Raptor Rear Frame Support and Air Bump Kit "Stage 2"

Installation Guide

Rev 1C

Sales: 866-691-7750 ext 1

Tech Support: 866-691-7750 ext 2

23231 Vista Grande

Laguna Hills, CA 92653

Install Videos: YouTube "Raptor Performance Group"

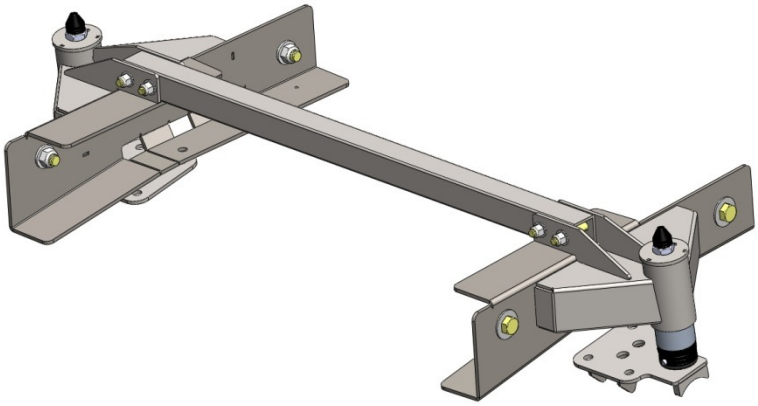
COMPLETELY READ INSTALLATION INSTRUCTIONS PRIOR TO INSTALLING PRODUCT and WATCHING VIDEOS

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

Prepared by: Engineering Innovations INC for Raptor Performance Group

Engineering Innovations INC DBA

RPG - Raptor Performance Group



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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 installer 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 in 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 gases: 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 gases 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

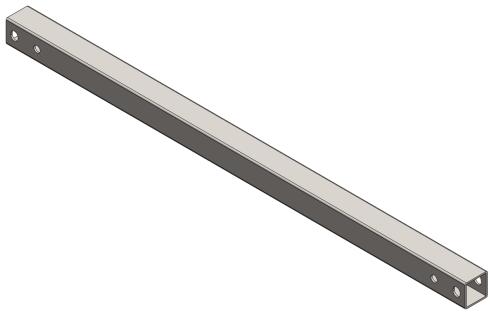
See OEM manual for detailed instructions. Items to be retained for re-installation are noted.

*** it has been found that placement of the safety floor jacks under the rear tow hooks will help to straighten the frame when installing the frame supports.*****

- Rear Wheels and Tires (to be re-installed)
- Rear Shocks (to be re-installed)
- Jounce Stops (mounting bolts are to be re-installed)
- Exhaust hanger if equipped (to be re-installed)
- Bottom Exhaust Hanger Nut Plate (this will be in the way of the frame support)

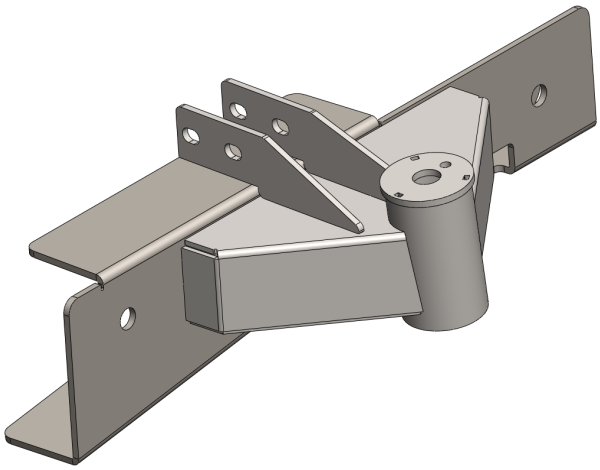
3.0 Installation of Kit

3.1 Placement of Cross tube.
Option 1, slide it in from either driver side or passenger side between the bed and the frame. You may scratch the powder coat.
Option 2, insert in diagonally from underneath the vehicle. Less likely to scratch it.



