

## **Savvy Off Road Under Armor TJ/LJ 2003-2006 Auto**

Thank you for purchasing one of our Savvy Off Road Under Armor Packages. Savvy Under Armor is a complete system that provides protection for your engine, transmission and transfer case. Enclosed you will find a set of instructions that will enable you to install the Under Armor with a minimum of fuss and little more than basic hand tools. If you are not comfortable with your mechanical ability when it comes to performing work on your vehicle's drivetrain, please enlist the aid of a competent mechanic to assist you with this installation. If you attempt the install and find yourself not understanding what needs to be done, please stop and contact Savvy Off Road with your technical issue. Do not attempt alternative solutions that may alter the design or function of any of the components included in this kit.

Please take the time to read these instruction and familiarize yourself with the hardware parts list before attempting your installation. The instructions are lengthy, but are written to provide you with a step-by-step guide to install the Savvy Under Armor with minimal issues. If you run into problems there is an appendix of solutions to known issues that you may run encounter with your installation.

Parts and tools needed for installation- Outside of the parts supplied in the kit, you will need personal safety equipment, blue liquid Loctite 243 or equivalent, assorted hand tools, allen wrenches, and a #4 Phillips socket to complete the installation.

Fitment— The ground clearance gained by the Savvy Under Armor is accomplished by moving the drivetrain higher. Due to our Crossmember design there is sufficient space around the tub and drivetrain and should expect no contact issues when properly installed. We have noticed that the exhaust system on 03-06 Wranglers are variable in design and can require modification for proper clearance. At a minimum you will need 1/4" of clearance for your exhaust system with the Savvy Under Armor and tub. We have provided a low profile exhaust hanger that is adjustable and instructions on how to eliminate any exhaust contact.

Requirements— A 1.25" Body Lift is mandatory for the installation of the Savvy Under Armor. The body lift provides the necessary clearance between the drivetrain and the tub. We advise that you install the Savvy Body Lift to minimize installation issues.

Regardless of suspension height, a double cardan rear driveshaft and properly adjusted pinion is required for vibration free operation. Depending on your transfer case you will need to install a slip yoke eliminator (SYE). The NP231J transfer case requires an SYE and the NV241OR transercase has an integrated SYE. Adjustable control arms are also required to adjust your pinion angles.

Note— With the proper installation of the Savvy Under Armor system there will be a minimal amount of vibrations felt at idle due to the reinforced rubber mounts used to support the drivetrain. You should experience no additional vibrations above 1,000 RPMs.



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## Hardware Parts List

Part	Quantity	Use
3/8 - 16 X 3/4" G8 Zinc	4	Front Brace to MML Block
3/8 Heavy Washer	4	Front Brace to MML Block
3/8 - 24 X 1" HHCS G8 Zinc	3	Front Brace to Skid
3/8 - 24 Flange Nuts	3	Front Brace to Skid
3/8 Heavy Washer	3	Front Brace to Skid
5/16 - 18 X 1" Flat Head Phillips Zinc	4	Drain Hole Cover
5/16 - 18 Flange Nuts	4	Drain Hole Cover
3/8 - 24 X 1" HHCS G8 Zinc	5	Angle Bracket Wing to Skid
3/8 - 24 X 1 1/4" HHCS G8 Zinc	1	Angle Bracket Wing to Skid
3/8 - 24 Flange Nuts	6	Angle Bracket Wing to Skid
5/16 - 18 X 1" Flat Head Phillips	4	Angle Bracket Skid to Wing
5/16 - 18 Flange Nuts	4	Angle Bracket Skid to Wing
5/16 - 18 X 3/4" Flat Head Phillips	8	Frame Out C to Inner C Both Sides Lower Flanges
5/16 - 18 Flange Nuts	8	Frame Out C to Inner C Both Sides Lower Flanges
5/16 - 18 X 3/4" HHCS G8 Zinc	8	Frame Out C to Inner C Both Sides Upper Flanges
5/16 - 18 Flange Nuts	8	Frame Out C to Inner C Both Sides Upper Flanges
3/8 - 24 X 1" HHCS G8 Zinc	2	Exhaust To Trans Mount
3/8 - 24 Flange Nuts	2	Exhaust To Trans Mount
3/8 Heavy Washer	2	Exhaust To Trans Mount
3/8 - 24 X 3" HHCS	2	Trans Mount to Crossmember
3/8 - 24 Flange Nuts	2	Trans Mount to Crossmember
3/8 Heavy Washer	2	Trans Mount to Crossmember
5/16 - 18 X 3/4" Flat Head Phillips	7	Rear Crossmember Flange to Wings and Skid
5/16 - 18 Flange Nuts	7	Rear Crossmember Flange to Wings and Skid
5/16 - 18 X 1" Flat Head Phillips Zinc	9	Rear Brace to Wings and Skid
5/16 - 18 Flange Nuts	9	Rear Brace to Wings and Skid
1/2 - 13 X 2 1/2" S/S SHCS	2	Crossmember to Frame C Mount
1/2 - 13 Flange Nuts	2	Crossmember to Frame C Mount
1/2 - Flat Washer	2	Crossmember to Frame C Mount
12mm X 1.75 X 40mm Flat Head Allen	6	Wings to Frame
10mm X 1.5 X 60mm HHCS	2	Motor Mount to Frame
10mm Extension - Motor Mount	2	Motor Mount to Frame (must cut the OEM stud)
12 mm X1.75 X 120mm HHCS	1	Motor Mount to Engine Mount (Optional Driver side)
<b>Total Fasteners</b>	<b>138</b>	

HHCS = Hex Head Cap Screw SHCS = Socket Head Cap Screw

## Hardware Parts List

Part (Reference Picture)	Quantity	Material
A. Main Skid	1	Aluminum
B. Drain Cover	1	Aluminum
C. Wings	2	Aluminum
D. Wing spacers	4	Zinc Steel
E. Wing Angle brace	2	Zinc Steel
F. Front Brace	1	Zinc Steel
G. Motor Mount Lift	2	Aluminum
H. Crossmember	1	Zinc Steel
I. Frame C	2	Zinc Steel
J. Frame C Inner brackets	4	Zinc Steel
K. Trans Mount	1	Zinc Steel
L. Exhaust Hanger	1	Zinc Steel
M. Rear Brace	1	Zinc Steel
Total Pieces	23	

Part	Quantity
5/16 - 18 X 3/4" HHCS G8 Zinc	8
5/16 - 18 Flange Nuts	40
5/16 - 18 X 3/4" Flat Head Phillips	15
5/16 - 18 X 1" Flat Head Phillips Zinc	17
3/8 - 16 X 3/4" G8 Zinc	4
3/8 Heavy Washer	11
3/8 - 24 X 1" HHCS G8 Zinc	10
3/8 - 24 X 1 1/4" HHCS G8 Zinc	1
3/8 - 24 X 3" HHCS	2
3/8 - 24 Flange Nuts	11
3/8 - 16 Flange Nuts	2
1/2 - 13 X 2 1/2" S/S SHCS	2
1/2 - 13 Flange Nuts	2
1/2 - Flat Washer	2
12mm X 1.75 X 40mm Flat Head Allen	6
10mm X 1.5 X 60mm HHCS	2
12 mm X1.75 X 120mm HHCS	1
10mm Extension - Motor Mount	2
Total Fasteners	138





**Step 1**



Organize the following components to install the Savvy Motor Mount Lift:

- (2) Black anodized CNC milled billet aluminum 1" motor mount spacer (G)
- (2) 10mm Extended Motor Mount Studs
- (2) 10mm x 1.5 x 60mm Motor Mount Extended Bolts
- (1) 12mm x 1.75 x 120mm Engine Mount Bolt (Optional Driver Side)

Park your vehicle on a level surface, apply parking brake, and block rear wheels to avoid any unnecessary movement.

**Step 2**



Start by removing each of the four transmission mount nuts on your transfer case skid plate.

Use a 13mm socket to remove these M8 nuts. Use a rust penetrating catalyst on the transmission studs if you are having difficulty removing the nuts.

**Step 3**

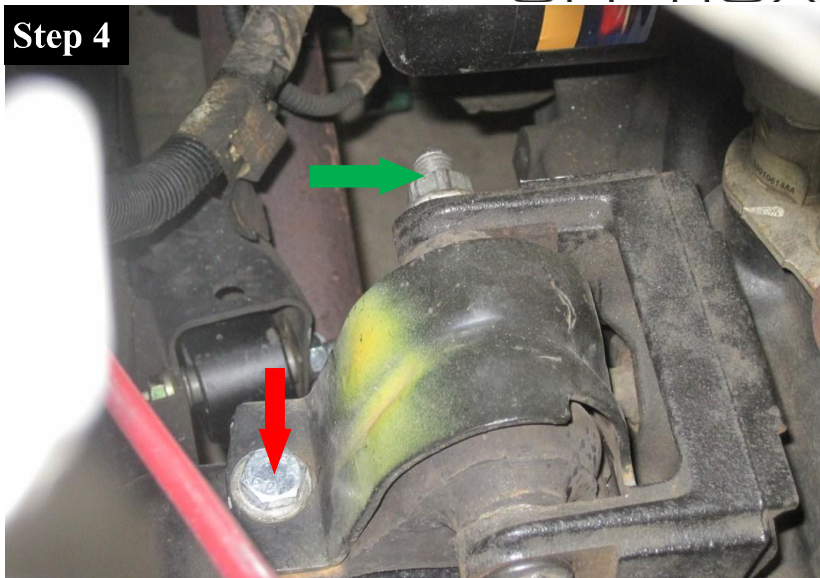


Under the hood, remove the radiator overflow bottle and remove radiator fan shroud.

There are (4) screws that secure the fan shroud in place, remove these. Disconnect your hood light as to not drain your battery unnecessarily.

