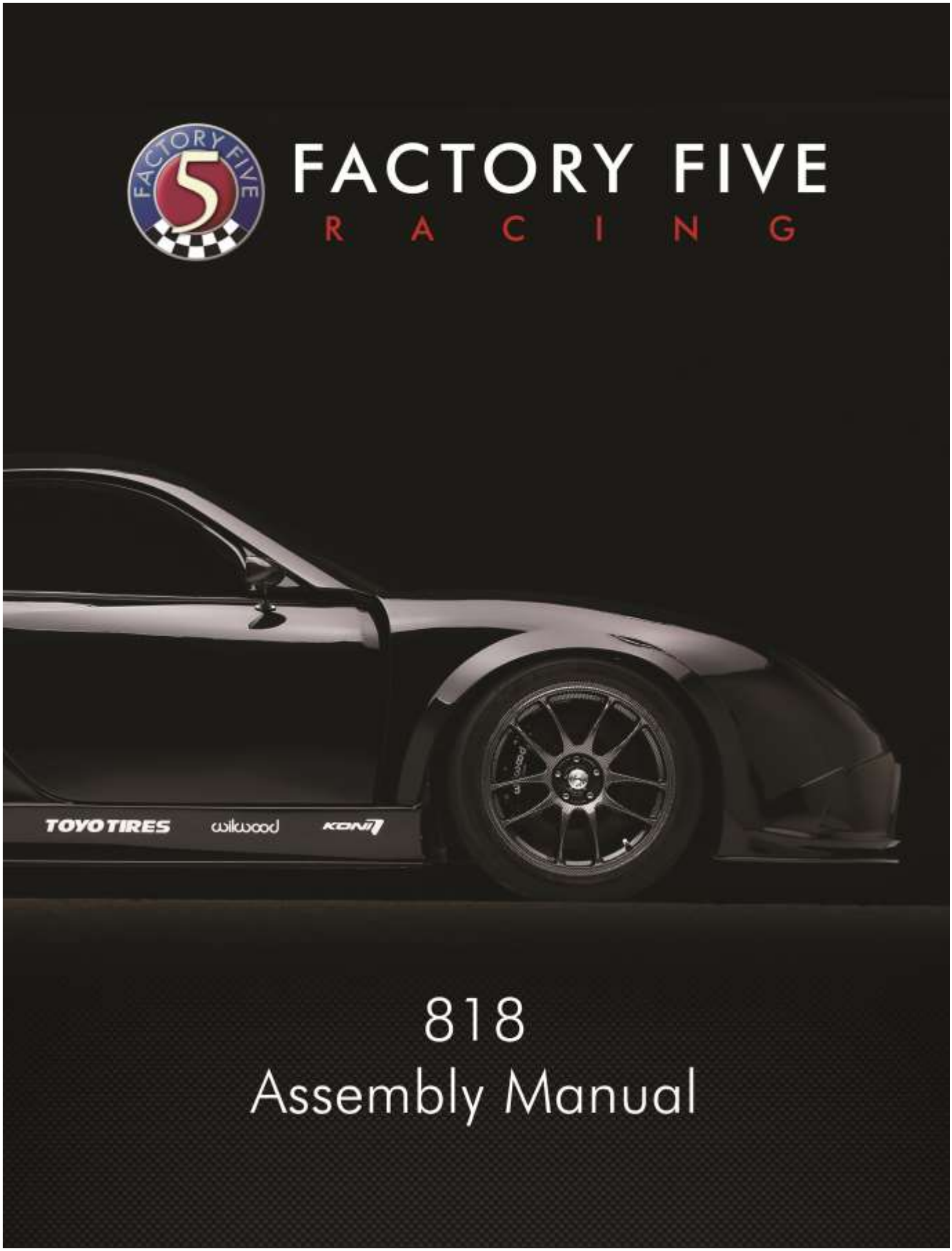

818
Assembly Manual

Revision 2a, April 2021

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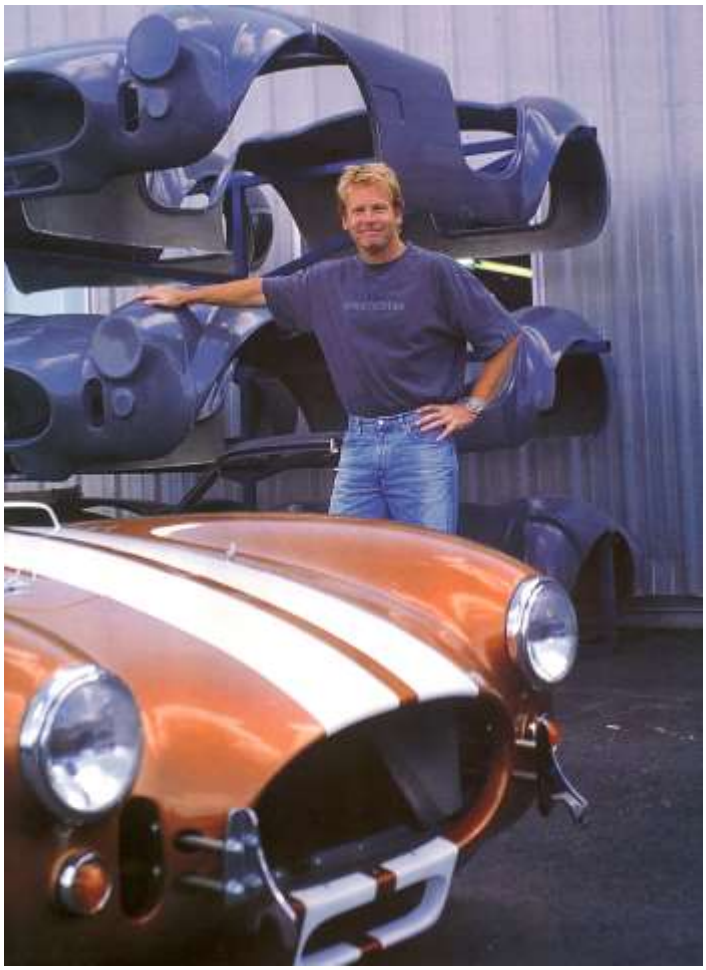
Chapter 1

General Information

Foreword



If you are reading this, you are embarking on a mission to build your own car, or at least considering doing so. I wanted to share with you some of my experiences and lessons learned while working with literally thousands of people who have completed this undertaking with us. The lessons learned here are important and will hopefully help with your decisions as well as with the project and the completed car.

First of all, the idea of building your own car is NOT for everyone. It is a serious endeavor that should be undertaken with care and consideration. The desire to build your own custom car goes way back. It is part of our uniquely American car-centric culture, and those who build their own cars are at the very center of this. Since the earliest days of Hot Rodding, literally tens of thousands of people have built their own cars. Even more have done restorations and major customizations to existing cars. As fun as this project is, a person should be candid about their abilities turning a wrench. This is not a place for novices. That is even truer in racing, where danger and risk are part of the very definition of always trying to go faster. The late Carroll Smith wrote something I really loved that speaks to this point.

"There is no magic! The one basic truth of successful racecar preparation bears repeating. There is no magic. There is only logic, common sense, forethought, vast amounts of hard work, and a fanatic dedication to the task at hand".

Carroll Smith

"Prepare to Win"

I can't think of anything more appropriate to say about the right way to approach the serious work of building your own car. Carroll passed away not too long ago, but his accomplishments behind the Ford

Lemans victories and his contributions to the motorsports community continues in his writings that are all at the top of my list of recommended readings for the car builder or racer.
After being honest about the skills, responsibility, and dedication required to build a car, I feel the need to talk about the PROCESS of building a car in an equally candid manner.
The process of building a car is a lot like the process of having kids. As a matter of fact, it's absolutely the best analogy I can find (apologies in advance to all of you without kids, try and bear with me). Both things are easy to get started. With a car project you order a manual, talk to car guys, get all excited over glossy photos and perhaps order a kit from us. With the whole pregnancy thing, well for most folks that's even easier to get started…
When my wife was pregnant with our first daughter I was sure we would never have any more children. From the swollen ankles to the morning sickness, to the delivery room scene from the movie "Alien", the whole process was difficult, and while she didn't complain too much thru the nine months, it was obviously hard work. Another thing, she wouldn't have been the best salesman for others considering getting started on the baby thing.
When it comes to the car project, once the kit arrives and the process begins it is much the same as pregnancy. Frankly the degree to which a person breezes thru the project or languishes is commonly a factor of skill, but still, building a car for anyone is a tough job and there are inevitably issues. How many times have you gotten the wrong part at NAPA, gotten home to realize the alternator has a six ribbed pulley not five…? You will meet challenges building this car and you will be frustrated at times. Thankfully there are internet discussion forums where you can vent your frustrations and complain about the idiots who designed this kit. We smile when reading these posts because we know that while the pregnant woman complains, the mother loves her children in an unreasonable and perhaps even undeserved way!
All the way thru the process, as you build your car, the seasoned guys at Factory Five in tech support will help you. The larger community of Factory Five customers will also be there for you, as the one thing that really sets us above the crowd of other companies is the size, competence and enthusiasm of our customer community.
When the baby arrives and when your car is done, there will still be more work. With babies, it's up all night, diapers, and strange maternity contraptions that men don't speak of in the light of day… With the car it will be other challenges. Registration and licensing can be frustrating and laws vary from state to state. A wrench dropped from 25 feet away will inexplicably shoot sideways into any freshly painted surface and my favorite was my own engineers who felt the need to test out how long a rear differential can run on a track without gear oil (answer, about three laps before deciding to stop moving).
There will be highs and there will be lows, but in the end, there are few parents who don't treasure their children more than life itself, and there are few Factory Five owners whose lives remain unchanged by the experience and the artwork they have crafted.
It's one of the greatest experiences in the world to raise children. It's also one of the most rewarding things I know to build your own car. Even today at car shows, open houses, and events wherever Factory Five cars are found, I smile to hear the inevitable first words every guy says to me… "Let me show you what I've done".
The cars that we build are more than cars. They are a reflection of us. The badge of honor that comes with having built your own car is a special one indeed. You will join a community with others who have earned their own… and THAT is the story of Factory Five Racing and that is what awaits you in this process.

David Smith
President

Safety Notice

Warning!

Assembly of a Factory Five vehicle kit should ONLY be performed by persons experienced, trained, and familiar with custom vehicle work including, but not limited to, brakes, wheels/tires, engines/running gear, steering systems, suspension systems, automotive restoration, competitive driving, and all aspects of custom vehicle work. Failure to safely assemble a Factory Five Racing vehicle parts kit can result in serious injury or death.

Advice of Factory Five Technical Support does not guarantee proper installation. YOU, or the person who does the assembly must be qualified to do this. It is not possible for Factory Five to foresee or understand all potential issues that may arise during your build while we offer advice and assistance over the phone, via email, or even in person.

Do not assume anything. Like all vehicle work, improperly assembled vehicle parts can cause serious injury of death.

Purchaser expressly ASSUMES THE RISK of all personal, property, and economic injury, damage, or loss, either direct or indirect, arising from the use, misuse, or failure to determine the appropriate use of any Factory Five product.

Factory Five vehicles are part of a category of vehicles that include custom builts such as hot rods, Cobra replicas, and other high-performance vehicles. They are capable of extreme performance and should be operated safely, and only by skilled drivers. Do not loan your Factory Five to a friend!

Building your own car and racing are dangerous endeavors, and the buyer expressly assumes the risk of all personal, property, or economic injury resulting from the use of said products.

Safety Tips

- Read the manual. It is at least a good guide and place to start.
- Don't take short cuts.
- Before starting work, make sure you have the proper tools, the required parts, and sufficient space for the job. If you damage any parts, it will probably be because they were either not stored properly or, the wrong tool was used to install them.
- Don't work when you're too tired or upset. The car you will be building is capable of supercar levels of performance, and your life depends on the quality of your workmanship.
- Never work under a raised car unless it is well supported by stands intended for that purpose. Never work under a car supported by a jack.
- Always observe good safety practices such as the use of eye protection, protective clothing, and gloves.
- Keep the battery disconnected whenever you work on fuel or electrical systems and always keep a fire extinguisher handy.
- Don't allow children in the work area.
- Partially assembled cars attract a crowd. Keep garage doors closed or mark off work areas.
- Make sure that all electrical equipment is grounded. If working alone, have someone check on you periodically.
- When using an engine hoist, make sure that the working load rating is correct for the weight.
- Work in a well-ventilated and well-lighted area.
- Use portable safety lights for under-carriage work. Never use an exposed bulb type light.
- Be mindful of the environment. Avoid spills of solvents or engine fluids. If a spill occurs, clean up immediately and dispose of it in hazardous waste containers
- Never let a friend or someone else drive your car.
- Always wear your harnesses.
- Clean your build area after each assembly is completed. This will speed your build process as it ensures that you know where your tools are and prevents tripping injuries.
- It is impossible to anticipate all of the possible hazards. Care and Common Sense will prevent most accidents.

How to use This Book

This Assembly manual is intended to help you build your Factory Five Kit. This book will not explain such things as engine or transmission building. A secondary purpose of this book is to use it as reference for owners that want to do maintenance work on their cars or for those that purchase finished cars, to understand their cars better.

This manual was written with the average weekend mechanic in mind. It is best to follow the manual step by step but if there is a part missing from the kit move to the next section and come back to it late when the part is available. If the instructions are followed then the resulting car should be a great handling sports car.

ICON KEY	
	Valuable information
	Tools needed
	Parts Needed

We have included an Icon key as the beginning of each section that contains useful information for each assembly that details the tools needed for that assembly, what assembly in the kit parts are packaged in that are needed for that step and any useful information or warnings.

What You Get

Frame: Complete jig-welded tube frame. Includes mounts ready to accept Subaru EJ 2.0L and EJ 2.5L engines.
Body: Hand laid 3/16" laminate composite body panels made with vinyl ester resin.
Chassis Aluminum Panels: Over 55 Laser cut, pre-formed aluminum panels for cockpit, wheel wells, and engine bay. 600 pre-packaged rivets.
Front Suspension: Tubular upper control arms, Upper Ball joints, Koni™ high performance shock absorbers, springs, custom spindle adapter brackets.
Rear Suspension: Custom spindle adapter brackets, Koni™ high performance shock absorbers, springs and fasteners.
Brake/Fuel lines: Pre-flared 3/16", ¼" and 5/16" brake and fuel lines.
Cooling System parts: Stainless steel and aluminum radiator hose kit.
Engine/Exhaust parts: The 818 kit is configured to accommodate the EJ 2.0L or 2.5L engines. The kit comes polished stainless steel exhaust parts to adapt to either the turbocharged WRX or naturally aspirated Subaru Impreza engines.
Gauges and Dash and Electrical Assembly: Parts are included to adapt the Subaru Impreza wiring harness and comes with a molded dash designed to allow the Subaru gauge pod to bolt-in.
Interior Accessories: Parts are included to bolt-in the Subaru Impreza seats and seat belts. Foot box carpet, cable shifter assembly and shifter boot.
Exterior Accessories and Lighting: DOT approved windshield, License plate light and bracket, DOT approved headlights, turn signals, and tail-lights, hood pin kit, hood, trunk and side mesh louvers.
Assembly Manual: Bound assembly manual full of pictures and diagrams.
Fasteners: Over 400 top quality zinc plated and stainless steel fasteners.

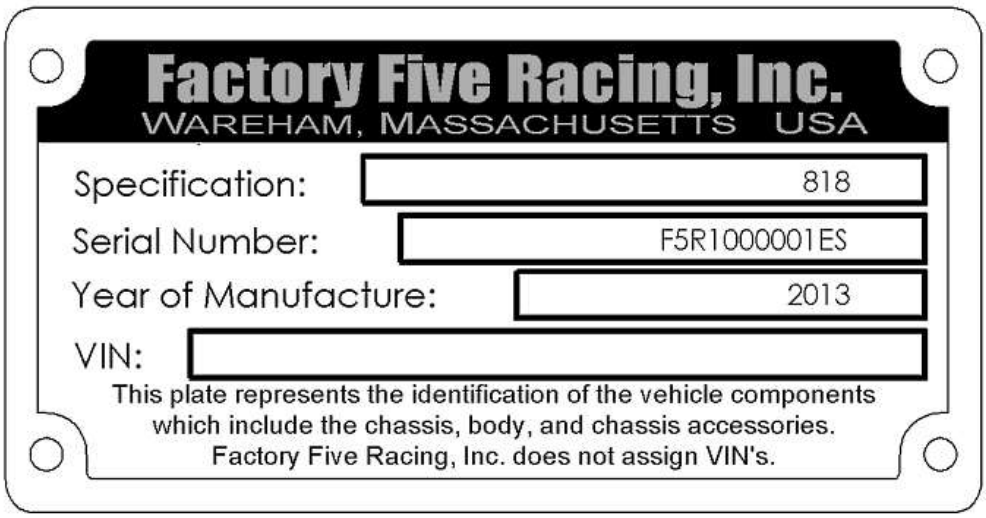
Major parts needed

See the complete list in the appendix.
Engine
Transaxle
Front and rear suspension
Wheels and tires
Radiator
Steering rack
Steering column
Seats
Fuel pump/fuel level senders

Serial Number Identification

Factory Five Racing has included a Certificate of Origin along with a Nameplate for your kit. The serial number from the Certificate of Origin matches the number engraved on the 1.50"x 1.50" tube going across the car at the front of the cockpit. Below is an example of how the nameplate looks for the street

version. The R version uses ER at the end of the number. The VIN number space is provided so that your state issued VIN number can be engraved if you so desire. This can be engraved at any Trophy or mall engraver.



Tools and Supplies List

The following lists detail the tools and supplies that are needed to build your kit. The "helpful" items are not crucial to the assembly but make life easier. Home Depot HUSKY®, Sears CRAFTSMAN®, and Snap-On® tools are all guaranteed for life and we've found them to be reliable tools.

_____ Storage Shelves for kit and running gear parts
_____ Body storage area (can be outside)
_____ SAE and metric socket set, a 52-piece set is a good choice
_____ Deep sockets for some common sizes are helpful.
_____ SAE Combination wrench set (⅜"-$^{15}/_{16}$")
_____ Metric combination wrench set (7mm – 24mm)
_____ A set of standard and Phillips head screwdrivers
_____ Standard and Metric Hex key sets
_____ Long nose pliers, 4.5"
_____ Snap ring pliers
_____ Tin Snips
_____ Drill
_____ Drill bits (#30, #11, $^{3}/_{32}$"-½" standard drill bits)
_____ Caulk gun
_____ Dead Blow hammer
_____ Razor knife
_____ Wire stripper/crimping tool
_____ Bench top vise

_____ 6" C-Clamps
_____ Tape measure or straight edge ruler/T-square
_____ Hydraulic floor jack

_____ Engine hoist
_____ 6’ 5/16” chain (to lift engine)
_____ 4 Jack stands
_____ 3/16”, ¼”, 5/16” Fuel/brake line bender (hand held)
_____ Jig saw (Body cut outs)
_____ Torque wrench (Click style, ⅜” or ½”drive)
_____ Eye protection
_____ Bucket
_____ Vise grip C-clamps (3 or 4 pairs medium size)

Helpful

_____ Cordless drill (w/clutch helpful, 14-18 volt units are best)
_____ #6 hex driver attachment for cordless drill
_____ Adapter for cordless to use ¼” socket driver
_____ Flare nut wrenches (⅜” & 7/16”)
_____ Flat file and round file

_____ Ratchet wrenches

Required Supplies

_____ Engine degreaser (for used engine if using)
_____ Silicone Door and window sealant, GE Silicone II or equivalent – 4 tubes
_____ Coolant
_____ Engine oil
_____ Gear oil
_____ Transmission Fluid
_____ Brake fluid, DOT 3
_____ Chassis grease with grease gun and grease fitting coupler
_____ Oil filter
_____ Battery
_____ Spark plugs
_____ Black permanent marker
_____ Duct tape
_____ Masking tape
_____ Electrical tape
_____ Bodywork supplies
_____ Rags
_____ Gojo® pumice hand cleaner
_____ Acetone
_____ Aluminum polish/cleaner
_____ Paint sticks (used as panel spacers)- Hardware store paint department
_____ 3M Super 77 spray adhesive – 1 large can
_____ 3M General Trim Adhesive (for headliner) – 1 large can

Stick with name brand products like Eastwood®, 3M®, and Duplicolor®. The Eastwood brand coatings are great. Sherwin Williams, PPG and Dupont brand paints are excellent

Chapter

2

Donor Car Disassembly

Removing the Donor Parts

- Keep fasteners from every part that is being saved. (Keeping all the fasteners from the donor until the car is built is a good idea; the spares can come in handy).
- After removing an electrical box, plug it back into the harness.

Remove the hood. Save the hinges, they will be used in the build.

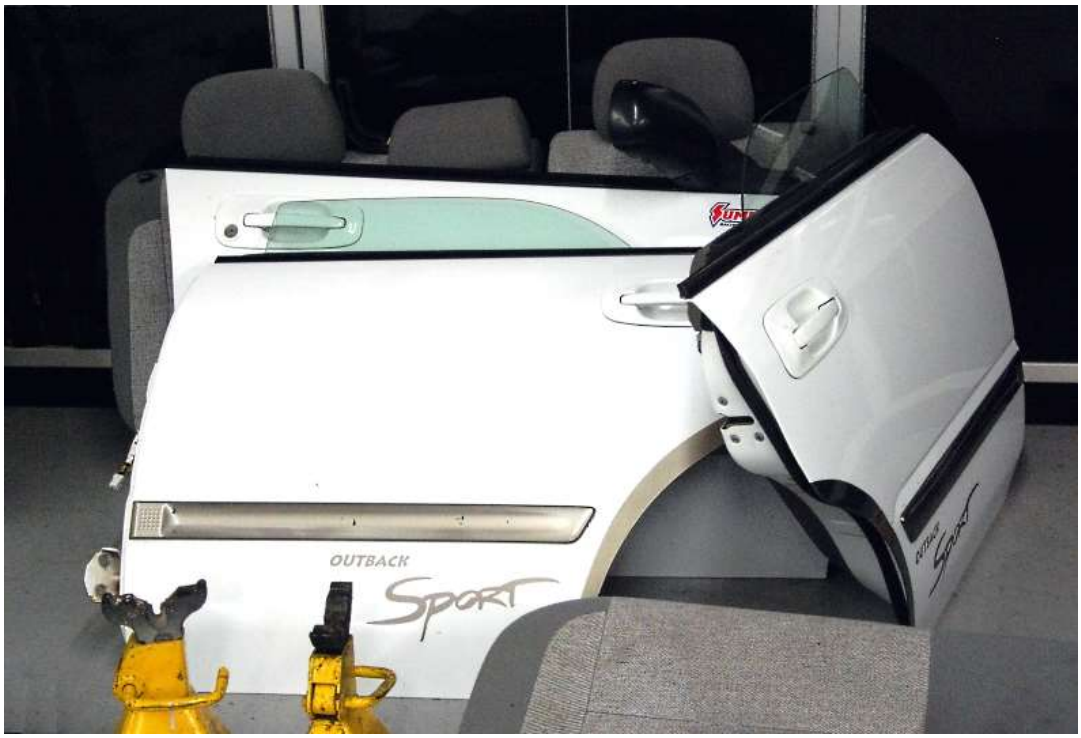
Remove the trunk.

Rear Doors

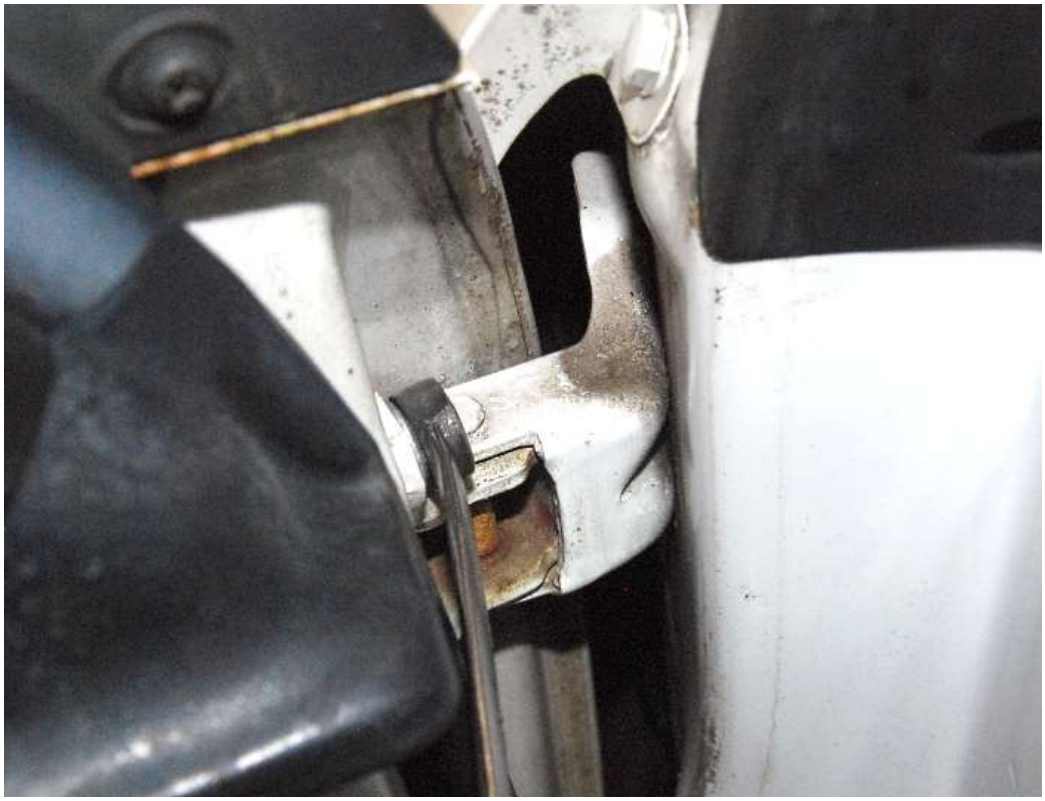
Remove the inside door panels.
Remove the inside door handles. Save along with the hardware for use on the 818.
Remove the door latches and linkages. Save along with the hardware for use on the 818.
Roll down the windows to protect the glass from breakage.

Disconnect the battery, ground terminal first, and remove from the car.

- If the battery is in good shape save it for the build otherwise note that you will need a new one.



Remove the doors, this will help access to the rest of the parts on the car.



Remove the hinge, latch, latch strikers and hardware for use in the build.

Seat Belts

Remove the rear seat belts. Undo the upper side mount.

Remove the trim to access the seat belt reel bolts. This trim will not be re-used so it can be cut off to ease removal.

As you are uncovering the various mounting bolts, remove any trim and carpet for easy access to the wiring harness later.

Remove the **REAR** seat belt reels and the center receptacles, these will be the belts used in the 818. Leaving the two pieces connected is a good way to not lose the smaller part.

Seats

- The front seats will be re-used so be careful removing them. Some models have electrical plugs that must be undone before seats can be pulled clear of the car.

Pull the plastic covers off the back of the seat tracks to access the bolts holding in the seats and remove the bolts.

Slide the front seat all the way back in the tracks to allow removal of the front mounting bolts.

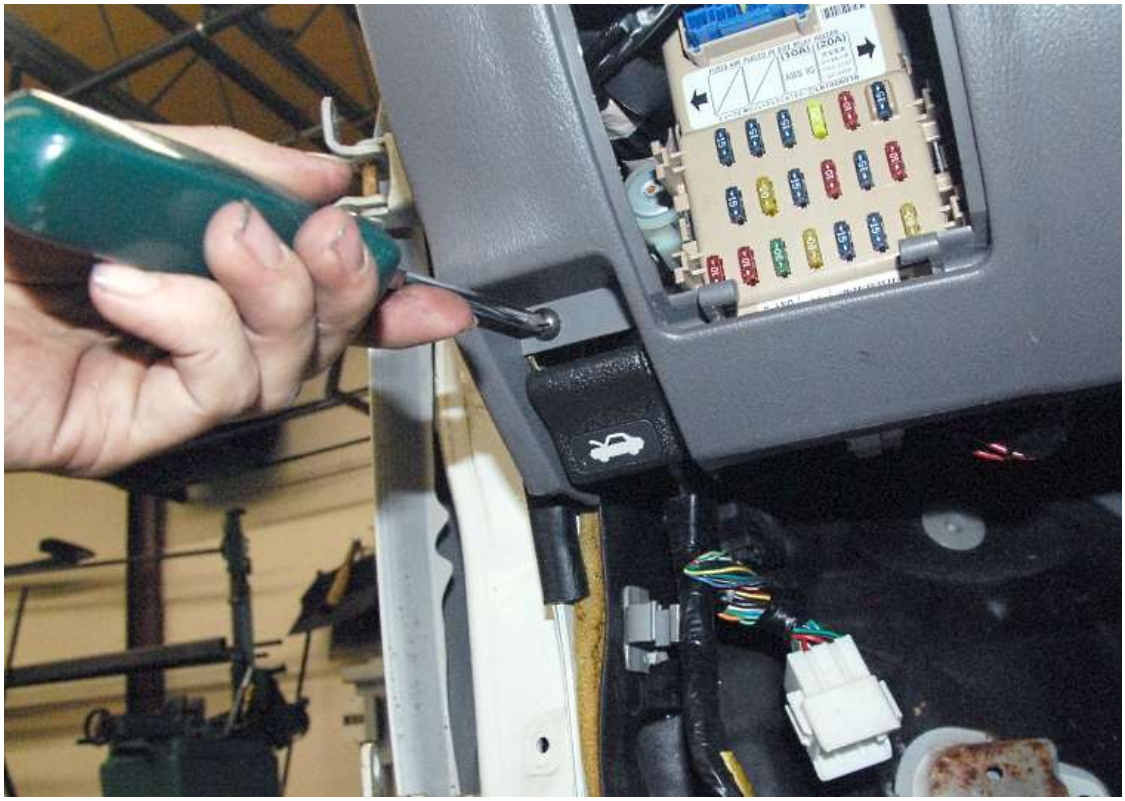
Unplug any electrical connections and remove the seats.

Remove rear seat for access to the fuel tank and wiring.

Dash

🛠 Philips head screwdriver, flat head screwdriver, 10mm socket, ratchet.

Begin removing the dash for access to the wiring and instrument cluster. Start at bottom left side.



Remove the fuse panel cover and set it aside so you will have the diagram on the back.

With all the screws removed pull off the driver's side lower dash panel.

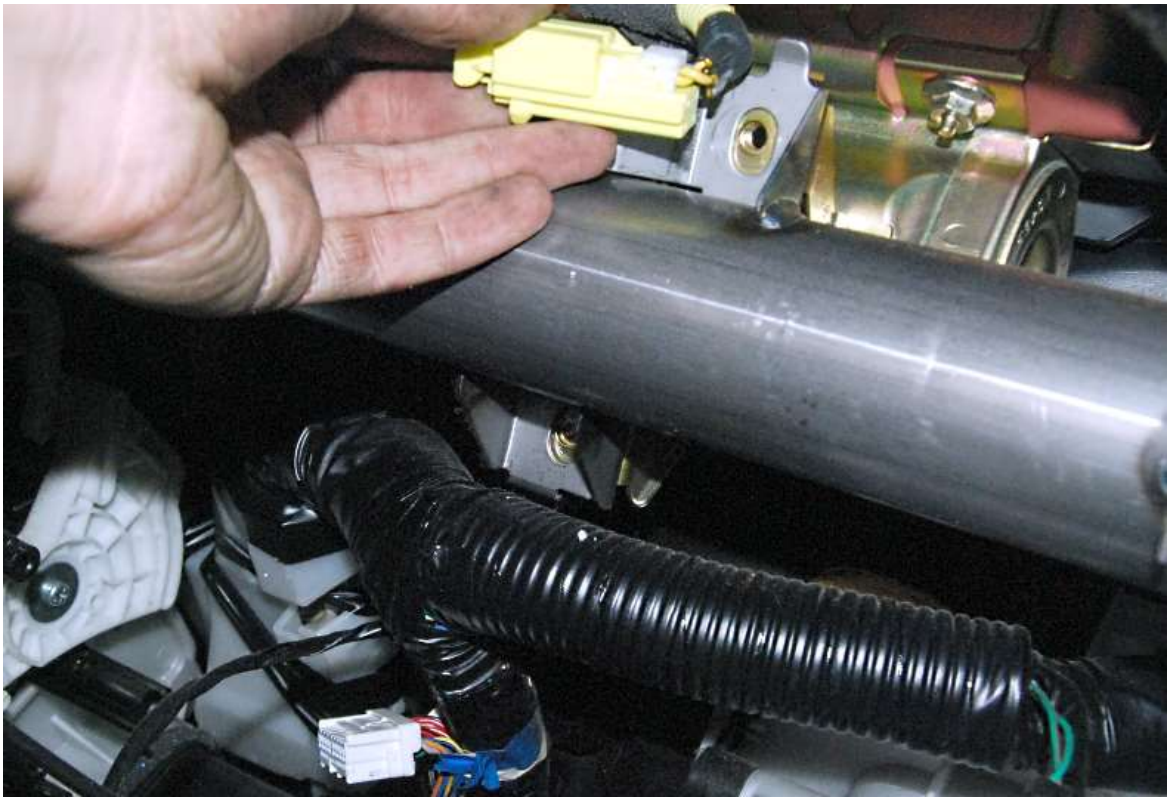
Pull off the radio cover plate to uncover the radio and climate control mounting hardware.

Remove and unplug the radio and HVAC controls. Mark these plugs with masking tape or a label now before the rest of the harness is unplugged so you know what the plugs go to later.

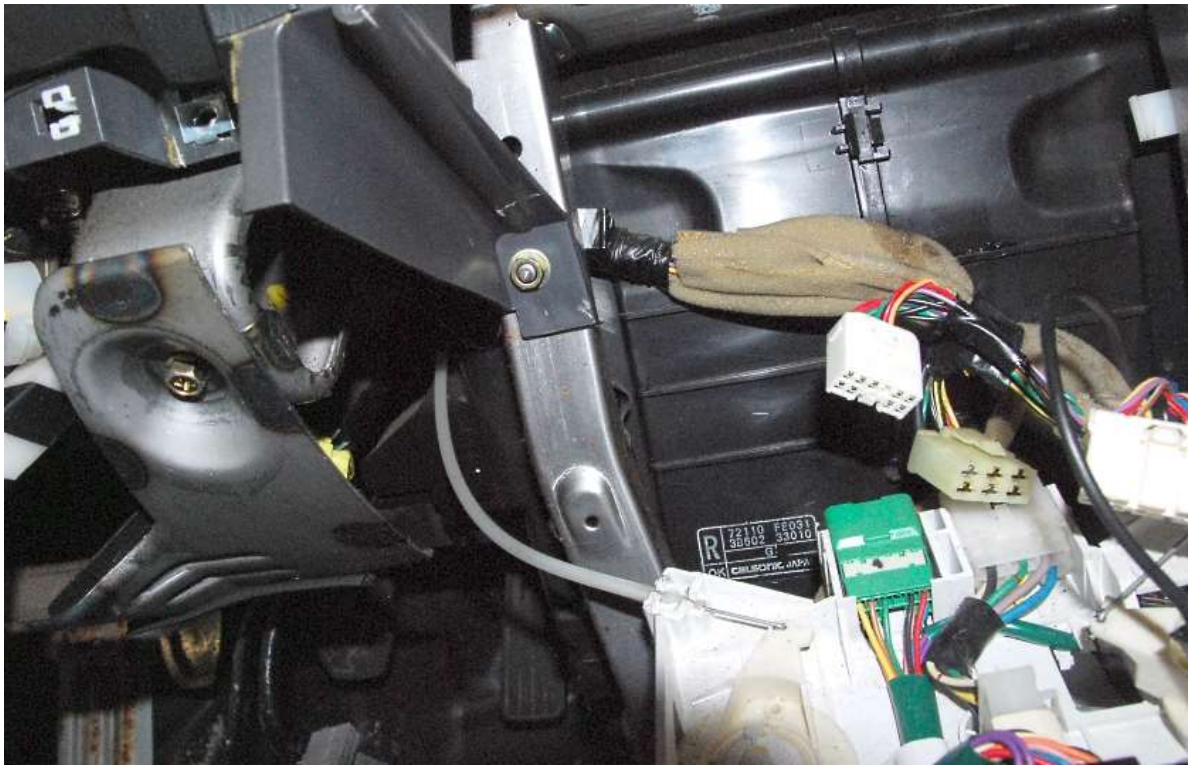
Using a screwdriver pry up the cover to the clock so it can be removed and the top dash screws are uncovered. Label this plug with a piece of tape or label maker.

Double check that your battery is disconnected. You do not want to work around live air-bags.

Gently lift off the cover to the passenger side air-bag.



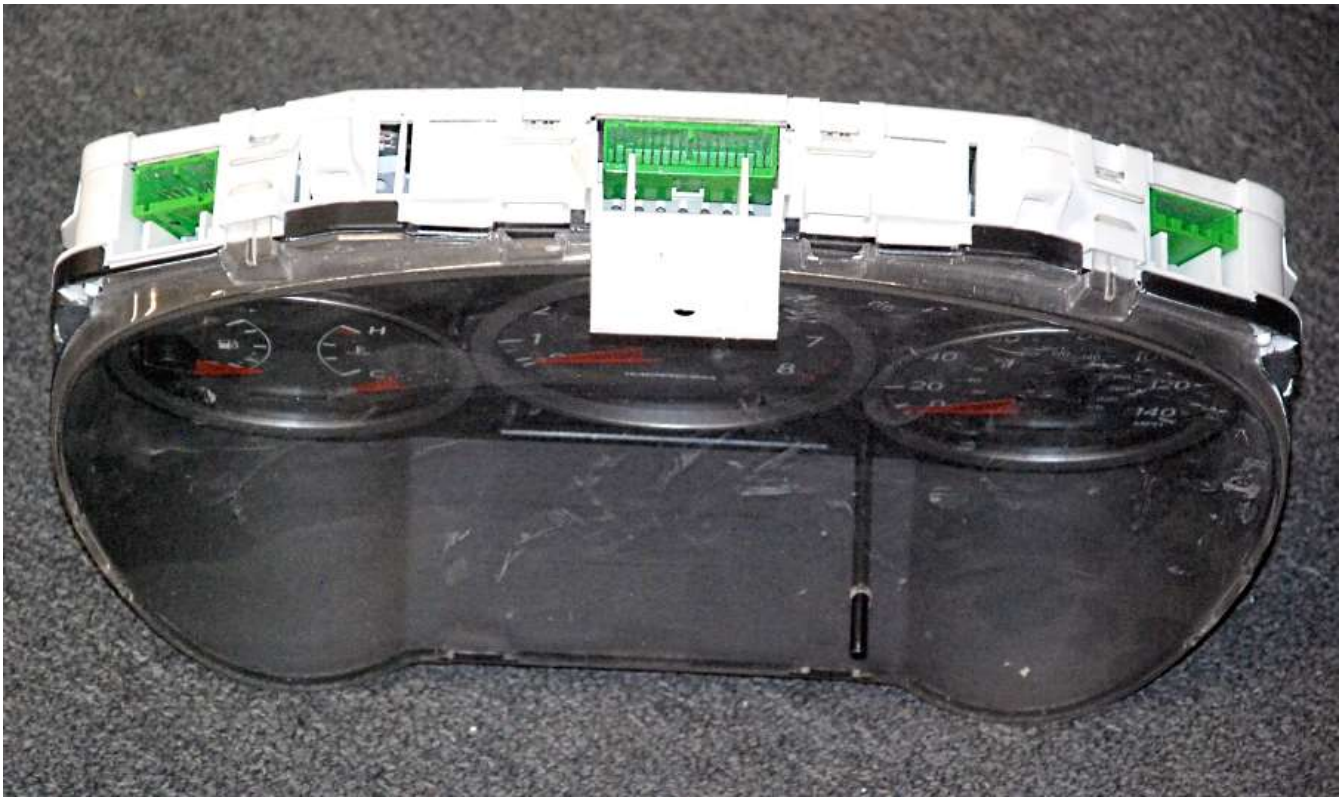
After removing the three 10mm screws that hold the airbag to the dash bar, unplug the airbag and remove it. It will not be used and can be scrapped or sold if it still in good condition.



Unplug all of the accessible connections under the dash labeling each as you go. If you do not recognize the component you are unplugging, label it as well so that it can be matched back up to the plug later.

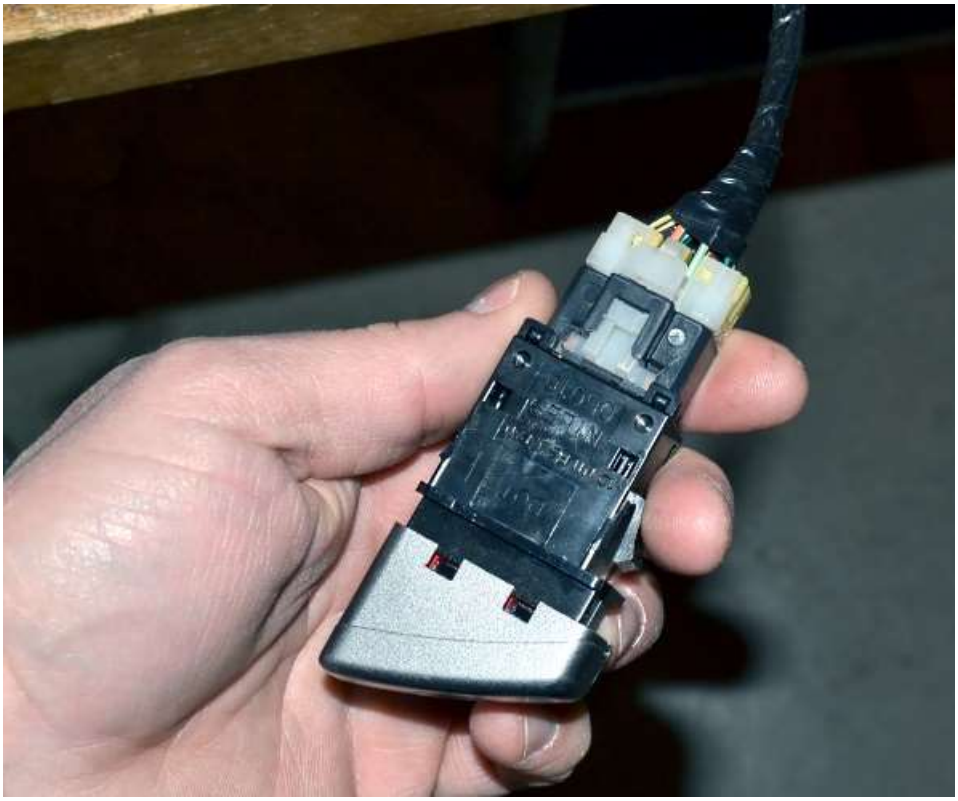
Gauges

Remove the instrument cluster being very careful not to damage it. It has one screw up high as well as two along the bottom.



