Wrangler (JK) AiROCK

Installation Document

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Thank you for your purchase of the Wrangler (JK) AiROCK Air Suspension System. You are the owner of one of the most unique Jeep accessories currently available. We have designed this system to provide more cargo capacity without loss of suspension travel and to give the operator the ultimate in adjustable suspension for the ultimate in on and off-road performance.

The AiROCK Suspension System is a spring replacement kit designed to be compatible with the stock JK with stock control arms and track bars in stock locations. Modifications to the JK suspension may not be compatible with the AiROCK system as designed.

When you are installing the AiROCK Suspension System, it is vitally important to route the airlines and the wiring harness correctly. Failure to follow the airline and wire harness installation recommendations can result in AiROCK failures, namely harness failures and air leaks. The exhaust system puts out a lot of heat and the airlines and wire harness is specifically routed to keep them away from the heat as much as possible.

The recommended installation order is as follows:

- Front and Rear Airsprings
- Shocks
- AiROCK Control Unit (ACU)
- Airline
- Wire Harness
- In-Cab Controller
- Perform Calibration Procedure

Tools Necessary:

- Floor Jack
- Jack Stands
- Reciprocating Saw or Hacksaw with metal cutting blade
- Standard Electrical Tools
- Standard Hand Tools
- 3/8” Drill Bit
- ½” Drill Bit

AiROCK Reference Data

The AiROCK system refers to the four corners of the vehicle in a numerical pattern. The ACU is labeled with Arabic numbers that depict which port is for which airspring. For the purpose of this manual and all correspondence with ORO, the left and right sides are determined from the driver's seat.

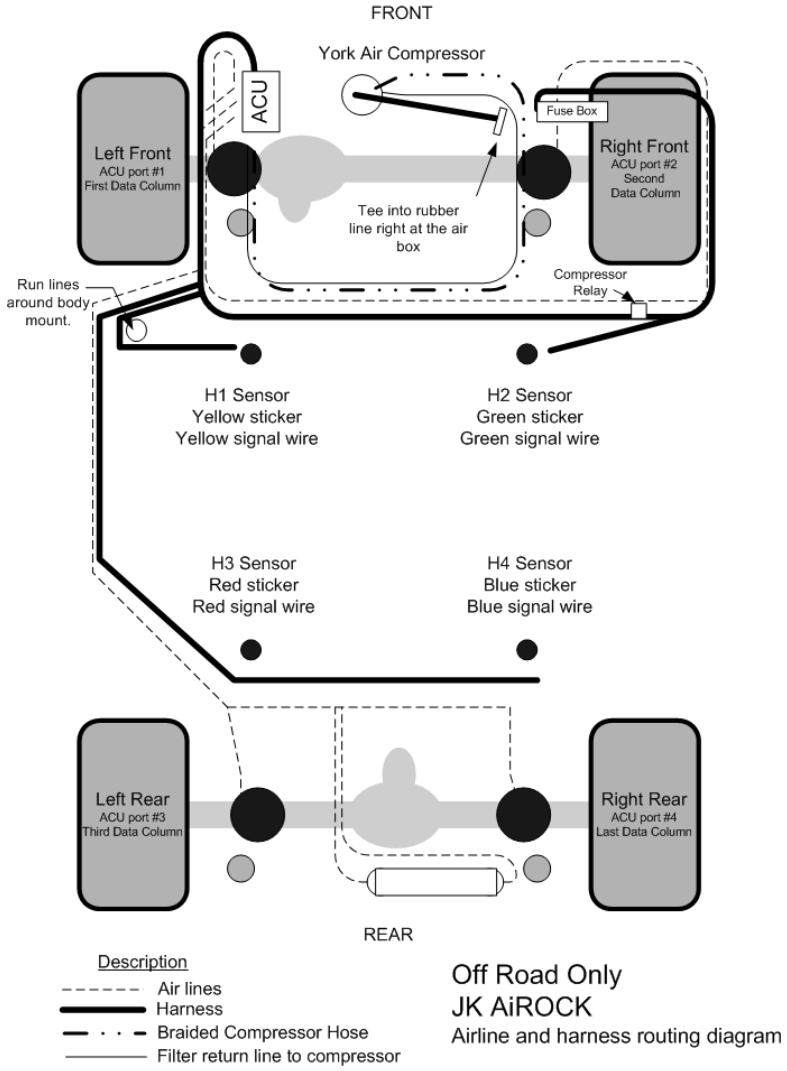
The ACU port positions are as follows:

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

For this manual, the Height Sensors are labeled as H1 through H4. H1 would refer to Height Sensor position 1, and H2 through H4 respectively. The sensors are also labeled with a colored sticker. The color of the sticker correlates with the color of the signal wire in the wire harness from that position. The wire color that matches the scheme is the B terminal on the 3 plug connectors for the height sensor harness. The colors and corners are as follows:

1. Left Front – YELLOW
2. Right Front – GREEN
3. Left Rear – RED
4. Right Rear - BLUE

The diagram below portrays the recommended and specified way to route airlines, return line, wiring harness and compressor braided line.



Installation:

Now we are ready for the front and rear airsprings. Place the JK on a level surface before beginning. Support the JK by the frame to allow the axles to drop down with the tires removed. Remember, left side refers to driver side and right side refers to passenger side.

With the JK supported on jackstands, remove the wheels. Disconnect the front sway bar from the axle. Remove the shock absorbers. Support the axle with a floor jack and remove the wheels and the coil springs. You must trim the front bumpstop mount to approximately 1" remaining as shown in image to the left. Remove the coil spring isolator, measure 1", mark it, then cut the mount with a reciprocating saw. Test fit the airspring mount against this cut. The mount major diameter should sit flat onto the bottom of the frame. DO NOT install the airspring until you drill the lower mount.

RECENT CHANGE: This lower mount is now a D shape, place this on the spring pad so that the flat of the D matches the flat in the OEM mount, then mark the hole. This will keep the air spring mounted as close to the wheel as possible, resulting in more airspring to frame rail clearance.

Remove the lower mount washer from the airspring. Place this mount on the lower spring pad on the axle. Locate the center of the spring pad and mark it appropriately. Remove the lower mount and drill out your mark with a ½" drill. It is easiest to start with a smaller drill bit and work your way up to the ½" bit. **The lower mount washer will then go under the bracket** to distribute the load and eliminate the twisting of the airspring from fatiguing the mount.

Place the front airspring in the lower spring pad. Install the lower mount washer under the bracket and fasten with the nylock nut. These can be snugged up and should be final tightened when the JK is on the ground. This allows for the airspring to seat itself properly. Rotate the airspring so the inlet fitting for the airline is facing towards the front of the Jeep. Wrap the fitting with pipe tape and screw into the upper airspring mount. Place another nylock nut and large aluminum washer on the stud on the upper airspring and tighten it up. The upper airspring mounts can be final tightened. Again, final tighten on the lower nylock nut will occur when the JK is on the ground. You may use a blowgun and air pressure to extend the airspring if necessary, but be careful as a little makes quite a reaction!

Recent Change: Ream swayabr for ½" studs.
Now the front sway bar can be put together. Of the 4 rod ends supplied with the kit, 2 have smaller studs. These rod ends attach to the factory sway bar. Find the links included in the kit. One small stud rod end and one long stud rod end need to be screwed into each link. Assemble the multiple linkage pieces to create an assembled length of 8" using the short stud. Make these link assemblies equal in length. Place a bushing on the small stud end and insert into the sway bar. The image to the right illustrates this. Snug up a nylock nut to the stud. The rod ends with the larger stud will be attached at the axle end.

Place into the stock axle mounting location and snug up with a nylock nut. It may be necessary to have the rod end studs facing opposite directions to maintain a fairly vertical link placement.

