

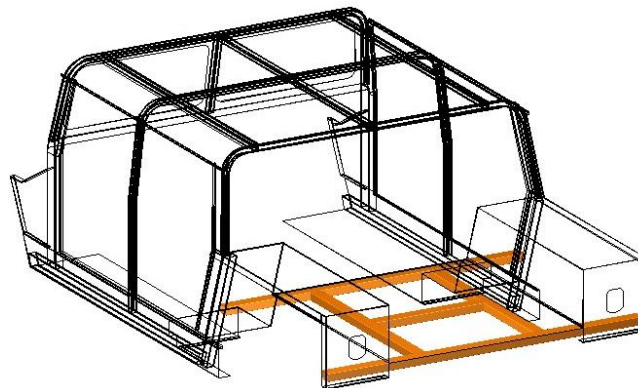
## Weld-it-Yourself Instructions

Before you begin remember SAFETY FIRST. Nothing else matters if you and your family are not safe - so be wise and use accepted safety, welding, assembly.... precautions. And wear eye, ear, skin... protection and guard against sparks, fire, electrical... issues.

These instructions may vary if you have a narrower Sport body, custom Stretched, 2-door, 6-door, custom rocker panel setup (like the time-lapse video with plate in place of normal 2x3 tubing)... So always do a reality check and double check fitment before finish welding. Also you may want to wait to weld the tubing until the entire section is in place and aligned and fitted. Then you can go back and finish weld (rotating around where welding to not overhead, pull, warp... the metal. Only finish weld parts that you can't reach later to get a finish weld. So you will wait to finish stitch welding almost all of the sheet metal until the very end after everything is tacked into place and lined up by all the other pieces.

This quick guide is meant to be used with the weld-it-yourself time lapse video and give a little more specific detail and notes to augment the process highlighted in the video.

### Bed Tubular Substructure



When assembling start from the bed area. Get the longest 2x3 tube with square ends. That is the back of the bed area. Get the second longest 2x3 tube with square ends and that is the front of the bed area. Then there are two front to back bed tubes and then a single cross-member piece that fits in between.

Lay the tubes down on a flat/level surface. Make sure to lay the tubes down flat (so 3" width is horizontal to the ground and not upright as this will throw off the measurements). Using the front to back tubes and center tube as a reference make sure to have equal space from each end of the rear tube to the front to back tubes (spaced properly by the left to right center bed tube). Tack the front to back tubes to the back tube.

Then slide the center tube to the front end of the front to back tubes to align and center the front bed side to side tube. Then tack into place. Then center the center side to side tube and tack into place. By getting all the sides tacked in properly everything should be square. You can check square by measuring the same location diagonally in both directions and you should get the same measurement. You can also ensure square using a square when tacking the tubes into place.

After everything is tacked and square you can start welding the tubes together. Remember to support the tubes with another tube (e.g. using two clamps secure a large 2x3 oriented in the long direction for strength to keep the tube you are welding from warping) or something to keep them from warping when welding. It is always wise to weld in stages and let cool down between welds by moving around and welding to keep from overheating/warping one area.

One professional welder warped the large 2x3 on one side by 3/4 of an inch because he was welding too hot for that thickness of metal and wasn't spreading around the welds. That is usually the biggest problem as welders think they need to do massive welds with too much amperage on the welder. This results too thick of welds, back side pitting, warping... So remember you don't need a weld that is 5 times as thick/wide as the material!

## Installing The Bed



Mark a center mark on the rear bed tube (longest) on the top of the back side. Also mark the center of the front of bed tube. Locate the bed sheet metal piece and mark the center on the front and back (bends are on the left and right sides for your reference).

Line up the center of the back of the bed to the center of the back tube. Clamp or tack a small tack so the bed can pivot around the lined up marks. Then align the front center marks. Make sure the back of the bed sheet metal is aligned to the back tube as that portion may be visible after completion of the body.

When everything is properly in place and aligned then you can run some tack welds at each corner to hold things in place.

## Tack the Taillight Plates to the Bed Sides



Next find the right taillight plate (curved side goes downward and bent edge goes on outward side). Tack the taillight plate to the right bed side piece. Using the outer edges and inside corner as a guide.

You can tack a spot where it is lined up and then move down a little and line up the next spot and tack and move in the direction you want. That way you can make sure it is exactly right where you are welding and then only tack where the parts are precisely aligned. Tack on the inside and you can keep a clean outside edge (perhaps can fill with seam sealer or body filler as it will just be a pretty fine line).



Another trick is to tack and then hammer the metal into place while the tack is hot. This can be useful when pulling a part into location. This only works if you gently hammer immediately after the weld. If the weld cools then you will probably need to cut off the tack and start over as it can leave an island of weld that will keep the part from going into place and may damage body skin if you hammer hard or once cooled.

Repeat the entire procedure with left side taillight plate and bedside. Now you can use the squared back bed sides to align the next parts in order like a giant 3-D model/puzzle.

