



## INSTALLATION INSTRUCTIONS

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### 6690 REAR FLIP KIT WITH C-SECTION 97-UP FORD F-150

#### CONGRATULATIONS!

You were selective enough to choose a **BELLTECH PRODUCT**. We have spent many hours developing our line of products so that you will receive maximum performance with minimum difficulty during installation

- Note:** Confirm that all of the hardware listed in the parts list is in the kit. **DO NOT** begin this installation if any part is missing. Read the instructions thoroughly before beginning this installation.
- Warning:** **DO NOT** work under a vehicle supported by only a jack. Place support stands securely under the vehicle in the manufacturer's specified locations unless otherwise instructed.
- Warning:** **DO NOT** drive the vehicle until all work has been completed and checked. Torque all hardware to values specified.
- Reminder:** Proper use of safety equipment and eye/face/hand protection is absolutely necessary when using these tools to perform procedures!
- Note:** It is very helpful to have an assistant available during the installation process.
- Note:** We **DO NOT RECOMMEND** using wheel ramps while performing this installation.

#### RECOMMENDED TOOLS:

- Properly rated floor jacks and support stands
- Ratcheting Socket Wrench
- Safety Glasses
- Pneumatic Cutting Wheel / Saw
- Combination Wrench
- Torque wrench: 0-75 lb ft. range

This kit has been specifically engineered for the 1997-2003 Ford F-150 series. We **DO NOT RECOMMEND** using this kit on vehicles where other aftermarket suspension components have been previously installed. If the vehicle's suspension has been modified from stock, please return it to its exact original configuration prior to installing this kit.

In order to properly lower your truck, **WE RECOMMEND** using only high quality Belltech lowering coil springs, spindle kits, flip-kits, and Belltech shock absorbers. Note that the shorter shocks are required following installation of many of our kits.

**WE RECOMMEND** that you install Belltech front and rear Anti-Sway Bars to further improve your vehicle's handling and performance.

## **IMPORTANT NOTES:**

1. In order to properly install the REAR C-SECTION KIT, we find it important to follow, in sequential order, the step-by-step procedures listed on the following pages. Our R & D Techs have simplified the step-by-step installation procedure to minimize any difficulties that may arise during the installation.
2. As this is relatively involved installation, **we recommend** that a qualified mechanic at a properly equipped facility perform it. **We also recommend doing one side (modification) at a time.**
3. **We also recommend** measuring and recording all stock driveline angles prior to installing this kit. This information may be helpful if vibration problems arise after installation.

## 1. **KIT INSTALLATION**

- 1a. Open the hardware kit and remove all of the contents. Refer to the parts list (Page 8) to verify that all parts are present.
- 1b. Park the vehicle on a smooth, level concrete or seasoned asphalt surface and activate the parking brake. Block the FRONT wheels of the vehicle with appropriate wheel chocks; making sure the vehicle's transmission is in 1st gear (manual) or "Park" (automatic).
- 1c. Using a properly rated floor jack, lift the REAR wheels of the vehicle off the ground. Place support stands, rated for the vehicle's weight and in the factory specified locations. Refer to the vehicle Owner's Manual. Prior to lowering the vehicle onto the stands, make sure the supports will securely contact the chassis.
- 1d. It is very important that the vehicle is properly supported during this installation to prevent personal injury and chassis damage. Make sure that the support stands are properly placed prior to performing the following procedures. We **DO NOT RECOMMEND** using wheel ramps while performing this installation.
- 1e. Slowly lower the vehicle onto the stands and, before placing the vehicle's entire weight on them, again check that they properly and securely contact the chassis as described above. Check for possible interference with any lines, wires, cables, or other easily damaged components.

## 2. **BRAKE-LINE / WIRE HARNESS BRACKET REMOVAL**

This will need to be done, prior to trying to lay the pattern flush to the outside of the frame chassis. With the mounting bolt in place, the pattern will not sit flush, not allowing you to trace the pattern correctly.

- 2a. Locate the bracket that mounts the brake-line and the wire harness. This is located on the drivers' side, just behind the gas tank. This is mounted with one mounting bolt (**Photo 1**). Remove the mounting nut completely.
- 2b. Working from the inside of the frame chassis, pull out the bracket from its mounting hole and move the bracket to where it won't be in the way when drilling the mounting holes for the C-Section bracket (**Photo 2**).

### 3. TRACING THE PATTERN(C-NOTCH)(KIT SUPPLIED) TO THE FRAME CHASSIS FRAME

Prior to removing the truck bed, trace the pattern (kit supplied) to the frame chassis. This needs to be done because the use of the truck bed cross-members play a role. These cross-members act as guides with the pattern when tracing to the frame chassis.