Underneath the passenger motor mount, remove the nut on the motor mount stud using a 13mm socket. (red arrow). A long socket extension is necessary.

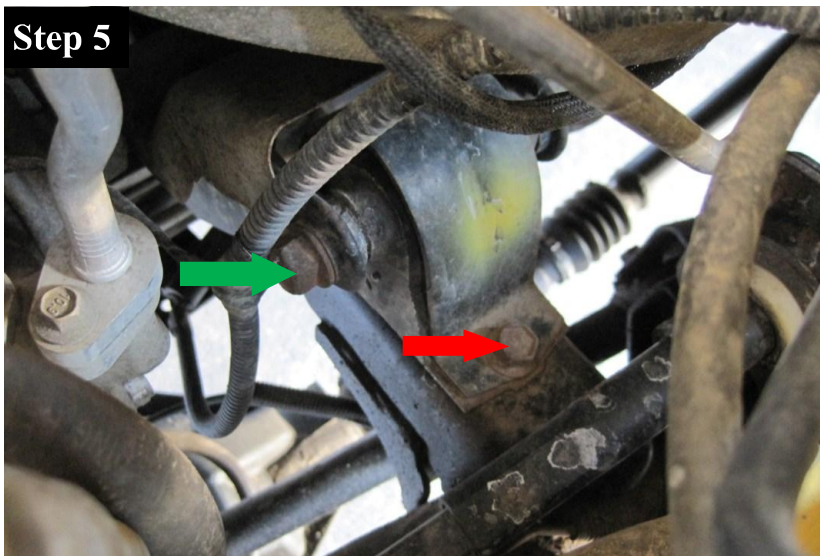
**Step 4**



Loosen the motor mount through bolt using 18mm socket (DO NOT REMOVE) shown by the green arrow.

Remove the 10mm motor mount bolt (17mm head) that attaches the motor mount to the frame located on top the motor mount. (red arrow)

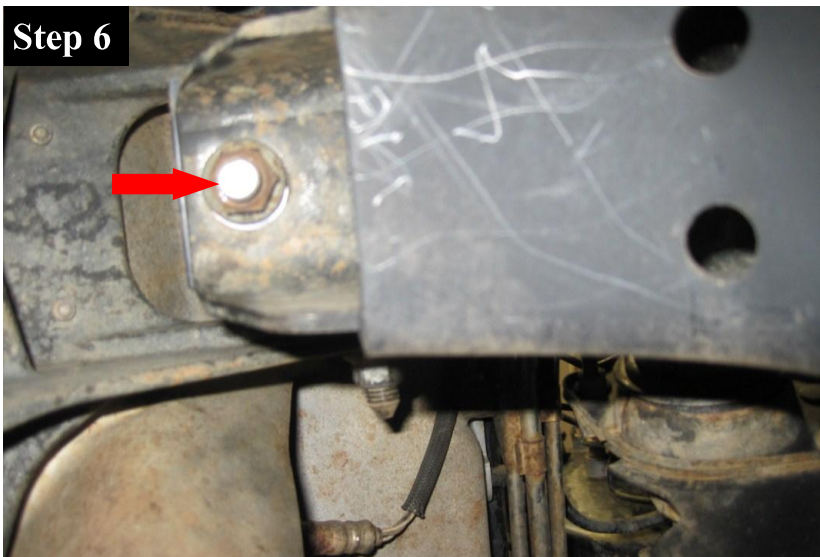
**Step 5**



On the driver side, loosen the motor mount through bolt (DO NOT REMOVE) shown by the green arrow.

Remove the 10mm motor mount bolt that attaches the motor mount to the frame located on top the motor mount. (red arrow)

**Step 6**



Remove the 13mm nut on the motor mount stud. (red arrow).

Place your floor jack underneath the oil pan using a block of wood to distribute the load against the oil pan. Apply slight upward pressure against the oil pan to raise the engine off the vehicle.

Note: Since you are unable to remove the motor mount through bolt due to the A/C compressor, push the through bolt against the A/C compressor. Cut the head off the through bolt using a cut-off tool and carefully tap the through bolt out of the motor mount with a hammer and screw driver against the through bolt nut.

If you are unable to cut the through bolt move to the next step.

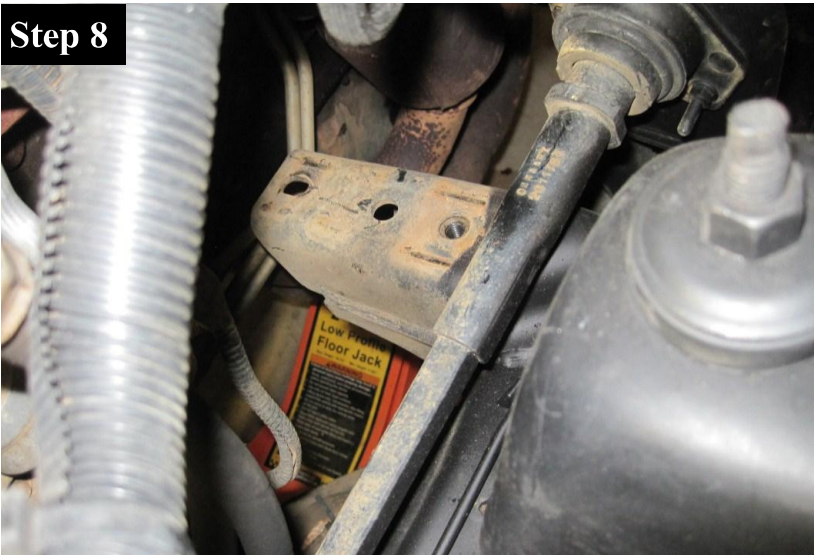


**Step 7**



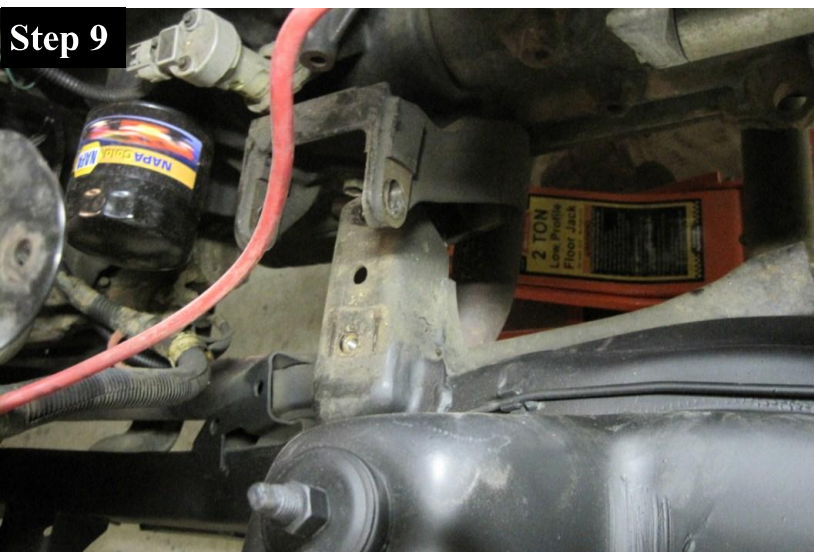
There are 3 bolts that hold the motor mount bracket to the engine. With the engine raised off the frame, start by removing these bolts using a 15mm socket.

**Step 8**



Remove the entire motor mount and engine bracket off the frame and out of the engine bay.

**Step 9**



On the passenger side, remove the motor mount through bolt and the motor mount out of the vehicle.

## Step 10



At this point you will need to cut the studs on both motor mounts. Cut each stud so that the 10mm stud extension sits flush against the motor mount. Take care and make your cut straight.

Optional: If you have a tap and die set you can thread a die onto the stud and make your cut. After cutting back the tap out of the threads so that you clean up the threads.

## Step 11



Remove the stud extensions and apply a removable thread locker on the motor mount studs. Tighten the stud extension onto the motor mount studs.

## Step 12



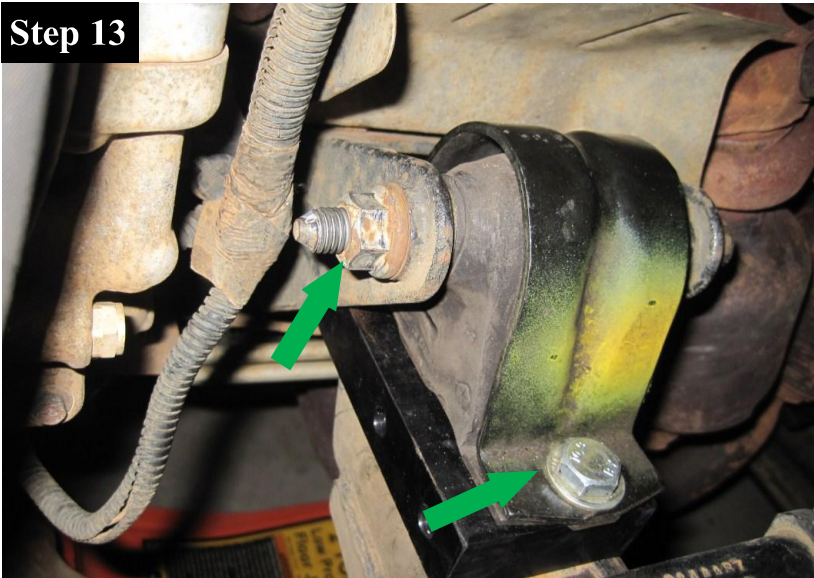
It is now time to install Motor Mount Spacers (G). Both Motor Mount Spacers should be installed with the threaded side facing the front of the vehicle. The L-shaped motor mount spacer should be installed on the passenger side of the vehicle.

Working on the passenger side first, place the motor mount on the L-shaped Motor Mount Spacer and install onto the frame and engine. It may take some wiggling to get the motor mounts to slide onto the engine bracket. You may have to lift the engine a bit more to slide the motor mount and Motor Mount Spacer.

