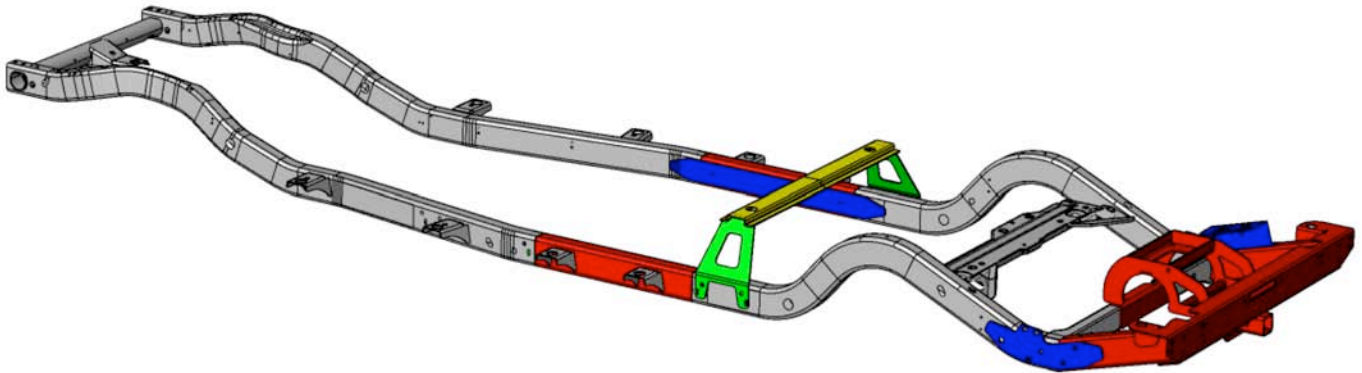




AMERICAN EXPEDITION
VEHICLES

BRUTE KIT 02. The Brute Frame



Installation Guide



PLEASE READ BEFORE YOU START

TO GUARANTEE A QUALITY INSTALLATION, WE RECOMMEND READING THESE INSTRUCTIONS THOROUGHLY BEFORE BEGINNING ANY WORK. THESE INSTRUCTIONS ASSUME A CERTAIN AMOUNT OF MECHANICAL ABILITY AND ARE NOT WRITTEN OR INTENDED FOR SOMEONE NOT FAMILIAR WITH AUTO BODY REPAIR.

Required Tools

4" Grinder w/

- 80 Grit Sanding Discs
- Med ScotchBright Pads (Red)

Sawzall with long metal cutting Blade

Drill Motor

R Drill Bit (21/64)(8.5mm)

Combination Square and Scribe

Tape Measure

Appropriate Safety Equipment

Common Hand Tools

Spring Loaded Center Punch or Equivalent

Transfer Punches

File or Die grinder

220V Wire Feed Welding Machine



A. PREPARATION OF THE JEEP FRAME

OVERVIEW

Preparation of the Jeep frame is a simple task that most builders can perform easily. Preparing the frame to be stretched consists of:

- Removing the fuel system. (Fuel and evaporative emission lines and fuel tank)
- Removing the brake line along the frame.
- Cleaning the frame assembly in the areas to be modified.
- Mounting the cutting jig to the frame and cutting the frame in half.

INSTRUCTIONS

1. Remove the fuel tank assembly. Use the quick disconnect fittings properly.
2. Cut the exhaust. Normally this is done behind the muffler.



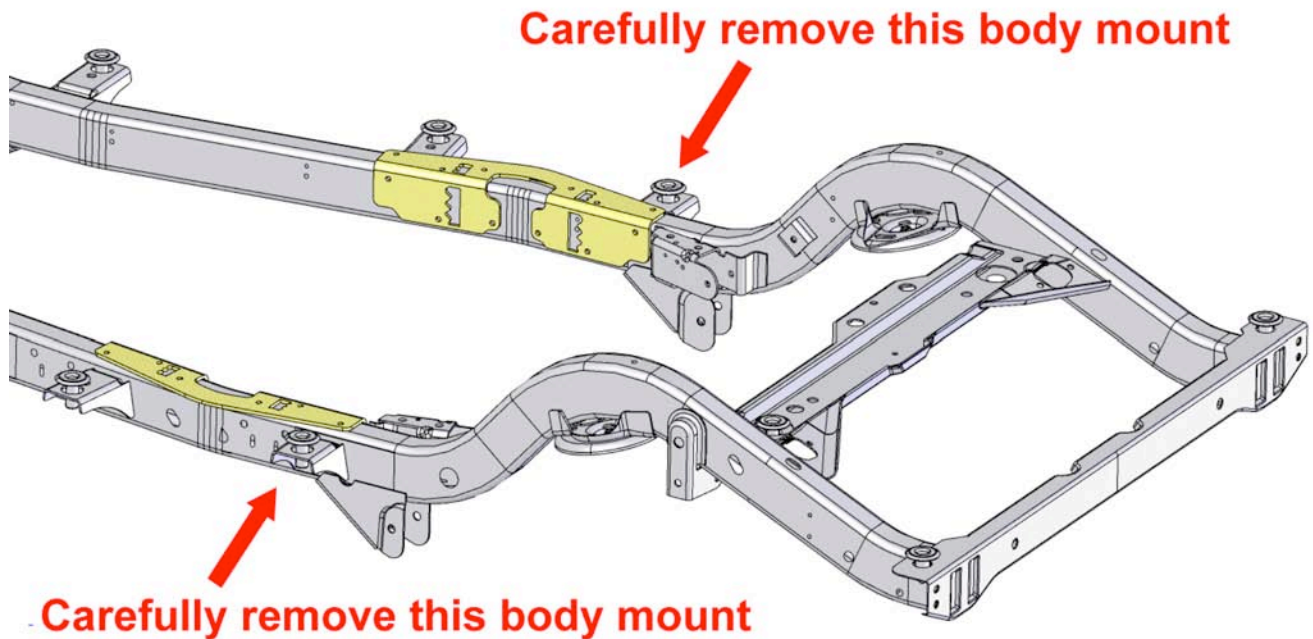
3. At this point many builders find it helpful to remove the tub from the frame. You can leave the fenders, grill and hood in place simply by unbolting them. The wiring harness can be unplugged in the left-hand foot well from the instrument panel. Pull the harness through the large grommet in the firewall. Undo any other connected items and remove the body mounts so that you may remove the tub and windshield frame. You may remove the doors at this point to make it lighter. The emergency brake lines can be disconnected at the bracket located under the tub. If you don't have the proper tool, one can be made using a 1/2" 12 point closed end wrench with a 1/8" slot cut in it so that you can slip it over the cable.



