

TUBULAR FRONT END KIT INSTALLATION INSTRUCTIONS

2010 – 2014 MUSTANG

**INCLUDING
TOP PLATE INSTALLATION**

THANK YOU FOR PURCHASING OUR PRODUCT!

WE STRIVE TO PROVIDE AN EXCEPTIONAL KIT FOR YOUR CAR!

OUR WORD OF CAUTION – PLEASE READ:

THE INSTALLATION OF THIS KIT REQUIRES AN ADVANCED SKILL LEVEL AND IS NOT INTENDED AS A BEGINNER’S MODIFICATION.

READ THESE INSTRUCTIONS THOROUGHLY AND UNDERSTAND THEM COMPLETELY BEFORE YOU BEGIN INSTALLATION.

IF, FOR ANY REASON, YOU ARE NOT CONFIDENT OR COMFORTABLE PERFORMING THE MODIFICATIONS NECESSARY TO INSTALL THIS KIT AS DESCRIBED IN THESE INSTRUCTIONS.

- PLEASE -

DO NOT START CUTTING YOUR CAR APART!

THIS PARTICULAR MODIFICATION IS ESSENTIALLY IRREVERSIBLE YOU ARE 100% RESPONSIBLE FOR YOUR CAR AND ANY MODIFICATIONS DONE TO IT – KNOW YOUR CAPABILITIES AND YOUR LIMITS!

IF YOU DECIDE YOU SHOULD NOT COMPLETE THE INSTALLATION YOURSELF, PLEASE CONTACT US AND WE WILL WORK TO FIND A CAPABLE INSTALLER NEAR YOU. WE ARE AVAILABLE MONDAY THROUGH FRIDAY, 8 – 5 EST., CALL US @ 980-635-1930

**THANKS,
THE RSM TEAM**



motorsportsrocksolid1@gmail.com

2130 NEWTON DRIVE
STATESVILLE, NC 28677
980-635-1930

Pre-Installation Notes & Recommendations:

A. Before disassembly, remove anything within the engine bay that can be removed; this will give the most room to perform the installation.

B. Spray penetrating lubricant on any suspect fasteners.

C. Necessary Tools:

- i. Small steel ruler, 6"
- ii. Tape Measure
- iii. Plumb Bob (Optional)
- iv. Bullet levels – the more, the merrier
- v. 2' & 4' level (Optional, makes life easier)
- vi. Small Square
- vii. Welding Magnets
- viii. Metric wrenches & Socket set
- ix. Screwdrivers & pry bars
- x. Hammers
- xi. Cutting tool – abrasive wheel, reciprocating saw, body saw, etc. - note that the frame can be cut by a variety of methods, all of which will net the desired result. The example shown in these instructions is a combination of reciprocating saw, body saw, and abrasive cut-off tool, which many DIY-er's will most probably use. Make sure the tooth-count on your reciprocating saw bladed are at least 16 tooth-per-inch. Any less TPI and it will mutilate the sheet metal and blade quickly.
- xii. Floor jack
- xiii. Jack Stands or other means to support tube kit during assembly (wood blocks, boxes, be creative)
- xiv. Various clamps & locking pliers
- xv. Angle grinder or right angle air grinder with sanding wheels
- xvi. Air die grinder with small stone
- xvii. Wire Brush
- xviii. Hand-held drill with small drill bit
- xix. Welder – TIG welder highly recommended! MIG welder can be used but may prove to be more difficult for final welding of assembly.



1.) Removal of Front End Parts:



- A. Begin the disassembly process by removing the air intake and/or any other top-side accessories that may be installed on the car.
- B. Remove the black plastic radiator cover.
- C. Remove the bumper:
 - i. Remove the screws attaching the top of the bumper to the plastic support.
 - ii. Remove the screws in the front inner fender well area.
 - iii. Gently pull out the sides of the bumper near the junction where it meets the fender, until they pop free from the plastic retainer.
 - iv. Disconnect the turn signal lights and any other lights that may be installed in the bumper.
 - v. Pull the bumper off the car (this may be easier with another person to assist).
- D. Remove the front fender liners.
- E. Beginning at the rear of the front fender wells, remove and disconnect the fasteners that hold the rocker covers. You will need to disconnect them far enough rearward to be able to pull the rocker covers away from the car to reach the bottom fender bolts.
- F. Remove the fenders.
- G. Disconnect & remove the headlamp assemblies

- H. If you haven't done so already, remove the hood latch and windshield washer reservoir & hose.
- I. At this point the front end of the car should be looking like the picture below:



- J. Disconnect the wiring harness & pull out from engine bay:
 - i. The wiring harness circles the engine bay and passes through the firewall in the passenger side foot-well with a large rubber grommet. Locate the wire bundle from the inside of the firewall.
 - ii. Remove the (5) connectors from the junction box located under the passenger side of the dash. Refer to the picture below for the connectors to be removed.



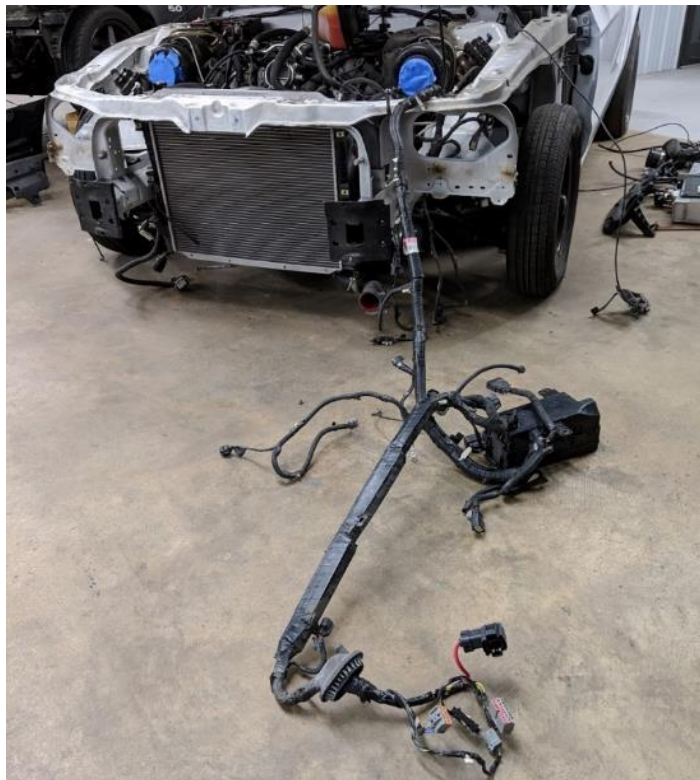


(View of junction box from passenger floorboard)

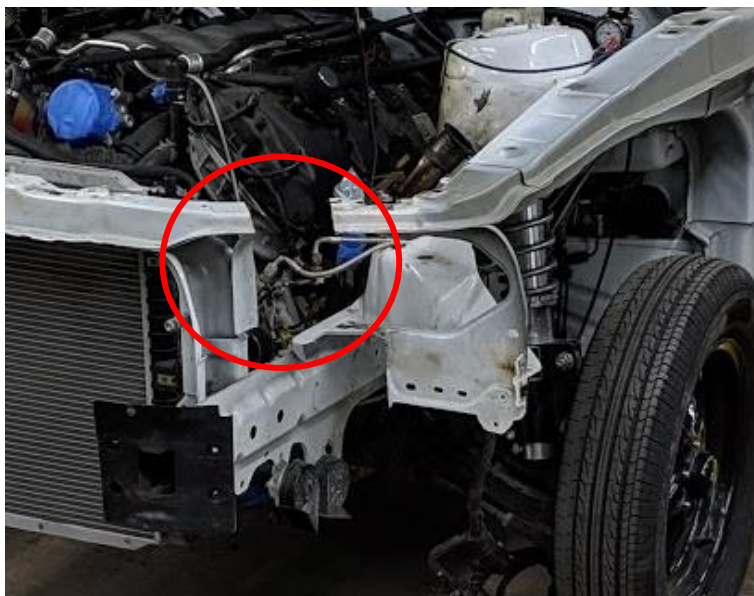
- iii. Once disconnected, pull the rubber grommet loose from the firewall and pull the harness through the hole. Remove the retainers that hold the harness bundle to the chassis and work your way forward and upward to the engine bay where the computer and junction box are located.



- iv. Continue to remove & disconnect the electrical components as you work the wiring harness out of position from above the radiator. Once you get to the driver side of the car, lay it out straight away from the car as shown below.



- i. At this point, you will need to make a cut in the front portion of the factory frame to allow the harness to pass through and be pulled out of the way. The harness cannot be removed (within reason) without making this cut first.



- ii. Once the structure is cut, pull the harness through the opening and out of the way.



- K. Unbolt the flexible brake line brackets from the frame rails on both sides. You will need to flex these lines and brackets out of the way to ensure they are not cut during the tube front installation.



