



SYNERGY MFG. 870 INDUSTRIAL WAY, SAN LUIS OBISPO, CA (805) 242-0397

## 8580 – 03-12 DODGE 2500/3500 4X4, 06-08 1500 MEGACAB 4X4 LONG ARM SUSPENSION KIT

V3.0

### **GENERAL NOTES:**

- These instructions are also available on our website; [www.synergymfg.com](http://www.synergymfg.com). Check the website before you begin for any updated instructions and additional photos for your reference.
- The installation of this kit requires cutting, grinding and drilling. All of the factory control arm brackets will be removed for installation. A 4-1/2" angle grinder with cutoff wheel works best, but a plasma cutter or oxy – acetylene torch can be helpful in some areas.
- This kit is designed to be used in conjunction with 8585 Dodge Long Arm front upper control arms, and 8583 Dodge Long Arm front lower control arms.
- Installation of this kit will require slight trimming of the forward cab mount as well for control arm clearance at full bump.
- This kit can be run with no bump stop spacers and no lift if desired. The following instructions document an install on a 2010 Dodge 2500 4x4 with 3" of lift and no bump stop spacers.
- The use of this long arm kit in conjunction with adjustable control arms, replaces the need for cam bolts. We recommend using Synergy Cam Bolt Eliminator Kit (8560-16 or 8560-18) in conjunction with this long arm kit.

### **PARTS LIST:**

- **8581 DODGE LONG ARM BRACKETS 03-13**
  - (1) 858101-L Drivers side control arm bracket
  - (1) 858101-R Passenger side control arm bracket
  - (2) 858102-01 Control arm bracket nut tab, bottom
  - (2) 858103-01 Control arm bracket nut tab, side
  - (2) 858101-08 Control arm bracket, frame spacer plate
  - (1) 858104-L Drivers side cross member bracket
  - (1) 858104-R Passenger side cross member bracket
  - (4) 858105-01 Frame Sleeve
  - (2) 858101-08 Control arm bracket, spacer tab
  - (1) 8581-HDW 03-13 Dodge long arm bracket hardware kit
    - (2) 9/16-12 UNC x 4.0" long hex head bolt
    - (2) 9/16-12 UNC Stover nut
    - (4) 9/16-12 UNC Flange nut
    - (8) 9/16" flat washer
    - (4) 1/2-13 UNC x 4.0" long hex head bolt
    - (4) 1/2-13 UNC Stover nut
    - (14) 1/2" flat washer
    - (2) 1/2-13 UNC x 1.5" long hex head bolt
    - (4) 1/2-13 UNC x 1.0" long hex head bolt
    - (4) 9/16-12 UNC x 7.0" long hex head bolt
    - (2) 5/8-18 UNF x 4.0" long hex head bolt

- (2) 5/8-18 UNF stover nut
- (4) 5/8" flat washer

- **8583-02 DODGE 03-09 LONG ARM, FRONT LOWER CONTROL ARMS (16mm @ axle)**

- (1) 858302-L Assembled Dodge Long Arm, Left FLCA (2003-2009)
- (1) 858302-R Assembled Dodge Long Arm, Right FLCA (2003-2009)

OR

- **8583-03 DODGE 10-12 LONG ARM, FRONT LOWER CONTROL ARMS (18mm @ axle)**

- (1) 858303-L Assembled Dodge Long Arm, Left FLCA (2010-2012)
- (1) 858303-R Assembled Dodge Long Arm, Right FLCA (2010-2012)

- **8585 DODGE LONG ARM, FRONT UPPER CONTROL ARMS**

- (1) 858501-L Drivers side front upper control arm
- (1) 858501-R Passenger side front upper control arm

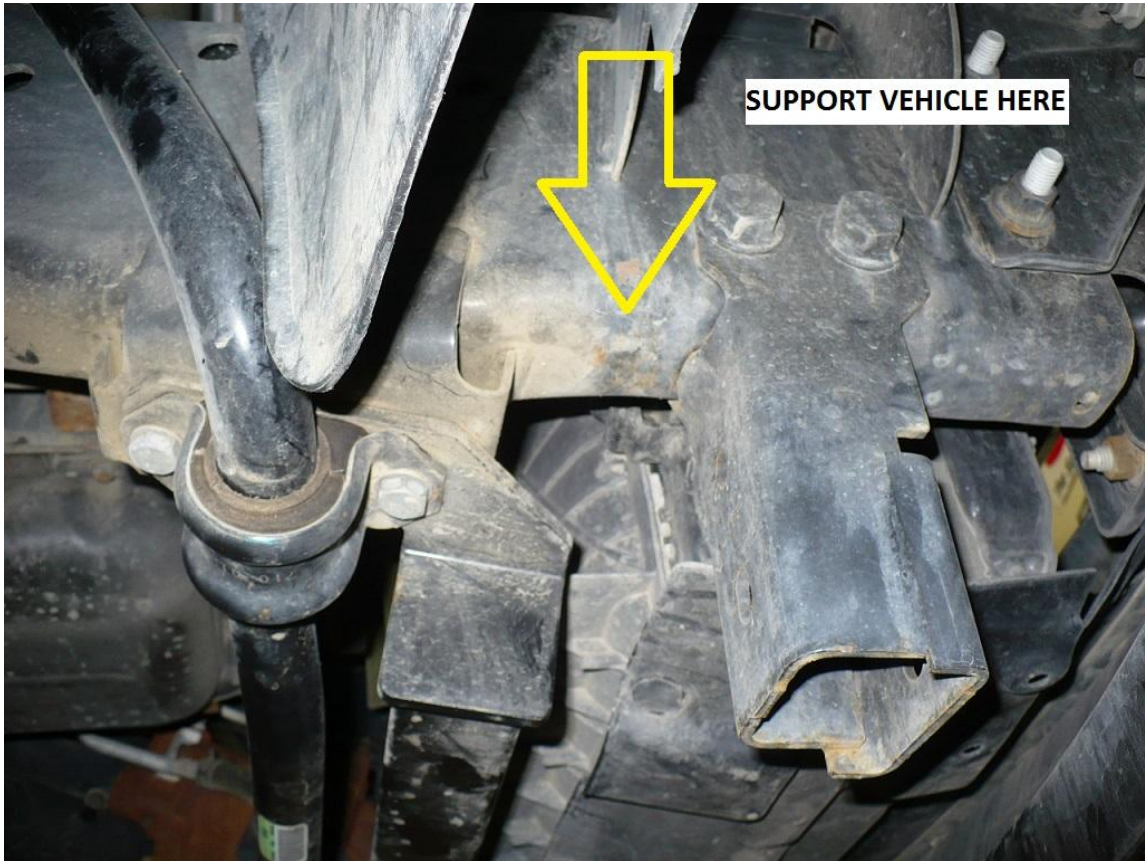
**Parts / Tools Needed to complete installation:**