- 3a. With the rear tires removed, locate the (kit supplied) pattern to the side of the frame chassis.
- 3b. To do this, there are several reference points to use as a guide to locate the pattern correctly. (See illustration on page 9)
- 3c. The first, are the two truck bed cross-members. Align the cut-outs at the top of the pattern to the cross-members (**Photo 3**). The cut-outs need to sit flush to the underside of the cross-members.
- 3d. The second, is the one hole located on the side of the frame chassis (**Photo 4**). Align the hole on the pattern to match the hole on the frame chassis. All four points of reference should all correspond to one another in terms, matching them up from the pattern to the frame chassis.
- 3e. Using a heavy-duty marker, trace the pattern to the frame chassis (**Photo 5,6**). The drivers' side is shown here.
- 3f. Using a straight edge, mark the underside of the frame chassis straight across the channel leg of the frame chassis (**Photo 7**), at both ends of the lines already traced.
- 3g. Trace the pattern to both side of the frame chassis, flipping the (kit supplied) over, accordingly to what side you are tracing the pattern too (**Photo 8**). The passengers' side is shown here. **Its important that you trace the correct side of the pattern to its respective side of the vehicle.**

### 4. REMOVING THE TRUCK BED (optional)

Once the pattern has been traced to the frame chassis, we recommend removing the truck bed to gain access to the frame chassis, making the modification easier.

Though the truck bed removal is not required while performing this install, our R & D Techs have determined, that by removing the truck bed, you will have better access to the frame chassis where the modification will take place. If truck bed removal is decided, please refer to the appropriate section in the vehicle's manual for recommendations regarding ***Pickup Bed Removal Procedures***.

- 4a. To simplify the modification, remove the truck bed.
- 4b. There are six mounting bolts that mount the truck bed to the frame chassis.
- 4c. Remove all six mounting bolts completely.
- 4d. Detach the wiring harness (brake-lights) and the gas-intake neck from the truck bed.
- 4e. Lift the truck bed off the frame chassis and set aside.

## 5. ADDING THE ROUNDED CORNERS TO THE CUT-OUTS

With the pattern traced to the frame chassis, add round corners (two per side), to minimize the chance of fractures along the frame section.

- 5a. Using a circle template, align an edge of a 1/2 dia. Circle to the edge of the radius outline on the pattern (**Photo 9**).
- 5b. Using a scribe, outline the 1/2" dia. (**Photo 10**). Using a center punch, mark the center of the hole (**Photo 11**).
- 5c. Using a 3/16 drill bit, drill out the center of the hole. This will be used as a center guide for a larger hole (**Photo 12**).
- 5d. Using a 1/2" drill bit, drill out the two holes (**Photo 13**).

## 6. CUTTING OUT THE C-SECTION OUTLINE

- 6a. Using a cutting wheel, cut along the horizontal marked line, between the two 1/2" dia. Holes (**Photo 14**).
- 6b. Using a cutting wheel, cut along both vertically diagonal lines (**Photo 15**).
- 6c. Using a cutting wheel, cut along the underside marked lines (**Photo 16**).

**NOTE:** Be careful with the cut-out piece of frame chassis. It will still be **hot!!!**

- 6d. Once the part has cooled, remove the part (**Photo 17**).
- 6e. Using a grinder, de-burr all edges that were cut (**Photo 18**). Smooth out all sharp edges.

## 7. INSTALLING THE NEW C-SECTION BRACKET

- 7a. Using the correct C-Section bracket to the corresponding side, install the C-Section bracket (**Photo 19**). Using a rubber mallet, fit the C-Section bracket inside of the C-Section cut-out.

**For reference, all photos that are being shown, are for drivers' side install.**

- 7b. Using a drill and a 1/2" dia. drill bit, (**Photo 20**), drill out the four center holes on the new C-Section bracket. Drill through the frame chassis as well, creating a clearance thru-hole through both parts.

## 7. INSTALLING THE NEW C-SECTION BRACKET –cont'd-

- 7c. Locate the inner frame flange. This is located on the inside of the frame chassis (**Photo 21**). Match the inner four holes of the inner frame flange to the four inner thru-holes on the frame chassis.
- 7d. Using a wrench, tighten all respective hardware, torquing to spec (**Photo 22**).
- 7e. Again using a 1/2" dia. Drill bit, drill out the remaining four outer holes, using the C-Section bracket as a guide (**Photo 23**).
- 7f. Install the remaining four mounting hardware at the outer holes. On the drivers' side only, the top outer mount hardware (**Photo 24**), will be put on last. Tighten up the three other mounting hardware.

## 8. INSTALLING THE BRAKE-LINE BRACKET MOUNT

- 8a. Using a small screwdriver, pry open the O.E.M. bracket that mounts the brake-line to the frame chassis (**Photo 25**). Remove the O.E.M. bracket and discard.
- 8b. Using wire cutters, clip off the wire harness loom bracket (**Photo 26**).
- 8c. With the kit supplied brake-line bracket extension, mount the O.E.M. bracket, extending it (**Photo 27**). On this particular set-up, the kit supplied brake-line extension bracket has three holes in it. The single-hole end will mount to the frame chassis, the two-hole end will mount to the O.E.M. bracket. On the two-hole end of the bracket, a small-hole is located. This will mate with the O.E.M. bracket nipple and keep it from spinning.
- 8d. With the remaining mount hole on the C-Section bracket, insert the mount hardware. This mount hardware will also mount the new brake-line extension bracket (**Photo 28,29**).

