

Raptor Billet Upper Control Arm Kit

Installation Guide

Rev X1



Sales: 866-691-7750

Tech Support: 949-444-3213

Install Videos: YouTube "Raptor Performance Group"

COMPLETELY READ INSTALLATION INSTRUCTIONS PRIOR TO
INSTALLING PRODUCT and WATCHING VIDEOS

WARNING: Failure to follow these instructions may lead to serious personal injury and/or property damage.

Due to the extreme and punishing nature of offroad use, Raptor Performance Group has no implied or expressed warranty. Raptor Performance Group components are designed and manufactured for offroad use only. Installing most suspension products will raise the center of gravity of the vehicle and can increase the susceptibility to a rollover and alter the handling characteristics. Raptor Performance Group may void the vehicles warranty, check with your local dealer. The loss of use of the product, loss of time, inconvenience, removal, shipping costs, commercial loss or consequential damages are not covered. Raptor Performance Group reserves the right to change the design, material or specifications of any product without assuming any obligation to modify any product previously manufactured and without prior notice. Every effort has been made to avoid printing errors and specifications. By installing and/or using these products you are accepting these stated conditions and accept all liability and responsibility.

Prepared by: Engineering Innovations LLC for RPG OFFROAD

RPG OFFROAD

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1. General Information

The Kit is designed with the utmost consideration for safety, quality and ease of installation. The kit comes complete with all necessary hardware and fasteners. However, it is assumed that the installer has advanced/professional skills automotive vehicle servicing. It is recommended that installers obtain an OEM service manual for the vehicle.

1.1 Installation Information

The information contained in this Installation Guide is intended for use by technicians of advanced to professional skill levels. Attempting installation without the proper training, tools and equipment could cause injury to you or others. It could also damage the vehicle or cause an unsafe condition.

1.2 For Your Safety

Because this guide is intended for technicians of advanced to professional skill levels, we do not provide warnings about many basic shop safety practices. If you have not received shop safety training or do not feel confident about your knowledge of safety practices, we recommend that you do not attempt to perform the procedures described in this guide. Some of the most important general safety precautions are given below. Engineering Innovations cannot warn you of every conceivable hazard that can arise. Only you can decide whether or not you should perform a given task.

1.3 Important Safety Precautions

Make sure you have a clear understanding of all basic shop safety practices and that you wear appropriate clothing and use safety equipment. Be especially careful of the following:

- Read all directions before you begin, and make sure you have the tools, the parts and the skills required to perform the tasks safely and completely.
- Protect your eyes by using proper safety glasses, goggles or face shields anytime you hammer, drill, grind, pry or work around pressurized air or liquids, and springs or other stored-energy components.
- Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts.
- Protect yourself and others when you have a vehicle up in the air. Anytime you lift a vehicle, either by hoist or a jack, make sure that it is securely supported.

Make sure the engine is turned off and battery disconnected before you begin work.

- Carbon Monoxide poisoning from exhaust gasses: Be sure there is adequate ventilation whenever you run the engine.
- Burns from hot parts: Let the engine and exhaust system cool before working on those areas.
- Injury from moving parts: If running the engine, keep hands, fingers and clothing away from moving/rotating parts.

Gasoline vapor and hydrogen gasses from batteries are explosive. To reduce the possibility of fire or explosion, be careful when working near gasoline and batteries.

Use only nonflammable solvent, not gasoline, to clean parts.

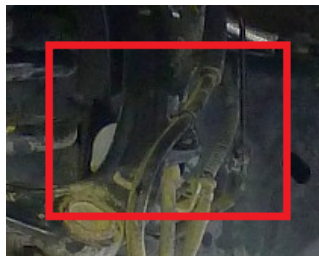
Never drain or store gasoline in an open container.

Keep all cigarettes, sparks or flame away from the battery and all fuel related parts.

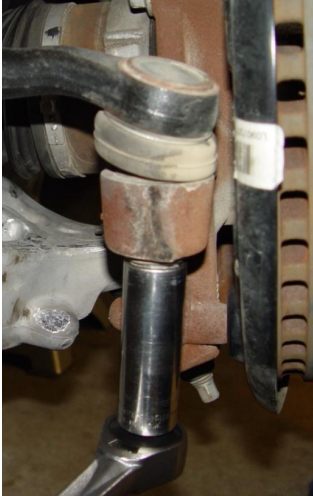
2.0 Removal of Original Parts

See OEM manual for detailed instructions. Items to be retained for re-installation are noted.