- L. Radiator & AC System – There are two ways you can address the radiator and air conditioning equipment for the tube front install.
- i. Best way: Disconnect, drain and remove radiator and AC Condenser & lines. If you plan to remove the air conditioning equipment now is the best time to do so. Remove the serpentine belt and remove the alternator. This will allow you to have the most clearance to weld the frame tube plates to the chassis.



- ii. Alternate method: Leave radiator & AC equipment attached. **This is doable, but not recommended** as you must support the radiator and condenser assembly during the entire time you are installing the tube front; it obstructs your reach of the parts during installation as well.



- iii. With either method, keep the lower radiator mount bushings if you plan to use the formed lower radiator brackets with the kit. (Not needed if using the RSM Billet Radiator Mounting Brackets)



M. Remove OEM Sway Bar & lower radiator support

- i. If your car has the OEM front sway bar, remove it now. These instructions are made with a car that has had the sway bar removed, and utilizes an aftermarket lower radiator support.
- ii. Remove the lower radiator support if not already done.

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2.) Cutting the Frame:

A. Mark the cut lines.

- i. Mark the fender structure cut between the fender bolt mounting boss ahead of the strut tower on each side, and the formed dimple in the sheet metal structure.



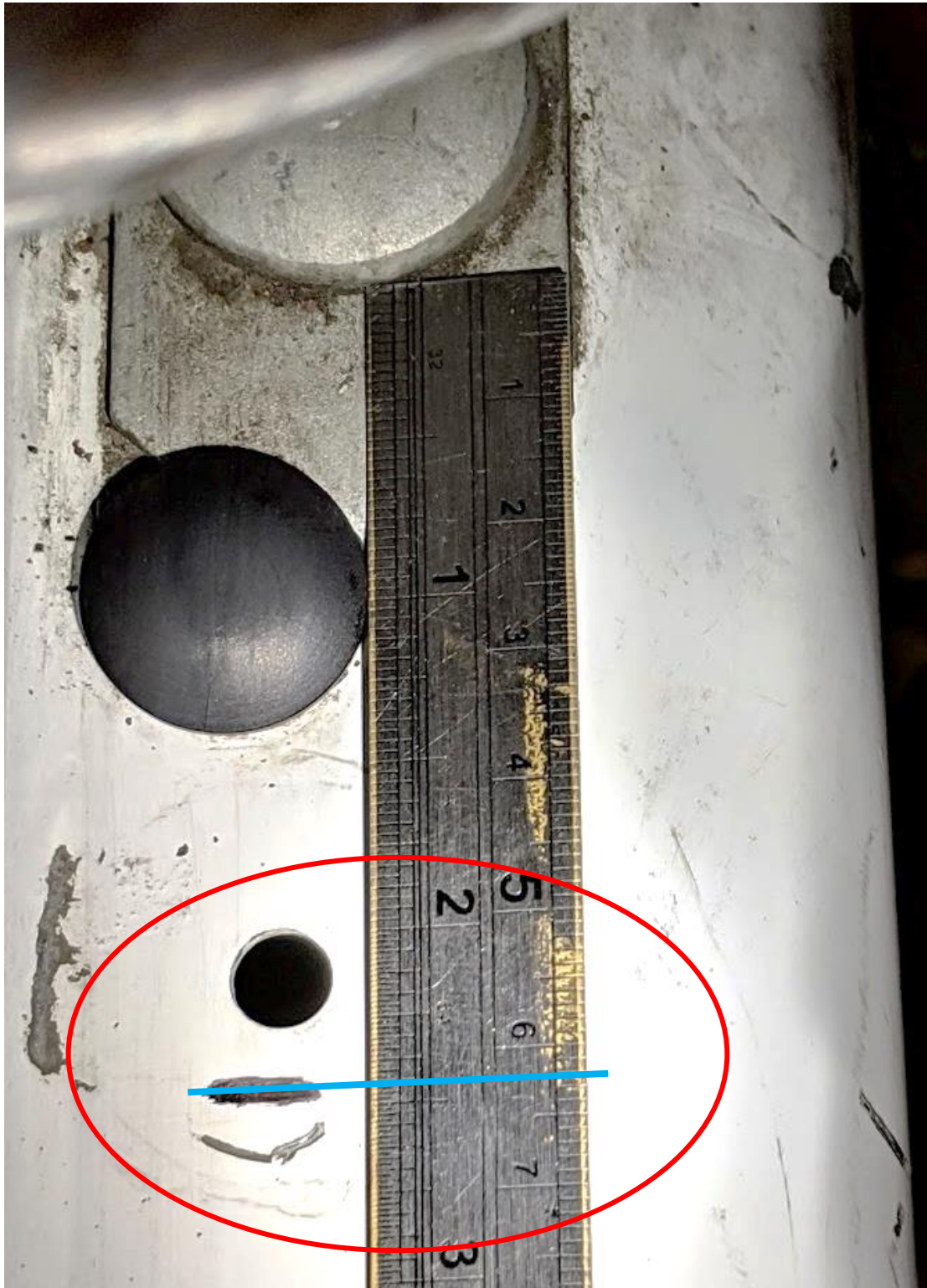
- ii. Bias this cut more forward than rear, to leave enough material to trim back later when fitting the new tube & plate. There is a formed metal sub-structure inside this portion of the frame, almost directly under the threaded fender mounting boss. **DO NOT CUT TOO FAR REARWARD.**



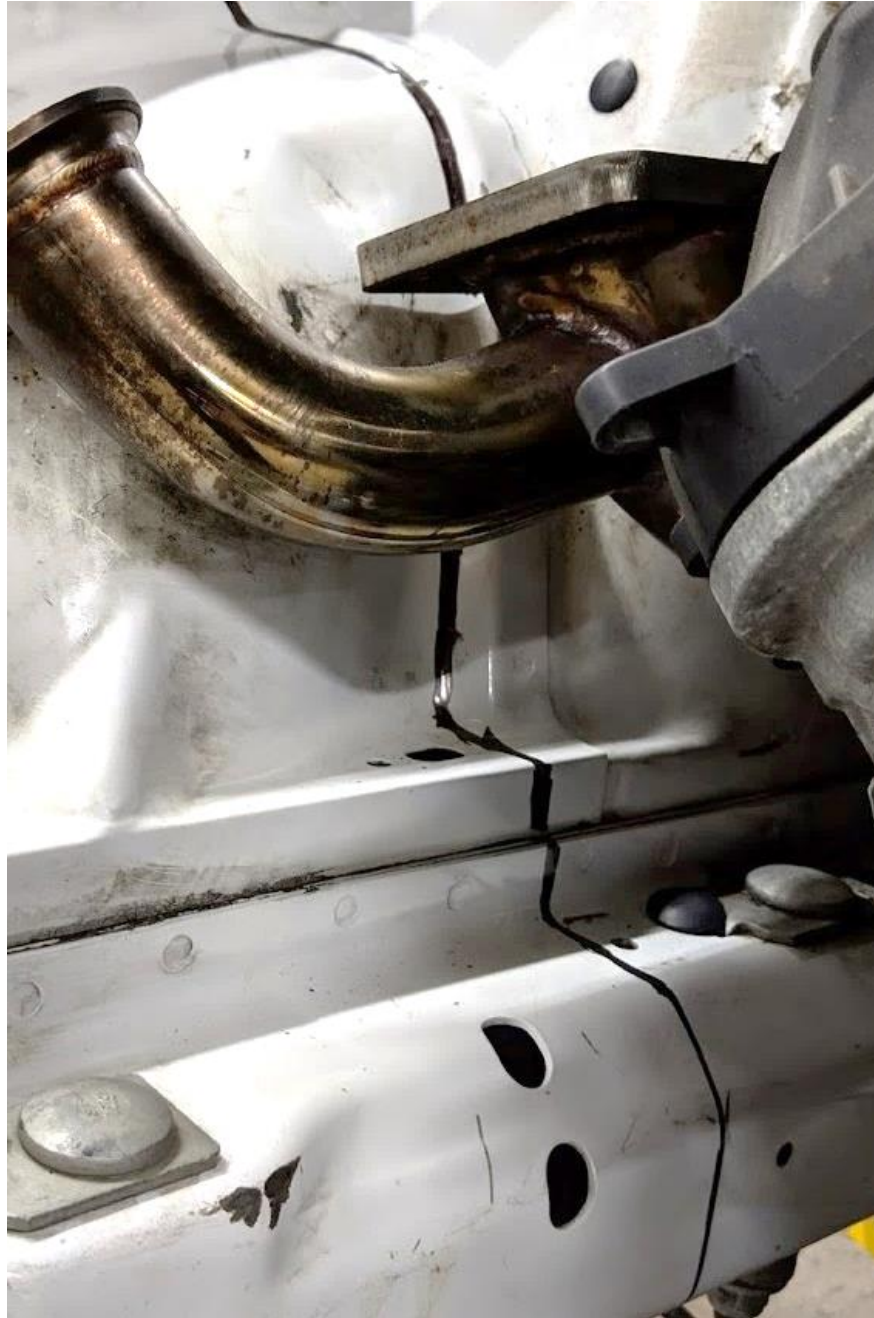
- iii. Continue the mark from the upper fender structure down the inside of the inner fender, just ahead of the sheet metal overlap and offset.



