



**GROUND CONTROL[®]
TT LEVELING SYSTEM
OWNER'S MANUAL**

**L I P P E R T
C O M P O N E N T S[®]**

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System Information

With the push of a button, the Ground Control® TT Leveling System levels and stabilizes your travel trailer quickly and accurately, enhancing your overall camping experience. It can take up to an hour to get a travel trailer level with manual jacks, chocks and wedges. The Ground Control TT Leveling System saves you time by leveling and stabilizing the travel trailer in a matter of minutes, and prevents annoying rocking and swaying at the campsite.

Features

1. Saves time setting up camp
2. Fast, accurate automatic electric leveling
3. Auto re-hitch memory function
4. Level travel trailers function more efficiently than non-level ones

Safety Information



Failure to act in accordance with the following may result in death or serious personal injury:

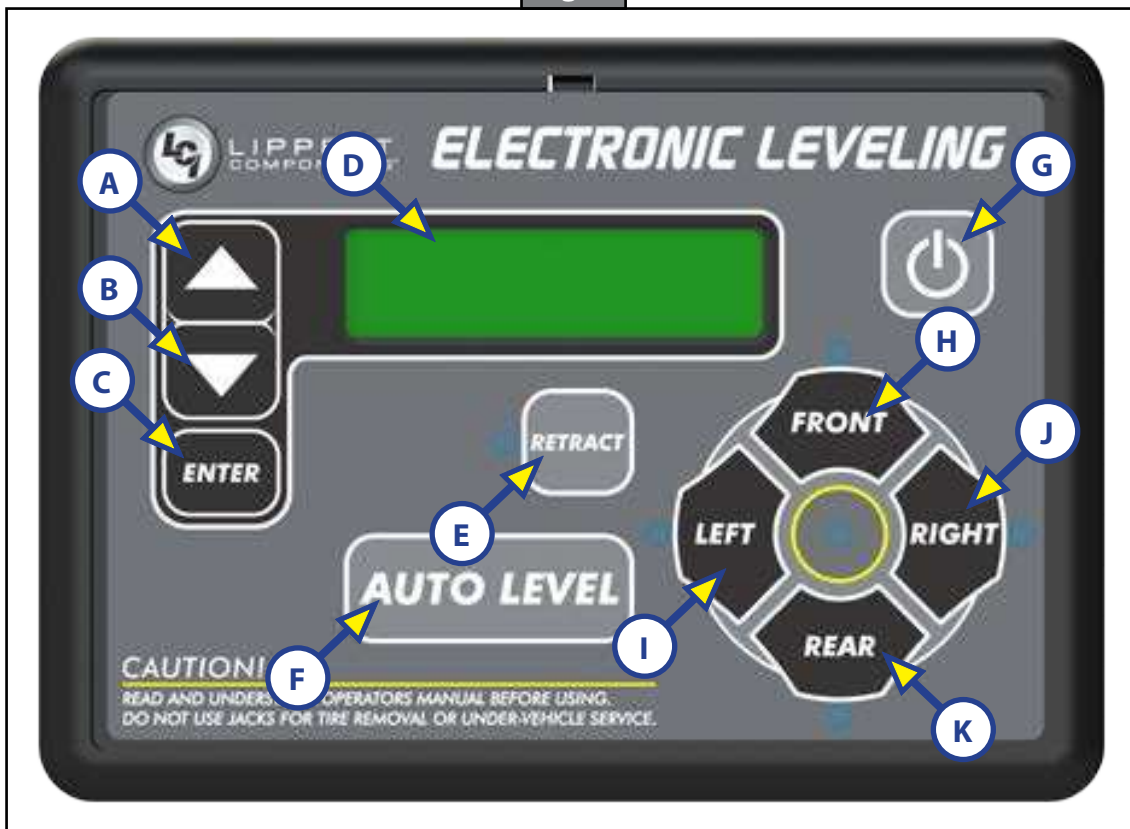
1. **The use of the Ground Control TT Leveling System to support the travel trailer for any reason other than which it is intended is prohibited by Lippert's limited warranty.**
2. **The Ground Control TT Leveling System is designed as a "leveling" system only and should not be used to provide service for any reason under the travel trailer, such as changing tires or servicing the leveling system.**
3. **Any attempts to change tires or perform other service while travel trailer is supported by the Ground Control TT Leveling System could result in damage to the travel trailer and/or cause death or serious injury.**

CAUTION

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

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	LCD Display - Displays procedures and results.
E	Retract - Places leveling system into retract mode.
F	Auto Level - Places leveling system into auto level mode.
G	Power Button - Turns leveling system on and off.
H	Front Jack Button - Activates tongue jack in standard mode - Activates front jacks in manual mode.
I	Left Jack Button - Activates left jacks in manual mode.
J	Right Jack Button - Activates right jacks in manual mode.
K	Rear Jack Button - Activates rear jacks in manual mode.

Operation

⚠ WARNING

Be sure to Park the travel trailer on solid and level ground. Prior to operation, clear all jack landing locations of debris and obstructions. The locations should also be free of surface depressions and moisture. When parking the travel trailer on extremely soft surfaces, utilize load distribution pads under each jack.

⚠ CAUTION

People and pets should be clear of travel trailer while operating leveling system. Never lift the travel trailer completely off the ground. Lifting the travel trailer so the wheels are not touching the ground will create an unstable and unsafe condition.