3.2 Install Frame Supports

Locate the Driver side frame support. see figure to Right



Place the support up onto the frame and align the cross tube in between the cross tube mounts. see figure to the Right

Insert the factory jounce stop bolt into location to ensure the bracket will not fall during installation. Do not torque this bolt down. It will be tightened further along in the installation process. See figure to the Right

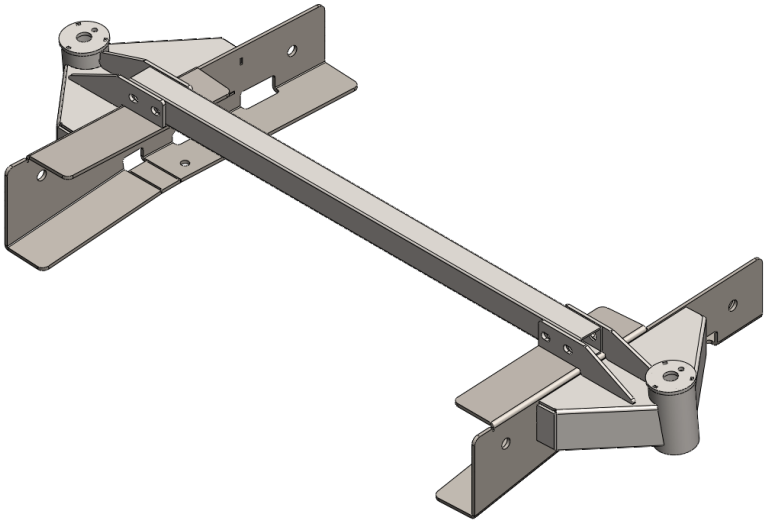
Install RHS Frame Support

Locate the passenger side frame support.

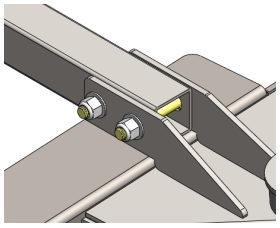
Place the support up onto the frame and align the cross tube in between the cross tube mounts.

Insert the factory jounce stop bolt into location to ensure the bracket will not fall during installation. Do not torque this bolt down. It will be tightened further along in the installation process.

Your installation should look similar to the figure below, but include the OE jounce stop bolts.



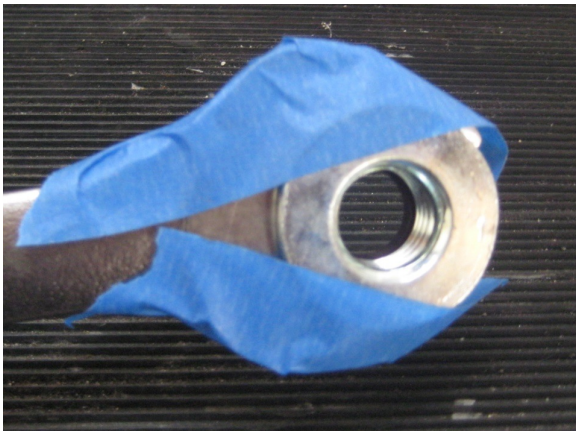
Insert Cross Beam Hardware



Bolt, Washer, Cross Beam, Washer, Nut (3/4" tools)

