



LEVEL RIDE

AIR SUSPENSION™

INSTALLATION MANUAL

Touch Screen Controller

Introduction

The purpose of this Level Ride Air Suspension (LRAS) leveling system fitting instructions is to provide the purchaser with the step by step guide to installation.

This warranty does not apply and is void if damage or failure is caused by:

- Faulty installation
- Operating the product(s) outside the instructions, specifications or guidelines

LRAS does not represent or warrant that the information available on or through the fitting instructions will be correct, accurate, timely or otherwise reliable. LRAS may make changes to the features, functionality or content of the fitting instructions at any time. LRAS reserves the right to make changes, improvements, edit or delete to its products, publications, documents and information at any time.

NOTATION EXPLANATION

Hazard notations appear in various locations in these fitting instructions. Information which is highlighted by one of these notations must be observed to help minimize risk of personal injury or possible improper installation which may render the vehicle unsafe. Notes are used to help emphasize areas of procedural importance and provide advise. The following definitions explain the use of these notations as they appear throughout this guide.



DANGER

Indicates immediate hazard which will result in severe injury or death



WARNING

Indicates hazards or unsafe practices which could result in severe injury or death



CAUTION

Indicates immediate hazards which will result in damage to the machine or minor personal injury



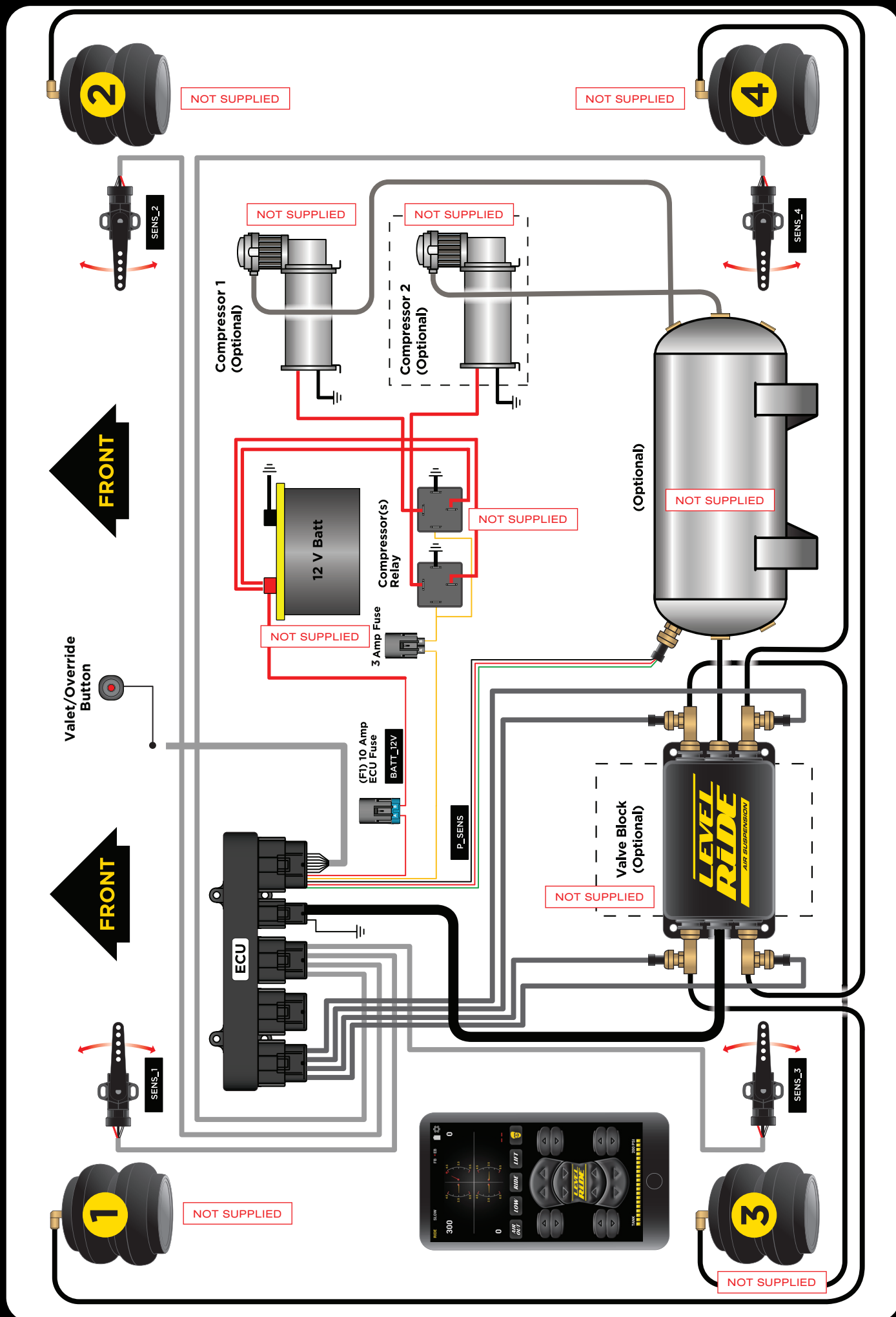
Level Ride Air Suspension



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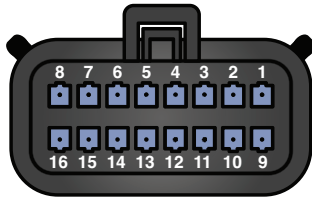




CONNECTOR PIN-OUT CHART:

Looking at Wire Side

16 Pin Connector:



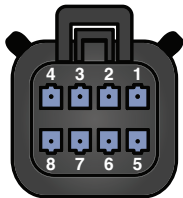
Top Row:

1. Brake 12V..... Brown
2. Tank Pressure Sensor Signal..... Yellow
3. Valet/Override..... Purple
4. Blank
5. Blank
6. Blank
7. Blank
8. Ground Black

Bottom Row:

9. 12V Main 10A Fuse..... Red
10. 5V Tank Pressure Sensor..... Red
11. 12V Key On/Ignition..... Orange
12. Ground Tank Pressure Sensor.. Black
13. Compressor Trigger 12V Out... Yellow
14. Blank
15. Blank
16. Blank

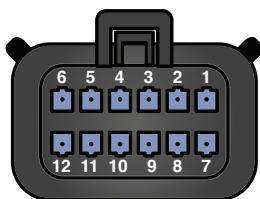
8 Pin Connector: Valves



1. Up..... Front Left
2. Up..... Front Right
3. Up..... Rear Left
4. Up..... Rear Right

5. Down..... Front Left
6. Down..... Front Right
7. Down..... Rear Left
8. Down..... Rear Right

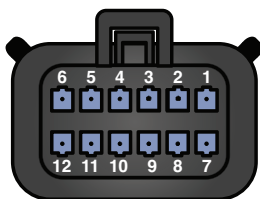
12 Pin Connector: Height Sensors



1. Front Left..... White
2. Front Right..... White
3. Left Rear..... White
4. Right Rear..... White
5. Ground..... Black
6. Ground..... Black

7. 5V Power..... Red
8. 5V Power..... Red
9. 5V Power..... Red
10. 5V Power..... Red
11. Ground..... Black
12. Ground..... Black