- iv. On the upper face of the 'frame' rails, locate the front K-Member mounting carriage-bolt head on each side. Using a small ruler, measure from the front of the bolt head forward **2-3/8"** and make a mark.



- v. Continue the cut line down from the inner fender over to the mark on the frame done in the previous step. Use a square to mark across the top of the frame rail and down the inside vertical face.



B. Making the cuts

- i. Start at the top, and cut through fender structure first. The best way is with a reciprocating saw and sharp blade at least 8-10" in length to reach across the entire structure. As mentioned earlier, bias the cut forward of the mark, as you can trim and sand to better fit the plate later.



- ii. Continue the cut down the inner fender sheet metal. We like using a body saw for this area since it's smaller and easier to handle.



- iii. Once you reach the overlapping sheet metal seam just above the frame rail, stop the cut, and begin another cut from front to rear following along the top of that joint. The goal with this cut is to get the material out of the way for the frame rail cut, so don't be too picky.



- iv. Repeat those steps for the opposite side.





(End view of cut fender structure – note the formed metal brace on the interior)

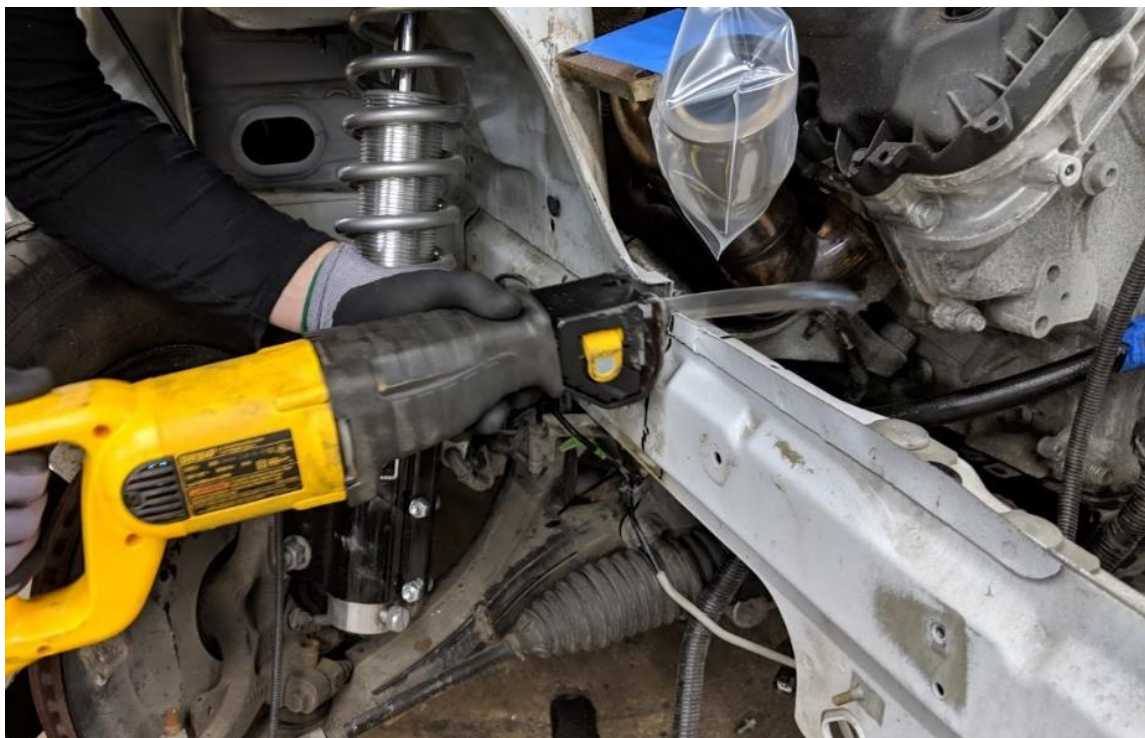
- v. After both sections of inner fender well are removed, cut down the center of the upper radiator core support to reduce binding during the frame rail cuts



- vi. With the inner fender well sheet metal out of the way, transfer your inner frame rail mark to the outside of the frame rail on both sides.



- vii. Using the reciprocating saw, cut the frame rails. If you are leaving the AC system in place, be extra careful to not hit any of the lines or compressor while cutting. As well, keep a watchful eye for the brake lines and the wiring for the alternator.





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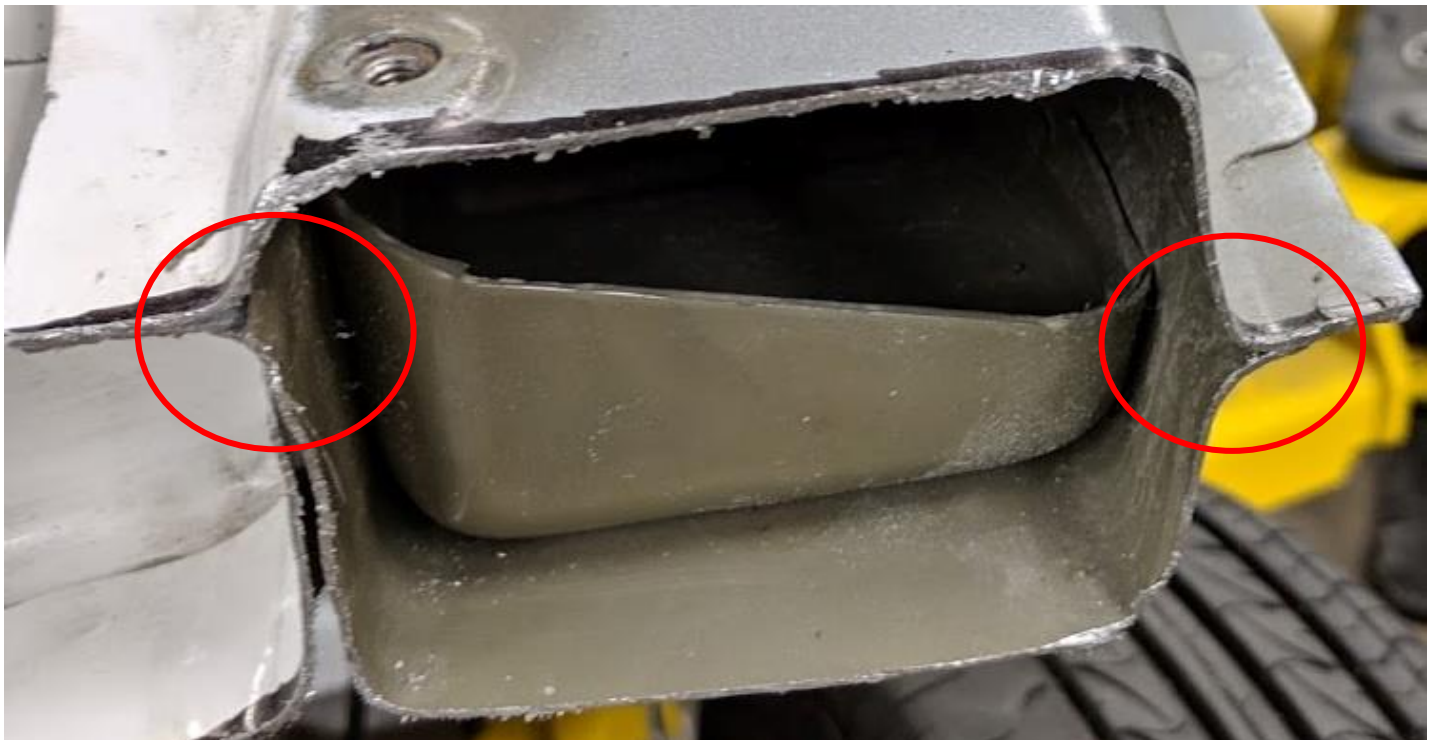
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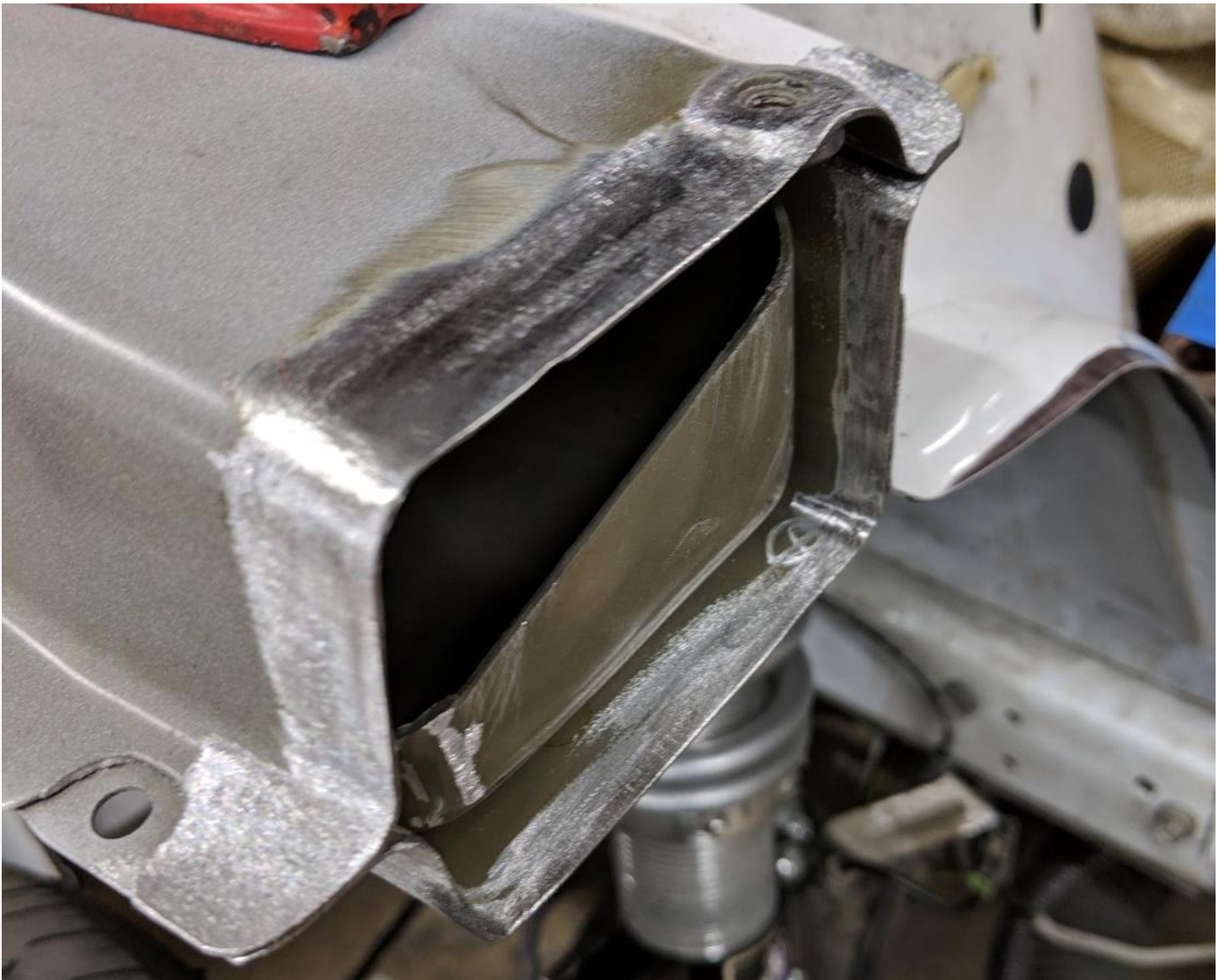
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- viii. **Note: As much as you wish, these cuts will neither be perfectly square, nor perfectly aligned.** After the frame cuts have been made, you can go back with a square and a flat plate to gauge how square and planar each cut is.
- Sand each cut to get it squared up.
 - If one side is farther forward than the other (measure from that K-member bolt head to the top edge of the cut to check), sand it more to get both sides within 1/16" of each other. If that puts the cut edge closer to the K-member bolt head, no worries, the frame tubes have enough length to accommodate.
 - This step is critical as it will affect your ability to easily square the frame tubes in a later step.
- ix. Finish the cutaway process by removing all of the paint from the attachment areas on the front end. We recommend a 3" disc sander or abrasive flap-wheel for the outside faces, and a die grinder with small diameter stone for the interior faces.
- **Be sure to sand through the manufacturer's rust prohibitive coating, and ensure that the base metal is clean before welding.**
 - Once sanded, use a wire brush to hit the hard to reach places near the punched holes and inside corners where the sander could not reach.
 - The fender structure seams have a sealant bead inside the corners where the two pieces of sheet metal meet. Use the die grinder to grind this out, at least 1/2" back into the opening. See picture below.