Basic Jack Operation

The power tongue jack can be operated at any time using the buttons on the front of the tongue jack motor enclosure or by pressing the "FRONT" button (Fig. 1H) of the touch pad in standard mode.

The leveling jacks can only be extended when the touch pad is in manual mode. Once in manual mode, pressing the "FRONT" button (Fig. 1H) will extend both front jacks at the same time. By pushing the button combination of "FRONT" and "LEFT" (Fig. 1I), or "FRONT" and "RIGHT" (Fig. 1J) buttons, the individual front jacks can be extended. Pressing the "REAR" button (Fig. 1K) will extend both rear jacks at the same time. To extend individual rear jacks, press the button combination of "REAR" and "LEFT" (Fig. 1I), or "REAR" and "RIGHT" (Fig. 1J) buttons, depending on which jack needs to be operated. Pressing the "LEFT" button (Fig. 1I) will extend both the left front jack and the left rear jack. Pressing the "RIGHT" button (Fig. 1J) will extend both the right front jack and the right rear jack.

If the touch pad is put in the retract mode, which is indicated by the orange illuminated LED next to the "RETRACT" button (Fig. 1E), the front jacks can be retracted together by pushing the "FRONT" button (Fig. 1H). Individual front jacks can be retracted by pushing the combination of the "FRONT" and "LEFT" (Fig. 1I), or "FRONT" and "RIGHT" (Fig. 1J) buttons. Similarly, the rear jacks can be retracted together by pushing the "REAR" button (Fig. 1K), or individually by pushing the combination of the "REAR" and "LEFT" (Fig. 1I) or "REAR" and "RIGHT" (Fig. 1J) buttons. Pressing the "LEFT" button (Fig. 1I) will retract both the left front jack and the left rear jack. Pressing the "RIGHT" button (Fig. 1J) will retract both the right front jack and the right rear jack.

NOTE: If the leveling 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 travel trailer.

Unhitching From Tow Vehicle

1. Park travel trailer on level ground.
2. Chock all tires.
3. Make sure battery power is on.
4. Disconnect any wires, chains, or sway control that may be equipped between the tow vehicle and travel trailer. Unlatch the travel trailer coupler.
5. Press and hold the "EXT" button on the tongue jack or press the "FRONT" button (Fig 1H) on the touch pad in standard mode to extend the tongue jack to the ground (Fig. 2A). Continue extending until the travel trailer coupler releases from the tow vehicle hitch.
6. Once the coupler is clear of the hitch, pull the tow vehicle away and park at a safe distance.

Fig. 2



Auto Level

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

1. After unhitching from the tow vehicle and parking the vehicle at a safe distance away from the travel trailer, locate the leveling touch pad on the unit (Fig. 3). It will usually be in a side compartment near the front of the travel trailer.
2. Press the "ON/OFF" button (Fig. 3A) and then press "AUTO LEVEL" (Fig. 3B).

Fig. 3



Auto Level Sequence

NOTE: Sequence may vary slightly based on the height of the travel trailer coupler prior to leveling.

1. When the Auto Level Sequence begins, the front of the travel trailer will seek a position near a level state using a combination of the tongue jack and front jacks. During this sequence the tongue jack will partially retract.
2. The rear jacks will then extend and complete a rear leveling sequence.
3. When the rear leveling sequence has been completed, the travel trailer will adjust front to back and side-to-side.
4. Each jack will perform a final grounding touch.
5. Once this has been completed the LCD screen will read "AUTO LEVEL SUCCESS."
6. The LED screen will then read "READY" followed by the current battery voltage. The green LED in the center of the four leveling jack buttons will be illuminated (Fig. 4A).

Fig. 4



NOTE: If the AUTO LEVEL sequence does not perform as described above, place the system in 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, etc. If the jack functions are incorrect, check that the correct jack wiring harnesses are plugged into the correct ports on the controller.

Reconnecting To Tow Vehicle

1. Press the "ON/OFF" button to turn panel on (Fig. 5B).
2. Press the "UP ARROW" (Fig. 5A) button on the touch pad until "AUTO HITCH HGT, ENTER TO BEGIN" is displayed on the LCD. Press the "ENTER" button (Fig. 5C).
3. The rear leveling jacks will retract, followed by the tongue jack extending to the ground, then followed by the front leveling jacks retracting. The tongue jack will then adjust the height of the front of the travel trailer coupler to the point at which the "AUTO LEVEL" button was most recently pressed.
4. Press the "ON/OFF" button to turn system off (Fig. 5B).
5. Back the tow vehicle into position to align the tow vehicle hitch and travel trailer coupler with each other.
6. Press and hold "RET" on the tongue jack to retract the tongue jack (Fig. 6A) until the coupler sets into position on top of the tow vehicle hitch.
7. Latch the tow vehicle hitch and connect any wires, chains, or sway control that may be equipped between the tow vehicle and travel trailer.
8. Press the "RET" button (Fig. 6A) twice and then press and hold the "RET" button for 3-5 seconds to engage the tongue jack's auto retract feature.

NOTE: The "RET" button (Fig. 6A) can also be pressed and held until the jack is fully retracted.

Fig. 5



Fig. 6



Troubleshooting



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

Manual Override

NOTE: For ease of manual override it is recommended to unplug the power harness to the motor prior to performing the manual override procedure.

NOTE: Use of a 12-18 volt cordless screw gun or pneumatic screw gun is acceptable to manually override the jacks. Do not use an impact screw gun to perform any of the override procedures, as this may damage the motor. If manual override is necessary there are two options for each style of jack.