## 9. MOUNTING THE FUEL-LINE, BRAKE-LINE and WIRE HARNESS TO THE FRAME CHASSIS

- 9a. The fuel-line needs to be located against the inner-wall of the frame chassis. With a kit supplied mount clip, attach the clip to the fuel-line with the legs of the mount clip facing inward towards the frame chassis (**Photo 30**).
- 9b. Mount the new bump stop with the stud going up through the bottom of the new C-Section (**Photo 31, 32**). Tighten the bump stop, securing the mount clip to the frame chassis.
- 9c. Using the kit supplied tie-clips, attach the wire harness to the fuel line (**Photo 33**). Using wire cutters clip off the excess tie-clip.

## 10. MODIFYING THE TRUCK BED INSULATOR WASHERS

- 10a. There are six truck bed insulator washers that sit between the truck bed and the top of the frame chassis. Using a pair of wire cutters cut back the nipple of the insulator washer so it sits flush atop the frame chassis (**Photo 34**). This needs to be done, because the new C-Section bracket will not allow the nipple through, causing it to not sit flush to the top of the frame chassis.

## 11. MODIFYING THE CENTER TRUCK BED CROSS-MEMBER

This modification will give clearance, horizontally and vertically, to the rear differential housing to allow for more travel to the rear axle.

- 11a. Located just above the rear differential, the truck bed cross-member is located.
- 11b. To gain better access to the area being modified, un-bolt the vapor-return canister. Using a wrench, un-bolt the four mounting bolts (**Photo 35**). Carefully move the canister out of the way.
- 11c. Using a marker, outline the area that will be cut-out (**Photo 36**) . The outlines shown here are located opposite the vapor-return canister. Use the hole centers as your reference points. On both sides, mark lines that are approximately 15° off center of the hole. To aid in keeping the cross-member stiff, come down approximately 1" down to the top of the cut, as shown. These will give enough clearance, horizontally and vertically, to allow for more travel of the rear axle.
- 11d. Do the same on the vapor canister side. Mirror image the marked lines (**Photo 37**). Mark on the underside of the cross-member.
- 11e. Using a cutting tool, begin cutting the marked lines that you have sketched out (**Photo 38**).
- 11f. Once you have cut-out the lines, carefully remove the center piece (**Photo 39**), being careful with the part because it still may be hot!!!
- 11g. Use a grinder to de-burr all sharp edges (**Photo 40**).
- 11h. Re-install the vapor-return canister to its original position, mounting it with the four mounting bolts.

## 12. MODIFYING THE CENTER FRAME CHASSIS CROSS-MEMBER

This modification will give clearance, vertically, to the driveline, to allow for more travel to the rear axle.

- 12a. Locate the center frame chassis cross-member. The cross-member that needs to be modified is located above the heat shield for the muffler pipe (**Photo 41**).
- 12b. Looking directly from underneath, give at least a 1" clearance on each side of the driveline.
- 12c. Using a cutting tool, cut the marked lines back the length of the cross-member leg. Once the cuts have been made, bend the leg upward 45°. This creates clearance **and** still provides the cross-member with the rigidity it needs for carrying loads inside the truck bed (**Photo 42, 43, 44**).

As stated previously, **WE RECOMMEND** using only high quality Belltech lowering coil springs, spindle kits, flip-kits, and Belltech shock absorbers. Whether using the O.E.M. shock absorbers or have purchased new Belltech shock absorbers, this particular kit, the rear shock mounts are included.

**13. INSTALLING THE NEW REAR SHOCK EXTENSIONS**

- 13a.** Locate the O.E.M. top shock absorber mounts (**Photo 45**). Un-bolt the mounting nuts and remove completely.
- 13b.** Locating the rear O.E.M. shock absorber mounts, un-bolt and remove all mounting hardware (**Photo 46**).
- 13c.** Mount the new rear shock mounts. Locate the new rear shock mounts, with the legs facing towards the rear of the vehicle (**Photo 47**). Install the (kit supplied) mounting hardware and finger-tight.
- 13d.** Using a wrench, torque all mounting hardware to specs.
- 13e.** Re-install the O.E.M. shock absorber and tighten the mounting hardware to manufacturer's specs. In this particular (**Photo 48**), new Belltech shock absorbers are being shown.

The following information listed below shows location and usage of the rear shock extensions for the different models of vehicles.