- Wheels and Tires (to be re-installed)
- To Simplify, perform this on the driver's side first
- Remove Brake Line ATTACHMENT BOLTS on Chassis and Knuckle. Performed only as a safety precautionary.. not Necessary
- Remove ABS and 4x4 Vacuum Line attachment bolts. Performed only as a safety precautionary.. not Necessary
- Vacuum line attached to the upper control arm. Cut the ZIP TIE. Be Careful to not cut the Vacuum Hose.



- Tie-Rod
 - Loosen Tie-Rod Nut 21mm or 13/16" Socket. Do not remove completely.



To Loosen, Tap on Knuckle and bottom of ball joint with Hammer



Stock Upper Control Arm to knuckle ball joint. Remove this using the same method as the OE stock Tie Rod.

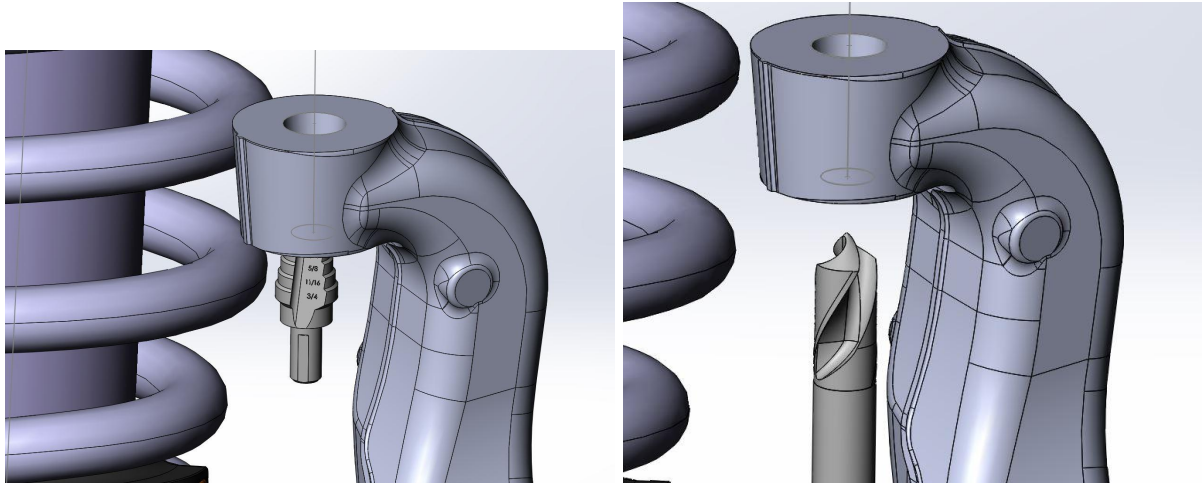
Stock Shock removal.

- loosen the lower shock nut (30mm) while holding the bolt (28mm or 1 1/16"). Note this bolt and nut are very tight from Ford. 406 Ft-lbs.
- on the top of the stock shock, mark the tapered wedges with a white marker or white out to help simplify the orientation upon installation of the stock Fox shocks. (these will not be reused with the Fox 3.0" shocks)
- loosen the upper nuts (15mm or 5/8") I have found that this is easier when opening the hood of the truck and using a long extension with a 5/8" swivel spark plug socket.

Remove the stock upper control arm to chassis bolts. REMEMBER THE BOLT ORIENTATION Very important otherwise the coil spring will collide with the bolts. (Bolts / Nuts are to be reused) 13/16 or 21mm

2.1 Drill out Knuckle for Upper Control Arm Pin

- 5/8" Drill Bit, step drill bit or File. You need to remove very little material out of the bottom of the taper only. The pin that is going into the knuckle is 5/8" diameter where the threads are.