- Basic simple hand tools.
- Drill with 1/2" – 9/16" drill bit.
- Quality jack and jack stands
- Torque wrench
- 4-1/2" angle grinder with cutoff wheel, grinding disc and sanding disc
- 1-1/4" Hole saw or plasma cutter / oxy acetylene torch **\*\* (See step 15)\*\***

**APPROXIMATE INSTALL TIME:** 10-12 hours

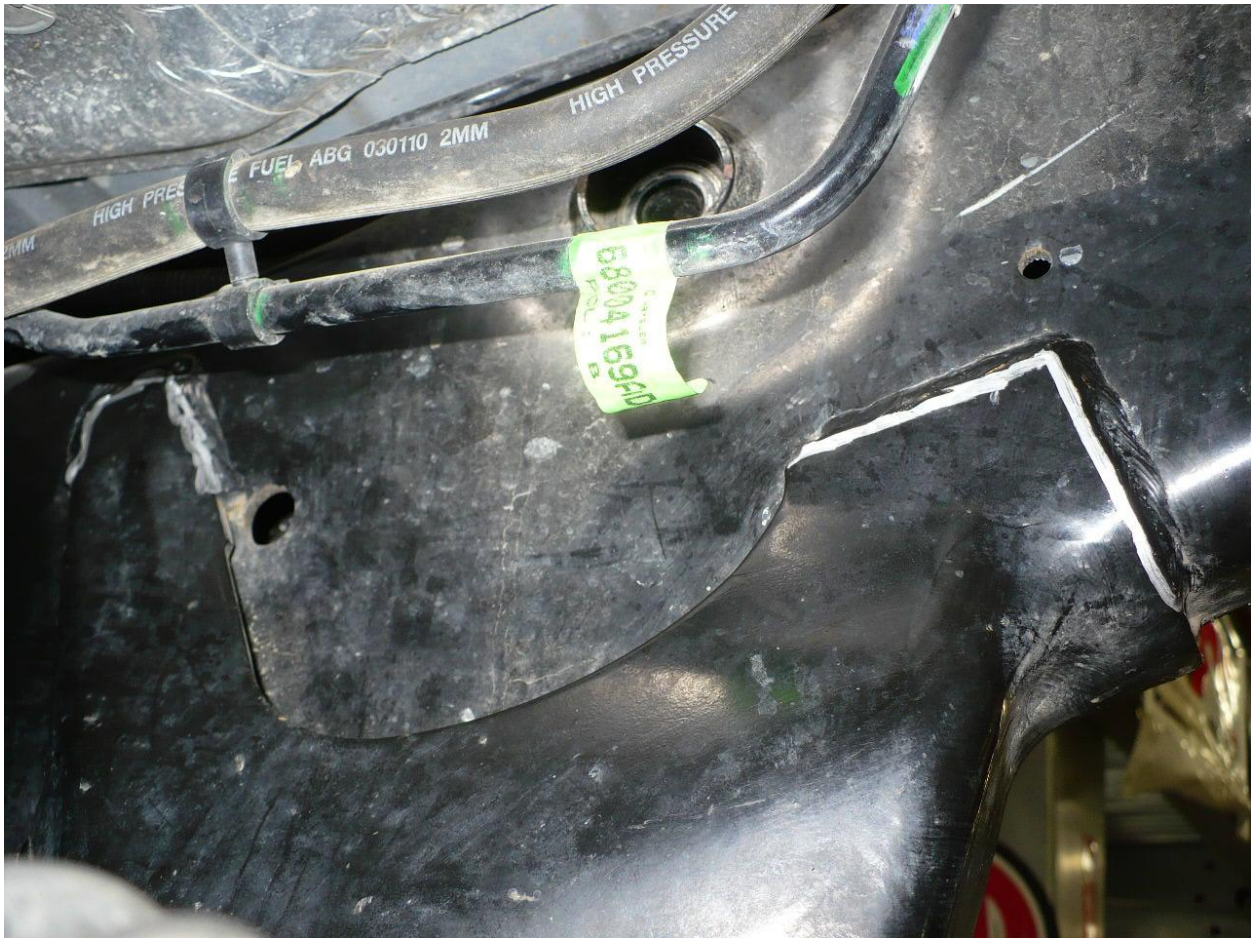
**INSTALLATION:**

- 1) Work on one side of the vehicle at a time. Begin on the drivers side.
- 2) Begin by safely jacking the vehicle up and supporting it to allow the front suspension to hang free. Remove the front tires.
  - Place jackstands at either the front of the vehicle or just behind the factory control arm mounts on the frame.



