

ROCK KRAWLER S U S P E N S I O N

INSTALLATION MANUAL

FOR

**ROCK KRAWLER SUSPENSION, INC. 2003-
2013 Ram 2500/3500 HD 4x4**

3.0" X-Factor System

2022 1st EDITION

September 2022



ROCK KRAWLER S U S P E N S I O N

Dear customer: Thank you for purchasing the best system on the market for your Ram Vehicle. We are sure you will be happy with this system after your installation is complete. Please take your time during the installation and be sure to do it correctly. Completely read the directions before starting your installation so you know what to expect. Remember, your personal safety depends on it. Should you have any questions during this installation feel free to give our tech line a call (518-270-9822) and we will be happy to help you.

Welcome to TEAM RK

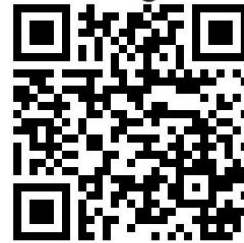
Share your before & after pictures, install photos & wheeling images.

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@rock_krawler

Note: BE SURE TO CHECK ALL FASTENERS FOR PROPER TORQUE BEFORE TEST DRIVE. RECHECK AFTER 500 MILES AND BE SURE TO CHECK PERIODICALLY.

WARNING

- Properly block and secure vehicle prior to installation.
- Always wear safety glasses when using power tools.
- Rock Krawler Suspension recommends the use of Loctite on all hardware, unless noted otherwise.
- The use of limiting straps is recommended to avoid possible damage from overextending the suspension of your vehicle.
- Read and understand all instructions, warnings and safety precautions in these instructions and your owner's manual before attempting to install these components.
- Proper installation of Rock Krawler Suspension products requires knowledge of recommended procedures for disassembly/assembly of OE vehicles and components. Access to OE shop manuals and special tools are required. Attempting to install this kit without knowledge of these procedures may affect the safety of your vehicle and or the performance of these components. Rock Krawler Suspension, Inc. strongly recommends that this system be installed by a certified mechanic with off road experience.
- Rock Krawler Suspension does not recommend combined use of suspension lifts, body lifts or other lift devices. Combined use of lifts may result in unsafe and unexpected handling characteristics. Also, many states now have laws restricting Vehicle lift, bumper heights, and other alterations. Consult local laws to determine if your proposed alterations (including installation of this system) comply with your state laws.
- Rock Krawler Suspension does not condone or authorize the use of any other suspension components with its products. Should Rock Krawler Systems or components be installed in junction with other products or not per the provided instructions Rock Krawler Suspension warranty is void and is not to be held accountable for any resulting actions.



Driving and Handling Tips

- For Highway driving it is best to have the front sway bar connected. This will give you the on-highway ride and handling characteristics you expect. **If you choose otherwise, you do so at your own risk.**
- The ride quality and handling that Rock Krawler is known for is based on using OEM sway bars front and rear with approved shocks. Using any components other than directed can result in adverse handling characteristics and poor ride quality.
- For Off-Road use it is best to have the front sway bar disconnected and the rear sway bar connected. This will allow your suspension to do its intended function. Our suspension will give your vehicle unmatched articulation which will provide traction and feedback to keep your vehicle moving in almost all conditions. Let the suspension do the work!

IMPORTANCE OF JAM NUTS

This is a note about jam nuts and the consumer's responsibility. The installer is the person or persons initially responsible for the proper setup of the suspension system and/or components and the initial tightening of the jam nuts. The jam nuts not only hold the orientation of the joint it is on, but it is the single component that puts the necessary pre-load on the joint's threads. The consumer or vehicle owner is the person or persons responsible for maintaining the jam nuts tightness. Failure to do so will result in the rapid deterioration of the threads in the control arm and will impose a "cause for concern" for the occupants of the vehicle. Failure to comply with the warnings heeded in the directions regarding the number of threads showing past the jam nut will also result in the same "cause for concern" for the occupants of the vehicle. All the above items are the responsibility of the vehicle owner and or installer. If a threaded section of a component is bad it will show itself defective immediately. Threads that fail over time are due to improper maintenance of jam nuts and can be proven very easily. Thread sections and jam nuts not properly maintained or setup, are not covered under warranty. This is the end user and installer's responsibility.