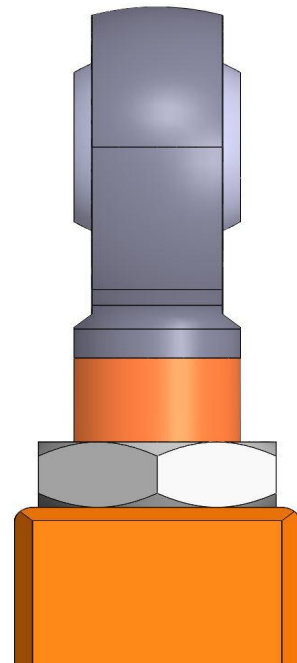


2.2 Adjusting the Rod Ends in / out. As a baseline for camber and caster alignment, with the jam nuts on, thread the rod end in all of the way (clockwise) then unthread the rod end 4 revolutions (counter clockwise). If you are setting the truck up for a tall stance, set the front pivot at 5 revolutions out and the rear pivot at 3 revolutions out from all the way in. Tighten the jam nuts.

of Threads showing here -----

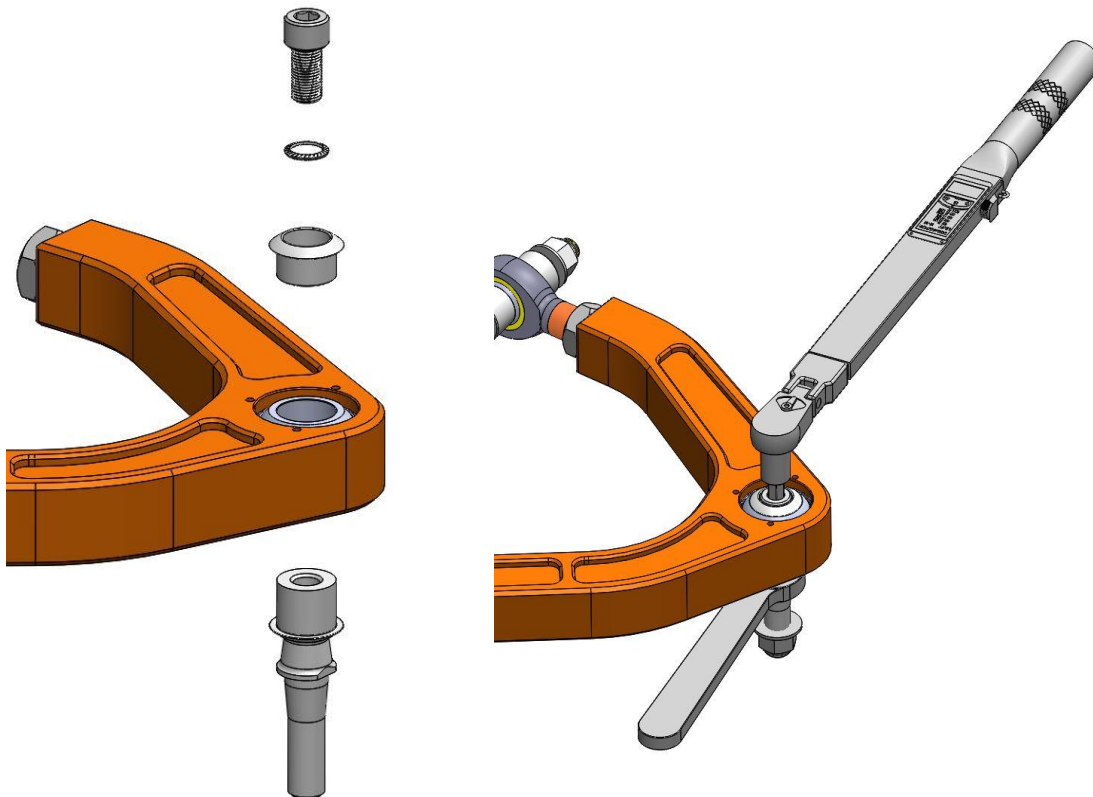
Any additional adjustment can be made with the lower control arm slots.

If you have lower control arm slot deletes, you will need to adjust these accordingly to set camber (not positive to -1.0 degree) and caster alignment (4.5 to 5.5 degrees, try to get closer to 5.5 for stability).