Install the new shocks, tighten the upper mount to flatten but not deform the bushings. If there was anything else that was disassembled to install the front airsprings, reinstall those items now. You can also install the front wheels at this time and lower the jack supporting the axle.

Move to the rear of the JK. First, disconnect the parking brake cable bracket from the underside of the body. Support the rear axle with a floor jack. Remove the rear wheels. Remove the rear shock absorbers. Remove the rear coil springs. Disconnect the rear sway bar by removing the hardware attaching it to the frame rails. It should not be necessary to remove the rear track bar and sway bar links to allow the coil springs to come out. Since we do recommend you loosen and retorque all the rubber control arm and track bar bushings at the new ride height, loosening all of these joints will allow the axle to droop freer and make coil removal easier.

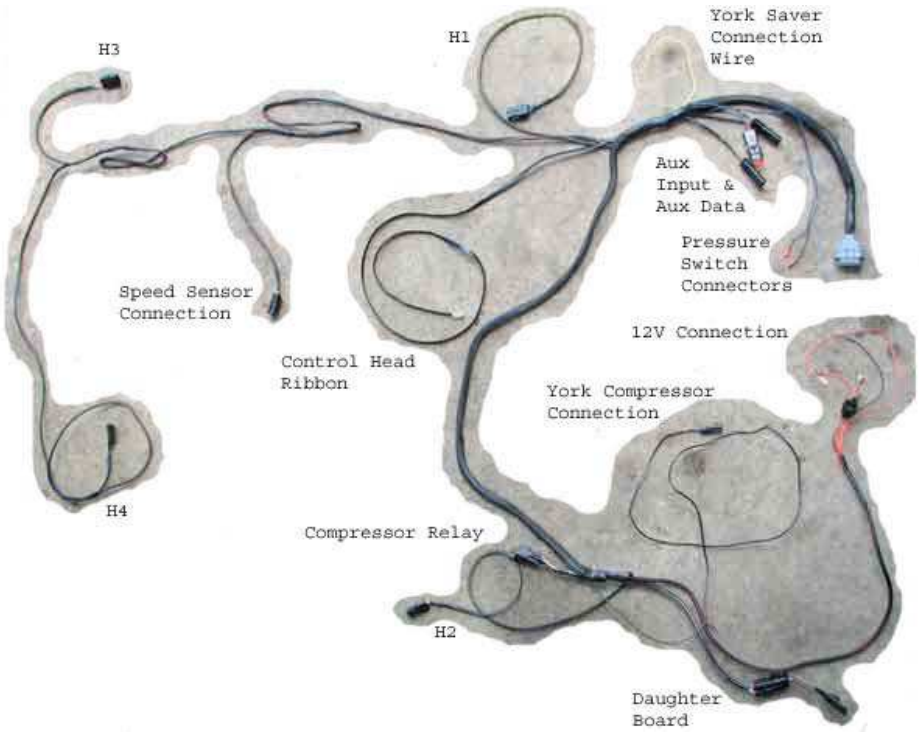
Start by installing the rear airsprings to the axle spring pads. Insert the nut with welded tang up from the front side of the rear axle and position the airspring onto the spring pad while turning the airspring to start and tighten the airspring to the lower mount. Make a tight as possible by turning and gripping with both hands. Once tight, then you will need to extend the airspring to meet the frame end on top. There is a large washer and huge hair pin on the upper mount when delivered, remove these two pieces, the washer can be slipped above the frame mount for the rear springs and then when pushing the upper airspring mount up to the frame, feel above the mount to position the washer over the mount as you removed it, then insert the hair pin to retain the mount in the frame. Note that the pin hole location is parallel to the air spring fitting and the hair pin may be inserted from either direction. The final rotation of the airspring is not important, as you can reach and plug the airline in with any rotation.

Place the rear sway bar spacers between the rear swaybar mounts and the frame rails and reuse the OEM hardware to retain them. Install the rear shocks, start by mounting the supplied bar pin eliminators to the body end of the rear shocks. You will need to press the steel sleeve out of the shock bushing if your shock is so equipped. Using supplied 10mm x 50 mm bolts, mount the shocks body up to the frame in the rear, and using the factory hardware to the axle brackets in the rear. You can install the wheels at this time.