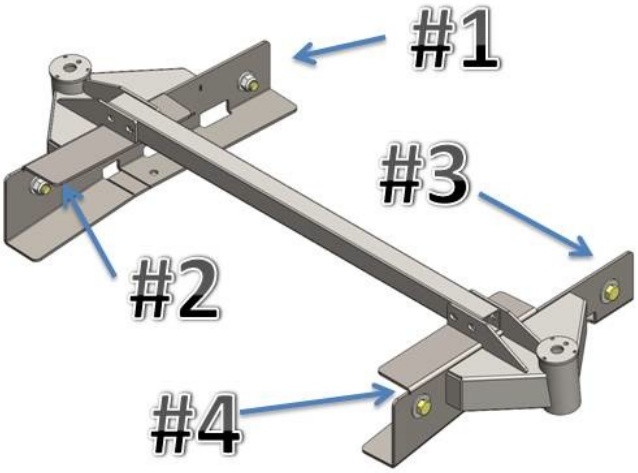
Note: It doesn't matter the direction of the bolts; forwards or backwards, DO NOT TORQUE DOWN THE HARDWARE

Locate and install frame support mounting hardware. This is the tricky part of the installation process, so we recommend that you start with the passenger side to become familiar to the process. Locate your 1 1/8" wrench. Tape the flange nut to the open end of the wrench. On the inside of the frame, there is an oval cut out, located approximately 1/2 way between the 2 frame support mounting bolt holes. see figures below.



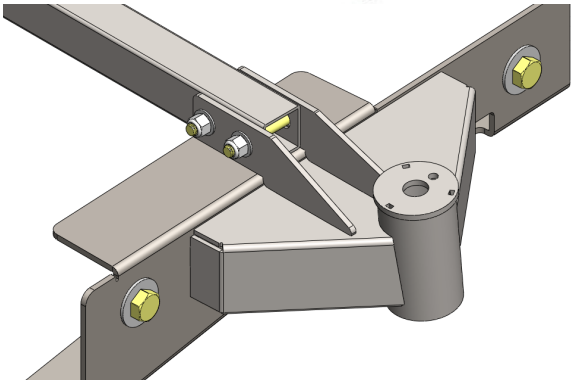
Start with the passenger side rear frame support mounting bolt hole. Insert the wrench into the cutout and align the flange nut with the frame support mounting bolt holes. See Figures below

Locate one of the 3/4" -10 x 1.75" Bolts and a large washer. (1 1/8" Tools) Insert the bolt into the hole and thread the bolt into the flange nut. If you drop the nut, don't worry, simply use a magnet to retrieve the flange nut. Prior to torquing down the bolt and nut, you want to get the remaining 3 started. Follow the sequence to the Right. Torque bolts to 250 Foot-Pounds.



3.3 TORQUE Cross Beam Hardware

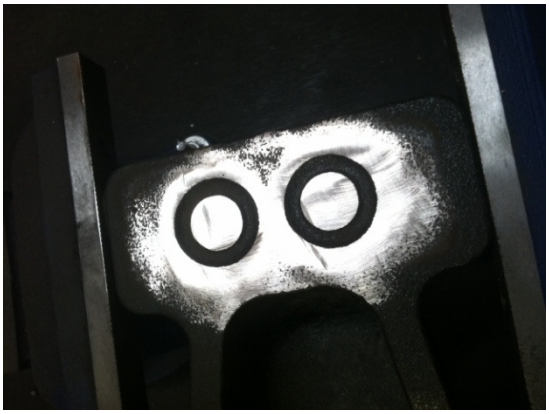
Torque to 75 Foot-Pounds



Torque OE jounce stop bolt to 32 Foot-Pounds (13mm tools) and use a thread locking compound.