Slide the motor mount through bolt and loosely thread the 10mm x 1.5 x 60mm motor mount extended bolt.



### Step 13



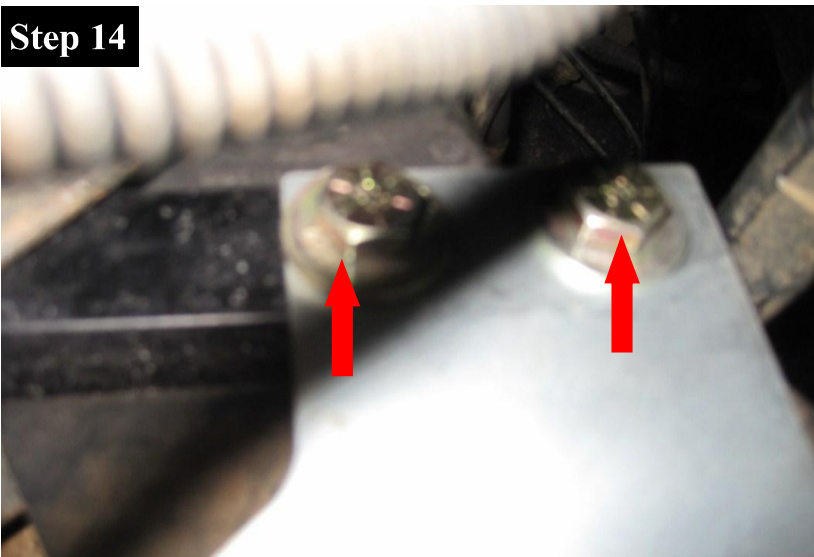
On the driver side of the vehicle, reinstall motor mount bracket if it was removed and torque the 3 bracket bolts to 40 ft-lbs.

Install the motor mount with the Motor Mount Spacer (G) such that the threaded side of the motor mount spacer is facing the front of the vehicle.

Slide the motor mount through bolt (use replacement bolt if needed) and loosely thread the last 10mm x 1.5 x 60mm motor mount extended bolt.

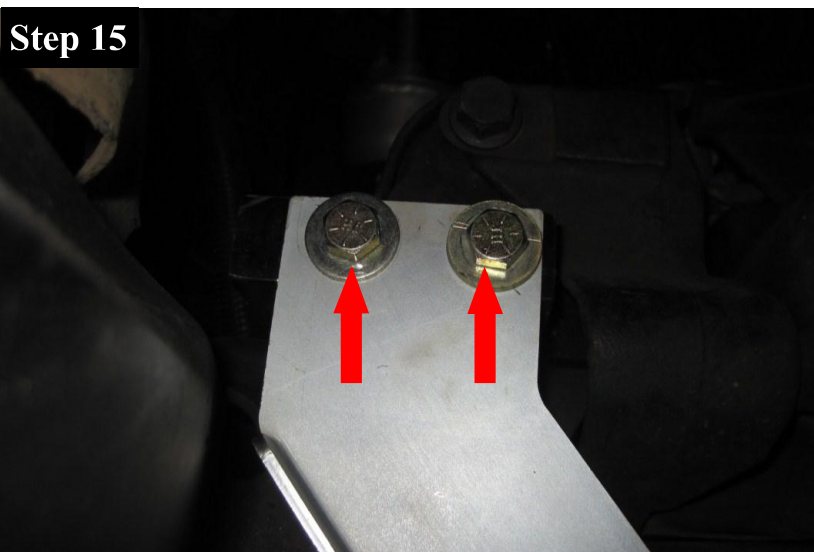
Tip: install the motor mount through bolt such that the nut is on the same side as the A/C compressor. This will help with the replacement of motor mounts.

### Step 14



Loosely install the (2) 3/8 - 16 X 3/4" G8 Zinc Bolts and 3/8 heavy washers using 9/16" socket.

### Step 15



On the passenger side, install and tighten the (2) 3/8 - 16 X 3/4" G8 Zinc Bolts and 3/8 heavy washers.

Now tighten the 3/8 bolts on the driver side of the vehicle. (previously illustrated)

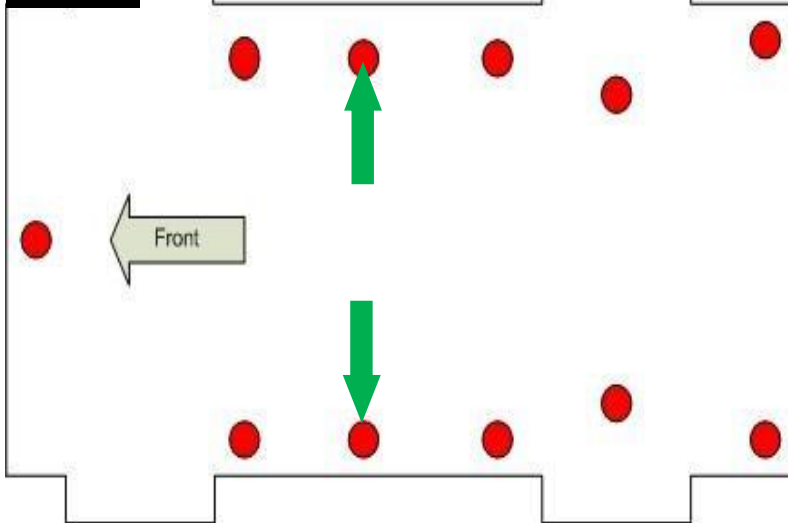
Note: You may have to wiggle the Motor Mount Spacers (G) to install the 3/8 16 X 3/4" G8 Zinc Bolts.

Begin SLOWLY lowering the support from the oil pan so that engine rests on the engine mount mounts and install each studded nut.

Torque the studded nuts to 30 ft-lbs, the extended bolts to 40 ft-lbs, and the motor mount through bolts to 48 ft-lbs.



**Step 16**



Identify all the body mount locations on your TJ/LJ as shown. The Frame Cs (I) are not interchangeable. The Frame Cs should be installed such that the body mount opening is slightly aft of the frame nutsert.

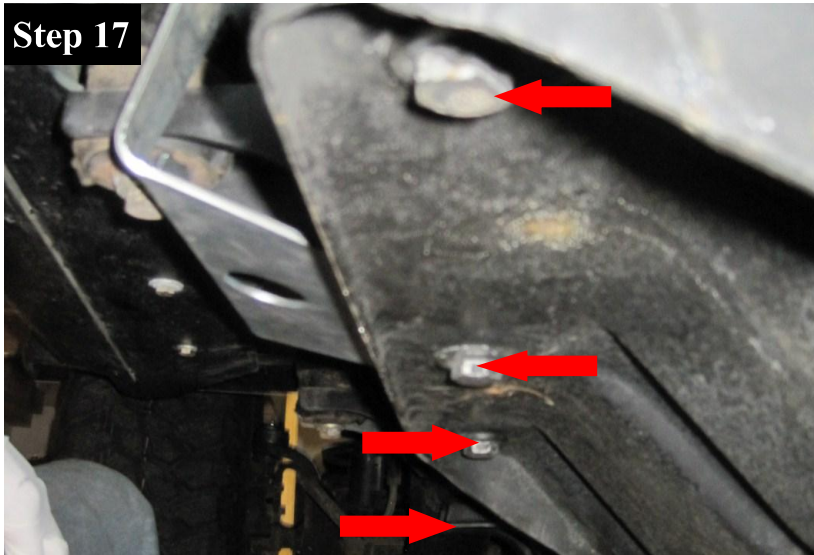
Loosen all the body mount bolts and remove the driver side bolts including the grill body mount bolt.

Support and raise the vehicle at the rocker guard area and slip the Frame C over the body mount location. (green arrow) Make sure it will not get snagged and bind in any way.

Lower the vehicle onto the body mounts and loosely install only the driver side body mount bolts. Repeat the previously mentioned steps to install the passenger side Frame C.

Tighten all body mount bolts to 35 ft-lbs.

**Step 17**



At this point SLOWLY raise the drivetrain at the output shaft of the transfercase so that the transmission studs are clear of the transfercase skid.

Support the drivetrain at the bell housing using an appropriate jack stand.

With a supported drivetrain, remove the 6 transfer skid bolts and the 2 bolts supporting the transmission skid using an 18mm socket. (locations of bolts are on the other side of the vehicle)

**Step 18**



The Frame Cs (I) are a tight fit. On the driver side of the vehicle, use a flat head screwdriver as a shoehorn to snap the Frame C onto the frame.

**Step 19**



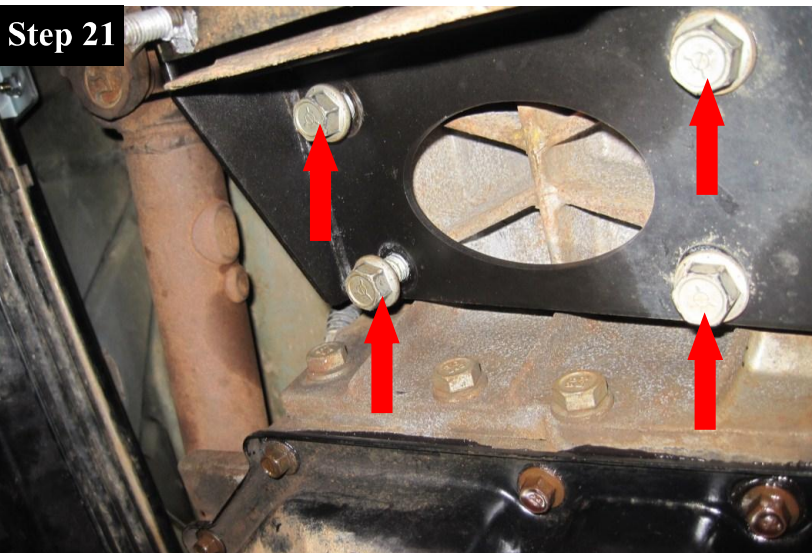
Using a rubber mallet tap the Frame C (I) so that it is centered in the frame nutsert. Now install the passenger side Frame C.