<b>VEHICLE MODEL</b>	<b>LOCATION</b>	<b>USAGE</b>
<b>REGULAR CAB EXTENDED CAB</b>	<b>BOTH SHOCKS FACE REAR-WARD</b>	<b>USES THE SAME EX- TENSION 6690-050</b>
<b>QUAD CAB</b>	<b>DRIVERS SIDE—FACES REAR-WARD PASSENGERS' SIDE— FACES FORWARD</b>	<b>USES THE SAME EX- TENSION 6690-060 &amp; 6690-050</b>

#### 14. **FINALIZING THE INSTALLATION**

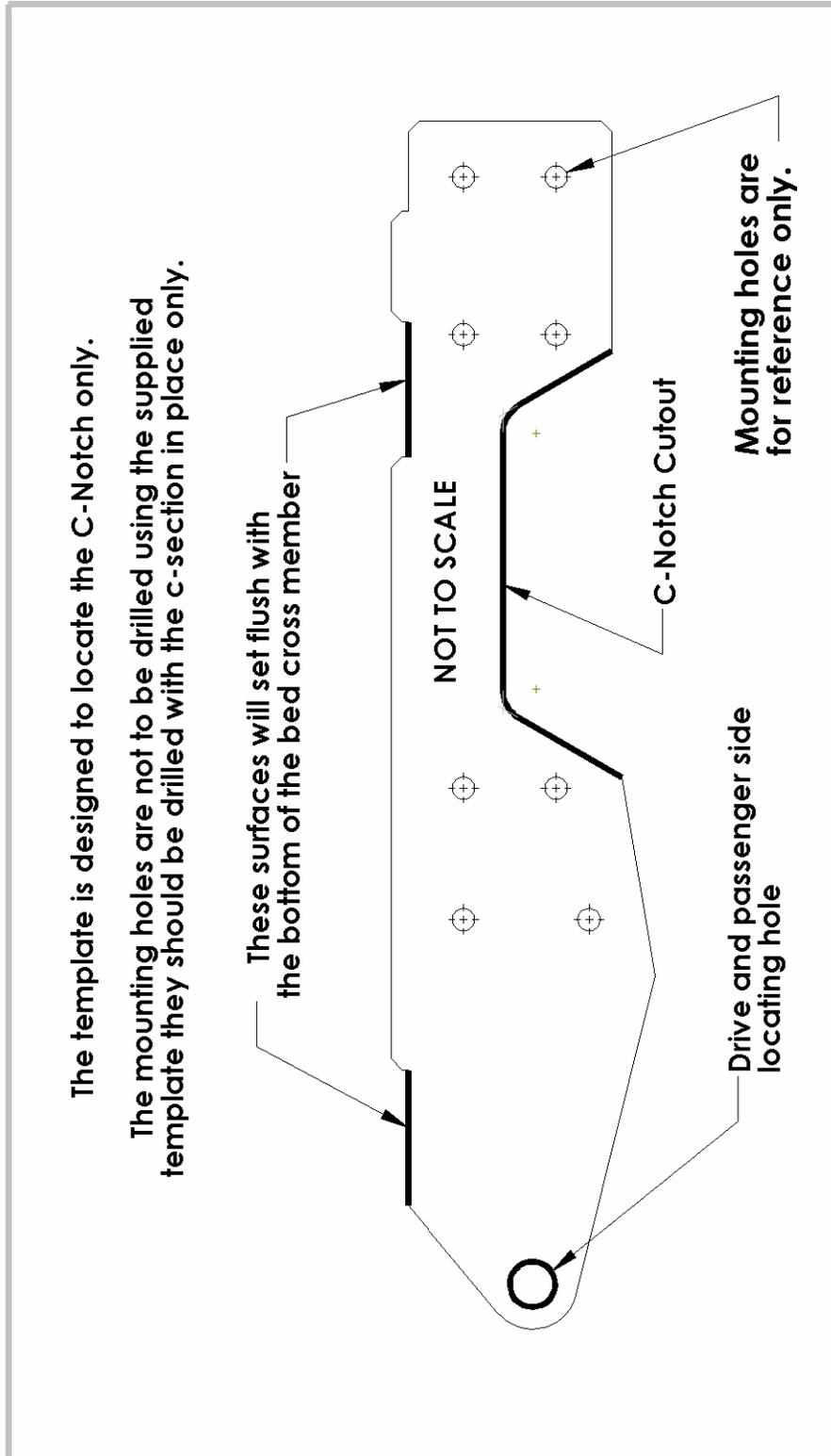
- 14a. All hardware being fastened to the vehicle's original fastening points should be torqued to the proper specifications. To prevent chassis damage, never over-torque the hardware.
- 14b. Check brake hoses and other components for any possible interference.
- 14c. Lift the vehicle and remove the support stands. Carefully lower the vehicle to the ground.
- 14d. Immediately test-drive the vehicle in a remote location so that you can become accustomed to the revised driving characteristics and handling. Be aware that the vehicle will handle substantially different now that it has been modified.
- 14e. Installation is complete. Check all of the hardware and re-torque at intervals for the first 10, 100, 1000 miles.

