

INSTALLATION MANUAL

FOR

PURE PERFORMANCE SUSPENSION

2003-2013 Ram 2500/ 2003-2012 Ram 3500

6" LONG ARM SYSTEMS

THIRD EDITION

03/21/17

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Dear customer:

Thank you for purchasing the best system on the market for your Dodge Ram 4x4 Truck. We are sure you will be happy with this system when 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 DRIVING. 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 Pure Performance Group, 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. Pure Performance strongly recommends that a certified mechanic with off road experience install this system.

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Warning

Pure Performance Group, Inc. 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 lifts, 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

Pure Performance Group, Inc. recommends the use of loctite 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

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

Tools required:

Metal Removing Saw or Tool, Drill, Drill Bits , Standard and Metric Hand Tools, Jack Stands, Bottle Jacks or Floor Jacks, Lift if possible.

Helpful hint:

Do not tighten connections until assemblies are installed in entire

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It is time to do the front suspension!

1. Block the rear wheels and make sure the parking brake is applied.
2. Jack up the front end at least eight inches, place jack stands under the front of the frame as far forward as possible.
3. Remove the following items:
 - a) Factory wheels and tires.
 - b) Front shocks, but save lower hardware for re-use.
 - c) Front sway bar end links. Please discard them since they will not be reused.
 - d) Front track bar. **(KEEP AXLE HARDWARE)**
 - e) Disconnect the drag link from the pitman arm using a ball joint separator.
 - f) Remove the front springs and discard them for they will not be reused.
 - g) Remove the upper and lower control arms. Discard them, but save the axle hardware, for it will be reused.
 - h) Remove the OEM lower control arm mounts from the frame since they will interfere with the new control arms.
4. Let's install the new Long Arm Mounts.

Support the transmission cross member with a jack. Remove the two factory bolts per side that bolt the cross member in place. In some applications it may be helpful to remove the exhaust pipe in this location. Start with the front upper long arm mounts at the frame. These are the smaller of the two styles. Use the included 14mm x 200mm bolts to lightly fasten the bracket into the vehicle to determine and center punch the holes for the frame crush sleeves. Be sure the opening for the control arm is facing forward.

Helpful Hint: Once the holes are marked, a right angle drill is great for getting into tight places and a uni-bit is great for stepping up the holes quickly to the proper size....



Right Angle Drill (Helpful)



Front Upper Bracket Installed

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With the bolts still protruding through the cross member, mount up the lower long arm mounts behind the cross member. These have larger hardware holes, and much longer bracket. Locate and center punch the holes for the frame crush sleeves for this bracket as well. In some applications it may be necessary to remove and relocate a module mounted on the passenger side of the frame. Use the included (4) 3/8" self tapping screws to do so.



Crush Sleeves Installed



Module Relocation and Crush Sleeves Welded

For the front upper long arm mounts (set of mounts in front of cross member) drill the center punched holes in steps ending with a drill bit diameter of 9/16" all the way through the frame. Then enlarge the outside holes in the frame to 7/8". **Make sure to only enlarge the outside holes only.** Slide the 7/8 O.D. by 9/16" I.D. by 2.625 Long crush sleeves into the frame. It is helpful to insert a bolt from the inside facing out before welding to ensure that the sleeve stays concentric with the drilled holes. Then tack weld the sleeve in place taking care to not weld on the bolt. Slide the bolt out and fully weld in the crush sleeve. Grind the welds smooth and prep the surface with a durable finish when cooled. Secure the upper long arm mounts to the frame with the two 14mm x 100mm bolts, washers and nylok nuts. Torque the 14mm mounting bolts to 85 ft-lbs.