MAINTAINING JOINTS

Krawler Joints/Pro Flex Joints, Anti-Wobble Joints and Pro Disconnect Joints

The Pro Series Krawler Joints, Pro Flex Joints, Anti-Wobble Joints and Pro Disconnect Joints are greaseable. They come pre-lubed from the factory. The grease valley is machined into the housings. Grade 1 grease can be used in all joints. We recommend Mobil Lux EP1. They will not take a lot of grease, nor do they need a lot of grease. Approximately every 4 to 6 months under normal operating conditions they should be greased. This is condition and use dependent so please use common sense. Over lubrication or using the incorrect grade of grease can do damage to the joints and hydraulically displace the race way material causing a sloppy joint condition. Never ever use red and tacky.

If the joint is not loose, it is not bad. Only if the ball is sloppy in the joint housing is it a bad joint and should be rebuilt. Krawler Joint Raceways, Pro Flex Joint Raceway, or Anti-Wobble Joint Raceways are available through Rock Krawler Suspension or an authorized dealer.

Please note: If you are not using the full range of motion of the Krawler Joint, Pro Flex Joint or Anti-Wobble Joint very often, the lubrication will not be moving inside the joint. In such cases we recommend spraying down the outside of the Joint with WD-40 or Liquid Fluid Film to ensure the race ways do not dry up. In highly corrosive environments it is also recommended to spray down the suspension components with WD-40 or Liquid Fluid Film. This will minimize corrosion of the components due to exposure to the elements.

HEIM JOINTS (Non- rebuildable spherical joints)

All Rock Krawler Heim Joints use Teflon Liners and thus are self-lubricating. They too can also benefit from spraying down the outside of them liberally with WD-40 or Liquid Fluid Film. Grease should never be applied to them! Take caution when using cleaners and detergents on your vehicle as it can ruin the adhesives used on the Teflon liners yielding a bad heim joint.

TORQUE VALUES FOR HARDWARE AND JAM NUTS

- All 14mm and 9/16" are torqued to 90 to 100 ft-lbs.
- All 16mm and 5/8" bolts are torqued to 120-140 ft-lbs.
- All 20mm bolts are torqued to 200-220 ft-lbs.
- All 1" Jam Nuts are to be torqued 250-300 ft-lbs. Up to 3/4" of threads showing past the jam nut is safe for final adjustment. These specifications are critical for the overall longevity of the threaded section.

SUGGESTED STARTING LENGTHS

Front Track Bar 2003-2013 (RK3180HD)

3.0" lift – 39 3/16"

Front Upper Control arm 2003-2013 (RK05261)

3.0" lift - 17"

Front Lower Control arm 2003-2013 (RK05266)

3.0" lift – 19"

****Please Note:*** All Control Arms, Track Bars, and Sway Bar Links come preassembled, but require adjustment to the above recommended starting dimensions. These measurements are taken from the center of one bolt hole to center of the other bolt hole. **Please check out our Rock Krawler YouTube Channel for lots of great informational videos.**