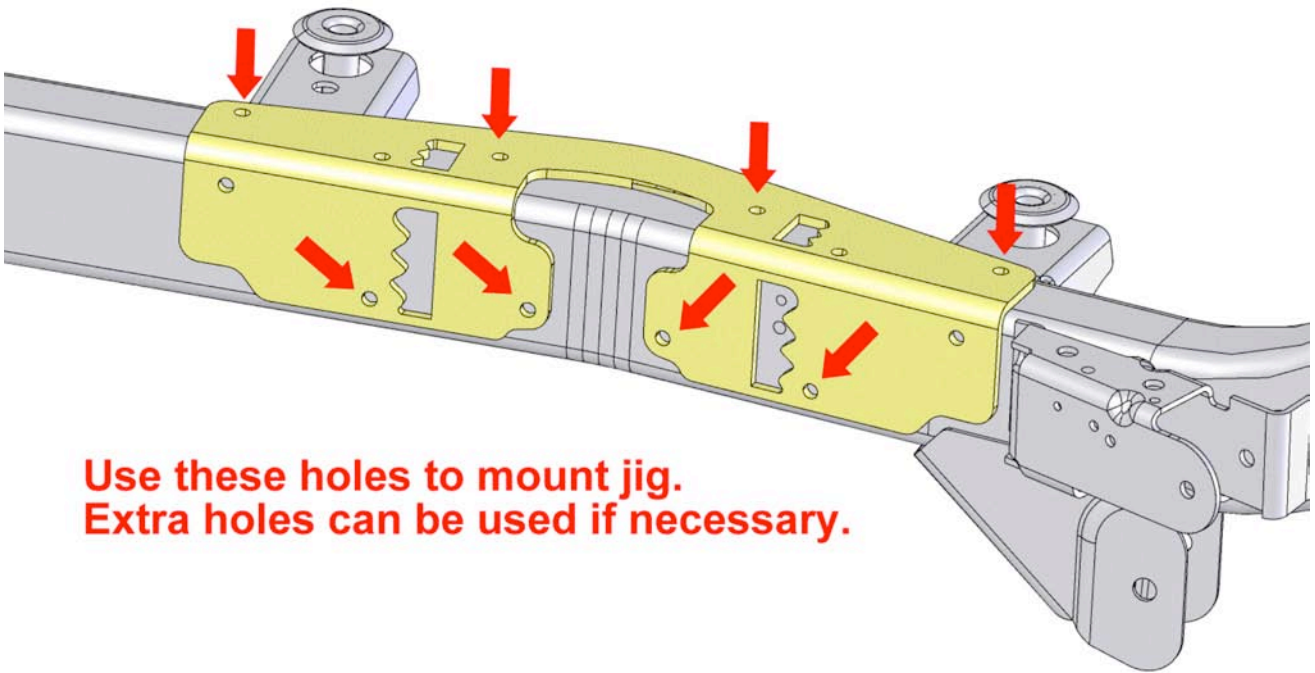
4. Remove the brake and fuel line bundle. Rubicon Locker Pump hose and any vapor lines on your particular year Wrangler will be lengthened with rubber hose available at any auto parts store. Be sure to get hose that is not affected by gasoline fumes for any vapor lines.



5. Clean the frame. A good job will require the area to be stretched to be free of any dirt or rust.
6. Remove the rear driveshaft. This will need to be re-tubed for the new length. We recommend waiting till you have your vehicle sitting at ride height before taking a measurement and sending the shaft to your local driveshaft shop.
7. Remove the body mounts located directly in front of the rear wheels. Take your time cutting, you will be reusing these later.