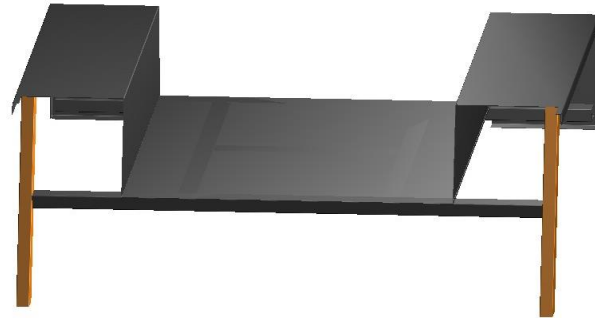
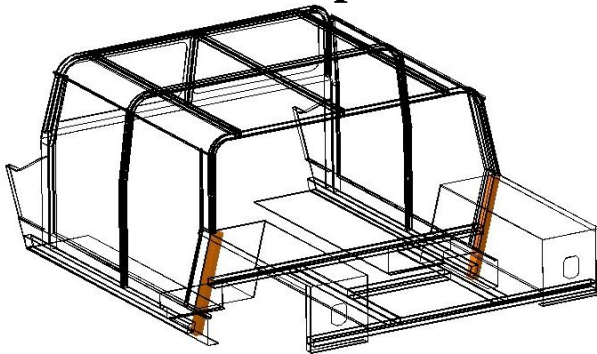
Set one Bedside into place. You can use another piece of tubing to clamp the bedside to the inward side of the bed lip. Make sure that the bedside is down flush to the bed and pushed all the way forward so the taillight plate sits flush against the tube. You will need to block up the bed frame so the taillight plate lower flange can fit under the rear bed tube. Also note that there will be a gap on the outward side of the tube and the outer edge of the taillight plate. That gap is necessary so you can later fit the quarter panel insert into place without hitting the rear cross tube.

You can use a clamp on the taillight plate to hold the outward side of the bedside square. Don't weld that until later when you can square both bedsides at the same time. Tack several spots along inside of the rear tire area to hold the bed side to the lip of the bed. You will still be able to adjust the square of the bedsides as the tacks will flex a little for precision alignment and squaring. Repeat the process with the left bedside.

Run a long straightedge (e.g. rocker panel tubes) across the back and another across the front of the bed so that the tops of the bedsides are square and true. **Make sure the vertical bed sides are square to the bottom bed** because if that is at an angle it can mess up all future steps. You can check the outer width of the back of the bed sides at try and match that at the front. They should be right around 84" on full-width body or 72" for regular Sport body. So keep the same measurement on the front and back widths as the bed sides will serve as the foundation of the widths on the A, B, and C posts/hoops. When they are square and true you can weld a spot or two of the taillight plate to the rear bed tube to maintain that square.



## Sloped 2x3 Behind Back Seat Area

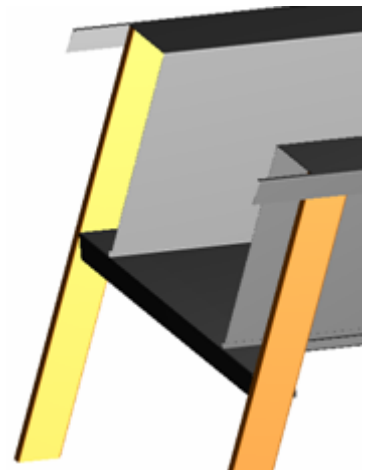


Next using the fronts of the squared-up bedsides you can align the sloped 2x3 tubes. You will want to align the outside edge of the top with the notch in the bedside (about an inch inward from the outside edge). This leaves room for the fiberglass quarter panel insert later.

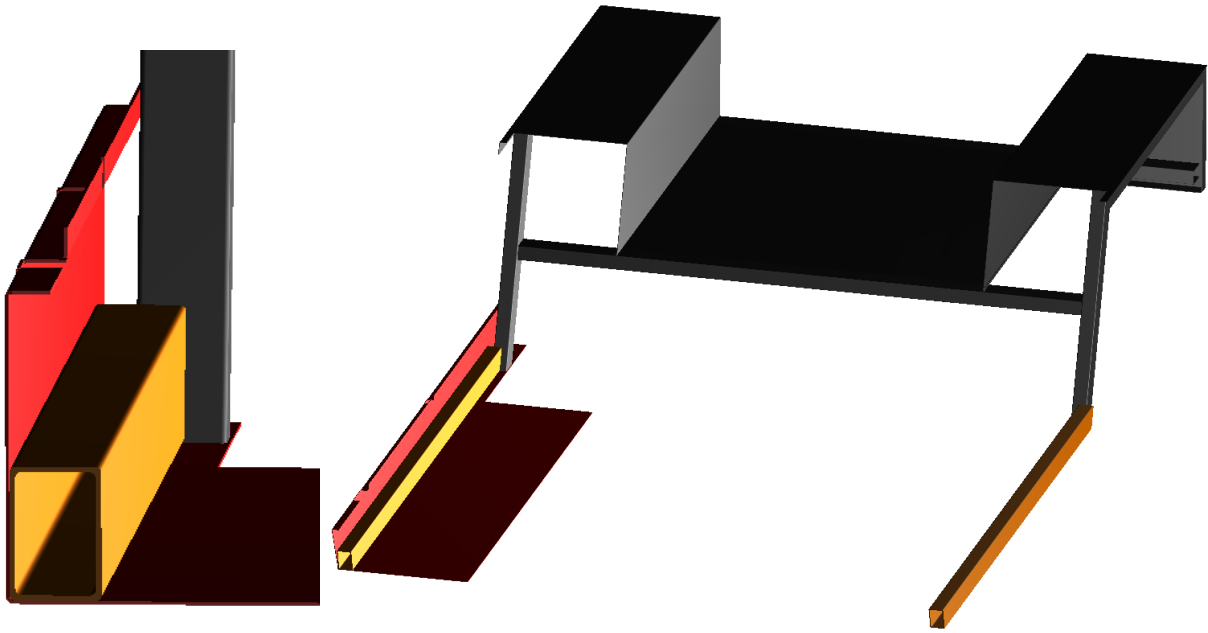


You may want to have the tube about an 1/8th of an inch under the edge of the sheet metal to leave room for the back seat pedestal that will fit into that area later. You can tack the top of the tube into place so you can align the middle part to the front of the bed front cross tube and tack into place.

