

# Raptor Rear Frame Support, Air Bump and Leaf Spring Kit

## Installation Guide

Rev 1E



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**

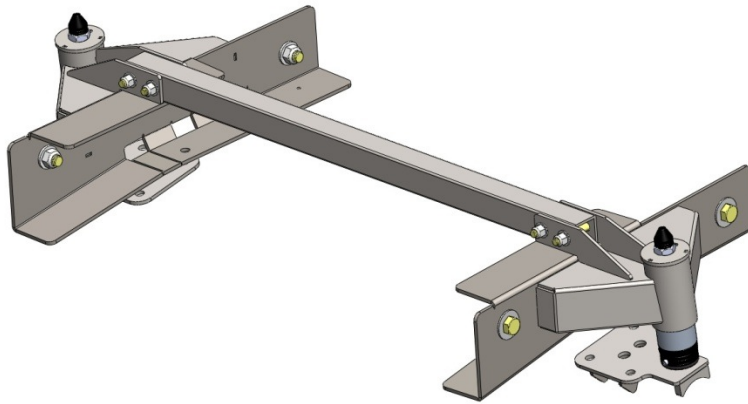
**WARNING: Failure to follow these instructions may lead to serious personal injury and/or property damage.**

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 INC for Raptor Performance Group

**Engineering Innovations INC DBA**

**RPG - Raptor Performance Group**



## Table Of Contents

### 1. General Information

#### 1.1 Installation Information

#### 1.2 For your Safety

#### 1.3 Important Safety Precautions

### 2.0 Removal of Original Parts

#### 3.0 Installation of Kit

#### 3.1 Insert Cross Tube

#### 3.2 Install Frame Supports

#### 3.3 Insert Cross Beam Hardware

#### 3.4 Install Impact Pad

#### 3.5 Install Leaf Springs

#### 3.6 Install Shock Absorber

#### 3.7 Install Factory Exhaust hanger if Equipped

#### 3.8 Install Fox 2.5" Air Bump

#### 3.9 Torque Down Rear Suspension

#### 3.10 Install Rear Wheels and Tires

## 4.0 Inspection

## 5.0 Maintenance

### 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 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 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.\*\*\*\*\*

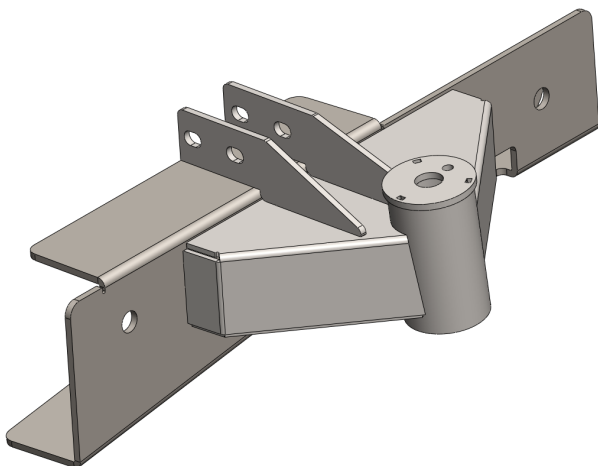
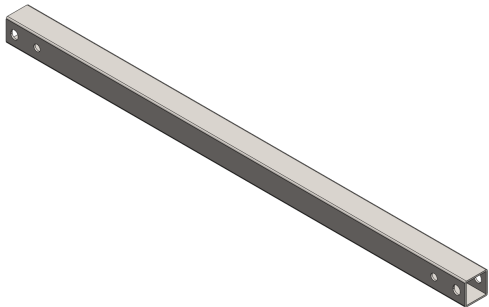
- Rear Wheels and Tires (to be re-installed)
- Rear Shocks (to be re-installed)
- Jounce Stops (mounting bolts are to be re-installed)
- Rear Leaf Springs
- Rear Leaf Shackles (to be re-installed)
- Exhaust hanger if equipped (to be re-installed)
- Bottom Exhaust Hanger Nut Plate (this will be in the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