2.3 Assembly of Pin into Upper Control Arm Bearing

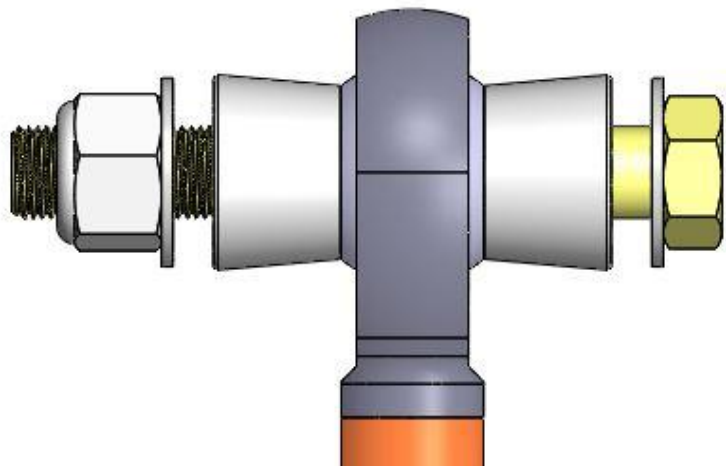
- Assemble pin as shown below
- Apply RED loctite to Socket Head Cap Screw Threads
- Hold pin with a 7/8 " Wrench
- Torque SHCS to 60 Ft-Lbs.

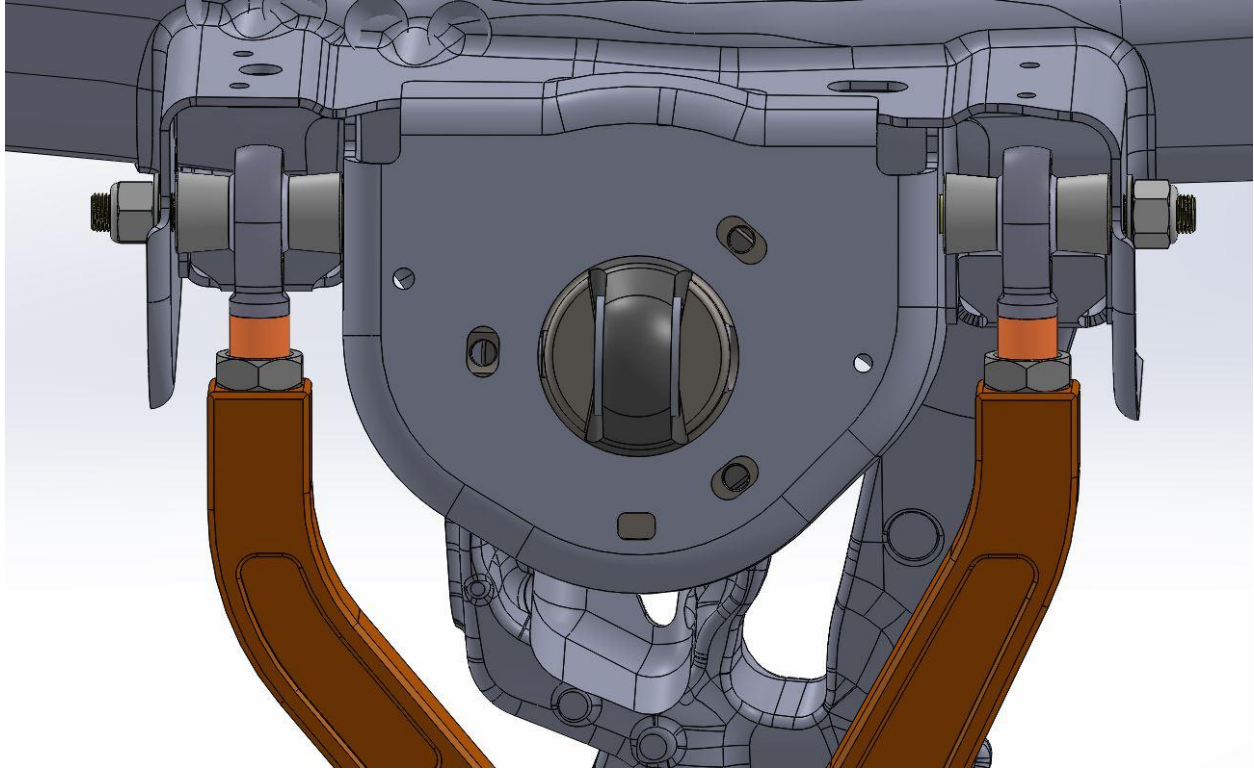


3.0 Installation of Kit

3.1 Install upper Control Arm

- Apply a thin film of anti-seize between the rod end and the misalignments.
- Install mis-alignments into control arms as shown
- Orientate the bolts as shown