Align the front surface of the sloped tube to the top front corner of the front cross bed tube so that the back seat pedestal will rest flat on top of both tubes.



## Rocker Panel Tubes



Next you will need to elevate the back of the bed into the air (e.g. with blocks or stay jacks ~14") You can place the rocker panel pieces under the sloped 2x3's and then do the final leveling. (On some builds the rocker panel skins will be trimmed to about an inch under the 2x3 tubing for QuickSwap applications or there may be bent plate in place of the standard 2x3 setup as in the custom build in the Time-Lapse Video).

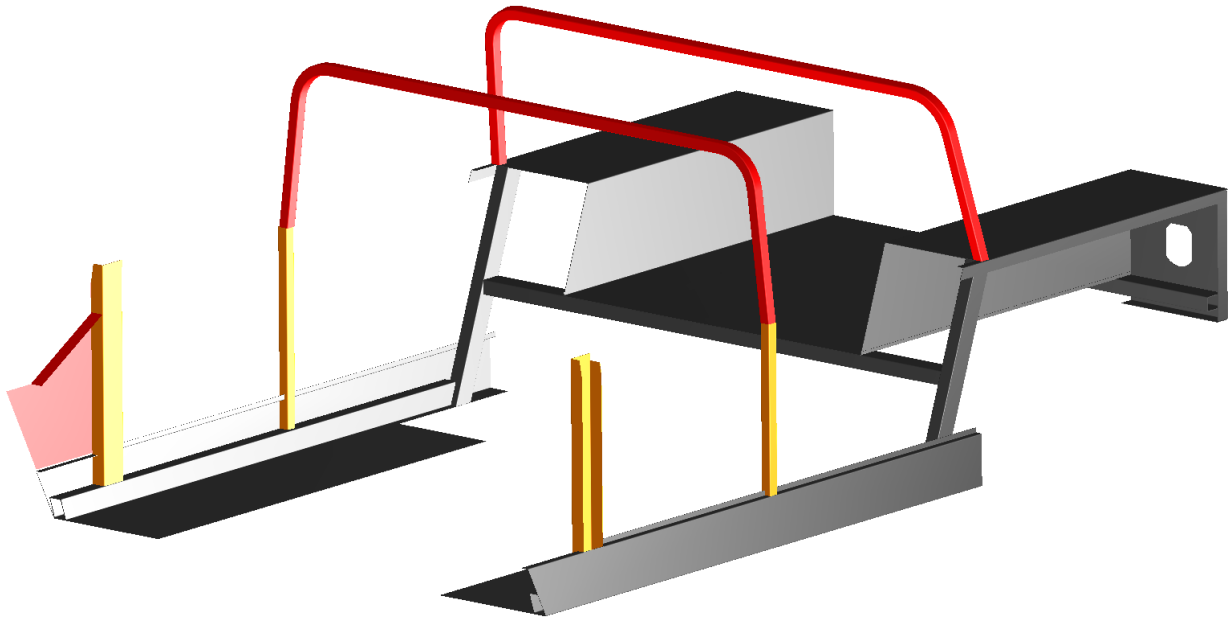
Do not weld the rocker panel skins into place because you will need to use for alignment several times and may want to remove several times during assembly (e.g. to weld tubing after fitment of all parts).

Using the rocker panel as a guide for the amount of offset, place the 2x3 rocker tube into place. The rocker tube will be offset to the outside by about an inch. This is so the quarter panel inserts have a place to rest and to fit the door jam. You may also want to clamp a cross member across the fronts of the tubes to hold approximate square. Tack the rocker tubes into place. You can remove the rocker panel skins later to finish weld after all the tubing is in the precise location.

Position the rocker panel skins with the lower front edge about 1/8" forward of the rocker panel tube. If you ordered the firewall/floor pan kit then you will be aligning the bottom of the rocker panel skin to the bottom of the firewall at a later stage so you will need about 1/8" clearance to fit the firewall skin on front of tube. Clamp or temporarily tack (e.g. where easily removable where can access with grinder) the rocker panel skin into place. This will act as a guide to align the subsequent components.

At this point you install the back seat pedestals (after finish welding the tubes) but you may want to proceed as in this guide to get all the tubing aligned before finish welding any more tubing.

## Roof Hoops



On vehicles the posts are labeled starting with A for the front windshield post. So the B-post/hoop is the second post (e.g. behind front door) and C-post is behind the rear doors on a 4-door. On the 6-door it is like there are two sets of B-posts/hoops.

On the B-hoop there are a couple of ways to do it. You can locate the lower B-posts into place and later add the upper B-hoop using straight edges as a guide. Or you can attach the B-hoop to the lower B-post pieces first using tubing and clamps to make sure aligned and tack together and then attach the one complete hoop to the rocker panel tubes. Either way use the notches in the rocker panel skins (may need to grind corners of notch slightly as they tighten when bent some times) to place, clamp, square, and tack the lower B-post to the rocker tubes.