There are three separate electrical plugs along the top that can be unplugged once the cluster has been pulled away from the dash a little ways.

Remove the center vent from the dash then remove the hazard switch from the center vents, only the switch itself will be used and not the vents themselves.



Plug the switch back into the harness

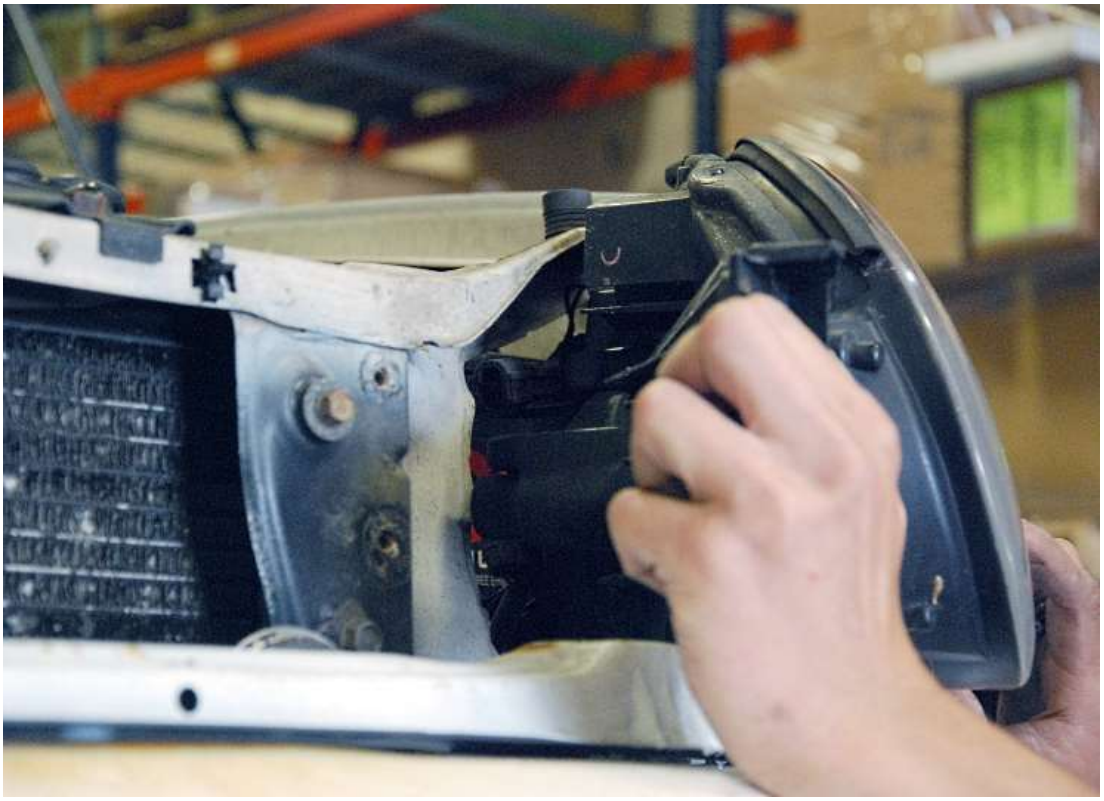
Set aside the center console section with the shift boot and knob.

Wheels

Break the lug nuts free but leave them snug. Place the car on jack stands and remove the wheels. Even if you are not planning on using them on the finished car they are handy for rolling the chassis around during construction.

Engine/Radiator/front suspension/exhaust

Begin Engine bay disassembly by removing the front fenders to provide access.



Remove front grill and headlights, mark the headlight plugs with labels for later.

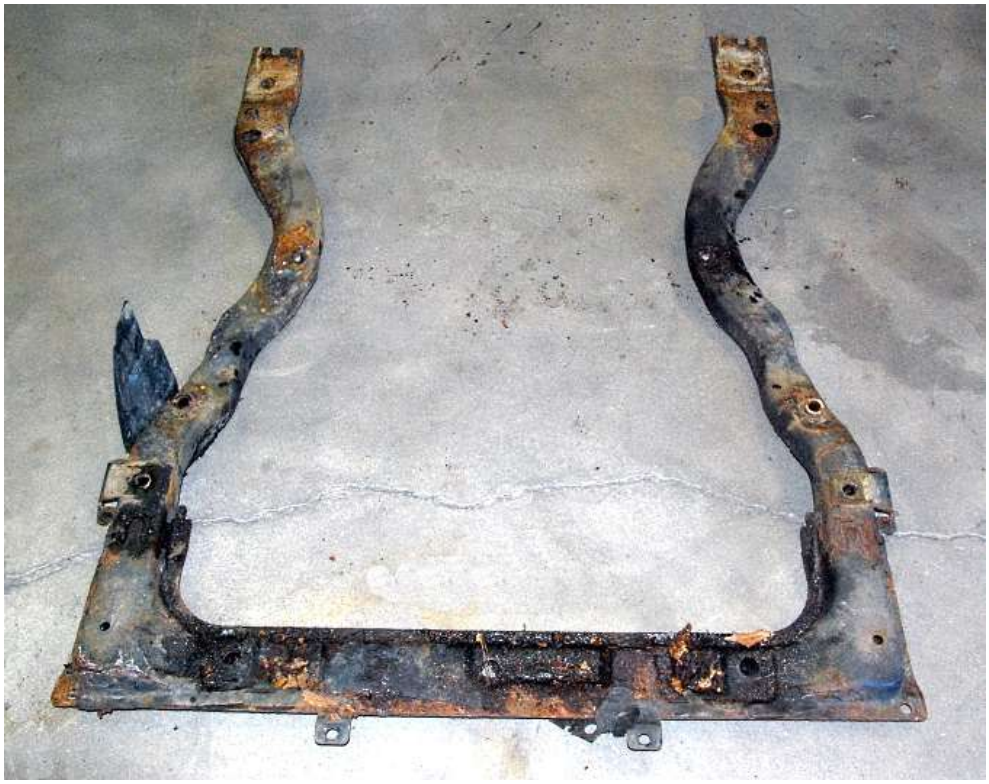
Remove front bumper cover and support.

Remove the Air box and set aside for use in the build.

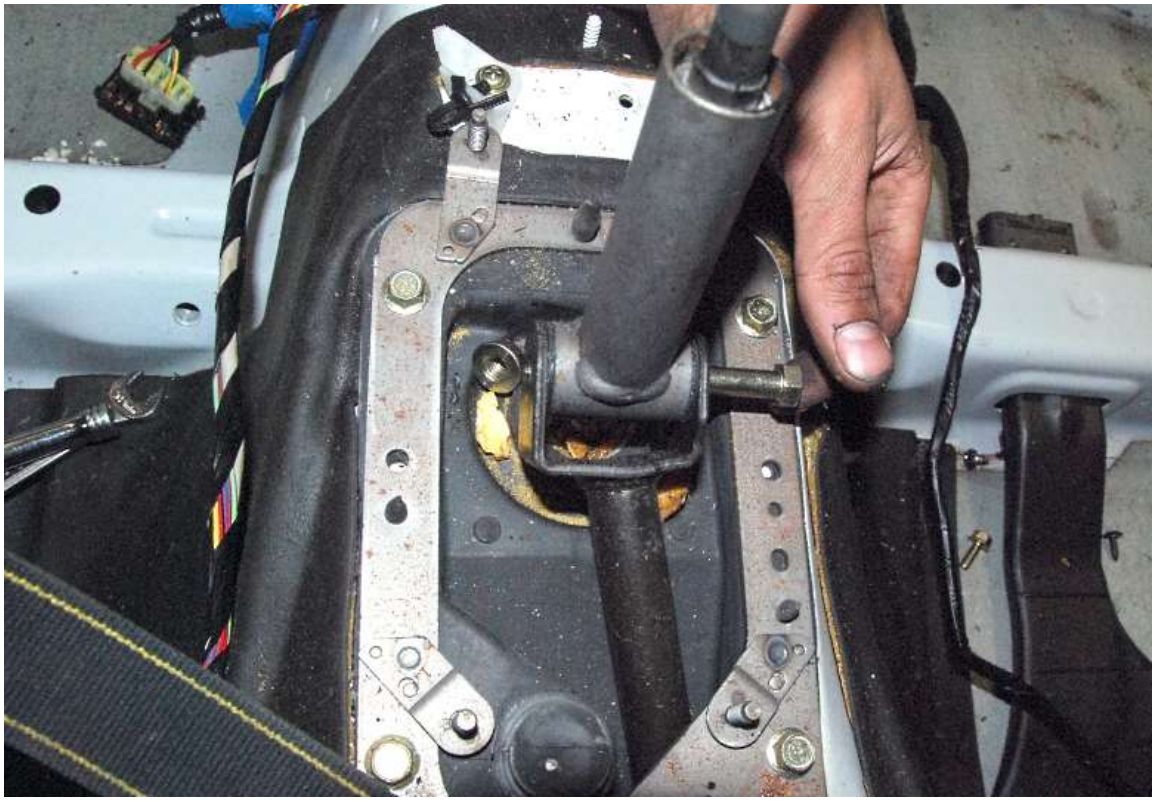
Drain the radiator and remove cooling lines to engine and radiator, save all of the radiator hoses as sections of them will be used later.

Remove the radiator and fans making sure to keep all of the mounting brackets fasteners and rubber isolators.

Remove all electrical, fuel, and mechanical connections to the engine and droop them out over the wheel wells to give space for the engine removal.



Remove the suspension brace from underneath the car, you may need to move your jack stands to access this piece, make sure they are in a secure location before crawling underneath.

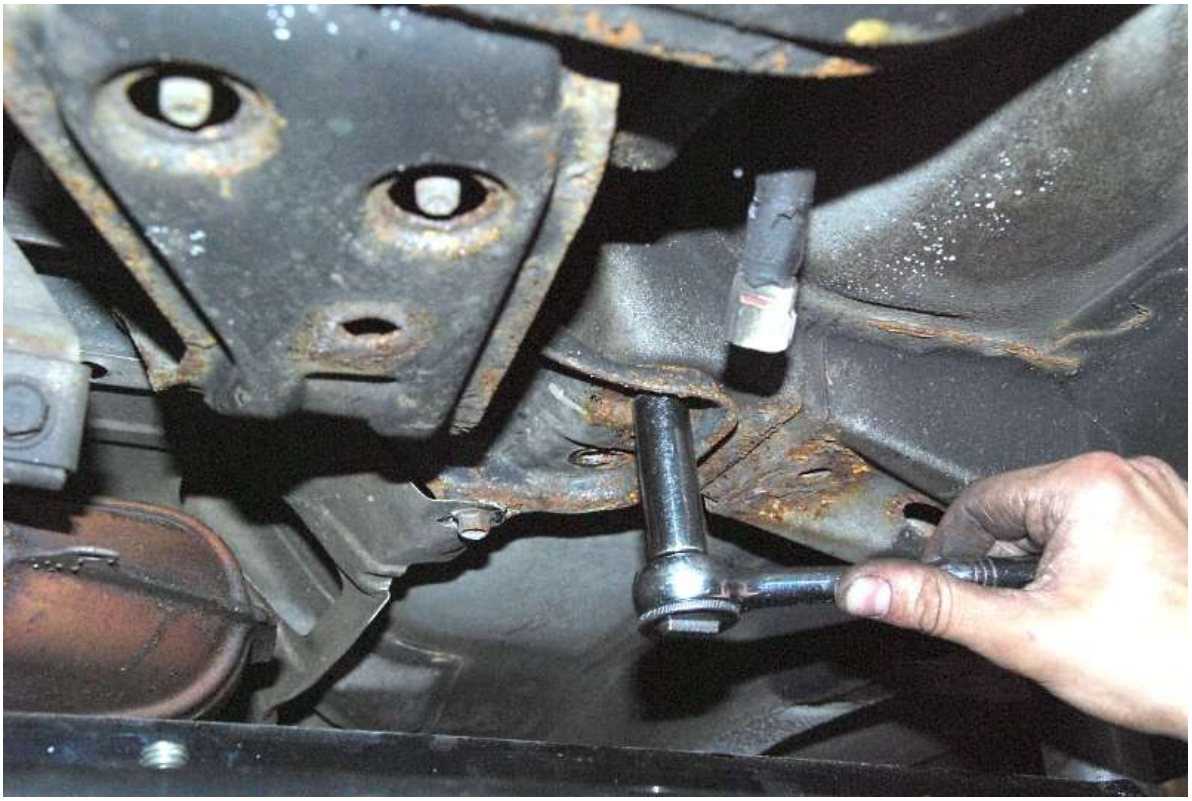


Disconnect the shift linkage from the shift lever and remove the rubber boot. Make sure the linkage is free to drop out of the car with the transmission.

Remove the exhaust system from behind the turbo (WRX only). Keep the down-pipe with the catalytic converter, or the cat itself in normally aspirated models as it will be re-used. Save the oxygen sensors.

Using an engine hoist, secure the engine and take up any slack in the chain. Loosen the transmission and engine mounts. While under the car, double check that everything has been disconnected from the engine and transmission.

Disconnect the lower steering shaft (the bolt must be completely removed) and pull the entire column out of the car.



With the engine and chassis safely supported, disconnect the sub frame hardware including the bolts that hold the front control arms.

Slowly loosen the upper strut mounts; you may need to adjust the engine hoist height during this process to keep the sub-frame from dropping too quickly.

Lower the engine and sub-frame down and out of the car and set them aside for further disassembly. Make sure your flexible brake lines are disconnected from the chassis (they will be used again).

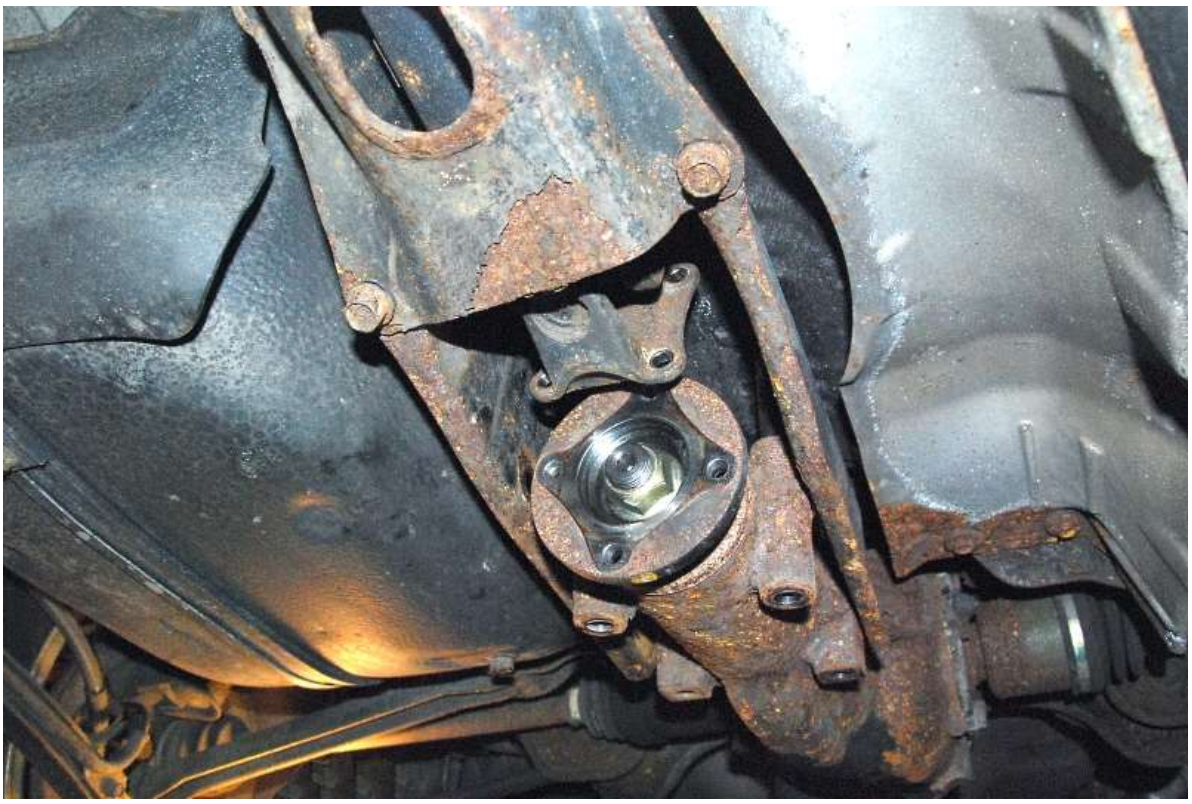
The control arms, spindles, brakes, steering rack, engine/transmission mounts, engine/transmission and shifter parts will all need to be saved.

E-brake handle/cables

Remove the emergency brake cable bracket and handle, save both of these parts.

Push the emergency brake cables down through the floor to allow them to be removed with the rear sub-frame.

Rear Suspension



Disconnect the driveshaft and unbolt the rear differential housing from chassis.

Undo the flexible brake lines from the chassis leaving them attached to calipers.

Disconnect the trailing arms and rear struts then lower the rear sub-frame out of the chassis using a floor jack. Set the rear sub-frame aside for later disassembly. Save the rear sway bar, bushings and mounting brackets.

Power booster/pedals/Steering column

Remove the clutch and brake master cylinders along with the brake booster.

Set aside the brake booster even if you are not planning on using it. The pushrod will be used even with the manual brake set-up.

Remove and save the pedal assembly, and throttle pedal being careful to not damage the brake light switch which will be re-used. Either cable or drive-by-wire pedal can be used.

Fuel vapor canister

Remove the fuel vapor canister from the rear of the car.

Save the fuel vapor canister and lines.

Fuel tank

Unplug all of the fuel lines and electrical plugs from the fuel tank

Lower the tank down from the car. Remove and keep the pressure sensor in the middle of the tank for emissions control.

The stock tank will not be used but the internal fuel pump and Fuel level sender will need to be removed for use in the new tank.

Horns

Remove and save the horns.

Rearview mirror

Remove the rearview mirror from the windshield along with the pedestal that the mirror mounts to. Use a heat gun or hair drier to heat up the glue on the mirror from the outside and then pull the mirror off when it gets soft.

Wiring harness

Remove the various firewall plugs and connectors to allow the main wiring harness to be removed.

Pull all of the remaining harness and electrical boxes from the chassis, Leave all electrical boxes plugged into the harness.

If there is any question about something being used always save it until the build is over to be sure.

Saving Possible Options

ABS

If you are interested in customizing your car with ABS make sure you save the unit.

- The interior of the car should now be empty except for sound deadener and welded on brackets.

Once you are sure there is nothing useful remaining of the shell you can cut it up or have it hauled away.

Preparing the Donor Parts

Engine

- With the engine out, now is a good time to check or replace the timing belt if the engine is close to 100,000 miles

Remove the A/C compressor.
Remove the Power steering pump.

Front lower control arms

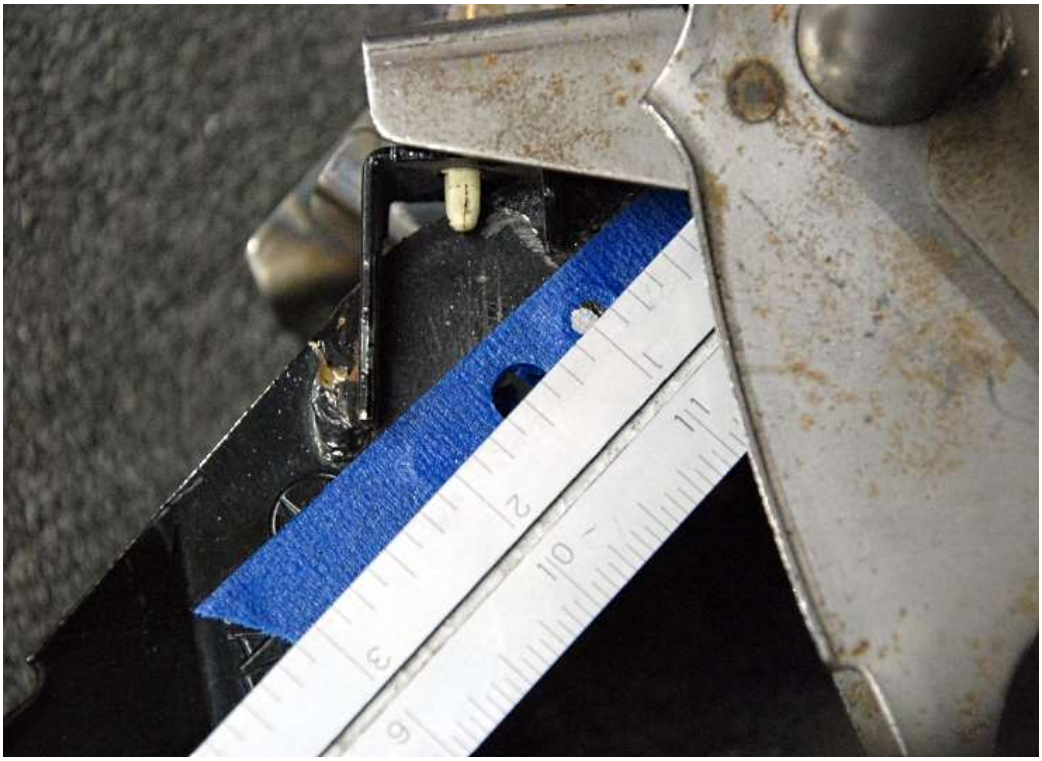
Remove the rear bushing and mount from both front control arms keeping track of which one was on which side and the locations of the end bushings and caps.

Re-install the mounts on the opposite side arms you removed them from using all the original hardware and pieces.

Pedal box modification for manual brakes

- The 818 is 1000 lbs. lighter than the Subaru Impreza. Because of this, the power brakes are not needed. They are very touchy if they are used. We recommend using manual brakes in the 818.

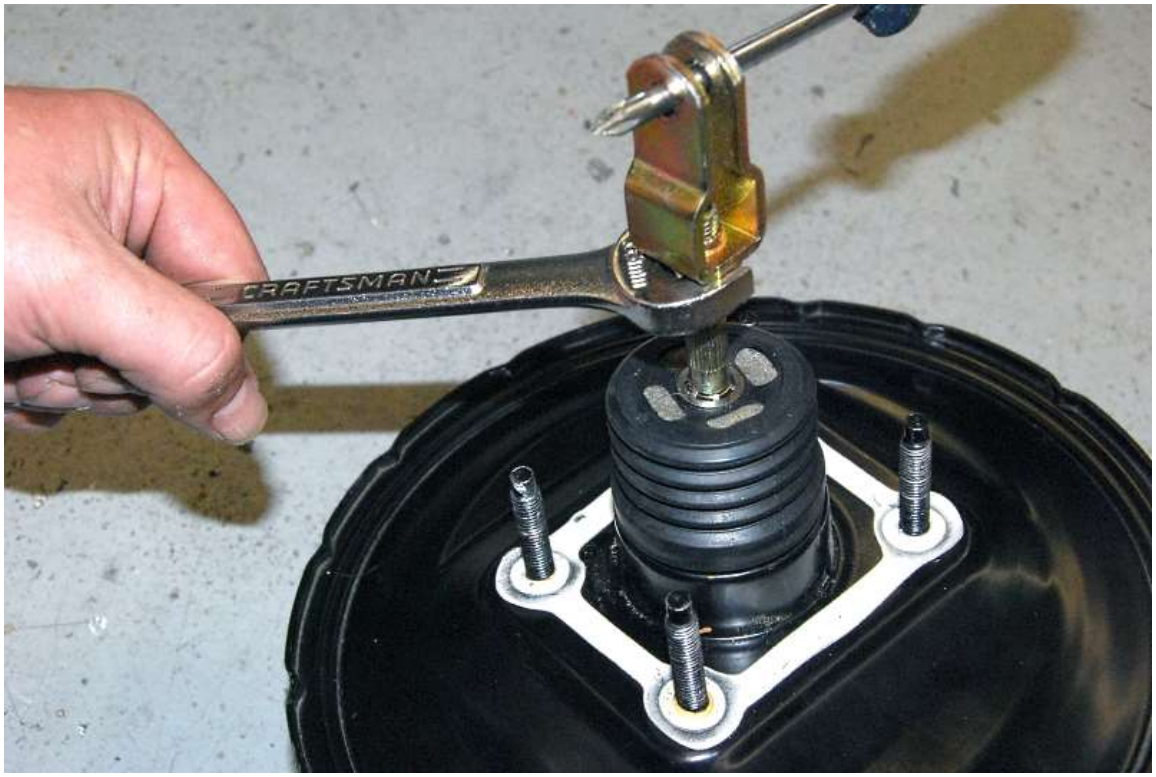
Place some blue painters tape on the brake pedal over the hole used to attach it to the power booster and poke a hole through the booster push-rod mount hole



Use a ruler and marker to mark ½” up from the stock booster push-rod mount hole.

Drill a new booster push-rod mounting hole using a $^{5}/_{16}$” drill bit. After drilling, test fit the stock push-rod connecting pin.

Power Booster parts



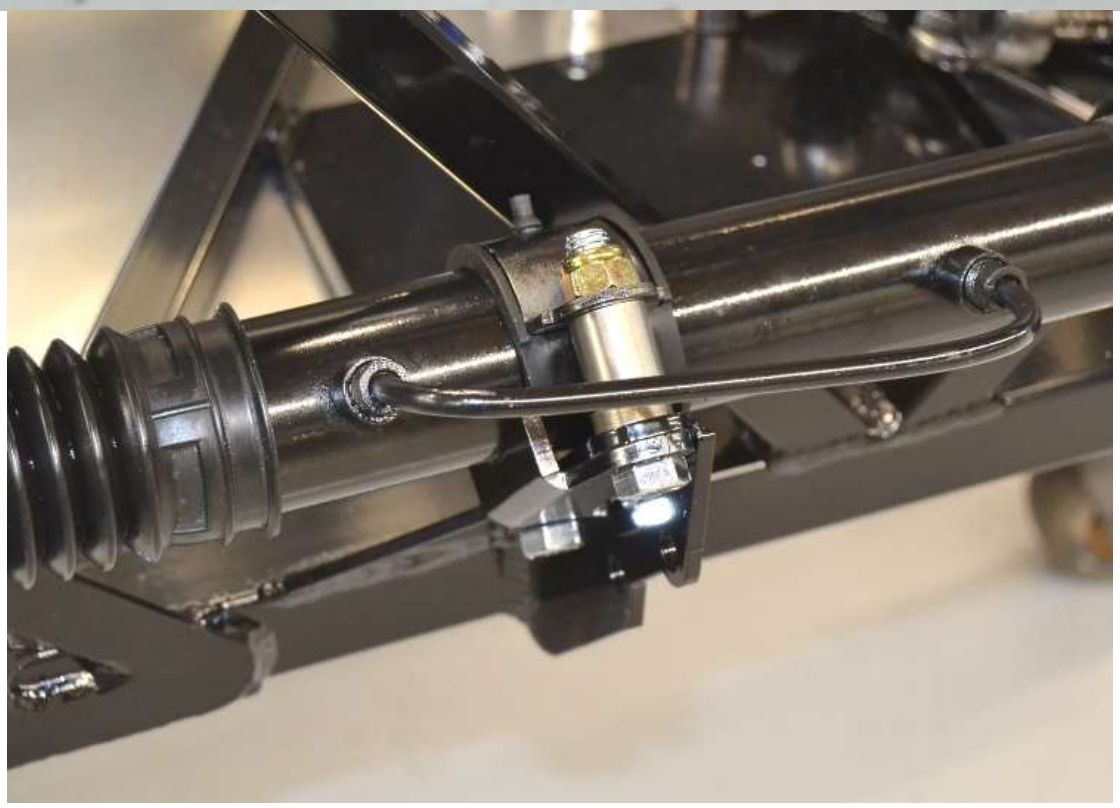
Remove the clevis and nut from the back of the power booster using a screwdriver in the hole to hold it while loosening with a wrench.

Put the clevis and nut aside for use later.

Sway bar

The rear sway bar can be used on the front of the 818 with some additional linkages provided in the kit. Remove it from the rear sub-frame and set it aside with the bushings and mounting brackets. The end links will not be re-used.

Steering rack



Connect the two front ports on the steering rack by bending and reflaring the line or cutting the line and using a rubber hose from the donor. There is no pressure here but the air and any remaining fluid needs to be able to go back and forth.

Side mirrors

If you are not using power mirrors, cut the power mirror wires.

Cut the alignment tabs off the bottom of the mounts.

Front outer CV joint

🛠 Tin snips, hammer, flat head screwdriver, rags
🚘 Front CV axle

Locate the donor front CV joint and pull back the boot from the front outer joint. You can cut this boot off as it will not be re-used.

With the axle shaft in a vice or clamped to a table, tap the outer CV joint off with a hammer.

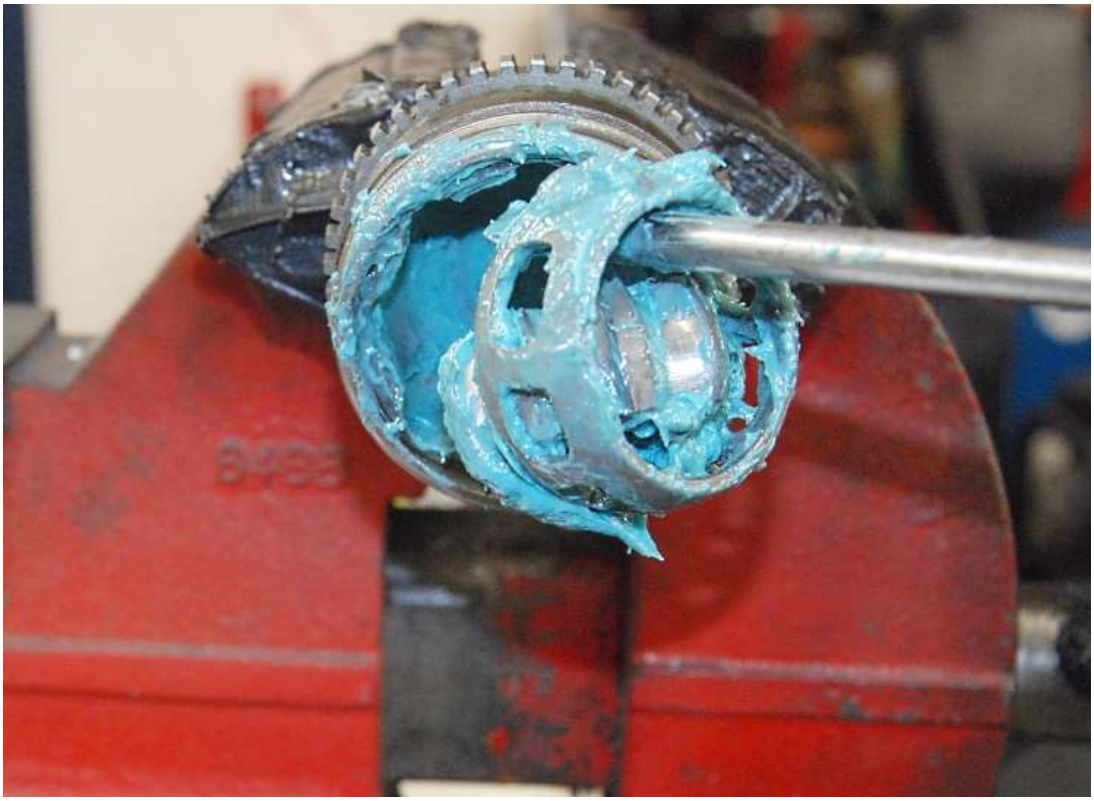
Save the shaft with the inner joint for the rear axle conversion.

With the joint separated put it in a vice so the axle end is accessible.

With a screwdriver or pry bar twist the inner joint until it is out far enough that the ball bearings are exposed.

Pop the individual ball bearings out with a screwdriver or hammer and chisel if needed.

Once a few of the bearings are removed the rest should come out easier.



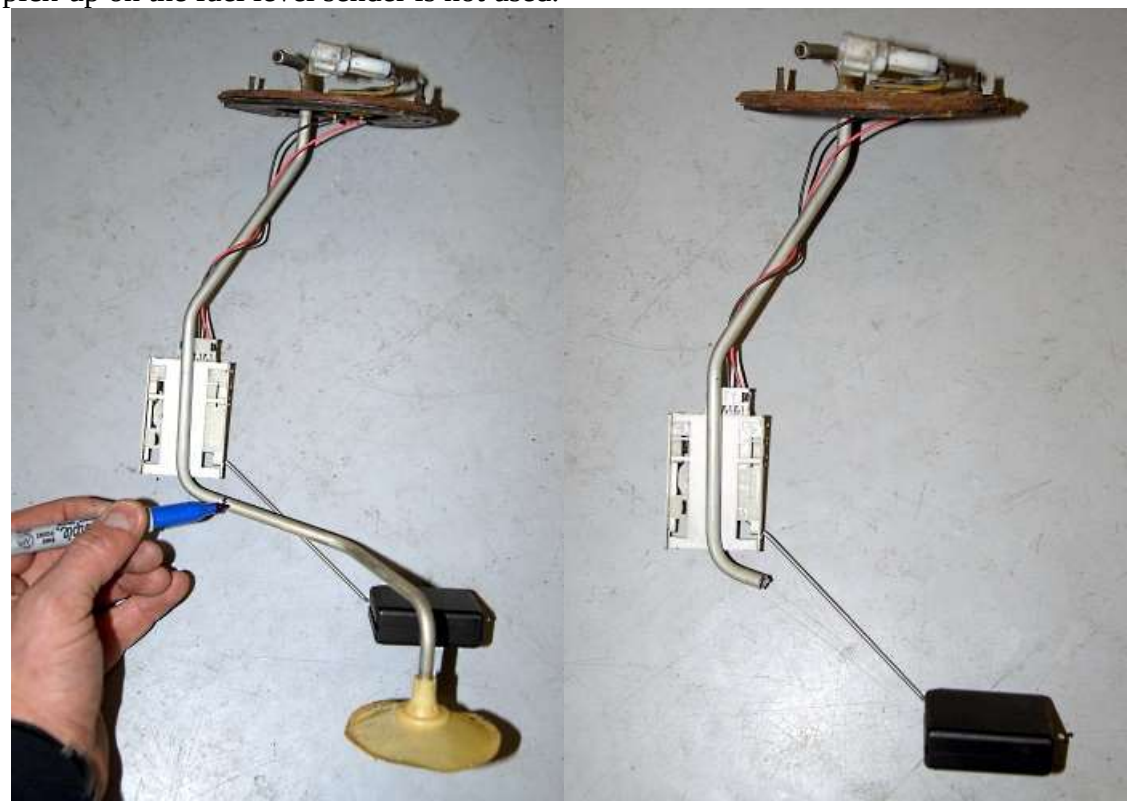
With the bearings removed pull out the race and cage.

Clean the remaining grease out of the housing or it will make a mess the first time you drive.

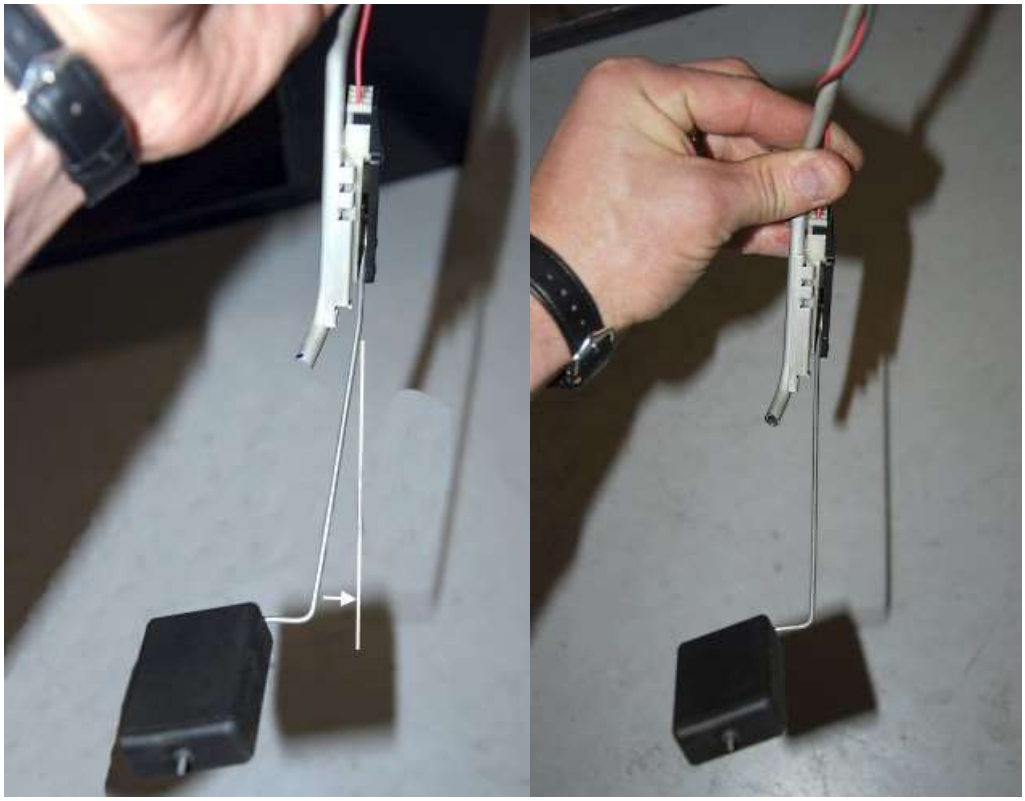
The empty CV housing will be used in the front spindle.

Fuel level sender

- The pick-up on the fuel level sender is not used.



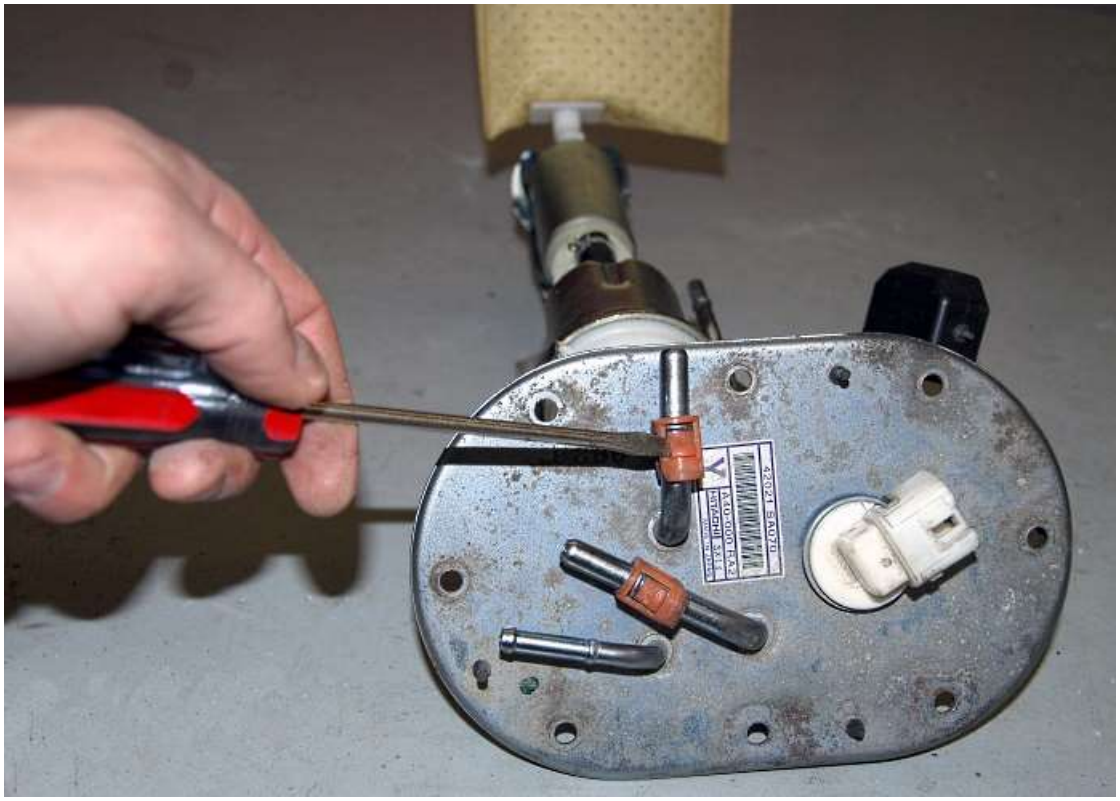
Mark the pickup tube just after the bend then use a hack saw to cut off the un-used pickup.



Holding the level sender as shown and holding the float wire near the resister board with a pair of pliers, carefully bend the wire sideways to straighten the wire out. Do not bend it in any other direction.

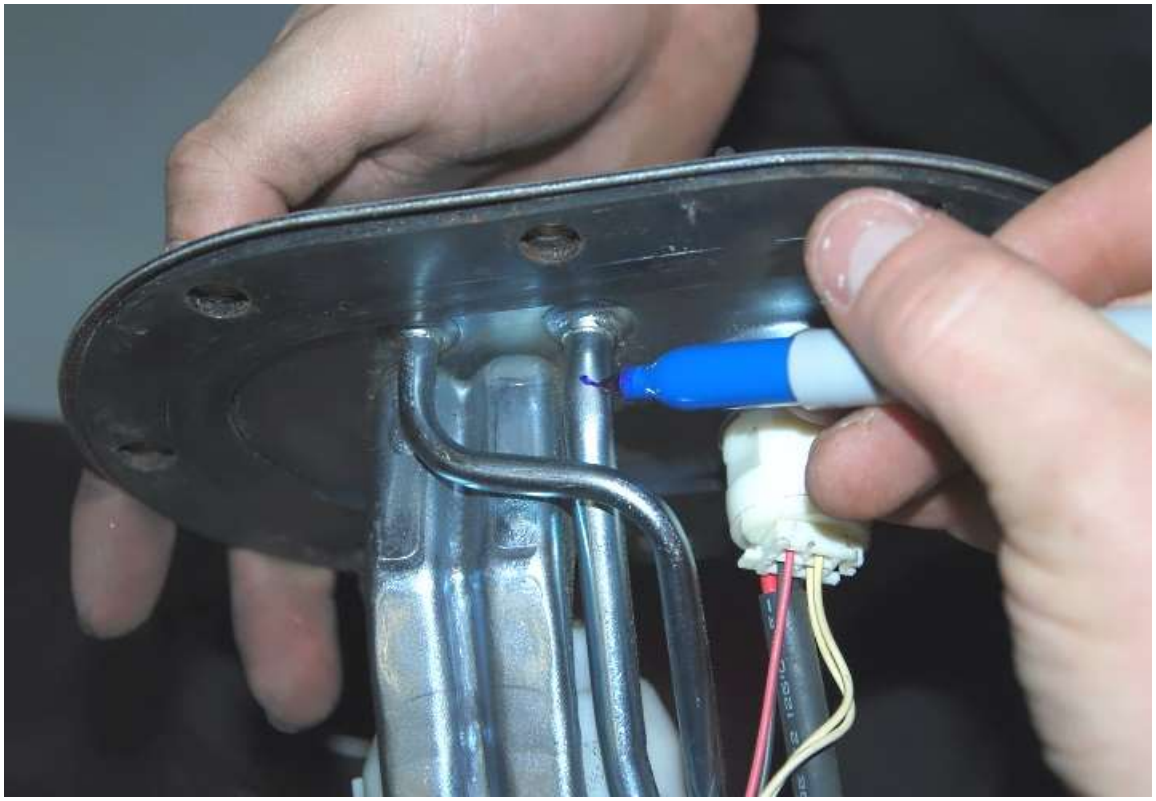
Fuel pump

- Different year fuel pumps had different return connections on the top. Early years had a barb with a clamp while latter models used a plastic connector like the send.