2K or 3K C-Jack Motor Override:

Tools needed: $\frac{3}{8}$ " drive ratchet and extension (no socket)

1. Find the port on the top of the jack motor (Fig. 7A).
2. Remove the rubber plug (Fig. 8A).
3. Insert the $\frac{3}{8}$ " drive into the port.
4. Turn the override until the jack extends or retracts to desired position.

2K or 3K C-Jack Manual Override Nut:

Tools needed: $\frac{3}{4}$ " socket wrench

1. Locate the manual override nut (Fig. 7B).
2. Place $\frac{3}{4}$ " socket wrench over the manual override nut (Fig. 9A) and turn the override nut until the jack extends or retracts to desired position.

Fig. 7



Fig. 8

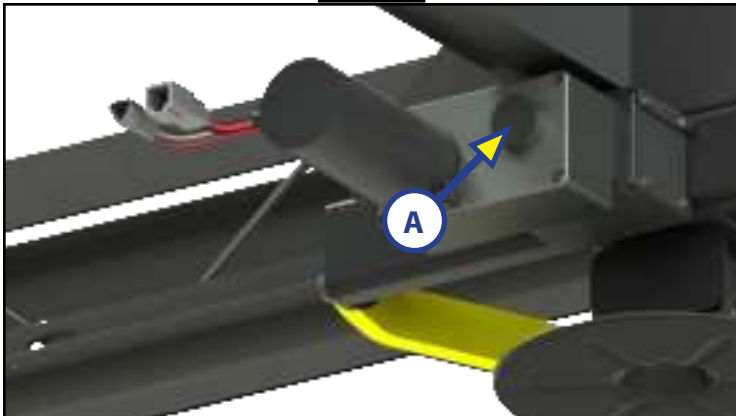
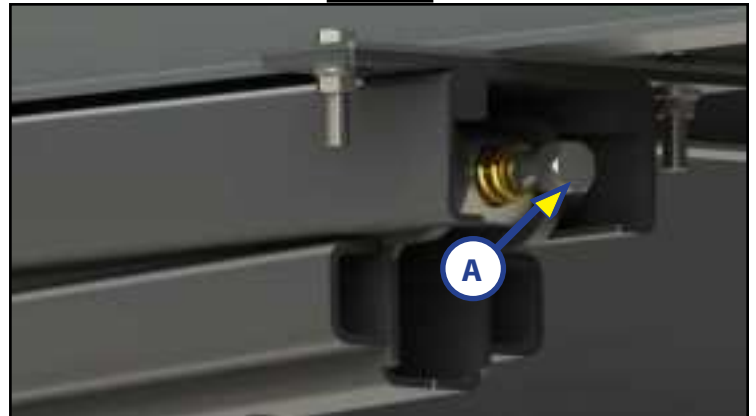


Fig. 9



5K Jack - Top of Jack Motor Override:

Tools needed: $\frac{3}{8}$ " drive ratchet and extension (no socket)

1. Find the port on the top of the jack motor (Fig. 10A).
2. Remove the rubber plug (Fig. 11A).
3. Insert the $\frac{3}{8}$ " drive ratchet into the port (Fig. 12).
4. Turn the override until the jack extends or retracts to desired position.

Fig. 10

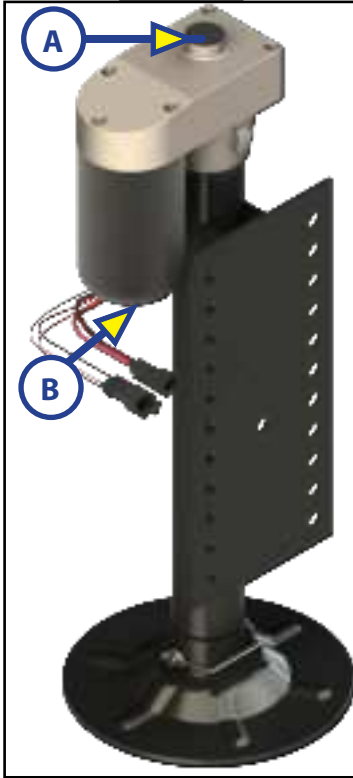


Fig. 11

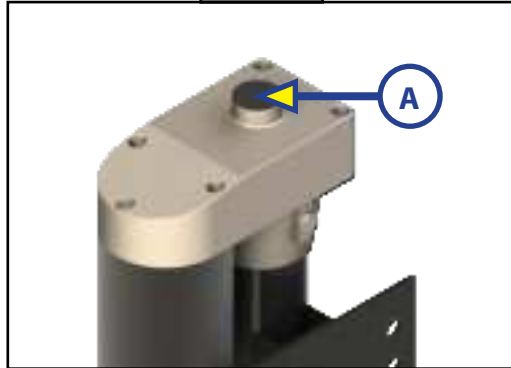


Fig. 12



5K Jack - Bottom of Jack Motor Override:

Tools needed: $\frac{3}{8}$ " drive ratchet and extension, $\frac{5}{16}$ " socket

1. Find the port on the bottom of the jack motor (Fig. 10B).
2. Remove the rubber plug (Fig. 13A).
3. Insert the $\frac{5}{16}$ " socket into the port (Fig. 14).
4. Turn the override until the jack extends or retracts to desired position.