FRONT SUSPENSION INSTRUCTIONS

- 1) Make sure vehicle is on a level, hard, working surface if you are using a floor jack and jack stands.
- 2) Block the rear wheels so the vehicle cannot move and make sure the emergency brake is applied.
- 3) Raise and support the front of vehicle with safety jack stands. Locate jack stands on the frame in front of the axle.
 - a. If you are using a vehicle lift, place the lift arms according to the specific vehicles lifting procedures. Ensure that the lift arms will not interfere with the components that are being replaced.
- 4) Remove the front wheels and tires while the axle is supported by a floor jack.
- 5) Remove the OEM shocks and discard. Save the bottom mounting hardware for reuse. (We recommend aftermarket shocks for the front end. Rock Krawler offers this kit with our TT shocks or our 2 5/8th remote ressy.)
- 6) Remove the OEM sway bar link assemblies and discard them.
- 7) Remove the OEM coil springs and discard.
- 8) Make sure the frame and axle are stabilized, remove, and discard the front trackbar from vehicle. Retain axle side hardware.
- 9) Set new Rock Krawler track bar to 39 3/16" bolt hole to bolt hole and prepare to install.
 - a. Drill out the OEM track bar mounting hole at the frame to 5/8" if not already to size. This may not be required for most 2007 1/2 and newer model Ram HD's! This will allow for a hardware upgrade that was performed at the factory for trucks that are still using 14mm (9/16) hardware to mount the track bar at the frame connection.



Drill Out the OEM Track Bar Mount to 5/8 or Make Sure the Hole Passes a 5/8 Bolt

- b. Install the correct misalignment spacers for axle connection into heim joint. We supply you with 2 sets – 14mm and 16mm. Make sure the spacers fit snugly on the OEM bolt at the axle connection.
- c. Install the new track bar with the OEM hardware at the axle and 5/8 supplied bolt frame connection. The adjustable heim joint connection goes at the axle and the anti-wobble joint goes to the frame connection.
- d. Lock the Jam Nut and make sure the heim joint is free to move equally in both directions when installed. *The Torque on the jam nut should be 200 -240 ft- lbs. Red locktite must be used on jam nut.

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- 10) Remove the OEM lower control arms and discard them for they will not be reused. Retain the OEM Hardware for it will be reused.
- 11) Remove the upper control arms and discard them. Save the axle end hardware for it will be reused. It is ok if you have to cut the passenger side front upper control arm mounting bolt at the frame and destroy it. We have provided you with new hardware for the front upper control arm mounting positions at the frame.
- 12) Set the Upper Control arm to 17" center to center for most 3" systems. The Adventure Joint (fixed joint end) gets secured at the frame with the supplied 14mm x 150mm bolts, (6) 14mm washers and (1) 14mm nylok nuts for each side. The reason we supplied so many washers is so you can flip your hardware around and put it from the outside in. Use (5) washers on each bolt on the inside of the frame as shown below. The washers will ensure the nut does not get sucked inside the frame so you can get a wrench on it as shown below. Use the OEM hardware at the axle end where the spherical/adjustable joint goes.



Extra Front Upper Washers inside the Frame

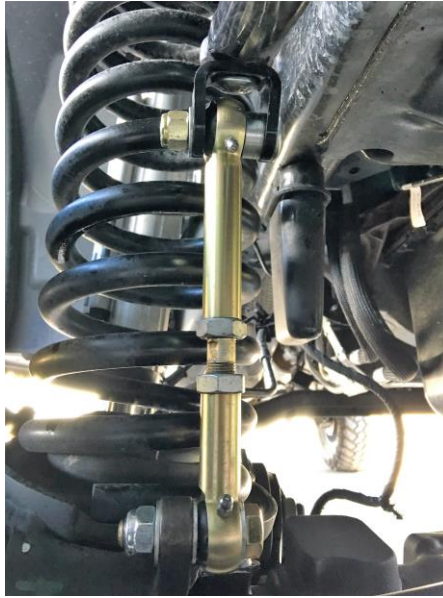
- 13) Install the newly supplied lower control arms using the OEM Hardware. Please set the assembled length to 19" center to center for most standard 3" systems. Just like the upper control arms, the Adventure Joint (welded end) go to the frame connection and the adjustable/spherical end goes to the axle connection.
- 14) Install the supplied front coil springs in the OEM location.
- 15) Install the front **Pro Sway Bar End Links** supplied with the system. The clevis bracket end attaches to the sway bar and has a billet stainless steel machined washer with a step in it that goes on top of the sway bar and underneath the nut. The step in the billet stainless steel machined washer helps keep the clevis bracket centered properly with the 1/2" upgraded hardware. At the bottom, if your OEM mount will not pass the supplied 14mm hardware you will need to drill it out to 14mm or 9/16. This is only required on very few Ram HD's! The bottom end attaches with the supplied 14mm bolt, (1) washer on the outside of the OEM mounting bracket and (1) washer on each side of the ball as shown. Please note: Inside the clevis bracket there is an offset spacer. The new Pro Link must be offset to the outside of the vehicle as shown in the image below. Apply red loctite the rod end jam nuts once the final length of the sway bar links is set. Be sure to tighten the jam nuts. Jam nuts not only hold the orientation of the joints, but they also preload the threads. The preloading on the threaded sections will ensure a long component life and proper structure. 40-50 ft-lbs. of torque is recommended for the 5/8" jam nuts on these connections. This is critical for the overall longevity of the sway bar end link assembly. If you do not apply a large enough pre-load you could also be compromising the structural integrity of the assembly which could lead to problems for your vehicle down the road.