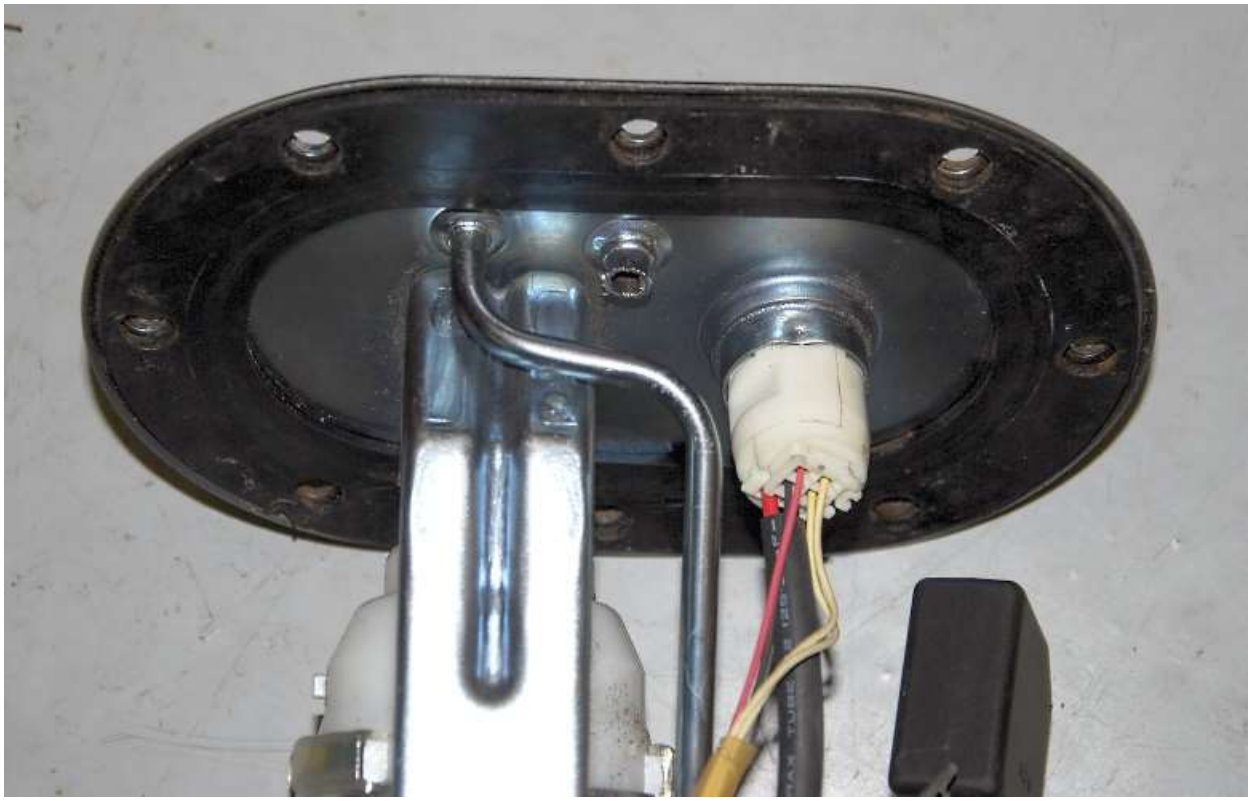


Use a flathead screwdriver to pry off the plastic connector pieces from the send and return tubes.

Pull the small plastic venturi pump off the fuel pump, it is not used.



Mark the larger $^{5}/_{16}$" tube that was connected to the venturi pump ½" from the mounting plate.



Cut the large tube at the mark, this is now the tank vent.

RADIATOR

🛠 Hack saw, flat head screwdriver, ratchet, sockets.

Remove the overflow tank from the factory radiator. It will be re-used but mounted in the back near the engine.

Remove the lower radiator hose and store it. A section of it will be used as an elbow to adapt to the corrugated tubing.

On the bottom of the radiator there is a plastic mounting boss that needs to be removed. Cut this boss off with a hack saw.

Trunk hinges

🛠 Marker, hack saw, ruler, vise, drill, $^{5}/_{16}$" drill bit.

Locate the OEM hood hinges from the donor car.

The top original mounting flange needs to be trimmed off, mark with a marker straight across from where the tab extends so it can be cut flush.

Cut off the top mounting hole tab with a hack saw.

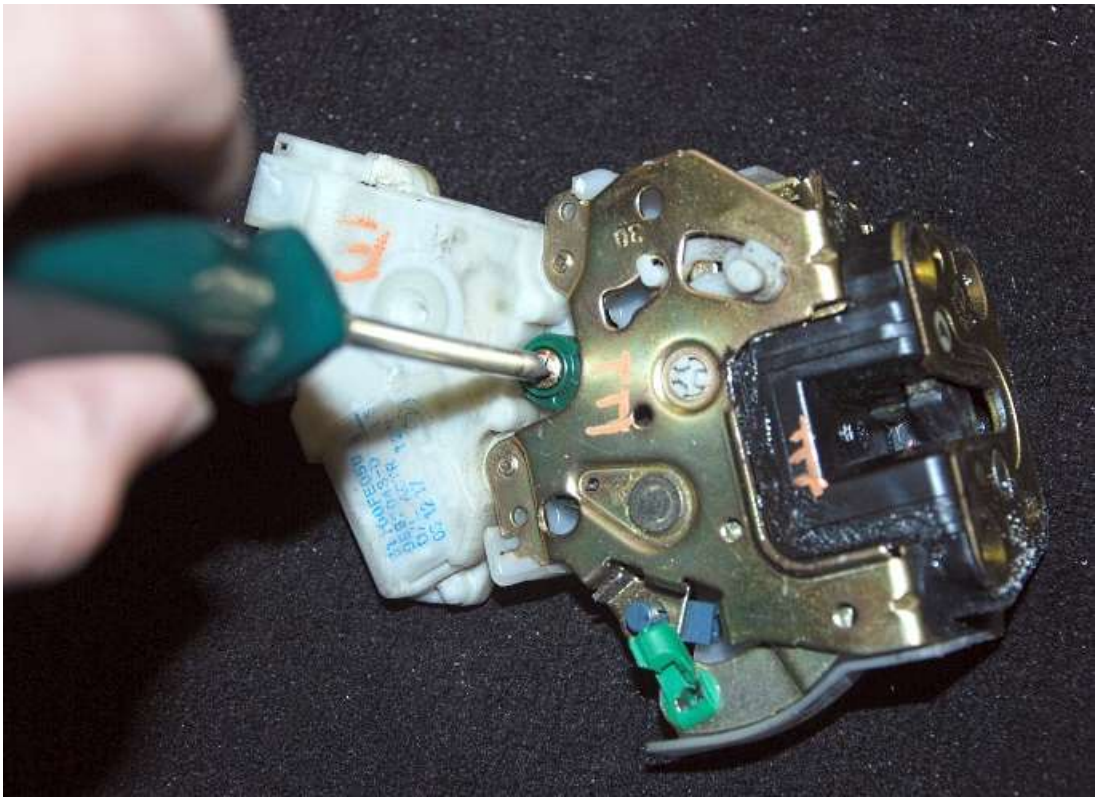
Mark a point 2¼ inches and centered side to side in front of the remaining hole.

Drill out the new mounting hole location with a $^{5}/_{16}$ inch drill bit.

Repeat the process for the other side hinge.

Door Latches

🚘 Rear door latches
🛠 Philips head screwdriver



Use a Philips head screwdriver to remove the plastic actuator housing.

On the back of the latch, remove the plastic cover.

Repeat for the opposite side.

Chapter

3

Chassis Build-up

Unpacking Your Kit

- The boxes are numbered, when you read your packing list you will see that next to each assembly there is a number circled. This is the box number that the assembly was packaged into.
- After everything is safely in your garage, take the time to open each box and do a physical inventory of all the parts. Do one box at a time and replace all the contents before going on to the next box. Call Factory Five if you are missing parts that are not on your Parts on Order List.
- Most of the fasteners are packaged in Box 3 in the 818 fasteners package. Refer to the appendix for bolt length diagrams

Place the kit on (3) 2 x 4's to simulate ride height.

Kit Parts Prep

There are a number of parts in the kit that are packed as bare metal. This is done to allow you to paint, powder coat, or chrome the parts as you desire. It makes the build a lot smoother if you coat these parts ahead of time so you do not have to wait for them when doing the assembly.

Standard kit

80267	FRONT LOWER SHOCK MOUNT BRACKET	EA	2.00
80051	FRONT SPINDLE ADAPTER BRACKET	EA	2.00
80500	LOWER IFS BRACKET NUT HOLDER	EA	2.00
80255	LEFT IRS WELDED REAR BRACKET ASSEMBLY	EA	1.00
80256	RIGHT IRS WELDED REAR BRACKET ASSEMBLY	EA	1.00
80407	LEFT IRS WELDED FRONT BRACKET ASSEMBLY	EA	1.00
80408	RIGHT IRS WELDED FRONT BRACKET ASSEMBLY	EA	1.00

80300	REAR SHOCK TOWER BRACE	EA	1.00
80364	SHIFT CABLE WASHER	EA	4.00
80142	CABLE SHIFT BRACKET	EA	1.00
80143	SHIFT LINKAGE BRACKET	EA	1.00
80419	FBW PEDAL MOUNT (if applicable)	EA	1.00
80420	02-05 CABLE PEDAL MOUNT (if applicable)	EA	1.00
80347	E-BRAKE HANDLE MOUNT	EA	1.00
80505	CLUTCH MASTER CYLINDER SPACER	EA	3.00
80362	DOOR STRIKER BOLT ON MOUNT, LEFT	EA	1.00
80363	DOOR STRIKER BOLT ON MOUNT, RIGHT	EA	1.00
80140	LEFT DOOR FRAME	EA	1.00
80141	RIGHT DOOR FRAME	EA	1.00
80509	SIDE MIRROR MOUNT, LEFT	EA	1.00
80510	SIDE MIRROR MOUNT, RIGHT	EA	1.00
80472	HOOD VENT MESH	EA	2.00
80473	LICENSE PLATE MESH	EA	1.00
80474	REAR DECK VENT MESH	EA	1.00

Hardtop only

81009	ALUMINUM INSIDE REAR WALL	EA	1.00
81081	HARD TOP MOUNT TAB	EA	2.00
80987	LEFT SIDE HINGE MOUNT	EA	1.00
80988	RIGHT SIDE HINGE MOUNT	EA	1.00
80954	HINGE ARM	EA	2.00
80957	HATCH HINGE MOUNT	EA	2.00
81092	DOOR WINDOW INSIDE TRIM	EA	2.00
80992	POWER WINDOW TRACK UPPER BRACKET	EA	2.00
80996	POWER WINDOW TRACK LOWER BRACKET, LEFT	EA	1.00
80997	POWER WINDOW TRACK LOWER BRACKET, RIGHT	EA	1.00
81036	WINDOW ROLLER GUIDE BRACKET	EA	4.00
81119	DOOR LOCK ACTUATOR	EA	1.00
81059	DOOR LATCH LINK, LEFT	EA	1.00
81060	DOOR LATCH LINK, RIGHT	EA	1.00
80990	DOOR HANDLE BRACKET, LEFT	EA	1.00
80991	DOOR HANDLE BRACKET, RIGHT	EA	1.00

Removal of the Body

🛠 Vise, Thread locker, ⅜”, ¾” wrench, ¾” socket, Torque wrench

✋ Removing the body should be done very carefully. Once the body is removed, it is fine to store it directly on the ground.

Remove the rear bumper, body sides, and nose from the chassis.

The body parts can be stored on the ground or outside if space is limited.

- Make sure to store the panels flat side down or the hood on its side to help prevent any deformation if they are left for an extended period of time

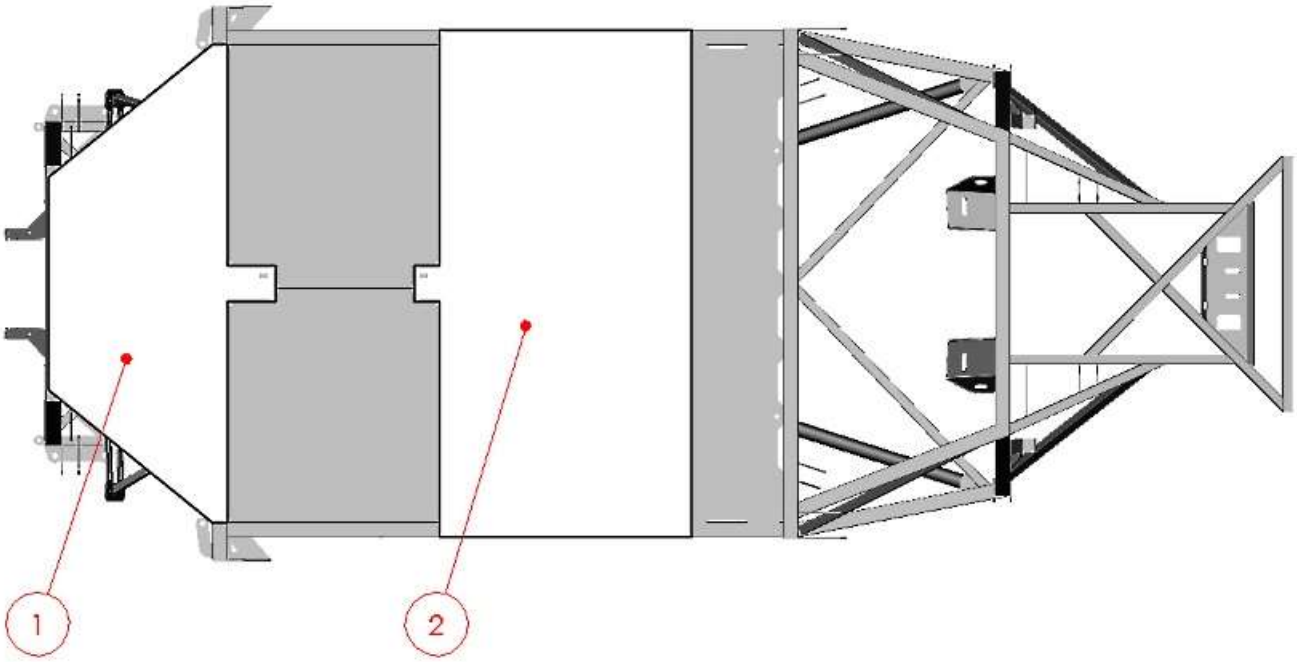
Remove the mounted aluminum panels so that the frame is bare.

Under car Aluminum

Clamps, marker, 1/8" drill bit, drill, silicone, rivet gun, acetone or other aluminum cleaner, ruler.
Rivet pack, packaged aluminum.

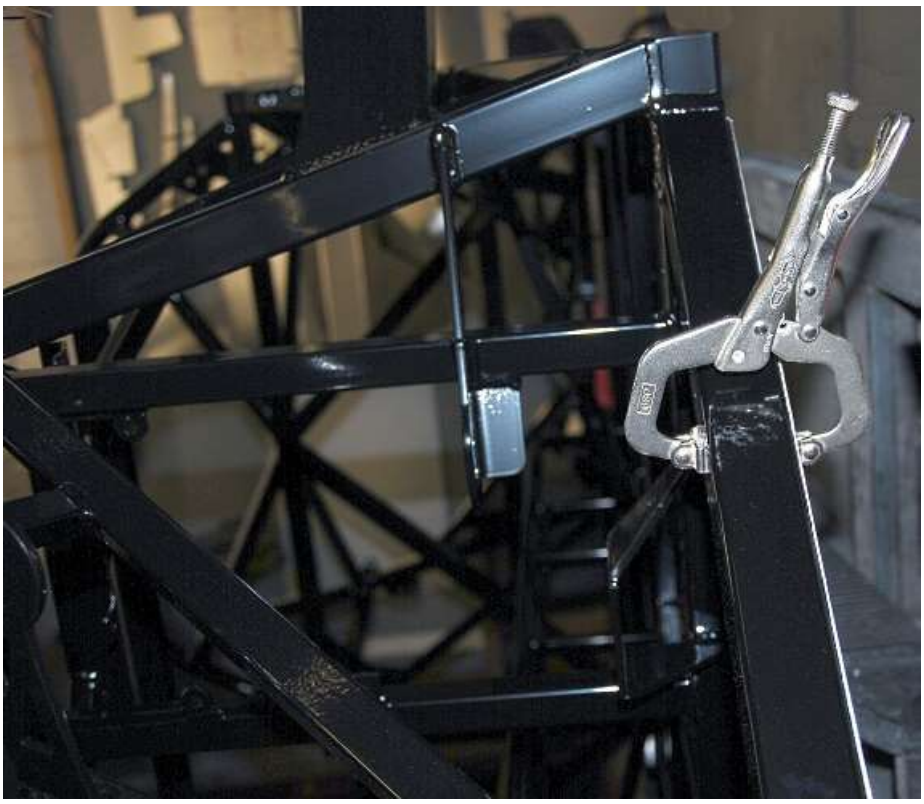
- In most cases we use a 3" rivet spacing when mounting aluminum panels to the chassis and a 2" spacing when mounting panel to panel.
- Use the ⅛" rivets for all of the aluminum panels unless otherwise directed.

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	80581	UNDER BATTERY TRAY COVER	1
2	80447	UNDER SEAT ALUMINUM	1

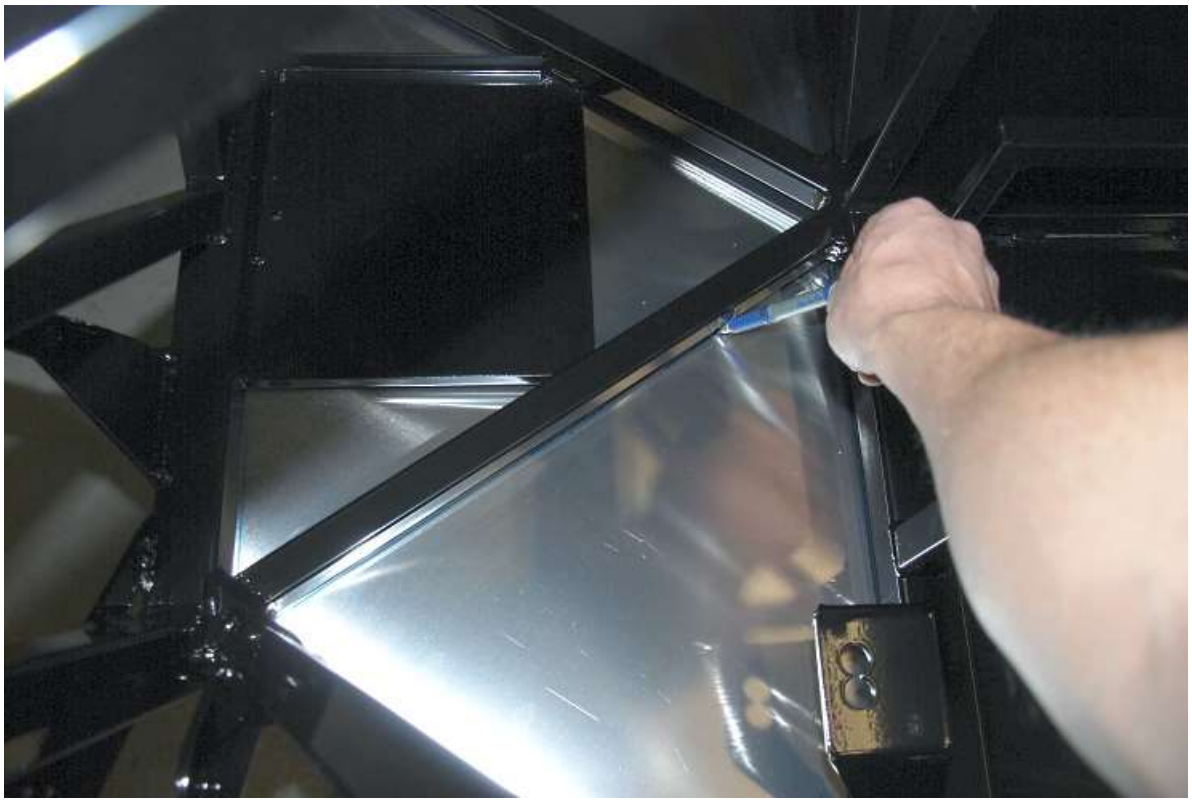


- The easiest and best way to start the build is to rivet the undercar panels onto the frame. To do this without having to lie on your back and get metal shavings in your face, roll the frame onto its side on the ground.

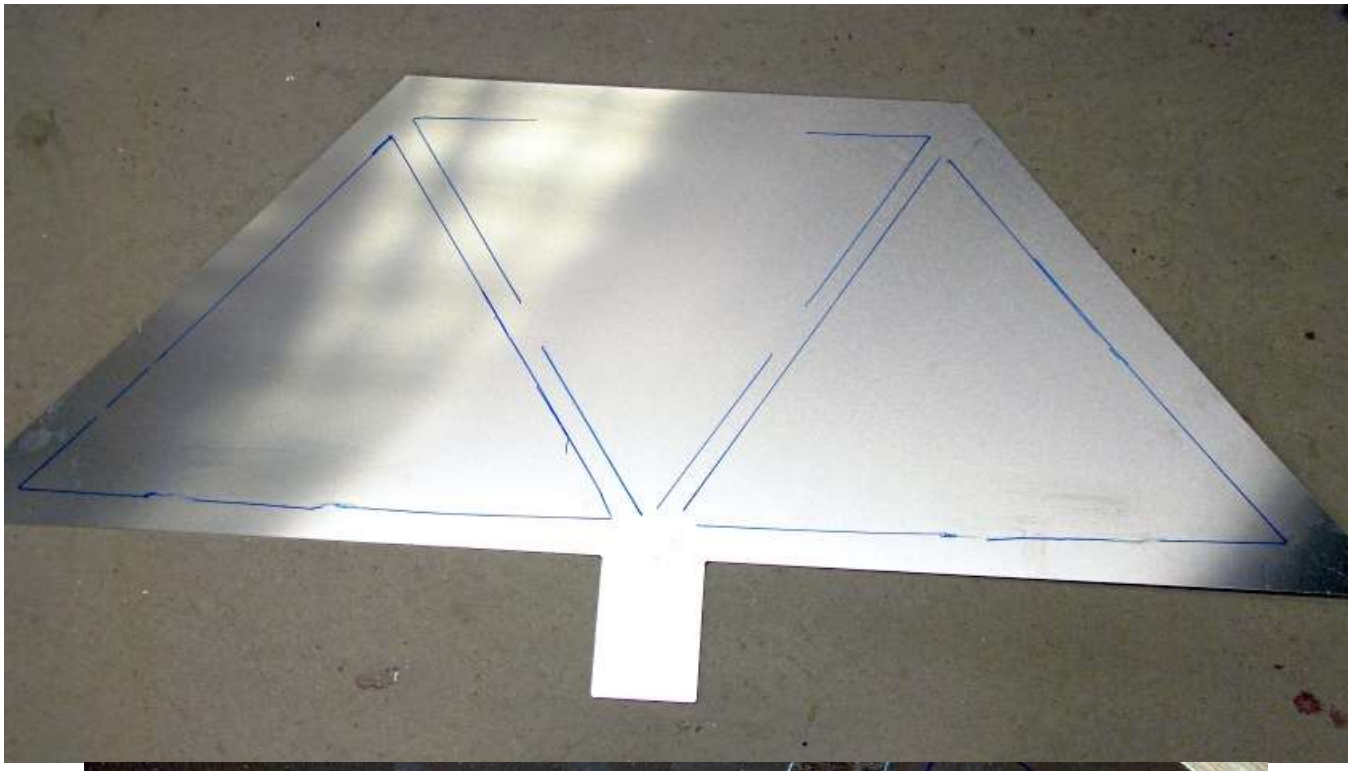
Under Front Aluminum

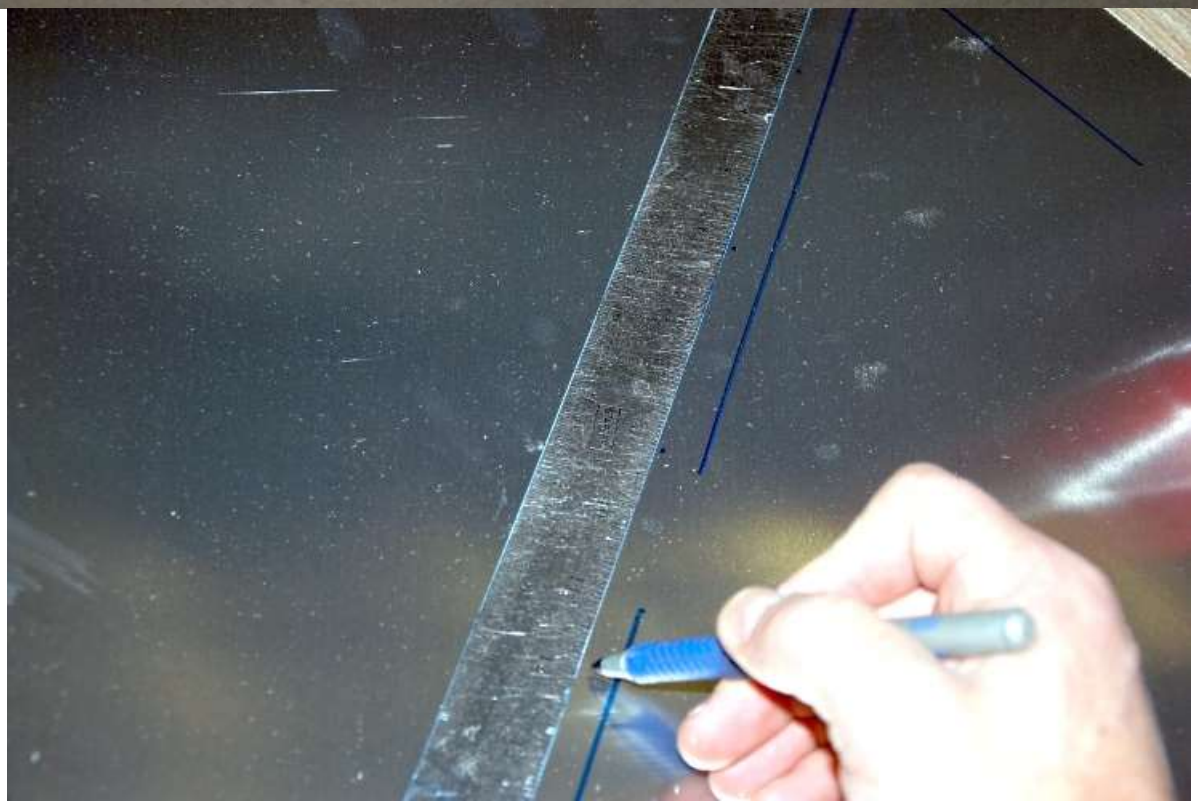


Clamp the under battery tray aluminum to the chassis.



Use a marker to outline tubes then remove the aluminum panel.





Use a ruler to mark the middle of the tubes every 3” for rivets.

Drill the marks on the aluminum.
Use acetone or other cleaner to remove the marker and any writing from the aluminum.
Drill and rivet the panel to the bottom of the frame.

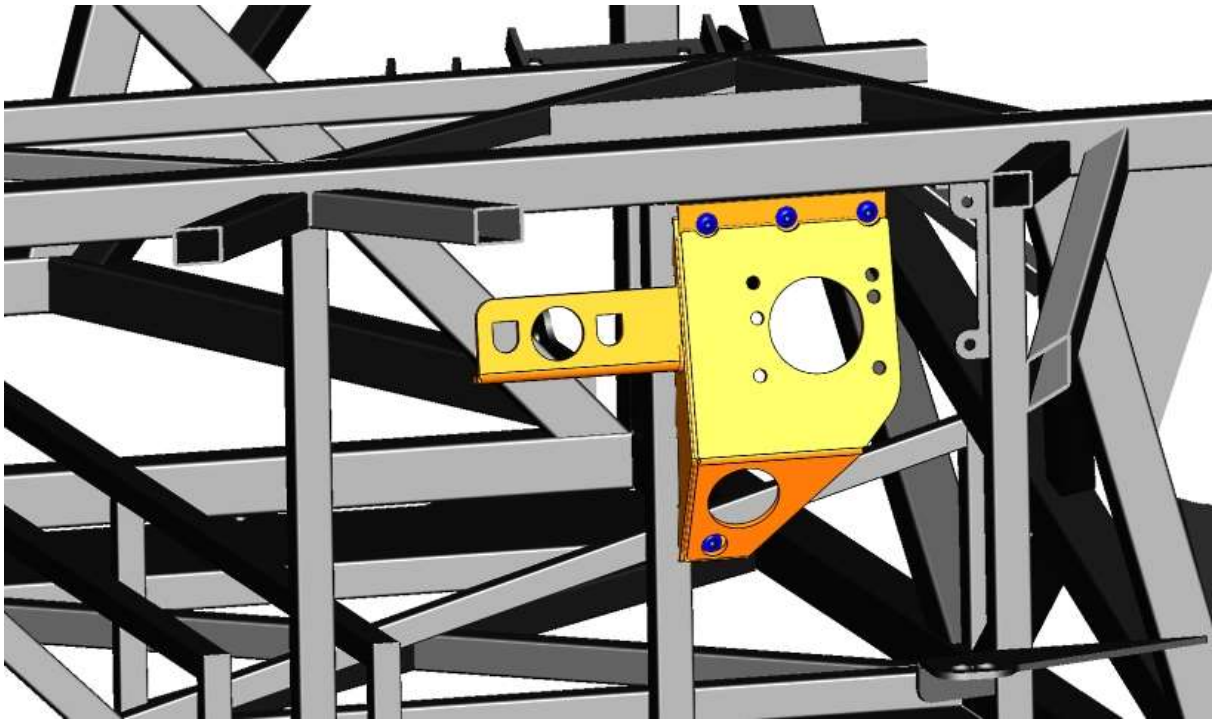
Floor

Clamp the lower floor to the frame and mark around the tubes from the top. The tab in the middle goes towards the front of the car. Make sure to cover the slots in front of the fuel tank (circled).

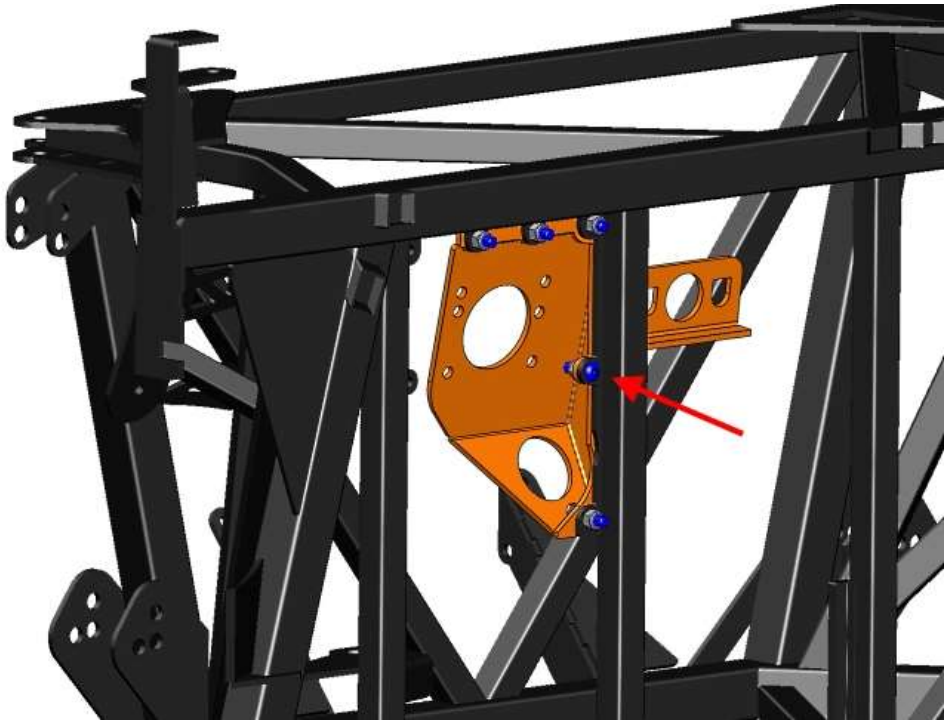
Drill, silicone and rivet the cockpit floor to the chassis.

Pedal box mount bracket

¼”-20 x 0.75” flanged button head screws and locknuts.
7/16”wrench, 5/32” hex key.
For Wilwood pedals, see instructions with pedals



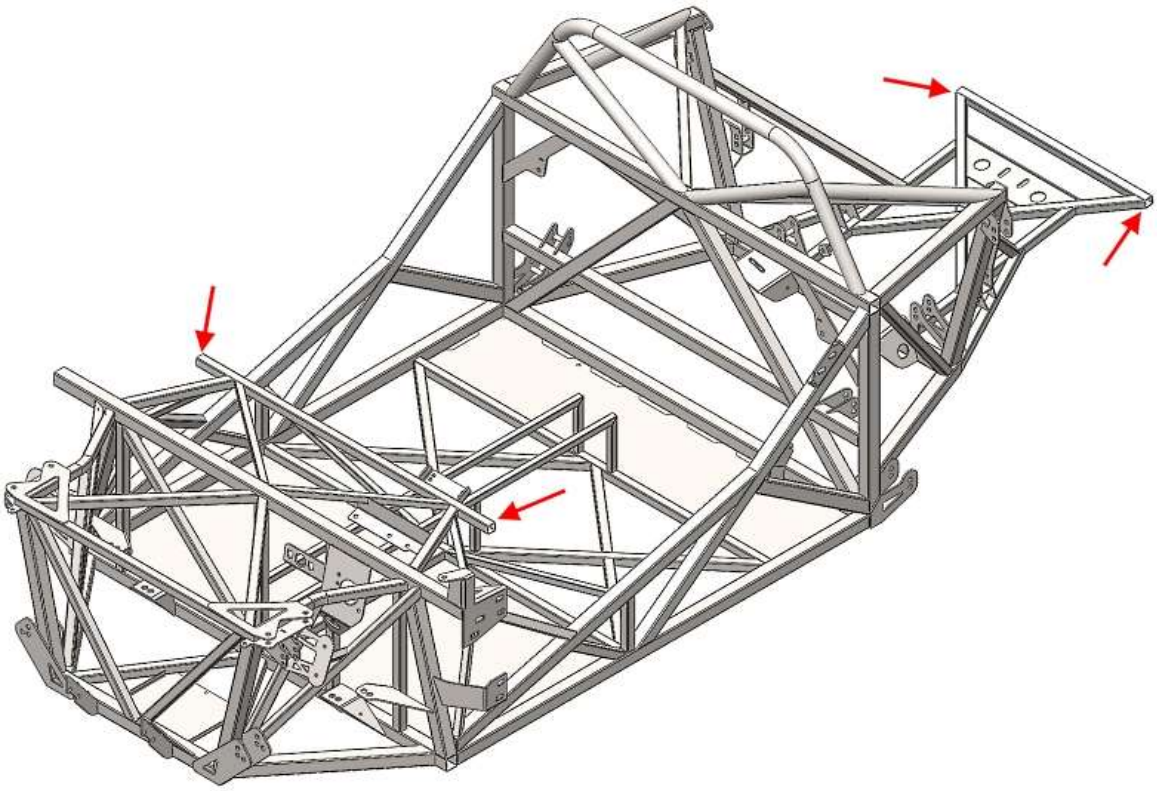
Attach the OEM pedal box front plate to the front of the frame brackets as shown.



Don’t forget to attach the middle bolt from the back side.

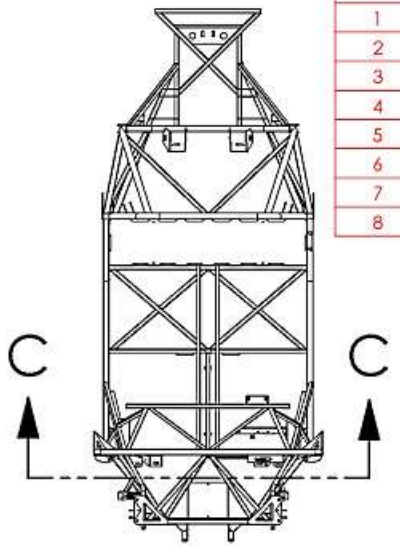
Cockpit front firewall aluminum

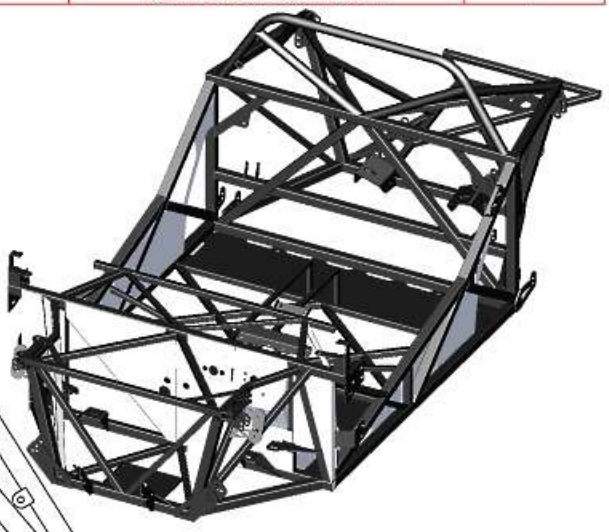
Plastic end caps (Box 1), packaged and mounted aluminum, rivet package (Box 4).
Permanent marker, silicone, caulking gun, drill, $^1/_8$" drill bit, rivet gun.
See the appendix for aluminum drawing and part numbers.

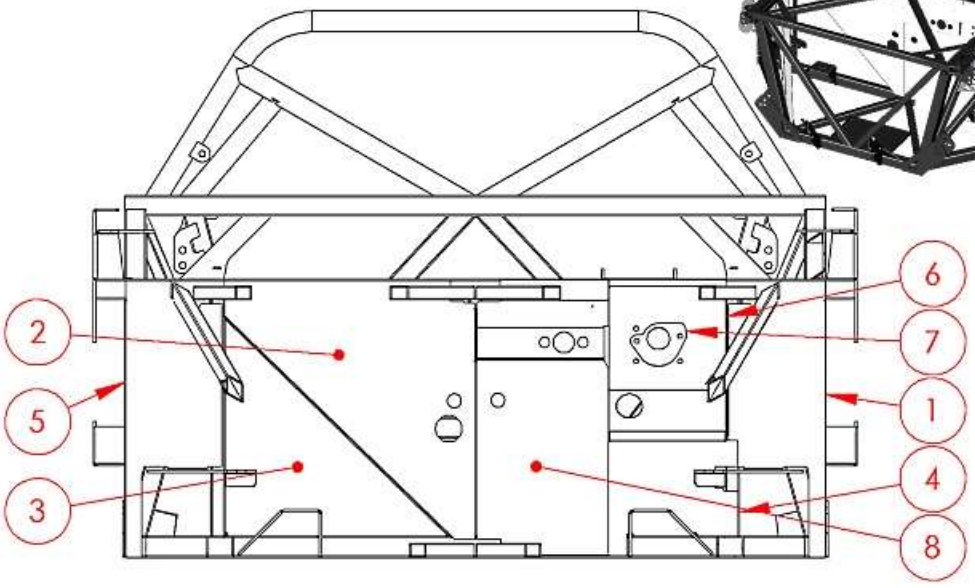


Push the four 1 inch plastic end-caps into the open ends of the 1" tubes on the chassis. These are located at the ends of the dash and the rear most section of the transmission mount.

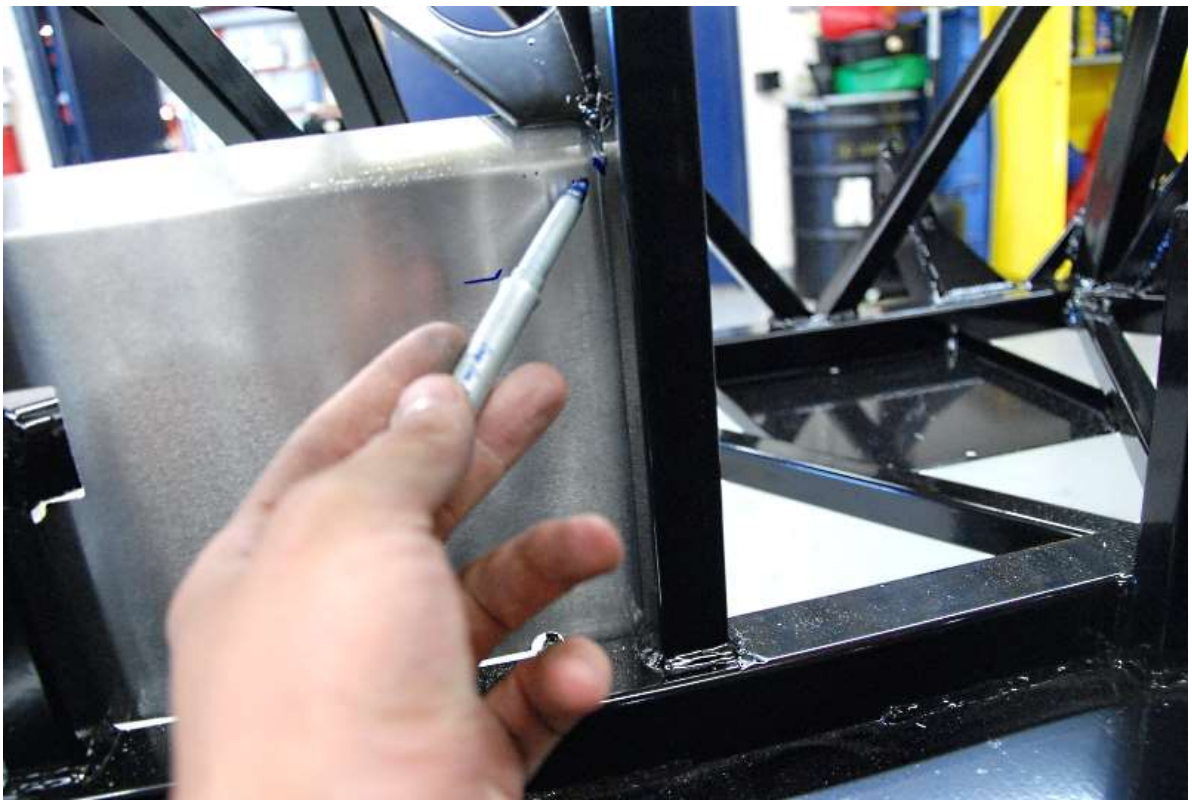
ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	80126	80127 - LFT FNT WHEEL REAR SPLASH GUARD	1
2	80123	COCKPIT MIDDLE RIGHT FRONT	1
3	80124	RIGHT SIDE COCKPIT FRONT	1
4	80416	LEFT SIDE COCKPIT FRONT LOWER	1
5	80126	80128 - RT FNT WHEEL REAR SPLASH GUARD	1
6	80417	LEFT SIDE COCKPIT FRONT UPPER	1
7	80511	POWER BOOSTER COVER PLATE	1
8	80448	RIGHT SIDE COCKPIT FRONT	1







Start with the left side lower front cockpit corner. Locate this piece on the frame for marking. Use a few of the mounted aluminum sheet metal screws to hold the panel in place.