- x. Ensure the cuts are clean and mostly square on the upper fender structure.



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3.) Position Tube Frame Rails:

- C. Take note of the rake of the car as it sits. Where circled in the picture below, use a level (or an angle finder) to determine the rake angle (if any) and note that for when you begin the tube front installation. Match this angle with the frame tubes during initial fitment.



- D. Using a jack-stand and welding magnets, place each frame bar assembly into position. Use a level to match the frame bars to the rake angle previously measured. Keep in mind this may not be the final angle of the frame tubes, which may be adjusted further in later steps.



- i. Tack each frame plate in at least one place to assist with holding in position.



- ii. Place a 4' level (or section of straight material and shorter level) across the frame tubes and level them from side to side.
- iii. We recommend at this point to place the 1-1/4" cross bar between the frame tubes, using either a pair of magnets to hold it in place, or a ratchet strap looped across the frame tubes to hold the cross tube snug in place.
- iv. Now that these bars are in place, they must be squared with the car.
- Measure from the face of each frame plate straight out 20", and mark that point on the top of each frame tube. Using a square (or 90° magnet) here will help tremendously to keep your measurement accurate. Set the square on the tube, and line it up with the 20" measurement – then mark the tube where the base of the square sits.
 - Measure diagonally from the lower inside corner of each frame plate to the mark on the opposite tube (from the step above).
 - Adjust the frame tubes from side to side ever so slightly until your diagonal measurement is within 1/16" from each side.
 - Recheck your level side to side, and front to rear – adjust as necessary.
 - Double check your diagonals, and if good – tack weld the frame plates in a second spot.



- E. Reinstall the front fenders, and bolt them back into the factory position using the paint lines around the washers as a locator.
- F. Using an existing fender bolt, bolt up the RSM top support loosely, with 2-3 flat washers per side between fender and top support (you're wanting to provide a ~3/16" spacer offset to set the elevation of the top support properly – this has a direct effect on the mounted height of the front bumper and how it matches with the hood and fenders).



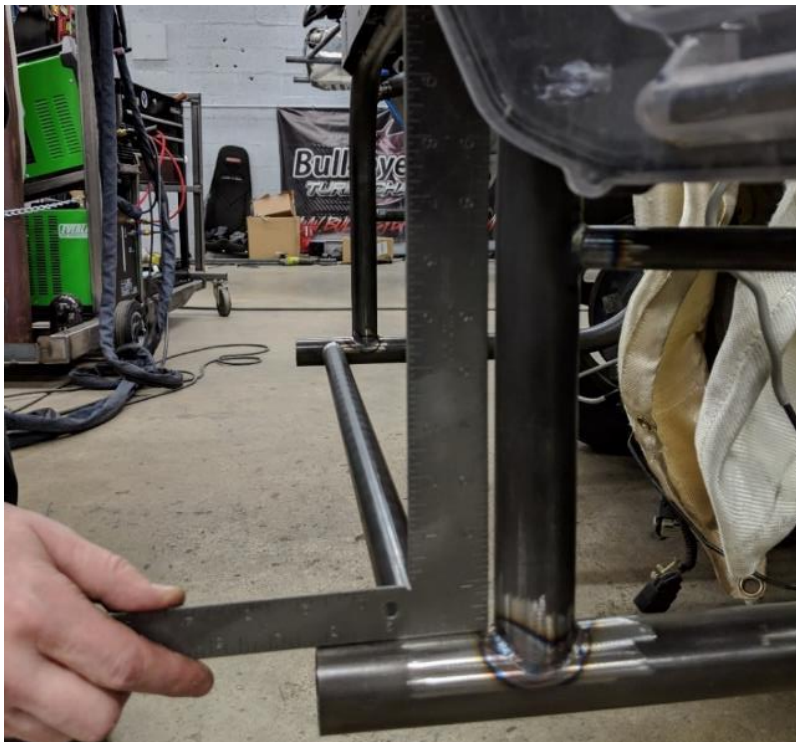
- G. Take the 1-1/2" hoop and insert the top section into the horseshoe shaped gussets on the underside of the top support. **Weld tube to gussets AFTER all tubes are set in place.**



- H. Level the top support side-to-side and front-to-rear as best you can, and support it in place temporarily. Snug down the fender bolts. Keep an eye on the level and ensure it does not change after tightening the fender bolts. If so, add (1) washer to the higher side and readjust.



- i. Square the hoop to the lower frame tubes and check the notch fitment.
- Make a mark in front and behind the notch on one side, swing the hoop out of the way and drill a small hole in the frame tube centered between the marks. This will allow the air inside the hoop to vent during final welding.
 - Swing the hoop back in place, square it again and refer to the next two steps.