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Billet Stainless Steel Washer Installed



Pro Sway Bar Link Installed (Note Offset)

- 16) Install the front shocks.
 - a. If you are installing our 2 5/8 Remote Reservoir Shocks perform the following: remove the OEM shock mount and replace it with the Rock Krawler raised shock mount. The reservoir will secure to the new mount using the supplied hose clamps as shown below.



- 17) Install the newly supplied extended poly bump stops. Helpful hint: spraying them with WD-40 for lubrication will help when trying to push them into the OEM mounting cup.
- 18) Reinstall wheels and tires. Lift the vehicle off the jack stands and place it on the ground. Tighten all hardware to proper Torque Spec.
- 19) Move to the rear.



Time To Start the Rear End

1. Block the front wheels in place and make sure the parking brake is applied.
2. Jack up the rear end at least eight inches, place jack stands under the rear of the frame as far rearward as possible.
3. Lower the axle on jack stands to remove the load off the rear leaf springs.
4. Remove the rear wheels and tires.
5. Remove the rear shocks. Save the OEM hardware for reuse.
6. Remove the OEM U-bolts securing the rear axle to the rear leaf springs.
7. Install the supplied custom Rock Krawler Mini Spring Pack! The proper way to do this is simple, but please be careful to control the OEM spring pack so it does not spring apart on you. Secure the spring pack with some u-shaped clamps. Remove the OEM pins that hold the pack together. Remove all the flat spring mounting pad from the very bottom of the spring and set the bottom most one aside for reuse. Take the lowest pad (has one central centering pin) and bolt to the bottom of the Mini Pack using the 2 included through bolts. With the newly supplied through pins, secure the Mini Pack to the bottom of the OEM spring pack, and tighten the centering pins collapsing the spring pack. For a more factory like rake, you can install all the factory shims under the mini pack instead of just the bottom one. Then secure the newly modified spring pack back to the axle with the supplied U-bolts. Tighten the U-bolts in an X pattern and torque to the specified value at the end of the directions. Please note: most Ram 2500's will have a heavy overload spring under the OEM spring pack. This is to be removed when installing the supplied custom Pure Performance Mini Spring Packs! Only if you really think you are going to need the extra carrying capacity should you retain the factory overload spring! This will also make your Ram HD ride a little rougher!
8. Install the new longer rear shocks. If you are installing our 2.625 Remote Reservoir Prodigy Shocks; the body of the shock goes toward the ground, the reservoir attaches with supplied hose clamps and isolators to the shock body and goes away from the axle tube.
9. Reinstall the wheels and tires.
10. Set vehicle down on the ground.
11. Tighten all hardware to proper Torque Spec.
12. Drive the vehicle forwards and backwards to "roll it out" to ride height. Then adjust the drag link to center the wheel by loosening the collar and extending the drag link until the steering wheel is straight. The vehicle can be aligned professionally by adjusting the radius arm cam bolts.
13. Head to an alignment shop and have vehicle professionally aligned.