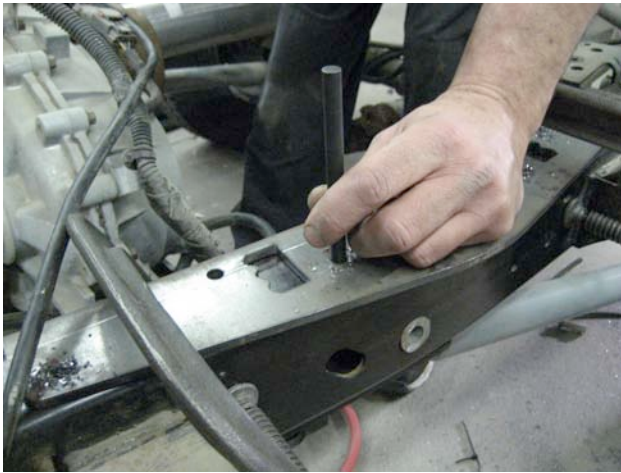


8. Fit the cutting jig to the frame and mark all critical locations. The cutting jig is symmetrical and designed to be used on both sides of the vehicle to locate the holes that mount the extension jigs and also to locate the cut line. Start by locating the cutting jig on the frame using C-clamps. It's not critical where the jig lies exactly, just that it fits on the frame as best as possible. Once you are satisfied with the location, FIRMLY clamp it to the frame. Scribe the cut line on the inside of the frame rail and along the top. Using your transfer punch, locate the center of the holes shown in the following diagram.



**Use these holes to mount jig.
Extra holes can be used if necessary.**





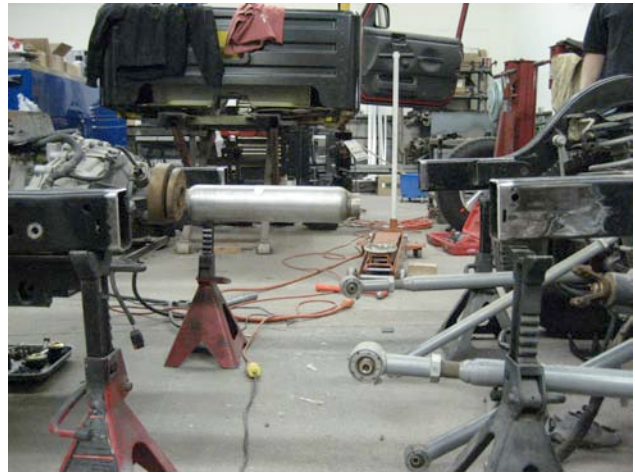
9. Drill and tap the extension jig mounting holes. With the cutting jig still firmly clamped in place, use a 3/16" pilot bit and carefully locate the tip in the center punch mark and drill. Step up to a 1/4" bit next and finally your R Bit (21/64)(8.5mm). Take the self tapping bolts supplied in the Brute hardware Pack and carefully run them into the holes with an impact wrench. DO NOT TIGHTEN; the point of this step is to thread the holes. Repeat the procedure for the opposite frame rail.
10. Cut the frame in half. Remove the cutting jig and using the combination square, transfer the scribe line around the frame. Support either side of the frame with jack stands and carefully cut along the line. Use a Sawzall, plasma torch or gas torch. We use a Sawzall because it does the cleanest job.



