

**INSTALLATION MANUAL**

**FOR**

**ROCK KRAWLER SUSPENSION, INC.**

**TJ and LJ SHORT ARM SYSTEMS**

**FIRST EDITION**

**6/1/09**

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**Dear customer:** Thank you for purchasing the best system on the market for your Jeep 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.

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

## **Warning**

Read and understand all instructions, warnings and safety precautions in these instructions and your owner's manual before attempting to install these components.

## **Caution**

Proper installation of Rock Krawler Suspension, Inc. 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.

## **Warning**

Rock Krawler Suspension, Inc. does not recommend combined use of suspension lifts, body lifts or other lift devices. Combined use of lifts may result in unsafe and

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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.

## Caution

Rock Krawler Suspension Inc. recommends the use of locktite on all hardware, unless noted otherwise.

## Warning

Properly block and secure vehicle prior to installation.

## Warning

Always wear safety glasses when using power tools

## Warning

Rock Krawler Suspension Inc. 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 Inc.'s warranty is void and is not to be held accountable for any resulting actions.

## Warning

The use of limiting straps is recommended to avoid possible damage from over extending the suspension of your vehicle.

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## Tools required:

Metric sockets: 13, 15, 18 Standard sockets: ½, 9/16, and 13/16  
Metric box wrenches: 13, 15, 18 Standard box wrenches 9/16, 13/16  
Hammer pliers, 2 medium Phillips head screwdrivers, pickle fork, T-55 torx, needle nose pliers, and Pitman Arm puller

## You will also need:

Red locktite, grease, jack, jack stands, and another useful item is a come along.

## Helpful hint:

Do not tighten connections until assemblies are installed in entirety.

## Driving Tips:

- 1) For Rock Crawling it is best to have the front sway bar disconnected. This will allow your suspension to do its intended function. Our suspension will give your vehicle unmatched articulation which will give you traction to keep your vehicle moving. Let the system do the work. This will save on vehicle abuse.
- 2) For Mud, especially sloppy mud, it is best to have the front sway bar connected. This will limit the suspension travel which is better for mud.
- 3) 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.**

## Reference Lengths:

**TJ/LJ Front Lower Control Arm Assembled Length = 16.25”**  
**TJ/LJ Front Upper Control Arm Assembled Length = 15.375”**  
**TJ/LJ Rear Lower Control Arm Assembled Length = 16.25”**  
**TJ/LJ Front Track Bar Assembled Length = 32.50”**  
**TJ/LJ Rear Upper Control Arm Assembled Length = 13.75”**  
**TJ/LJ Triangulated 4 Link Upper Arms = 22.19”**

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**Please Note: All Control Arms, Torque Arms, Track Bars and Triangulated 4 -Link Assemblies come pre-assembled, but they require final adjustment as specified in the directions above.**