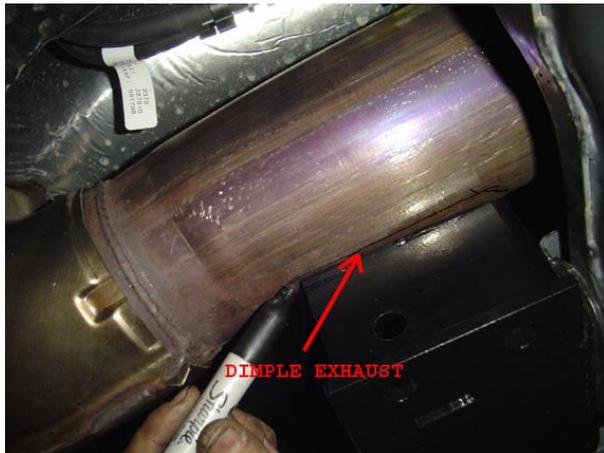
The long arm mounts for the lower control arms (brackets behind cross member) will follow the same procedure, except drill up to 5/8" all the way through the frame. The outside holes in the frame are still 7/8", and the same welding technique is used. Use the supplied 5/8" x 4.5" bolts, washers and nylok nuts to fasten the lower long arm mount through the crush sleeves. Tighten the 5/8" hardware to 120 to 140 ft-lbs. See picture on next page. Be sure to tighten the 14mm x 200mm bolts that go through both brackets and cross member to 70 to 85 ft-lbs.

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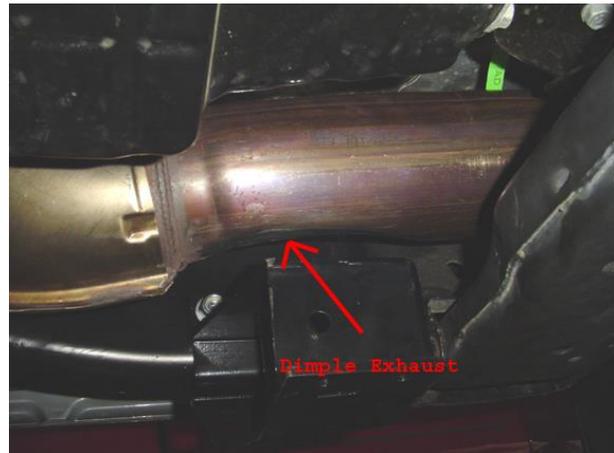


Pass. Side Lower Long Arm Mount Installed

Please Note: In some cases, exhaust modifications may need to be done around the area of these new long arm mounts. Besides having an exhaust shop custom route the exhaust to clear these mounts, a simple dimple modification can be used as another option. First mark the locations of interference on the exhaust. Heat the area of interference, and use a small hammer to dimple the areas marked. Check clearances, and repeat as necessary to allow proper clearance between exhaust pipe and brackets.



Mark Exhaust Area of Interference



Dimpled exhaust to Clear Brackets

Front Lower Long Arm Mount Clearancing: The front lower long arm mounts have been made in such a way that you can trim some material out of them on the inside of the mounts for either exhaust flange clearance on the Passenger Side or T-Case Clearance on the Driver's Side! Trim only what material is needed for clearance as the remaining material is all for structure!

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Indexing Ring Clearance: A common fix for front driveline vibrations which may be caused from this amount of lift is an indexing ring! Pure Performance has made provisions for a 10 degree indexing ring to be installed with this system. You will more than likely have to trim the inside of the driver's side lower long arm mount. This is fine. Just clearance what material is required for t-case clearance and nothing more. **Helpful Hints:** With a 10 degree indexing ring, typically the flange of the front drive shaft will contact the cross member. Adding 3/8 thick spacers under the t-case mount where it attaches to the cross member will typically be enough to clear the cross member. This method is much preferred over clearanceing the cross member. Also, when an indexing ring is installed you will want to take a look at your front drive line length as it might need to be lengthened.

5. Install the front upper control arms. Set the front upper control arm assembled length is 31 7/8" mounting bolt to mounting bolt or eye to eye. Slide the frame end joint in first which is the wider joint (joint w/adapters) and bolt in place with the supplied 14mm x 120mm bolt, washers, and nylok nut. The narrower joint end goes to the axle and attaches with the stock hardware. Make sure the spherical joints are centered to allow maximum deflection. Apply red loctite the jam nuts once the final length is determined so they will not back off. Be sure to crank on the jam nuts. Jam nuts not only hold the orientation of the joints, but they also preload the threads in the arm and on the joint itself. The preloading on the threaded sections will ensure a long component life and proper structure. 250-275 ft-lbs of torque is recommended for the 1.25" jam nuts on these connections. This is critical for the overall longevity of the control arm 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. Never allow more than 3/4" of threads to show past the jam nut(s).