Secure the C-hoop into place by tacking the back of one side into place and then pushing/holding the other side into place to tack the other side's back. You will want to align the front of the C-hoop bottom to the front edge of the bed side and inward at least 1/8" from the outward bed side (see figure showing left bed side gap) to leave room for the C-post cover or the weld-into-place SlantBack sides. You can use the C-post cover skin (if applicable) as a guide to hold the angle of the C-hoop and then tack into place (e.g. tack bottom of skin into place (will remove later to finish weld) and then tilt hoop to back angle and then tack hoop to top of C-post cover to hold the correct angle while assembling.



Use a long straightedge on each side to align the bed sides with the B-post and A-post. You can put some sheet metal in to space the A and B posts as necessary but may not matter as that is only 0.075" difference.

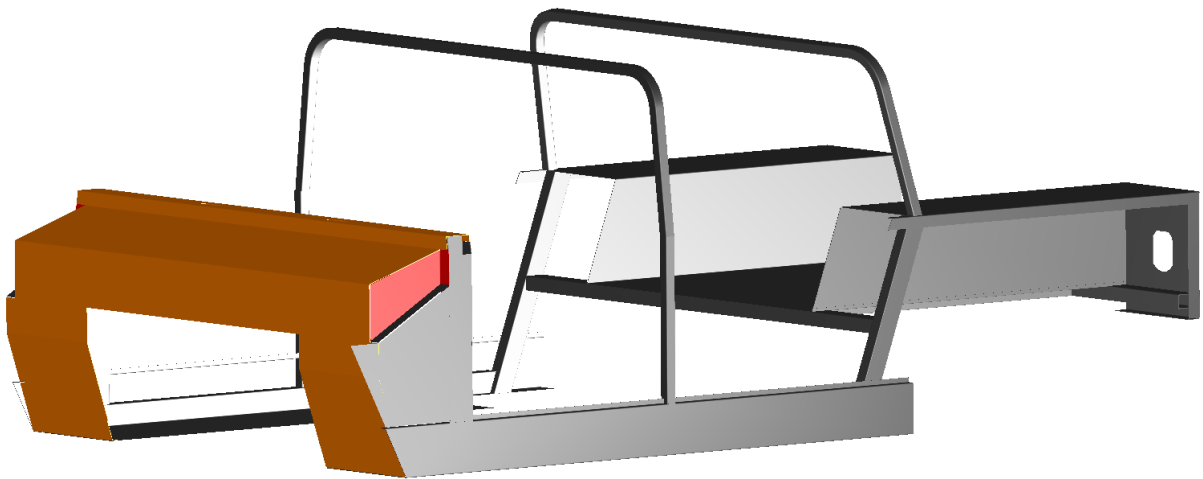


In the video it shows a customized A-hoop setup with tubing on the lower portion but that is quite complicated with 2 small compound miter short stubs. This was required by the customer for a special full-electric vehicle application. On normal builds there is a formed sheet metal lower A-post that welds to the firewall side pieces to create a 2x4 tube for added strength.

Using the firewall side pieces as a square/alignment guide, place the lower A-post pieces into place. You can tack the firewall post/lower A-post pieces to the 2x3 rocker tubes. Later you can slide out those pieces in order to access to weld the lower B-post and sloped 2x3 after all of the tubing is in place.

## Firewall (Optional)

Those doing regular builds without the firewall/floor pan option skip to the next section.

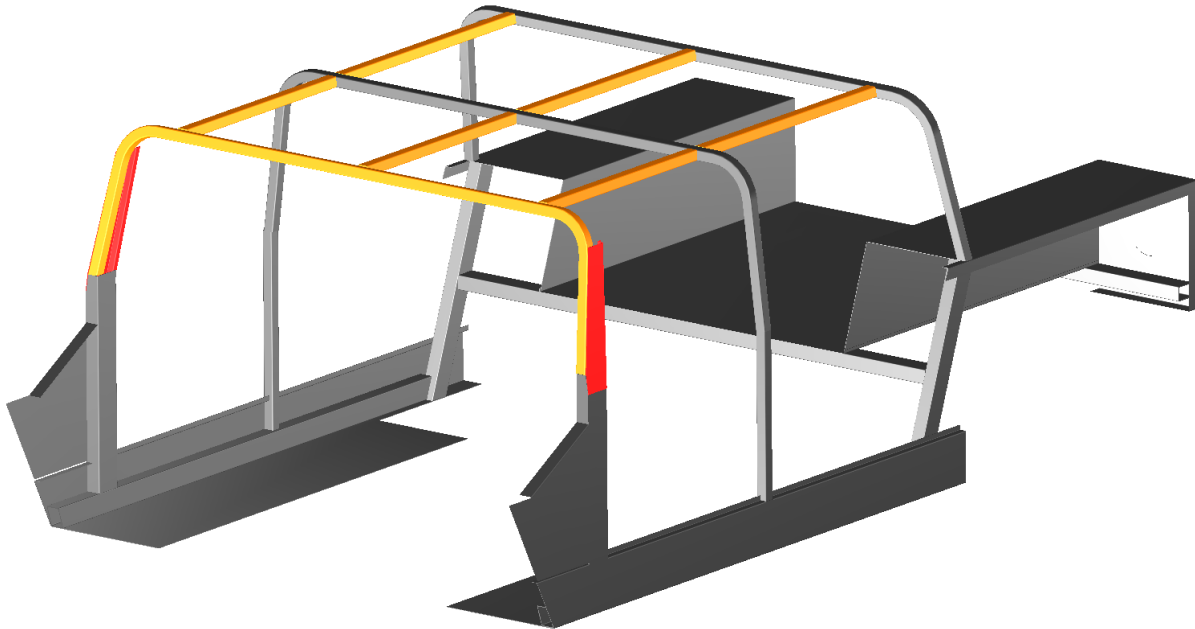


At this point those with the optional firewall will want to finish weld any parts they can't reach after they fix the rocker panel skins into place (e.g. lower B-Post and 2x3 rocker tube to bottom of sloped 2x3). Then replace the rocker skins and install the firewall over the lower A-post/firewall posts.