#### **PARTS LIST FOR FORD F-150 C-SECTION KIT**

<b>PART No.</b>	<b>DESCRIPTION</b>	<b>QTY.</b>
4915-001	BUMP STOP w/Nylon Lock Nut	2
110408	SCREW HH CAP 1/2"-20 x 1-1/4"	18
110402	LOCK NUT 1/2"-20	18
110660	FLAT WASHER 1/2"	36
110502	FLAT WASHER 5/8"	8
110505	LOCK NUT 5/8"-18	8
110251	SCREW HH CAP 3/8"-24	6
110625	FLAT WASHER 3/8"	12
110254	LOCK NUT 3/8"-24	6
9999-975	NYLON BLACK CABLE TIE	3
6690-004-99	BRAKE LINE BRACKET	1
6690-887	C-SECTION TEMPLATE	1
6690-060-99	RH REAR SHOCK EXTENSION	1
6690-050-99	LH REAR SHOCK EXTENSION	2
6690-010-99	U-BOLT PLATE	2
6690-005-99	AXLE SADDLE	2
6690-200-99	RH C-SECTION	1
6690-100-99	LH C-SECTION	1
6650-003	U-BOLT 5/8-18 x 9	4
5008-301	INSULATED CLAMP 1/2"	1

**NOTE:** The C-Section Template is to locate the C-Notch only. This template is for both sides of the vehicle. Remember there is a left-hand and right-hand side for the C-Notch. Using both sides of the C-Notch will establish left and right, with the drivers' side being the left and the passenger side being the right.

The drawing below is for reference only. Included in this kit is a full scale C-Section Template.