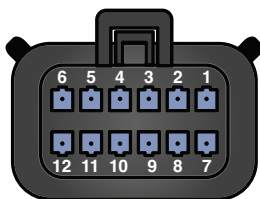
12 Pin Connector: AUX Blanking Plug



- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

12 Pin Connector: Bag Pressure Sensors

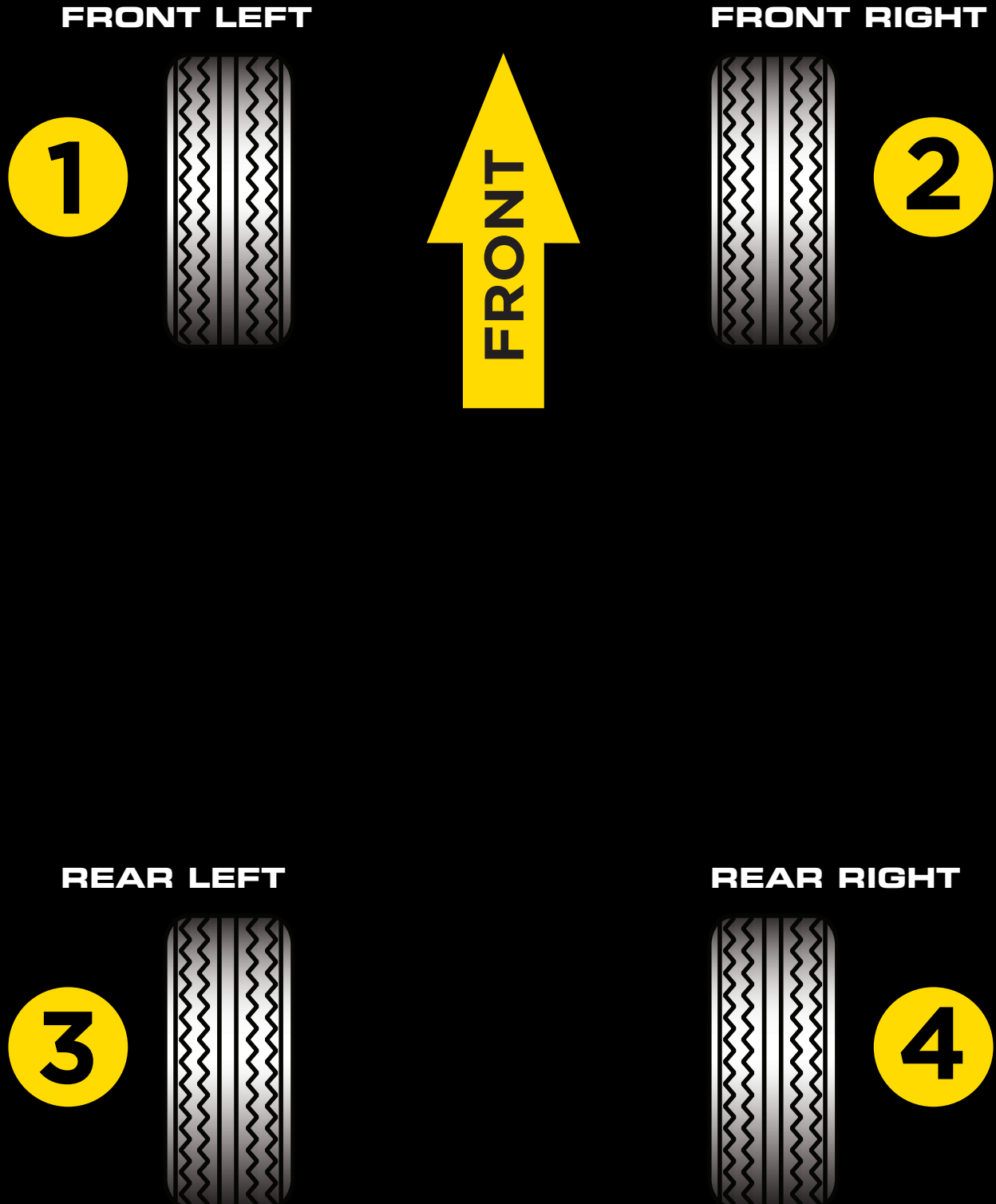


1. Front Left..... White
2. Front Right..... White
3. Left Rear..... White
4. Right Rear..... White
5. Ground..... Black
6. Ground..... Black

7. 5V Power..... Red
8. 5V Power..... Red
9. 5V Power..... Red
10. 5V Power..... Red
11. Ground..... Black
12. Ground..... Black

GENERAL REFERENCE

For simplicity of use and understanding we refer to the four wheels of a vehicle by using “Front Left” or “Front Right,” etc. Refer to the following diagram for labeling:



INSTALLATION OVERVIEW

Air Springs and Suspension Components must be fitted prior to the installation of the Level Ride components. Complete installation in the following order:

1. Mount your Valve Block and Bag Pressure Adapters (not supplied by LRAS, please see supplier's instructions for installation). Ensure you have a good ground.
2. Mount ECU, bolts supplied.
3. Run 16-Pin Harness and terminate all connections as marked in wire diagram.
4. Mount your tank and fit LRAS Tank Pressure Sensor facing upwards. For bag pressure, mount connections for Compressors, Valve Block and Pressure Sensors. These must be facing up or above parallel to the ground.
5. Solder the wire to either side of the Valet Switch pins and connect to 12 volts constant or Key On. Second connection on Valet Switch goes to the purple wire on the main harness.
6. Install your Compressor/Compressors (not supplied by LRAS, please see supplier's instructions for installation). Yellow Compressor trigger from 16-pin harness connects to the + (positive) 12V trigger on your relay.
7. Install Pressure Sensor Harness (see below).
8. Ensure tank fills when car is started. Note: Vehicle must be running when LRAS control system is in operation.
9. Fit Height Sensors (see Page 8).
10. Move on to Calibration Set-Up on Touch Screen (see Page 10).