Tack the lower part of the firewall into place and then tack the firewall to the top of the A-post/firewall post. Then use the firewall side and the upper firewall side flat pieces as guides rough position the parts. You may need to grind or shift grooves depending on how you placed the lower firewall, etc... (e.g. if you want to overlap or under lap the rockers with firewall base).

Tack the parts to complete assembly/fitment of the firewall/sides. This can be a little tricky lining everything up. So start with the corners/critical alignment locations and then tap/hold into place as you tack. Then inch your way tacking as you hold the next inch or two in place. A little patience and possibly some quick rework may be necessary as some of the bends may have sprung during shipment.

## A-Hoop and Roof Supports



Now you are ready to position the A-hoop into place. Start by positioning the A-post cover skins into place as guides to locate the A-hoop. Then you can line up the A-hoop to the front edge of the correctly-position A-post covers. You can then tack the hoop into place and proceed with the rest of the roofing tubing. You may want to tack the front edge down and then rotate until the front edges of the A-hoop and A-post covers align. Then you can do a temporary tack to hold the correct angle as the skin holds the correct angle of the hoop.

Remember to check the alignment (keep aligned with straight edges) of the bed sides and the firewall sides/post and the B-post so the entire body remains true and doesn't spring outward or inward at the hoops or the front (especially if no firewall). This one simple step can keep everything aligned from front to back. You can look straight down the sides occasionally to make sure everything is exactly true.

Mark the centerline of the A- and C-hoops on top (can use a straight edge and square to transfer center from bed or firewall area up to top of roof hoops. Check square and measurement in both directions to make sure you get the same reading and for more precision.

Use a straight edge or chalk line to transfer the center line to the B-hoop. You may want to mark 3/4" either side of the center line to aid in position the roof supports. Then position the center roof supports in place. Use a tube or straight edge and clamp the center tube supports to it in order to level the top of the roof supports to where the flat roof skin will sit. There will be a gap on the upper portions of the roof supports where they meet the A- and C-hoops. This is required for the roof skin to sit flat on the roof supports and the tilted hoops.





Measure the width of the roof skin and mark the front and back centers of the roof. You can either position the roof skin in place and mark the hoops where the edges will fit after aligning the centers of the front and back of the skin to the A and C-hoop center marks. Or if you want to just measure over or don't have the roof skin (e.g. Combat) then you can measure and mark.

In that case measure half the distance to the left and right on top of each hoop so you know where the roof skin will fit (also where you will position the inward side of the roof roll pieces). Mark the left and right edge lines on the roof hoop. You can mark 3/4" to each side of the center marks and the edge marks to know where to position the 1.5" square tube roof supports. If you don't have the roof skin option then center 60" wide for full-width (84" wide) bodies and 48" wide for the standard Sport body (72" wide).

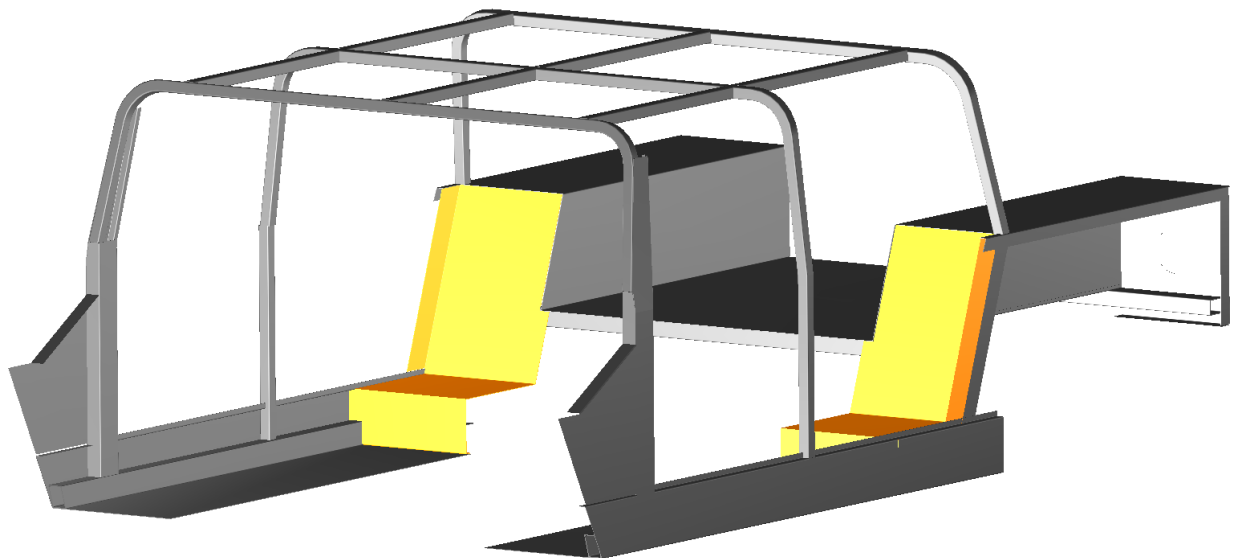
Clamp and tack in the left and right roof supports into place. Using a straight edge or straight tube or angle all the way from the front hoop to the back hoop can help ensure that level is maintained for proper fitment of the roof supports and skin (where applicable).