Fig. 13

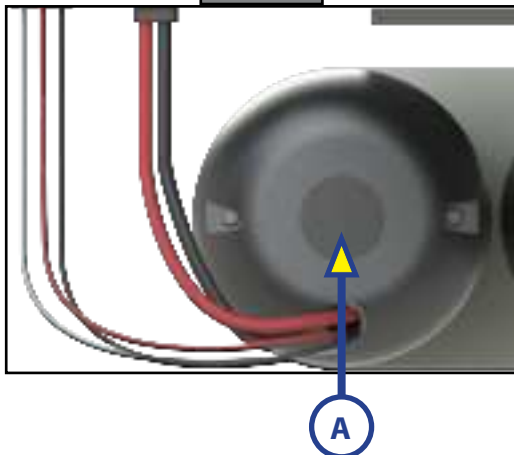


Fig. 14



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.

Touch Pad Error Codes		
LCD Error Codes	What's Happening?	What Should Be Done?
Excess Angle	Excessive angle reached during auto operation.	Relocate the travel trailer.
Excessive Angle	Excessive angle reached during manual operation.	Stop manual operation and reset jacks to a more level state. The code will self clear, there is no need to hit "ENTER."
Feature Disabled	Hitch recognition requested but no hitch height set.	Perform "AUTO LEVEL" sequence to establish hitch height.
	Zero point not set.	Set zero point.
Low Voltage	Battery voltage dropped below 9.5V.	Check wiring - repair or replace.
		Test battery voltage under load - charge or replace.
Out Of Stroke	Jack has reached maximum stroke length and is unable to lift.	Check disposition of jacks. Relocate the travel trailer.
	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.
External Sensor	Bad connection or wiring from the controller to the leveling sensor.	Replace or repair connection to leveling sensor.
Jack Timeout	Time limit exceeded for the requested auto operation.	Check disposition of jacks.
Auto Level Fail	Unable to auto level due to uneven ground.	Check disposition of jacks. Relocate the travel trailer.
	Unable to auto level due to zero point being set incorrectly.	Reset zero point.
Comm Error	Communication between controller and touch pad has been lost.	Check harness for proper connections or damage. Replace if necessary.
Bad Calibration	Sensor calibration values are out of range.	Replace controller.
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.
Hall Power Short	Short circuit detected in one of the hall effect power wires.	Test for short and repair or replace.

Special Jack Error Codes

To clear one 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 inches.

2. Extend all jacks to reach the 6 inches of minimum retract needed.
 - A. Press "FRONT" (Fig. 1G) to extend the front jacks (if required).
 - B. Press "REAR" (Fig. 1J) to extend the rear jacks (if 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 touch pad screen. This is typically caused by wiring interruption.

Special Leveling Jack Error Codes		
LCD Error Codes	What's Happening?	What Should Be Done?
LF Jack RF Jack LR Jack RR Jack Tongue Jack	Error at a specific jack (left front, right front, left rear, right rear, tongue jack). • 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.

System Settings

Zero Point Calibration

The "Zero Point" is the programmed point that the travel trailer 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. In manual mode run the jacks to level the travel trailer. This is best achieved by placing a level in the center of the travel trailer 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 travel trailer is level, turn off the touch pad.
3. With the touch pad off, press and release the "FRONT" button (Fig. 1H) five (5) times and then press and release the "REAR" button (Fig. 1K) 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. 15).
5. To set the current position as the zero point, press the "ENTER" button (Fig. 1C).
6. LCD display will read "Zero point stability check" (Fig. 16).
7. LCD display will read "Zero point set successfully" once process is complete (Fig. 17).
8. The system will set this point as its level state and the touch pad will turn off.

Fig. 15



Fig. 16

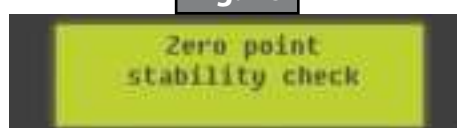
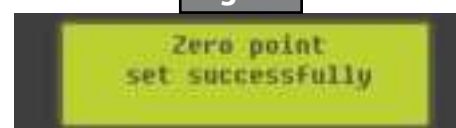


Fig. 17



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 coach is located in a salty environment, it is recommended to spray the rods every four to six weeks.