- 3) Begin by removing both upper and lower control arms on the drivers side.
- 4) Mark cut lines at the top of the welds as shown below.





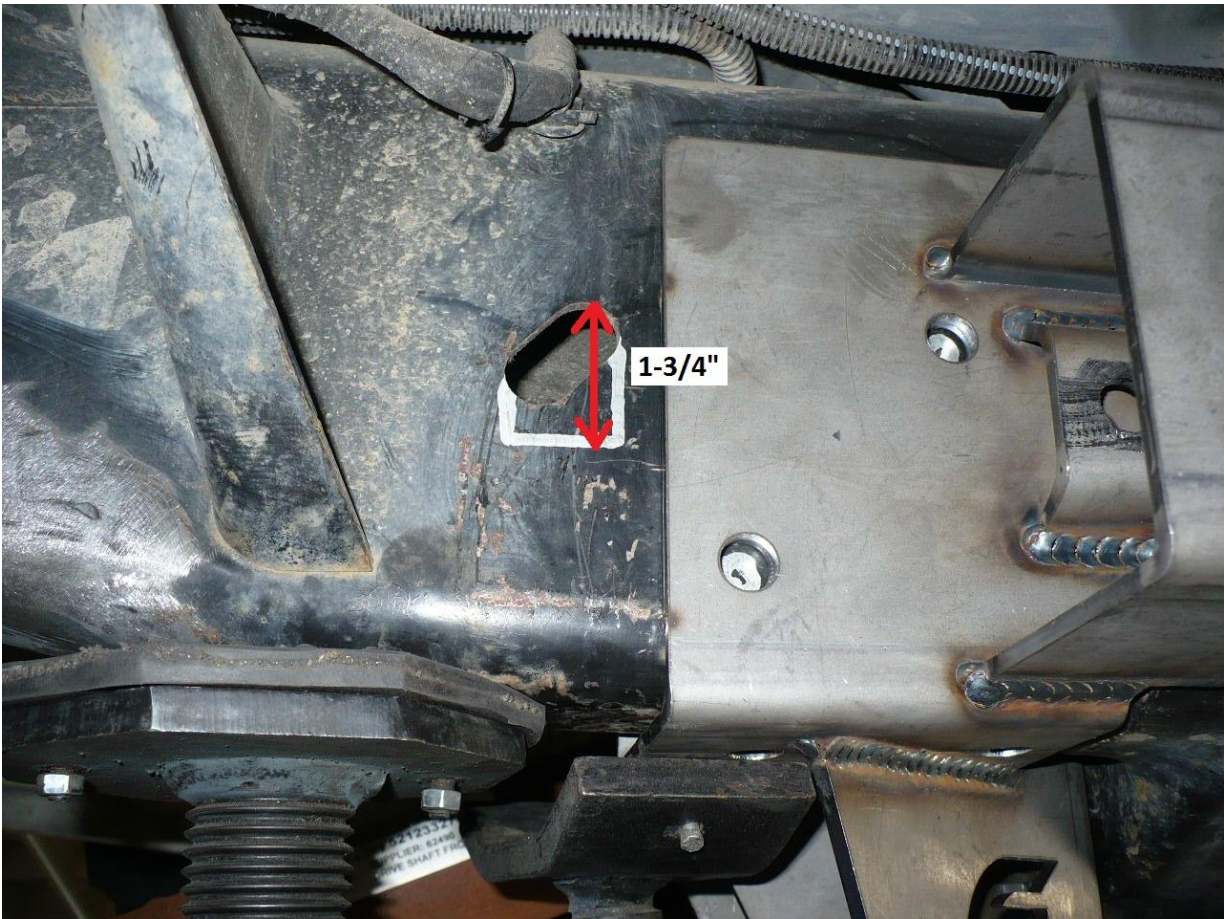
- 5) Using a 4-1/2" angle grinder with cutoff wheel, cut at the top of the weld. Be careful not to cut into the frame. Be careful not to damage any fuel or brake lines when cutting.
  - Once cuts have been made, strike the bracket with a hammer and knock the entire assembly off of the truck.



- 6) At this point there should just be a few welds left remaining on the frame. Note, the inside rear attachment point of the stock control arm bracket (circled in red below) can be left as pictured.



- 7) Grind the welds smooth where the factory control arm brackets were removed. Note, this is not necessary for installation, but aesthetically, makes for a cleaner install.
- 8) Open up the slot in the frame just forward where the new control arm bracket will sit. Note bracket is installed for reference but should not be installed yet at this time. Use a plasma cutter or oxy acetylene torch to open the holes as shown below in IMG 15.1. Or use a 1-1/4" diameter hole saw and drill out as shown in IMG 15.2. Clean up edges with a small dremel or die grinder.



IMG 15.1 Cut lines of notch to be made for nut tab installation



IMG 15.2 Hole saw location to drill for nut tab installation.

- 9) *Drivers side Body Mount Trimming* – Driver and passenger body mounts get trimmed differently, trimming of the drivers side body mount will be done first. On the rear flange of the body mount, measure up 2-3/4” from the frame and over 1-1/4” or to the bend flange.



- 10) On the front flange, measure 2-3/4” up from the frame and 1-1/2” over from the edge. Wrap measuring tape around bend to the 1-1/2” mark. Mark cut line and trim.





11) Trimmed drivers side body mount should appear as shown below.



12) Begin fitment of the new 8581 long arm bracket. Start by removing the nuts on the transmission cross member bolts. Note, if bolts are oriented with the nuts towards the rear of the vehicle, swap them around so the bolts are installed from the rear as pictured below.