Triple check all fitment and alignment and then you can proceed to weld up the tubular substructure provided everything fits into proper position. Where applicable this can entail removing skin pieces so you can get a proper/complete weld around all the tubing.

Remember to rotate around where you are welding (as in the video) so you don't overheat or pull the components. If you aren't using too much heat, in many cases you can weld up one side and then the opposite side (or weld the top side and bottom side) to have the welds pull in balance as they cool. Allow for proper cooling before removing support braces so that things don't pull out of balance while cooling.

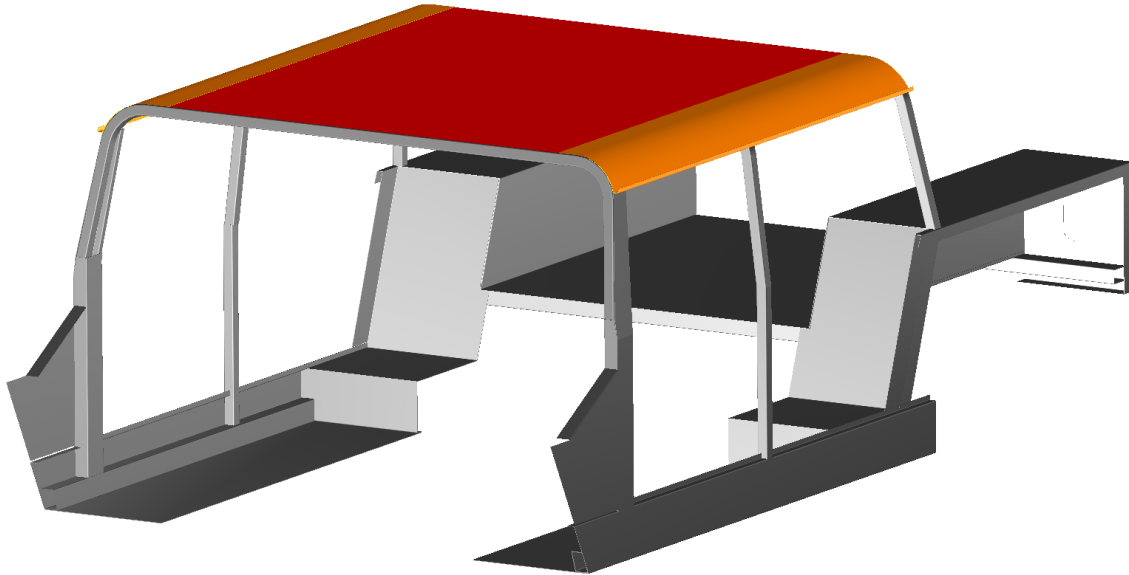
Replace skin pieces (grinding down some welds on tubes as necessary for fitment) that were removed for welding and tack into place.

## Back Seat Pedestals



Position the back seat pedestals into place and tack. You may want to set in the lower portions and then start aligning the top (may need to trim some parts for desired fitment). Some people will want to get alignment on the outward corner and then move inbound and maybe grind off some of the inward side to match the bed side. Others may want to start an upper inward corner and move out to edge.

## Roof Skin and Roof Rolls



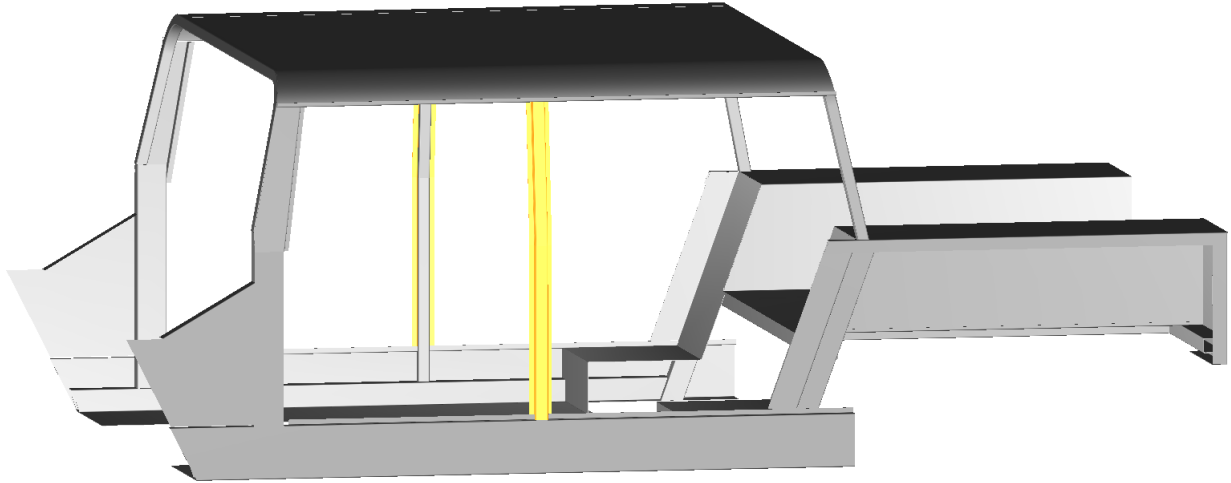
Center the roof skin (if applicable) after smoothing down any welds as necessary for fitment. Be sure to slide to the front for proper alignment of rear hatch alignment. Many times there is a little extra on the front that you can grind off after finish welding.