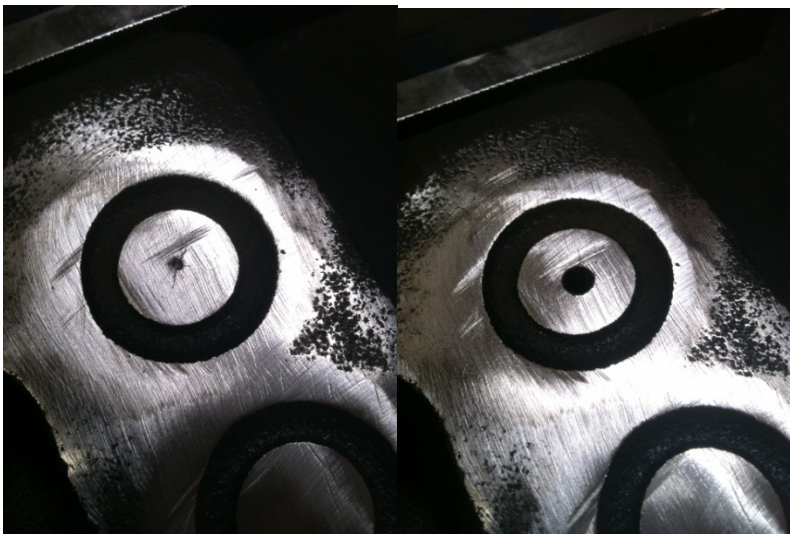
3.4 Modify Factory Block

Place Factory Block in a vise as shown (In an attempt to see the work more clearly to be performed, I ground the surfaces smooth, otherwise the pictures would have been dark)

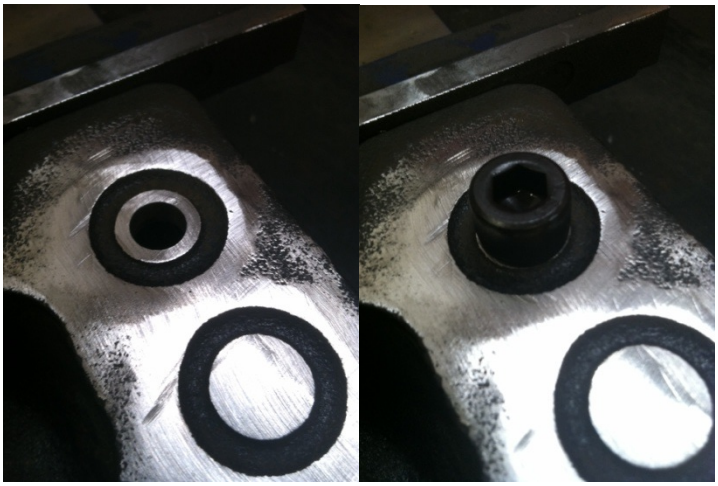



Locating center of the Pin on the OE block. Measure the Diameter of the locating pin. Divide the value by 2. Scribe a line as shown. Scribe an additional line at 90 Degree intervals to find center of the pin

Locate the center of the scribed lines and use a center punch to locate your drill location. Drill Guide hole. I choose a 1/4".



Final drill diameter of 1/2" and repeat for the other 3 pins



Place Socket Head Cap Screws (SHCS) into Block. Insert the 1/2" washer with the 1/2"-13 Ny-Lock Nut on the inside of the block.

Torque the SHCS with a 3/8" Allen wrench and 3/4" combination wrench to 80 Foot Pounds. Check fitment

3.5 Install Modified Factory block and Impact Pad.

Place the Impact pad onto the rear end.

Locate the Modified block onto the impact pad ensuring that the locating pins (Heads of Socket Head Cap Screws) register into the rear end.

Note: U-Bolts go up and over the leaf springs then thru the holes in the air-bump impact pad.

3.6 Install Shock Absorber Bolts and Nuts

Do not torque down bolts / nuts.

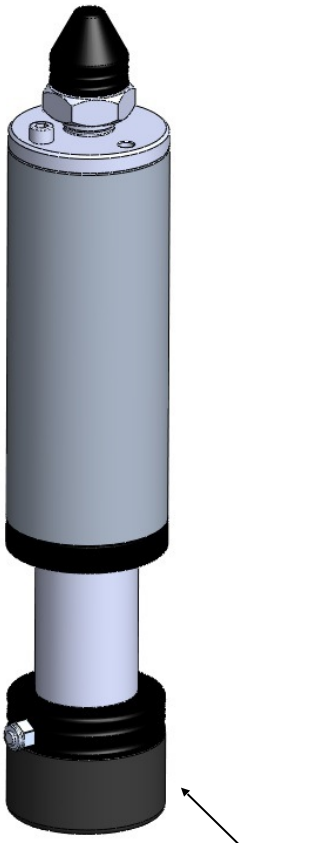
3.7 Install Factory Exhaust hanger if Equipped