Please note the above brake lines and ABS lines have been routed and can be run down the new front upper control arms.

As an option, the front upper mount at the axle can get additional clearance for easy access to the jam nuts.



Front Upper Axle Mount Clearance

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6. With a metal removal tool of your choice, remove the OEM front lower control arm mounts from the frame. This is required for clearance for the new longer control arms.
7. Set the front lower control arm assembled length is 43 5/8" mounting bolt to mounting bolt or eye to eye. Slide the frame end joint in first which is the wider joint (joint w/adapters) and bolt in place with the supplied 5/8 x 5.5" bolt, washers, and nylok nut. The narrower joint end goes to the axle and attaches with the stock hardware. Make sure the spherical joints are centered to allow maximum deflection. Apply red loctite the jam nuts once the final length is determined so they will not back off. Be sure to crank on the jam nuts. Jam nuts not only hold the orientation of the joints, but they also preload the threads in the arm and on the joint itself. The preloading on the threaded sections will ensure a long component life and proper structure. 250-275 ft-lbs of torque is recommended for the 1.25" jam nuts on these connections. This is critical for the overall longevity of the control arm 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. Never allow more than 3/4" of threads to show past the jam nut(s).



Long Arms and Long Arm Brackets Installed

- 8) Install the track bar drop bracket. In some applications (most '08 and earlier trucks) it may be necessary to drill out the factory mounting locations.
 - a) Drill out the factory track bar mounting location at the frame to 5/8". This may not be required for '07 1/2 and newer Dodge Ram 2500's. This will allow a hardware upgrade from factory 14 mm to the included

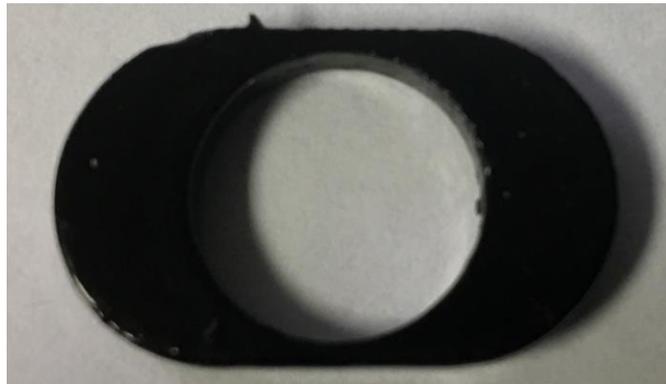
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5/8" hardware.



Drill out the OEM Track Bar Mounting Location at the Frame

b) Grab the front track bar bracket and install it inside the factory bracket as shown. Through the original mount, fasten the bracket in place with the supplied 5/8 x 3" bolt, washers and nylok nut. Going up through the bracket through the engine cross member, bolt the bracket with the supplied 1/2" x 1.25" long bolt. Place the oblong washer shown below in the oblong cutout in the cross member. This will fill the gap above the newly supplied bracket. Use the supplied tab nut on the top side to secure the connection. Torque the 1/2" bolt to 35 ft-lbs first. Then torque the 5/8 bolt in the OEM hole to 150 ft-lbs.



Oblong Washer

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9) Install the front track bar.

a) **For the X Factor Long Arm Systems**, If your OEM track bar does not pass a 5/8 bolt where the track bar mounts to the frame, then you will need to drill out the track bar sleeve using the same 5/8 drill bit used above. This will allow us to upgrade your hardware at the track bar mounting connection. Drill out the track bar sleeve at the frame connection now to 5/8 as shown below.