Mount the ACU to the filter/regulator bracket in the engine bay as shown in the image to the left. The rear of the bracket mounts to the right side of the master cylinder, remove the nut, slide bracket over and then mark the 2 mounting legs, where you will drill ¼" holes in the inner fender structure. Remove bracket, drill the holes, reinstall the bracket and master cylinder nut. Then using the self tapping 5/16 screws, mount the 2 legs to the inner fender structure. Then mount the ACU to the bracket using the #8 self tapping screws. The Oil filter and air filter will now be mounted in separate places using their own brackets. Those can be found at the end of this document.

Locate a convenient spot in the cab for the Controller. You may leave the unmounted on the dash until after you final installation, just to utilize the buttons and see where it will best mount for your convenience. Clean the dash thoroughly with an alcohol pad. Remove the film from the self-adhesive tape and press firmly on the Control Head to secure it to the dash. Try to position the Controller in the position you would like it the first time, as the tape may not stick as well if it removed for a second attempt. The Controller cable will run through the firewall and be snaked through the dash to your mounting location. We utilize the grommet at the top driver side of the JK firewall. Simply plug in the ribbon cable to the Control Head until it clicks. To release, press the small latching tang and pull out ribbon cable. This connection may be made/disconnected at any time, there is no need to cycle the power to the ACU when disconnecting this cable. In the event of a static spike, the display may display 2 rows of black boxes or a blank screen, simply disconnect this connection and reconnect to correct the connection.

You have already completed some of the airline installation. It is now time to finish it. Using ¼" airline, start at the Right Rear airspring and connect one end to the air fitting. Run the airline across the JK (near the air tank or where the fuel line comes across the JK) and run it between the fuel filler tube and the tub, above the fuel tank crossmember (to the inside of the driver side rear airbag). Continue running this airline along the top of the frame rail to the second body mount. Loop to the rock rail and run the airlines over the mounting tabs for the rock rail. Continue around the front body mount on the driver side by the fender (following the 3/8" airline previously installed to the air tank). It is extremely important to run the airline around the front body mount and to not follow the brake lines in the engine bay to keep the airline away from the heat generated from the exhaust system. Run the airline up the inside of the inner fender and route it to the ACU. Trim this airline and connect it to the #4 port air fitting on the ACU. Be sure to leave enough room for some slack in the line. Move to the Left Rear airspring. Plug in the airline and give it a tug to ensure it is properly seated. Follow the same path as before and route the airline to the #3 port on the ACU. From the Right Front airspring, fish the airline through a hole in the upper spring mount at the frame and run it up to the power steering fluid reservoir. Continue under the plastic panel on the radiator and behind the windshield washer fluid reservoir. Trim the airline and plug into the #2 port on the ACU. Lastly, plug in the airline to the left front airspring and push it through the hole in the upper spring mount at the frame and route it up to the washer fluid reservoir and over to the ACU and plug into the #1 port. For help in understanding the layout, refer to the JK AiROCK Airline and harness routing diagram located at the beginning of this document.



The harness is designed for a certain layout on the Jeep. Begin the install of the JK harness by laying it out in the engine compartment. Ensure that the harness will be easily routed to avoid heat sources that may damage airline and/or the harness. Start with the large plug and place it by the filter/oil return bracket. Route the harness toward the driver side fender and then back towards the firewall following the wiring sheathing already present in the engine bay. The Controller cable will be run through the firewall to the cab. You will find a grommet near the brake booster. You may have to put a small cut in the grommet to push the wires and the airlines through. It is recommended to temporarily remove the grounding strap that attaches to the hood. Continue along the firewall between the wire sheathing and the weatherstripping. The Relay is ziptied above the battery. The H2 harness will run towards the battery and down to the right front sensor. The H1, H3, H4 and speed sensor harness will run down the fender, **AROUND THE FRONT BODY MOUNT** and along the top of the driver side framerail. Do not follow the brake lines in the engine bay, for there is too much heat there. Along the framerail, you may follow the brake lines. The speed sensor harness will tail off at the crossmember at the back of the transfer case. At the rear airspring, loop to the passenger side along the fuel filler neck/line where the recommended air tank mounting position is. The connectors will reach the area where they will connect to the height sensor brackets. Height sensors will be installed shortly.