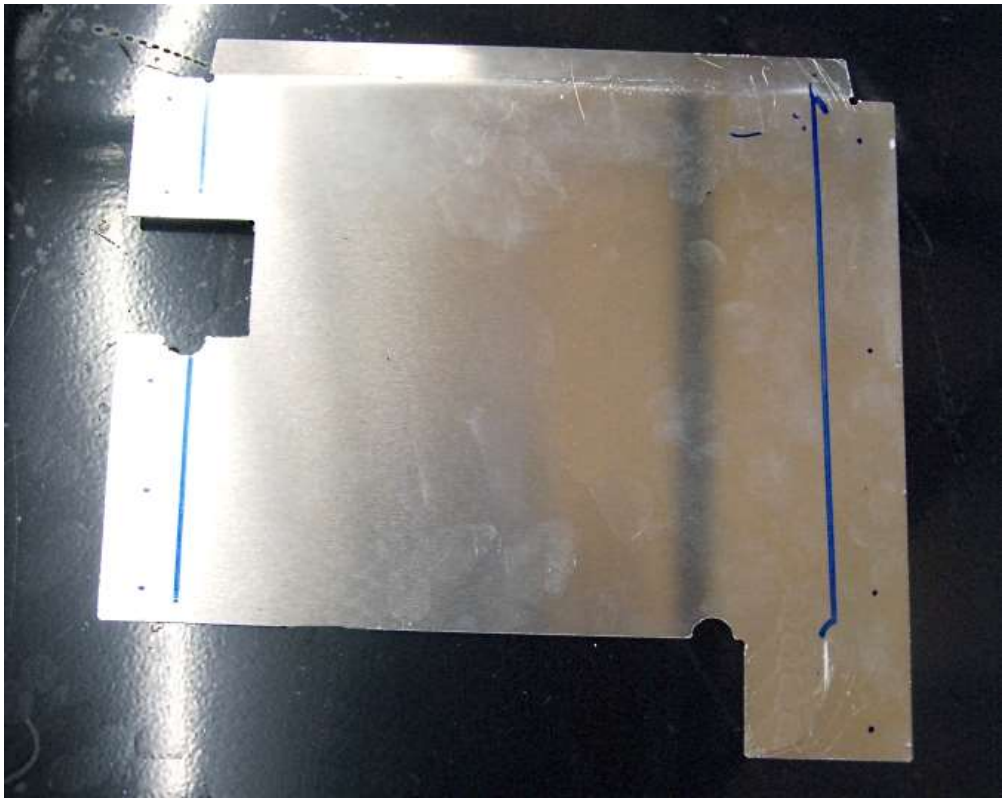
Use a marker to mark all of the spots where it contacts the chassis tubes, and tight areas where you will not be able to reach with a drill bit. Do not rivet in these areas.

If you cannot rivet, use extra silicone in these areas and clamp until dry.

- Use brake cleaner or acetone to remove the marker later.

Use the rear front lower mount to mark the center of the bolt location on the aluminum. Sedans use the inside holes and the wagons use the outside holes.

- Depending on the front lower control arm rear threads, the end of the bolt may contact the aluminum panel. To prevent this the aluminum panel can be dented in or the end of the threads can be cut.

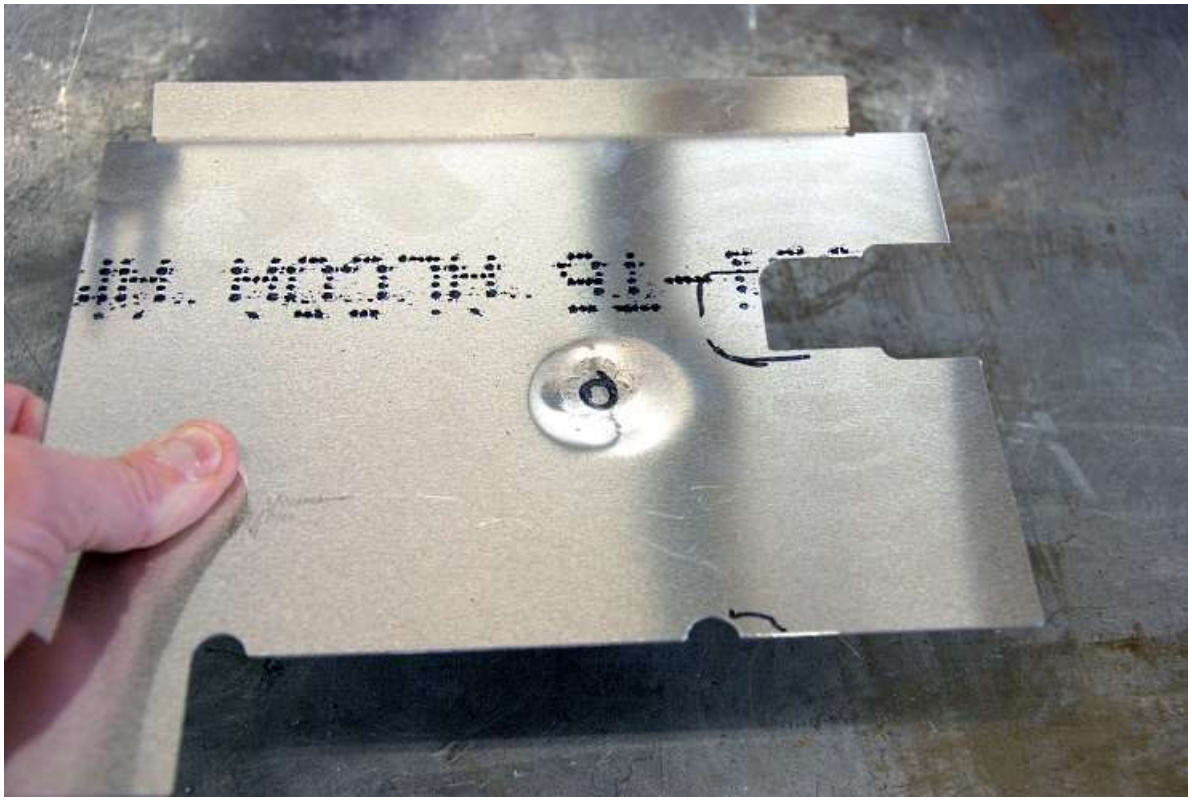


Pull the piece off the chassis and mark the locations for riveting.

- We generally use a 3 inch space between rivets although some areas it is easier to space evenly in from the corners. If two panels are next to each other it looks best if the rivets line up all the way down.

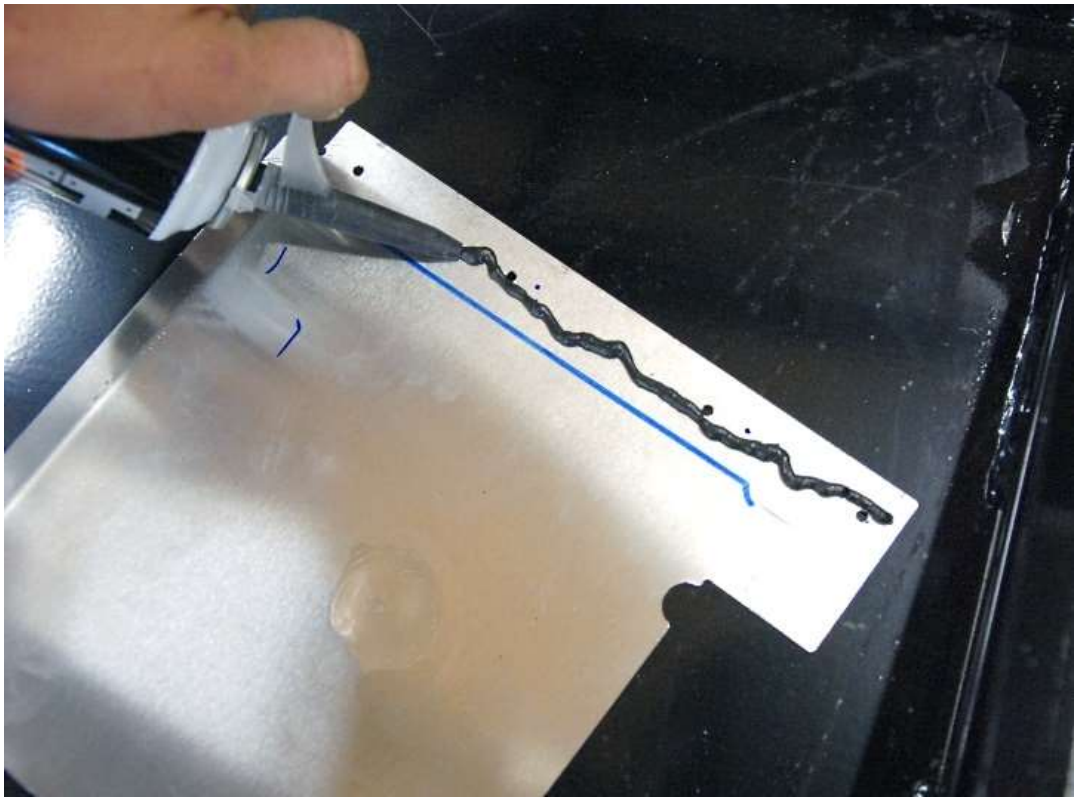
Put a large socket like the one for the front CV axle on a bench and put the center aluminum mark over the socket.

Use a ball peen hammer to dent the center bolt location.



Dented center location.

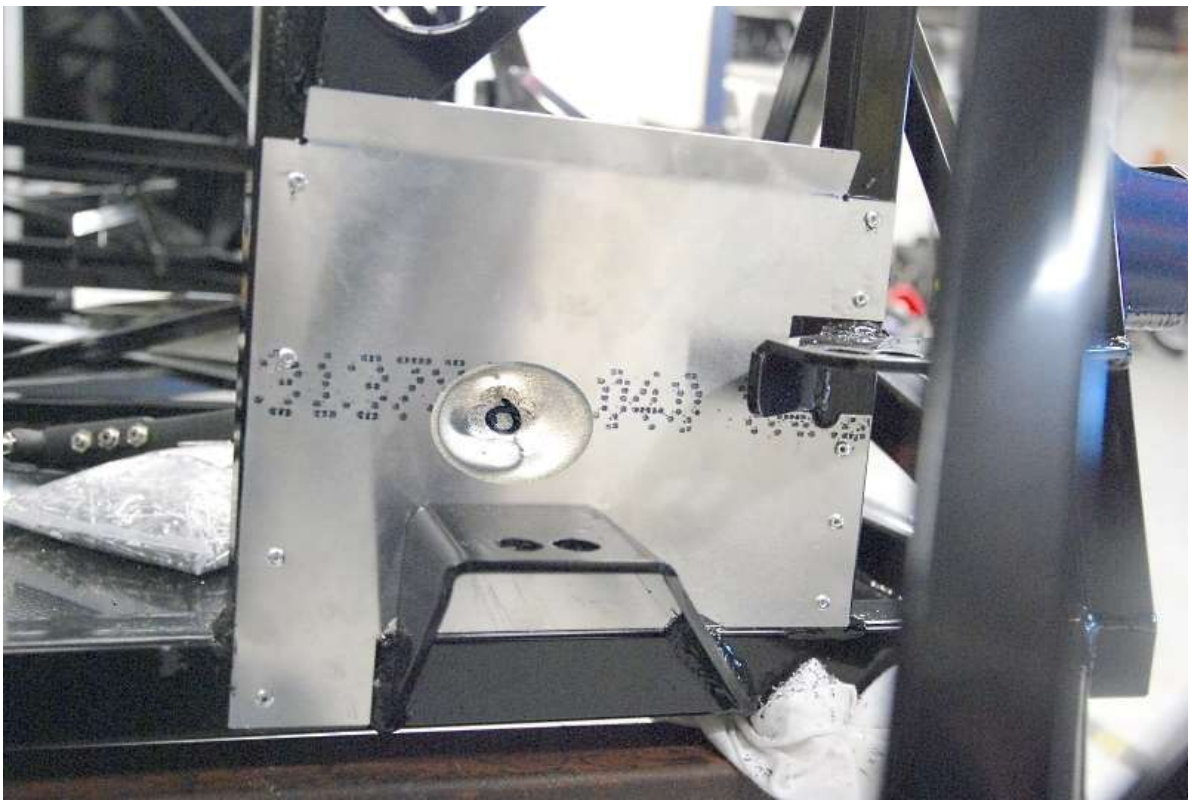
Drill all of the holes out using a 1/8 inch drill bit.



Lay down a bead of silicone on where the aluminum will contact the frame and get riveted.

Position the panel by either holding it in place or use a few of the mounted aluminum sheet metal screws to hold the panel. Drill out one of the easier holes for riveting.

Rivet the first drilled hole and then drill out the remaining holes. If you are not using any of the locating screws, put in a second rivet before drilling out the remaining holes.



Finish riveting the panel in place remembering to go back and replace any locating screws with rivets. All of the remaining aluminum on the chassis will follow this same procedure.

- Make sure all of the holes that pass through the chassis and the panels are lined up before drilling into the frame.

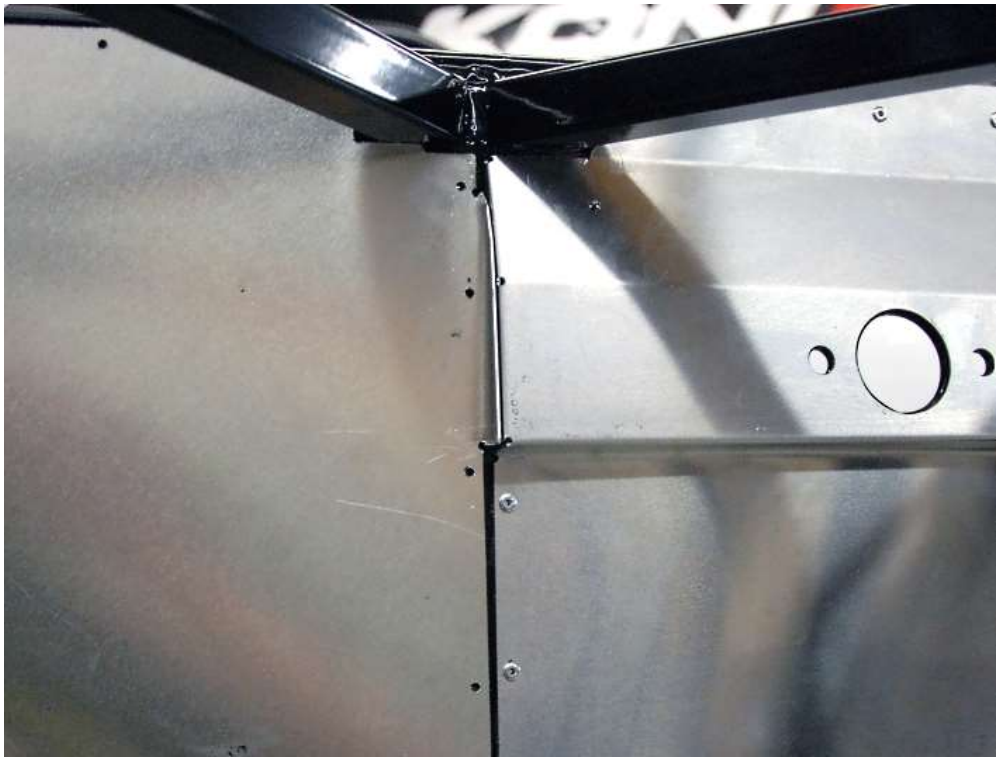
Position the left cockpit front upper cover on the chassis and mark it for riveting.

Drill, silicone and rivet the panel in position. Although the brake system will sandwich the panel to the chassis, a few extra rivets in the middle will help prevent rattles.

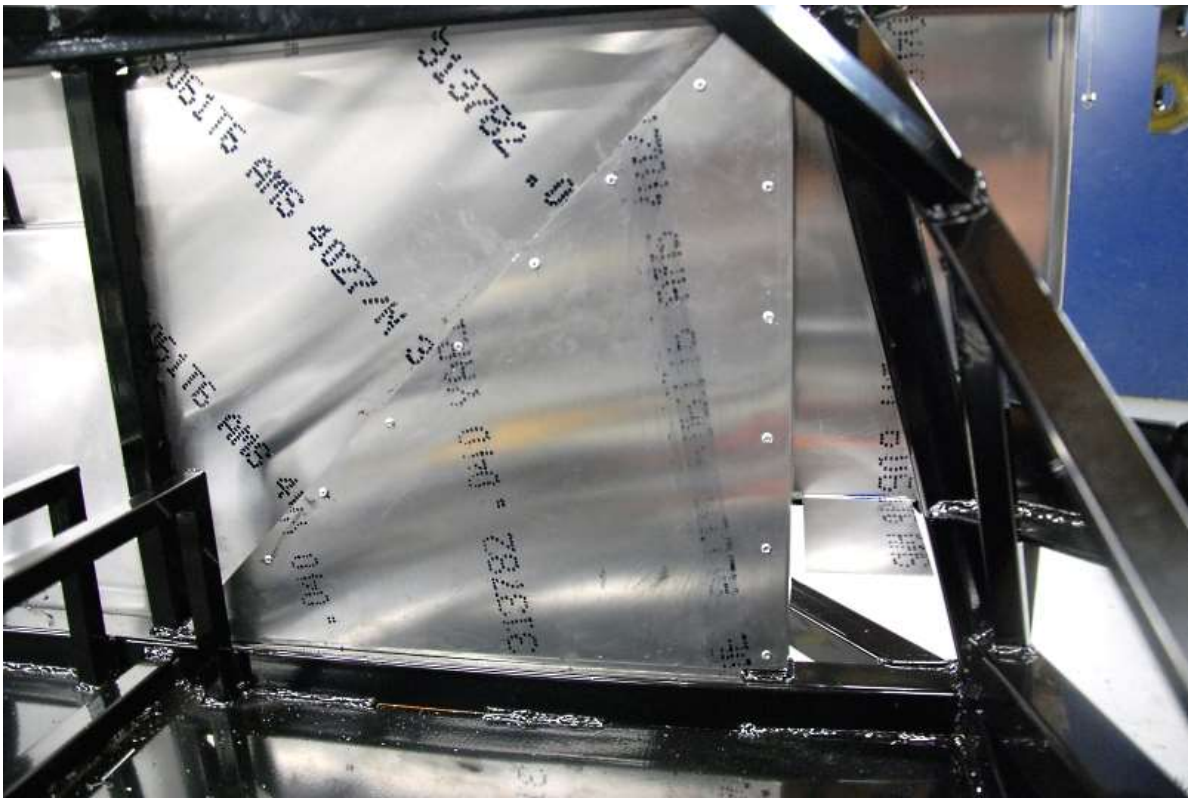
The left side cockpit end piece is next. It is correct to have an open space below the suspension mount; the cooling tubes will pass through this hole. Drill, silicone, and rivet the piece in place.

The cockpit middle left front panel finishes off the left side of the firewall. Mount the panel the same way as the previous ones making sure that the holes are lined up with the corresponding holes in the chassis.

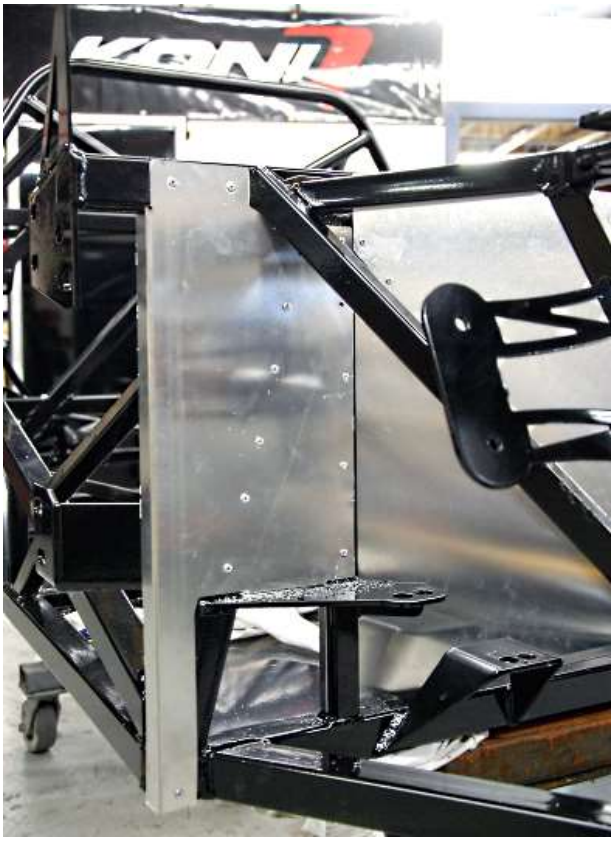
Double check all the left side panels for missed rivets or retaining screws that were missed.



The inside of the right side firewall is next, there is a small flange that lines up with the last panel positioned that helps to make sure you are aligned correctly. Drill, silicone, and rivet this panel in place.



Install the middle triangle of the right side firewall from inside the cockpit.



Finish the firewall with the similar end piece to the one used on the left side.

Use silicone to make sure the firewall is sealed and there are no gaps around the panels. The bottom of the inside triangle also needs a bead to seal to the frame.

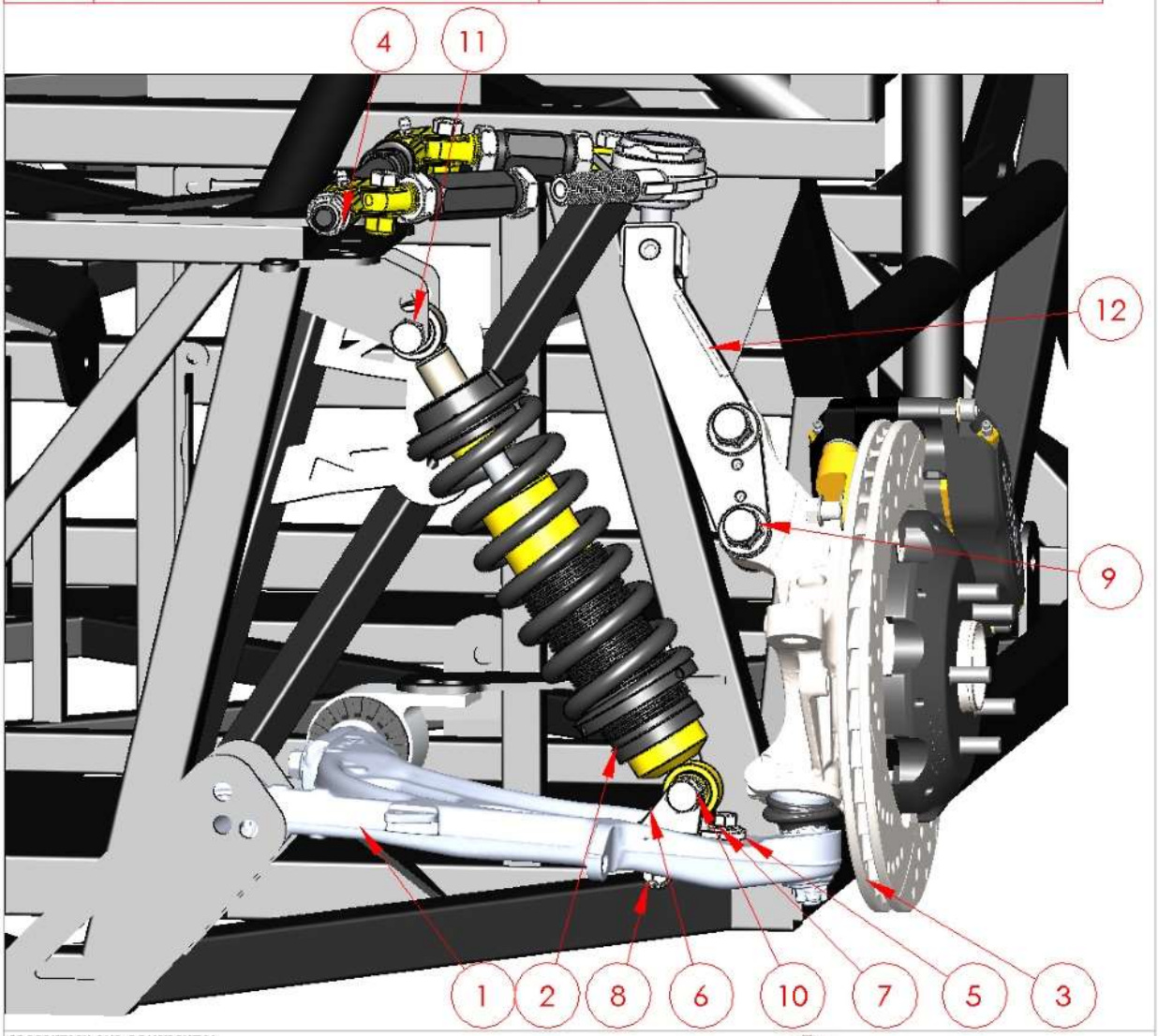
Use some acetone or brake cleaner to remove the ink marking and any marker lines from the aluminum.

The front firewall is now finished.

Front Suspension

🛠 Wrenches, sockets, ratchet, torque wrench

ITEM NO.	PART NUMBER	DESCRIPTION	Competition/QTY.
1	Front Lower Control Arm		1
2	818 koni Shock	818 KONI FRONT SHOCK	1
3	Front Spindle		1
4	15501	FRONT UPPER CONTROL ARM	1
5	80267	FRONT LOWER SHOCK MOUNT BRACKET	1
6	B18.2.3.4M - Hex flange screw, M10 x 1.5 x 40 --26N		1
7	B18.2.3.4M - Hex flange screw, M10 x 1.5 x 35 --35N		1
8	AM-M10-N		2
9	B18.2.3.4M - Hex flange screw, M16 x 2.0 x 60 --38N		2
10	HBOLT 0.5000-13x2x1.25-N		1
11	12385	HBOLT 0.5000-13x2.5x1.25-N	1
12	80051	IFS BRACKET ASSEMBLY	1



The lower shock bolts for the stamped steel arm should be in opposite locations than shown above.

FRONT LOWER CONTROL ARM

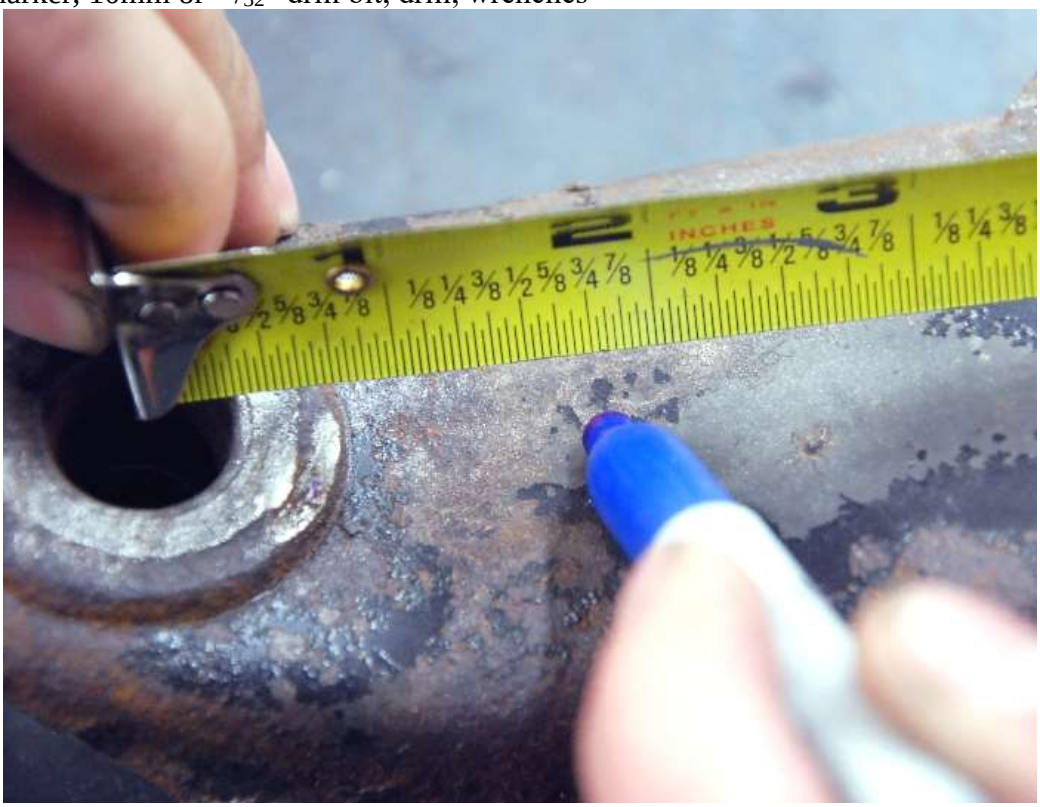
OEM fasteners, front lower control arms, M10 x 35mm and M10 x 40mm Flange head bolts and locknuts, IFS components

- There are 3 mounting locations to choose from, the top hole is for track ride height, the inner lower hole is for WRX sedan control arms, and the outer hole is for 2.5RS and Wagon control arms.
- Only the 2006 WRX came standard with aluminum lower control arms
- If you have changed control arms between donors it is very important you check the ball joint tapers to make sure they are the same. Some spindles have a smaller taper that does not fit the aluminum arms.

Control arm preparation

Measuring tape, marker, 10mm or $^{13}/_{32}$" drill bit, drill, wrenches

2002-2005, 2007 Stamped steel arms



From the center of the spindle ball joint area on the top side of the lower control arm measure back 2.00 inches and mark the control arm.

From the rear edge of the control arm at the point just marked, measure in 1.25 inches and mark the new point on the control arm.

Position the front lower shock mount on the control arm with the outer hole centered on the point just marked and so the mount is angled 90° to the control arm mounting bolts.

Mark the center of the inner bolt hole on the top of the control arm.

Drill out the marked locations using a 10mm or $^{13}/_{32}$" drill bit.

Test fit the M10 x35mm and 40mm bolts in the holes.

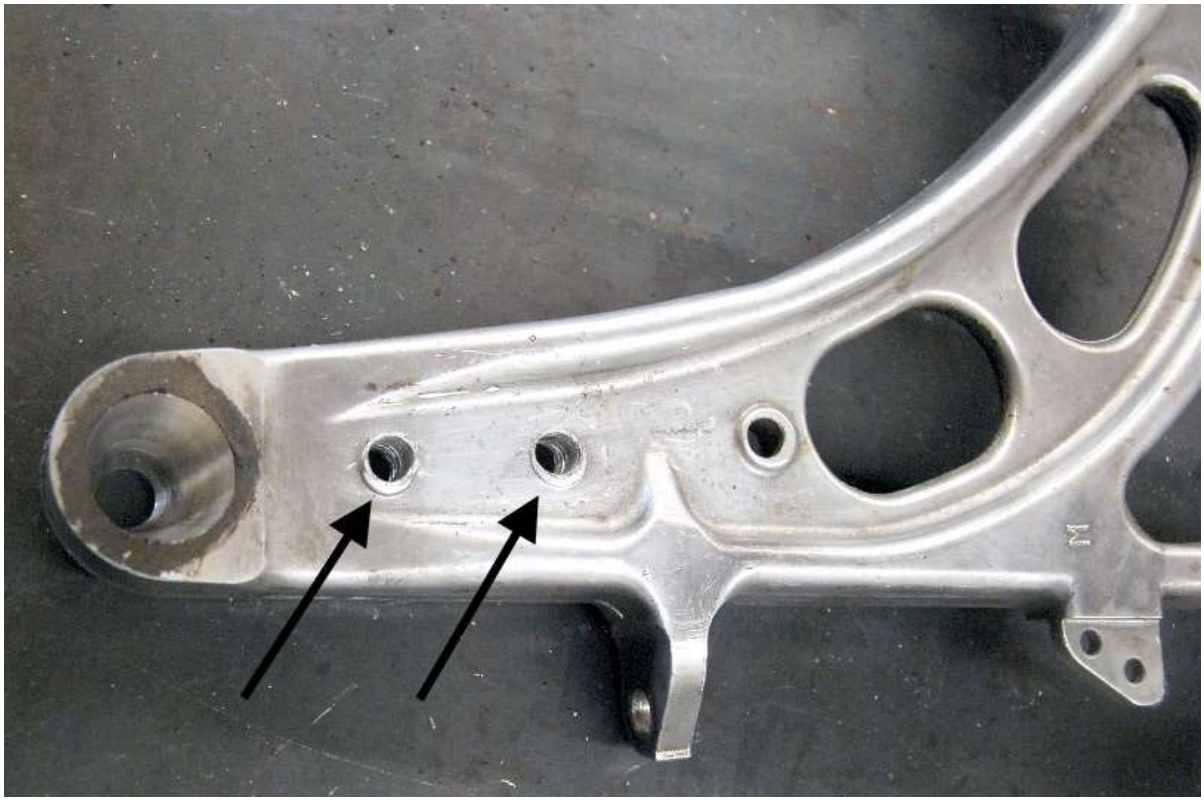
Attach one of the 10mm bolts to the nut holder bracket on the end with the welded plate as shown above.

Insert the nut holder into the control arm through the large factory hole.

Align the nut holder with the drilled holes.

Fasten the lower shock mount to the control arm using the M10 x35mm and 40mm bolts and locknuts. Note the orientation of the shock bracket in the picture.

2006 Aluminum arms



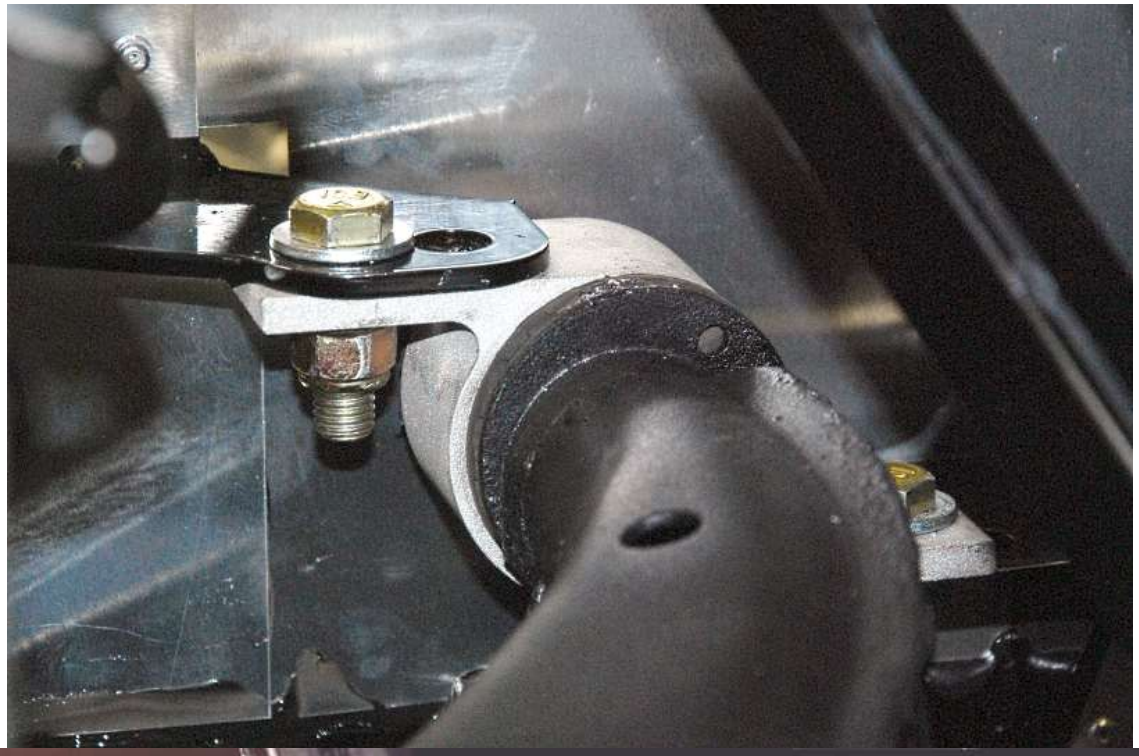
Using the shock mount as a drill guide, drill the front two casting bosses using a 10mm or $^{13}/_{32}$" drill bit.

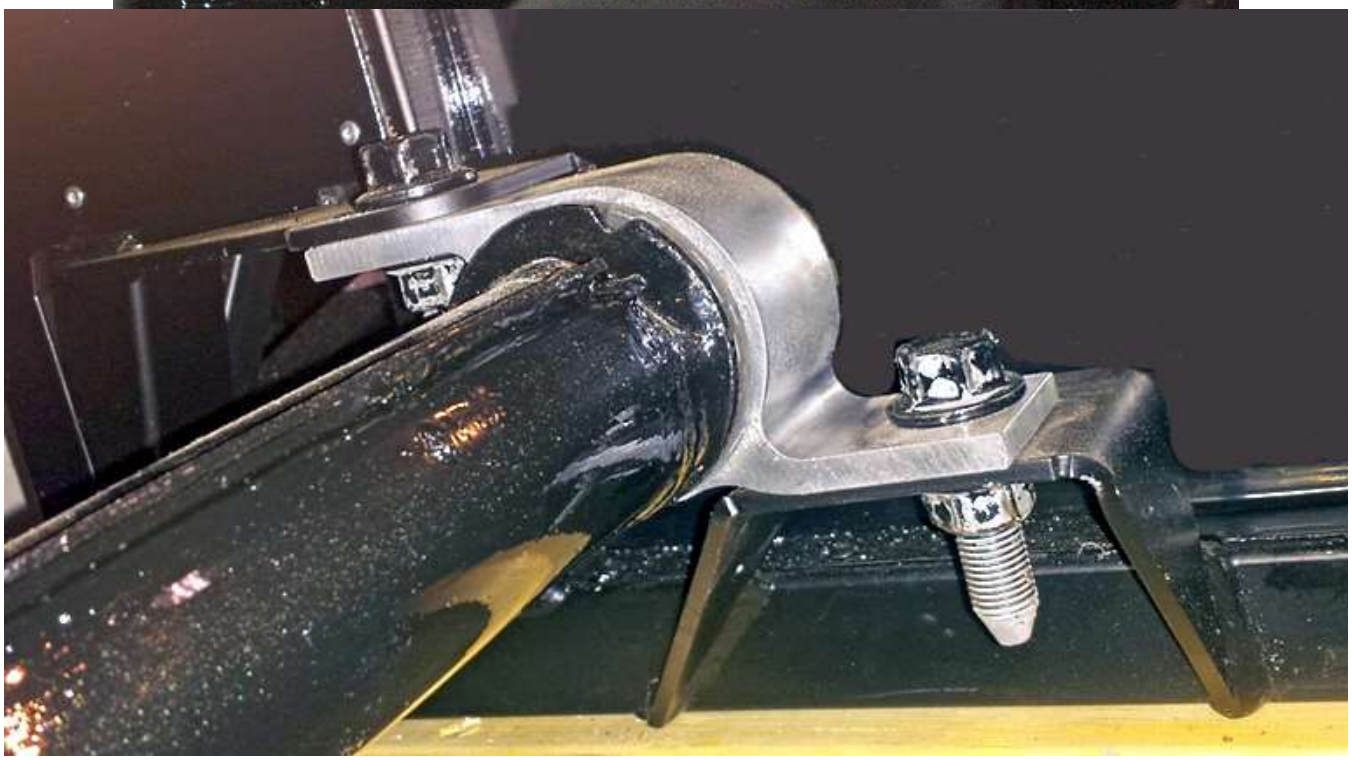
Bolt the lower shock mount to the top of the control arm using the M10 x35mm and 40mm bolts and locknuts. Note the orientation of the shock bracket in the picture.

The front of the lower control arms are installed on the chassis re-using the factory mounting hardware. The rear mount uses the factory mount bolts with two of the strut bolt locknuts.

Do not torque bolts until at ride height.

The front of the lower control arms are installed on the chassis using the lower inside holes. For the 2.5 RS or wagon donors, the outside set of holes are used for the control arms.