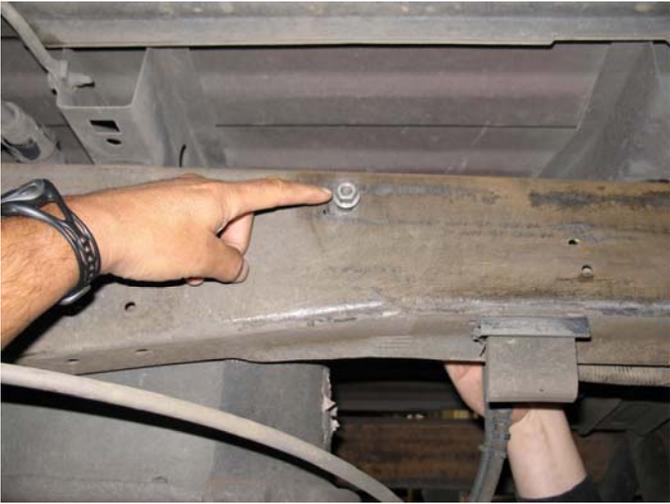


PHOTO 1

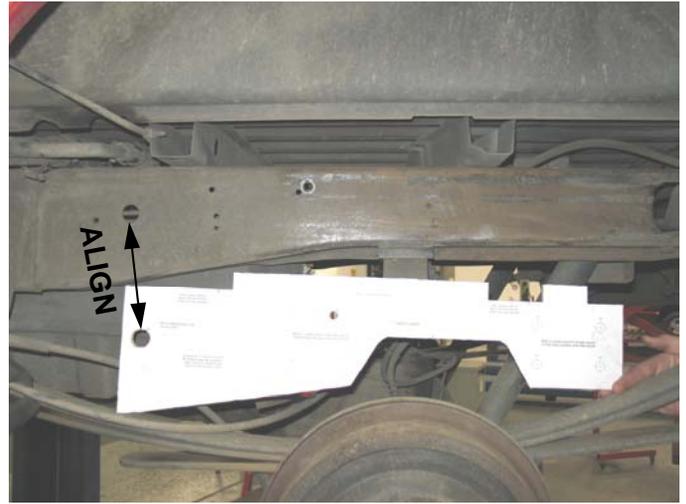


PHOTO 4



PHOTO 2



PHOTO 5

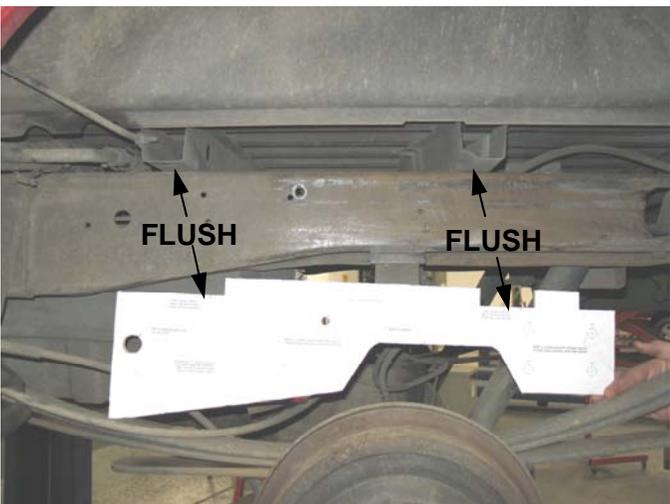


PHOTO 3



PHOTO 6



**PHOTO 7**



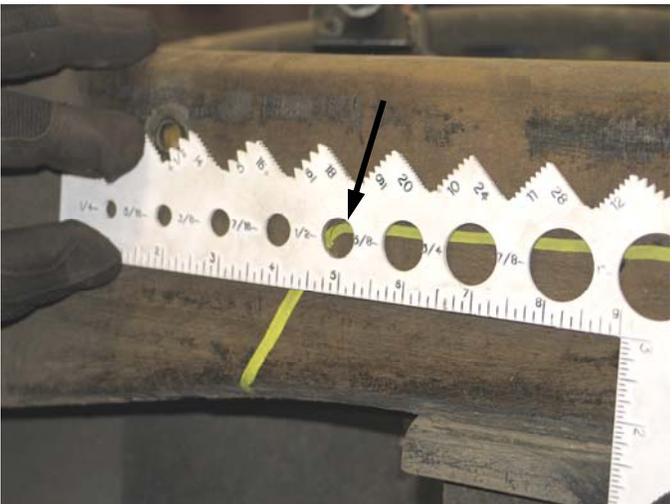
**PHOTO 10**



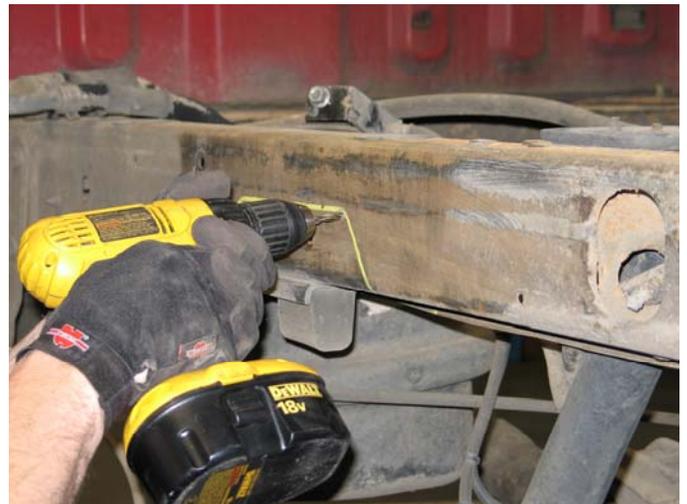
**PHOTO 8**



**PHOTO 11**



**PHOTO 9**



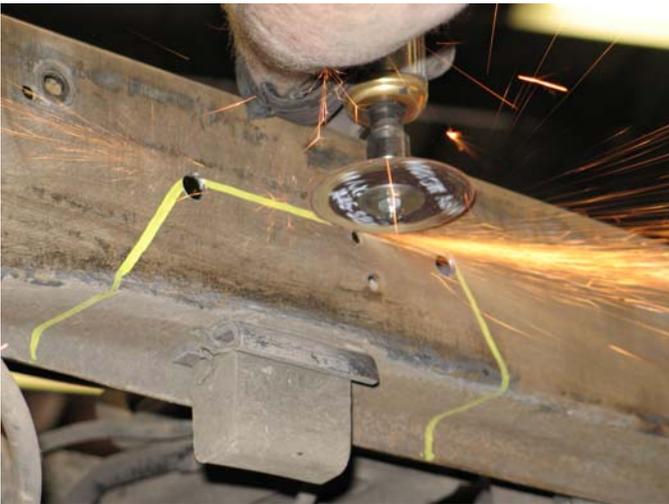