13) Before installing bracket, pry off the brake / fuel line clip just forward of the transmission cross member



14) Using a pair of dykes or a razor blade, cut off the bottom barb as shown below. Do not fully press bracket back into frame at this time.



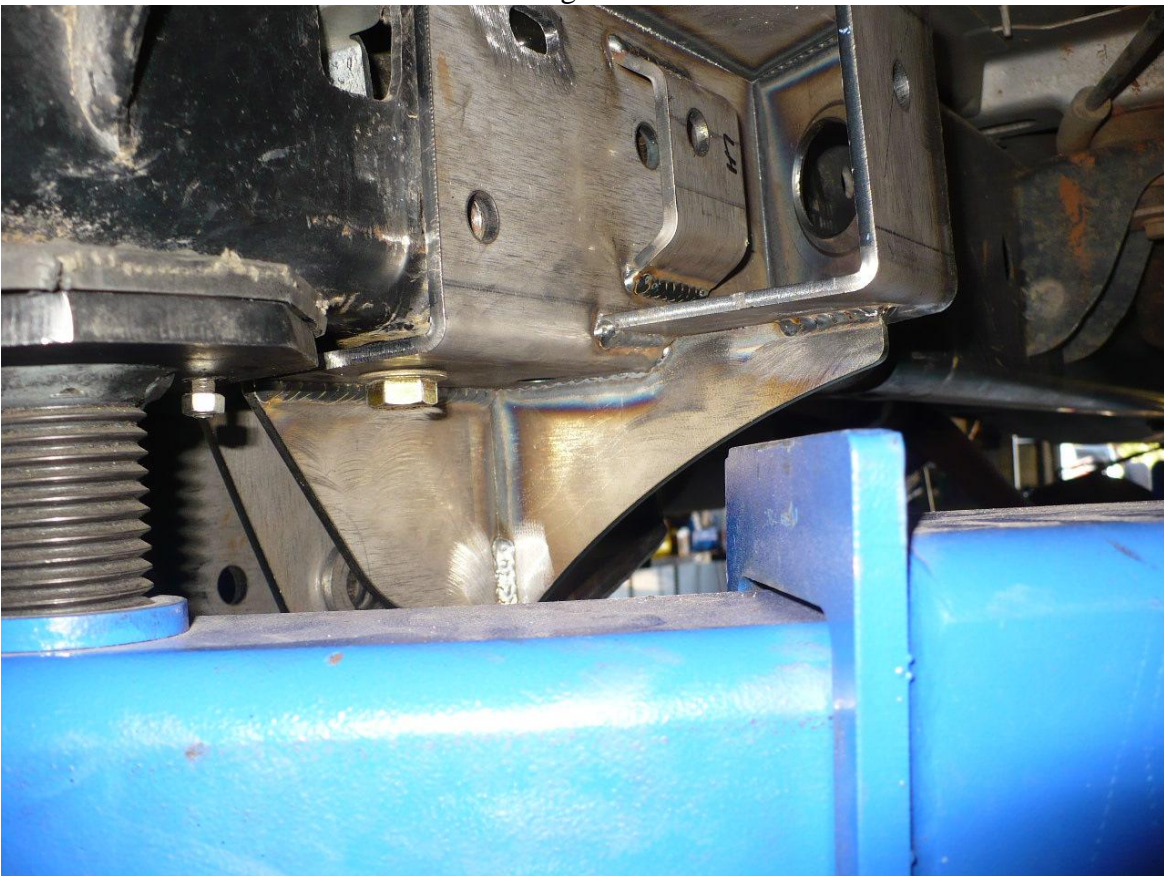
15) Install the control arm bracket by supporting the transmission cross member and removing the cross member bolts as shown below.



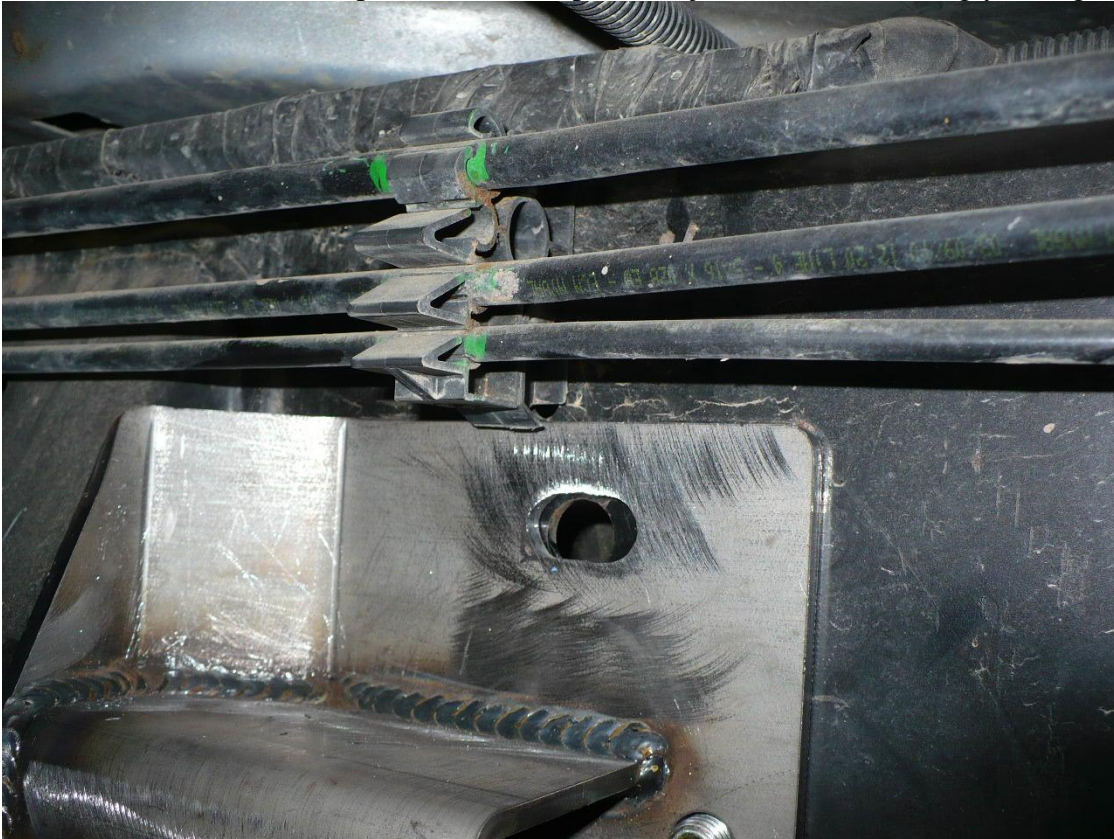
16) Use the bottom nut tab and factory hole circled in red in image 16.1 below to suck the bracket up to align with the inner frame hole in step 17.