PRESSURE SENSORS MOUNTING

- Mount the bag Pressure Sensor in line between the bag and Valve Block or on the Valve Block if you have a port for them. They must face up (either install type).

Step-By-Step

1. Coat the thread of the Pressure Sensor with a thread sealer to prevent air leaks. We strongly recommend an anaerotic thread sealer such as Loctite 569.
2. After tightening the sensor, wipe off the excess thread sealer.

LEVEL RIDE WIRING HARNESS INSTALLATION CONSIDERATIONS

- The plugs that connect to the ECU will only fit in the desired orientation. Do not force the connectors into the wrong mating connector. Match the correct plug on the schematic drawing on Page 3.
- Make sure to press all connectors on firmly until an audible “click” sound can be heard from the lock.
- Route all wiring away from exhaust or other high-temp areas and all power supply cables for car and audio. Never run the wiring parallel to power supplies, cross over at 90 degrees if no alternative route is available.
- Use rubber grommets for areas where sharp metal could eventually wear through the wire.

STEP-BY-STEP ECU MAIN HARNESS

1. First connect the Harness at the ECU, connect as per wiring diagram.
2. Route the Tank Pressure Sensor sub-harness labelled “P_SENS” to the sensor.
3. Route the “Brake” brown wire to the brake pedal +12V out when brake pedal depressed.
4. Route the single yellow to 3-amp Fuse Holder to +12V trigger on Relay. Note: This cannot be ground/ earth triggered as it will blow the fuse.
5. Route the single red wire labelled “BATT_12V” with a 10-amp fuse supplied to the vehicle’s battery.
6. Mount the single black wire with eyelet end to ground.
7. Connect the Valve Harness to the ECU.
8. Connect the bags’ Pressure Sensor Harness to the ECU.
9. Connect the Height Sensor Harness and run to correct corners.

SYSTEM SET-UP FOR HEIGHT SENSORS

Now that the majority of your system components are installed, plumbed and wired (Mechanical Air Suspension Components, Compressor(s), Tank(s), Tank Pressure Sensor, Bag Pressure Sensors, Valves, Air Line, ECU, and Height Selection Rocker Switch), it is time to test the system and begin the Height Sensor installation.