## Start with the Front End

1. Make sure vehicle is still on a level hard, working surface. Block the rear wheels so the vehicle cannot move and make sure the emergency brake is applied. Raise the front of vehicle and support with safety jack stands. Locate jack stands on the frame in front of the axle.
2. Remove the front rims and tires.
3. Support the front axle housing using a hydraulic floor jack.
4. Remove the front shocks using 15mm box wrench for the top and 13mm socket with ratchet in combination with 13mm box wrench on the lower bolts. Keep the original hardware to install the new shocks.
5. Remove the front sway bar links from upper location using 15mm box wrench. It may be helpful to use a hammer to push up against then end of the sway bar while pulling down on the old links to release.
6. Remove the front track bar from the vehicle and discard the hardware since it will not be reused.
7. Remove the front spring retainer clip(s) if applicable and remove the front springs.
8. Lower the front axle assembly.
8. **For TJ and LJ Flex, X Factor, and X Factor Plus Systems (All others please omit this step).** Remove the front lower control arms using 21mm wrench and 21mm socket with ratchet and save the hardware for reuse.
9. **For TJ and LJ Flex, X Factor, and X Factor Plus Systems (All others please omit this step).** Remove the front upper control arms and save the OEM hardware for reuse.
10. Remove the front springs.
11. **For TJ and LJ X Factor and X Factor Plus Systems (All others please omit this step).** Install the new Rock Krawler front upper control arms using the OEM hardware. Use the supplied shoulder spacers; insert them into the Krawler Joint to step down the joint to a 10mm bore. Set the arms to 15.375" center to center to start and adjust as required. **Do not allow more than 1/2" of threads to show past the jam nut for final adjustment. Be sure to orient the joint to allow for the maximum deflection and tighten the jam nut! It is important to make sure the jam nut is tight to apply preload to the threads in the arm. The use of red loctite is recommended to stop the jam nut from backing off.**
12. **For TJ and LJ Flex, X Factor, and X Factor Plus Systems (All others please omit this step).** Install Rock Krawler Lower Control Arms with Krawler Joint at the axle mount and the Monster Bushing on the OEM frame mounts. Use the OEM hardware for installation. Set the front lowers to 16.25" center to center to start and adjust as required. **Do not allow more than 1/2" of threads to show past the jam nut for final adjustment. Be sure to orient the joint to allow for the maximum deflection and tighten the jam nut! It is important to make sure**

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the jam nut is tight to apply preload to the threads in the arm. The use of red loctite is recommended to stop the jam nut from backing off.



### 13. Installing the front track bar bracket.

**For TJ and LJ perform the following;** Bolt the bracket to the stock cast iron bracket with the supplied  $\frac{1}{2}$ " x 1.75" long bolt and nylok nut and tighten it to draw the bracket up tight. Once the bracket is tight, drill through the frame by center punching the holes and drilling through the frame with a  $\frac{1}{2}$ " drill bit and mount the bracket with the (2) supplied  $\frac{1}{2}$ " x 4.0" long bolts and nylok nuts.



**TJ/LJ Front Track Bar Bracket**

14. Drill out the lower track bar mounting hole at the axle to  $\frac{9}{16}$ . Install the Rock Krawler Adjustable Track Bar using the supplied 14mm x 70mm bolt, nylok nut and washers through the new track bar bracket and the mounting position at the axle.

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15. Install the supplied front track bar. Set the dimension to that prior specified center to center for your given application. Use the supplied 14mm x 70mm bolt and nylok nut for the lower axle connection. Use the supplied 14mm x 70mm bolt and nylok nut to connect the track bar to the track bar bracket. **Do not allow more than ½” of threads to show past the jam nut for final adjustment. Be sure to orient the joint to allow for the maximum deflection and tighten the jam nut! It is important to make sure the jam nut is tight to apply preload to the threads in the arm. The use of red loctite is recommended to stop the jam nut from backing off.**
16. Install the Rock Krawler front springs and reattach retaining clips if applicable. Please note; For LJ Owners we have also included a ¾” front coil spring spacer that can be used on top of our 3.5” coils to remove further rake from your LJ if you so choose.
17. Install the front shocks using original hardware.
18. Install the front sway bar disconnects as shown below.

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**Front Disconnects**

On top, connect the sway bar link assembly to the sway bar using the supplied carriage bolt 3/8" x 1.5" long bolt, lock nut and 3/8" flat washer (On XJ's there would be a stem cushion bushing and stem cushion washer on top of the sway bar). On the bottom, tighten the supplied special bolt (with hole) to the OEM mounting bracket, jam nut and spiral lock washer as shown. Then connect the sway bar link assembly to the special bolt with a supplied 1/2" nylon washer on each side of the rod end and then secure it with the hair pin as shown. **Make sure you have 5/8" of thread engagement at a minimum for your rod ends.**

19. Disconnect the drag link from the OEM pitman arm and remove the OEM pitman arm from the steering box. Install the supplied pitman arm. Reconnect the drag link to the new pitman arm.