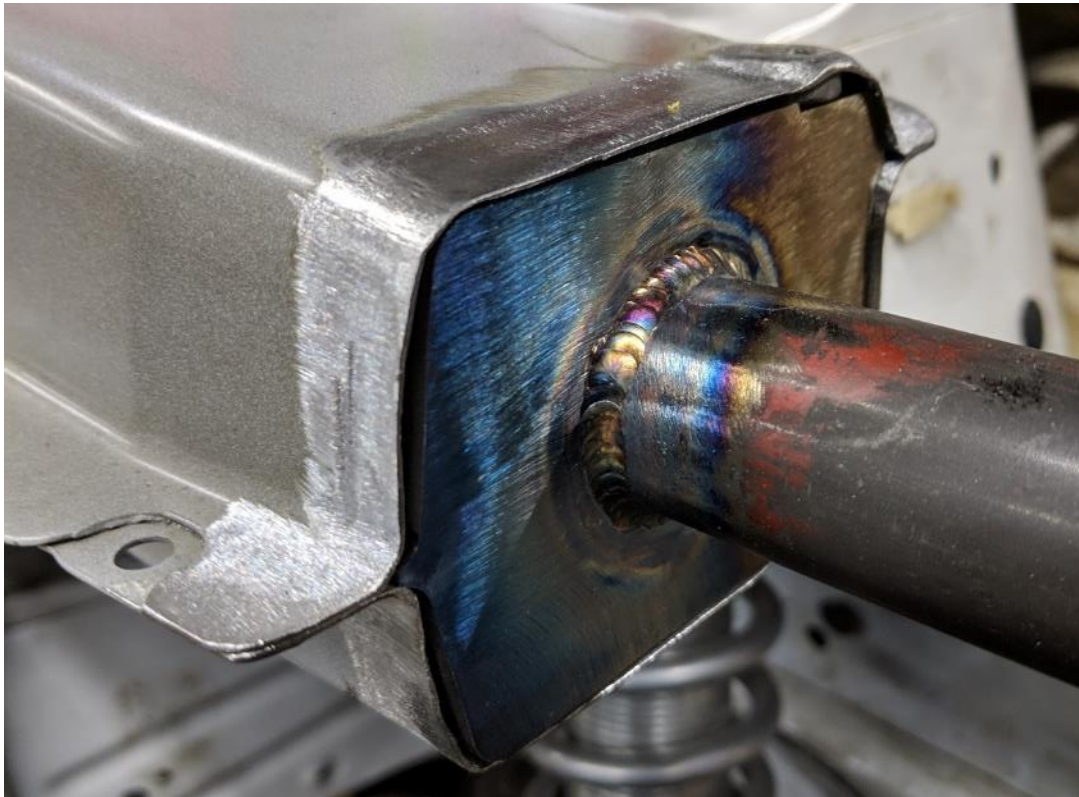
- ii. If there is a gap between the hoop notch and lower frame tubes (or the top support wants to sag), **EVER SO SLIGHTLY** raise the lower frame tubes to compensate. **A slight change of angle for the lower frame tubes will have no consequence on the rest of the installation – however an improperly installed top support as a result of no compensation will negatively affect how the bumper and hood match up during final installation.**
 - iii. If the hoop is pushing the top support up and making it unlevel front to rear as viewed from the side of the car, **EVER SO SLIGHTLY** lower the frame bars. Conversely, you can trim the notch deeper on the hoop legs if you prefer.
 - iv. Making the adjustments in the above two steps will make the hoop not 100% square to the frame tubes – this is OK. If it does remain square – awesome.
- I. Recheck the level of the top support. It is imperative that this part be positioned correctly as it has a direct effect on the bumper position, bumper to hood fitment, and bumper to fender fitment.**
- J. If all is good with the top support, tack weld the hoop notches to the lower frame tubes. Then add more tacks on the frame plates to strengthen that joint.

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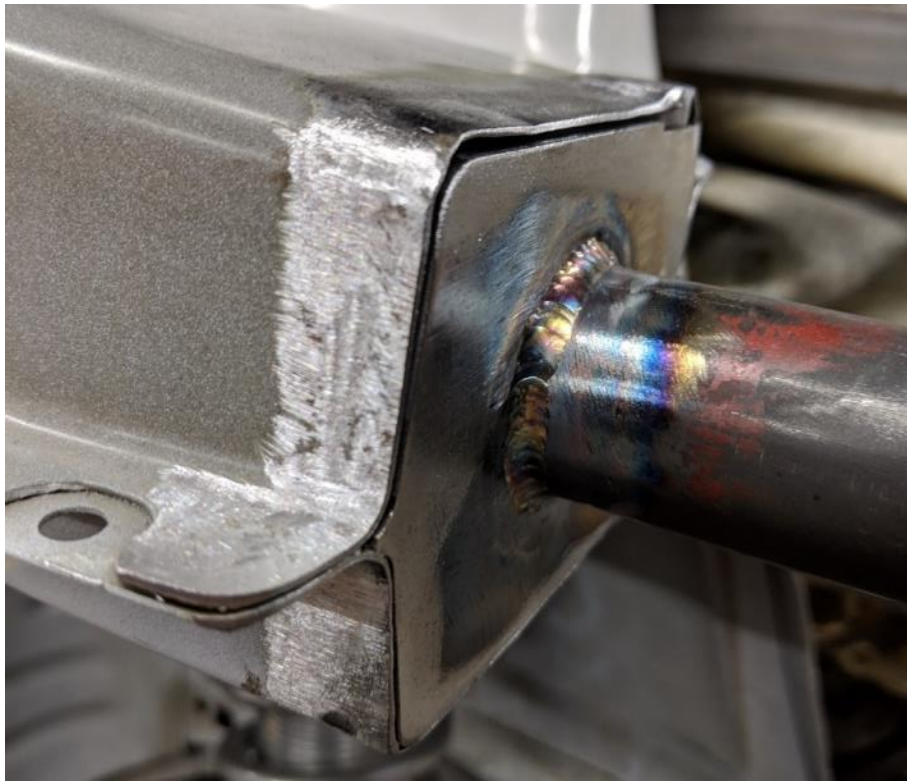


4.) Position Fender Bars:

- A. From the top side, insert the fender bars plated end first, down and into the fender well area over the tire, then bring the notched end back up to the 1-1/2" hoop. Gingerly swing the plated end into position into the fender structure opening.



- B. By design, the fender bars will have a bit of an interference fit getting them into the cut-out; you may find that sanding back the cut on the fender structure will allow the plate to insert more easily. Do not sand the notched end shorter unless you are absolutely sure it is necessary. Too much cut off from the notched end will not allow it to seat into the fender structure properly.



- C. Fit both sides, and verify their notch position on the 1-1/2" hoop as viewed from the front. Adjust as necessary. Tack in place on the hoop and the body.



5.) Preliminary Welding:

- A. Unbolt the fenders from the top support, and remove the fenders. Remove the top support to gain full access to the fender bar notches on the hoop.
- B. Note:
 - a. The 1-1/4" cross bar can be left to be welded later, to ensure that its position fits without any interference with the radiator and AC system (if reinstalled).
 - b. Note - this tube can be placed anywhere along the straight length of the frame tubes, at your discretion. The kit structure will be the strongest with the cross bar placed nearly in line with the 1-1/2" hoop.
- C. Fully weld all the tube and plate joints **except** the 1-1/4" cross bar. You can tack-weld it in for temporary placement, but final placement will be determined after the radiator assembly has been installed.



6.) Final Fitment of Top Support:

- A. Reinstall the fenders and the top support assembly; confirm that the top support is back to level in both directions.
- B. Thread the (4) provided hood rest bumpers into the top plate . The center (2) need to have about 1/2 the thread length showing, and the outer two should be about 1/4" lower than the center two.
- C. Lower the hood until it rests on the bumpers.
 - i. Check the hood elevation relative to the fenders
 - ii. Adjust the hood rest bumpers up or down as necessary to match the hood line to the fenders.



- D. Once the hood rest adjustment checks out, tack weld the (4) underside gussets of the top support to the 1-1/2" hoop.