GROUND CONTROL® TT LEVELING LCD COMMON COMPONENTS

LEVELING & STABILIZATION

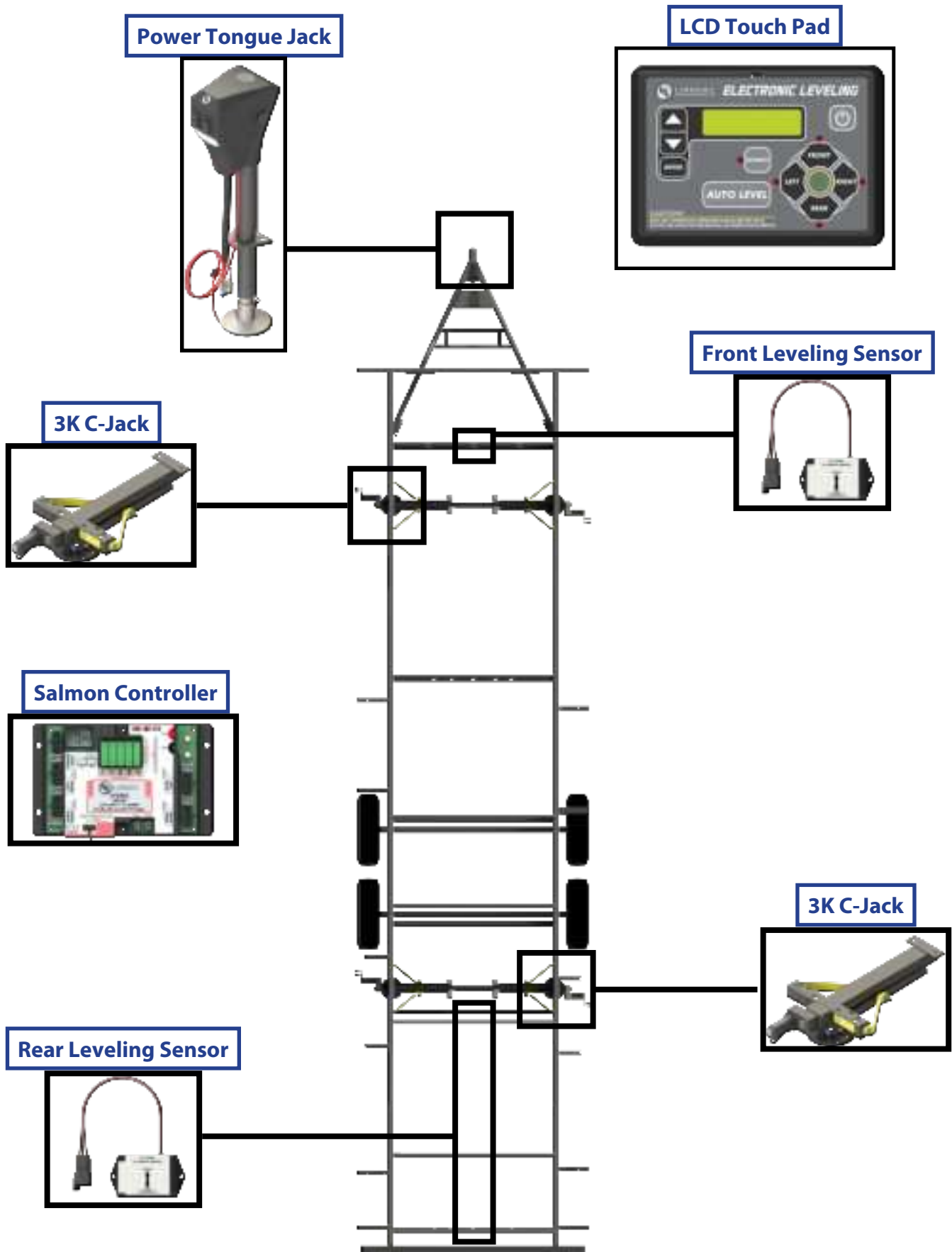


Callout	Part #	Description
A	421366	Power Tongue Jack
B	305115	Hall Effect Right Rear Jack Harness
	306298	Hall Effect Left Rear Jack Harness
	307489	Hall Effect Right Front Jack Harness
	307490	Hall Effect Left Front Jack Harness
C	421372	Tongue Jack Harness
D	426526	Power and Ground Supply Harness
E	241316	LCD Touch Pad Harness
F	434431	Leveling Sensor Harness 15' (Front)
	243688	Leveling Sensor Harness, 35' (Rear)
G	423094	Leveling Sensor
H	116112	Scissor Jack Crank Handle
I	421484	LCD Touch Pad
J	405217	Adjustable Footpad