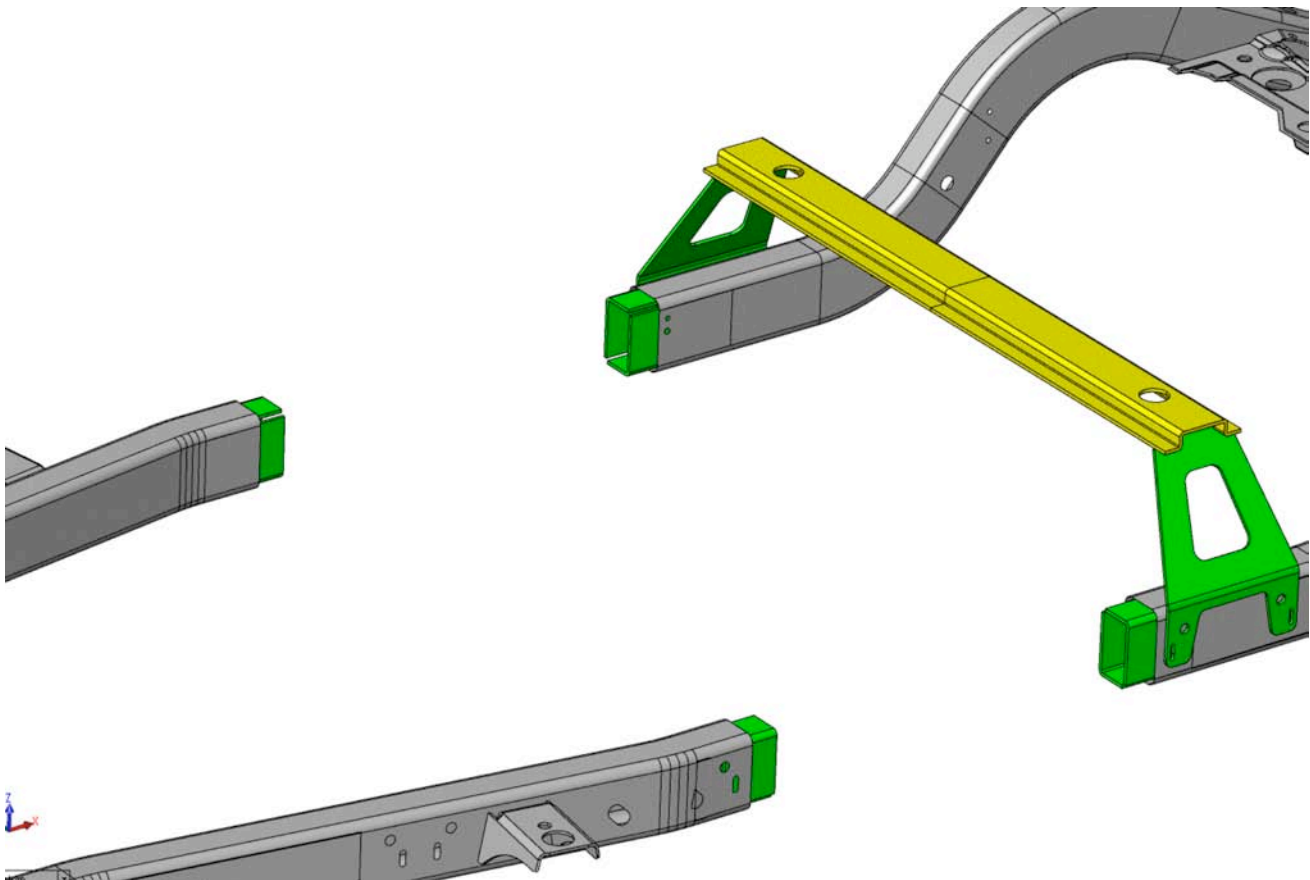
11. Prep the frame ends for welding. Carefully clean all slag or burrs from inside the frame rails with a file or die grinder. Using the four inch angle grinder bevel the edges of the frame rails with a 45 degree angle.

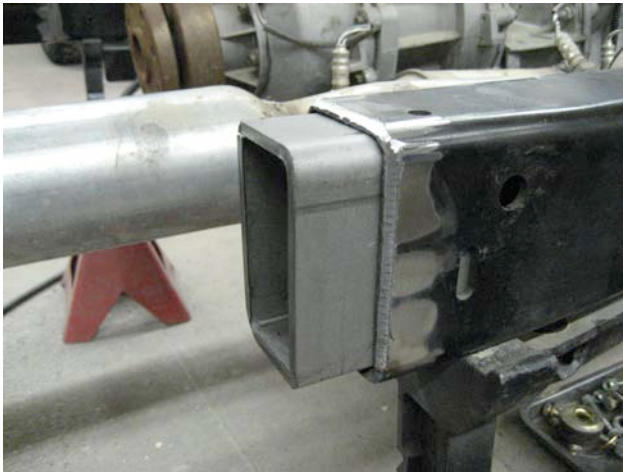


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12. Locate the frame sleeves. Use a small tack weld to locate the frame sleeves half way into the frame openings. Remove any E-coating where the sleeves will be welded or tack welded prior to placing them into the frame.





13. Prepare the frame extension pieces. The extensions come E-coated to prevent corrosion. This is the same coating the rest of the frame comes with from the factory. Grind the edges with a 45 degree bevel and remove any excess paint. Using the tape measure, combination square and scribe, mark the inside center of each extension with the tube seam to the inside of the frame. You'll use this to help align the fishplates later on.