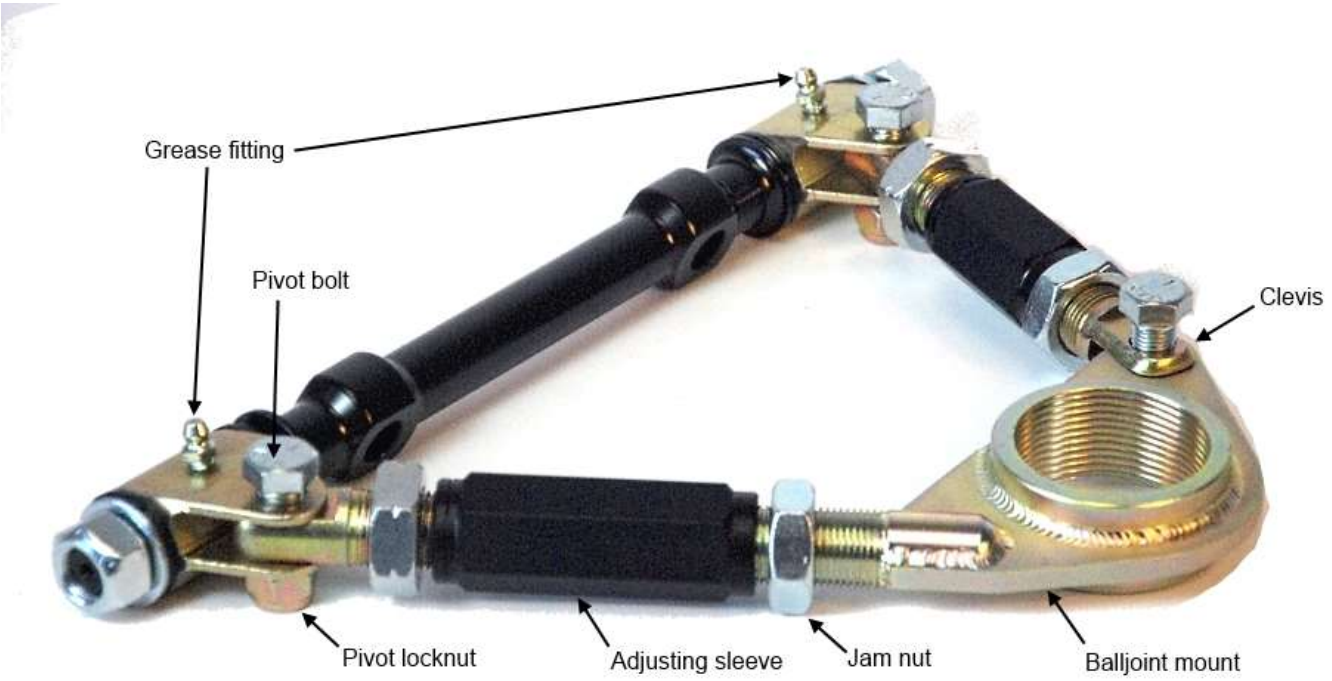
The rear of the control arm bolts to the top of the bottom bracket and the bottom of the top bracket. The flat shorter tab goes up. As with the front bushing the inner set of holes is for the WRX sedan arms and the outer is for the 2.5RS and Wagon.

For track ride height this bracket will be spaced up from the mount, see the 818R instructions.

Front upper control arm

½"-20 1.75" flange head bolts and locknuts, IFS components.
¾" Wrench, ¾" socket, ratchet

Adjusting the upper control Arm

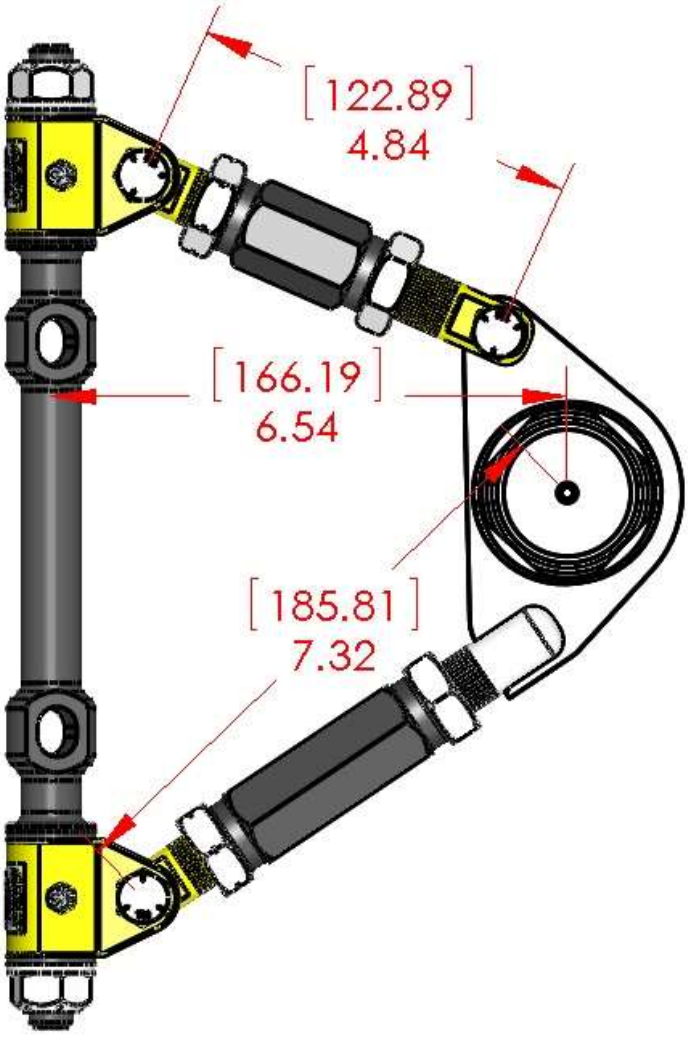


Slightly loosen the three pivot bolts using a ⅝" and $^{11}/_{16}$" wrench.
Loosen the jam nuts on both ends of each adjusting tubes using a 1⅛" wrench. Turn the adjusting tubes to lengthen or shorten the arm.
After you have adjusted the arm to the desired length, tighten down the jam nuts against the adjusting tubes, and then tighten each of the three pivot bolts. Torque the pivot bolts to 60 lbft.
Grease both ends using chassis grease frequently to insure smooth, trouble free operation.

- If the pivots will not take grease, the endplay may be too tight.
- There should never be more than 1" of thread showing past the tightened down jam nuts on either end of both adjusting tubes.
- The Pivot Bolts must be loosened while the car is being aligned and retightened afterwards

Pivot endplay Adjust the locknuts on the ends of the pivot shaft so that there is minimal endplay but so the pivots can still rotate easily on the shaft.

Rough alignment dimensions

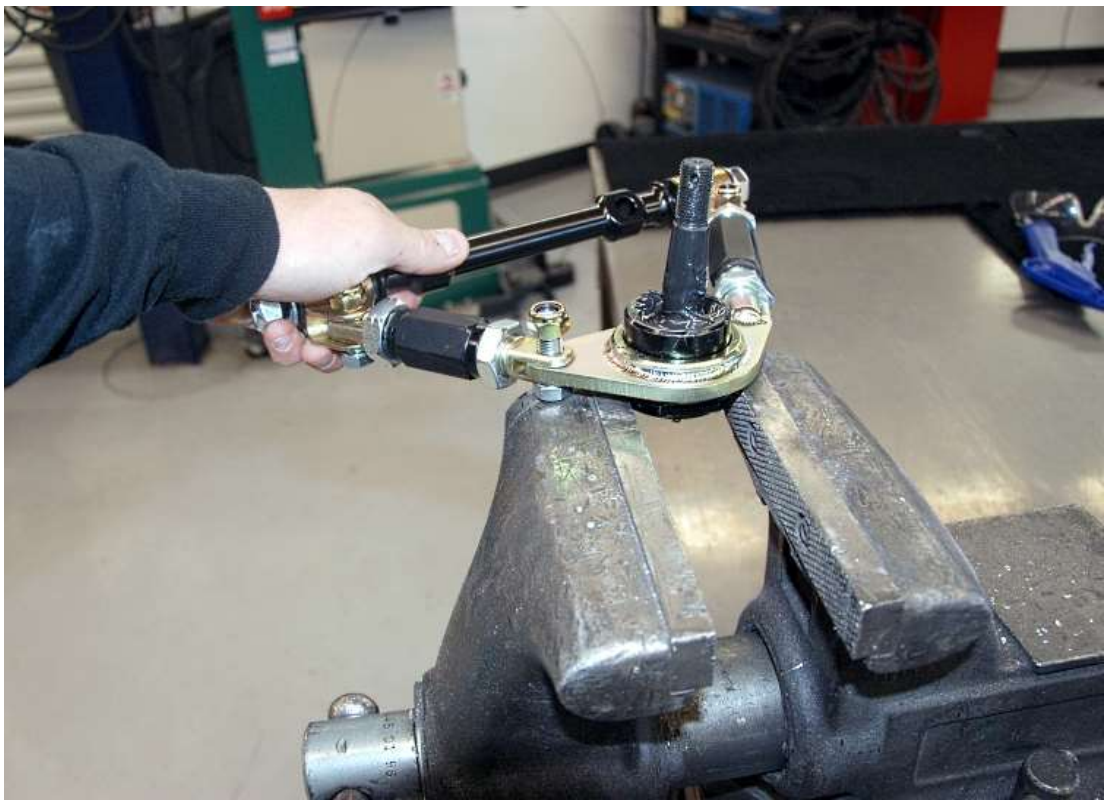


This picture shows measurements for a rough alignment.

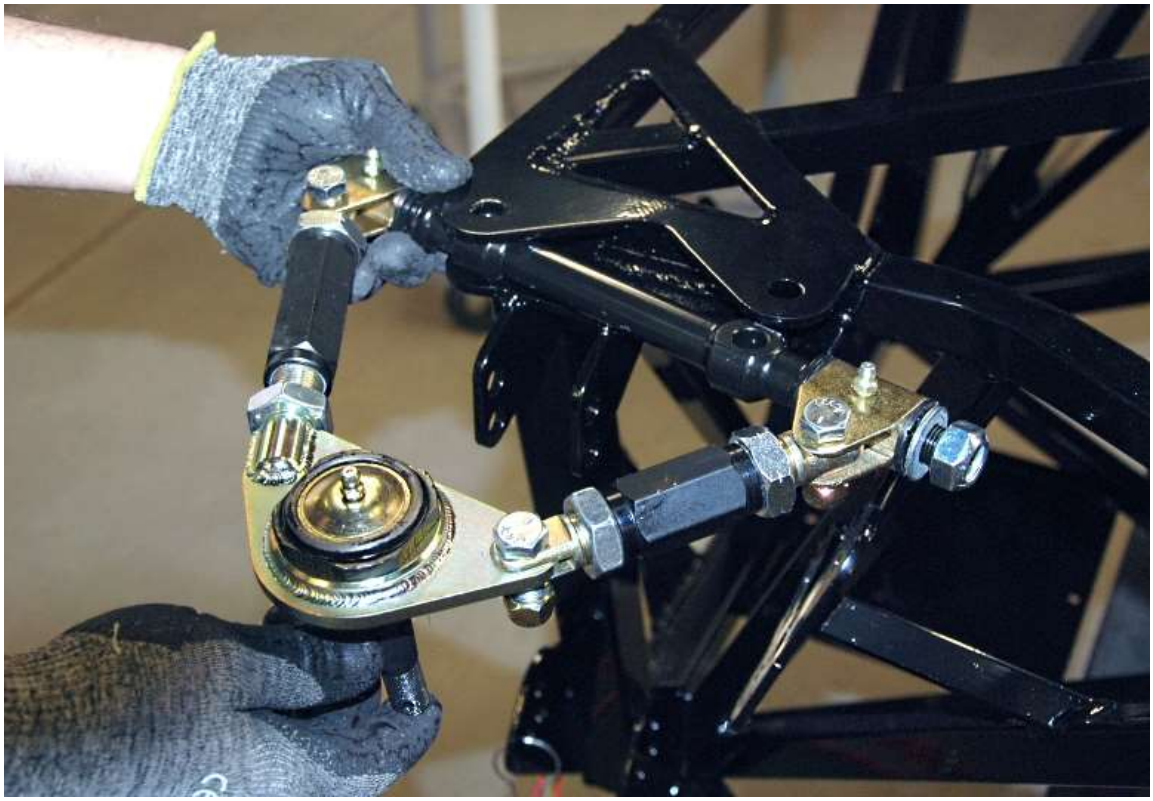
Test fit the upper control arms to make sure you are putting the ball joints in correctly. The welded side of the balljoint mount goes forward with the shorter adjusting arm toward the rear. The bolts holding the arm together should thread in from the top, switch them if they are incorrect.

- If threading the balljoint into the arm is hard, wire wheel the balljoint threads to remove the coating then retry.

Thread the upper ball joints into the arm from the top down. Use thread-locking compound on these threads to prevent them from loosening.



If you do not have a big enough socket, tighten the ball joint with a vice. Use the fixed arm of the control arm for leverage and tighten until the joints are completely seated and tight in the collar.



Install the upper control arms between the two sets of tabs.

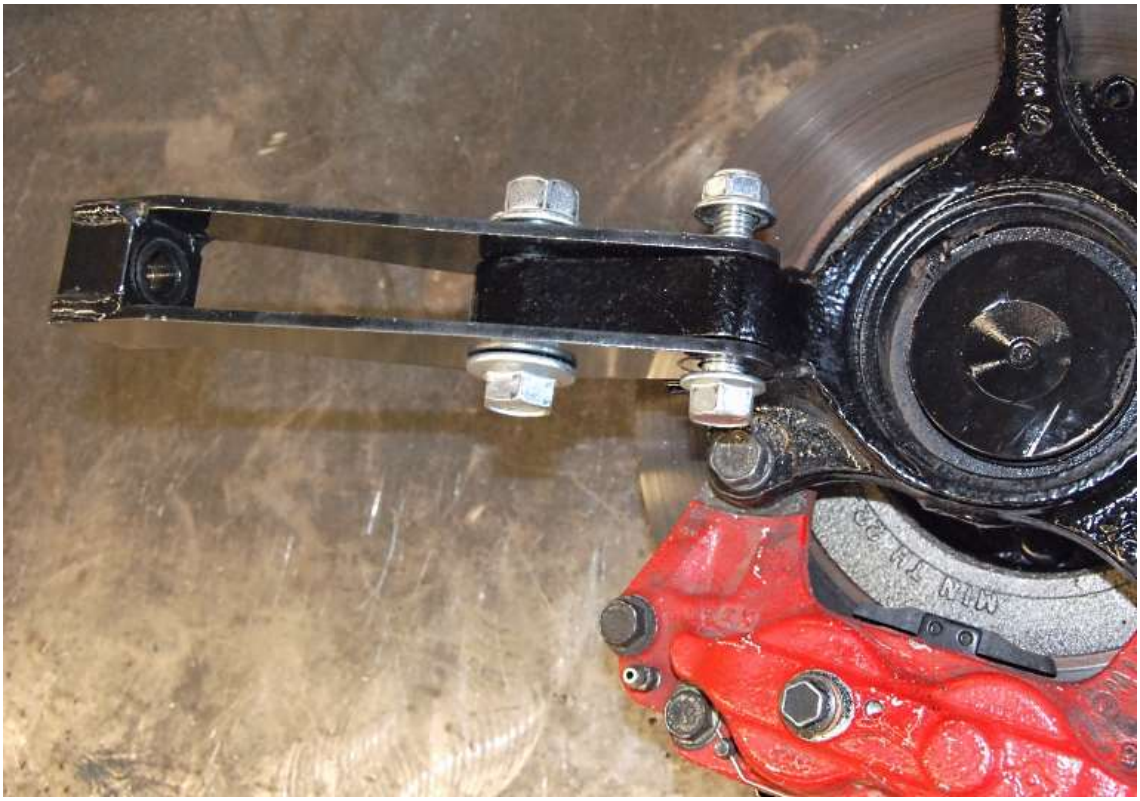
The pivots may be a little stiff at first but once on the car they will loosen slightly.

IFS Bracket

OEM spindles, OEM fasteners, IFS components, M16 x 60mm bolts

Locate the IFS brackets that attach the spindle to the upper ball joint.

Position the IFS bracket on the spindle with the ball joint mount leaning inward.

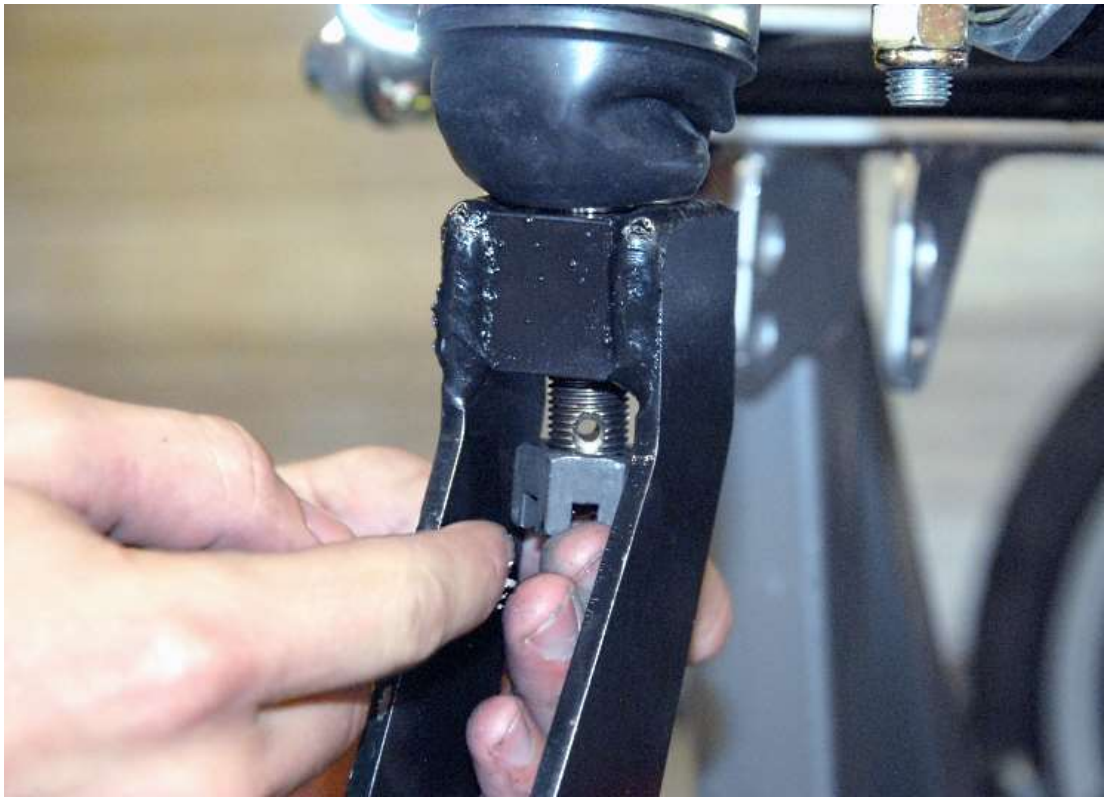


Attach the IFS bracket using the OEM strut bolt for one hole and the M16 x 60mm bolts.

Tighten the IFS bracket to the same spec as the OEM strut.

Position the spindle on the lower a-arm if it was originally detached, and torque the lower ball joint bolt to OEM spec.

With the ball joint's set to the factory torque spec, install the cotter pin. Never loosen the bolt to line up the pin, always tighten it to the next available hole.



Lower the ball joint stud into the tapered hole on the bracket and thread the castle nut onto the stud making sure the cotter pin hole is accessible.

Tighten the castle nut to **75 ft-lbs** and install the cotter pin.

Front outer CV joint

🚘 OEM front outer CV joint

Insert the outer axle into the spindle

✋ This part is mandatory as it holds the front wheels bearings in place.

Re-install the outer CV axle nut loosely. Do not torque until after shock is installed.

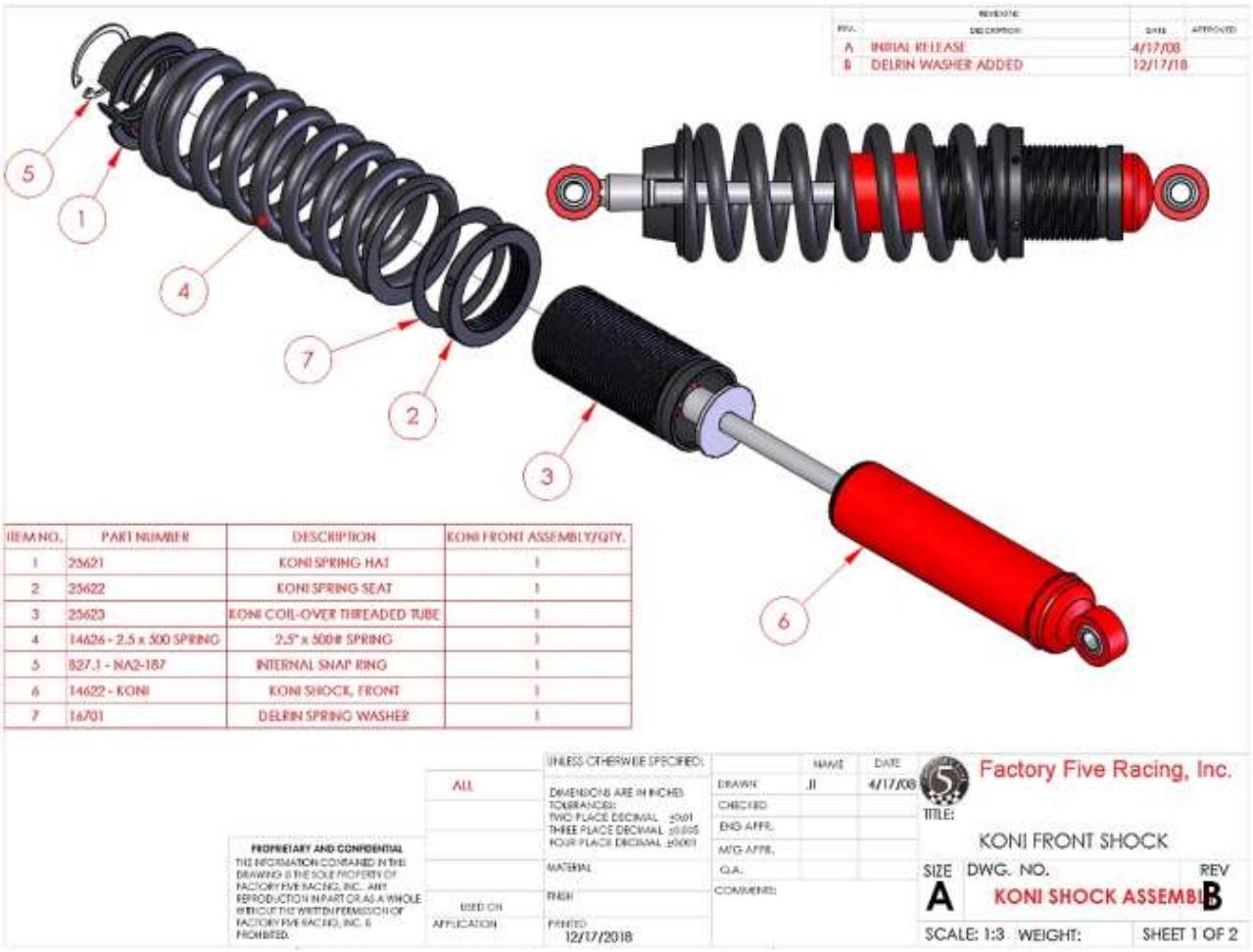
Front Coil-Over Shock

Coil-over Assembly

- ½”-13 x 2.00”, ½”-13 x 2.50” hex head bolts and locknuts, IFS Components, Insulated clip hardware.
- Snap ring pliers, ¾” wrench, ¾” socket, Ratchet, Torque wrench, chassis or lithium grease.
- The shocks are pre-valved at the factory in compression and rebound for good street use. The shocks can be adjusted in rebound as per Koni’s instructions if so desired. The front springs are 350lb, and the rear springs are 275lb. Other springs are available for different ride characteristics.
- WARNING! Incorrect assembly and maintenance of this part can cause serious injury or death.
- Race shocks and springs as well as double adjustable shocks and different spring rates are also available

Unpack the shocks, coil-over parts and hardware.

Double check the jam nut under the rod end and bump stop to make sure that it is tight.
Screw the spring seat down on the sleeve so it is closer to the unthreaded end.



Slide the coil sleeve over the body of the damper beginning at the end which has the rubber bump stop. The unthreaded end of the sleeve goes first so that it will sit on the snap ring on the shock body.

Place a small amount of white lithium or chassis grease on one side of the Delrin washer.

Put the Delrin spacer grease side down onto the spring seat on the threaded tube (shown without tube)

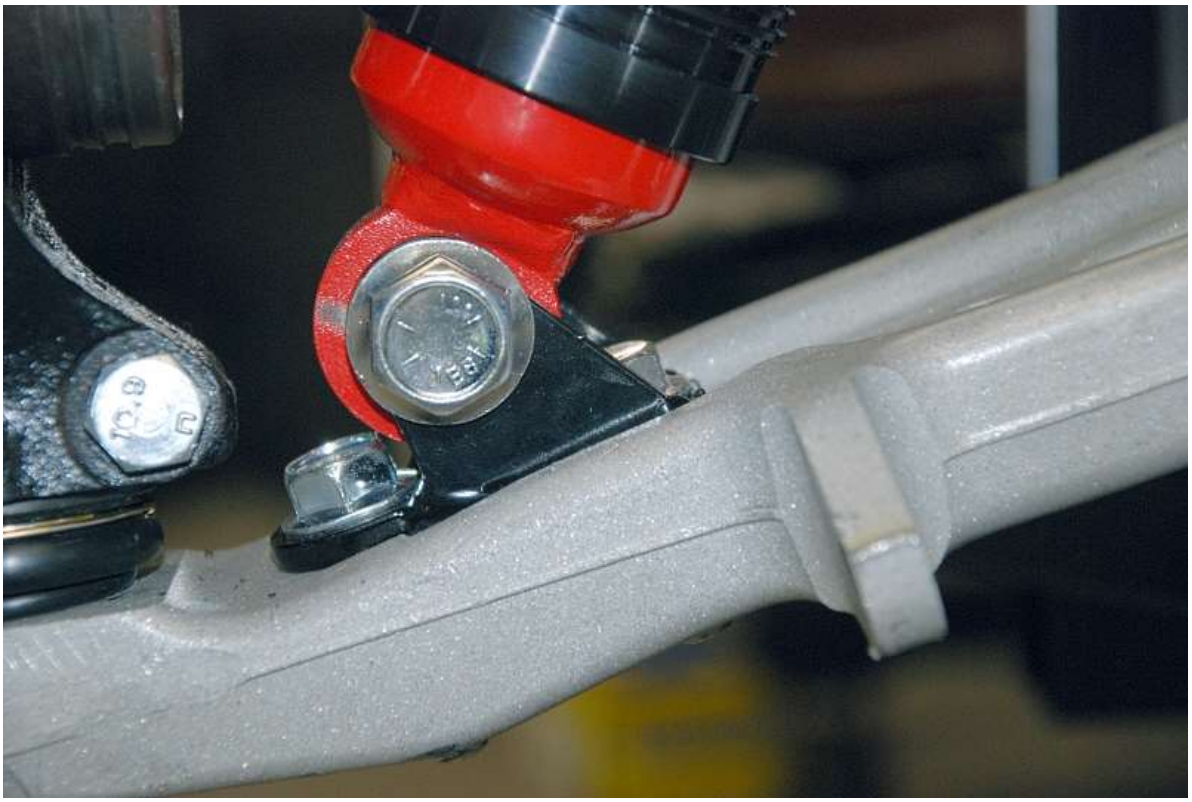
The coil-over hats have a snap ring which holds it in place. Remove this snap ring to assemble the coil over shock.

Slide the rubber bumper about two inches down on the shaft.

Put the 350# spring and hat on the shock and rotate the spring seat back up the sleeve so that the spring pushes the hat tight against the end of the shock.

Install the snap ring on the spring hat so that it holds onto the shock end. Make sure that the slot in the snap ring and the slot in the spring hat are not aligned.

Shock Installation



Bolt the front coil-overs to the lower control arm using the 0.125" spacers and provided hardware. The front coil-overs are the ones fitted with 350lb springs.

Attach the top of the coil-over to the chassis using the 0.43 inch spacers and provided hardware.

Front outer CV joint torque

🛠 Torque wrench

Torque the axle nut to the OEM spec. You may have to either wait until the brakes are connected or put a screwdriver through the rotor vanes to prevent the rotor from turning.

Steering Rack

🚘 Steering rack, steering system hardware, 7/16”-14 x 2.25” hex head screws and locknuts.
🛠 5/8” socket, 5/8” wrench, ratchet

Set the steering rack in place on the frame with the steering shaft stem on the left side pointed up at a shallow angle to the ground.

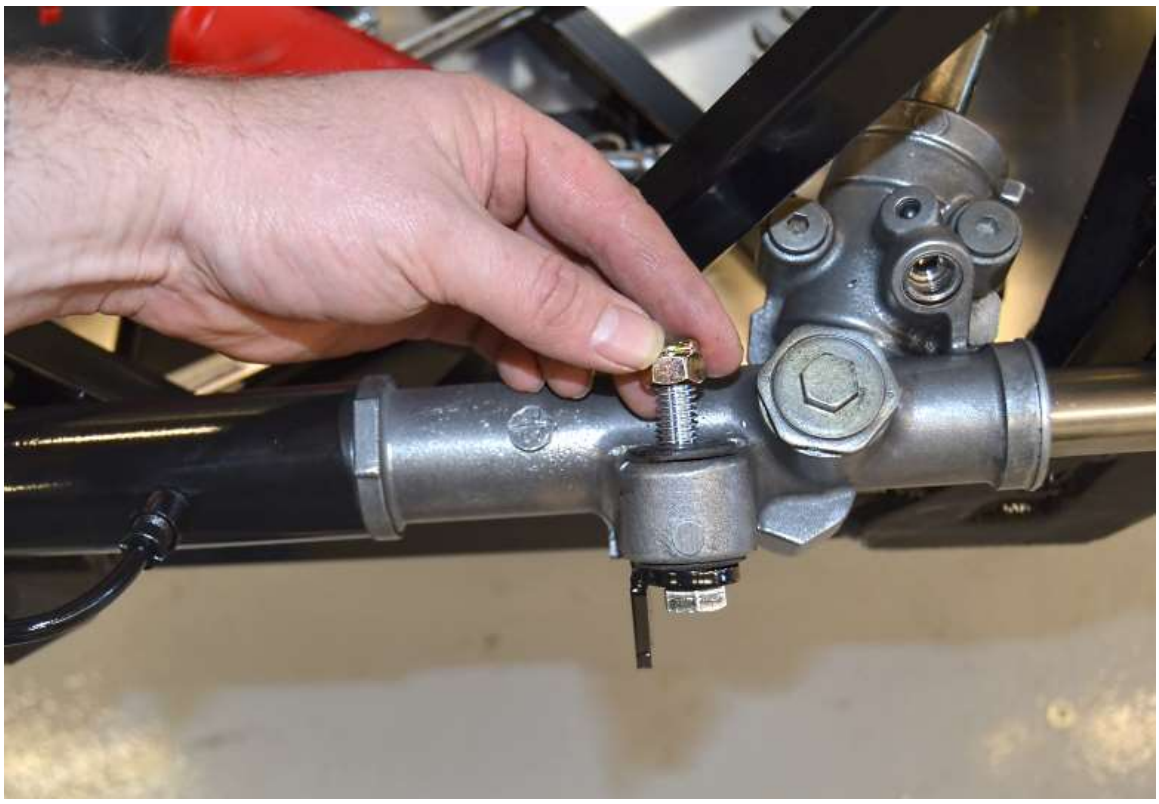
2002-04 Rack

Re-use the top saddle bracket and rubber insert. Attach the saddle to the chassis using the provided 0.93 inch spacers and $^{7}/_{16}$"-14 x 2.25" hex head screws and locknuts from the bottom up.

The steering rack support bracket mounts under the rack mount on the right side to locate the bottom of the rack.

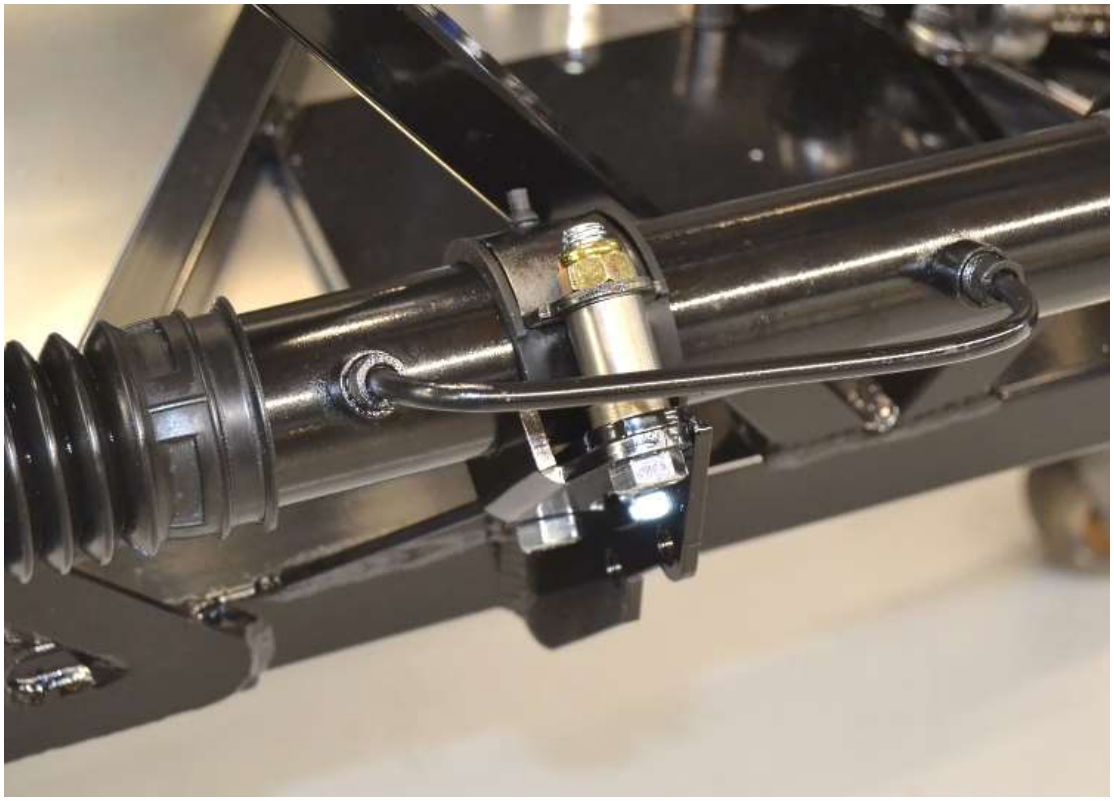
Slide the bracket under the rack mount with the factory saddle clamp and rubber. The rubber can be trimmed; it is only needed under the saddle. 0.865 inch spacers go between the bracket and the mount.

Insert the outer tie rod ends into the spindles. Leave the nut loose until the front alignment is done for easier adjustment.



Bolt the left side mount directly to the frame using the provided $^{7}/_{16}$"-14 x 2.25" hex head screws and locknuts from the bottom up.

The steering rack support bracket mounts under the rack mount on the right side to locate the bottom of the rack.



Slide the bracket under the rack mount with the factory saddle clamp and bushing in place. 1.12 inch spacers go between the rack mount and the bracket.

Bolt the right side steering rack mount in place using the spacers and $^{7}/_{16}$”-14 x 2.25” hex head screws and locknuts.

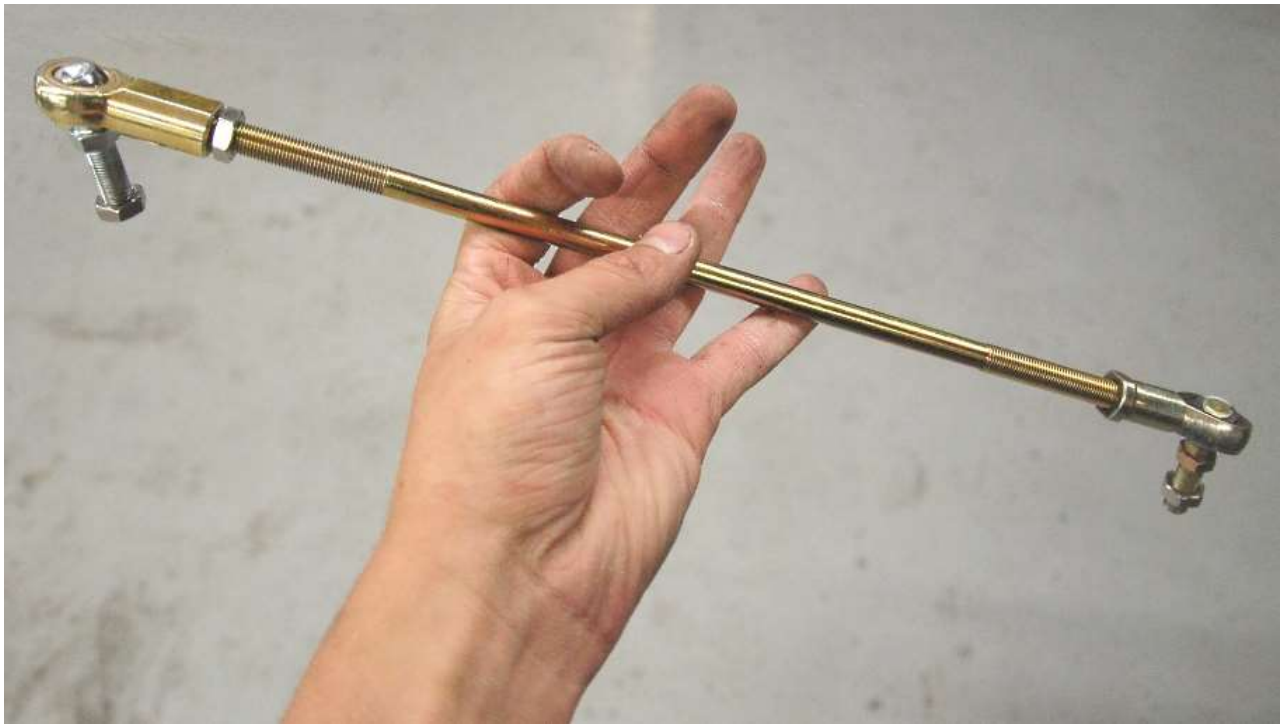
Insert the outer tie rod ends into the spindles. Leave the nut loose until the front alignment is done for easier adjustment.

Sway bar

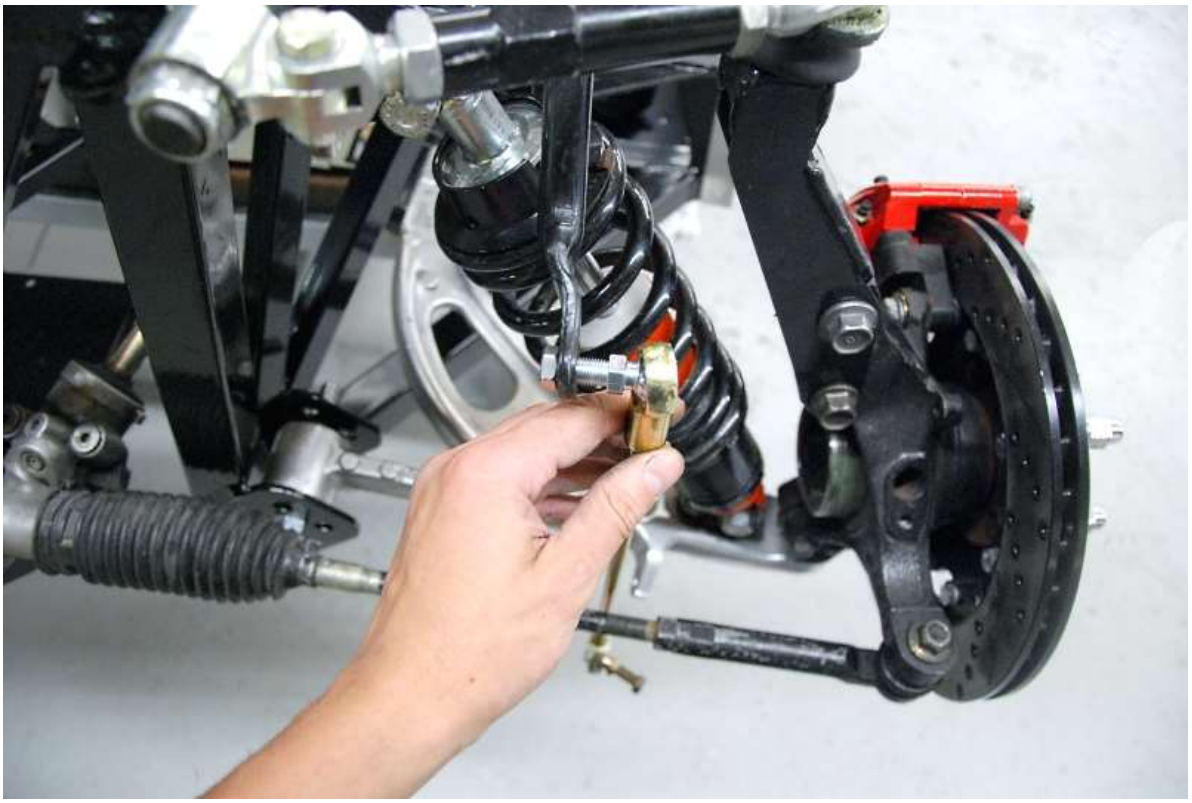
🚘 Rear sway bar, OEM sway bar mounts, Front sway bar components.

Slide the donor **rear** sway bar into the front end from the left side, if you are having difficulty getting it in place on the front side of the mounts you can remove the top bolt from the left side coil-over to give extra room.

Bolt the sway bar to the chassis brackets using the factory mounts and hardware.



Assemble the sway bar link by screwing the jam nuts and rod ends onto the threaded link.



Attach the linkage to the sway bar from the outside using the provided $^{3}/_{8}$"-24 locknut.

Attach the sway bar to the lower control arm from the inside to keep the link as vertical as possible. Due to some differences in the model years and models some links may need to be trimmed between ½ -1 inch on one side.

The sway bar should be re-adjusted once the wheels are put on at ride height.

Put the wheels on the chassis torque the front suspension bolts.