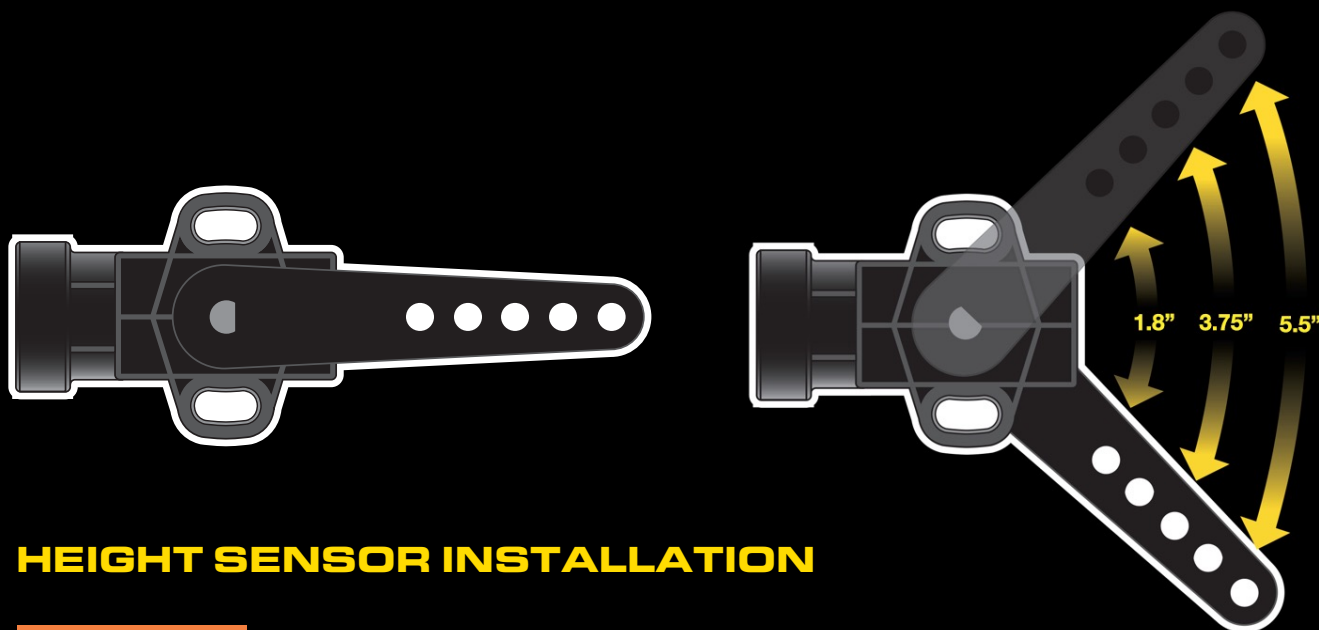


SETTING UP HEIGHT SENSORS

Understanding suspension movement is the key to sensor mounting. The term “vertical travel” means the amount of up and down distance that a point on a suspension arm moves as it rotates. Realize that there is no “vertical travel” at the sensor arm’s pivot point. If you mount a sensor too far out on an arm, it will travel too far and damage the sensor. The five increments of travel: 1.8", 2.75", 3.75", 4.5", 5.5". See the following diagram for an illustration of this theory.



DANGER: Sensor installation requires viewing suspension movement from underneath the vehicle. This must be done on a lift/hoist with ramps for safety. Do not attempt to get under the vehicle while it is on the ground or on jack stands for this process!!!



HEIGHT SENSOR INSTALLATION



WARNING: Sensor installation requires viewing suspension movement from underneath the vehicle. This must be done on a lift/hoist with ramps for safety. Do not attempt to get under the vehicle while it is on the ground or on jack stands for this process!!!

Step 1.

Choose a stationary mounting point on the frame where to mount the sensor (mark a Dot here). All of the following measurements will be taken from this point.

Step 2.

Mark a Dot on the moving suspension arm directly under the Dot from Step 1. This will be your Target rod end mounting point. With the vehicle at the top of its travel jacked up so the suspension is hanging (you may need to add air to push it to max travel), measure from your Dot up to the center of your Dot. We will call this distance “Dot.”

Step 3.

Exhaust the air to move to the very bottom of its travel. You may need a jack to do this and also de-couple the swaybar. Now re-measure from your Dot up to the center of your Dot. We will call this distance “B.” Calculate the sensor travel by subtracting B from A (sensor travel = A-B).

Step 4.

If your sensor travel is less than the indicated travel for the hole on the arm you're using, then move farther away from the pivot point of your suspension arm and repeat Step 1-Step 3. If your sensor travel is more than max, then either move the hole or move closer toward the pivot point of your suspension arm or repeat Step 1-Step 3. (We understand that getting the sensor travel right on is not always possible, so make sure the travel is less than indicated max travel rather than greater when you come to this point.)

Step 5.

Once you have established your rod end mounting point that yields the required travel, drill or weld to attach the supplied bolt and/or bracket at this exact point.

Step 6.

With the sensor rod end installed on the sensor arm and the vehicle at the middle of the travel, hold the sensor apparatus up as if it were attached to the rod end that you installed in Step 5. Determine if you will need to shorten the linkage. If not, continue to Step 8. If so, unscrew the rod ends and cut the threaded rod (make sure to restart the threads). You want 3/8" worth of thread engagement on each end. Then re-assemble the rod. Note that the end links do not need to get tight on the rod because, once installed, the rod end prevents them from rotating loose.

Step 7.

Attach the lower rod end to the suspension. With the vehicle about half way through the travel, find the exact sensor mounting point that keeps the mounting holes and linkage rod vertical. Once established, trace the outline of the sensor to the frame.

Step 8.

With the vehicle at the very bottom of the travel, hold the sensor at the same location traced on the frame in Step 7. Either rotate the sensor slightly or use the indicator on the Touch Screen to show you where the arm is in its travel.

Step 9.

With the vehicle at the very top of the travel, compare the clearance found in Step 8 to the clearance between the lower plastic stop and the rotating arm. Repeat Step 8 and Step 9 until the upper and lower clearance is approximately equal.

Step 10.

Use the final sensor location to mark the two mounting holes to be drilled through the frame. Drill the holes and install the sensor mounting hardware. **(BE CAREFUL NOT TO OVERTIGHTEN!)**

Step 11.

Now that the sensor is mounted, repeat Step 8 and Step 9 to make sure that the clearance is still equal. Adjust the linkage if necessary.