Use a file to oval out the hanger holes as per figures Below

You may need to clean up the threads M8x1.25 in the Frame Supports

Hanger Installed, Bottom View Looking UP see figure above Right

3.8 Install Fox 2.5" Air Bump



STAGE 2 CONFIGURATION

STAGE 3 CONFIGURATION

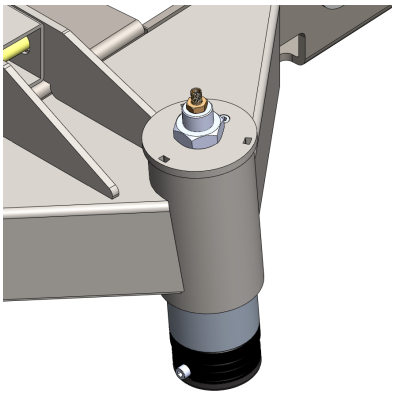
Insert the Fox 2.5" Air Bump as per figure below.

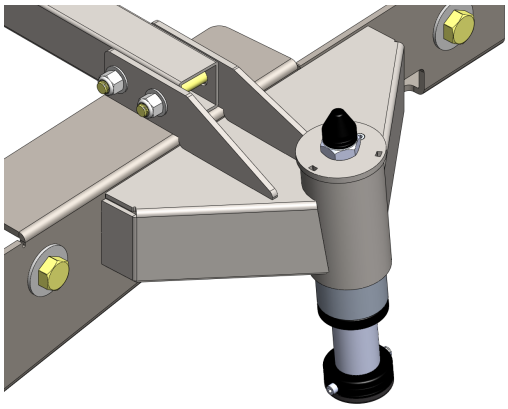
Note: ensure that locating SHCS goes into the small hole as per figure below.

Note: Air-Bumps are shipped from the factory, Nitrogen Charged with 200 PSI.

Torque to 150 Foot-Pounds and use appropriate thread locking compound.

Replace chrome cap and aluminum cap as per figures below.



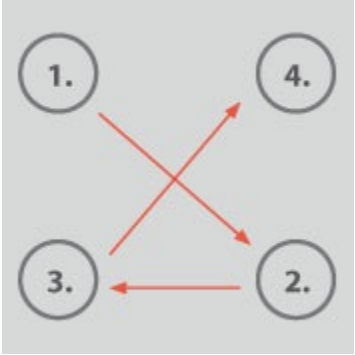


3.9 Torque Down Rear Suspension

Due to all of the bushings on the rear suspension, you want to torque down the nuts when the bushings are in a neutral position. In order to do this, lift the rear end up such that the leaf springs are loaded, but make sure that the safety floor jack are slightly loaded. Place additional safety floor jack stands under the rear end when performing the next step.

Per OE specifications

Leaf Spring u-bolts Torque in the sequence shown



Initial Torque to 75 Foot-Pounds

Final Torque to 100 Foot-Pounds

Fox Shock Bolts 66 Foot-Pounds

Impact Pad Bolts 50 Foot-Pounds

AS A PRECAUTIONARY, TORQUE THESE ALSO

*Leaf Spring to Frame Bolt (Front) 258 Foot-Pounds

*Leaf Spring to Shackle Bolts 136 Foot-Pounds

*Shackle to Frame Bolts 136 Foot-Pounds

3.10 Install rear wheels and tires

Torque to Factory Specification of 150 Foot-Pounds.

4.0 Inspection of complete installation.

5.0 Maintenance

Re-torque complete installation post

- 100 miles of driving

- as per manufactures recommendations