Next you can fit the roof rolls. The roof rolls may need to be adjusted to match the angle. **DO NOT ADJUST BY CLAMPING!** If you use clamps to hold into place then you may end up with a wavy drip edge. Adjust by gently stepping or pushing out the roll until it matches the desired curve. This may take a while as you adjust the roll all along the part to be the same.

**THE ROOF ROLL WILL NOT EXACTLY MATCH THE CURVE OF THE FRONT OR BACK HOOP.** This is to be expected as the tilt of those hoops flattens the bend radius and it is impossible to match three different curves and keep a consistent part - that is to be expected. Most important is to get the most accurate bend to look good from the outside and be consistent front to back.

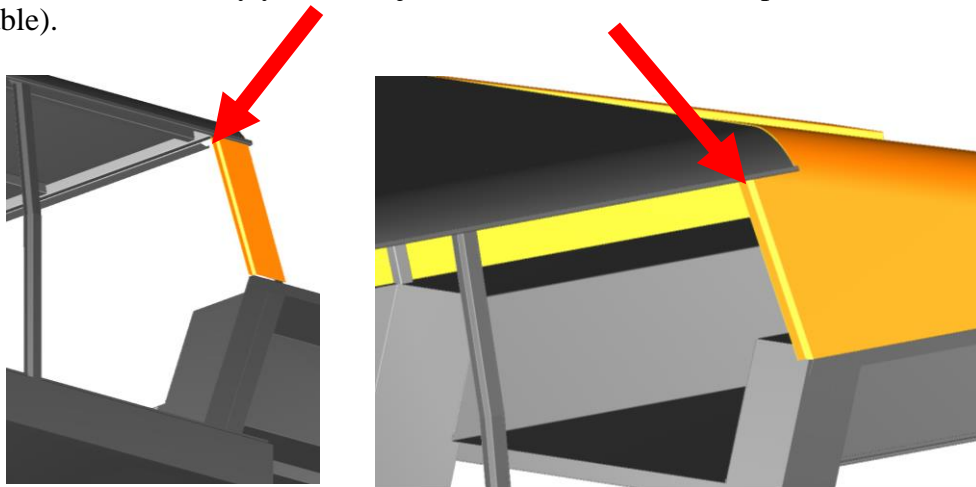
You want it to look right from the outside and forget the look on the inside. There will be gaps over the curves on the hoops and that is fine as long as you adjusted the roof roll to the correct amount of curve. So after you got the rolls to the correct amount of bed without any real pressure from clamps then you can tack into place. Don't forget to adjust forward and backwards so the lower drip edge is balance over the tubes. You can trim off the extra if applicable but make sure the lower portions are centered front to back before you tack into place. When you tack, and later on when you finish weld, remember to **not weld where there is a big gap above the hoops** or it can pull the roll and deform the skin. There is plenty of strength if you weld where the tubes are touching the roll and on the front and back where they are closer to the tilted hoops.

## B-Hoop Cover

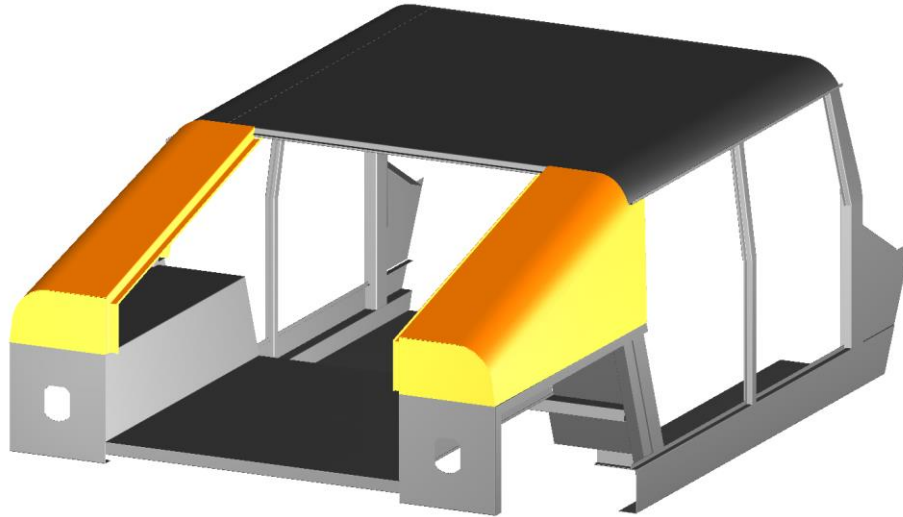


Position the B-post covers into place. You will probably need to grind a tiny bit to get the edges to fit perfectly along the bottom edges as the metal deforms along the edges where bent and due to the cutting process. You may also need to trim slightly to clear the roof roll. Also, you may need to open up the side wedge cuts a little so you can bend the top portion inward to match the taper of the B-post. Many times the wedge cut is not all the way to the outer surface so you can't bend the top in until you clear out the excess material. Remember to be safe as any time you grind in a groove the grinder can kick back and seriously injure someone (also always keep on a handle and guard over the grinding wheel for added safety (one guy ripped his cheek off when the grinder kicked back and another severed 2 tendons in a fraction of a second when the grinder flipped around and cut through welding glove).