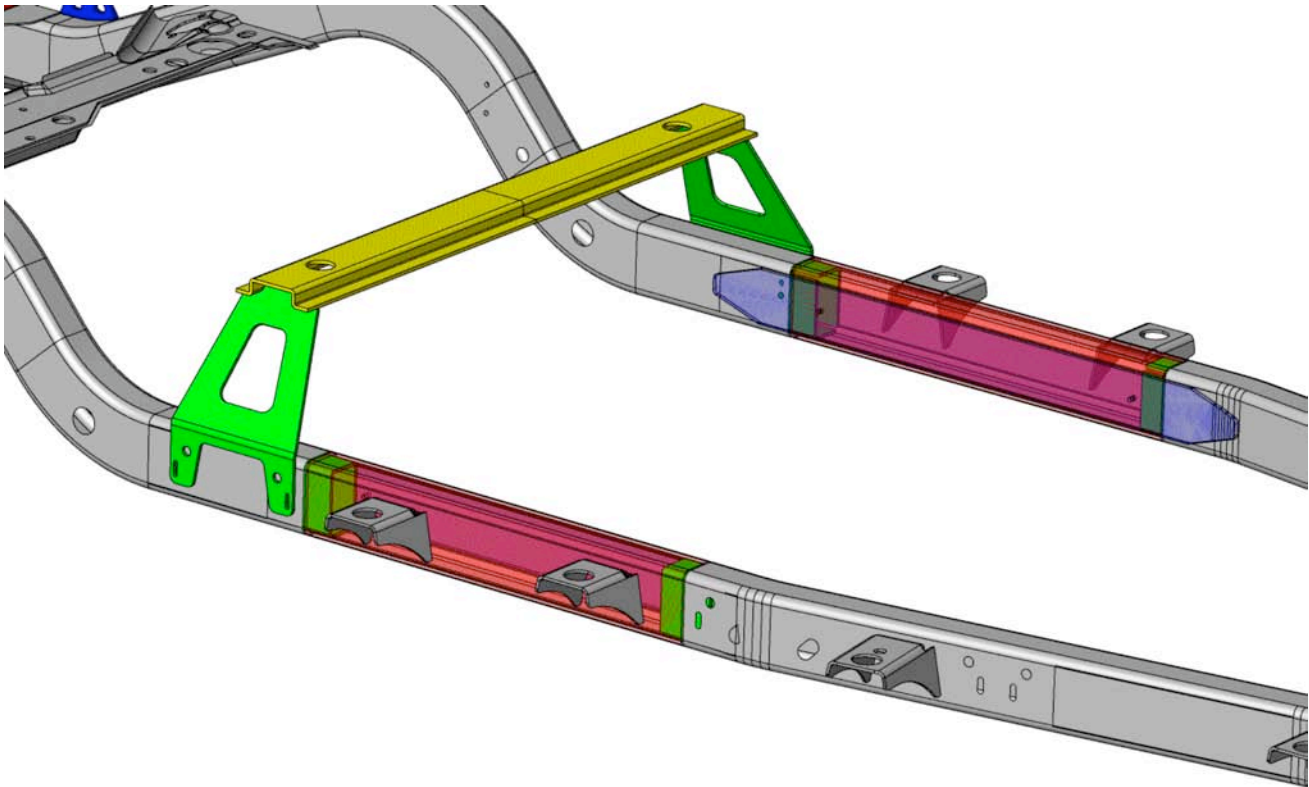




A. STRETCHING THE JEEP FRAME

OVERVIEW

Although some people find the prospect of modifying the frame a daunting task, in reality it is a very simple procedure made even easier with the supplied jigs and frame assemblies provided with your Brute kit. This procedure should only be performed by an experienced, certified welder. Welding is a skill that requires constant practice and general knowledge. Many successful Brute builders do not possess these skills and therefore find a person qualified to perform these modifications. Some builders choose to tow the rolling chassis to a shop to perform the necessary welding or by bringing in a knowledgeable welder to do the actual welding of the frame. Most of the prep work can be handled by the builder, including cutting the frame, prep work on the pieces being welded and all the finish work. The chassis can actually be moved short distances with the mid frame extensions in place and the extension jigs holding everything together to transport the chassis from shop to shop.



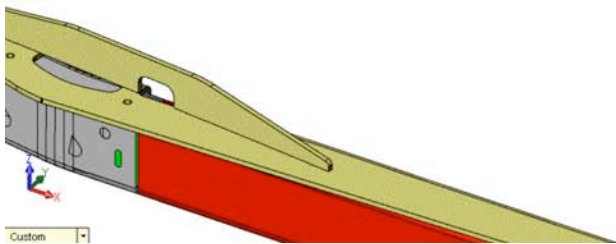
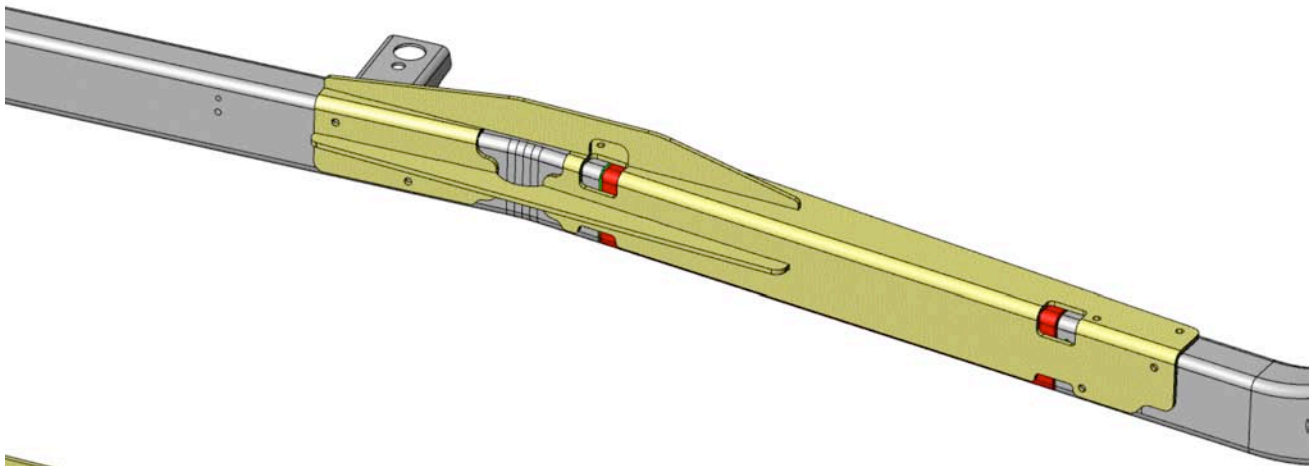
INSTRUCTIONS

1. Install the frame extensions and extension jigs. Install the extensions with the tube seam to



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the inside. Using the 3/8" self tapping bolts, install the frame extension jigs over the extensions. Tighten by hand and adjust the frame extensions for and aft so that the gap is even. The extensions are designed to leave a gap for welding to ensure full penetration of the weld. Tighten the bolts and clamp as necessary to take up any gaps near the weld area.