**Step 20**



On the passenger side, Using a rubber mallet tap the Frame C (I) so that it is centered in the frame nutsert.

**Step 21**



Remove the 4 bolts (5/8 socket) that hold the transmission mount to the transmission. At this point you can slide the mount off the exhaust hanger.

You will need to remove the rubber bushing from the exhaust hanger and install onto the supplied exhaust hanger (L).



**Step 22**



Using a flat head screw driver as a shoehorn, carefully tug the exhaust hanger bushing from the stock transmission mount.

Apply some grease on the outside of the bushing so that it slides easily into the new exhaust hanger (L).

**Step 23**

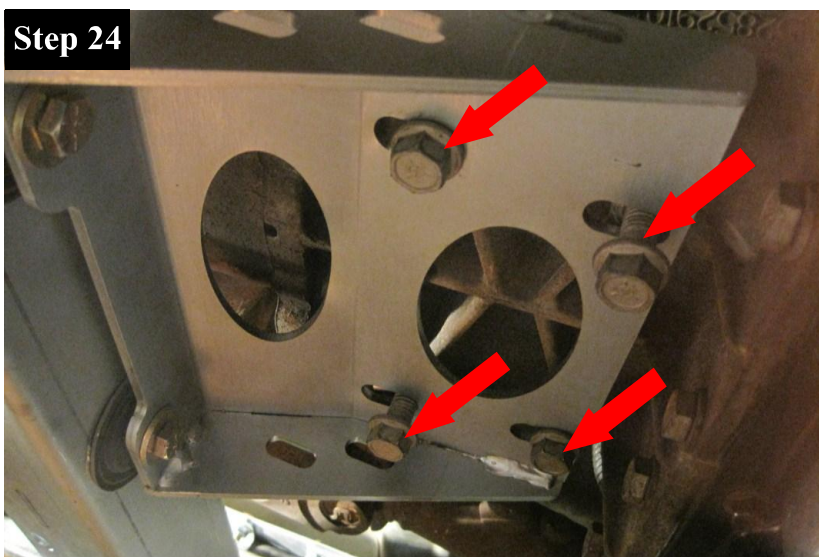


Push the rubber bushing onto the supplied exhaust hanger (L) as shown.

Loosely install the (2) 3/8 - 24 X 1" HHCS G8 Zinc Bolts, 3/8 heavy washers and 3/8 - 24 Flange Nuts.

The mount is slotted to allow for adjustability for the exhaust system.

**Step 24**



Loosely install the new transmission mount (K) with the exhaust hanger (L) onto the transmission using the stock transmission bolts removed previously.

Do not install any other bolts pictured at this time.

**Step 25**

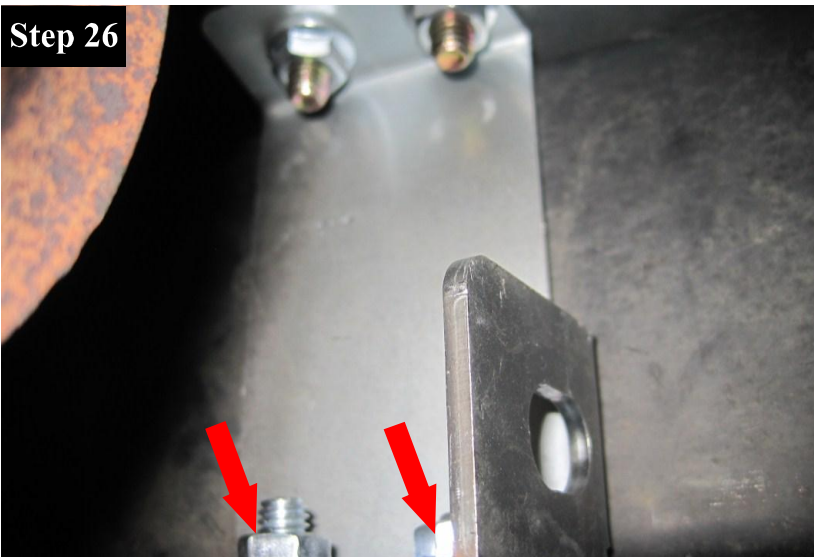


Working on the passenger side, slide the Frame Inner C Bracket (J).

Loosely install the (2) 5/16 - 18 X 3/4" HHCS G8 Zinc Bolts with 5/16 - 18 Flange Nuts as shown.

Note: A 13mm ratcheting wrench works well here.

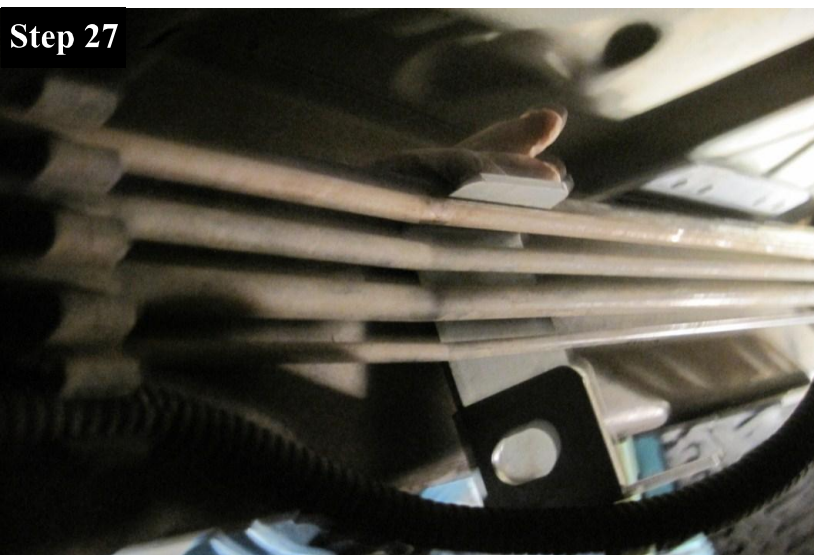
**Step 26**



Loosely install the (2) lower 5/16 - 18 X 3/4" Flat Head Phillips Screws with 5/16 - 18 Flange Nuts.

Note: If it's a snug fit take a rubber mallet and lightly tap the Frame Inner C Bracket (J) so that you can install one of the screws.

**Step 27**



On the driver side, you can slip the Frame Inner C Bracket (J) onto the frame where the frame begins to bend at the rear of the vehicle.

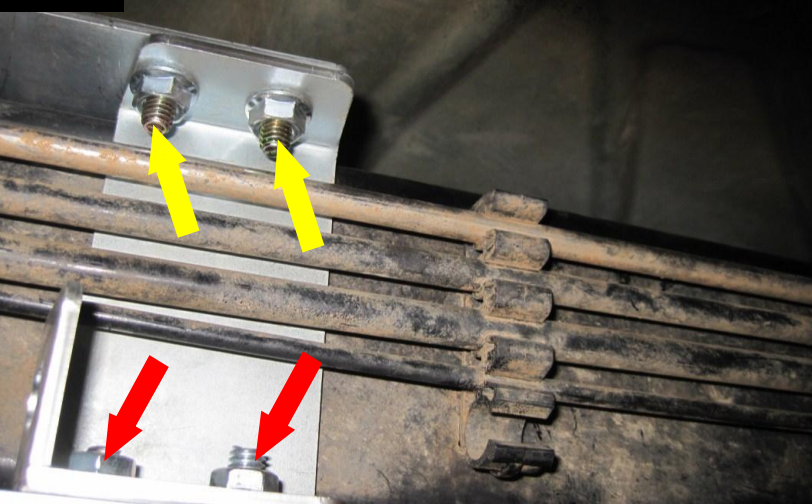


**Step 28**



Slide the Frame Inner C Bracket (J) all the way down to the Frame C (I).

**Step 29**

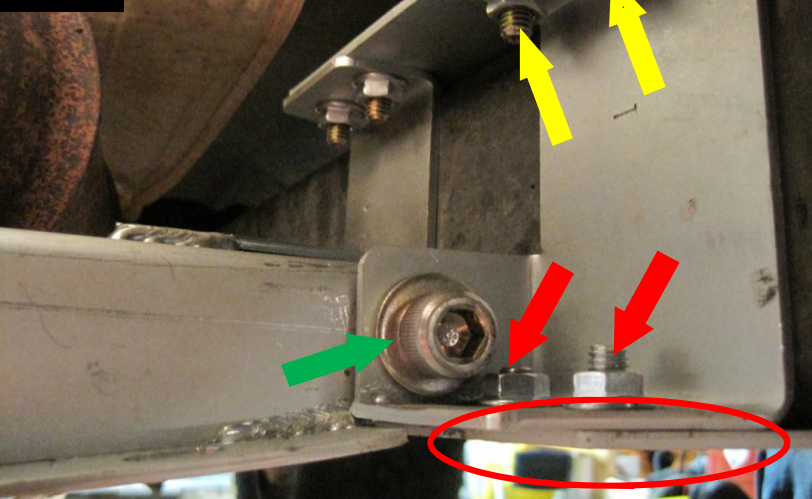


Loosely install the (2) 5/16 - 18 X 3/4" HHCS G8 Zinc Bolts with two 5/16 - 18 Flange. (yellow arrows)

Loosely install the (2) lower 5/16 - 18 X 3/4" Flat Head Phillips Screws with 5/16 - 18 Flange Nuts. (red arrows)

If it's a snug fit take a rubber mallet and lightly tap the Frame Inner C Bracket (J) so that you can install one of the screws.