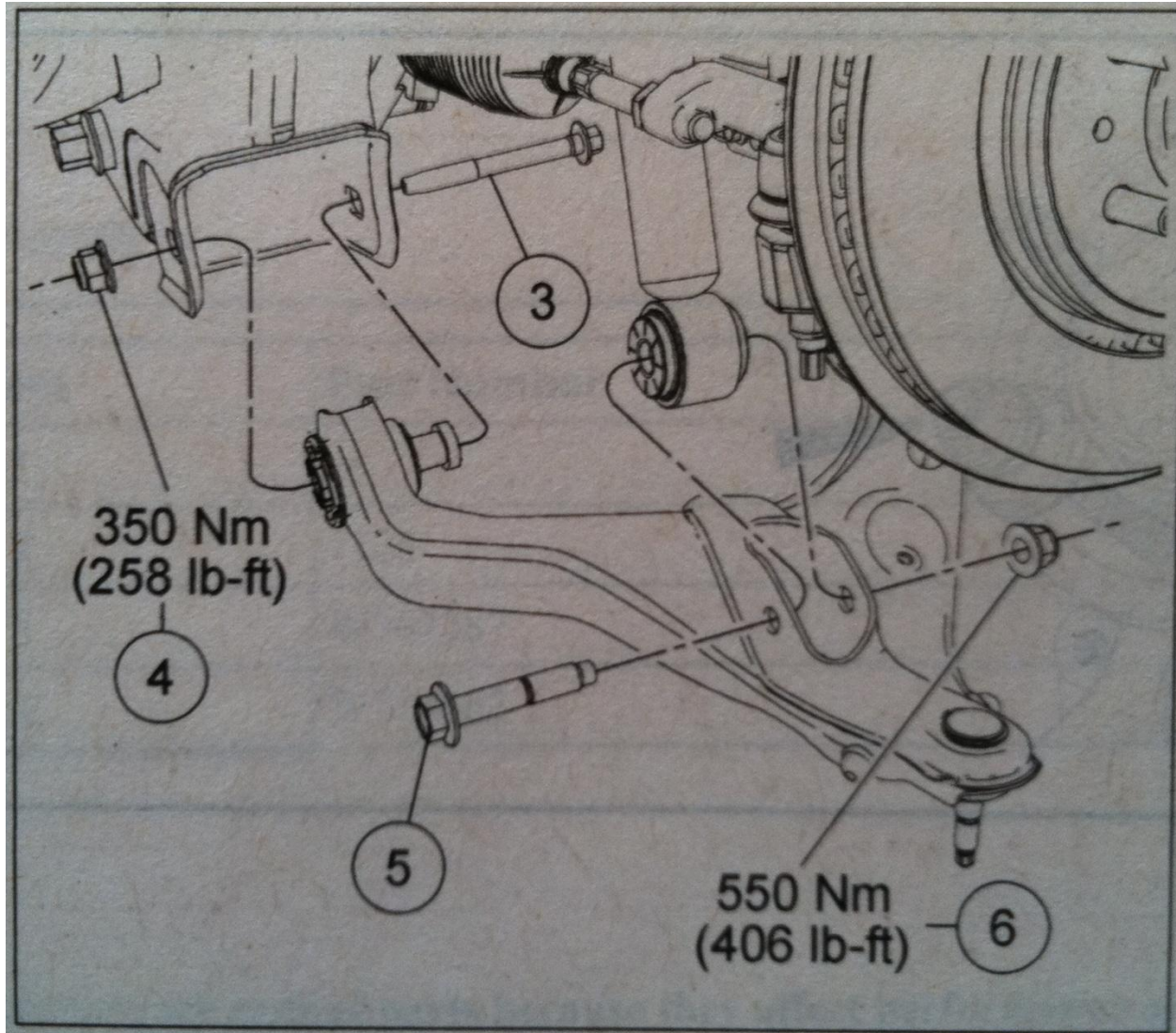
- Apply RED thread locking compound to stock chassis side bolts.
- Torque the UCA to Chassis bolts to Factory specification of 111 Foot Lbs

3.2 Install Shock

Chassis to Coil Bucket Tapered Wedges

- Wedges are reused with the Stock Fox Shock. The top wedge has the thick end facing the outside of the truck, while the bottom wedge has the thin end facing the outside of the truck.
- Wedges are NOT reused with the Fox 3.0" Shock. :)

LCA to Shock Bolt torque to 406 FOOT Pounds... yes that is correct. 406



3.3 Attach Tie Rods

Option 1 with Stock Tie Rods.

- Attach the outer tie rod to the knuckle and torque the nut down to 85 Foot Pounds. (13/16" or 21mm)

Option 2 with RPG Tie Rods.