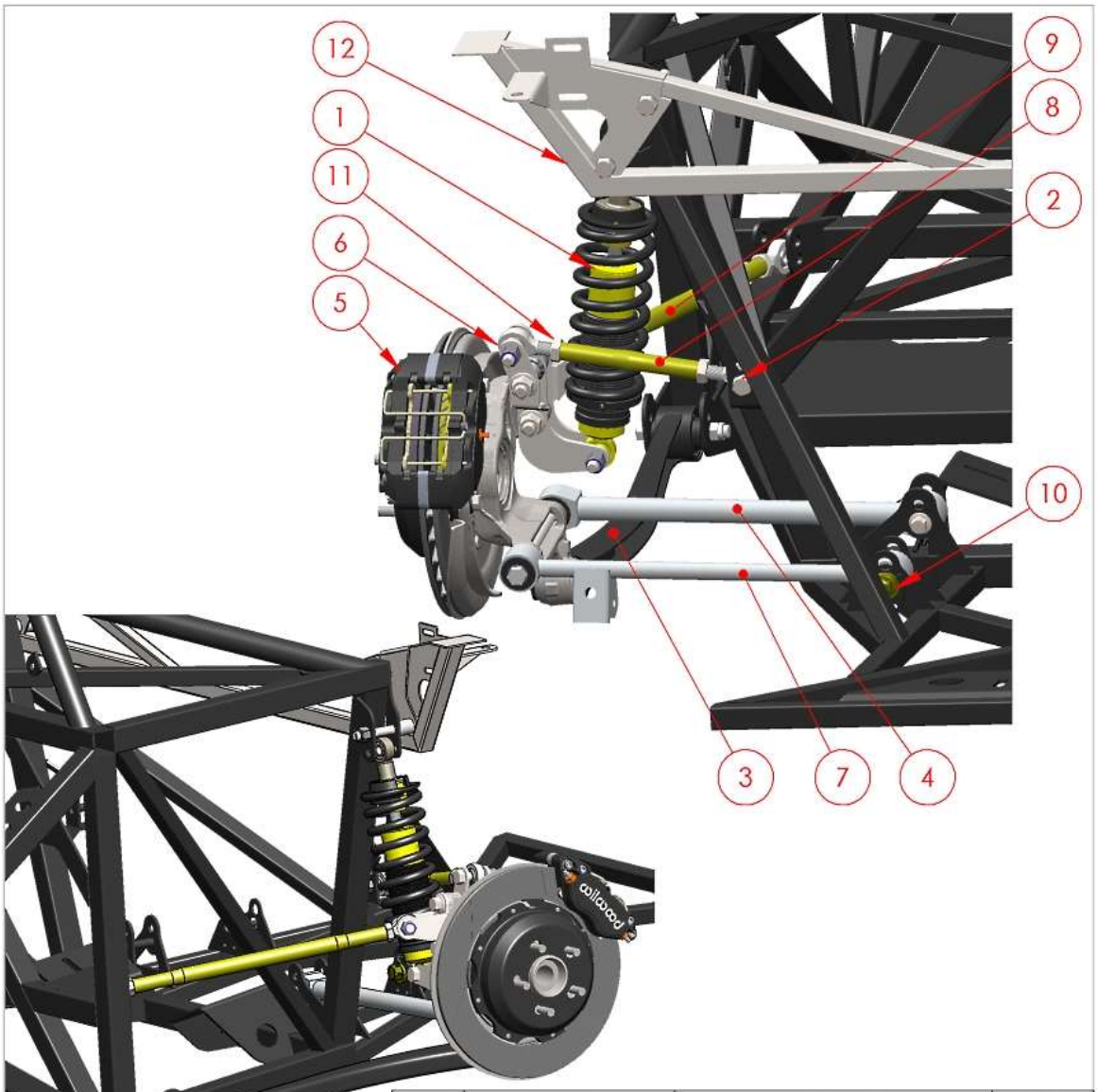
Front Suspension Torque Specs Chart

Item	Nm	Lbft
Front lower control arm front mount	95	70
Front lower control arm rear bushing mount	250	184
Front lower control arm to rear bushing	190	140
Front lower ball joint to spindle	50	37
Item	**Nm**	**Lbft**
Upper A-arm to frame	135-162	100-110
Upper ball joint to IFS spindle bracket	95-122	70-90
Upper ball joint bracket to spindle	175	129
Steering rack to frame	60	44
Tie rod end to spindle	27	20
Steering joint to rack	24	17
Front CV joint Nut	220	162
Sway bar mount to frame	25	18
Sway bar to sway bar link	45	33
Sway bar link to lower control arm	45	33

Rear Suspension

- Rear control arms, rear spindles, Rear suspension components

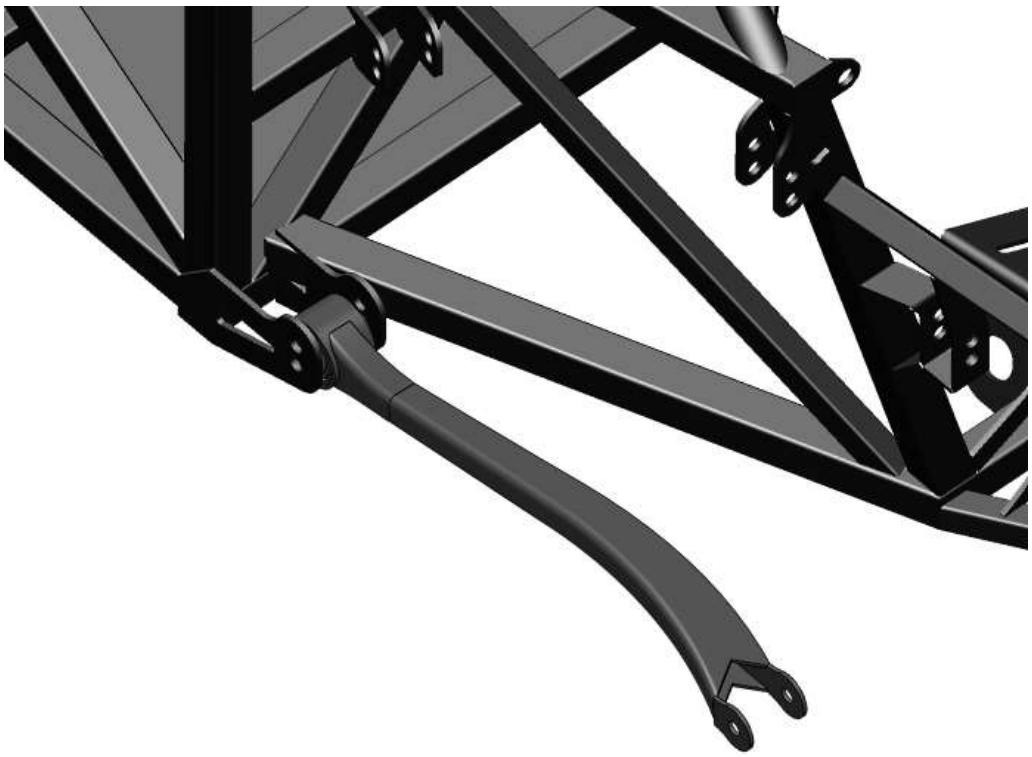
For 818R see appendix



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	818 koni Shock		1
2	HBOLT 0.5000-13x2.5x1.25-N		1
3	Rear Control Arm forward		1
4	Rear Control Arm front		1
5	Rear Spindle	REAR SPINDLE WITH IRS ADAPTER BRACKET	1
6	4475T151		4
7	Rear Control Arm rear		1
8	80035	6.00" ADJUSTABLE TUBE	1
9	80037	14.00" ADJUSTABLE TUBE	1
10	REAR LOWER CAM BOLT	REAR LOWER CONTROL ARM CAM BOLT	1
11	HJNUT 0.6250-18-D-N		4
12	80300	REAR SHOCK TOWER BRACE	1

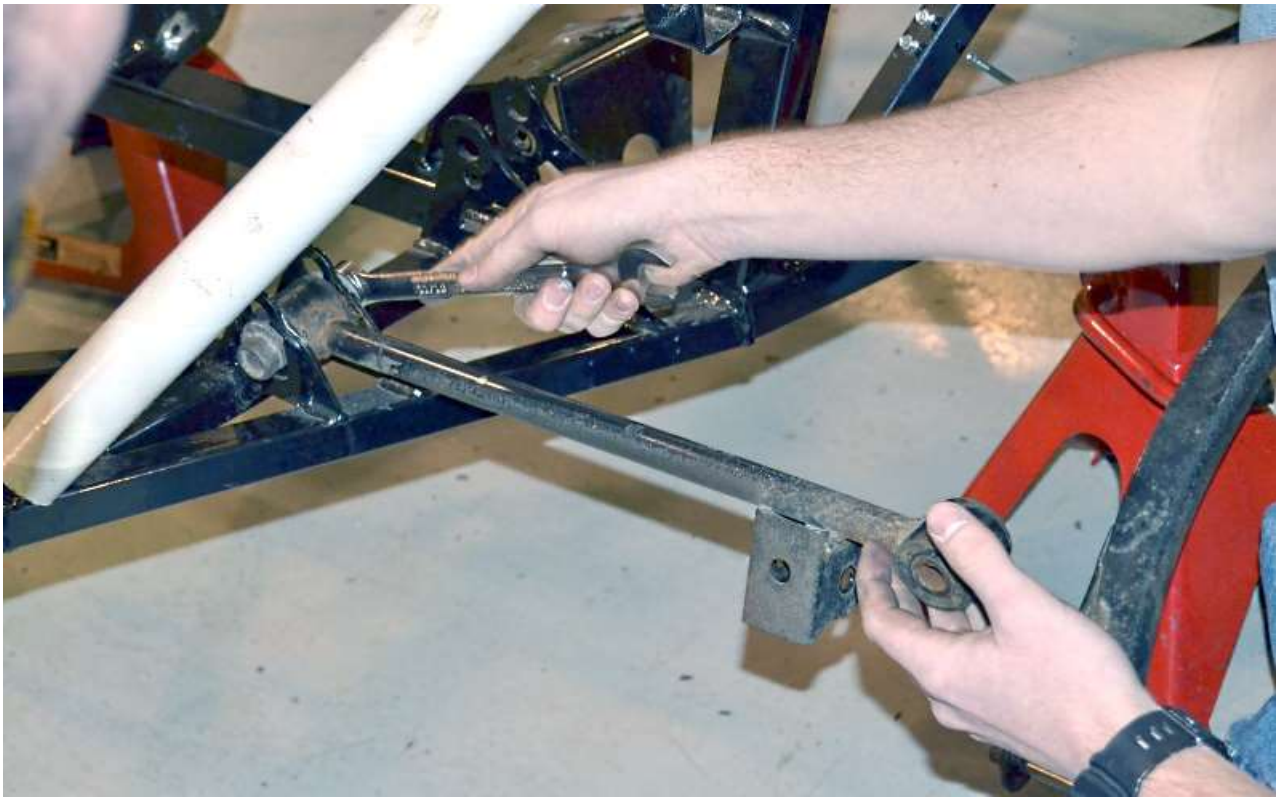
Factory Five Racing, Inc.

OEM Control arms



Bolt the rear lower trailing arms from the donor onto the chassis using the OEM mounting hardware.

Use the factory cam-bolts and washers to bolt the rear toe-links onto the chassis with the old sway bar mounts down and out.



With the cam washer in place tighten the nut snug enough that the arm will still move with a wrench.

Install the forward lower control arm to the lower hole of the chassis using the OEM hardware.

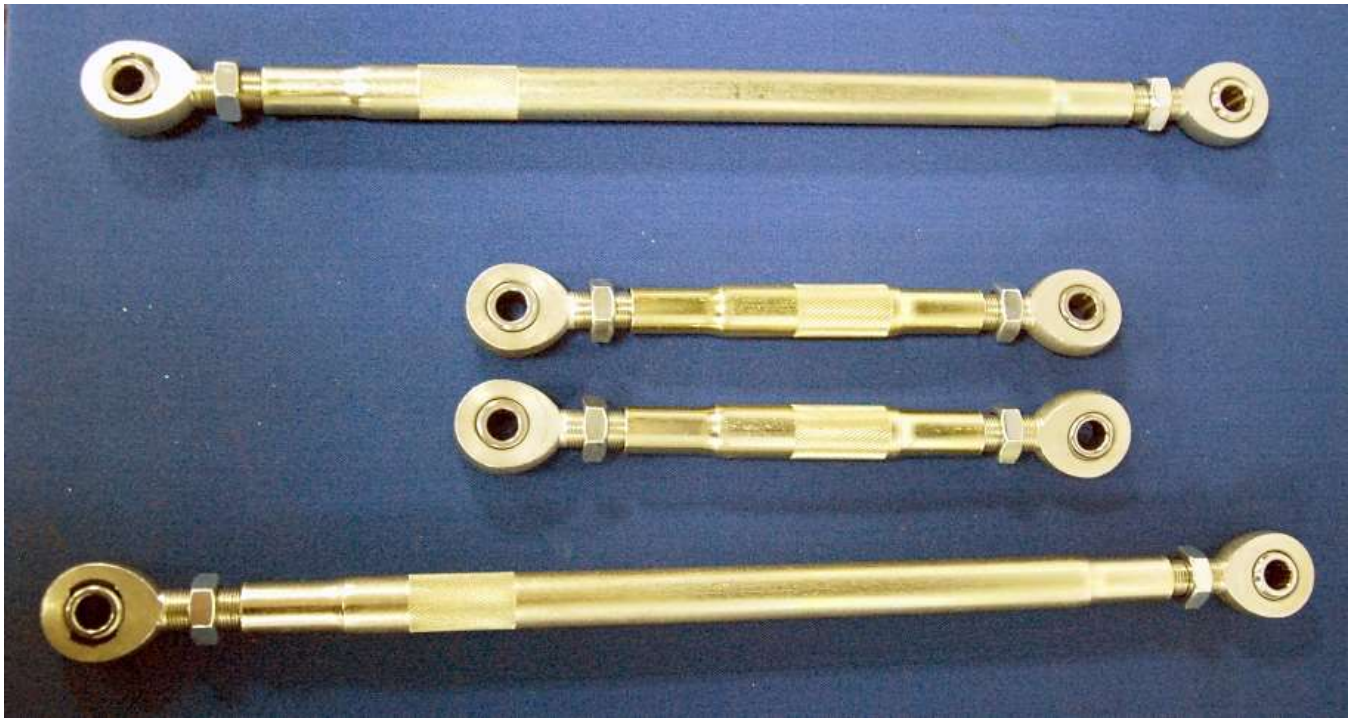
Rear control links

- Rear lateral and forward links, ½”-13 x 2.50” hex head bolts and locknuts, $^{5}/_{8}$” right and left hand thread jam nuts.

🛠 ¾”, 15/16” wrenches, ¾” socket, ratchet.

Unpack the rear control link components.

Thread jam nuts on each of the control link rod-ends. Half of them are left hand thread.



Assemble the rear control links with rod ends at each end. The rod ends should all be threaded an even amount on both sides in the tube for installation.

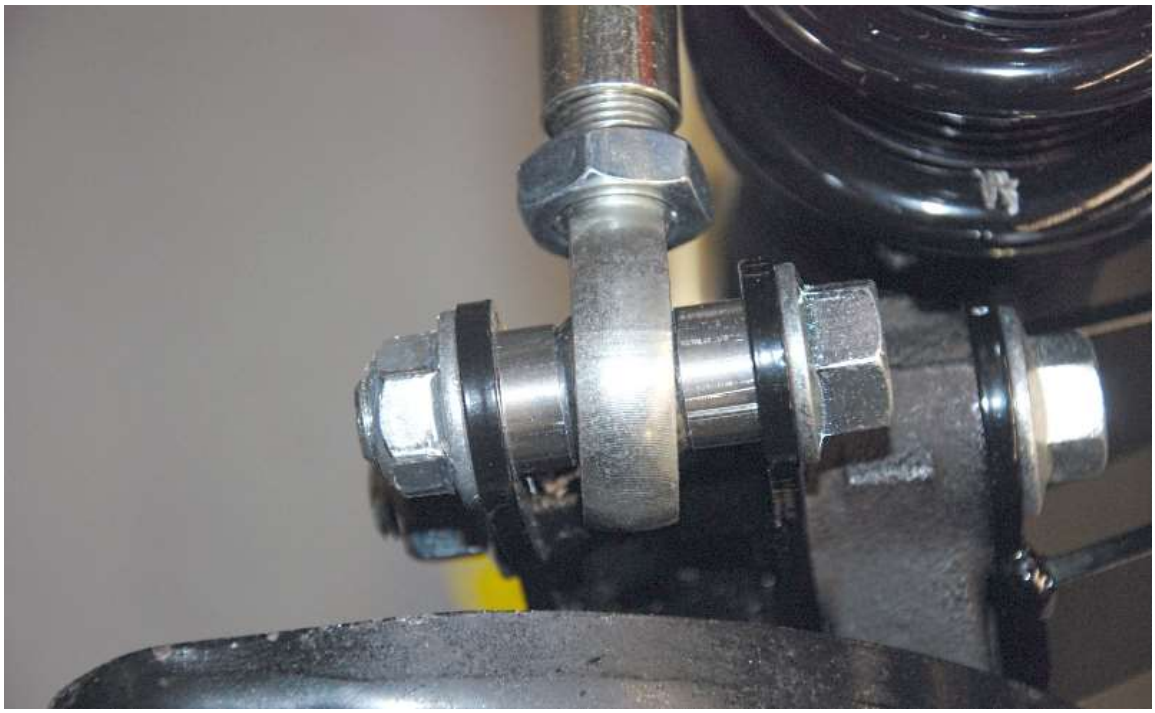
Make the longer links 18.00 inches to start.
Make the shorter links 10.125 inches to start.

Forward link

Install the forward link in the spindle with the 0.32” spacers, ½”-13 x 2.50”hex head bolts and locknuts.

The forward end of the upper link mounts to the chassis in the lower set of holes using 0.43” spacers, ½”-13 x 2.50” hex head bolts and locknuts.

Lateral Link



Bolt the upper lateral link to the spindle with the longer 0.375 inch spacers on the front side of the rod end, 0.25 inch spacers on the backside and ½”-13 x 2.50 inch hex head bolts and locknuts.

Do not do the inside of the lateral link yet.

Rear CV Axle Assembly

- Subaru CV joints, kit Axle shafts (Box 8), CV straps
- Flat head screwdriver, pliers, hammer, rags
- If you need to get replacement rear axles for a 2002-05 NA, we recommend Autozone 10705 axles for rear outer CV joint. These will however require changing the FFR axles to the FFR 80237 axles.
- Factory Five Racing also has complete CV axles available if you do not want to assemble your own CV axles.

Locate the donor rear complete axle assembly. Only the outer CV joint and boot will be used from this assembly.

Remove the clamps that hold the boot on the outer joint.

Pull the boot back and wipe enough grease away to see the inner CV bearing race.

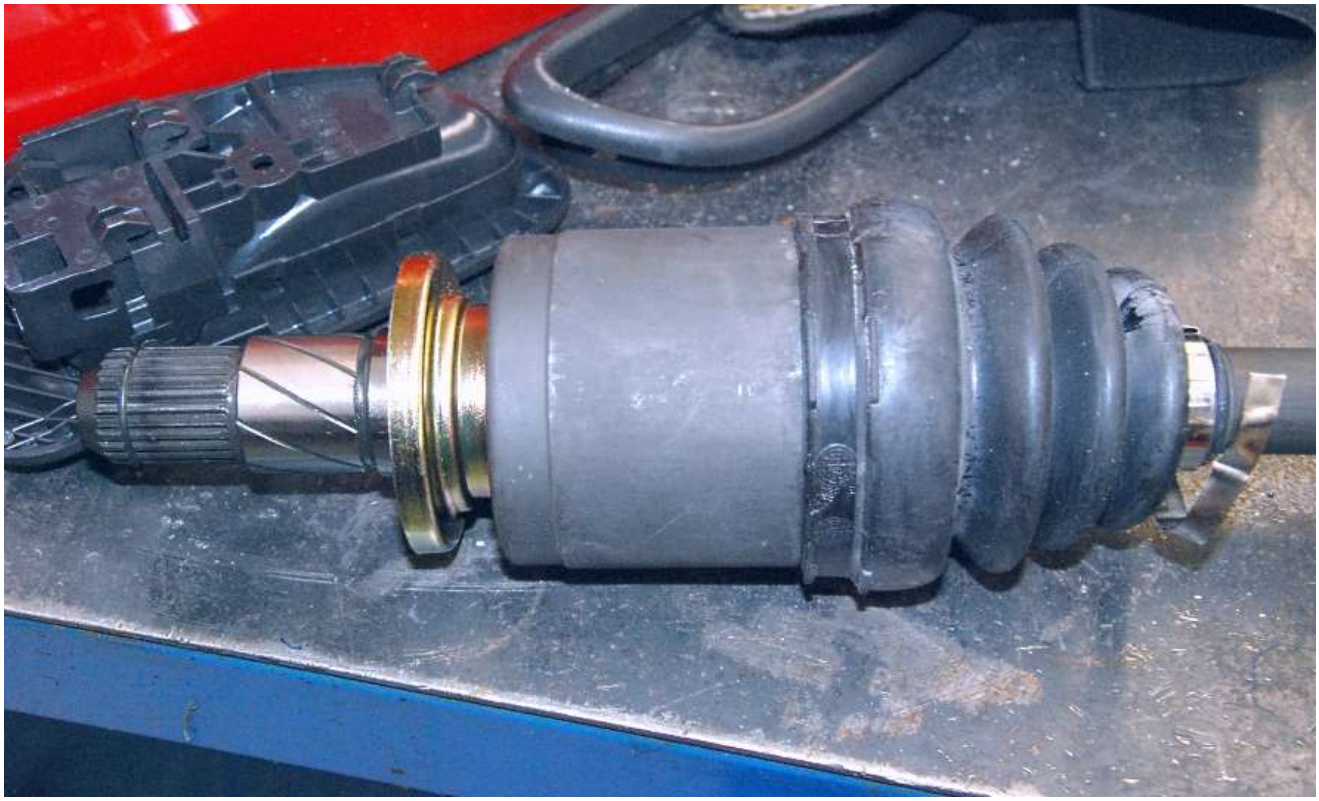
Clamp the axle shaft in a vice and use a hammer to tap the CV joint off the end. Be careful with the hammer to hit the thicker pieces of the inner race and rotate the axle if the joint is being difficult.

Outer CV joint removed from the axle.

Remove the retaining clip from the axle and save it for the new axle.

From the front axle only the inner CV joint and boot will be used. This is the early female style CV joint.

This is the front inner CV from the later years (2005-2007) that will be used.

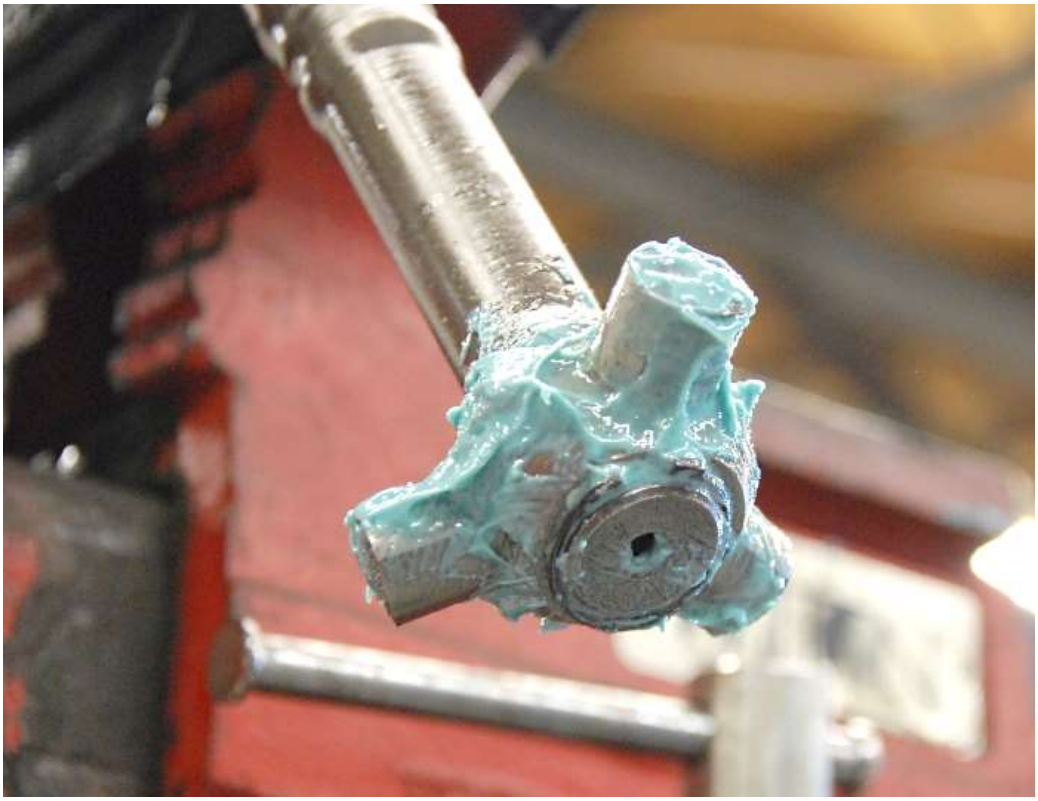


Cut the clamps off the boot from the inner CV joint.

Pull the boot back off the CV being careful not to damage it.

There is a wire clip that holds the CV joint together, pry it out with a small flathead screwdriver and save it for re-assembly.

Separate the axle shaft from the CV joint.



Wipe the grease away from the end of the axle to access the snap ring that holds the tri-lobe.

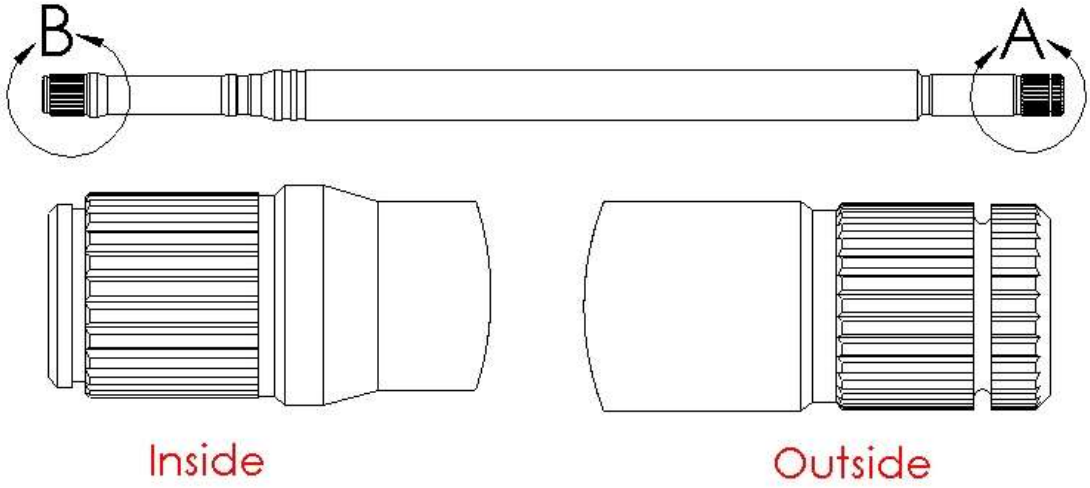
Remove the clip using snap ring pliers and save it for the new axle.

Remove the tri-lobe from the axle; it should slide off easy by hand or with a light tap.

Unpack the new axle shafts provided with the kit.

- These axles are specific to the model year donor you are using so test fit the splines to ensure they are correct.

Slide two of the provided small boot clamps and the original boots onto the new shafts.



The tri-lobe shaped boot goes on the end with the ring clip groove out at the very end of the splines.

Snap the original retaining clip on the axle shaft, it fits on the side where the groove is in about ¼ inch from the end of the axle.

Tap the axle shaft back into the outer CV joint using a soft mallet. Make sure the splines are starting easy and slide in as far as the clip before you start tapping with the mallet.

Slide the Tri-lobe on the new axle shaft and re-install the snap ring that holds it in place.

Slip the 3 rollers onto the tri-lobe and slide the entire assembly into the inner CV joint housing.

Re-install the clip that holds the inner CV joint together.

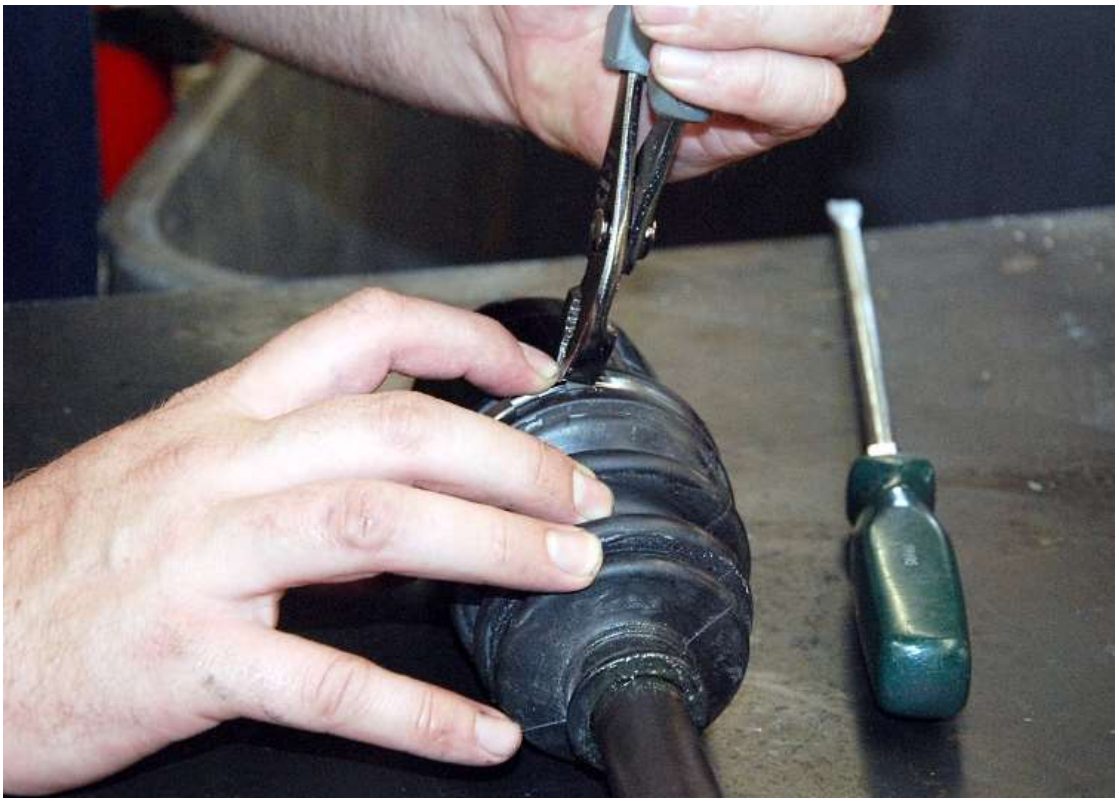
- Check the amount of grease in the joints and replenish it if needed.

Slide the boots down over the CV joints and slide the boot clamps in place.

Pull the extra tab from the strap up so you can grab it with pliers.

Grab the extra tab with pliers and, using a flathead screwdriver to lever against, pull the CV strap tight.

While holding the tab tight bend it backwards until it sits flat between the two upright tabs.



Bend the upright tabs flat to hold the clamp in place.

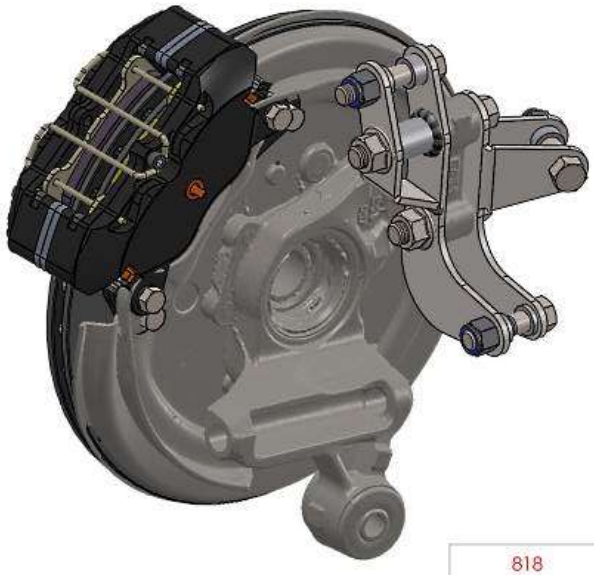
Install the rear CV axle into the spindle and screw the axle nut on finger tight to hold it.

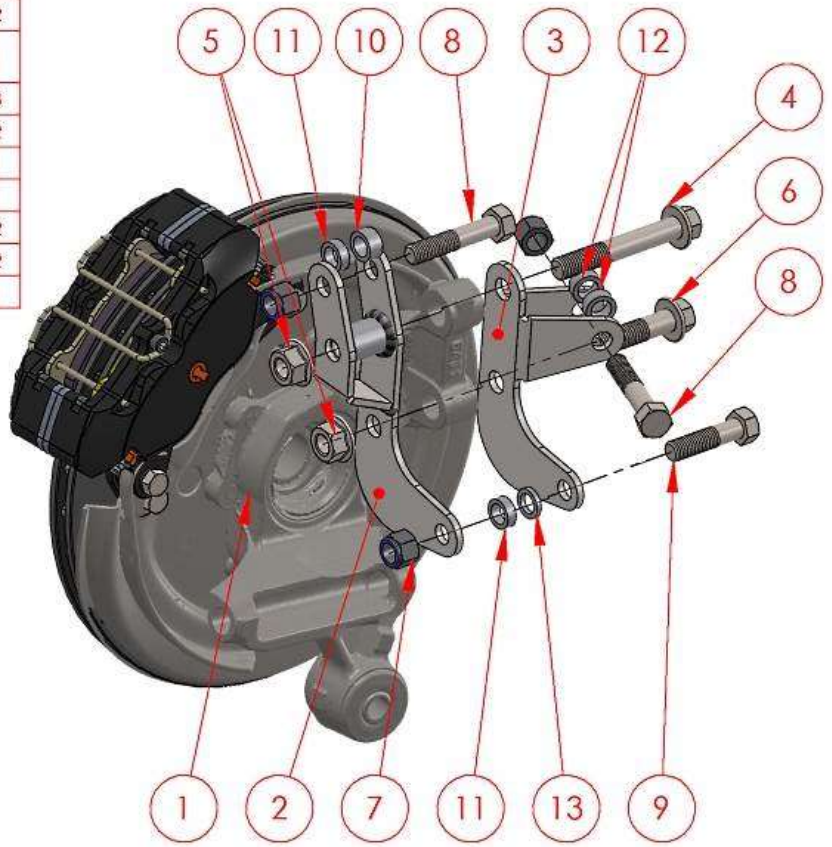
IRS Bracket

- IRS bracket assembly, Subaru rear spindles, M14 x 90mm flange head bolts and locknuts.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	R_Spindle	LEFT SIDE REAR SPINDLE	1
2	80255	LEFT IRS WELDED REAR BRACKET	1
3	80407	LEFT IRS WELDED FRONT BRACKET	1
4	B18.2.3.4M - Hex flange screw, M14 x 2.0 x 90 -- 34S		1
5	B18.2.2.4M - Hex flange nut, M14 x 2 --N		2
6	B18.2.3.4M - Hex flange screw, M14 x 2.0 x 55 -- 34S		1
7	10834	NYLON INSERT LOCKNUT, 1/2-13 UNC	3
8	HBOLT 0.5000-13x2.5x1.25-S		2
9	HBOLT 0.5000-13x2x1.25-S		1
10	80060	0.375" SPACER	1
11	80308	0.25" SPACER	2
12	33241	0.32" SPACER	2
13	13210	0.125" SPACER	1

	REVISIONS		
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	6/7/13	
B	FASTENER/SPACER CHANGES	7/8/13	





	UNLESS OTHERWISE SPECIFIED:		NAME	DATE
818	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN		
		COMMENTS:		
	MATERIAL			
USED ON	FINISH			
APPLICATION		PRINTED	7/8/2013	

Factory Five Racing, Inc.

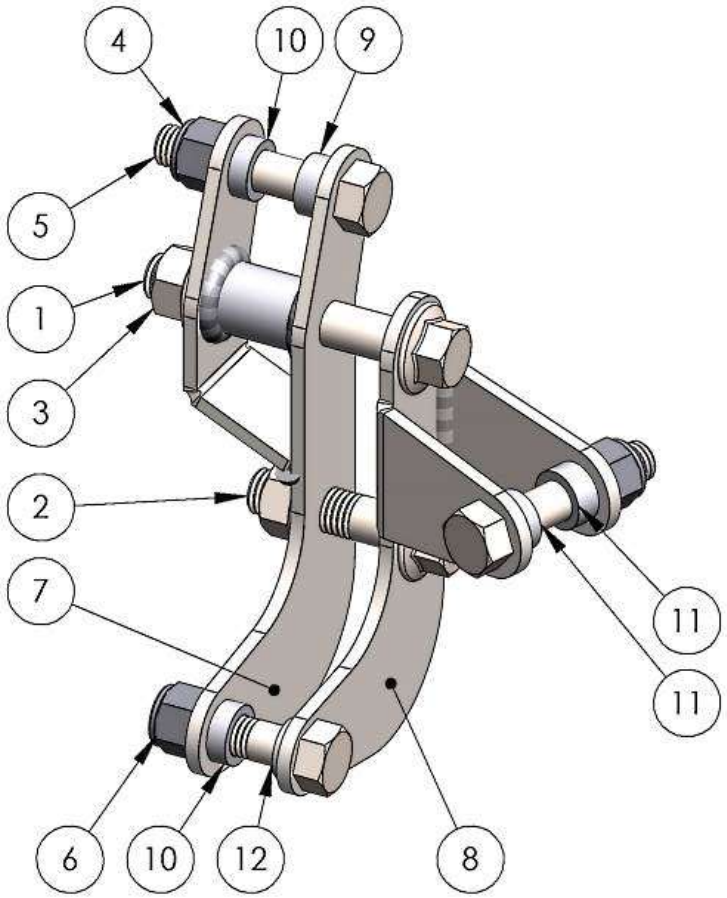
TITLE:
REAR SPINDLE WITH IRS ADAPTER BRACKET

SIZE	DWG. NO.	REV
A	Rear Spindle	B

SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B18.2.3.4M - Hex flange screw, M14 x 2.0 x 90 --34S		1
2	B18.2.3.4M - Hex flange screw, M14 x 2.0 x 55 --34S		1
3	B18.2.2.4M - Hex flange nut, M14 x 2 --N		2
4	10834	NYLON INSERT LOCKNUT, 1/2-13 UNC	3
5	HBOLT 0.5000-13x2.5x1.25-S		2
6	HBOLT 0.5000-13x2x1.25-S		1
7	80255	LEFT IRS WELDED REAR BRACKET	1
8	80407	LEFT IRS WELDED FRONT BRACKET	1
9	80060	0.375" SPACER	1
10	80308	0.25" SPACER	2
11	33241	0.32" SPACER	2
12	13210	0.125" SPACER	1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	1/14/13	
B	FASTENER/SPACER CHANGE	7/8/13	



UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	JI	1/14/13
	COMMENTS:		
MATERIAL: 7 ga HRPO STEEL			
FINISH:			
APPLICATION: IRS BRACKET	PRINTED: 7/8/2013		

818

USED ON

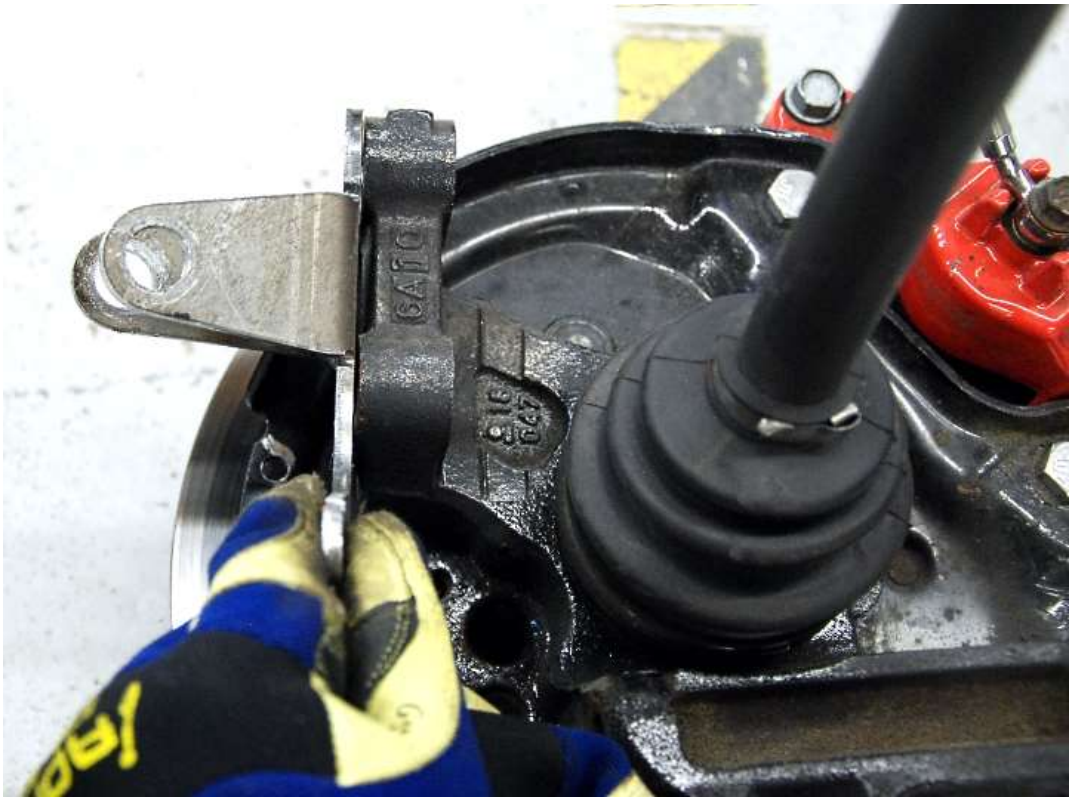
Factory Five Racing, Inc.

TITLE: IRS BRACKET ASSEMBLY

SIZE	DWG. NO.	REV
A	80254	B

SCALE: 1:2 | WEIGHT: | SHEET 1 OF 1

www.factoryfive.com 508-291-3443



Locate the forward section of the IRS bracket; it mounts to the spindle where the old strut holes are.

The rear bracket sandwiches the spindle along with the front. Use the original strut bolt on the bottom and the M14 x 90mm flange head bolt on top.

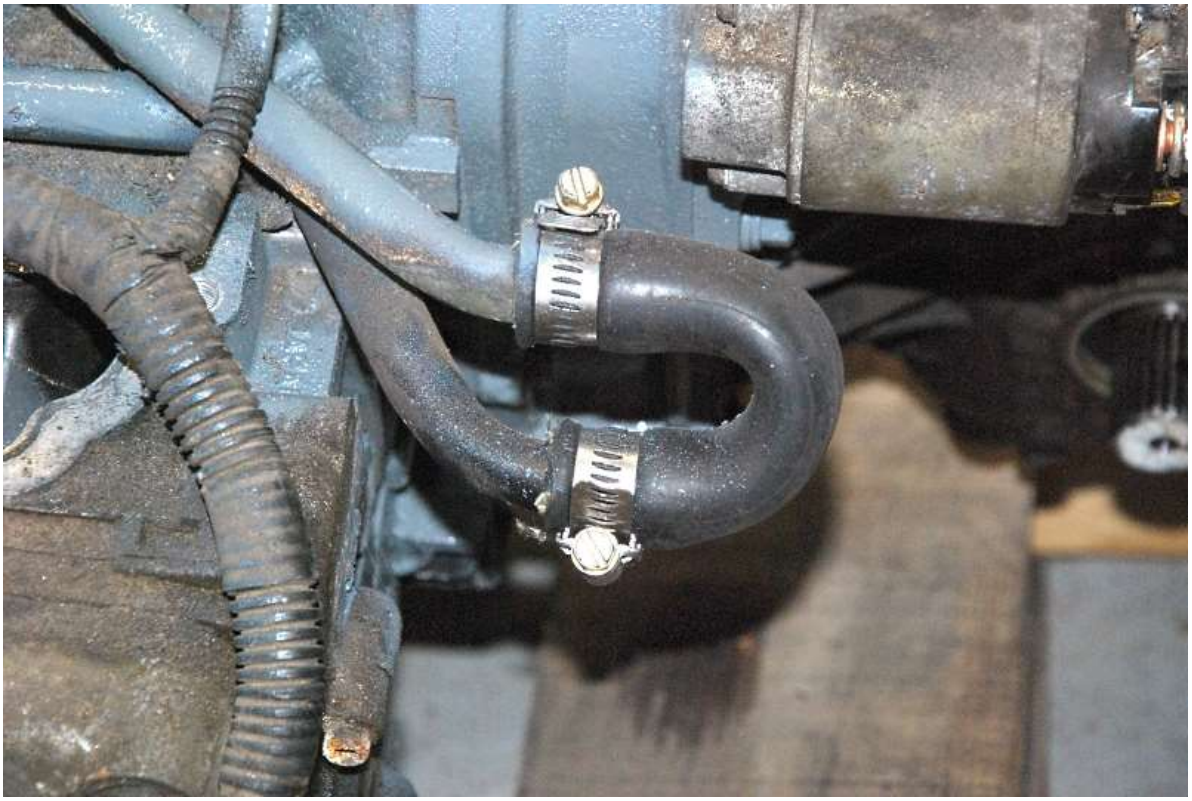
Hang the spindle on the lower control arms using the long factory lower arm bolt and the washer on the outside of the control arms.