TANK PRESSURE MODE

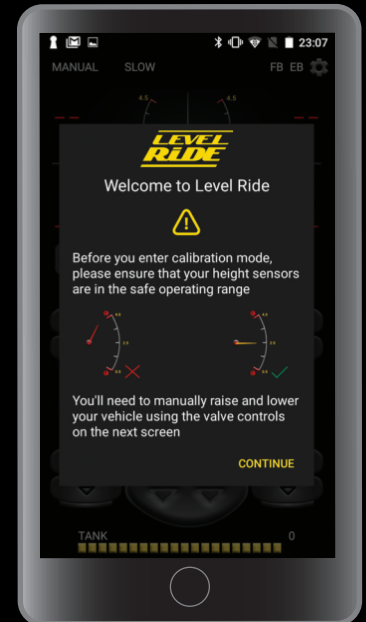
Set on Controller Touch Screen settings before calibration.

Your system was programed with the Tank Pressure Mode set at 150 PSI. If you have High Pressure Compressor(s) you can change the Tank Pressure Mode to 175 PSI or 200 PSI on the setup page on the Touch Screen.

SET UP PROGRAMMING

Automatic System Calibration, prompted by Touch Screen:

Before the system will operate, it must be calibrated to learn the vehicle characteristics. This process should be repeated if any air suspension components get changed, the tank pressure is changed or a Height Sensor is replaced.



CAUTION

The system will automatically Lower/Raise the vehicle in the next procedure.

Remove all obstructions and keep clear of vehicle before proceeding.

The vehicle needs to be on level ground with the wheels pointed straight ahead.

Leave vehicle running to charge the car and power the Compressor(s) during this procedure.

Set Maximum Height using controller Touch Screen with ONLY the pressure required to obtain this height. Adding too much pressure will affect the calibration: Car must start to drop as soon as the exhaust valves open.

With the ignition ON and car running, use the Manually Raise using Touch Screen to adjust all four corners until each corner is at your preferred MAXIMUM TRAVEL and the vehicle is level from side to side on level ground.

When calibration is complete, the following heights are saved automatically. These are not your permanent heights. You must now set your LOW, RIDE and LIFT settings. This can be done by using the Touch Screen. To set your height, press and hold your setting (example: RIDE) for 2 seconds or until Saved appears at the bottom of the screen. Use the same procedure for LOW and LIFT.

- Position #1 = LOW
- Position #2 = RIDE
- Position #3 = LIFT

SAVING YOUR NEW HEIGHTS

Manual Adjustment to a New Height:

In order to save a NEW Height, you must first manually adjust each Air Spring to the height that you wish to save using the procedure outlined above, once you have achieved the desired height on all corners.

LEVEL RIDE TIPS AND TRICKS

TIP 1.

If you don't want your car to auto level on start-up you need to turn the Ride Height On Start off. This is in the setup menu.

TIP 2.

If while driving you don't want LRAS to monitor the car at all, just tap any of the manual bag switches once. The word Manual will appear top left of the screen and the RIDE button will not be illuminated. This will take it out of ride monitor mode. To come back to monitor mode, just tap the RIDE button once.

TIP 3.

Brake Sensing: As a further measure to keep your car's saved Ride height setting, LRAS has added Brake Monitor Mode.

When you're braking, sitting in traffic or just slowing down for a corner, Brake Monitor Mode pauses any adjustments that could throw out your saved height.

TIP 4.

If you park on uneven ground you don't have to worry about the car becoming cross-jacked like in height-only systems. Terrain sensor will kick in and stop any adjustments before it gets to cross-jacked. When the car is back on flat ground it will readjust. Alternatively you can also tap LIFT to get you over the uneven ground. If your daily parking spot is on uneven ground, turn Ride Height On Start OFF. This will prevent unnecessary adjustments also.

TIP 5.

Make time to weekly drain any moisture from the water trap and tank drain. Valve Blocks and Pressure Sensors can clog up from lack of weekly maintenance. (Pressure Sensors' water damage is not covered under the warranty.)

TIP 6.

System voltage when car is running at idle should essentially be no less than 12.6 volts. Most cars will maintain this if the charging system (the alternator) is producing enough voltage at idle to keep up with the demands of the compressor(s). If you notice the LOW VOLTAGE warning come up on your screen, that's a sign you're in need of a upgraded alternator. LRAS is system protected against this but will shut down if the voltage doesn't increase to correct levels.

FAULTS