- Attach the outer rod-end to the pin in the Knuckle torque the 5/8" Nut to 80 Foot Pounds (15/16" Socket and Wrench)

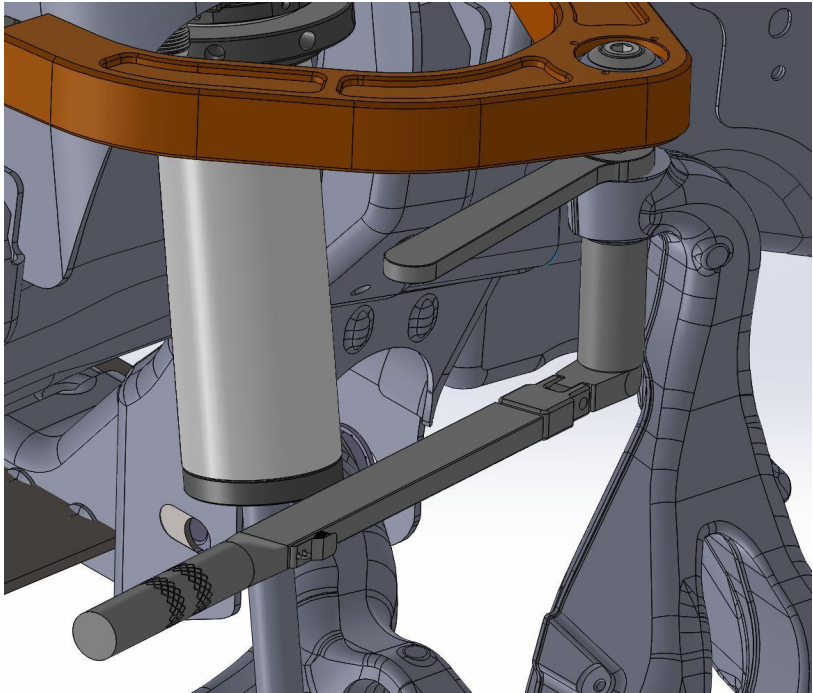
3.4 Install UCA Pin into Knuckle.

- Clean the tapered hole to make sure that there is no debris from drilling out to 5/8.

- Insert the pin into the knuckle. Be careful to not damage the threads.

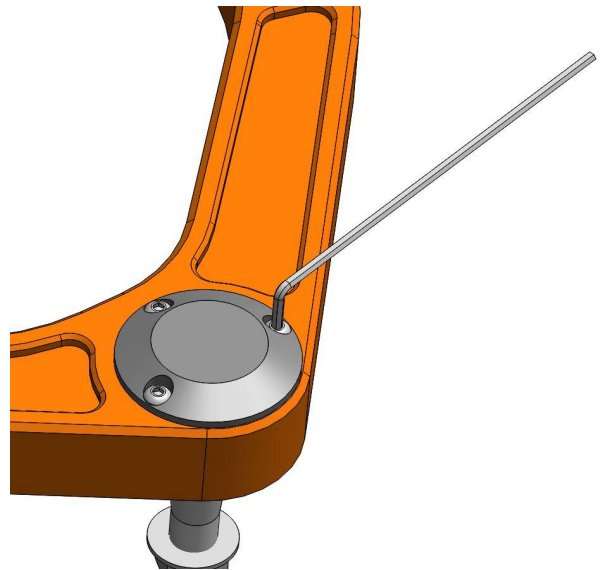
3.5 Attach UCA onto Knuckle Pin

- Gen 1 Raptor knuckle is steel therefore the thinnest where the pin goes through. We supply an additional washer to make sure to not run out of threads when tightening the flanged nyloc nut. The Gen 2 and Gen 3 Raptors have aluminum knuckles and are substantially thicker. You will not need the additional washer. Using a 15/16 socket and a 7/8 wrench, torque the pin to 100 foot pounds. as shown