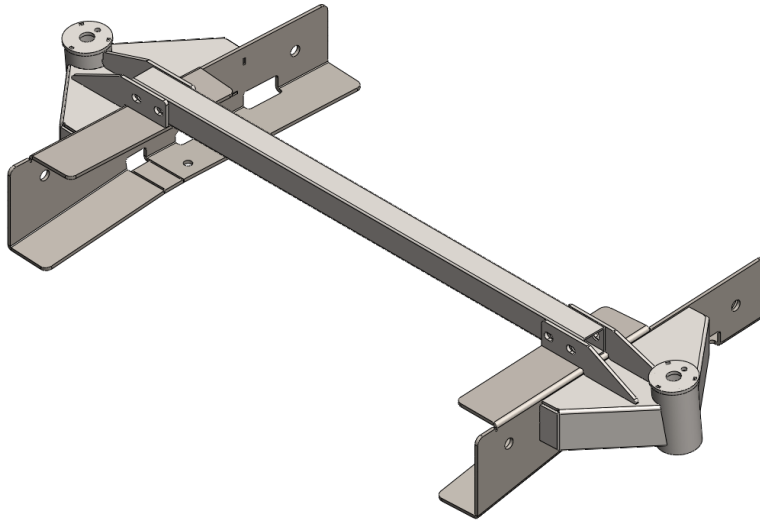
### Install RHS Frame Support

Locate the passenger side frame support.

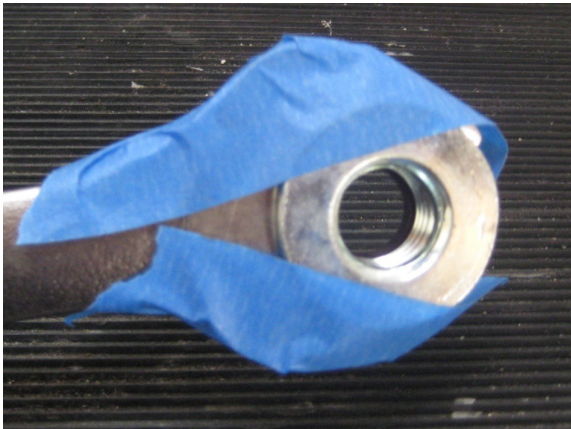
Place the support up onto the frame and align the cross tube in between the cross tube mounts.

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.



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.

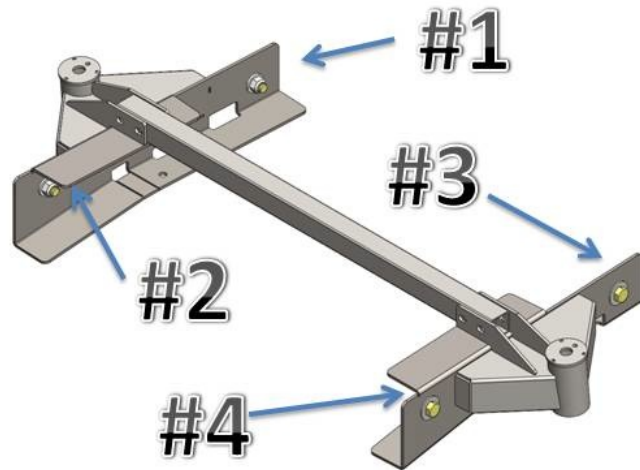


Start with the passenger side rear frame support mounting bolt hole. Insert the wrench into the cutout and align the flange nut with the frame support mounting bolt holes. See Figures below





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.

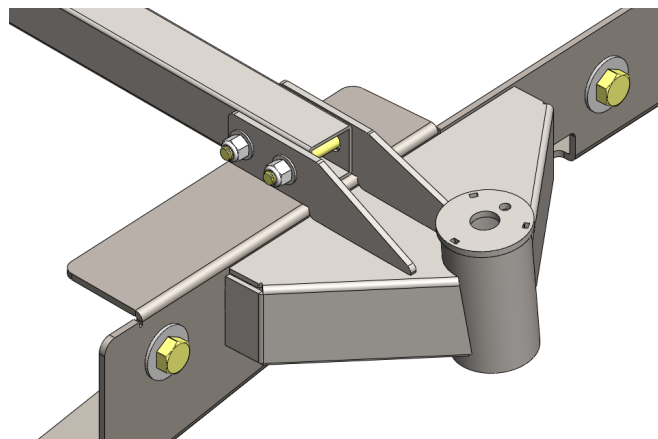


### 3.3 Insert Cross Beam Hardware

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

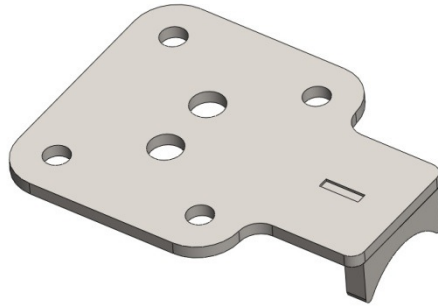
Note: It doesn't matter the direction of the bolts; forwards or backwards