Image 16.2



- 17) Note inner hole location on frame rail. The bracket should be aligned with this inside hole just below the frame rail brake / fuel line clip modified in step 10. Adjust bracket accordingly to align with hole.



- 18) Lastly, install the 8581-04 cross member / lower skid plate bracket and install both the cross member bolts and the 5/8 x 4.5" long bolt provided in the kit. See images 18.1 & 18.2 below. Do not tighten nut at this time. Just install to keep bolt in place.

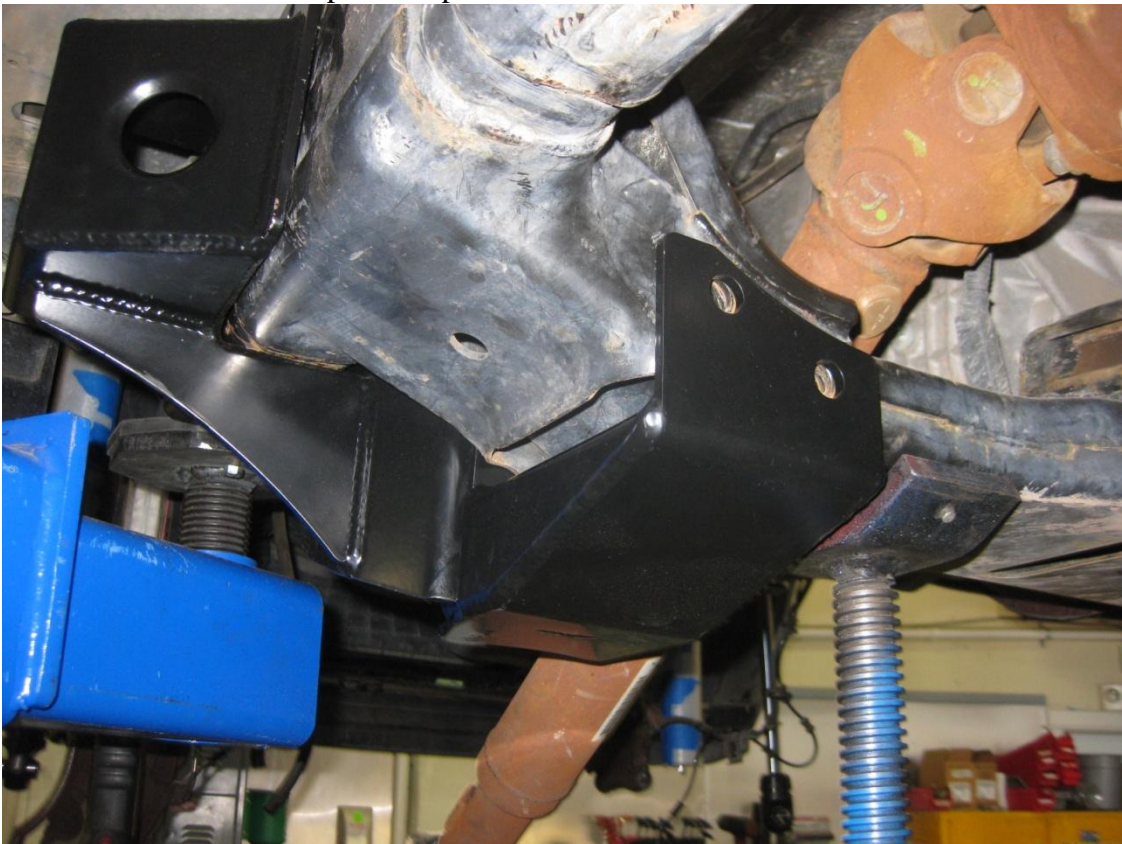


Image 18.1

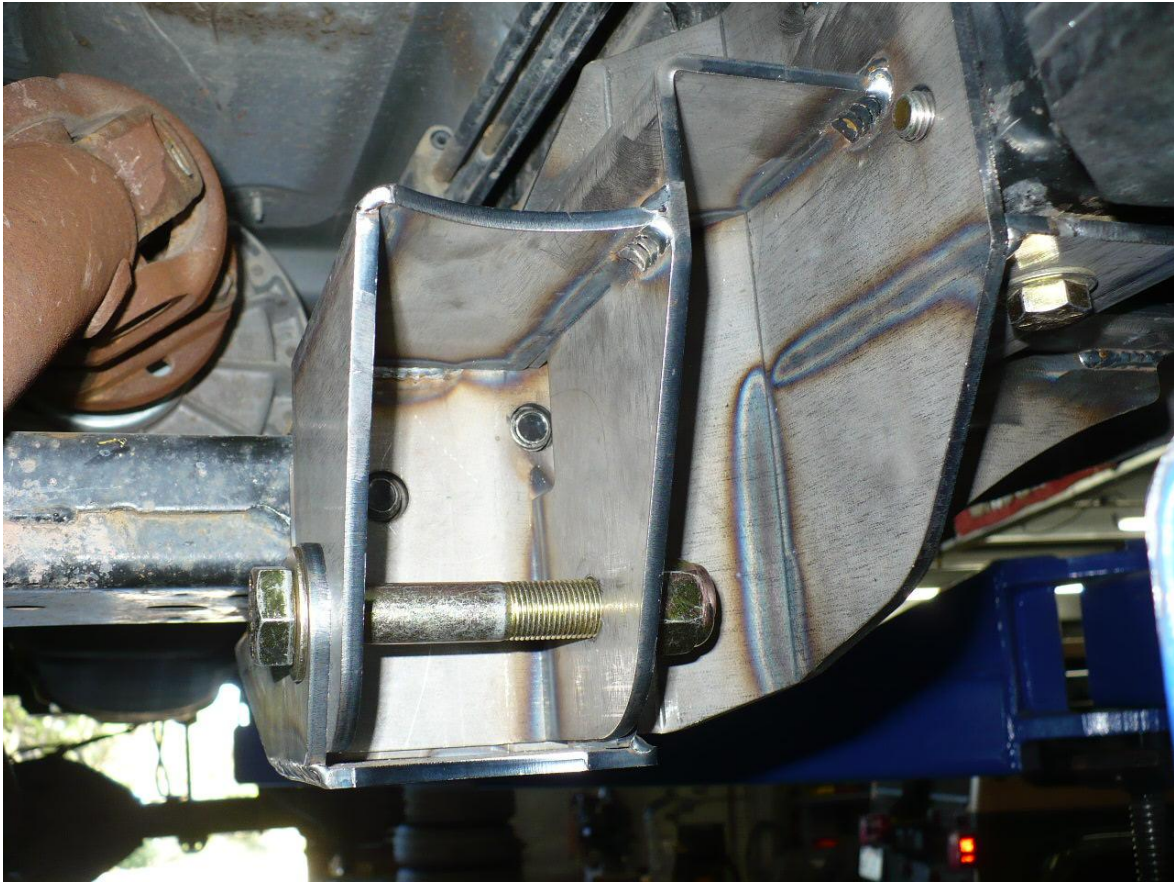


Image 18.2

19) With bracket positioned in place, use as a guide to mark and center punch all holes. There should be a total of 5 holes that need to be drilled. 1 on the bottom of the frame, 3 on the outside, and 1 on the inside.