GROUND CONTROL® TT LEVELING ASSEMBLY SALMON CONFIGURATION

LEVELING & STABILIZATION

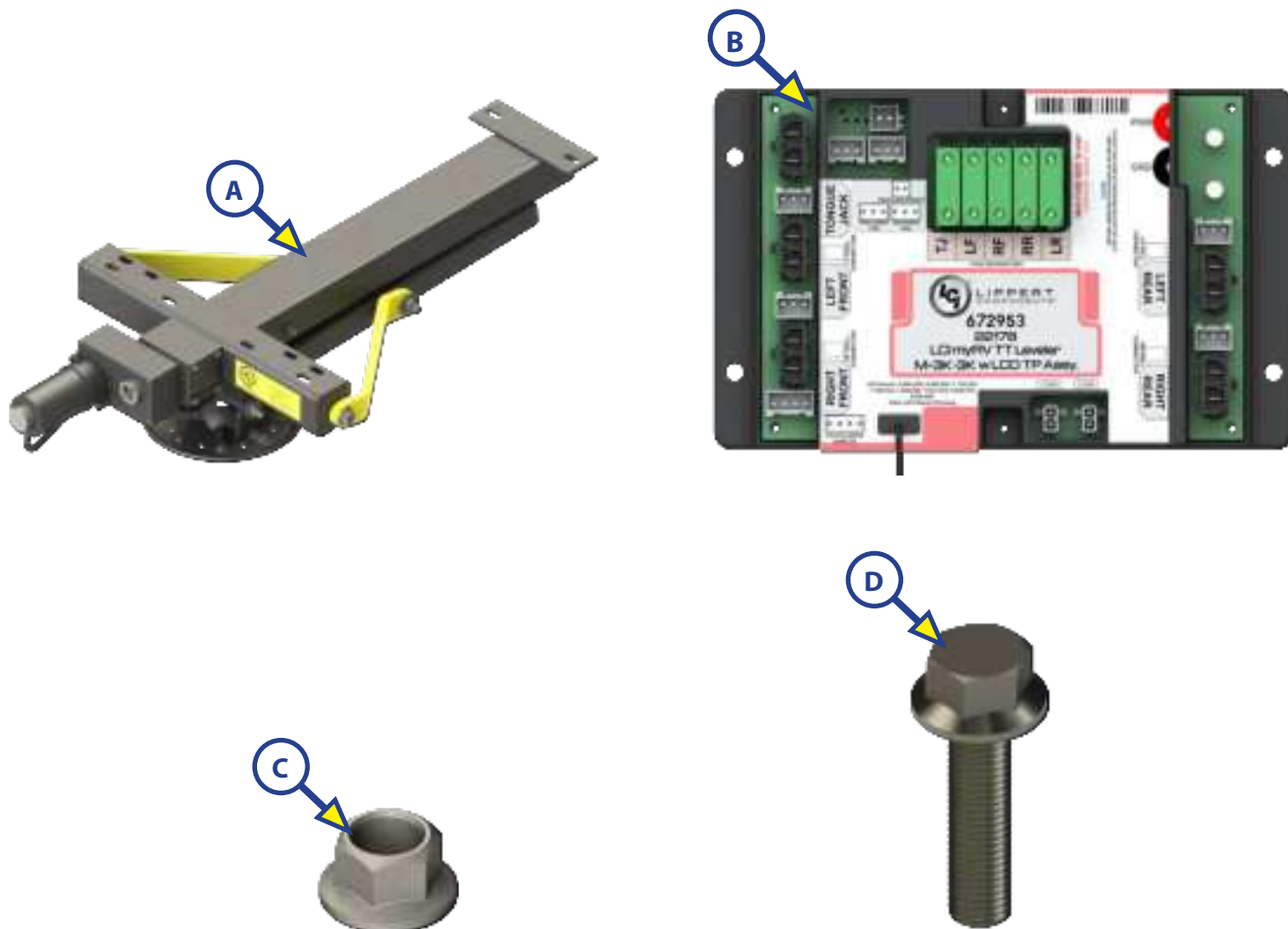




GROUND CONTROL® TT LEVELING COMPONENTS SALMON CONFIGURATION

LEVELING & STABILIZATION

NOTE: The components shown below are specific to the Salmon Configuration for the Travel Trailer leveling system. The remaining components can be found on the Ground Control® TT Leveling Common Components web page.