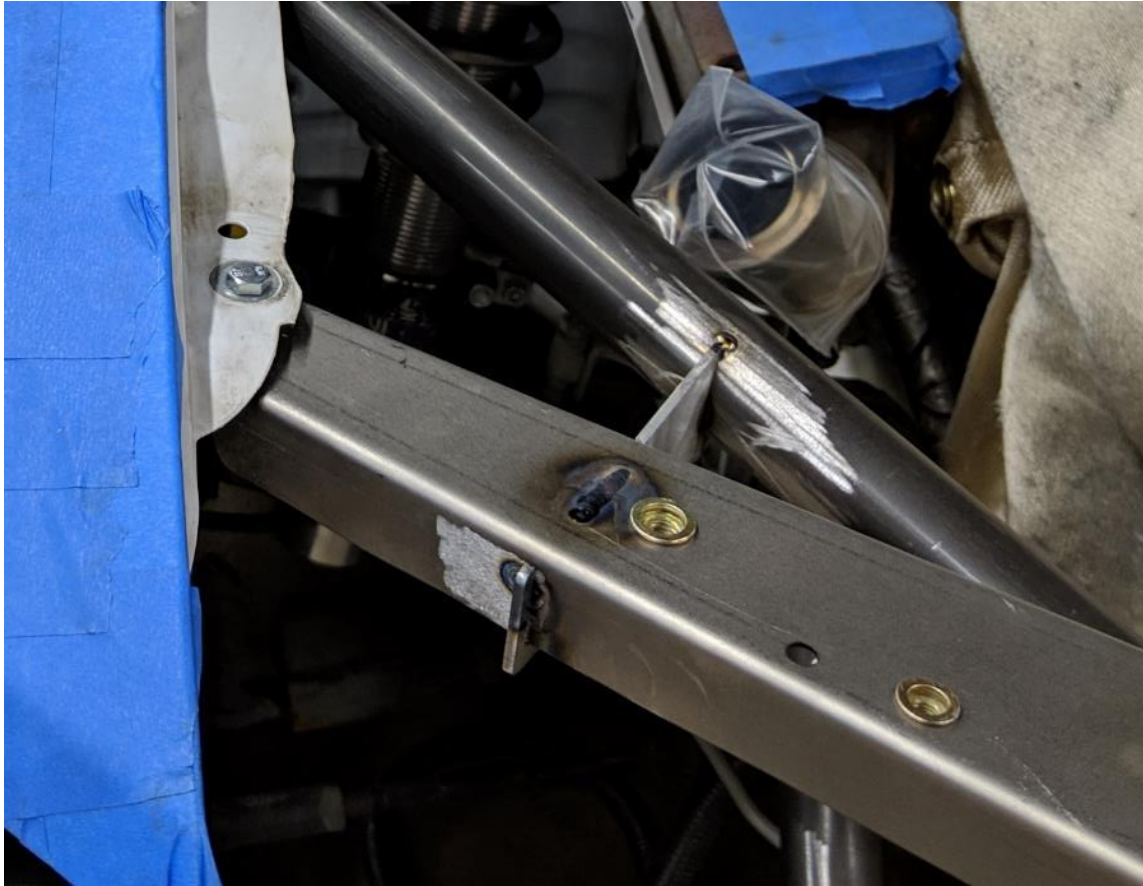


- E. With the top support welded to the hoop, add the side gussets that secure the top support to the tower bars.
- These are provided with extra length on the notched end, and ample clearance on the slots for ease of fitment with the top support.



- Position these gussets just to the outside of the last top support internal gusset (near the outer hood bumper rest nutsert)

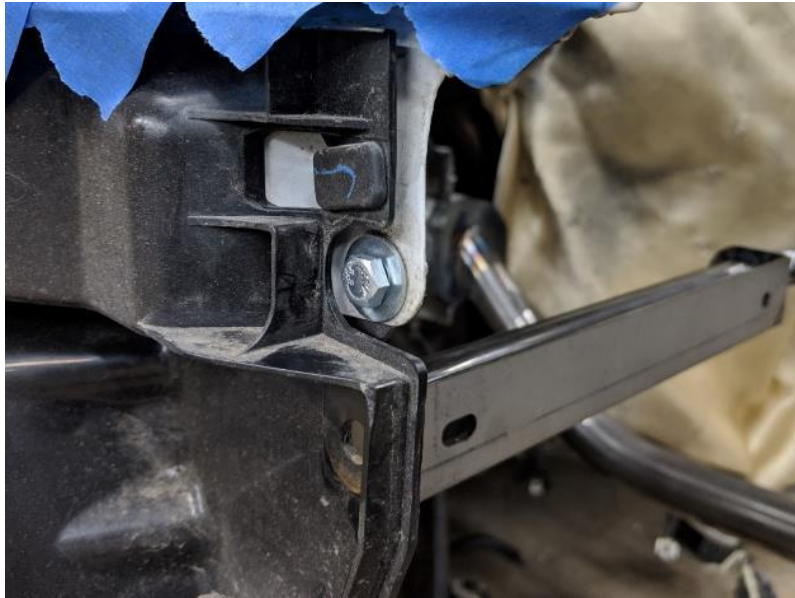
- iii. Hand fit the notch to the tube, so that the gusset seats fully into the top support. We recommend using a square or small corner magnet to square the gusset against the rear face of the top support.



- iv. Once fitted appropriately, tack weld in place.
- v. Repeat the steps above for the opposite side.
- vi. Fully weld both gussets to the tube, and to the top support.

7.) Install Headlight Supports:

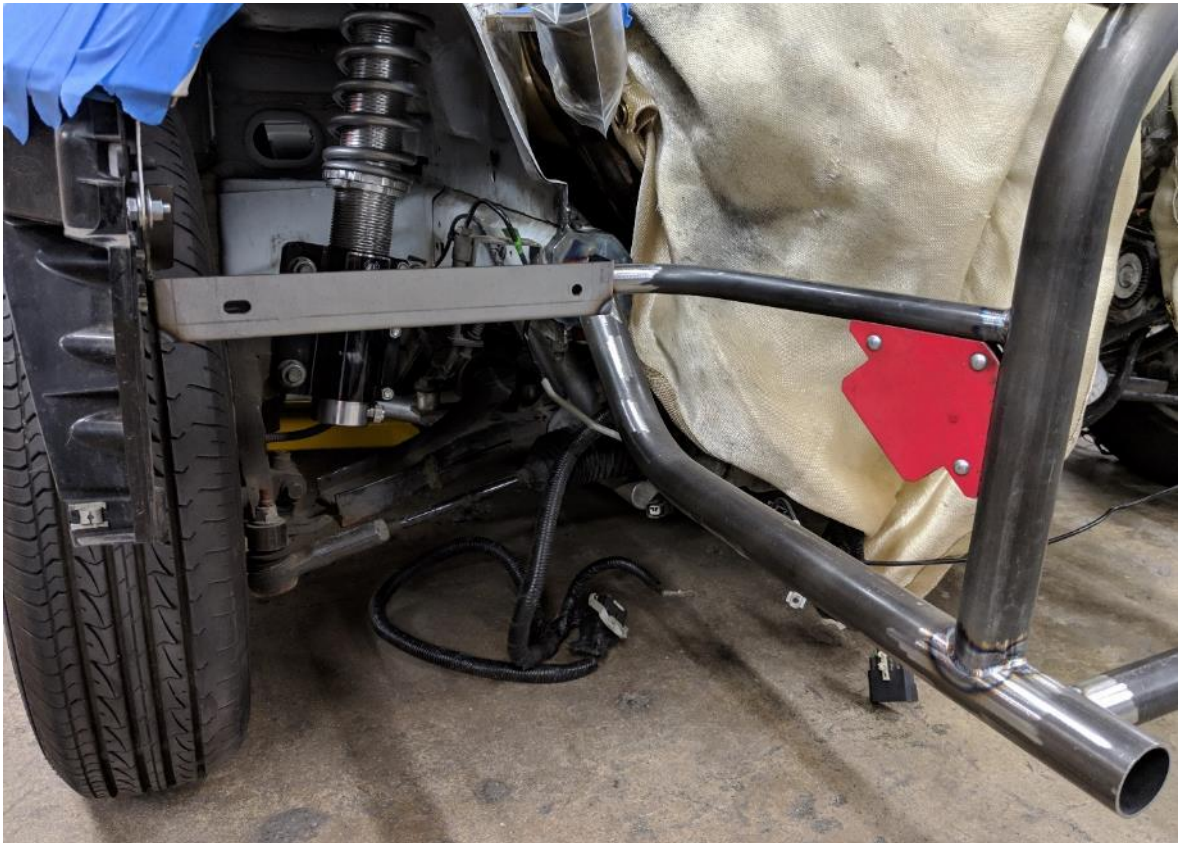
- A. With the fenders still installed, grab the lower headlight mounting brackets and the two bent 3/4" tubes.
 - i. The 3/4" bent tubes are provided with extra length on both ends – they must be fit to the car by hand. The long leg goes through the large holes in the headlight brackets, and the short leg will tie back to the 1-1/2" hoop.
 - ii. Before starting, sand/clean the holes in the brackets to allow the tubes to slide through without resistance – this will help the fitment process.
- B. Bolt the brackets to the fenders as shown in the picture below. Rotate them so that the face with the holes is vertical, and snug the bolts tight.



- C. Mount the headlight assemblies in place on the top support, and bolt them to the headlight support brackets. (You will need to support them temporarily).