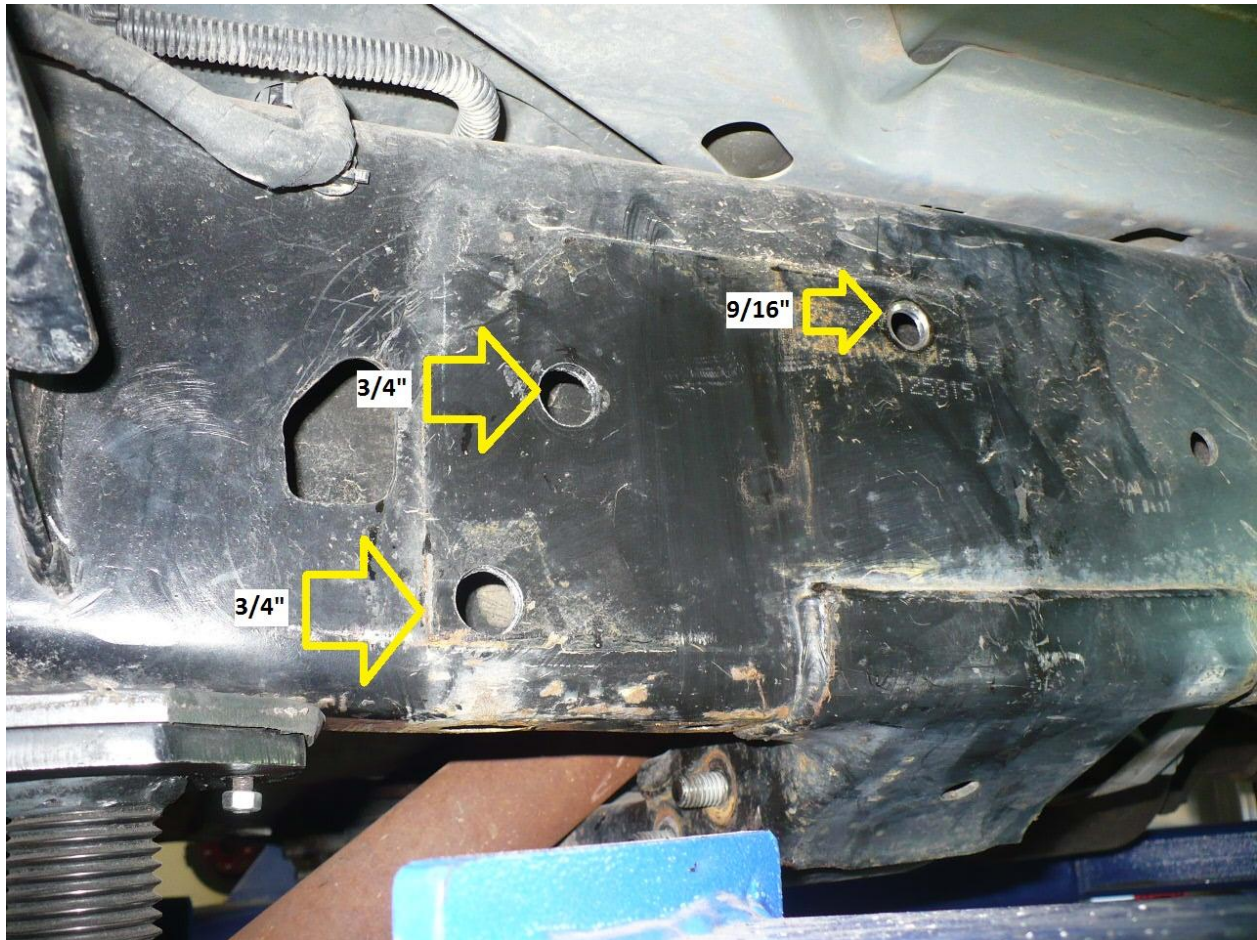


Bottom hole on frame bracket, note forward hole lines up with slot in frame.



Note slotted mid hole to compensate for frame hole variances. Note factory inner frame hole location for position of outer hole. Center of slot is ideal for most applications.

- 20) Once all holes have been marked and center punched, drill out all holes to a minimum of  $\frac{1}{2}$ ". Pilot holes can be drilled with the bracket in place, however there is risk of damaging the powder coat around the mounting holes. If this is a concern, remove the bracket from the truck prior to drilling.
- Note, for simplicity of installation, drilling holes slightly over  $\frac{1}{2}$ " makes for an easier install.  $\frac{17}{32}$ " drill bit is ideal,  $\frac{9}{16}$ " drill bit can be used at max.