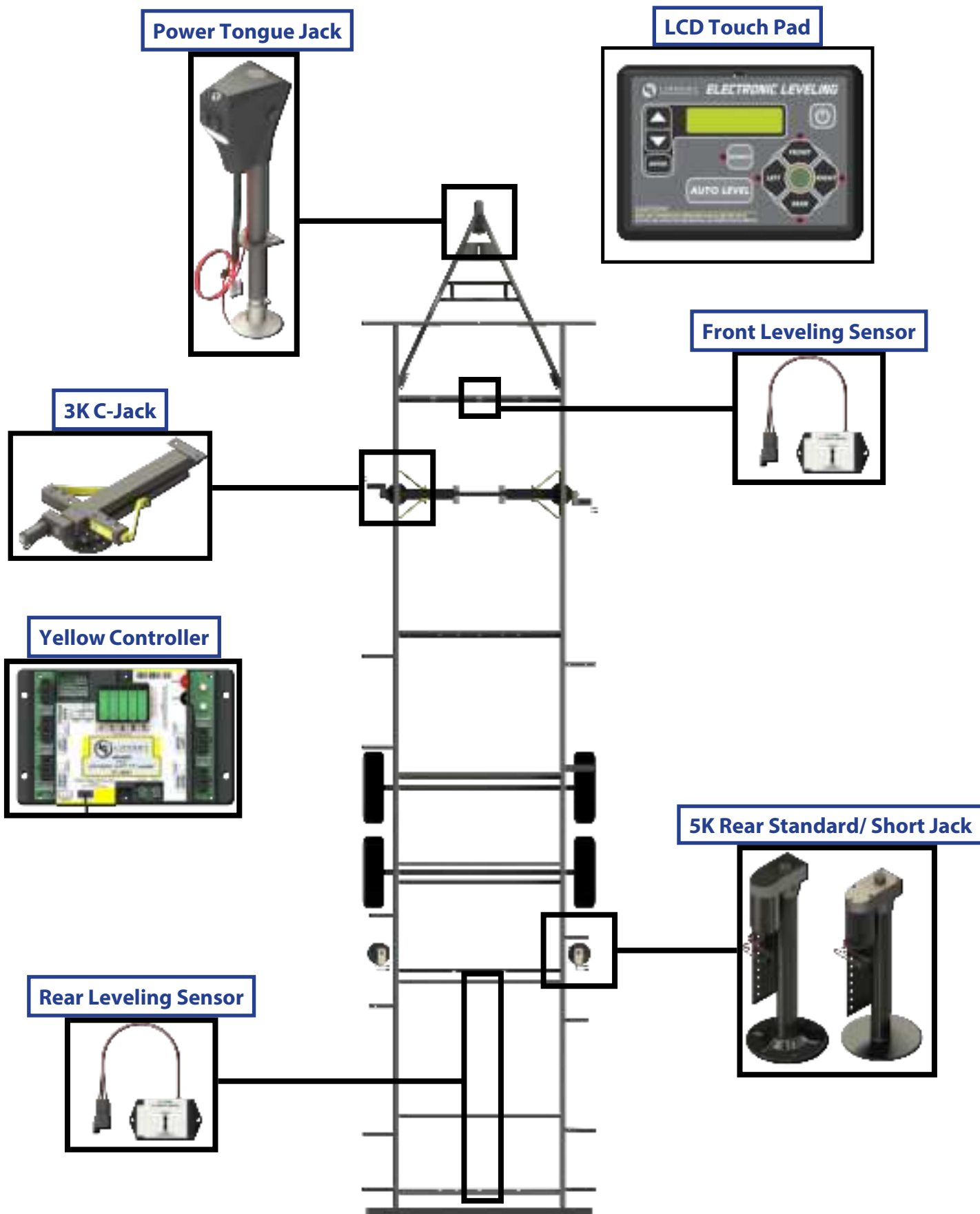


Callout	Part #	Description
A	404488	C-Jack 3,000 lbs
B	672953	Salmon Controller
C	434376	Flange Nut, $\frac{3}{8}$ " - 16
D	663511	Flange Bolt, $\frac{3}{8}$ " - 16 x 1 $\frac{1}{2}$ "



GROUND CONTROL® TT LEVELING ASSEMBLY YELLOW CONFIGURATION

LEVELING & STABILIZATION

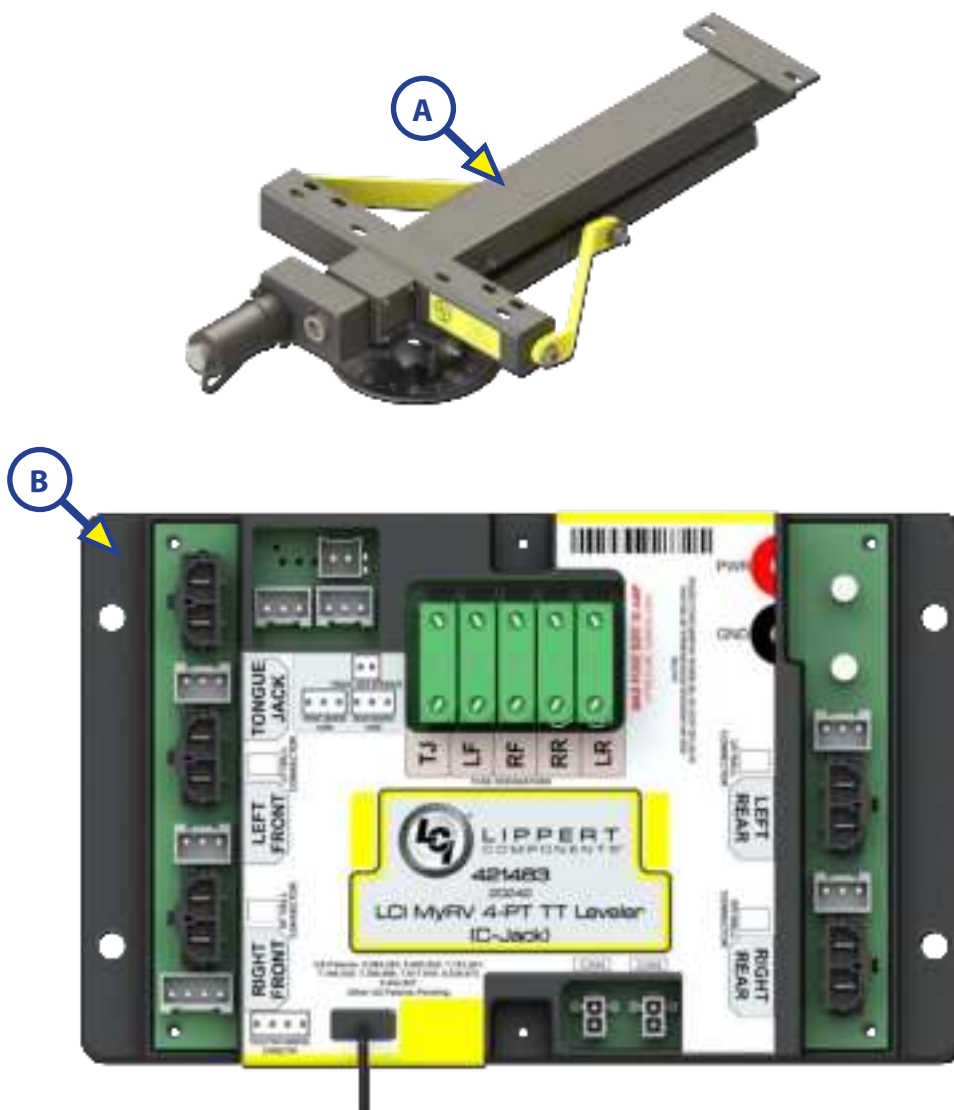




GROUND CONTROL® TT LEVELING COMPONENTS YELLOW CONFIGURATION

LEVELING & STABILIZATION

NOTE: The components shown below are specific to the Yellow Configuration for the Travel Trailer leveling system. The remaining components can be found on the Ground Control® TT Leveling Common Components web page.