Attach the trailing arm to the spindle bushing using the OEM hardware.

🚘 Heater Bypass hose (box 5), Serpentine belt (Box 1)
🛠 5/16", 10mm socket, ratchet

Put the included serpentine belt on the crank/alternator and tension the belt.

Remove the oil fill tube from the engine to make room for installation.



Cut the “U” shaped bypass hose so the legs are 1.25 inches long and attach it to the heater core tubes next to the starter on the left side of the engine using the stock hose clamps.

Attach a chain to the engine for the engine hoist. With the intercooler off the points shown above are good lift points.

Hoist the engine and transmission into the engine bay as a complete unit.

Plug the CV axles into the transmission.

- With the engine sitting level in the chassis the intercooler will appear to not sit flat. This is normal.

Bolt the engine and transmission mounts to the chassis using the OEM hardware. Torque the engine mount nuts to **25.8 Lbft (35Nm)**. Torque the Transaxle mount to **26 Lbft (35Nm)**.

Attach the lateral link to the chassis in the lower set of holes for street use. Again, use the longer 0.375 inch spacers on the front side of the rod end, 0.25 inch spacers on the backside and ½"-13 x 2.50 inch hex head bolts and locknuts.

Re-install the oil fill tube.

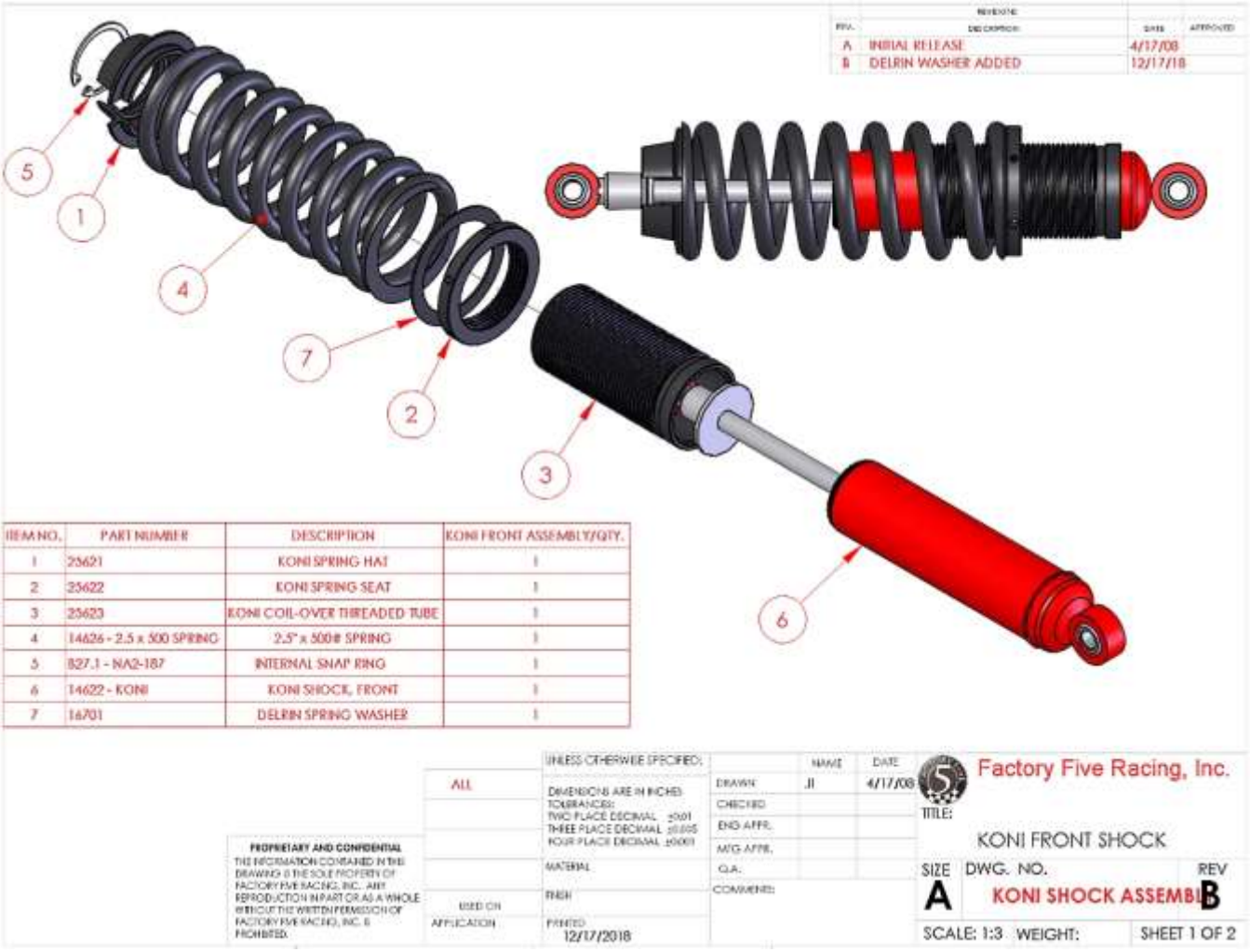
Rear Coil-Over Shock

Coil-over Assembly

- ½”-13 x 2.00”, ½”-13 x 2.50” hex head bolts and locknuts, IFS Components, Insulated clip hardware.
- Snap ring pliers, ¾” wrench, ¾” socket, Ratchet, Torque wrench, chassis or lithium grease.
- The shocks are pre-valved at the factory in compression and rebound for good street use. The shocks can be adjusted in rebound as per Koni’s instructions if so desired. The front springs are 350lb, and the rear springs are 275lb. Other springs are available for different ride characteristics.
- WARNING! Incorrect assembly and maintenance of this part can cause serious injury or death.
- Race shocks and springs as well as double adjustable shocks are also available

Unpack the shocks, coil-over parts and hardware.

Double check the jam nut under the rod end and bump stop to make sure that it is tight.
Screw the spring seat down on the sleeve so it is closer to the unthreaded end.



Slide the coil sleeve over the body of the damper beginning at the end which has the rubber bump stop. The unthreaded end of the sleeve goes first so that it will sit on the snap ring on the shock body.

Place a small amount of white lithium or chassis grease on one side of the Delrin washer.

Put the Delrin spacer grease side down onto the spring seat on the threaded tube (shown without tube)

The coil-over hats have a snap ring which holds it in place. Remove this snap ring to assemble the coil over shock.

Slide the rubber bumper about two inches down on the shaft.

Put the 275# spring and hat on the shock and rotate the spring seat back up the sleeve so that the spring pushes the hat tight against the end of the shock.

Install the snap ring on the spring hat so that it holds onto the shock end. Make sure that the slot in the snap ring and the slot in the spring hat are not aligned.

Shock installation

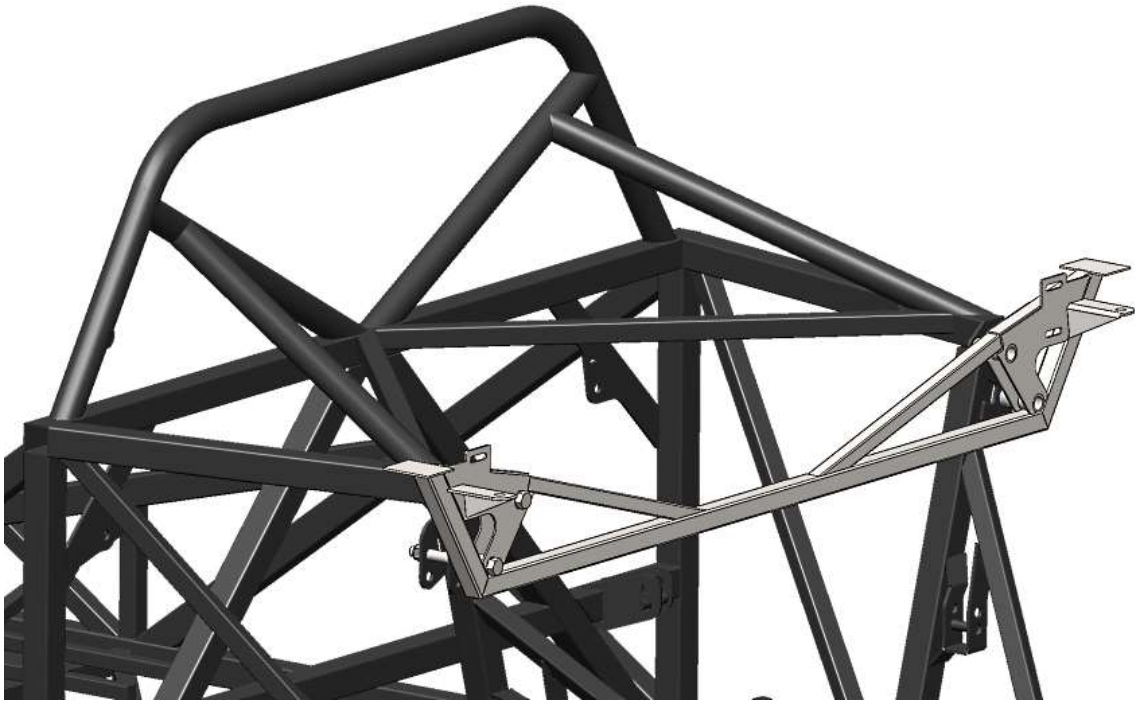
- Double check that the rear springs are marked 275#.

Bolt the top of the coil-over shock to the chassis using the 0.32” spacer on the front side of the shock, 0.43” spacer on the back and using a ½”-13 x 2.50” hex head bolt and locknut.

Bolt the rear coil over to the spindle mounting bracket with the 0.125 inch spacer on the front side of the shock, 0.25 inch spacer on the back and using a ½”-13 x 2.00” hex head bolt and locknut.

Rear Shock Tower Brace

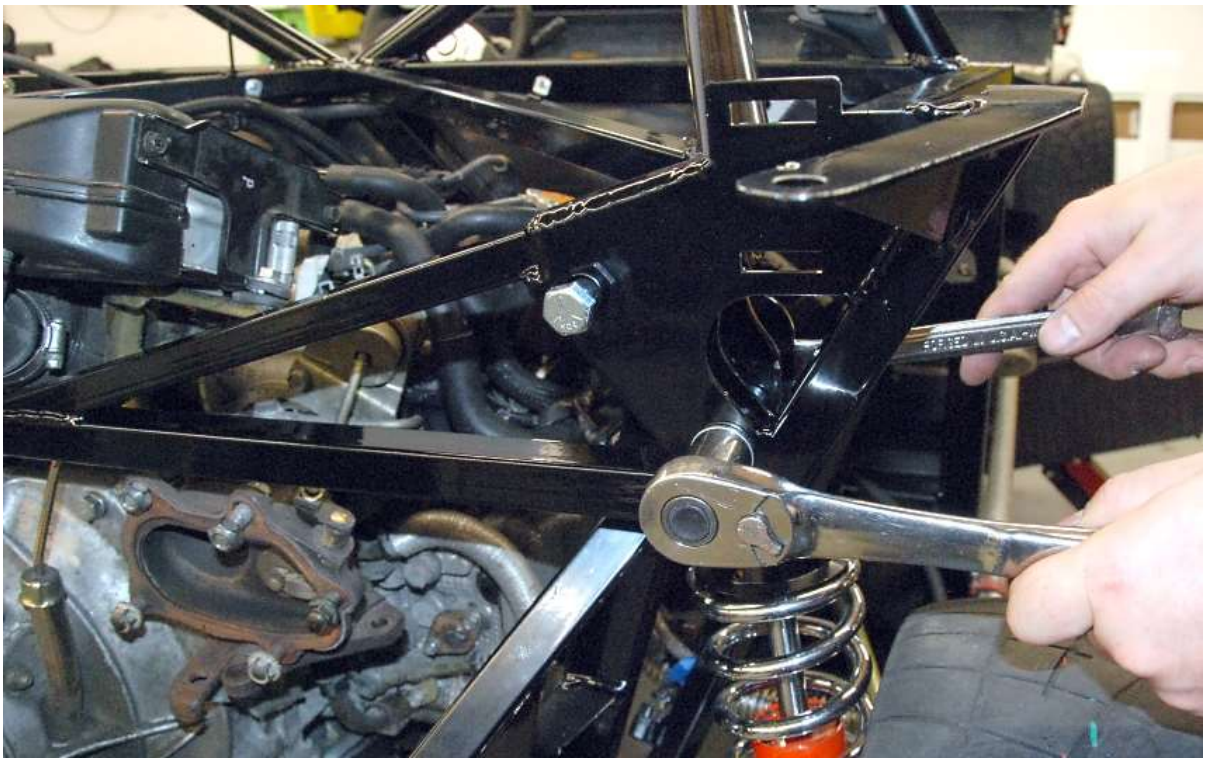
🚘 Rear shock tower brace components, ½” x 3.00”, ½” x 4.75” hex head screws and lock nuts.
🛠 ¾” wrench, ¾” socket, ratchet.



Locate the rear shock tower brace and position it on the frame.

Attach the brace using a ½” x 3.00” hex head bolt and locknut through the top hole.

Attach the brace through the bottom hole using a ½" x 4.75" hex head bolt with the 1.50" spacer between the shock mount tabs and a ½ inch locknut.



Tighten the bolts.

Put the rear wheels on the frame and torque the rear suspension bolts to spec.

Rear Suspension Torque Specs Chart

Item	Nm	Lbft

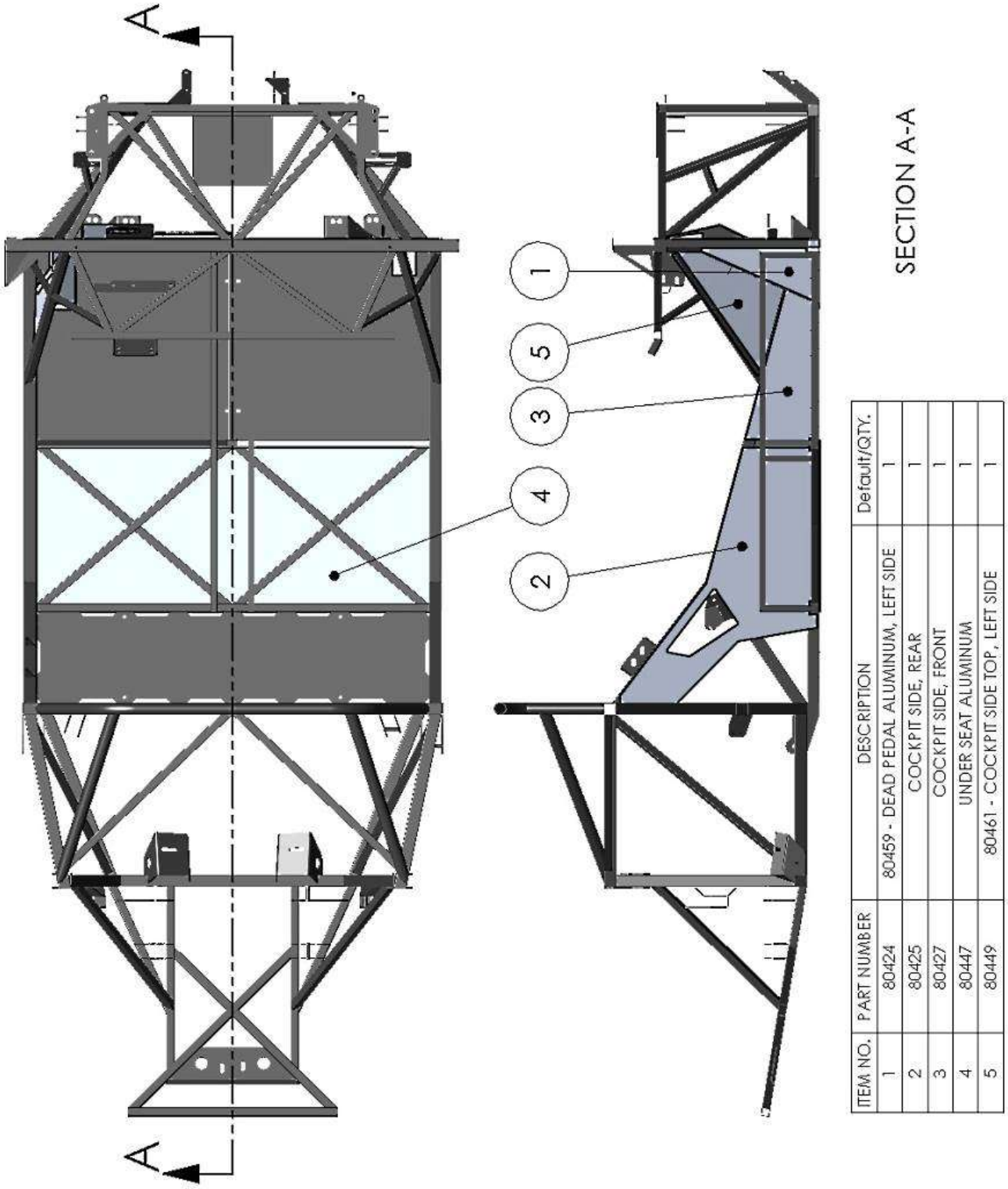
Trailing link to spindle	90	66
Trailing link to frame	115	85
Lateral link to spindle	140	103
Lateral link to frame	100	74
Upper ball joint bracket to Spindle	200	145
Upper shock to frame	54-67	40-50
Lower shock to spindle bracket	54-67	40-50
Rear CV joint Nut	190	140

Raise the frame and place on jack stands

Interior Aluminum

🚘 Packaged and mounted aluminum, rivet package (Box 4), Body finish components
🛠 Permanent marker, silicone, caulking gun, drill, 1/8" drill bit, rivet gun, clamps, tin snips.

Cockpit sides



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	80424	80459 - DEAD PEDAL ALUMINUM, LEFT SIDE	1
2	80425	COCKPIT SIDE, REAR	1
3	80427	COCKPIT SIDE, FRONT	1
4	80447	UNDER SEAT ALUMINUM	1
5	80449	80461 - COCKPIT SIDE TOP, LEFT SIDE	1

Push bulb weather-strip around the edge of the outer aluminum panels that stick into the cockpit area.

Mark, drill, silicone and rivet the front lower side cockpit panel to the frame.

Mark, drill, silicone and rivet the cockpit rear side aluminum to the frame.

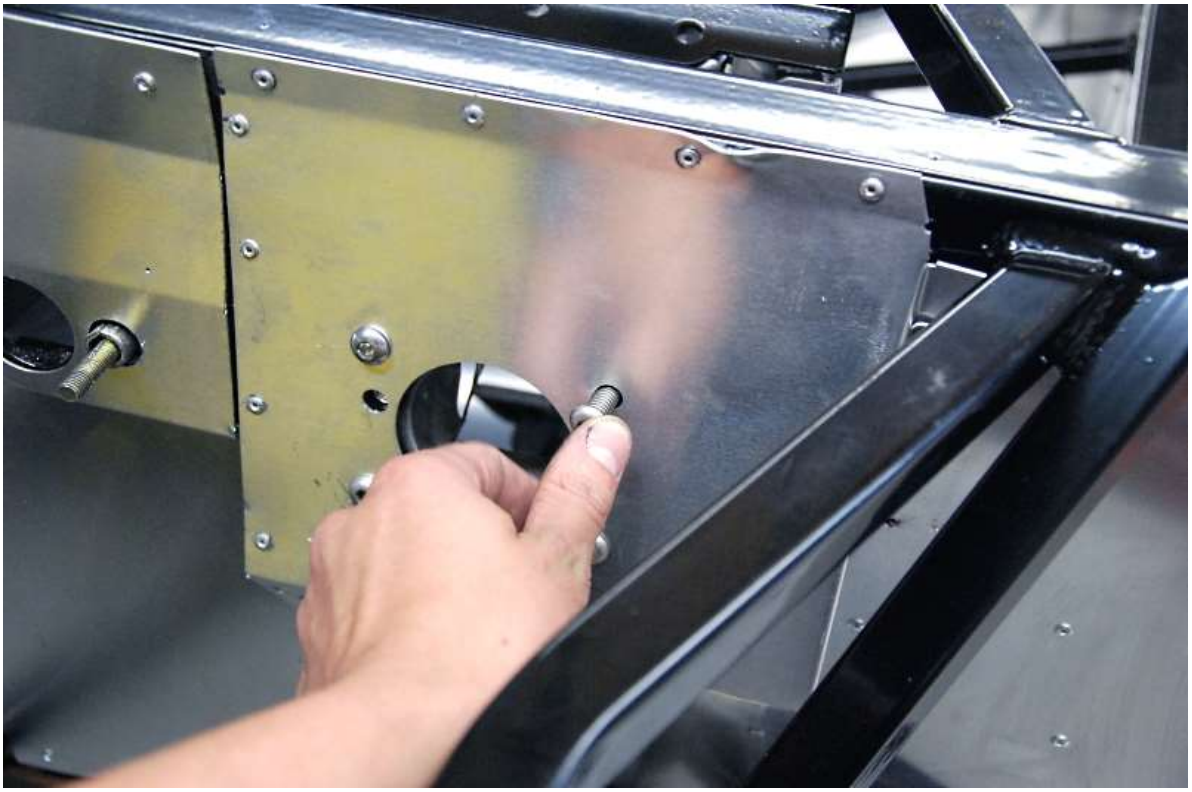

Mark, drill, silicone and rivet the cockpit side top panel to the frame.

OEM Pedalbox

- Pedal box, pedal box hardware, brake components, M10 x 25 mm hex head bolts and locknut, ¼”-20 x 0.75” flanged button head screws and locknuts, 5/16” x 1” button head screws and locknuts
- Drill, 5/16” drill bit, 7/16”wrench, hex keys, sockets, ratchet, 5/32” hex key.
- The Power Brake Booster may be installed and the holes are provided to do so, however we recommend the manual brake set-up as the booster makes the brakes very touchy.
- See Wilwood pedal instructions if installing them.

Locate the donor pedal box for installation.

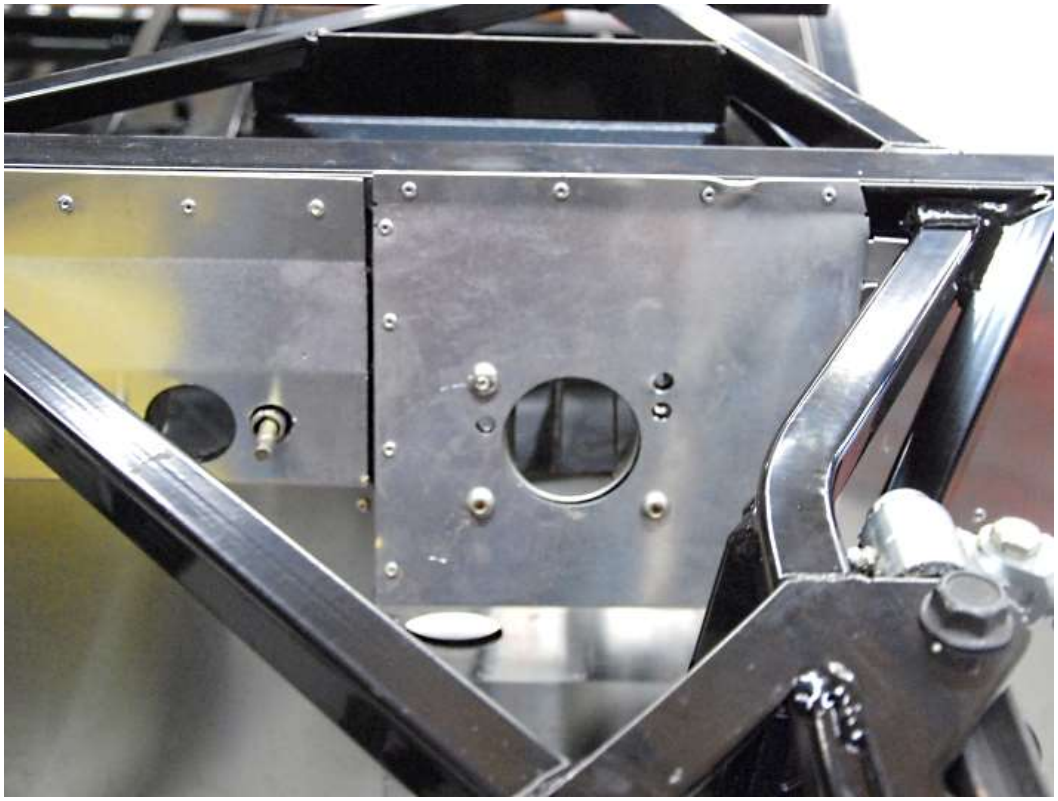
Fit the pedal box to the chassis with the two clutch master cylinder studs sticking through the holes in the front cockpit wall.



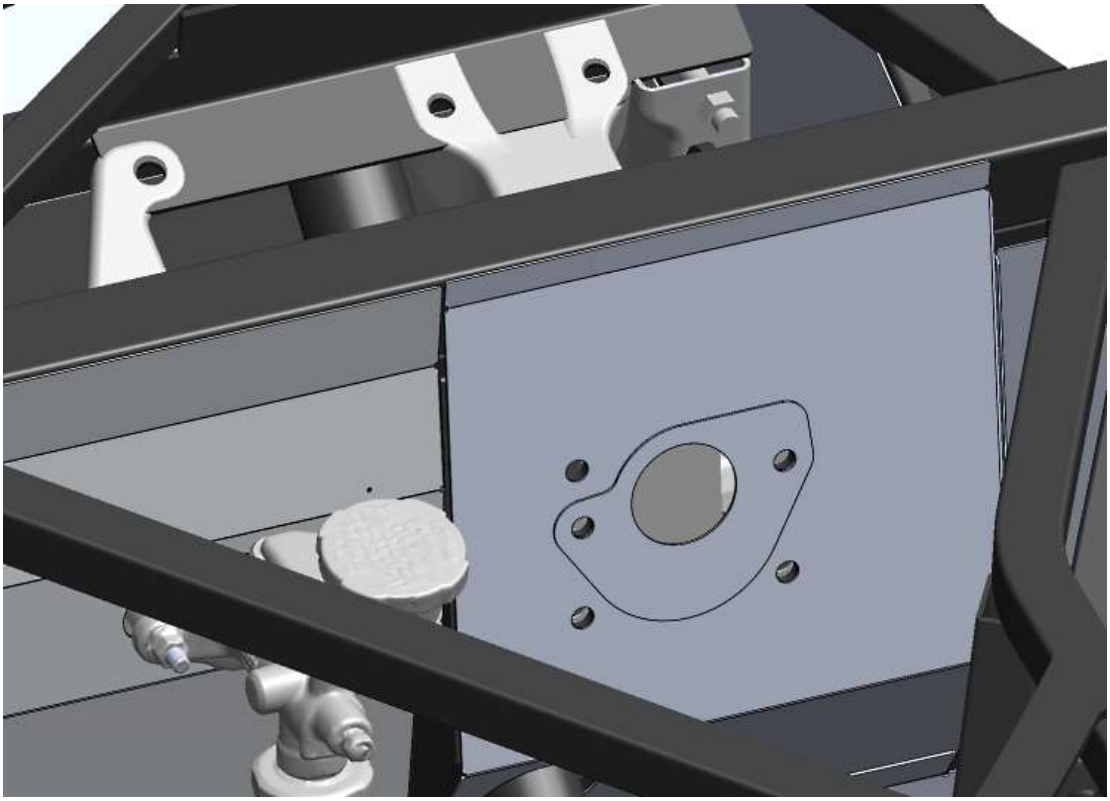
Bolt the pedal box to the front cockpit wall using the $^{5}/_{16}$" x 1" button head screws and locknuts.

Brake Master Cylinder

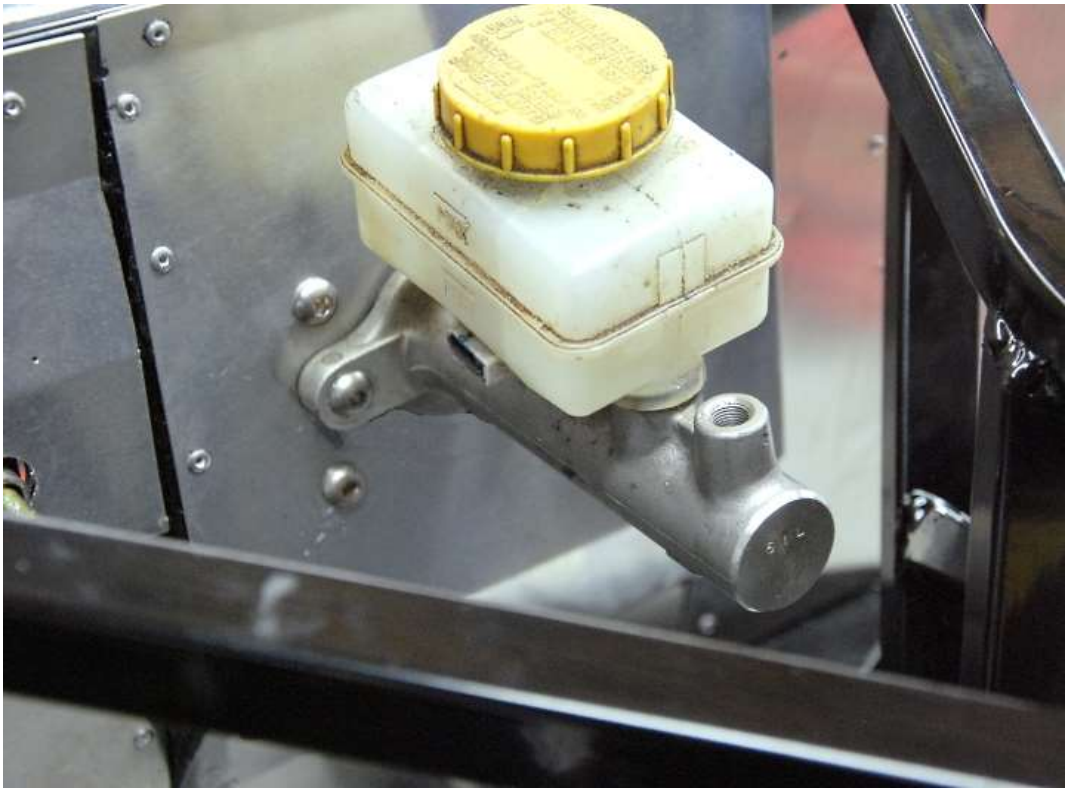
Drill out the pedal box using the chassis as a drill guide and a $^{5}/_{16}$ inch drill bit.



Remove the bolt in the upper left side corner of the pedal box for master cylinder clearance.



Position the power booster cover plate over the Master cylinder hole.



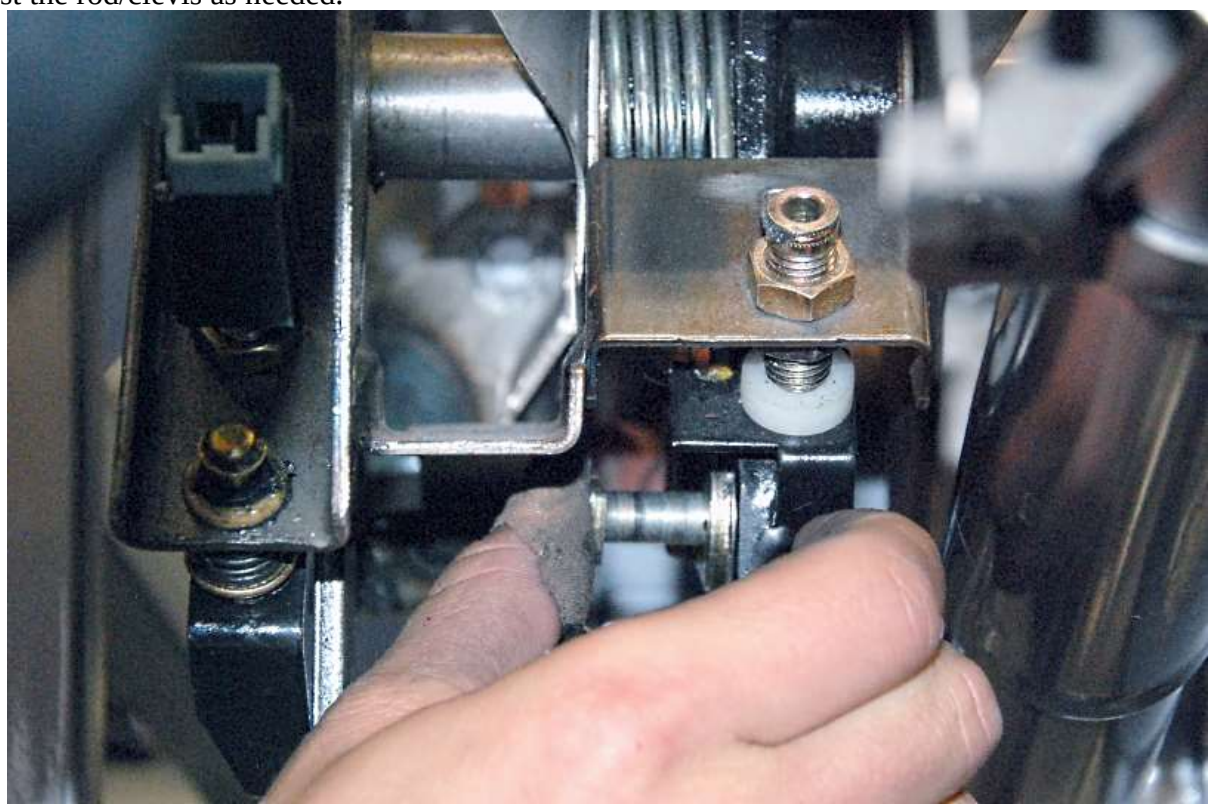
Bolt the master cylinder in place using the $^{5}/_{16}$" x 1" button head screws and locknuts.

Bolt the top of the pedal-box to the chassis using the ¼”-20 x 0.75” flanged button head screws and locknuts.

Thread the OEM pushrod clevis and jam nut onto the provided manual brake pushrod.

Install the brake pushrod into the brake master cylinder.

Adjust the rod/clevis as needed.



Slide the pushrod clevis over the brake pedal and install the OEM retaining pin.

Re-install the hairpin clip in the pushrod pin, **MAKE SURE IT IS FULLY SEATED.**

Clutch Master cylinder

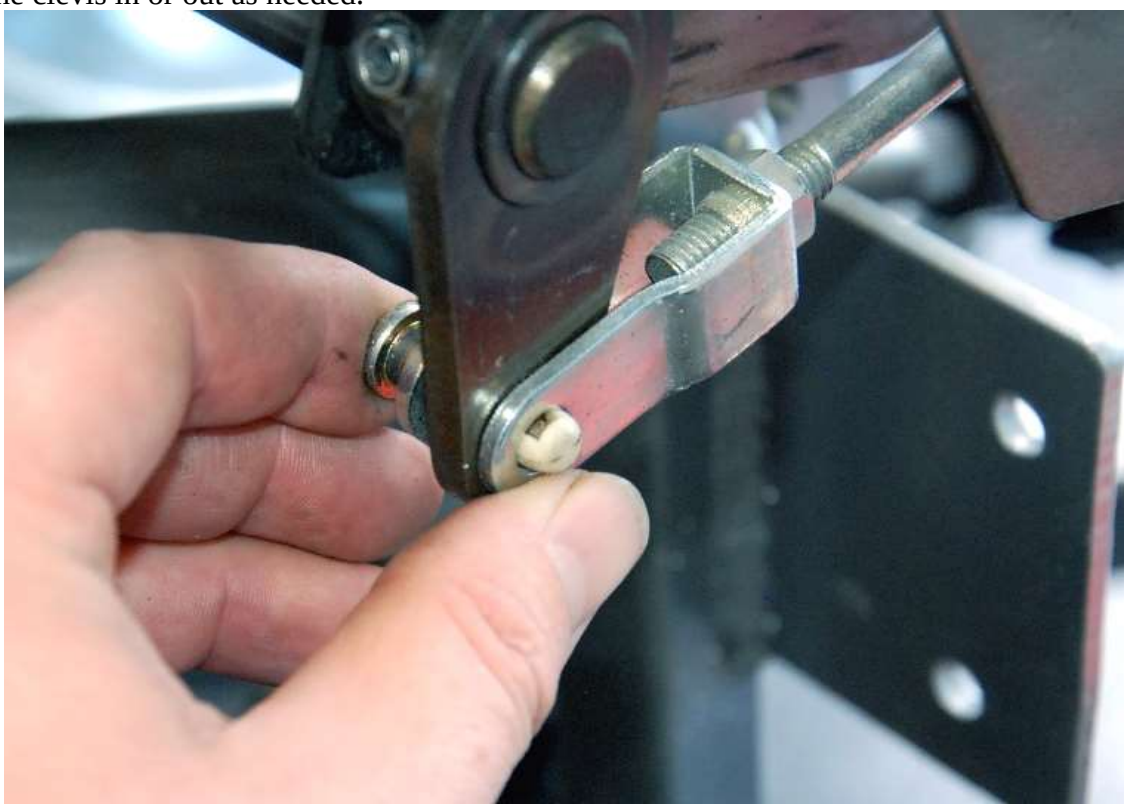
Locate the clutch master cylinder spacers

Slide the spacers over the master cylinder mounting studs so they are flush with the cockpit front wall.

Using the OEM hardware, bolt the clutch master cylinder onto the front of the pedal box wall.

Put the pushrod clevis on the arm for the clutch pedal.

Adjust the clevis in or out as needed.

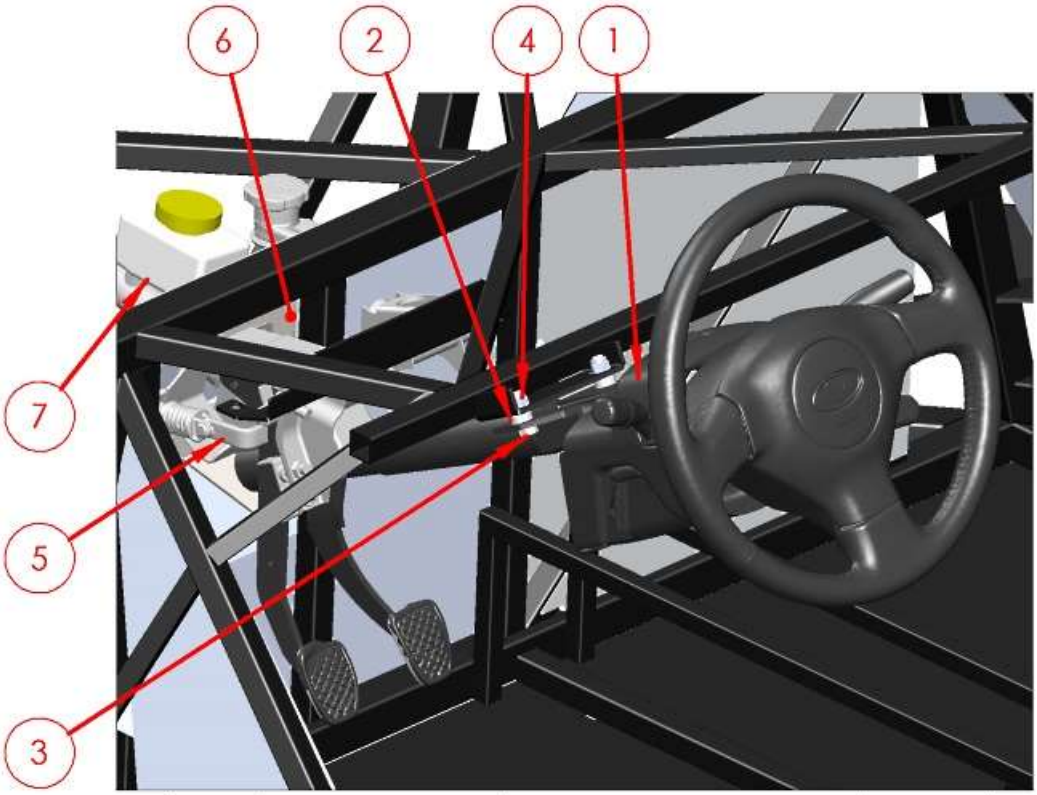


Install the pin between the master cylinder pushrod and the clutch pedal arm.

Don’t forget to put the hairpin clip through the pin to hold it in place.