**Step 30**



At this time you can slide the Crossmember (H) onto the Frame C (I) and then the Frame Inner C Bracket (J) . Note that the sloped edge of the Frame C matches the Frame Inner C Bracket. (red circle)

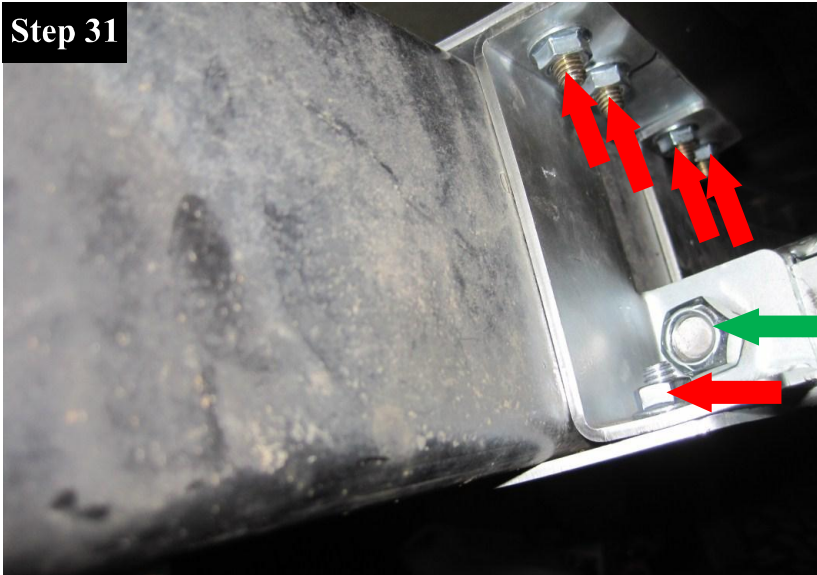
Start by loosely installing the (2) 5/16 - 18 X 3/4" HHCS G8 Zinc Bolts with 5/16 - 18 Flange Nuts. (yellow arrows)

Loosely install the (2) lower 5/16 - 18 X 3/4" Flat Head Phillips Screws with 5/16 - 18 Flange Nuts. (red arrows)

Now loosely install the 1/2 - 13 X 2 1/2" S/S SHCS, 1/2 washer and 1/2 - 13 Flange Nuts using a 3/8 allen wrench. (green arrow)

Do the same on the driver side of the vehicle.  
HHCS = Hex Head Cap Screw SHCS = Socket Head Cap Screw

**Step 31**



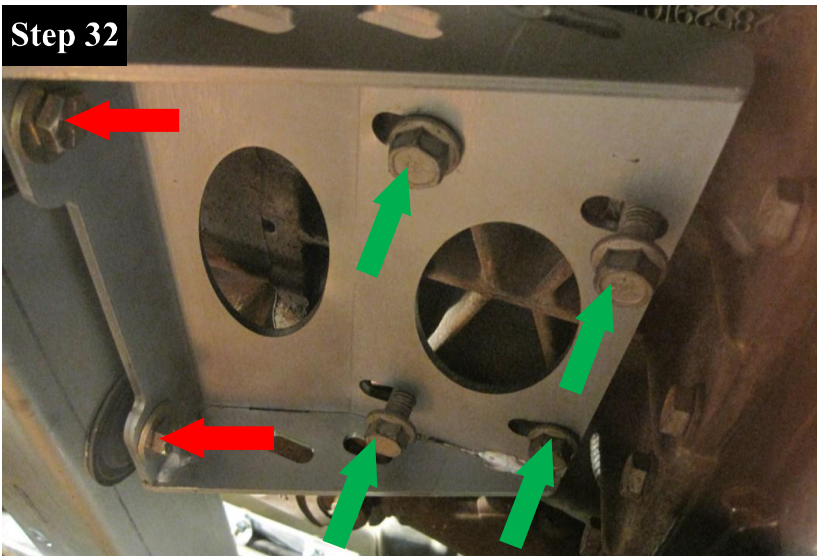
At this point tighten the 1/2 - 13 Flange Nut on each side of the vehicle. (green arrow)

Now you can tighten up the (4) 5/16 - 18 Flange Nuts and the (4) lower 5/16 - 18 Flange Nuts on each side of the vehicle. (red arrows)

Note: There are two lower 5/16 - 18 Flange Nuts on the other side of the Crossmember (H) not shown in this picture.

If you are unable to tighten the 1/2 - 13 flange nut due to interference with the lower 5/16 flange nut you can remove these and tighten the 1/2 bolt. Then reinstall the removed 5/16 screw and flange nut.

**Step 32**



Slowly lower the driveline so that you can install the (2) 3/8 - 24 X 3" HHCS G8 Bolts, 3/8 heavy washers and 3/8 - 24 Flange Nuts. (red arrows)

Once you have these (2) bolts tighten, you can now tighten the (4) transmission bolts (green arrows). You can use removable lock tight on the transmission bolts.

HHCS = Hex Head Cap Screw

**Step 33**



Loosen the two exhaust hangers at the rear of the vehicle. They are located near the passenger rear upper control arm and behind the passenger rear tire.

Once these are loosen, support the exhaust system at the muffler and slowly raise the exhaust so that the catalytic converter is centered between the Crossmember (H) and the tub.

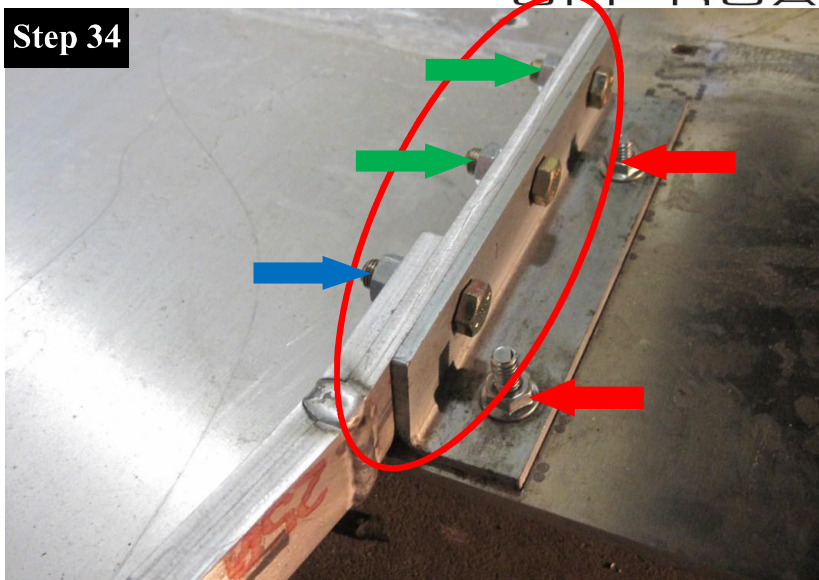
Now tighten the Exhaust Hanger (L) at the Transmission Mount (K).

Tighten the rear exhaust hangers that you previously loosen. As you lower the support on the exhaust system check for adequate clearance between the Crossmember (H) and the tub.

Note: You may have to try this more than once to gain the proper clearance. Now would be a good time to adjust your pinion angles and you can drive the vehicle with the Crossmember installed.



**Step 34**



Its time to attach the Wings (C) to the Main Skid (A). To join the Wing to the Main Skid, you will need to use a Wing Angle Brace (E).

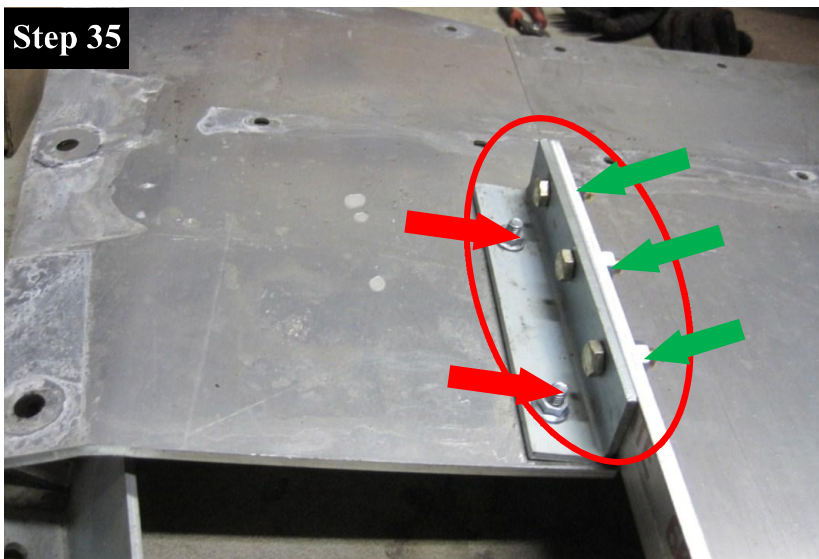
Attach the Wing Angle Brace to the Main Skid using (2) 3/8 - 24 X 1" HHCS G8 Zinc Bolts and 3/8 - 24 Flange Nuts. (green arrows)

Install the 3/8 - 24 X 1 1/4" HHCS G8 Zinc Bolt and 3/8 - 24 Flange Nut. (blue arrow)

Loosely attach the Wing to the Wing Angle Brace using (2) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts. (red arrows)

Only tighten the 3/8 Bolts at this time. Move on to the other side.

**Step 35**



Attach the other Wing Angle Brace (E) to the Main Skid (A) using (3) 3/8 - 24 X 1" HHCS G8 Zinc Bolts and 3/8 - 24 Flange Nuts. (green arrows)

Loosely attach the Wing to the Wing Angle Brace using (2) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts. (red arrows)

Only tighten the 3/8 Bolts at this time.

Note: be sure to install the correct Wing Angle Brace on each side of the Main Skid.