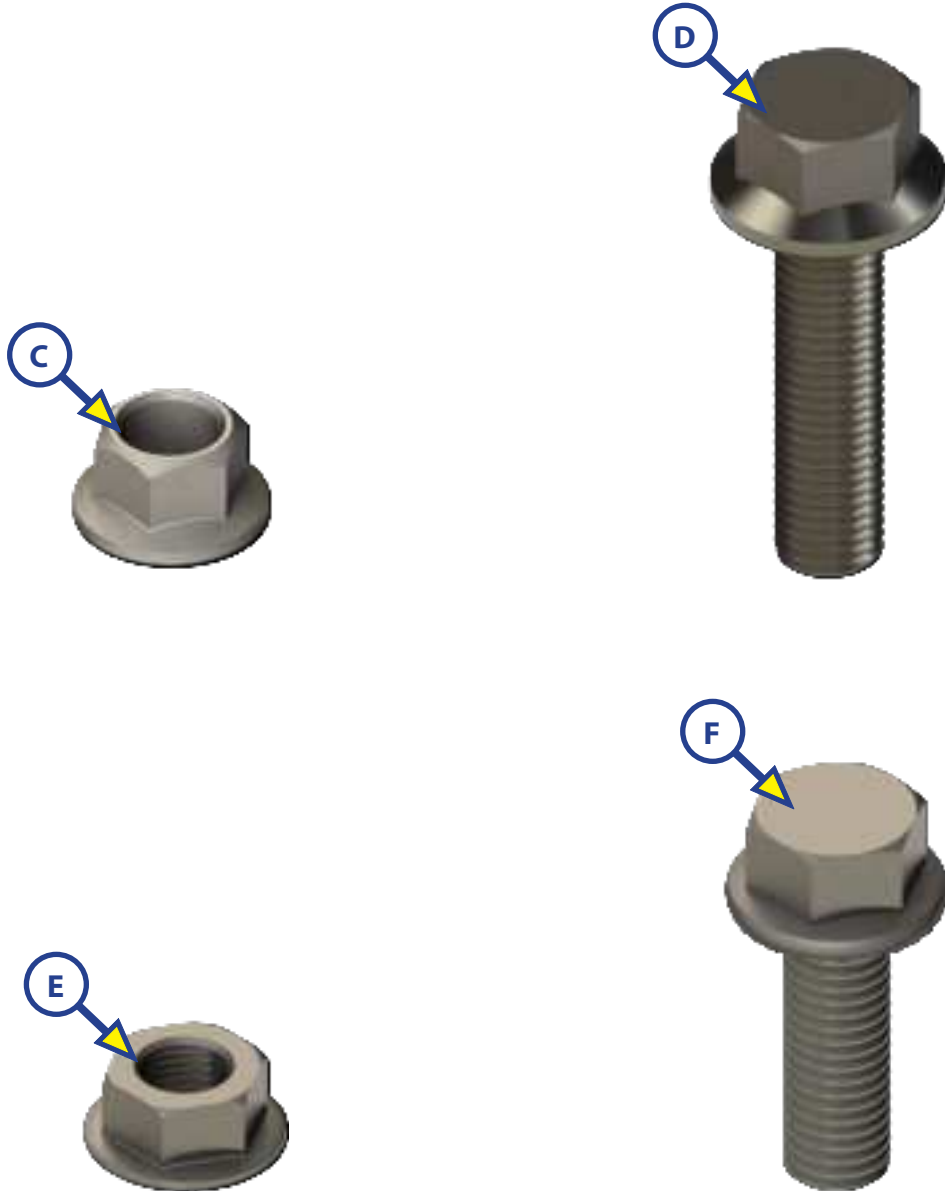
Callout	Part #	Description
A	404488	C-Jack 3,000 lbs.
B	421483	Yellow Controller



GROUND CONTROL® TT LEVELING COMPONENTS YELLOW CONFIGURATION

LEVELING & STABILIZATION

NOTE: Hardware and fasteners may vary for the Ground Control® TT Leveling Yellow Configuration. For your convenience we've listed all applicable hardware and fasteners for the Yellow Configuration.



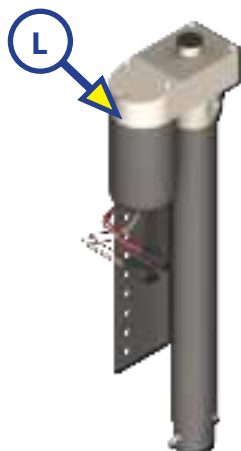
Callout	Part #	Description
C	434376	Flange Nut, $\frac{3}{8}$ " - 16
D	663511	Flange Bolt, $\frac{3}{8}$ " - 16 x 1 $\frac{1}{2}$ "
E	178210	Flange Nut $\frac{1}{2}$ " - 20
F	118076	Flange Bolt, $\frac{1}{2}$ " - 20 x 1 $\frac{1}{2}$ "



GROUND CONTROL® TT LEVELING COMPONENTS YELLOW CONFIGURATION

LEVELING & STABILIZATION

NOTE: Jack styles may vary for the Ground Control® TT Leveling Yellow Configuration. For your convenience we've listed all applicable hall effect jacks, and footpads.



Callout	Part #	Description
G	342610	Hall Effect Jack Short; Left Rear w/ Attached Footpad, 12.5" Stroke
H	428493	Hall Effect Jack Short; Left Rear w/ Attached Footpad, 12.5" Stroke
I	305339	Hall Effect Jack; Left Rear, 12.5" Stroke
J	344792	Hall Effect Jack; Right Rear, 12.5" Stroke
K	435867	Hall Effect Jack Short; Left Rear w/ Separate Footpad, 12.5" Stroke
L	435868	Hall Effect Jack Short; Left Rear w/ Separate Footpad, 12.5" Stroke
M	377962	Rear Hall Effect Footpad
N	225598	Snapper Pin

Notes

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