2. Check frame dimensions. The frame jigs are a proven way to stretch the frame with minimal hassle but it's still necessary to double check the frame dimensions.
3. Weld the frame. Once you're satisfied with the frame dimensions put a heavy tack weld approximately 1/2 to 5/8" on all four corners of each frame seam. Once the frame is tack welded you can weld outside and underneath the frame. Remove the extension jigs and finish welding the frame. Use appropriate welding standards for chassis modifications. Use at least two full passes and fill the gap ensuring an even, full penetration weld. Repeat for all seams.



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4. Install the Fishplates. Begin by grinding the inside welds smooth so that the fishplates can sit flush to the frame rail. Position each fishplate on the frame, centered vertically and horizontally on the frame extension center mark you made earlier. C-clamp the fishplate



firmly in place and mark the weld areas as shown on the extension and frame. Remove the fishplate and prepare the areas to be welded by removing the e-coat on both the frame and the fishplate. Weld in the positions shown. Using the fishplate as a drill guide, drill the fuel rail bundle clip holes through the frame.

Weld around ends and make stitch weld approx. 3" to 4" in length



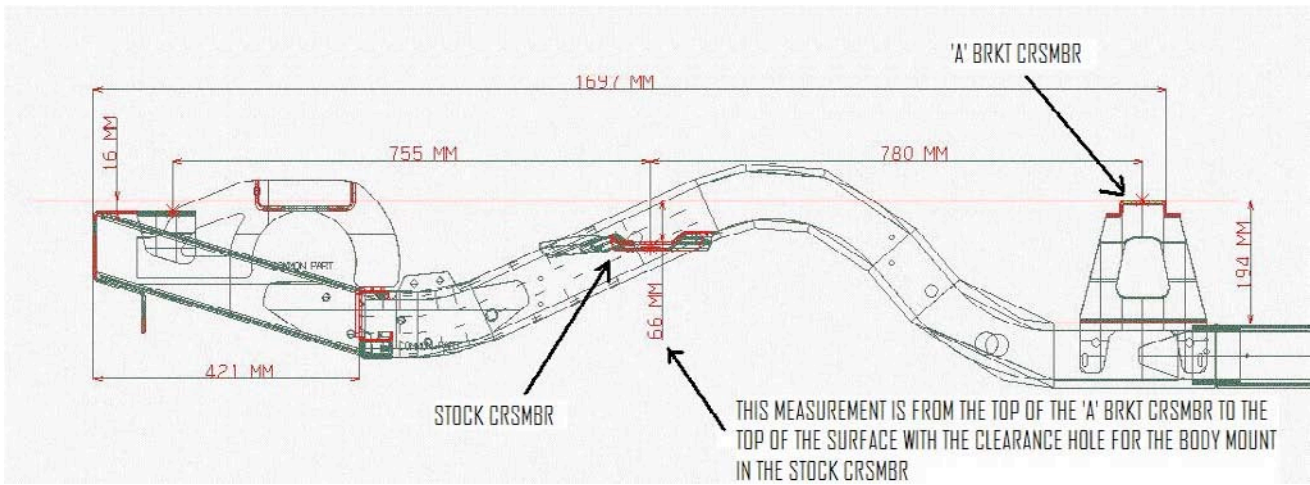
5. Prime and paint the frame. Use high quality primer and chassis paint. We recommend always using a catalyzed primer and paint.
6. Install the fuel rail bundle. Use the new fuel and brake line provided in the kit. Use high quality tubing for any vapor or air lines.



7. Install the E-brake cables. Install Jeep Unlimited E-brake cables; part #52013455AB & #52013457AB for disk brakes. For drum brakes and custom applications we have found the Lokar Universal Emergency Brake cable to be easy to adapt to the Wrangler's bracket and lever.