**Step 36**

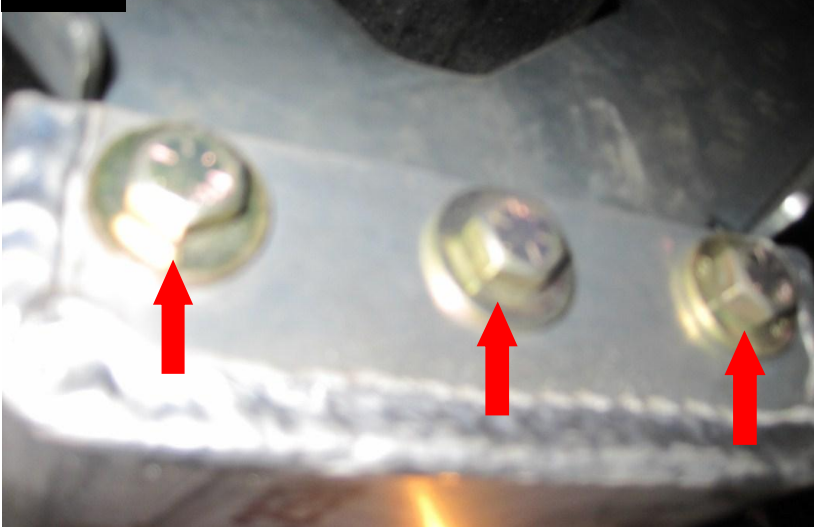


Using a jack you can support the Main Skid (A) with the Wings (C). Slowly raise the assembly and line up the Front Brace (F) and the Cross-member (H).

Do your best to line up the mounting holes of the Main Skid to the Front Brace.

Note: As you raise the Main Skid with Wings, check for clearance around your catalytic converter and the exhaust around the oil pan. You may find that when the assembly is fully raised there might be contact with the exhaust. If this is the case, go back to Step 33 and readjust your exhaust system.

**Step 37**



Loosely install the (3) 3/8 - 24 X 1" HHCS G8 Zinc Bolts, 3/8 Heavy Washers and 3/8 - 24 Flange Nuts.

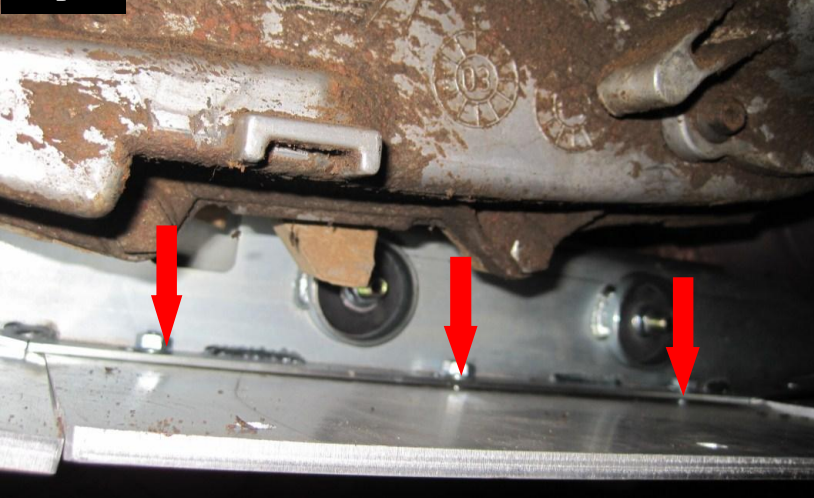
**Step 38**



Moving on to the back, you will find it will be initially difficult to line up the fasteners to the Crossmember (H).

Use a screwdriver and pry against the transfer-case and you will be able to install the first 5/16 - 18 X 3/4" Flat Head Phillips Screw. Doing so will keep the Main Skid (A) in position.

**Step 39**

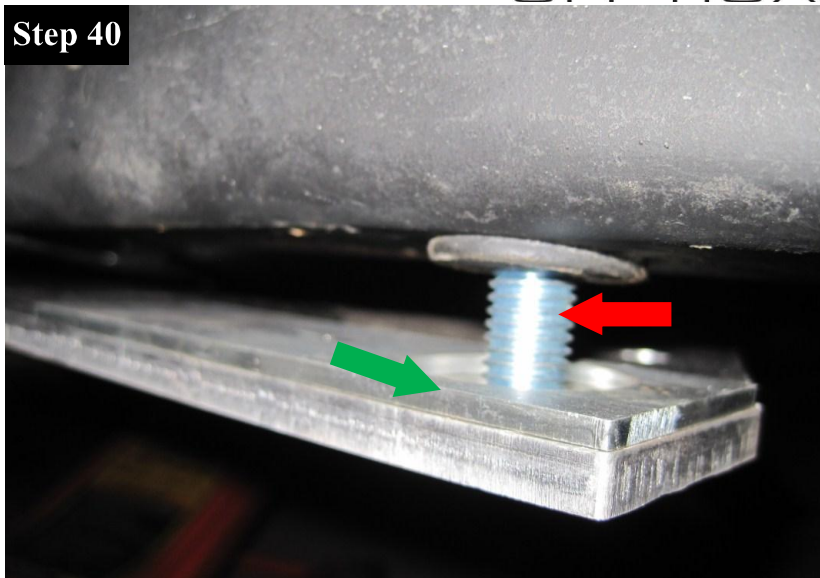


Loosely install the remaining (2) 5/16 - 18 X 3/4" Flat Head Phillips Screw and (3) 5/16 - 18 Flange Nuts.

Tighten these screws at this time.



**Step 40**



The Wing Spacers (D) are necessary for each end of the Wings (C) where they attach to the frame. (green arrow)

Note: Each Wing Spacer is cut at an angle to match against the Frame C (I). Verify that the Wing Spacer is installed in the correct orientation.

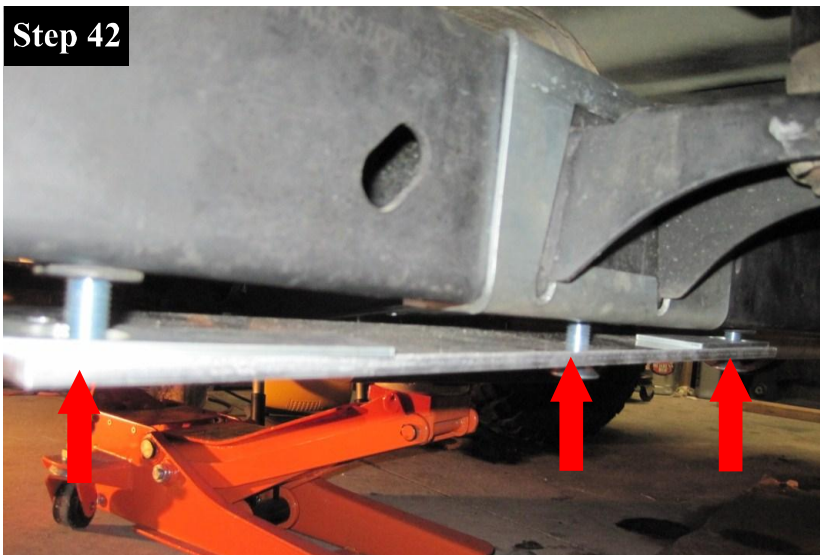
On the driver side of the vehicle, loosely install the 12mm X 1.75 X 40mm Flat Head Allen Screw using a 5/16 allen wrench and Wing Spacer. (red arrow)

**Step 41**



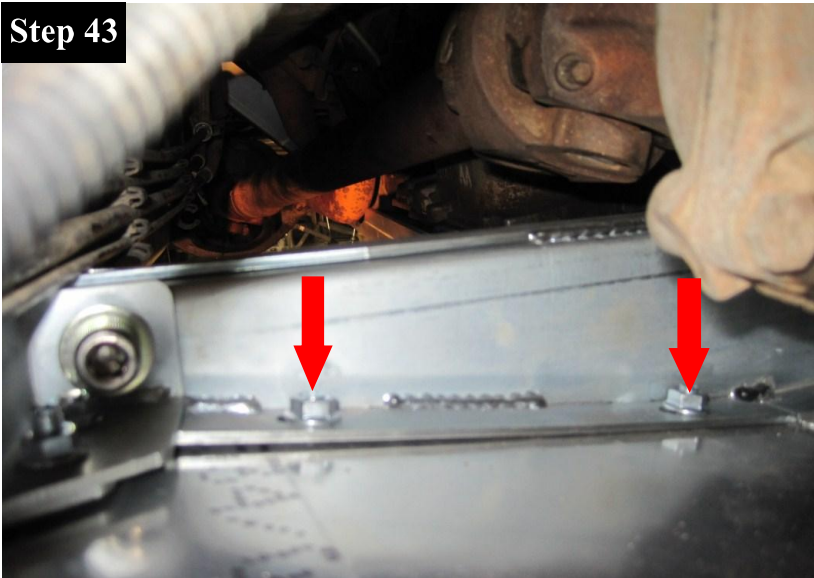
Loosely install the remaining (2) 12mm X 1.75 X 40mm Flat Head Allen Screws and Wing Spacers (D).

**Step 42**



Moving on to the passenger side of the vehicle, loosely install the (3) 12mm X 1.75 X 40mm Flat Head Allen Screws and Wing Spacers (D).

**Step 43**



On the driver side of the vehicle, loosely install the (2) 5/16 - 18 X 3/4" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

**Step 44**



On the passenger side of the vehicle, loosely install the (2) 5/16 - 18 X 3/4" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts. One is located behind the muffler and is not shown in the picture.