Torque to 75 Foot-Pounds



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





### 3.4 Install Air-Bump Impact pad

Locate this on top of the rear end. The Leaf spring and U-Bolts will locate this. The two locating pins on the bottom of the leaf springs go through this and register into the rear end.

### 3.5 Install Leaf Springs

Insert and snug up the leaf spring and shackle bolts.

Note: On the LHS, the emergency brake cable goes under the leaf spring. see figure below

Note: Do not torque down the leaf spring and shackle bolts until the springs are loaded therefore putting the bushings in a neutral position.

Note: ensure that the locating pins on the bottom of the leaf springs locate into the air-bump impact pad and then into the rear end.

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

The figures below are just a reminder of e-brake cables, the bolts and shackle orientation.



### 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 below

### 3.8 Install Fox 2.5" Air Bump

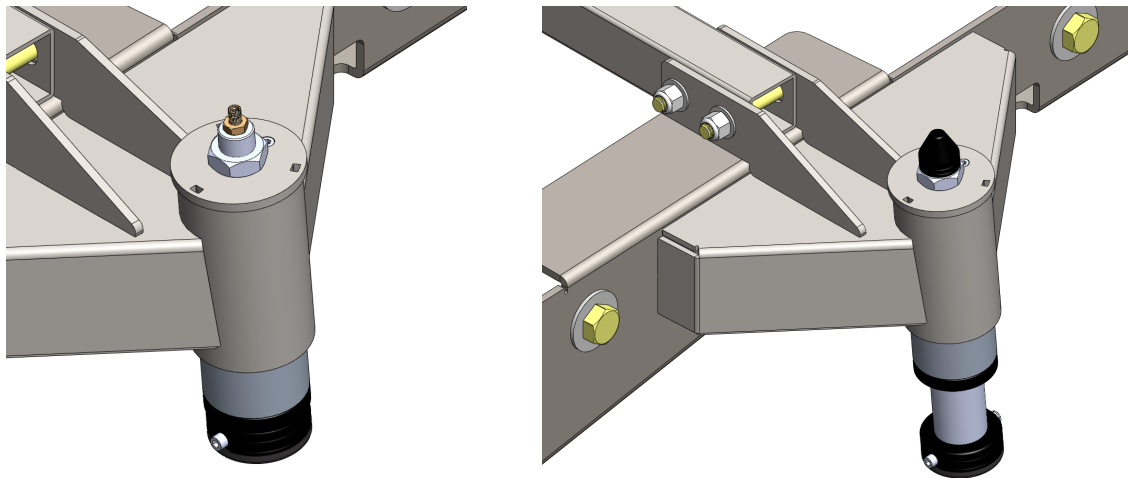
Insert the Fox 2.5" Air Bump as per figure below.

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

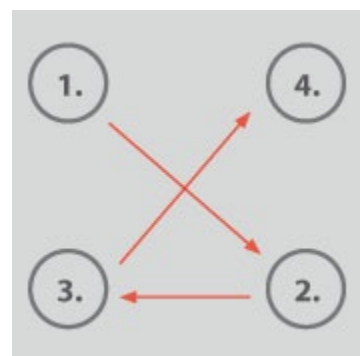
Due to all of the bushings on the rear suspension, you want to torque down the nuts when the bushings are in a neutral position. In order to do this, lift the rear end up such that the leaf springs are loaded, but make sure that the safety floor jack are slightly loaded. Place additional safety floor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



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

Leaf Spring to Shackle Bolts 136 Foot-Pounds

Shackle to Frame Bolts 136 Foot-Pounds

Fox Shock Bolts 66 Foot-Pounds

Impact Pad Bolts 50 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