If you have a cargo wall option you will want to put that into place before securing the C-post covers or the SlantBack sides. If you have the C-post cover, you can position and tack into place. NOTE: You may want to leave the top front of the C-Post cover loose (or same section of weld-in SlantBack sides). That way you can adjust in or out to match the top rear corner of the doors (if applicable).



## SlantBack Sides



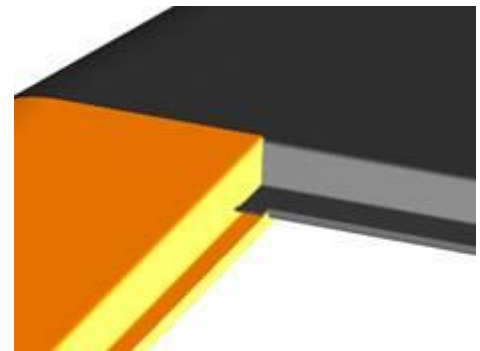
Where applicable get a SlantBack side and the corresponding flat back. Check for general fitment using the curve of the back as things can flex during shipment. Then start from the inward side (drip edge where hatch rests) and align and tack (you may need to shave a little with grinder to get precise fit).

Once you have the corner bend area tacked you can then move along the curve. Tack every little bit and then push metal together at next spot and tack. If necessary you can often do a tack and immediately tap with a hammer from the back side directly over the back side of the weld to close the gap. But it is generally easier to put some downward pressure on it and tack as you hold it in place.



Once you have both SlantBack sides ready to place on the body then you can start to position into place. You will want to measure the width of the bed area so you can mark the top for where you will be fitting the side pieces.

You may want to trim differently if you have the weld-in versus bolt-in SlantBack Pieces. It is always a good idea to think about how they shingle roofs, with the water flowing from above and top pieces overlapping and the lower drip edge under-lapping the one above it.



Once you have trimmed, fitted, aligned the slant back pieces you can begin to tack into place (if applicable) You may need to trim the curves in order to get the fitment (or gap for bolt-in pieces) that you want.

If you have the bolt-into place pieces you will want to put on the bulb trim for seal around the bottom. You can then determine how you want to attach the sides (e.g. some angle iron brackets

to bolt through and through bed area into another piece of angle support). At some point you may want to run a thick bead of silicone as a water barrier for under where the bulb trim will rest in an unbroken line from the C-post drip edge around the bed side and across the bed side to the hatch area. That can keep water from wanting to seep under the bulb trim as it creates a ledge like on some jeeps to resist water flow.

## Tailgate Supports



Position the tailgate side and bottom supports into place and grind for precise fitment. It is a good idea to work on a flat surface and align the flat sides down. You may even want to clamp down the tailgate to flatten the sides and then tack the side, bottom, and other side supports which can then hold the tailgate in a flat position. Once you have all the parts in place and everything is correct then you can then finish weld.

## Finish Weld

Once everything is in place and properly secured and aligned then you can start to finish weld the skin and remaining pieces.

**DO NOT OVER WELD.** The biggest problem with welding is when guys act like they are welding an inch thick ship's hull. Yes the sheet metal is very thick for automotive but it is not a structural member for a radio tower. So you will only want a narrow (~ 3/16" wide) weld about 1/2" long spaced about every 6 inches. Remember to not weld the stitches right by each other at one time but to rotate where you are welding and eventually end up with the right amount of welds by each other after proper rotation and cooling.

Thicker/fatter welds or higher amperage/heat will pull the sheet metal &/or pop out the back(good) side of the sheet metal resulting in a bunch of body work. You can also favor the time and heat on the thicker tubing and then let it flow into the sheet metal. There are a bunch of learning videos for welding so you can see how the edges should flow into the metal and not ball up (too much wire &/or not enough heat) or pit the edges (too much heat eating away edges of metal at weld or not enough wire to fill it in).

A 6 year old came in the shop and was welding good welds after only a couple of minutes of instruction so once the machine is set up properly it is quite easy to get good welds.

**SPREAD OUT WHERE YOU ARE WELDING.** Start with one weld in one area and then stagger to another location to do the next weld. Then move to another location and so on. This way you won't overhead one area and lead to warping. The warping happens much worse where there are flat sections like the bed and roof skin areas. So just be patient and rotate around where you are welding.

Leave the windshield loose until you fit the pre-welded body onto the chassis so you can position body and test proper fitment and clearances.\

You can reference the old General Assembly Guide for the applicable steps of installing body to your chassis. You will also fit the quarter panel inserts based on the wheelbase and body mounting. Don't forget to primer/paint any holes you drill for riveting or screwing in components otherwise rust could start expanding under the paint from those holes, etc...

## **Enjoy the Build and Your Dream Truck**

Most of all remember to enjoy the build and have fun. The process can be quite enjoyable and a great experience for your, your family, your spouse, your friends.... Soon you can tell others "I Built That" pointing to your dream truck.

Your ultimate 4x4 can be used to promote your business, skills, etc... and to possibly to start a business of helping others get their dream truck built!