**Step 45**

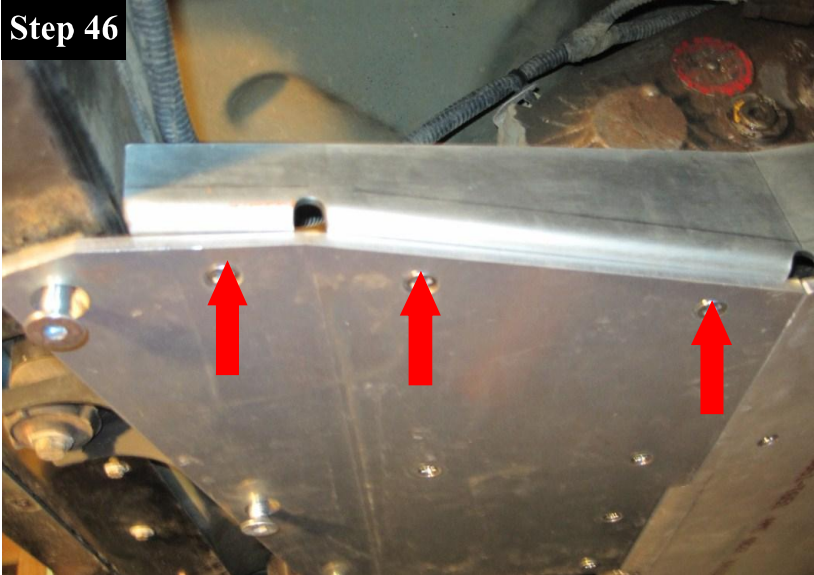


Slip the Rear Brace (M) onto the Main Skid (A). You may have to rotate it around the exhaust system to install it.

Once the Rear Brace is in the correct location, loosely install the (3) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts. (red arrows)

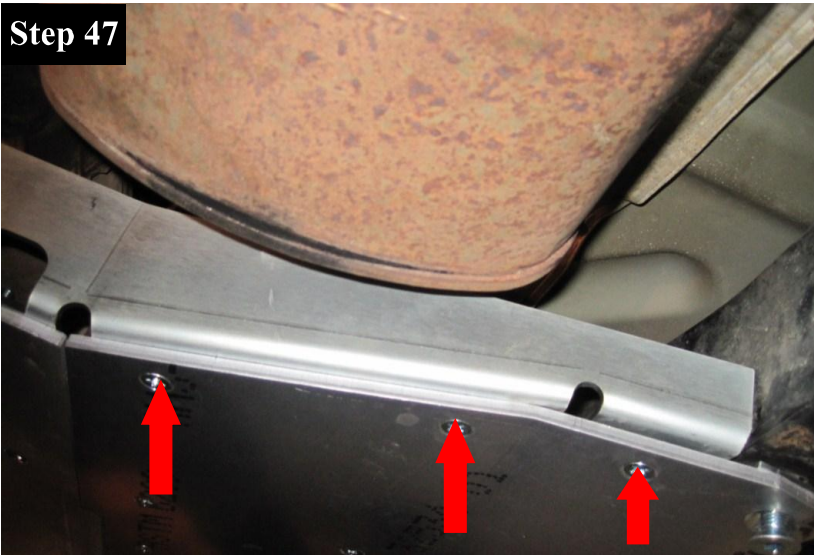


**Step 46**



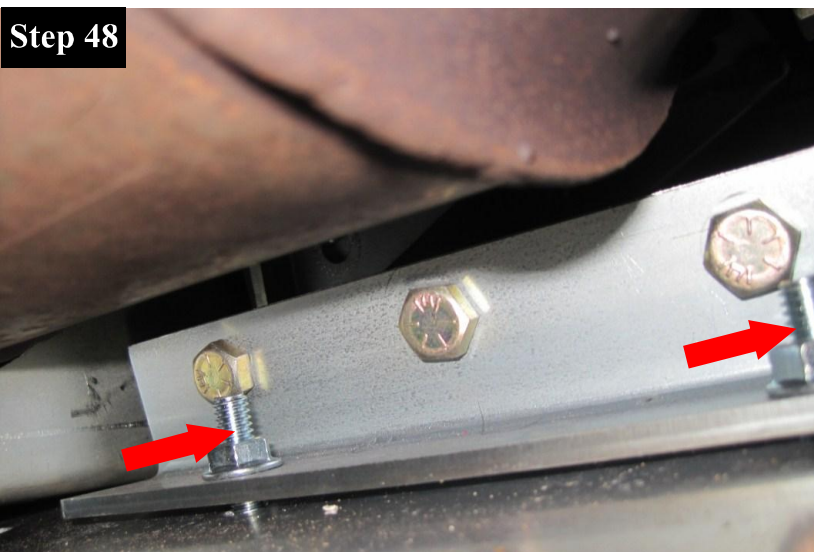
On the driver side of the vehicle, loosely fasten the Rear Brace (M) to the Wing (C) with (3) 5/16 - 18 X 3/4" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

**Step 47**



On the passenger side of the vehicle, loosely fasten the Rear Brace (M) to the Wing (C) with (3) 5/16 - 18 X 3/4" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

**Step 48**



Now begin the tightening sequence. Tighten the (2) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

**Step 49**



On the driver side, tighten the (2) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

**Step 50**



Tighten the (2) 5/16 - 18 X 3/4" Flat Head Phillips Screw and (2) 5/16 - 18 Flange Nuts.

**Step 51**



On the passenger side of the vehicle, tighten the (2) 5/16 - 18 X 3/4" Flat Head Phillips Screw and (2) 5/16 - 18 Flange Nuts. One fastener is located behind the exhaust system and is not shown in the picture.

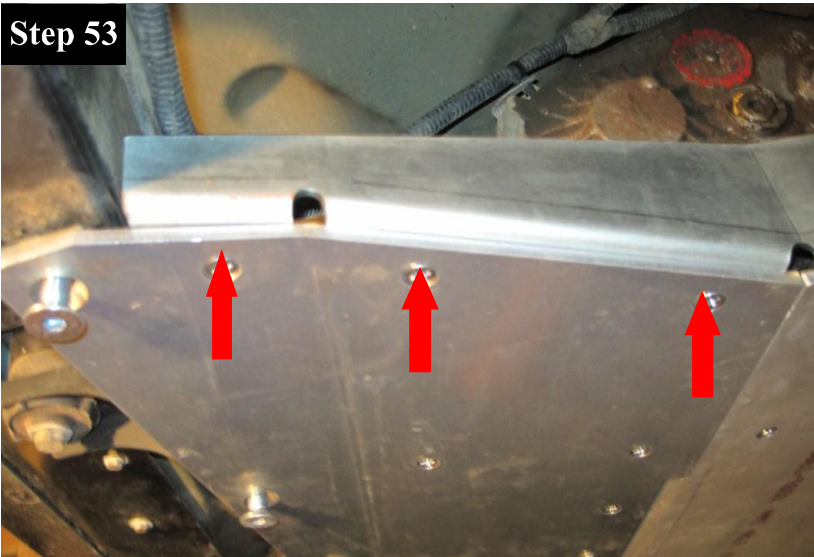


**Step 52**



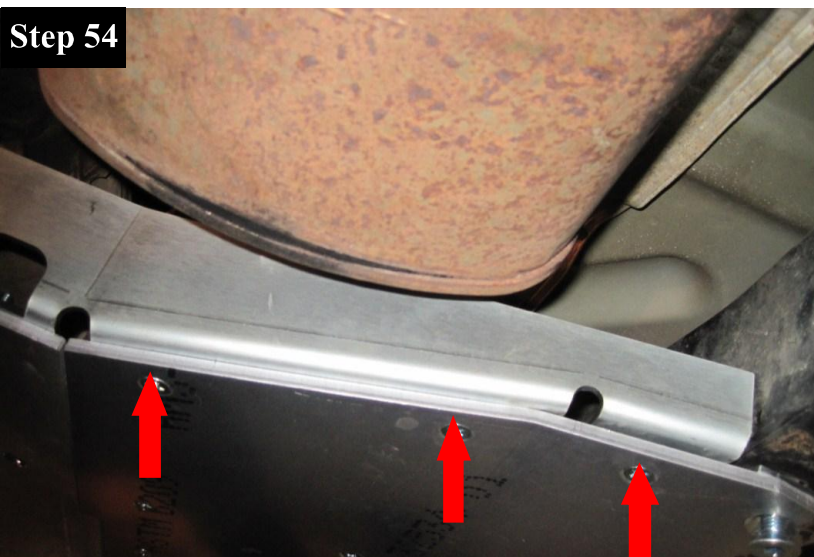
Tighten the (3) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

**Step 53**



On the driver side of the vehicle, tighten the (3) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

**Step 54**



On the passenger side of the vehicle, tighten the (3) 5/16 - 18 X 1" Flat Head Phillips Screws and 5/16 - 18 Flange Nuts.

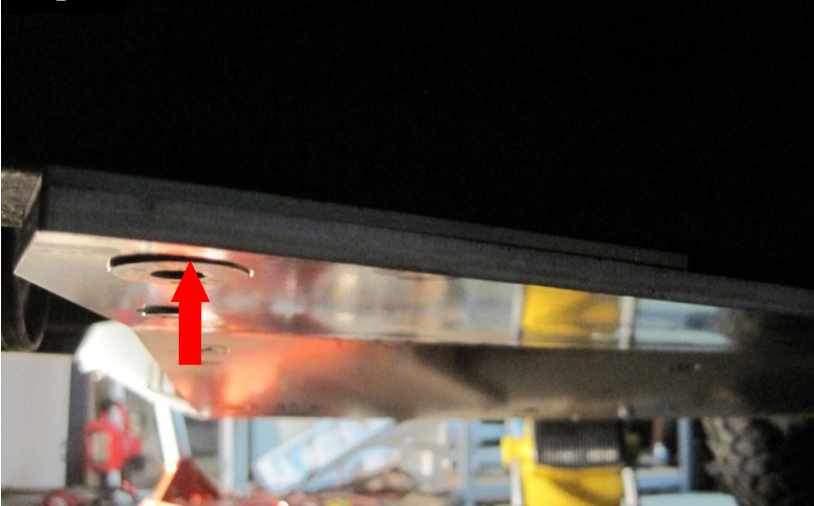
**Step 55**



Rotate the Wing Spacer (D) outwards and begin tightening the 12mm X 1.75 X 40mm Flat Head Allen Screw. As you tighten the bolt make sure that the Wing Spacer (D) is centered around the frame nutsert.