B. INSTALL THE FORWARD BED MOUNT

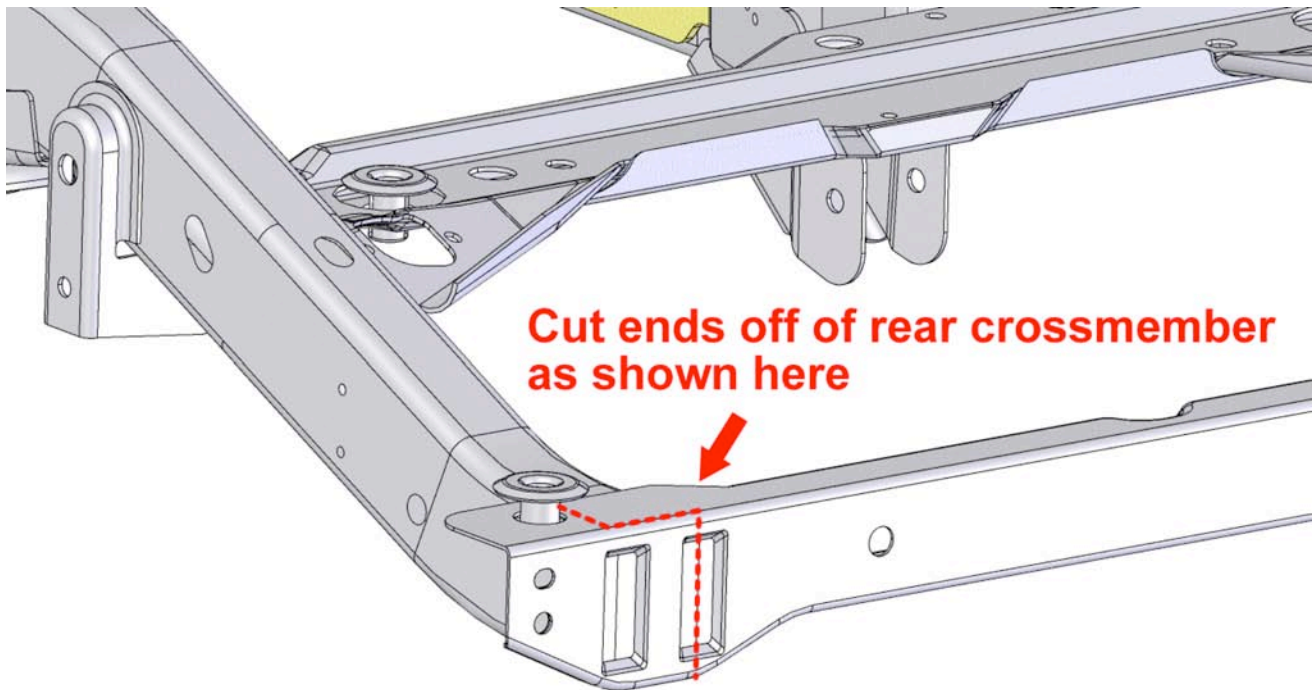
1. Locate the Forward Bed Mount using the measurements shown below. The holes on the "A" bracket of the forward Bed Mount may or may not line up with the holes in the frame depending on what year the vehicle is. USE THESE HOLES FOR REFERENCE ONLY. Loosely clamp the bracket in place and locate the height and the distance from the reference points in the frame.



2. Leave the Forward Bed Mount clamped or tacked in place until the Rear Frame Extension has been located. Finish welding of both pieces will take place once the Rear Frame Extension and the Forward bed mount are in place.

C. INSTALL THE REAR FRAME EXTENSION

1. Prepare the rear crossmember, Rear Frame Extension and frame rails. Begin by cutting the crossmember as shown. Do not remove the center portion of the crossmember. Using a grinder, clean, straighten and bevel (45) the rear of the frame rails and the front of the extensions on the Rear Frame Extension in preparation for welding the Rear Frame Extension permanently onto the frame. Clean off the paint on the crossmember where the winch mount welds to.



2. Temporarily mount the rear frame extension to check fit. Using eight 1/2" bolts and the fishplates, bolt the rear frame assembly to the frame. Using C-Clamps, adjust the Rear Frame Extension so that the measurements are as shown in the frame measurement diagram above. Clamp the Rear Frame Extension at the winch mount to the crossmember.

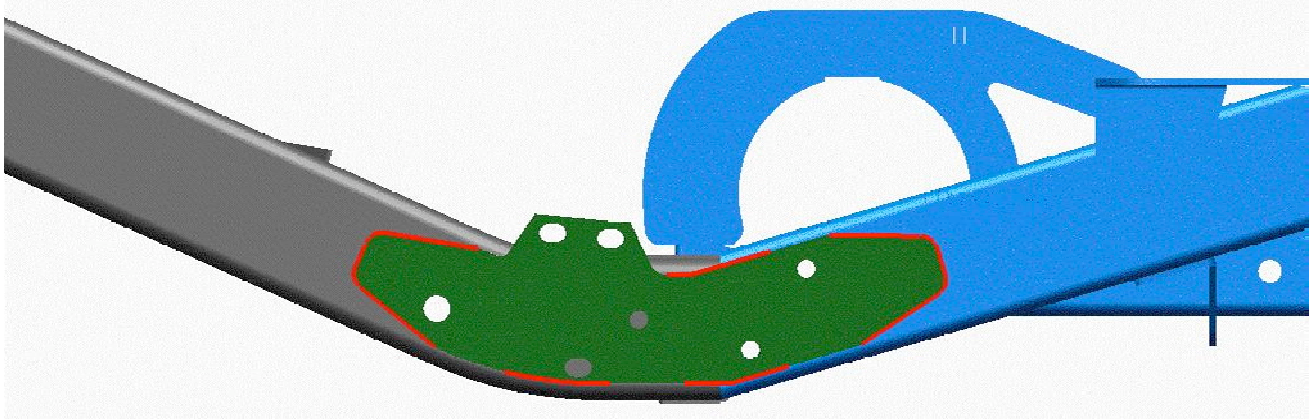


3. Check the location. Using a long straight edge, check the height locations of the body mount surfaces as shown. Check for squareness and overall length. Once you are satisfied with the position of the Rear Frame Extension, clamp everything down tightly and re-check all your measurements.