**PHOTO 12**



**PHOTO 13**



**PHOTO 16**



**PHOTO 14**



**PHOTO 17**



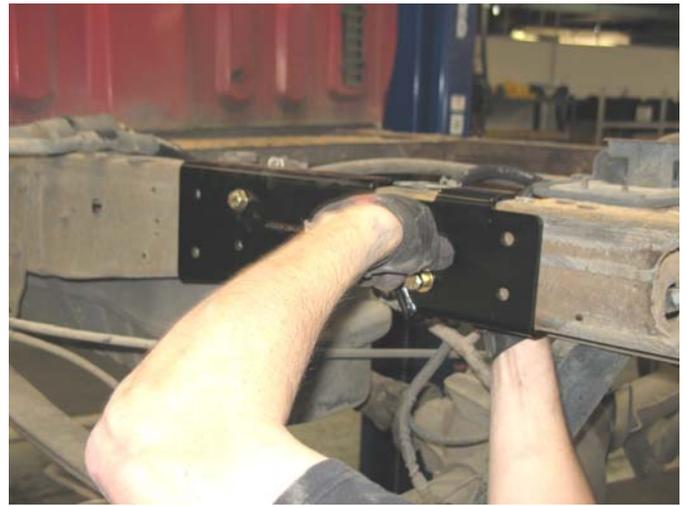
**PHOTO 15**



**PHOTO 18**



**PHOTO 19**



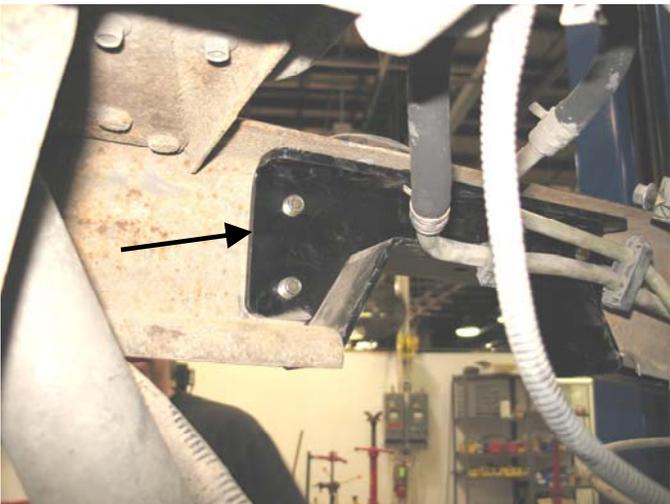
**PHOTO 22**



**PHOTO 20**



**PHOTO 23**



**PHOTO 21**



**PHOTO 24**



**PHOTO 25**



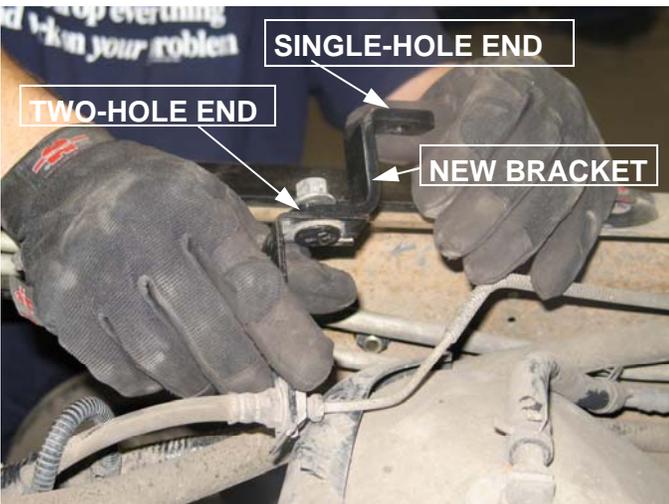
**PHOTO 28**



**PHOTO 26**



**PHOTO 29**



**PHOTO 27**



**PHOTO 30**



PHOTO 31

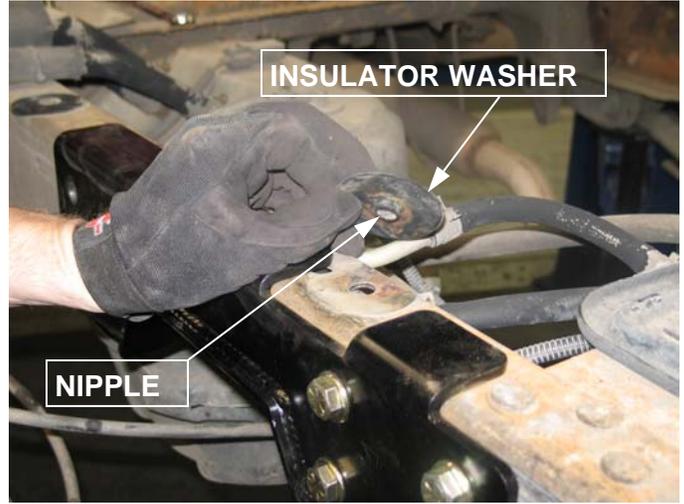


PHOTO 34



PHOTO 32



