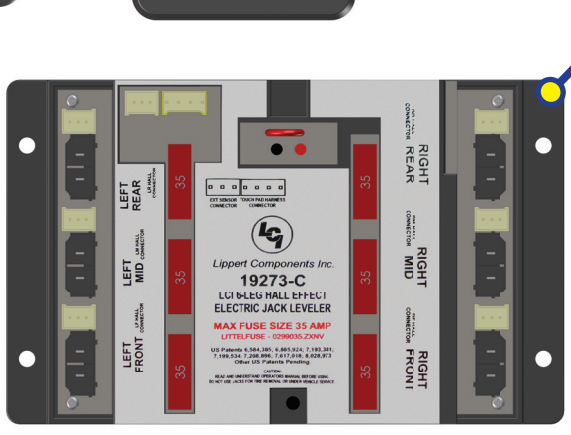
LEVELING AND STABILIZATION







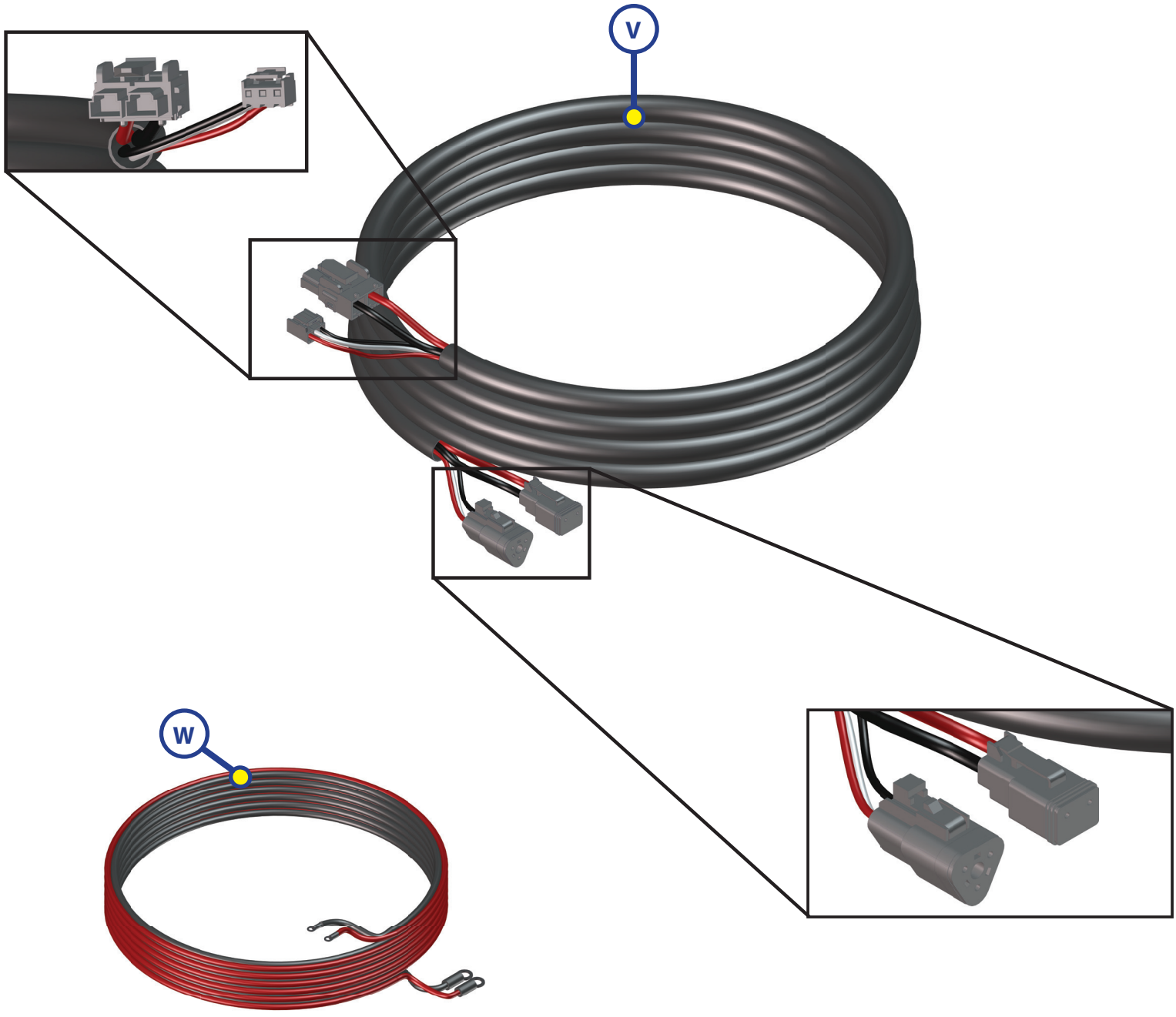




Callout	Part #	Description
N	232201	Rear Sensor
O	232937	LCD Touch Pad Harness
P	243688	Rear Sensor Harness
Q	267401	Linc Remote Charger
R	234802	LCD Touch Pad
S	329164	Linc Remote
T	304136	4-Point Hall Effect Canbus Wireless Ground Control Controller
U	346005	6-Point Hall Effect Ground Control Controller

GROUND CONTROL 3.0 COMPONENTS

LEVELING AND STABILIZATION



Callout	Part #	Description
V	305115	Hall Effect Right Rear Sensor Harness
	306298	Hall Effect Left Rear Sensor Harness
	307489	Hall Effect Right Front Sensor Harness
	307490	Hall Effect Left Front Sensor Harness
	347012	Hall Effect Right Mid Harness
	347013	Hall Effect Left Mid Harness
W	306176	Power and Ground Supply Harness

LIPPERT COMPONENTS™

Please recycle all obsolete materials.

For all concerns or questions, please contact
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