Center the Steering Wheel (This is critical for ESP/ESC equipped Ram HD's and must be done with the steering wheel position sensors at Zero as well.)

Typical alignment specs for the Rock Krawler 3.0" X Factor Kit

Caster 3.0 to 4.5 degrees with .2 degrees caster on the passenger side than the driver's side to account for road crown. Please note: some tire treads and steering stabilizers may cause a pull or push that needs to be accounting for.

Suspension tuning, ride quality and handling were developed on 35 and 37-inch-tall tires on 17- or 18-inch diameter wheels. Here are some recommended no load tire pressures for heavy walled aftermarket tires based on zero payload or tongue weight. 50 psi front and 40 psi rear. Tuning tire pressure to achieve what is optimum to you is up to you and your discretion.

Remember to retorque all hardware after 500 miles and check for proper alignments to ensure everything has settled in properly and is functioning correctly!

***Please Note:** If you do not have adjustable components, you will not be able to dial in the alignment or pinion angle settings so what you get is what you get.

A note about tires, wheels, tire pressure and how it effects ride quality:

Tire and Wheel combinations at a given tire pressure have their own spring and dampening rates associated with them. This plays a major part in ride quality and off-road performance. The stock tire pressure settings on your Wrangler are based on stock C rated light duty tires on 17" wheels. Larger aftermarket tires typically have a much firmer side wall than the stock ones, thus increasing the spring rate and decreasing the dampening rate associated with the tires themselves. Going from a C to a D or E rated tire also amplifies this effect. Increasing wheel diameters cuts down on the sidewall size of the tire; for example, going from a 17" wheel to a 20" to 22" wheels will increase the spring rate and decrease the dampening rate of the tire and wheel combination. As you increase tire strength and wheel size it is common to have to reduce the tire pressures in order to make your aftermarket tire and wheel combination feel like stock wheel combination. **Choose pressures wisely and safely! This is one part of your suspension tuning you can do on your own.**

Before hitting the pavement or the trails be sure to make sure the control arms are oriented properly, all spherical joints (heim joints and Krawler Joints) are oriented correctly to allow for maximum movement without bind, and all jam nuts have Loctite on them and are tight. Make sure the axles are properly centered, pinion angles are correct, there is proper slack in ABS lines, and all lines are properly routed. Go back over all your hardware and make sure each connection is tightened to its proper torque spec. Check your vehicles articulation and ensure that no moving parts contact or interfere with any other components throughout the travel (brake lines, shocks, coils, sway bar links). Also check to see if at full flex your coil spring losses tension, if so you may want to look into a limit straps. You may need to look at bump stops depending on what shocks you choose to run.

Congratulations, you have just finished installing your Rock Krawler Suspension System! Your Ram is now free to roam about the country.



Common Service Parts Listings:

Grade 1 Grease such as Mobil Grease – Mobilux EP1 [NLGI 1] or equivalent can be used for Systems After Jan 1, 2020.

Front Track Bars

Anti-Wobble Joint Bushings (Frame End of Front Track Bar) – RK07836K – Requires Small Joint Tool – RK04487

Front Track Bar Replacement Heim Joint (Axle End) – RK07535 (1” Shank) – Optional New Misalignment Spacers – RK04531

Front Upper Control Arms

Large Krawler Joint – RK04153 – Axle side

Adventure Joint – RK07417 – Frame Side

Front Lower Control Arms

Adventure Joint — Frame Side---- RK07413

Large Krawler Joint — Axle side—2003-08/09----1.25” Shank joint---RK05067

Large Krawler Joint — Axle side—2003-08/09----1.0” Shank joint---RK02256

Large Krawler Joint — Axle side—2008/09-12/13----1.25” Shank joint---RK05068

Large Krawler Joint — Axle side—2008/09-12/13----1.0” Shank joint---RK02989

List of systems these instructions are good for:

R2XF3003