Drill out the Track Bar Sleeve for the Frame Connection to 5/8 if Required

b) Secure the OEM track bar to the track bar drop bracket using the supplied 5/8" x 3.5" bolt, washers and nylok nut.

c) **For all other systems (X Factor Skip This)**, set the length of the new track bar to **39 3/16"** as a starting dimension. The Anti Wobble end goes to the frame with O-rings still on joint, and the spherical heim joint goes at the axle. For the axle end, you will need to insert the correct misalignment spacers that fit your factory bolt. Use the factory bolt/tab nut for the axle mount. For bolting the track bar into the drop bracket, use the included 5/8" x 3.5" long bolt with washer and nylok nut. **For final assembly do not allow more than 5/8" of thread past the jam nut for structural reasons on either end. Apply red Loctite the jam nuts once the final length is determined so they will not back off. Be sure to crank on the jam nuts. Jam nuts not only hold the orientation of the joints, but they also preload the threads in the arm and on the joint itself. The preloading on the threaded sections will ensure a long component life and proper structure. 200 ft-lbs of torque is recommended for the 7/8" jam nuts on these connections. This is critical for the overall longevity of the track bar 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.**

10) Install the new progressive rate front coil springs.

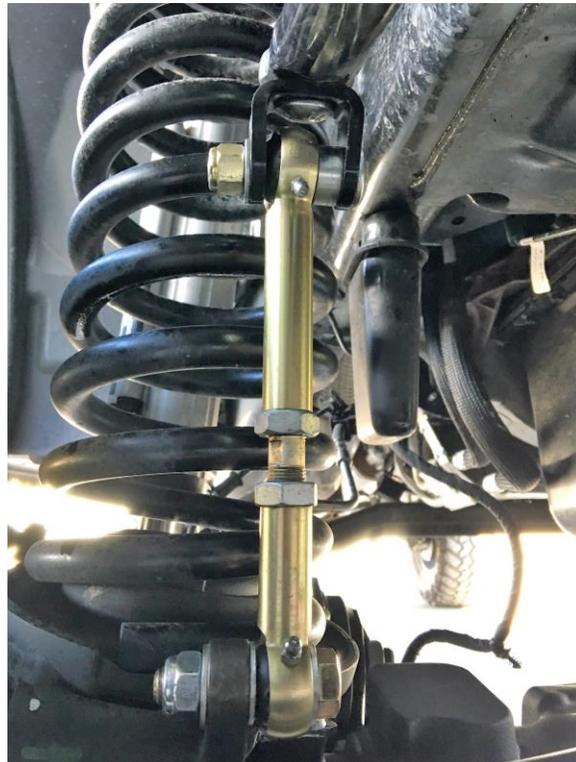
11) Install the front **Pro Sway Bar End Links** supplied with the system. The clevis bracket end attaches to the sway bar and has a billet stainless steel machined washer with a step in it that goes on top of the sway bar and underneath the nut. The step in the billet stainless steel machined washer 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.

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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.



Billet Stainless Steel Washer Installed



Pro Sway Bar Link Installed (Note Offset)

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12) Install the new shocks of your choice. If you are installing our 2 5/8 Remote Reservoir Shocks perform the following; remove the OEM shock mount and replace it with the Pure Performance raised shock mount. The reservoir will secure to the new mount using the supplied hose clamps as shown below.



New Top Mount and Ressey Installed

13) Make sure you have a drop pitman arm installed which we sell optional to ensure proper steering geometry. If you do not have one installed currently, then install one now.

Please note: Triple 0 Grade Grease is the only grease allowed for use on all Pure Performance Joints. The use of any other grease could cause premature wear of the joints. This goes for the Pro Sway Bar Link Ends as well.

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Time to Start the Rear End (Choose the System You Purchased)

For X Factor Systems-

- 1) Block the front wheels in place. Jack the rear of the vehicle up a minimum of 8". Place jack stands under the frame as far back as possible.
- 2) Remove the rear rims and tires.
- 3) Remove the OEM rear shocks and save the hardware for reuse.
- 4) Remove "U"-bolts retaining axle to the rear springs and move axle several inches away from springs.
- 5) Install the supplied 4" fabricated lift blocks. Please note; the taller end of the lift block goes towards the back of the vehicle. This will set your pinion angle properly. Be sure to align the alignment pins in leaf springs to the lift blocks, to the axle and secure 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. Torque them to 115 to 130 ft-lbs equally.
- 6) Install the supplied rear stainless steel brake line(s). Be sure to bleed the brake system prior to use and check for leaks.
- 7) Install the rear shock of your choice. For Prodigy 2 5/8 RR. Shocks, the body of the shock goes down and the Respy goes away from the axle tube.
- 8) Reinstall the rims and tires. **Torque the lug nuts to the OEM torque specs.**
- 9) Place the vehicle back on the ground.