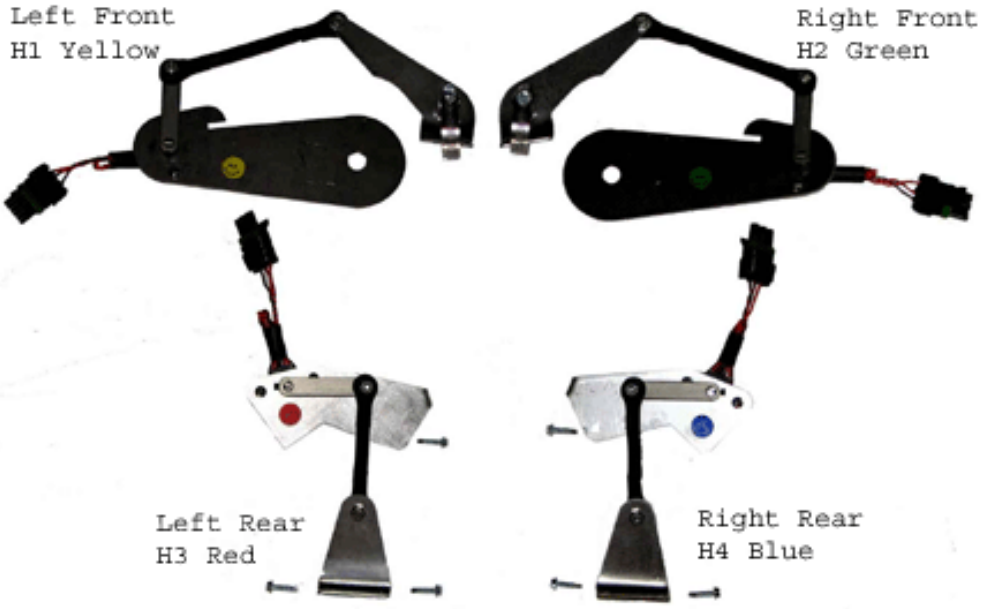
The fused connections go to a 12V continuous power source. There is a wire with a weatherpack connector on it coming off the relay. This attaches to the York Compressor.

The RED wire is the one tied to the Fuse shown in the image to the left. This is the link that powers everything up. This is installed on the FUSED side of the fuse. Be sure to clearance a bit of the fuse box next to the 13mm nut to allow the RED wire not to be pinched when the fuse box is put back together. NOTE: in this image, there are 2 wires going to

The BLACK wire is tied to a ground, utilize one of the fender mounted grounding nuts, we utilize the one shown on the bottom of the image to the left. The ORANGE wires with the fuses both attach to the bolt in the fuse box, as seen in image to the right. Attach the Relay to the wire harness somewhere near the battery with a zip tie. The YELLOW wire from the harness will attach to the YELLOW wire from the York Saver. You can use the included solder seal to attach the two wires together. If you have not installed the York Saver yet, do not attach the York Saver wire to the harness at this time. Make the connection when you are finished with the York Saver install as the York Saver wire must come from inside the Jeep. There are two wires with crimp on connectors. The BLACK and BLUE wires get plugged into the pressure switch.