  - The two forward outer frame holes are to be drilled to  $\frac{3}{4}$ " for frame sleeve installation. A step drill or  $\frac{3}{4}$ " hole saw works well for this application. See image below for reference.

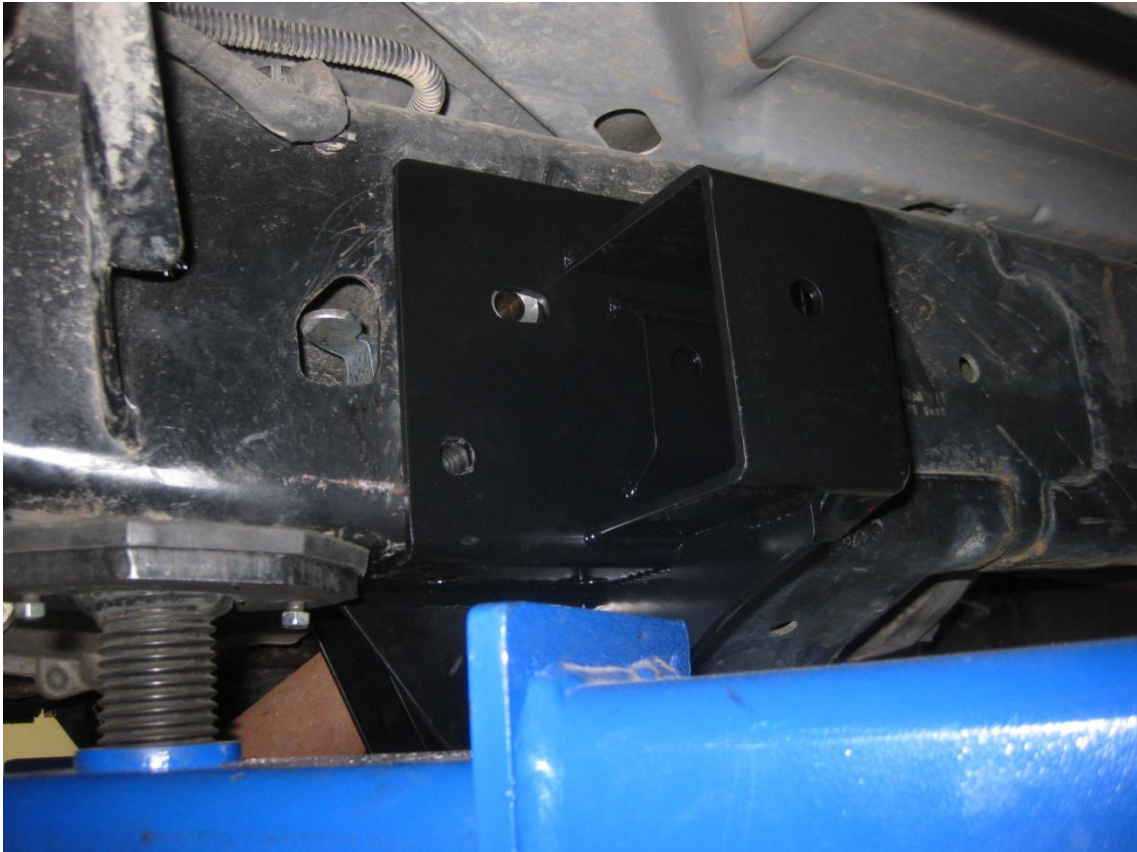


- 21) Paint any areas of exposed metal at this time. This includes any exposed areas from the factory control arm bracketry removal.
- 22) Install bottom nut tab and test fit frame sleeves to ensure holes were drilled straight and align correctly. If holes do not align properly from outside to inside, outer holes may need to be opened up slightly to allow frame sleeves some room to align.





- 23) With frame sleeves installed, reinstall control arm bracket in the same manner as step 16 above.
- Note, with the sleeves installed, you will likely need to tap the bracket into place using a rubber mallet or dead blow.