20. **For TJ and LJ Flex, X Factor, and X Factor Plus Systems (All others please omit this step).** Remove the factory front rubber brake lines and install the new stainless steel brake lines. Do not worry about bleeding the brake system at this time since you are going to have to install the new rear line in a little while.

21. Install front rims and tires and lower front of the vehicle to the ground, check that the front axle is centered under the vehicle. If the axle is not centered, adjust rod end to center the axle. If the axle is centered, tighten all hardware to proper torque spec. **Do not allow more than 1/2" of threads to show past the jam nut for final adjustment. Be sure to orient the joint to allow for the maximum deflection and tighten the jam nut! It is important to make sure the jam nut is tight to apply preload to the threads in the arm. The use of red loctite is recommended to stop the jam nut from backing off.**



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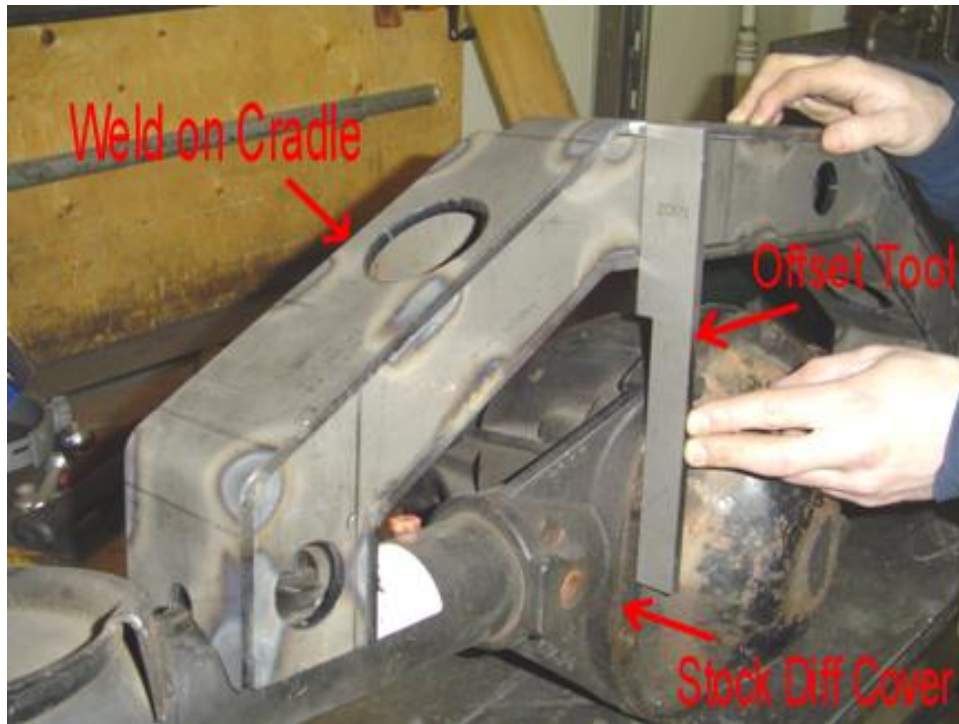
## Now Lets Start the Rear Assembly