- D. Using a straight edge or other means, line up the brackets so that the bolted faces are aligned across from passenger side to driver side. This will put the headlights in the proper orientation. (If you cannot temporarily hold the straight edge attached to the brackets, you will need to test this alignment during the tube fitment process).
- E. Trim and fit each end of the 3/4" bent tube:
- i. Begin by trimming small portions off at a time of the longer of the two legs – which will allow the shorter leg to become closer to intersecting the 1-1/2" hoop.
 - ii. As the short leg gets closer to intersecting the hoop, you will need to trim length off of it to fit that end against the hoop.
 - iii. We recommend using a corner magnet to square the 3/4" tube with the 1-1/2" hoop to set the final length of the short leg. Be sure that this junction is relaxed, as too long of a leg here will push the headlight bracket rearward.
 - iv. After the tube has been fitted and notched to the hoop, trim the opposite end flush with the outside of the bracket.
 - v. Repeat these steps for the opposite side
- F. Tack the tubes in place to the hoop, and to the lower headlight brackets. **Do not fully weld, as you will need to check fitment after later steps have been complete.**



8.) Install Hoop Gussets:

- A. With the headlight assemblies installed, locate the two 1-1/4" tubes with notches on both ends. Note that one end is notched to fit a 1-1/4" tube and the other a 1-1/2" tube.
- B. Place each gusset at a diagonal between the fender bar and the 1-1/2" hoop on each side. **Be sure that they clear the headlight assembly as installed.**



- C. Match the angle of each side to side, then tack in place.
- D. Remove the headlight assemblies and fully weld the gusset tubes in place.

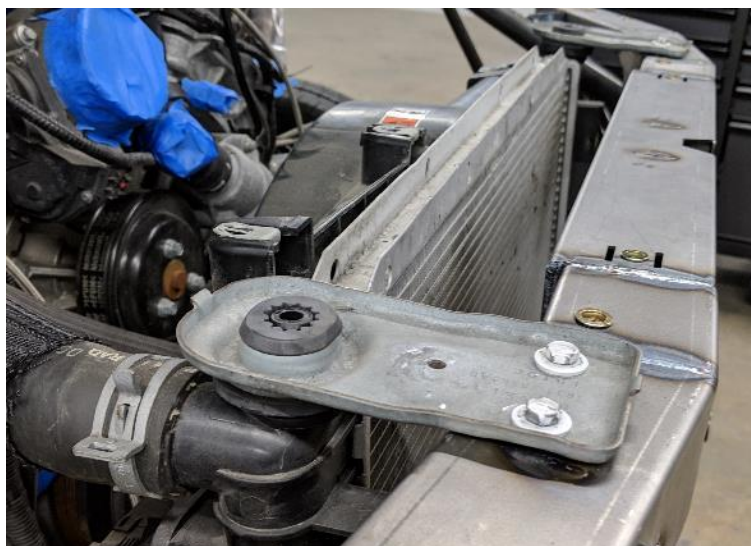
9.) Install Radiator Mounts:

Note – Skip this section if you plan to install an aftermarket radiator using our machined aluminum mounts or another method.

E. Support the radiator in the general location where it will be installed.



F. Install the OEM top radiator retainer brackets, and position the radiator retainer studs in the rubber bushings, with it raised all the way up. Do not force it higher than the brackets are in a 'resting' position.



G. Level the radiator vertically.



- H. Place the lower radiator mounting bushings in the lower radiator mounting brackets – with the bigger side of each bushing located inside the cupped portion.
- I. Slide the bushing and bracket on the lower mounting stud and position the bracket so the notches contact the tube.



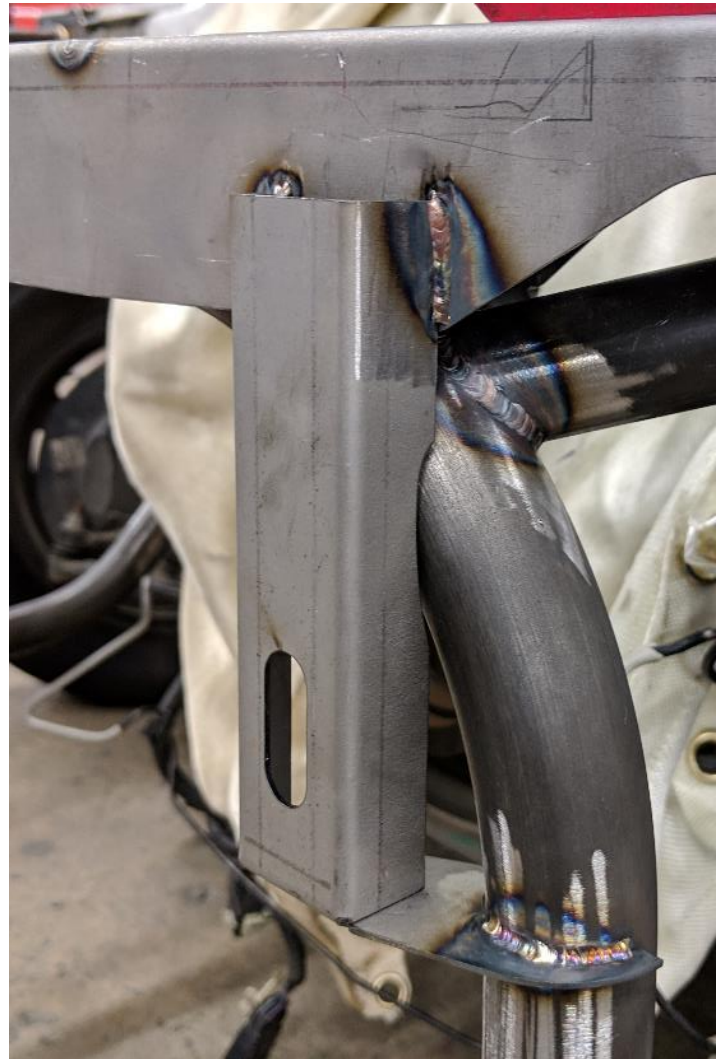
- J. Level the bottom surface of each bracket and verify that the bushing is touching or within 1/16" of touching the radiator mount. If not, rotate the mounting brackets up until they are in an acceptable position.

- K. Tack weld brackets and check that they are still in the correct position
- L. Remove the upper radiator support brackets and remove the radiator.
- M. Fully weld lower radiator brackets.

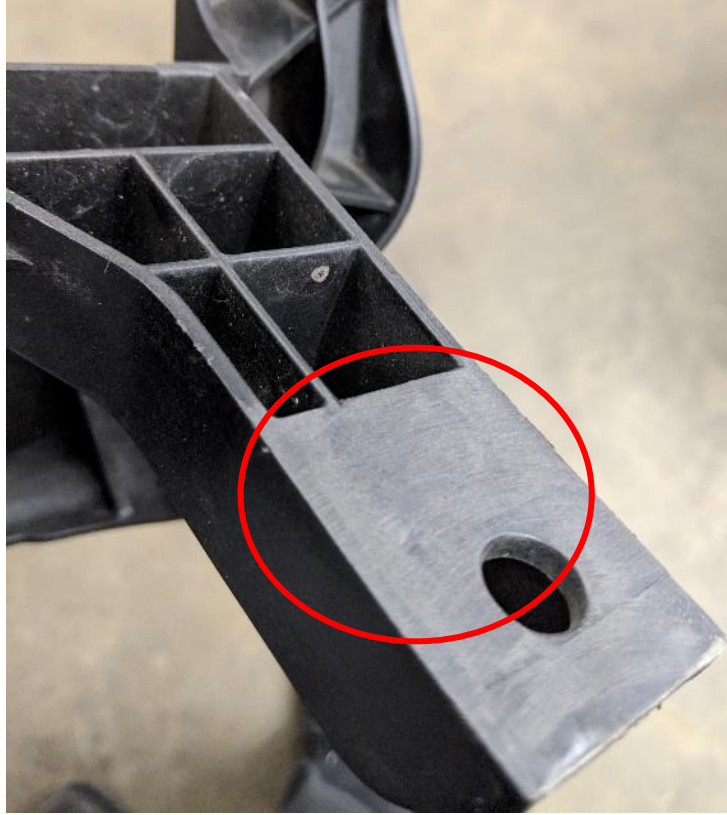


10.) Install Mid Mounts & Bumper Support Bracket:

- A. Position the left and right mid mounting brackets on the top support as shown below.
- B. Tack and weld in place.



- C. The bumper support requires measurable trimming to fit the RSM top support. The best way to trim the plastic is with a burr on a die grinder, then go back with a scotch-brite wheel (or pad) to smooth the edges and rough spots.
- i. Cut off the locating stud from the vertical legs & sand smooth.



- ii. Trim back the ribs directly behind the mounting holes on the center section, and sand them down until they are level with the circular mounting surface. **Note – Do not sand off the locating tabs/ribs that are on either side of these holes – these will assist with placement during installation.**



- iii. Trim back the edge band and rib adjacent to the center mounting holes.
- iv. Trim the outermost corners/edges of the outer locating arms, so they lay flat.