As the Wing Spacer becomes wedged by the Wing rotate the Wing Spacer so that it is flush with the Wing.

**Step 56**



Tighten the 12mm X 1.75 X 40mm Flat Head Screw.

Do the same procedure for the next 12mm X 1.75 X 40mm Flat Head Allen Screw.

**Step 57**



Tighten the middle 12mm X 1.75 X 40mm Flat Head Allen Screw.



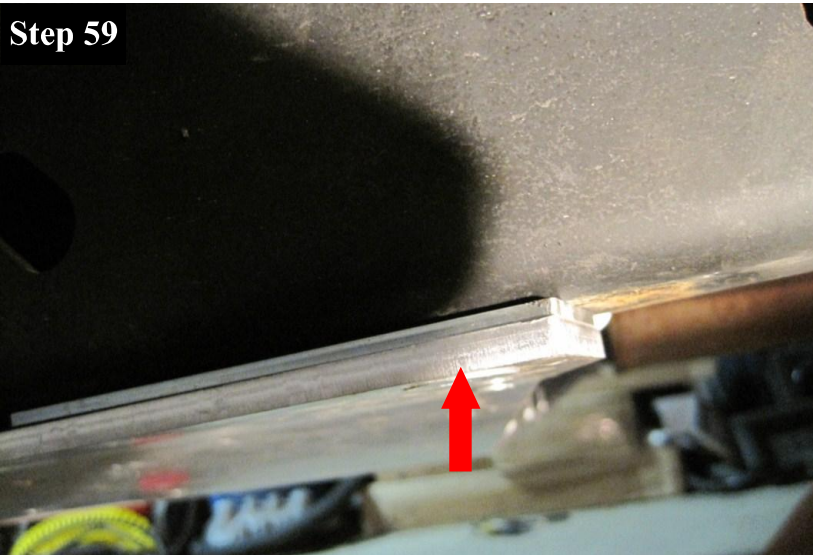
**Step 58**



On the driver side of the vehicle, rotate the Wing Spacer (D) outwards and begin tightening the 12mm X 1.75 X 40mm Flat Head Allen Screw. As you tighten the bolt make sure that the Wing Spacer (D) is centered around the frame nutsert.

As the Wing Spacer becomes wedged by the Wing rotate the Wing Spacer so that it is flush with the Wing.

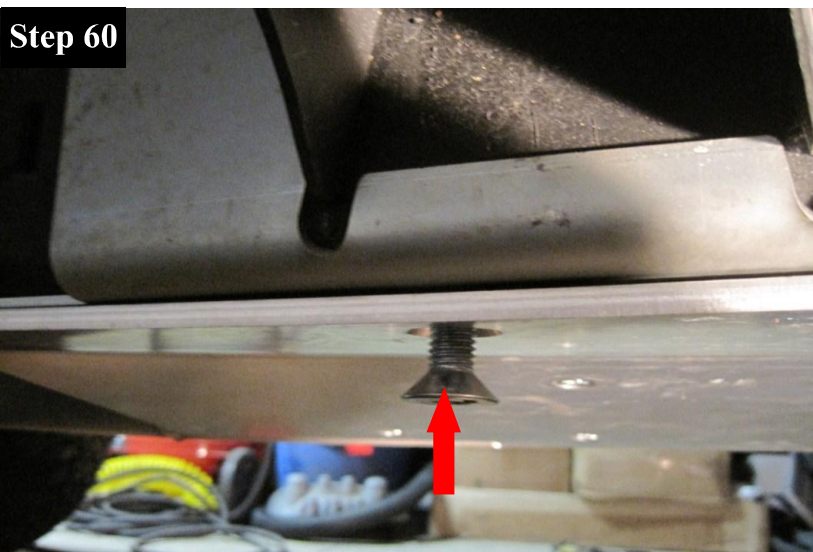
**Step 59**



Tighten the 12mm X 1.75 X 40mm Flat Head Allen Screw.

Do the same procedure for the next 12mm X 1.75 X 40mm Flat Head Allen Screw

**Step 60**



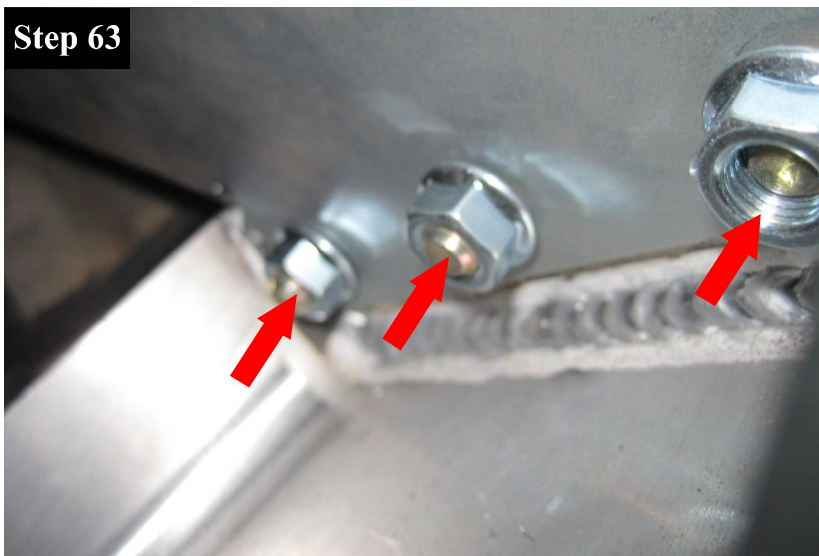
Tighten the middle 12mm X 1.75 X 40mm Flat Head Allen Screw.

**Step 62**



Moving to the middle of the Main Skid (A), install the Drain Cover with the (4) 5/16 - 18 X 1" Flat Head Phillips Screws and (4) 5/16 - 18 Flange Nuts.

**Step 63**



Tighten the (3) 3/8 - 24 X 1" HHCS G8 Zinc Bolts, 3/8 Heavy Washers and 3/8 - 24 Flange Nuts.

Reinstall your fan shroud, radiator overflow bottle and hood light.

Upon start-up verify that you have adequate clearance for your exhaust system.

If you have any issues, see the Appendix.





## Appendix: Installation Issues and Solutions

**Issue: Fan contact while driving—** Even though you might not have contact between your cooling fan and fan shroud, you may notice contact noise while driving. Since the body is supported above the frame it allows the tub to flex independently of the frame. The front end of the vehicle is supported by one body mount located underneath the grill. While driving, it is possible that the vibrations causes the fan to contact the bottom lip of the fan shroud. In addition, the installation of the Savvy Under Armor it creates a flatter driveline that naturally points the fan towards the lower fan shrouds. At a minimum you need 1/4" gap between your fan and fan shroud.

**Solution—** The best solution is to lower the fan shroud. Remove the fan shroud and slip it out from the cooling fan. You may have to remove the cooling fan to get the fan shroud out. Once removed, use a drill bit to create slotted holes so that you can adjust your fan shroud. Reinstall your fan shroud and adjust it so that it is centered around cooling fan.

**Issue: Vibration while idling—** If you notice or feel more than the anticipated vibration at idle you may have contact between the tub and the drivetrain or through the transfer case linkage.

**Solution—** Verify that transmission is clear of the transmission tunnel. Make sure there is at least 1/4" clearance around the transmission tunnel. With the installation of the Savvy Body Lift you should have no drivetrain contact issues. Verify that your currently installed body lift measure 1.25 inches.

Sometimes your transfer case linkage can be bound up causing vibrations against the tub. Ideally the linkage should be close to horizontal allowing for bind free operation. To isolate the vibration source, disconnect the transfer case linkage and check for vibration. If the source is the transfer case linkage try adjusting the set screw on the shift rod. If you vibrations persist, we suggest installing the Novak 231 shifter for a smooth bind free transfer case operation.

**Issue: Vibration while driving—** Most driveline vibrations while the vehicle is in motion is caused by driveline angles. Due to the flatter driveline most stock drive shafts cannot be adjusted to eliminate vibrations. A double cardan drive shaft is necessary. If you already have a double cardan drive shaft you may have an issue with your pinion angle or u-joints. A driveline vibration will have a droning sounds that will phase in and out as you change speed. Typically it is noted at 20 MPH and between 40-50MPH. Drive shaft issues (lost weights, bad u-joints) typically increase in vibration when you increase speed. Another source of vibrations can be out of balance tires. Vibrations from tires are typically slower vibrations.

**Solution—** For a stock driveshaft your transfer case output angle must be the same as your pinion angle. If your u joint angle is too steep you will need a double cardan rear drive shaft. With a double cardan drive shaft, verify your pinion angle should be equal to your drive shaft angle. Also, verify that your u-joints have no play in them and that you have no lost any driveshaft balance weights. Out of balance tires should be road forced balanced at your local tire shop. Inspect your tires for any missing wheel weights.

**Issue: Exhaust rattle while idling/driving—** Due to variation in the TJ exhaust systems you may notice vibrations at idle or while driving that cannot be corrected. Slowly follow your exhaust system from the front of the vehicle to the rear and look for potential contact spots. The most common contact spot is at the front passenger upper control arm. Note all areas that have less than 1/4" of clearance.

**Solution—** You can attempt to loosen the entire exhaust system at the y-pipes near the catalytic convertor, at the muffler flange and both rear hangers. Use pieces of wood to brace the exhaust system providing the clearance needed. Start tightening the exhaust system from the front of the vehicle to the rear. If you are unable to eliminate the exhaust rattle more than likely you will need some simple custom exhaust work. Make a trip to your local exhaust shop and explain to them where your is making contact. Your exhaust shop should be able to move your exhaust system to stop all rattling.