PHOTO 35



PHOTO 33

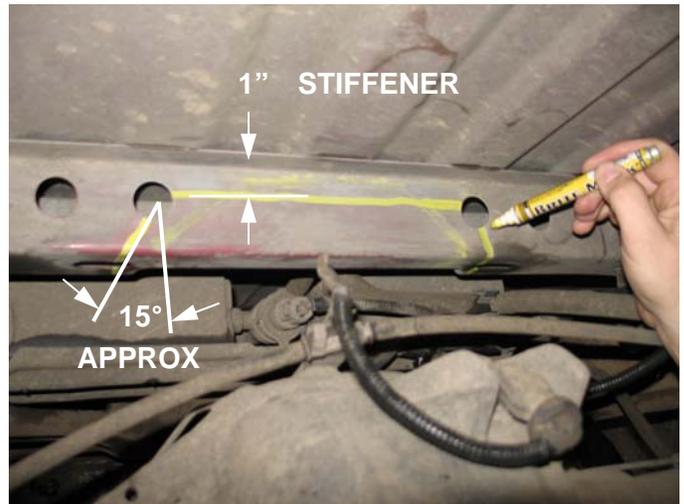


PHOTO 36



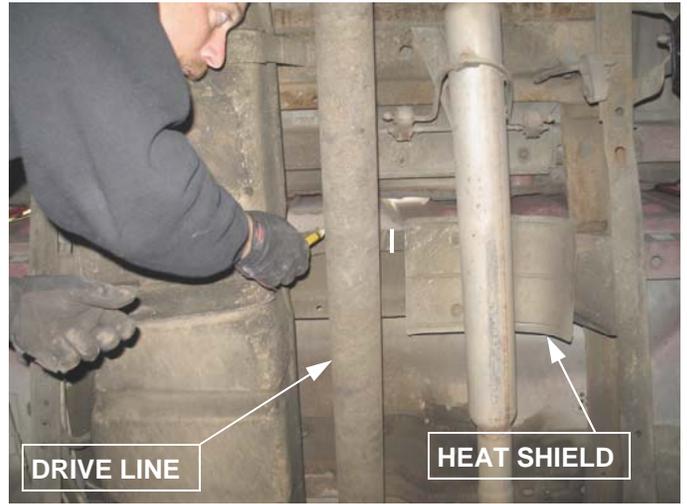
**PHOTO 37**



**PHOTO 40**



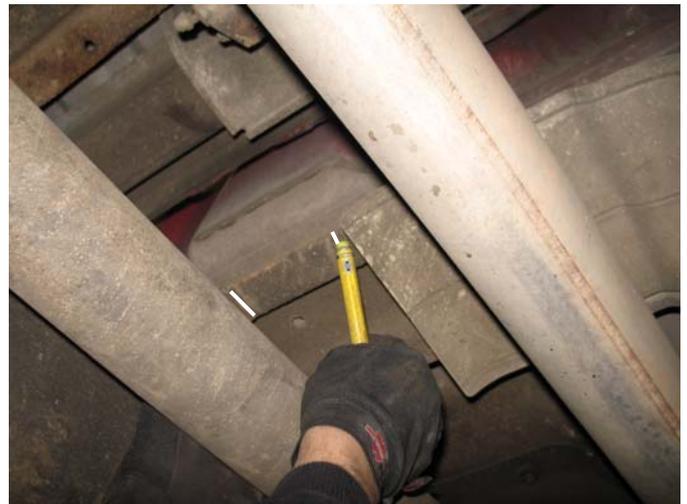
**PHOTO 38**



**PHOTO 41**



**PHOTO 39**



**PHOTO 42**



PHOTO 43



PHOTO 46

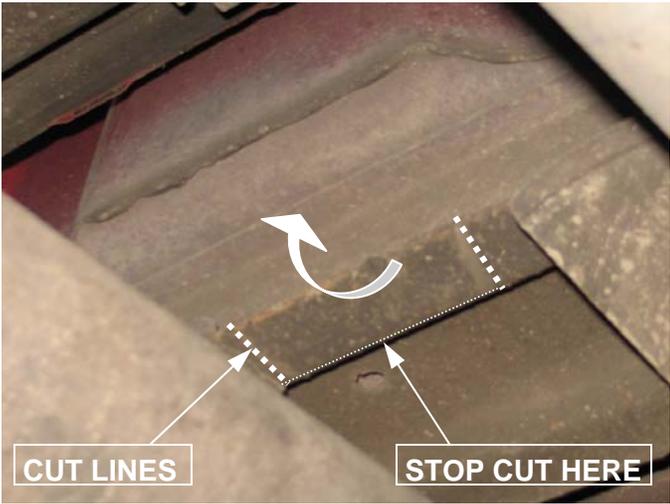


PHOTO 44

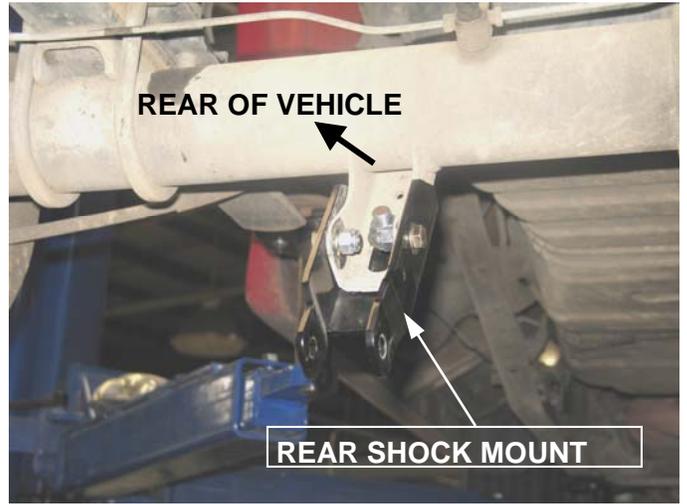


PHOTO 47

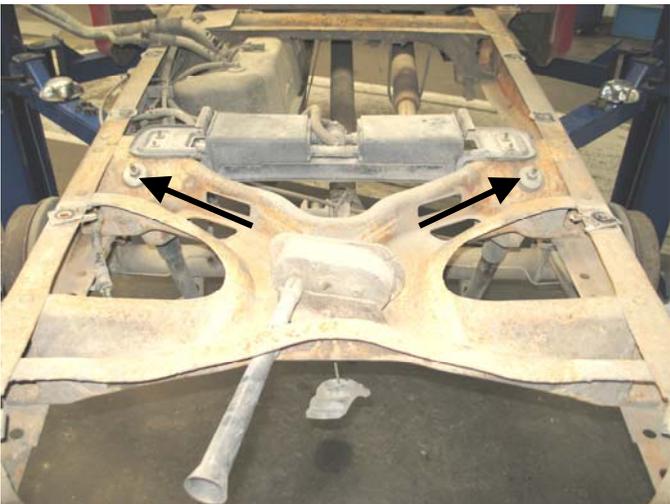


PHOTO 45



PHOTO 48