For Triple Threat Systems-

- 1) Block the front wheels in place. Jack the rear of the vehicle up a minimum of 8". Place jack stands under the frame as far back as possible.
- 2) Remove the rear rims and tires.
- 3) Remove the OEM rear shocks and save the hardware for reuse.
- 4) Remove "U"-bolts retaining axle to the rear springs and move axle several inches away from springs.
- 5) Install the supplied custom Pure Performance Add A 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 add a pack using the 2 included through bolts. With the newly supplied through pins, secure the add a 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.

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6) Install the supplied 2" fabricated lift block between the axle and the leaf springs with add a pack as shown below. Be sure to align the alignment pins in leaf springs with the newly supplied add a pack to the lift blocks, to the axle and secure 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. Torque them to 115 to 130 ft-lbs equally.



Fabricated Lift Blocks, OEM Spring w/ Add A Pa Installed and Secured

- 7) Install the supplied rear stainless steel brake line(s). Be sure to bleed the brake system prior to use and check for leaks.
- 8) Install the rear shock of your choice. For Prodigy 2 5/8 RR. Shocks, the body of the shock goes down and the Resy goes away from the axle tube.
- 9) Reinstall the rims and tires. **Torque the lug nuts to the OEM torque specs.**
- 10) Place the vehicle back on the ground

For Chase Series Systems

- 1) Block the front wheels in place. Jack the rear of the vehicle up a minimum of 8". Place jack stands under the frame as far back as possible.
- 2) Remove the rear rims and tires.
- 3) Remove the OEM rear shocks and save the hardware for re use.
- 4) Remove "U"-bolts retaining axle to the rear springs and move axle several inches away from springs.
- 5) Remove complete factory leaf pack and Save hardware for re use.
- 6) Install 2" lift full leaf packs into the vehicle at the frame connections.
- 7) Install the supplied 2" fabricated lift block between the axle and the leaf springs as shown below. Be sure to align the alignment pins in leaf springs with the newly supplied add a pack to the lift blocks, to the axle and secure with the supplied U-bolts. Tighten the U-bolts in an X pattern and torque to the specified value at the end of the

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directions. Torque them to 115 to 130 ft-lbs equally.



Fabricated Lift Blocks and Full Leaf Spring Installed and Secured

- 8) Install the supplied rear stainless steel brake line(s). Be sure to bleed the brake system prior to use and check for leaks.
- 9) Install the rear shock of your choice. For Prodigy 2 5/8 RR. Shocks, the body of the shock goes down and the Resy goes away from the axle tube.
- 10) Reinstall the rims and tires. **Torque the lug nuts to the OEM torque specs.**
- 11) Place the vehicle back on the ground

Be sure to go back over all the hardware and check for tightness and again after 500 miles.

The required Torque for all 3/8"/10mm bolts (10.9) is 28 to 32 ft-lbs.

The required Torque for all 1/2"/12mm bolts (10.9) is 60 to 70 ft-lbs.

The required Torque for all 9/16"/14mm (10.9) is 70 to 85 ft-lbs.

The required Torque for all 5/8"/16mm bolts (GR 8) is 120 to 140 ft-lbs.

Good Job. Your installation is complete. Now go out and enjoy your vehicle. But before you hit the pavement take the vehicle to a professional alignment shop and have the front end aligned! If you have a 2009 or newer Ram HD then be sure to take it to your local Dodge Dealer for alignment so they can properly hook up a Star Scan unit to your truck while performing the alignment to ensure your steering wheel position sensor is at zero when your tires and steering wheel are at

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zero! This will ensure you do not have improper ESP/ESC activation from a poor alignment.

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

Triple 0 Grade Grease is the only grease allowed for use on all Pure Performance Joints. The use of any other grease could cause premature wear of the joints. This goes for the Pro Sway Bar Link Ends as well. We have it in stock. If you do not have any and are in a pinch, simply spraying down the joint with WD40 or Liquid Fluid Film will get you by until you can get the Triple 000 Grade Grease. The joints do not take a lot of grease either. A few small pumps of grease is all you ever need unless the product is aggressively used off-road.