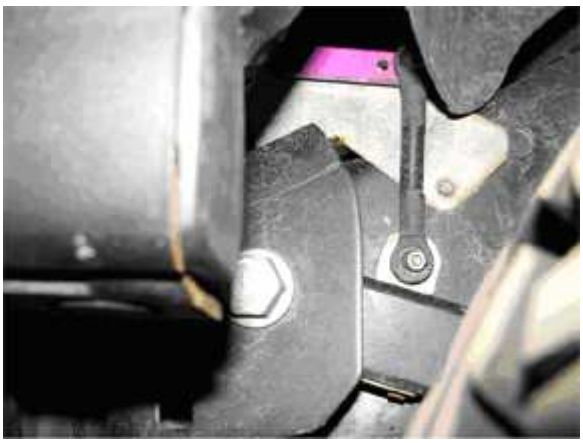
The Aux Input and Aux Data are for future expansion of the AiROCK system.

The height sensors are mostly assembled and ready to be installed. You will need to install the height sensor attaching brackets as seen in the image below. (Note this is the early version, the current production version the front linkage goes to the lower control arms as shown in the next image)



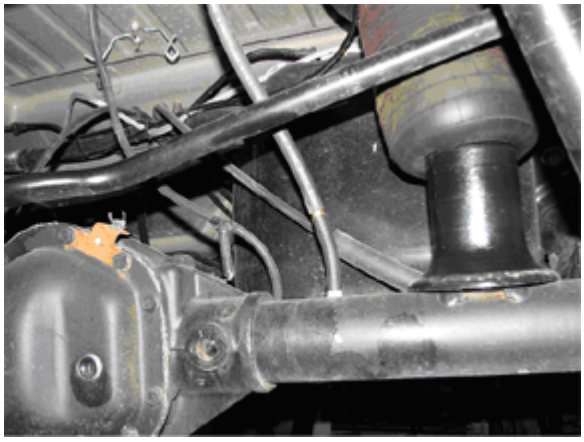
Right front height sensor (H2 Green) installed.

Loosen the upper control arm (UCA) bolt until the tanged nut comes off, turn the bolt back in 3 to 4 threads and place the sensor bracket over the bolt. Be sure to align the height sensor bracket tab onto the UCA mount as shown in the image above. Replace the tanged nut and tighten the bolt. With the sensor mounted properly, check to see if the linkage is free from binds. The nylon rod ends and shaft assembly should rotate freely. Repeat this procedure on the left front upper control arm and refer to image on the right. Note the dimension of 4" from the center of the control arm to bushing to the side of the arm where the 7/32 hole is to be drilled for the ¼" self tapping screw.



Move to the rear of the JK. On the frame above the UCA mount, there is a dimple. The bent tab on the height sensor goes into that dimple and the sensor rests on top of the UCA mount. Drill a 7/32 hole in the frame for the #8 self tapping screw to secure the bracket. The hole may need to be oversized slightly. The Lower mounting brackets should be slid forward up to the weld on the bushing end of the upper control arm. From the bottom, drill these mounting holes with the 7/32 bit and secure with the #8 self tapping screws. When the bracket is under the arm, there should be enough room for the nylon rod end above the control arm as shown in the image to the left, which is the left rear height sensor (H3 Red). With the sensor mounted properly, check to see if the linkage is free from binds. Repeat the same procedure for the right rear height sensor (H4 Blue)

At this point, go ahead and install the diff breather tube, as shown in the image to the left. Slide the breather tube off of the nipple on the axle. Insert the extension into the breather tube and reattach at the axle. Or, simply work the extension hose long enough to connect at full droop. There is plenty of hose, just need to wiggle it a bit longer on the axle side.



The speed sensor is next to install. On the transfer case, there are two threaded holes. The two spacers included in the speed sensor bag will be used to space out the sensor. Use the supplied bolts to secure the sensor to the transfer case. This can be seen in the image below left. Next, you need to adjust the bracket to allow .025" between the tip of the sensor and the wing of the driveshaft yoke. There is chunk of package from the speed sensor that should be in the bag with these parts, use this as the thickness gauge. If this is missing, you can use a scrap off of a 12 pack soda carton. Place this "spacer" between the sensor and the wing of the driveshaft yoke and tighten down the sensor bracket.