1. Park vehicle on a level, hard working surface. Raise rear of vehicle and support with safety jack stands. Locate jack stands on the frame behind the rear axle.
2. Remove the rear rims and tires.
3. Support the rear axle using a hydraulic floor jack.
4. Remove the rear shocks and save the hardware for reuse.
5. Remove the rear sway bar links and save the hardware for reuse.
6. Lower rear axle using hydraulic jack until rear springs can be easily removed and remove springs.
7. **For TJ and LJ Flex, X Factor, and X Factor Plus Systems** (*All others please omit this step*). Remove the rear lower control arms using 21mm socket with ratchet and a 21mm box wrench and save the hardware for reuse.
8. **For TJ and LJ X Factor and X Factor Plus Systems** (*All others please omit this step*). Disconnect the rear brake line and parking break lines from rear upper control arms.
9. **For TJ and LJ X Factor and X Factor Plus Systems** (*All others please omit this step*). Remove the factory rear rubber brake line and replace with the supplied stainless steel brake line.
10. **TJ and LJ X Factor and X Factor Plus Only** (**All other systems skip this step**) ; Remove upper control arms using 15mm socket with ratchet. Discard the rear uppers since they will be replaced. The hardware can also be discarded for X Factor Plus Systems only since it will not be reused in the triangulated 4 link rear conversion.
11. Remove rear track bar using the T-55 torx bit for the lower mount and 18mm wrench and 18mm socket with ratchet. Maintain the rear track bar and OEM hardware for reuse. *TJ and LJ X Factor Plus systems with the Triangulate 4 Link Conversion may discard the OEM rear track bar and hardware!*
12. **TJ and LJ X Factor Systems Only** (**All other systems skip this step**); Install the newly supplied rear upper control arms. Set the initial operating distance to 13.75" and install using the OEM hardware. Adjust as required to achieve the proper axle position and pinion angle. **Do not allow more than 1/2" of threads to show past the jam nut for final adjustment. Be sure to orient the joint to allow for the maximum deflection and tighten the jam nut! It is important to make sure the jam nut is tight to apply preload to the threads in the arm. The use of red loctite is recommended to stop the jam nut from backing off.**
13. **For TJ and LJ X Factor Plus Only** (**All other systems skip this step**) ; Now you are going to install the weld on rear cradle, tie in plate and rear upper control arm mount reinforcing brackets.
  - a) Remove the OEM rear upper control arm mounts and the OEM rear track bar mount flush from the rear axle. Install the new weld on cradle to axle. For Dana 35/44/60, Chrysler 8.25 and Ford 8.8 rear axles with the OEM differential cover only, center the cradle side to side on the rear axle housing. Using the supplied offset tool, place the thinner edge of the offset tool flat against the differential cover with the two of the diff. cover bolts removed. Rotate the cradle back until the back flat surface of the cradle contacts the thicker portion of the offset tool as shown below. Now the cradle is in position. Fully seam weld the cradle to the axle tubes. Once completed the offset tool

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is no longer needed. Replace the two bolts in your differential cover and apply a durable finish to the rear cradle of your choice. **Please note: Stock differential cover thicknesses range from 1/8 to 3/16 in thickness. If you have a heavy duty cover or something other than stock you will need to account for the thickness variation when positioning the rear cradle.**



**Weld In Rear Cradle**

b) Install the weld in cradle tie in plate. This plate makes sure the cradle can not bend and on some applications (Dana 60's) will allow you to join the tie in plate to the cradle and the axle housing itself. You may need to trim a little off the tie in plate for it to fit properly depending on axle. The tie in plate sits 1/4" inside the back surface of the cradle and gets welded to the cradle and the axle, thus calling it a tie in plate. Using a stitch weld technique is acceptable for joining the cradle to the tie in plate, just be sure to cover the corners well. This gives the cradle a nice finished look as well as add strength. Once cooled, apply a durable finish of your choice. See below for an example of what the tie in plate looks like installed.

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**Cradle Tie in Plate Installed**

c) Install the rear upper reinforcing mounts as shown and weld them into place on the bottom of the frame. (Passenger side shown) The new bracket goes in between the OEM bracket and where the new joint goes.



**Rear Upper Reinforcing Mounts**

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d) You will also need to drill out the OEM rear upper mounts to 9/16. You can drill from the outside of the frame right through the entire mounting brackets. This way we can upgrade your hardware when it comes time to put in the triangulated 4 link arms.