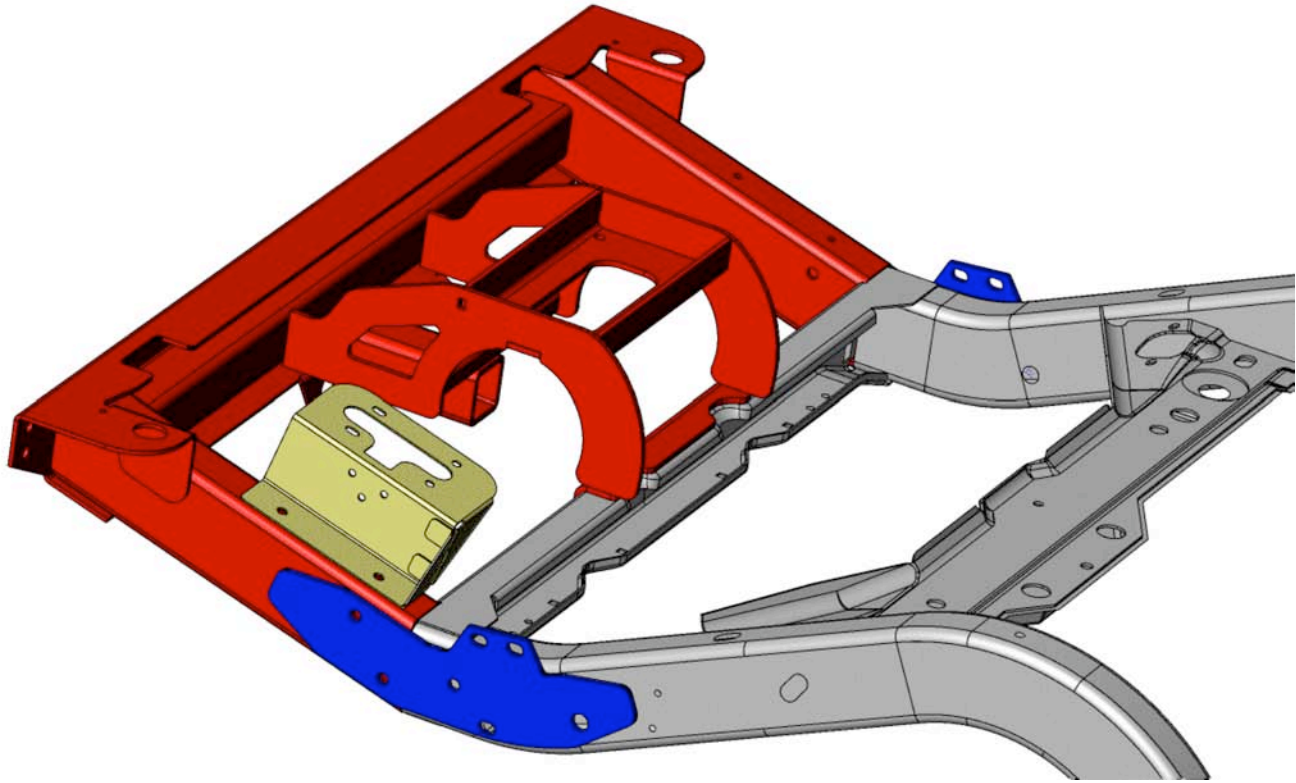


4. Weld the Rear Frame Extension to the frame. Tack weld the four corners at each frame joint and the winch mount to crossmember. **DO NOT TACK THE FISHPLATES ON AT THIS TIME.** Remove the clamps and fishplates. Weld the joints thoroughly with at least 2 passes as per welding specifications for chassis modifications. Weld the winch mount as shown.
5. Install the Rear Fishplates. Grind the outside of the Rear Frame Extension joint flush and locate the fishplates using the holes located on all the parts. Mark the weld pattern shown on both the fishplates and the frame rails. Remove the fishplates and sand the paint off of all weld areas. Relocate the fishplates and weld as shown.

Weld locations for rear frame extension fishplates



6. Finish weld the Forward Bed Mount to the frame.
7. If your Brute is a 2003-2006, install the NVLD Bracket as shown below.



8. Prime and paint all weld areas and the rest of the frame extension parts. E-coat will not hold up to UV radiation and must be painted. Use high quality primer and chassis paint. We recommend always using a catalyzed primer and paint.



A M E R I C A N E X P E D I T I O N
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COMMENTS OR QUESTIONS?

American Expedition Vehicles

Phone: 406.251.2100

Email: tech@aev-conversions.com

Website: <http://www.aev-conversions.com>