Note: 2012 and up Rubicons have a longer mounting boss, so the supplied spacers are shorter. These bosses are not tapped, but are drilled close enough for a ¼-20 thread. Use one of the ¼-20 self tapping screws to thread the opening of these bosses, and then use the ¼-20 mounting bolts to mount the bracket as shown in the following images.

If you have an automatic transmission, you will need to lower the automatic transmission skid plate in order to clear the front driveshaft. Included in the parts kit are ½" washers. Use as many washers as necessary to ensure the driveshaft does not contact the skid plate at full droop of the shock.

It is time to power up the ACU. Start the JK and check to see that the Controller display lights up with an “AiROCK” message and then display “Not calibrated”. Recently, the units have been shipped after an initial calibration and test on our shop Jeep, hence the display will start with “Manual Mode” Press the Check and X button to enter the menu from here. If it states “Not calibrated” continue. At this point, the ACU is working. Press the RIGHT arrow and the AiROCK will ask what application, select Jeep (UP or DOWN arrows to change selection) and press the RIGHT arrow to accept, and again RIGHT arrow to verify (you will only have one chance to enter this, it is then set in memory and not adjustable) Now, display should rear “Show installed AiROCK options”, press the DOWN button to scroll to “test installed airsprings “ and press the RIGHT arrow to accept. Now, if you do not have the air supply operating, this will be as far as you can go, IF you have the air supply working, and the regulator is turned up to 120 PSI on the gauge, then the display should rear “Front Left to 25 PSI”, simply press and hold the RIGHT arrow and the AiROCK will click repeatedly and fill the airspring to a maximum of 25psi. Once that is reached, the clicking will stop. The AiROCK will display numbers while this is happening, the bottom row is pressures and you should see the first column growing from appx 8 psi to 25 psi. Release the button, press the DOWN arrow to scroll to the Right Front to 25psi option, duplicate the push to get 25 psi in that corner, and continue thru to fill the rears as well. Refer to the included AiROCK Operations Manual for more details on the rest of the menu functions. Once you have each corner at 25psi, then you may remove the jack stands and put the Jeep back on the ground. You’re now ready to calibrate the Jeep, continue thru the rest of this document and then see the “calibration” document to finish the calibration. You can find information on how to do this in the included Operations/Set Up guides.

After you have filled the airsprings with 25 PSI of air and have taken the JK off of the supports, go back and tighten all the front lower nuts for the airsprings. Do not calibrate until the airspring nuts are tight.

Use the zip-ties to secure the harness and air lines together. Also use the zip-ties to secure the harness along the brake lines.

Updated Oil removal filter mounting (No longer used on current applications with finned head compressor). This is known to work on most models, SOME later models have a vacuum pump or other items that may cause interference in this location. Feel free to place this elsewhere in a similar manner.

Updated Air filter/regulator mounting bracket. This bracket is designed to hang the regulator right behind the headlight. There is typically 1 of the 2 horns mounted in this area, and if the Jeep is equipped with a hood switch, for the alarm, then you may need to modify the hood switch bracket to get it to fit.

The horn that is removed from behind the headlight can be moved to below the inner fender structure. You may be able to work the wire harness down to plug it in, but on some models, we have had to extend the wire harness on some models to get it to plug in. There is a screw under the inner fender that we hang the horn from.

Due to the heat generated by the engine of the JK Wranglers with the 3.8L engine and the poor ventilation of heat from under the hood, one of our recommendations to help alleviate the heat issue has been to trim the inner fender wells. The result of this inner fender trimming will be a cooler running engine, improved air conditioning operation, and a less likely chance of harness or airline failure due to extreme heat issues. Forward and rear are described as to forward of the front shock mount and rearward the front shock mount.

Behind some of these inner fender structures, there is expanded heat shield material. Try not to cut into this material. Careful of airlines, brake lines and anything else you'll find behind there!

driver rear

driver front

passenger rear

passenger front