14. **For TJ and LJ X Factor Plus Only (All other systems skip this step);** Set the triangulated upper arms to length as shown below. Set the arms to length specified above. The dimension is from center of Krawler joint to center of Flex Joint. **Note: That the Flex Joint is rotated 90 degrees from its correct position, for setting the proper length. Do not allow more than 1/2" of threads to show past the jam nut. Be sure to orient the joint to allow for the maximum deflection and tighten the jam nut! It is important to make sure the jam nut is tight to apply preload to the threads in the arm. The use of red loctite is recommended to stop the jam nut from backing off.**



**Triangulated 4 -Link Assembly**

15. **For TJ and LJ X Factor Plus Only ;** Install the rear upper Triangulated 4 Link Assemblies. The bushing end gets attached to the frame mounts with a 14mm x 90mm bolt, washers and nylok nut. The Krawler Joint connection gets attached to the cradle with the supplied 14mm x 100mm bolt, washers, and nylok nuts. The orientation of the arm is to be set and then the Jam nut at the frame connection is to be locked in order to hold the orientation of the arm. With the arm oriented properly the joint at the cradle then should be oriented to allow for maximum articulation and the jam nut closest to this joint should then be locked. We strongly recommend the use of red loctite on all the jam nuts to ensure they do not back off under harsh vibration. Show below is the basic assembly method and orientation of the parts as they go into the vehicle.



**Rear Tri-Link Connection**



**Triangulated 4 -Link Assembly**

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**Weld in cradle specified holes**

16. **TJ and LJ X Factor Only (All other systems skip this step);** You can remove the steel mounting brackets for rear parking brake cables and zip tie the brake lines to the rear upper control arms using the supplied zip ties.

17. **For TJ and LJ Flex, X Factor, and X Factor Plus Systems (All others please omit this step);** Install the Rock Krawler Lower Control Arms with Krawler Joint at the axle mount and the other Monster Bushing on the OEM frame mounts just like the front lower control arms. Use the OEM hardware for installation. Set the TJ/LJ rear lowers to 16.25" center to center to start and adjust as required. **Do not allow more than 1/2" of threads to show past the jam nut for final adjustment. Be sure to orient the joint to allow for the maximum deflection and tighten the jam nut! It is important to make sure the jam nut is tight to apply preload to the threads in the arm. The use of red loctite is recommended to stop the jam nut from backing off.**

18. **For All TJ and LJ Systems Except X Factor Plus (X Factor Plus systems please omit this step);** bolt in the supplied rear track bar relocation bracket as shown, below. Be sure to remove the factory plastic cover before installing the new bracket. Bolt the relocation bracket into place with the OEM fastener and the supplied two 5/16 x 3/4 bolts and nuts in the holes. Then bolt the OEM track bar to the relocation bracket with the supplied 10mm x 70mm bolt and lock nut. Bolt the top side of the track bar to the frame bracket using the OEM hardware. The rear track bar relocation bracket should look as shown below.

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**Rear Track Bar Relocation Bracket**

19. Install Rock Krawler rear coil springs.
20. Install the supplied rear sway bar links. Use the OEM hardware.
21. Now is a good time to bleed the entire brake system and check for leaks.
22. Install rear rims and tires, raise vehicle off jack stands and lower vehicle to the ground.

**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 are Tight.**

**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 consumer or vehicle owner is the person or persons responsible for maintaining the jam nuts tight. 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 headed in the directions regarding the amount of threads showing past the jam nut will also cause the same "cause for concern" for the occupants of the vehicle. All of 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 not**

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properly maintained or setup are not covered under warranty. This is the end user and installer's responsibility.

**Vehicle should be taken to a certified alignment shop for castor and alignment settings.**

The required Torque for all 14mm, 9/16 or 1/2 bolts not explicitly defined is 70 to 80 ft-lbs. For 10mm bolts the required torque is 40 to 50 ft-lbs. 1/4 bolts torque to 10 to 25 ft-lbs.

**Good Job. Your installation is complete. Now go out and enjoy your vehicle.**

If you are going to install your slip yoke eliminator kit and or new C.V. Driveshaft now, follow the supplied instructions with the kit.

**Optional Transfer Case Drop Kits;** Install the supplied tubular spacers between the skid plate and the frame and tighten with the supplied hardware.



**T-Case Drop Shown on TJ**