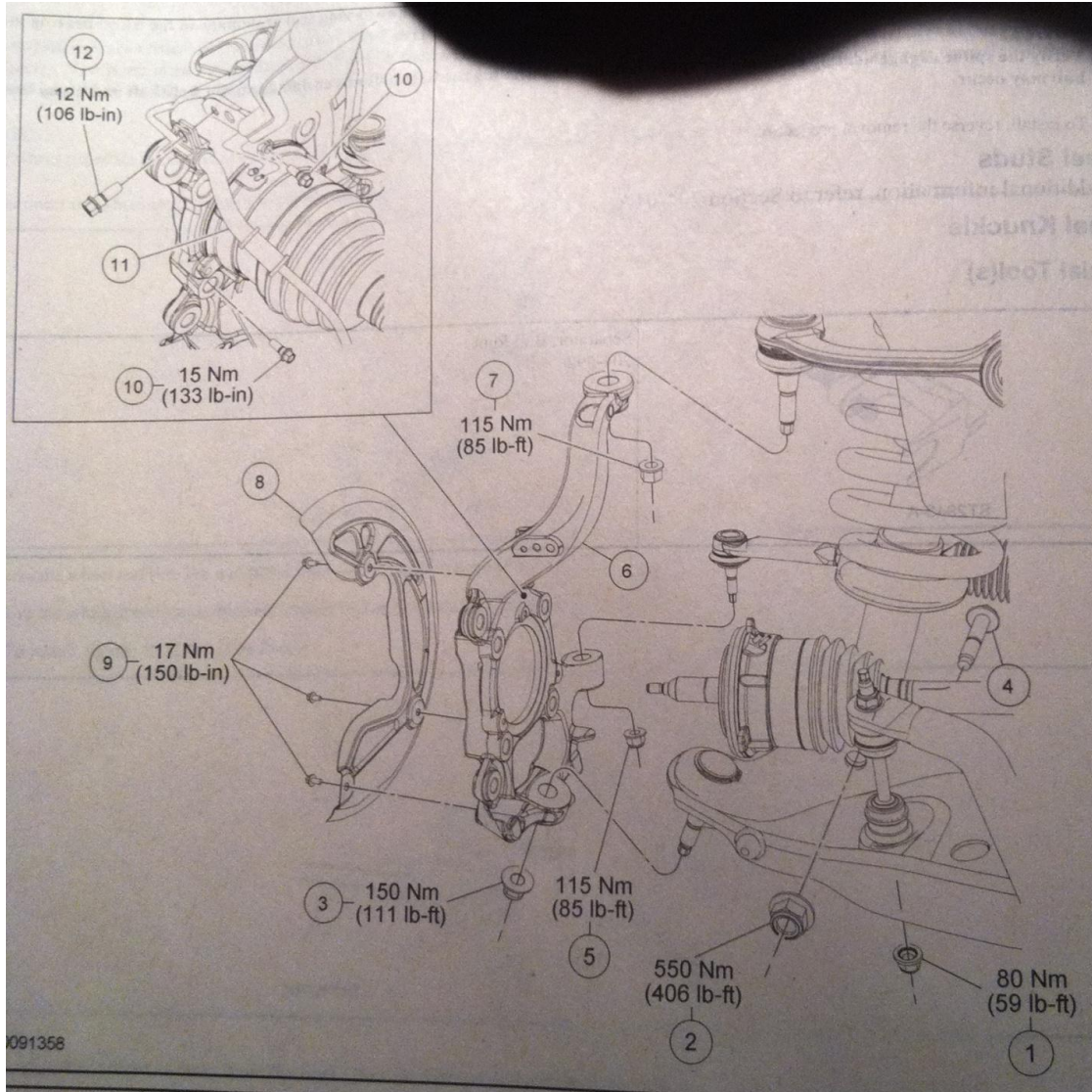


MAKE SURE TO NOT LOOSEN THE SOCKET HEAD CAP SCREW WHEN TORQUING DOWN THE 15/16 FLANGED NYLOC NUT.. Just as a precaution, double check the torque on the SHCS to 60 Foot Pounds.

- Dust Cap install as shown to the right. You will need a 1/8 allen wrench. It won't hurt to put a little anti-seize between the cap and the arm. Torque the little screws to 20 inch pounds.



3.6 Reattach Brake, ABS and Vacuum Lines



3.7 Perform the same operation to the Passenger's Side

3.8 Install wheels and tires

Torque to Factory Specification of 150 Foot-Pounds.

4.0 Inspection of complete installation.

5.0 Maintenance

- Lubricate rod ends with DuPont Teflon Non-Stick Dry-Film Lubricant available at Lowes 4oz. for \$5 Lowes Item# 363776

Re-torque complete installation post

- 100 - 500 miles of driving

- as per manufacturer's recommendations

***Your installation should look identical to the figures below. The pictures were taken for visual purposes only.