24) Once bracket is aligned with frame sleeves, install the  $\frac{1}{2}$ -13 UNC x 4" long bolts provided in the kit. Use a washer under the bolt head. Coat the bolt with antiseize before installing to allow for easy removal if need be at a later time.



25) Install the 858104 transmission cross member skid. Align holes and install the 9/16-12 UNC x 4.0" long bolts provided in the kit. Use a washer under the bolt head. Once through, install the 9/16-12 Flange nuts provided, but do not tighten. DO NOT use a washer under the flange nut.



26) Install 5/8-11 UNC lower control arm bolt through both transmission cross member skid and control arm mount. As shown. Start stover nuts on 1/2" through bolts as well. Use a washer under the 1/2" stover nuts.



- 27) Install the 858103-01 side nut tab and start one of the ½-13 UNC x 1.5” long bolts in the rear outer mounting hole. DO NOT tighten at this time.
- Note, there will be a gap between the control arm bracket and frame in this area, this will be addressed with a spacer tab in step 30.



- 28) Install the 2 bottom bolts into the bottom nut tab. Use the ½-13 UNC x 1.0” long bolts here. Be sure to use a washer under the bolt head.
- 29) At this time, all hardware should be loosely installed. Torque hardware in the following sequence to the following torque specs:
- 9/16-12 UNC x 7.0” long cross member bolts – 100 ft-lbs
  - ½-13 UNC x 1.0” long bottom bolts – 80 ft-lbs
  - ½-13 UNC x 4.0” through frame bolts – 80 ft-lbs.
- 30) For the rear upper nut tab bolt, insert 858101-08 spacer tab between control arm bracket and frame. Torque bolt to 80 ft-lbs.
- Note, at this time all hardware for control arm bracketry should be installed and torque to spec. You can now remove the 5/8” x 4.5 long control arm bolt from the bracket. This was installed to align and hold components in place during installation.



31) Reinstall fuel line bracket into frame if it hasn't been done already.

32) *Control Arm Installation* – Install the front lower control arm first. Note, the control arms come assembled at their shortest length. Install them at their shortest length and make all length adjustments with the arms installed using the double adjuster assembly. The arms are left and right specific. The Johnny joint goes at the frame end with the pinch bolt bungs pointed up.



- 33) Use the factory control arm hardware at the axle and the 5/8-11 UNC x 4.5" long bolt at the bracket. Use a washer under both the bolt head and stover nut. Install all hardware. Do not fully tighten at this time.
- 34) Install the upper control arm next, again install at the fully collapsed length. Install upper control arm as shown with the Johnny joint at the axle side and the bushing up at the frame side. Use the OEM bolt at the axle side and the 9/16-12 UNC x 4.0" long bolt at the bracket. Use a washer under both the bolt head and stover nut.



**DRIVER SIDE**

**PASSENGER SIDE**



- 35) *Passenger side* – Installation on the passenger side is very similar. Begin by following the same procedure in steps 2-8.
- 36) On the passenger side, the exhaust can cause some constraint issues when removing the factory control arm brackets. Remove as much as possible, however it is likely there will be some of the inside rear attachment point of the stock control arm bracket left due to exhaust routing.





- 37) With factory bracketry removed, follow steps 11-15 for control arm bracket fitment and hole drilling.
- 38) *Passenger Side Body Mount Trimming* – Body mount trimming on the passenger side is less in depth than it is on the drivers side. Only the forward flange of the body mount needs trimming. Measure up 2-3/4” from the frame and over 1-1/4” or to the bend flange. The finished trimmed mount should appear as pictured below.



- 39) Paint any areas of exposed metal at this time. This includes any exposed areas from the factory control arm bracketry removal.
- 40) Follow steps 20-26 for control arm bracket installation on the passenger side.
- 41) Install the control arms, follow steps 28-30 for installation procedure.
- 42) Adjust control arm length by turning adjuster sleeve with the arm fully installed. Do not remove the control arm and unthread the forged joint by hand. The Synergy double adjuster assembly is designed to be adjusted without removal from vehicle. When looking at the arm from the forged joint end, turn the adjuster clockwise to shorten the arm, counter clockwise to lengthen it.
- 43) We recommend the following control arm lengths for proper caster settings and axle placement.

Stock Height Vehicles

- Lower Control arm = 34-1/8”
- Upper Control arm = 32-3/8”
- Factory = 38-7/8”

3” Lifted Vehicles

- Lower Control arm = 34-1/4”
- Upper Control arm = 32-3/4”
- TB length = 39-1/8”

6” Lifted Vehicles

- Lower Control arm = 34-1/2”
- Upper Control arm = 32-3/4”
- TB Length = 39-7/16”
- NOTE – 2-1/2” Bump Stop Spacer required

- 44) With control arms lengths set, torque control arm bolts as follows:
- Lower Control Arm bolt at axle (18mm) = 160 ft-lbs
  - Lower Control Arm bolt at axle (16mm) = 145 ft-lbs
  - Upper Control Arm bolt at axle = 125 ft-lbs
  - Lower Control Arm bolt at frame = 160 ft-lbs
  - Upper Control Arm bolt at frame = 125 ft-lbs
- 45) Reinstall wheels and tires and lower the truck to the ground. Be sure the Johnny joints are neutral at ride heights and torque the pinch bolt bungs to 80 ft-lbs. Put a wrench on the adjuster sleeve at this time and try to move the adjuster. Make sure pinch bolt has adequately clamped onto Johnny Joint shank so that the adjuster is not movable. If movable, increase torque on pinch bolt but do not exceed 90 ft-lbs
- 46) Recheck all hardware after 100 miles of driving.

Installation is Complete