- v. As you trim & fit, ensure that the rectangular tabs go into the rectangular slots on the top support. When trimmed properly, these will fit snugly into the slots.
- vi. Once fitted, bolt the support with two bolts on top, and two larger bolts with fender washers in the holes on the vertical legs. Don't worry if the vertical legs are not exactly parallel with the mid mounting brackets – the slot is made to provide adequate room.



11.) Test Fit Bumper:

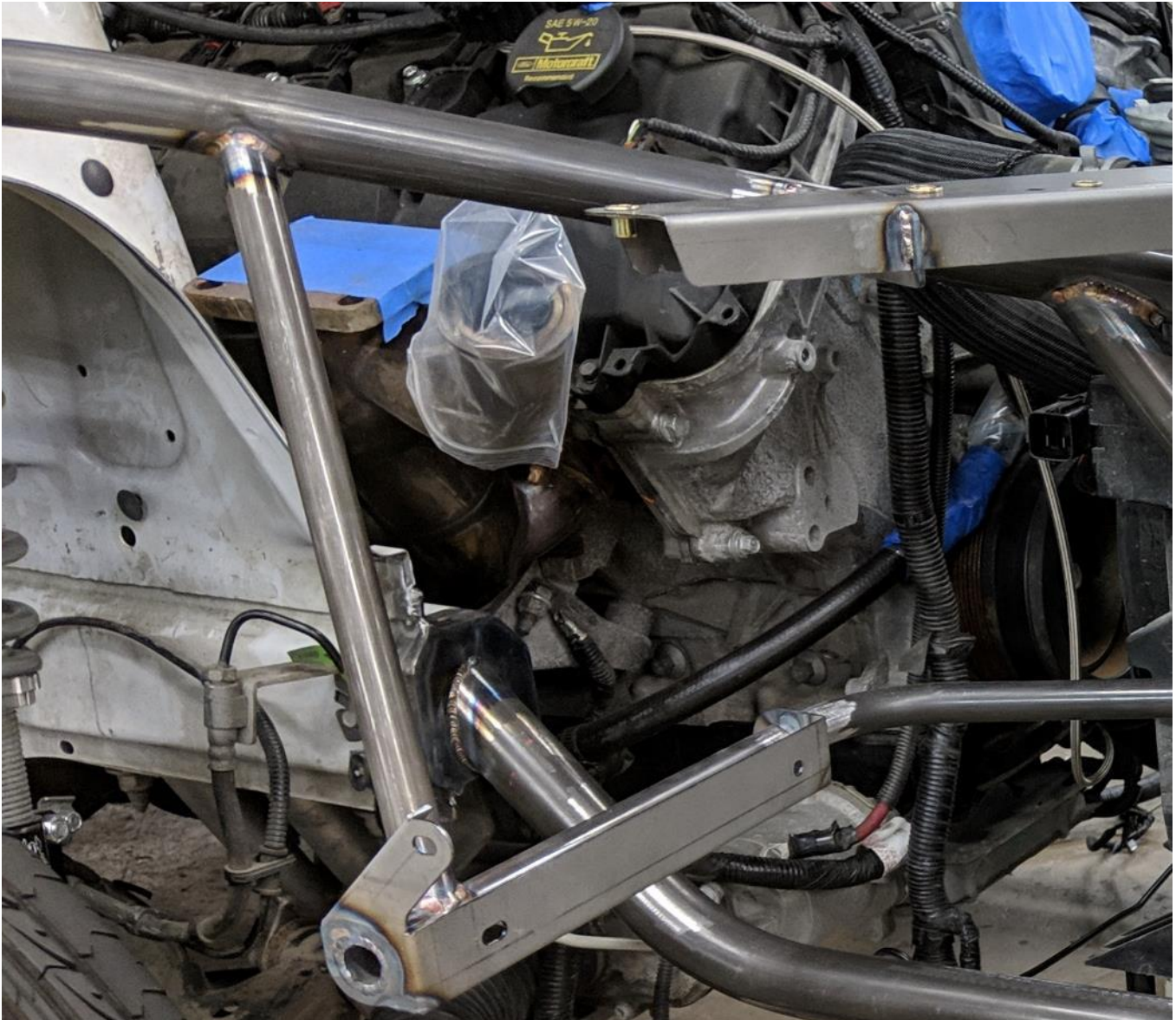
- A. With the fenders and headlights installed, install the bumper in place and fasten with the OEM fasteners; clip the sides back to the black plastic brackets on the fenders.
- B. If you have removed the hood rest bumpers, reinstall them and check the fitment of the hood to the fenders and bumper.
- C. Observe the placement of the headlights.
 - i. If the headlight placement fits appropriately with the bumper, hood and fenders, proceed to section #12.
 - ii. If the headlight placement needs adjustment, note how far out of position they are (or angled), and write that info down. You will need to remove fenders and bumper, then break the tack welds on the lower mounting tubes for the headlights and make the adjustments relative to the dimensions you noted previously. Refer to section #7 for assistance. Once adjusted, repeat section #11 again, and if fitment is then good, tack-weld tubes and brackets in place and proceed.

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12.) Add Headlight Support Gussets:

- A. Remove Bumper (and fenders if necessary), then locate the 12-1/2" straight 3/4" bars provided with the kit.
- B. Position and fit one end of the tube near the outer end of the lower headlight support tube, and then trim and fit the opposite end of the tube so that it lands on the fender bar somewhere near the bend. **NOTE:**
 - i. Ensure that the gusset tube clears the back of the headlight housing when installed.
 - ii. Ensure that the gusset tube does not interfere with your front tires when turned or during uptravel.

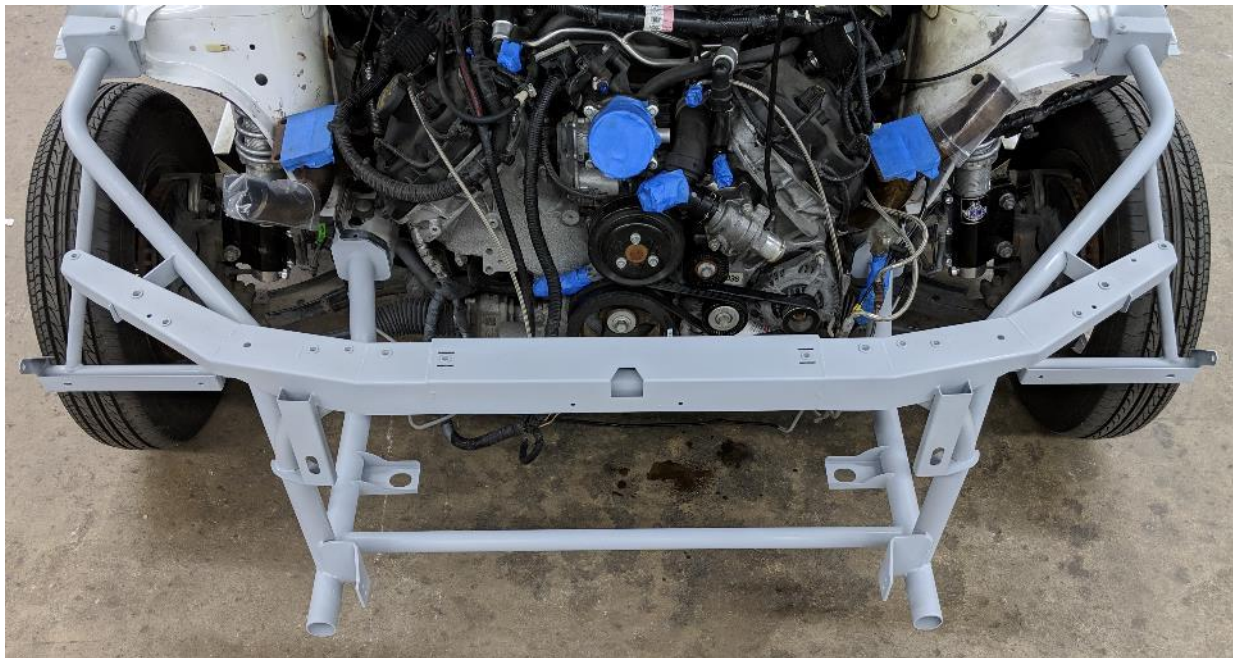


- C. Once fitment is confirmed, weld tubes in on both sides
- D. Fully weld headlight mounting tubes to 1-1/2" hoop, and to the lower headlight mounting brackets.



13.) Final Touches:

- A. Add any additional mounting brackets needed for your build.
- B. Mask off and paint tube front.



- C. Reinstall all components back into the engine bay, and re-route the wiring harness in reverse of the disassembly.
- D. Mount the ECM and fuse boxes as you see fit, and secure all the wiring in a safe manner.
- E. Ensure the brake lines are reattached to the body and all are in good working order.
- F. Reinstall the fenders & bumper, and adjust the hood rest bumpers to set the hood height. Lock them in place with the provided jam nuts.

**This completes your RSM Tubular Front End Kit installation
– The rest is up to you!**



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