Steering Column

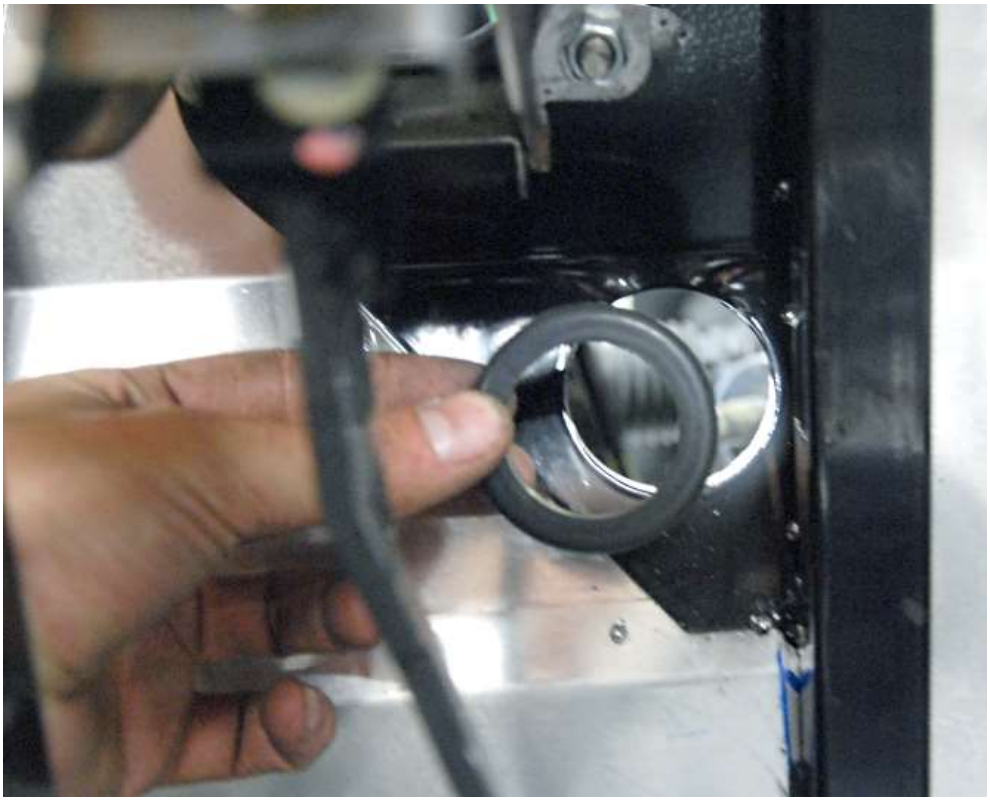
- Subaru steering column, universal joint, steering system hardware, $^{3}/_{8}$” x 1.25” hex head bolts and locknuts.



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	Steering Column		1
2	33241	0.32" SPACER	2
3	HBOLT 0.3750-16x1.25x1-N		2
4	13964	NYLON INSERT LOCKNUT, 3/8-16 UNC	2
5	Pedal Box	SUBARU	1
6	80790	OEM FRONT PEDALBOX MOUNT	1
7	Master Cylinder	SUBARU	1
8	80449	80461 - COCKPIT SIDE TOP, LEFT SIDE	1
9	80449	80462 - COCKPIT SIDE TOP, RIGHT SIDE	1

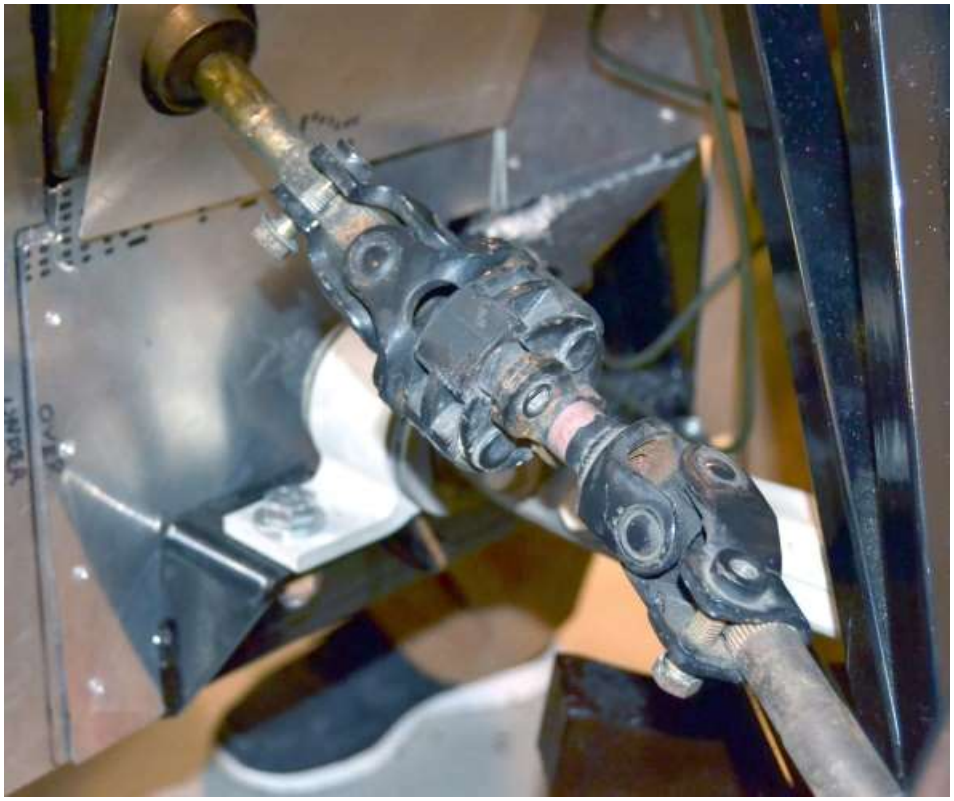
Locate the OEM steering column and shaft assembly.

The shaft needs to be detached to fit the column through the cockpit wall.



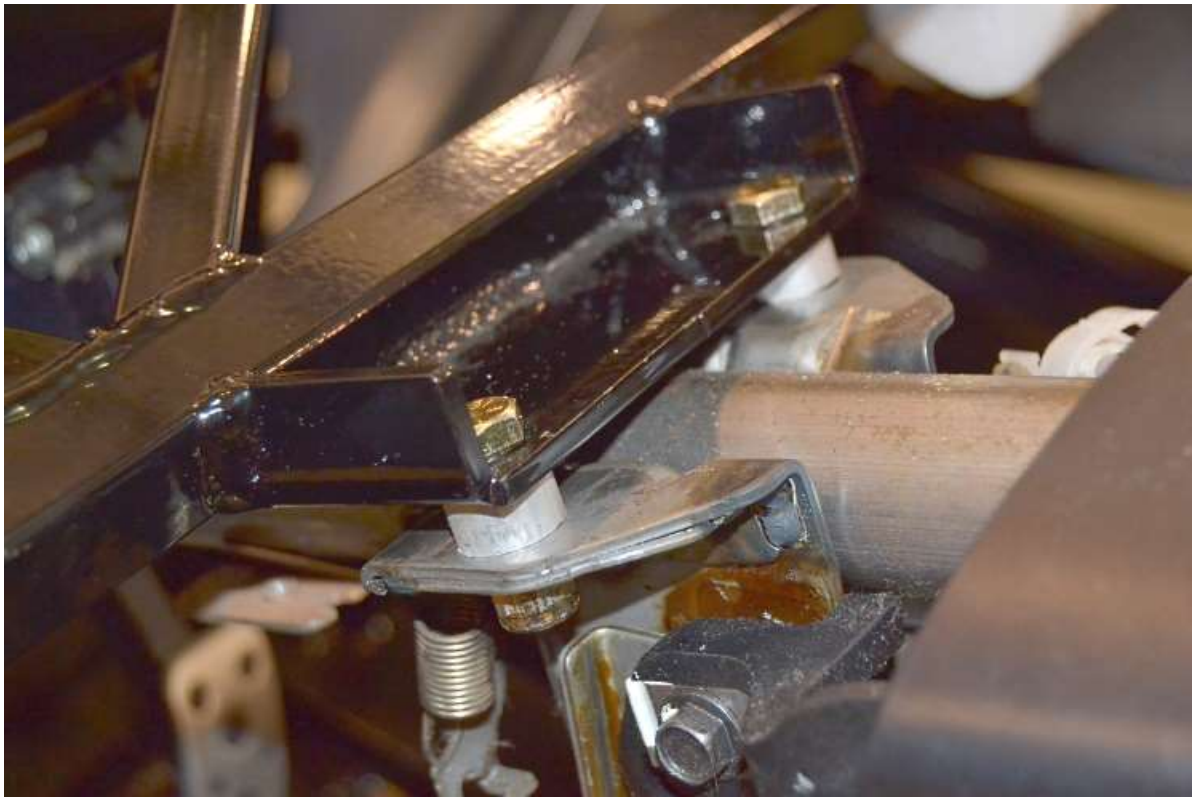
Insert the steering grommet in the hole in the front cockpit wall below the pedal box.

Put some WD40 or grease on the inside of the grommet then slide the steering column through the grommet from inside the cockpit.



With the rotors or wheels set so they are straight and the steering wheel is oriented correctly, attach the steering shaft to the steering rack.

Lift the column up to the chassis and bolt it to the mounting plate using 0.32" spacers, 3/8" x 1.25" hex head bolts and locknuts. If it does not line up easily, release the tilt mechanism and the bracket on the column will move.



If you are taller and need more knee room under the steering wheel, these two spacers can be removed.

Install the factory steering shaft assembly using the OEM hardware and torque all mounting bolts to OEM spec.

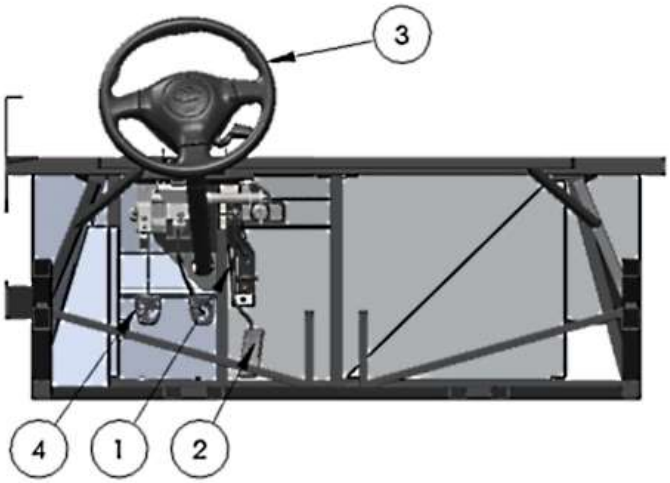
Item	Nm	Lbft
Steering column mount	25	17.4
Universal joint	24	18.1

Accelerator Pedal

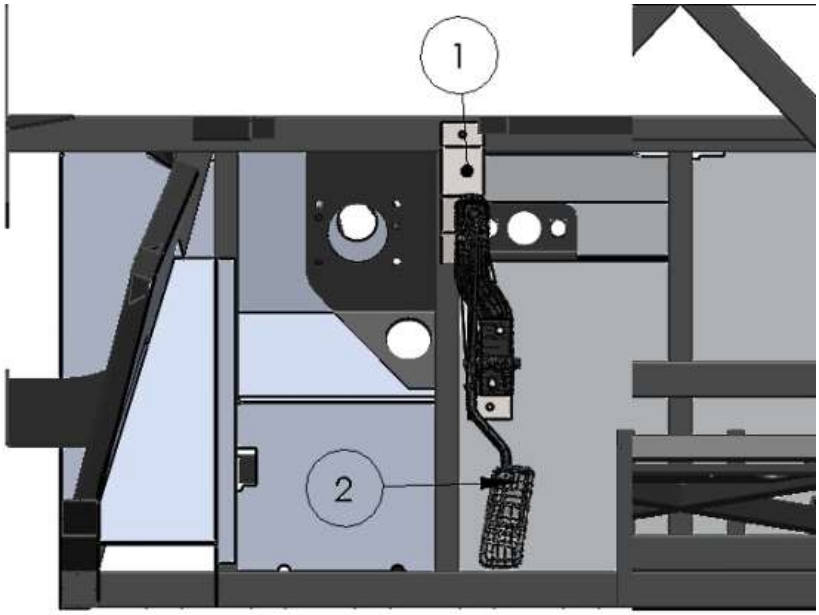
Cable Accelerator Pedal (2002-2005)

🚘 Accelerator pedal, Accelerator cable (Box 10), accelerator pedal mount (Box 10), rivnuts, ¼”-20 x 0.75” flanged button head screws

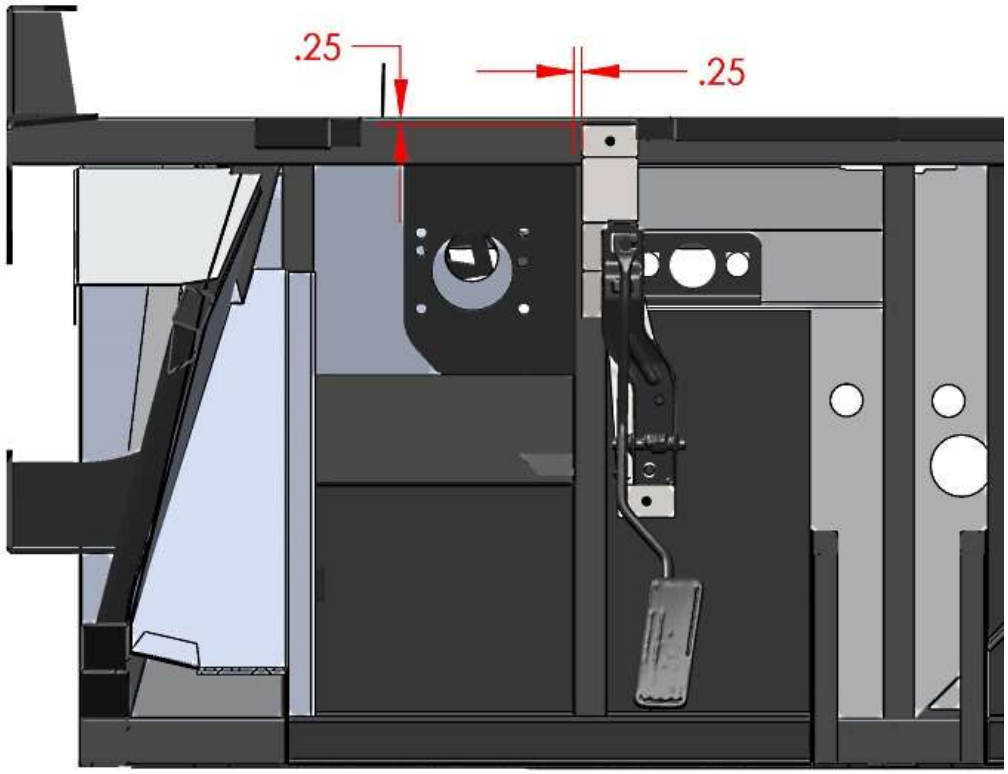
🛠 Drill, wrenches, marker, measuring tape, Rivnut tool, ½”, $^{25}/_{64}$” drill bits, $^{5}/_{32}$” hex key, $^{7}/_{16}$” wrench



ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	80420	02-05 CABLE PEDAL MOUNT	1
2	Cable Accelerator pedal		1
3	Steering Column		1
4	Pedal Box		1

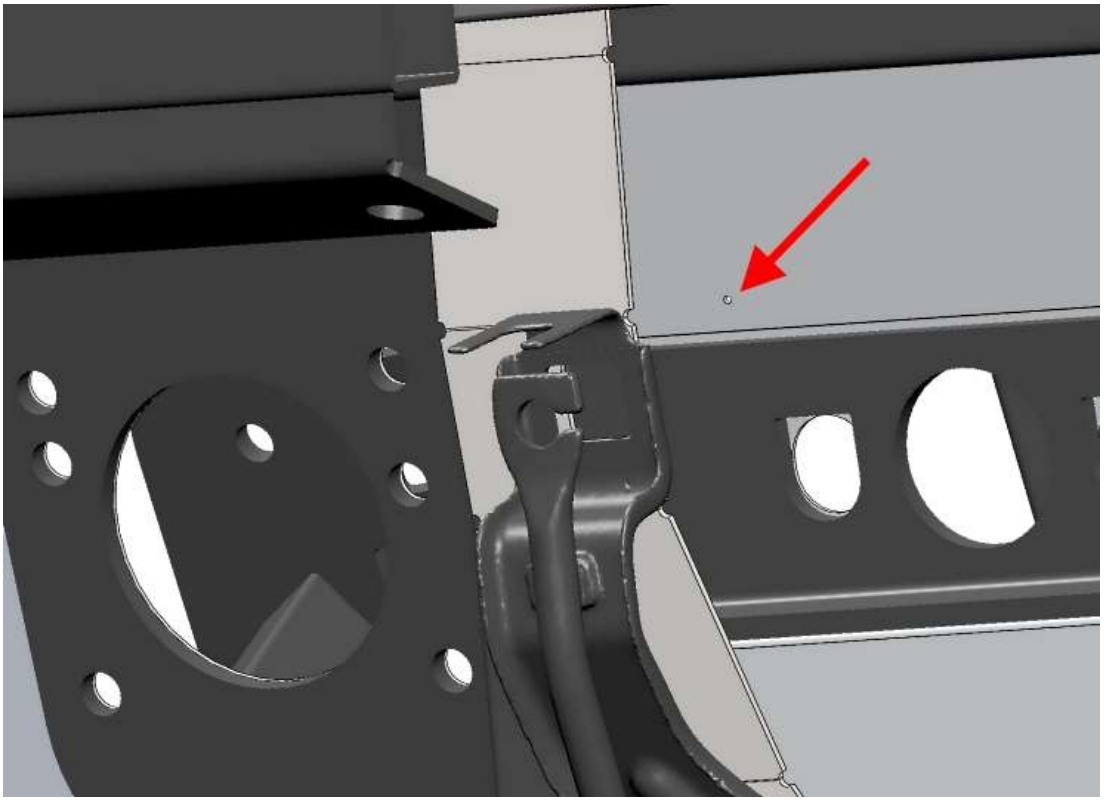


ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	80420	02-05 CABLE PEDAL MOUNT	1
2	Cable Accelerator pedal		1

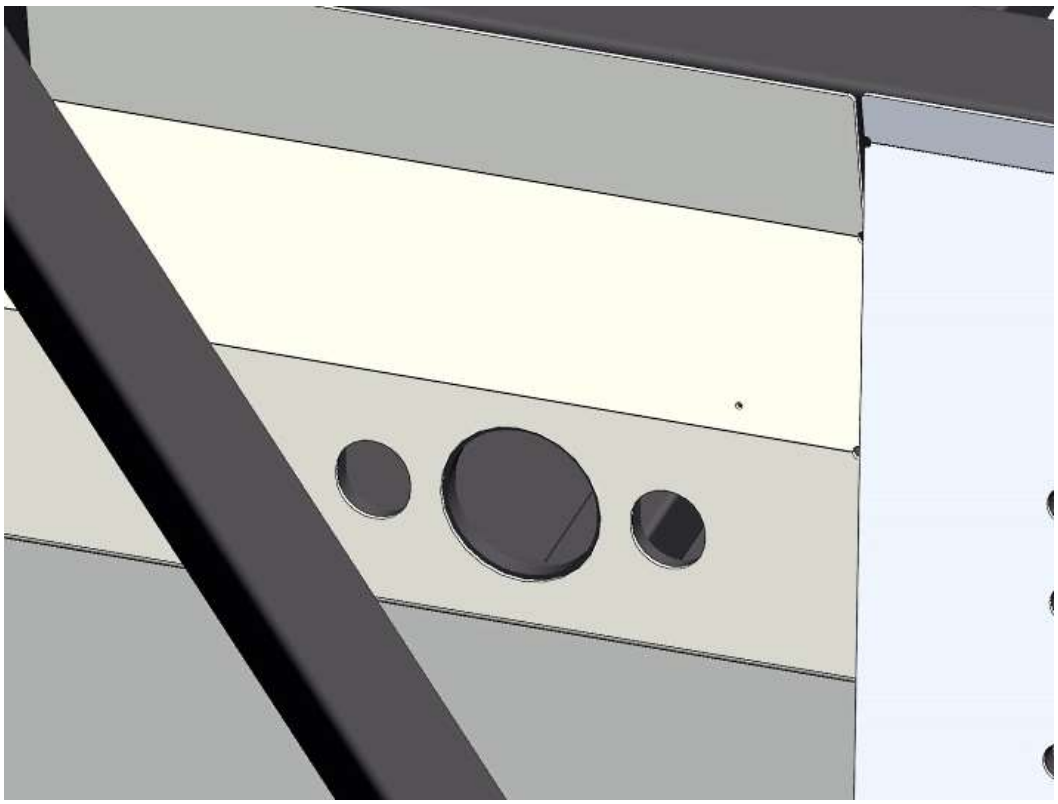


Locate the cable pedal mount on the frame as shown in the picture above and mark the two mounting hole locations.

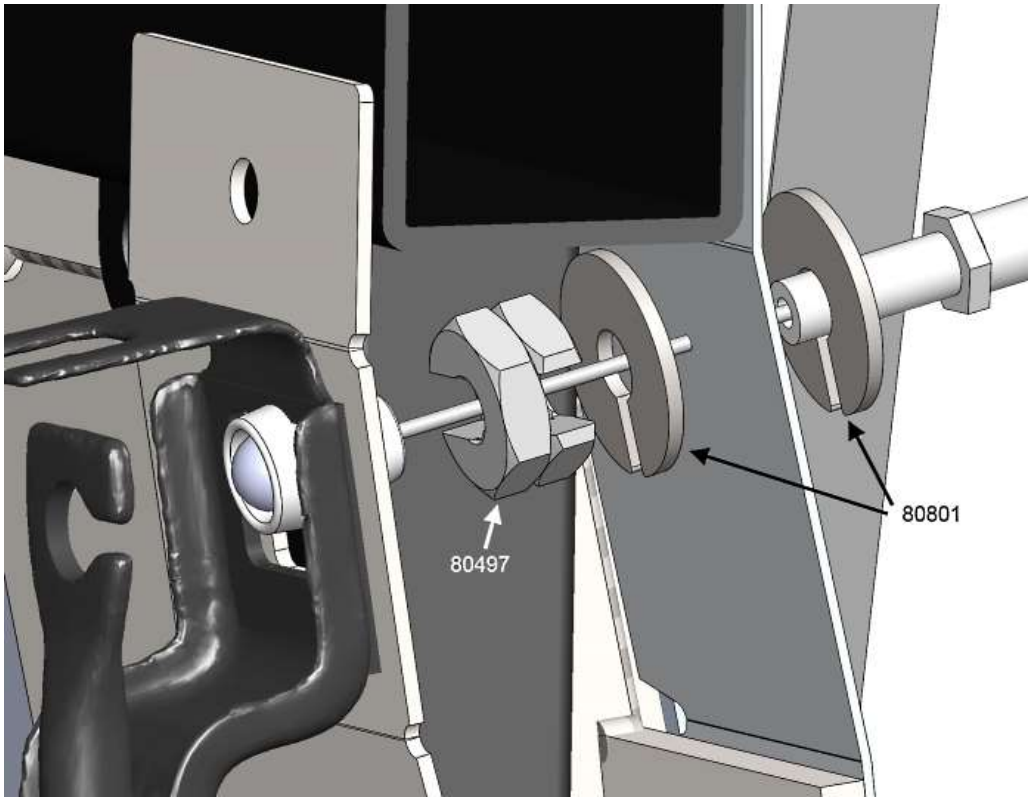
Drill out the top mark using a $^{25}/_{64}$ inch drill bit and install a ¼" rivnut. (See Appendix for rivnut tool instructions).
Drill the lower hole with a ¼ inch drill bit.
Mount the accelerator pedal to the pedal mount using ¼"-20 x 0.75" flanged button head screws and locknuts.
Mount the accelerator pedal mount to the frame using the same ¼" x ¾" washer head screws.



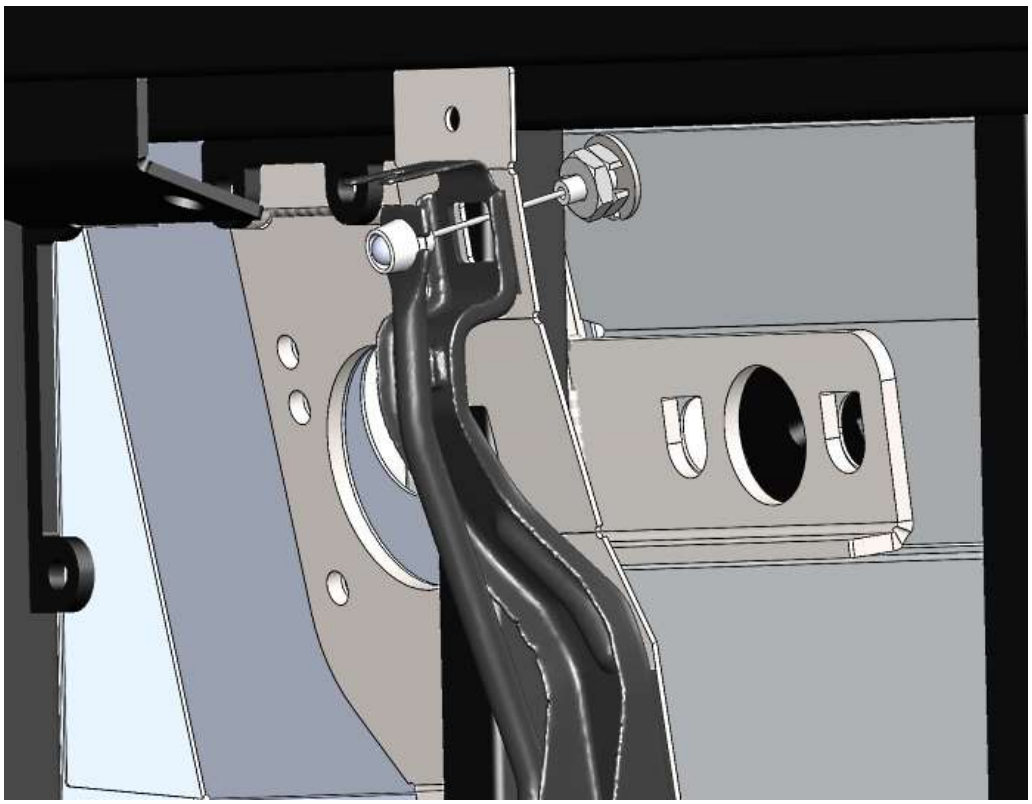
The accelerator cable will go through the aluminum where the small hole is in front of the accelerator pedal.



From the front of the firewall, drill a ½" inch hole through the existing small hole in the panel.



Put a split washer on the end of the accelerator cable then pass the cable through the hole and use the other split washer with the slip-on nut included to attach the cable to the firewall.

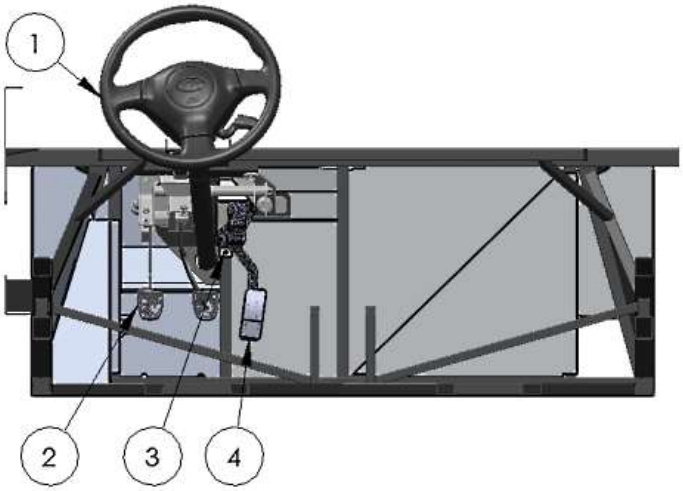


Push the nut onto the cable threads and rotate one half of the nut around the threads so it forms a complete nut around the cable then tighten the nut against the firewall.

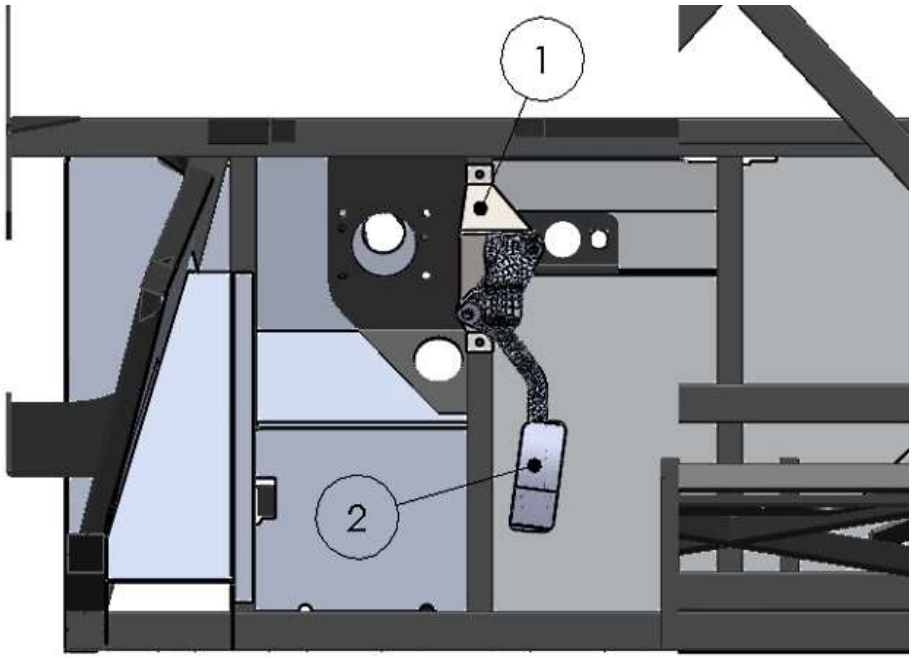
Fly By Wire Accelerator Pedal (2006-2007)

🚘 Accelerator pedal, accelerator pedal mount (Box 10), rivnuts, ¼”-20 x 0.75” flanged button head screws

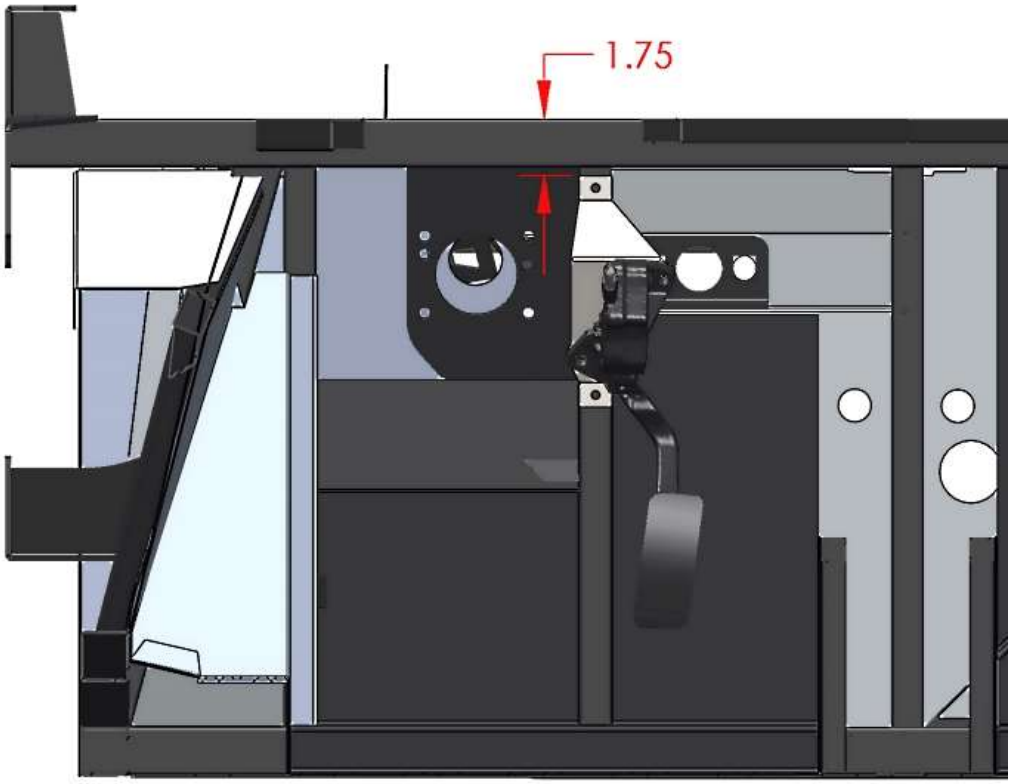
🛠 Drill, wrenches, marker, measuring tape, Rivnut tool, ¼”, $^{25}/_{64}$” drill bits, $^{5}/_{32}$” hex key, $^{7}/_{16}$” wrench

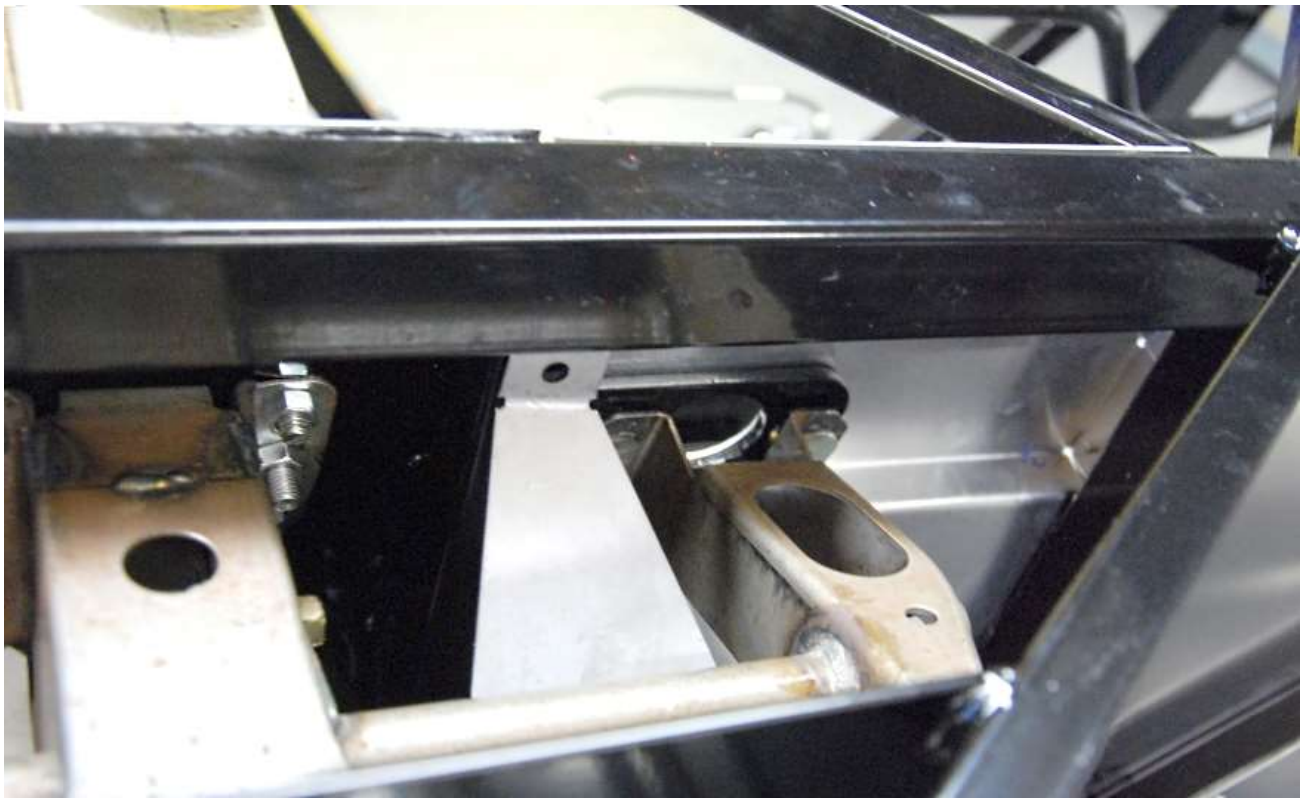


ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	Steering Column		1
2	Pedal Box		1
3	80419	FBW ACCELERATOR PEDAL MOUNT	1
4	FBW pedal		1



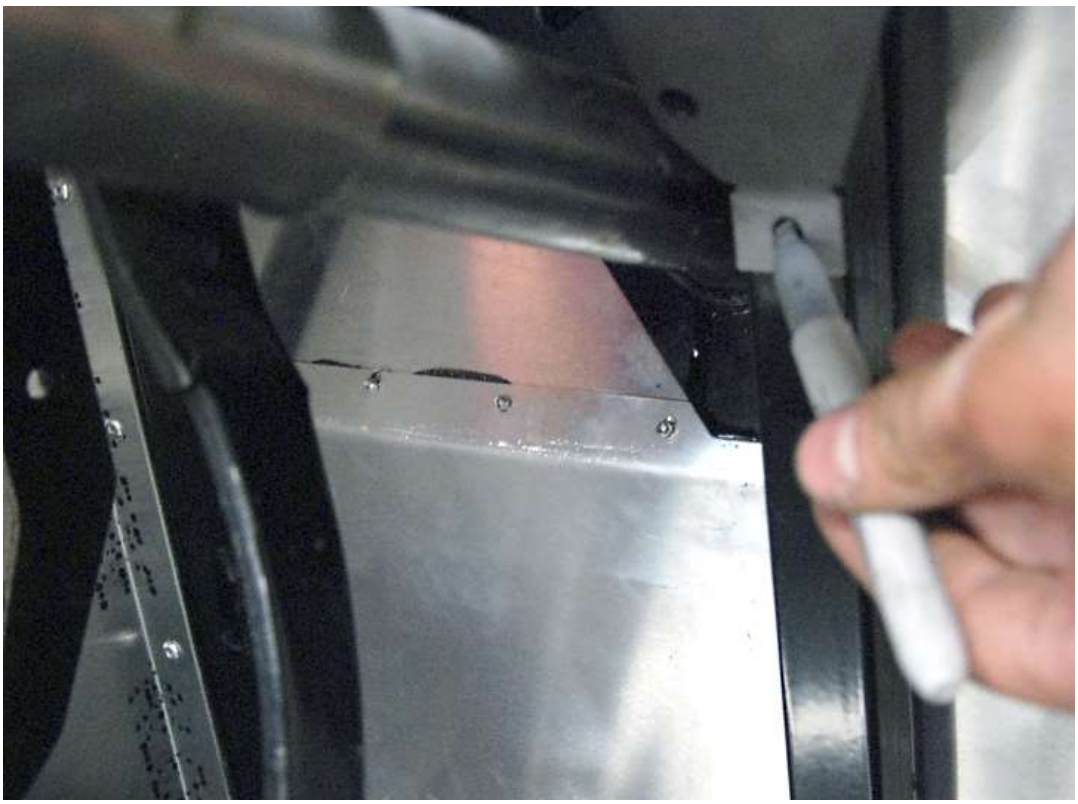
ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	80419	FBW ACCELERATOR PEDAL MOUNT	1
2	FBW pedal		1





Hold the gas pedal mount into position on the vertical tube between the brake and clutch master cylinder mounts. Mark the top hole with a marker for mounting.

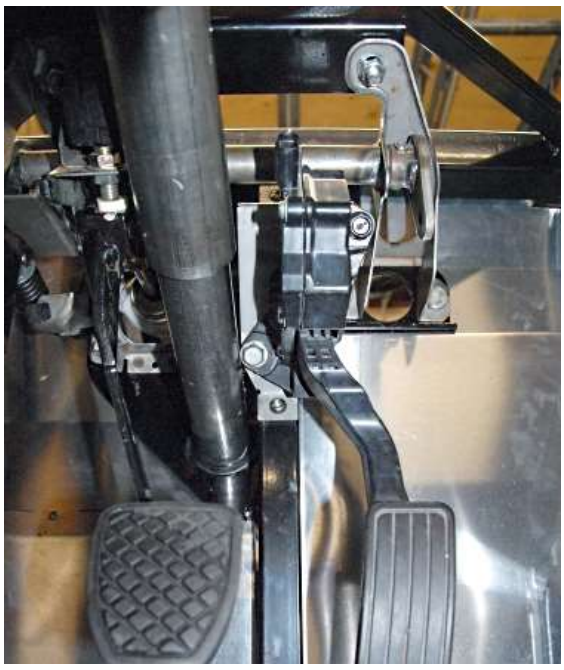
Drill out where your mark is with a $^{25}/_{64}$ inch drill bit and install a ¼" rivnut. (See Appendix for rivnut tool instructions)



Bolt the throttle mount plate in to the top hole and mark the bottom where the lower mounting hole lines up with the chassis.

Drill and install a rivnut in the lower hole.

Attach the pedal to the bracket using ¼”-20 x 0.75” flanged button head screws and locknuts.



Bolt the bracket into the chassis. Make sure it moves freely with no interference.

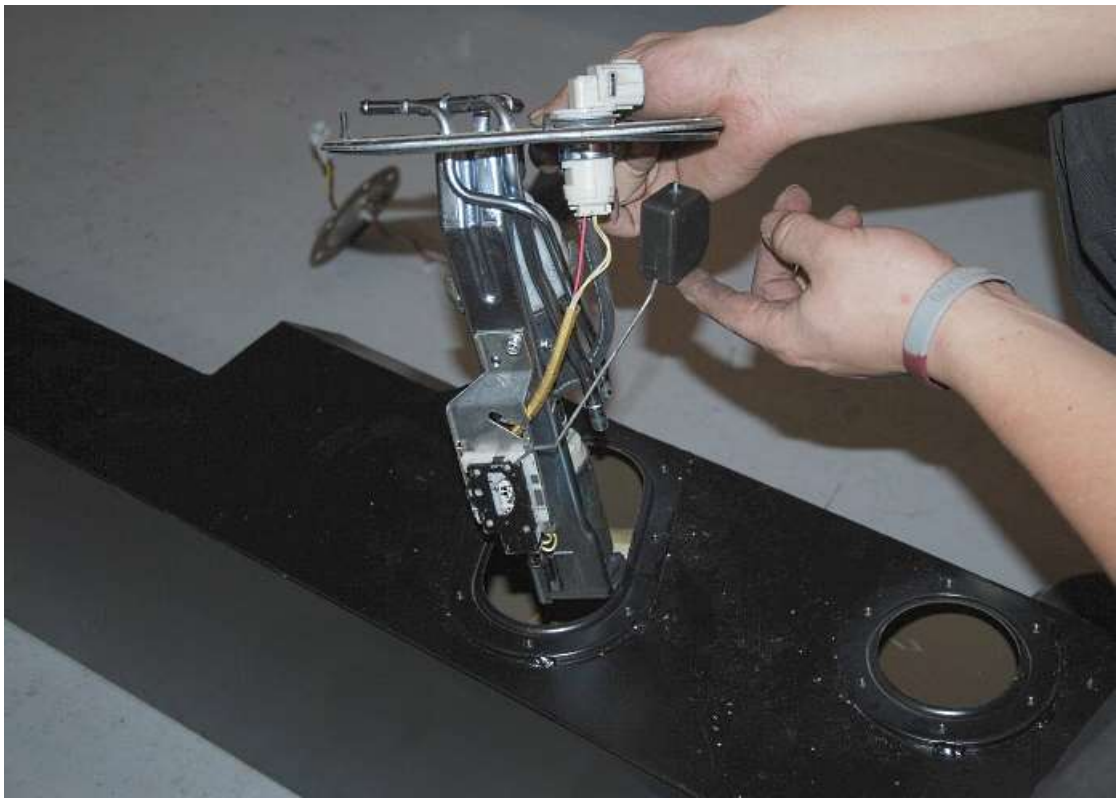
Fuel System

🚘 Subaru fuel pump, Subaru fuel level sender, Fuel tank components, packaged aluminum, fuel line components.

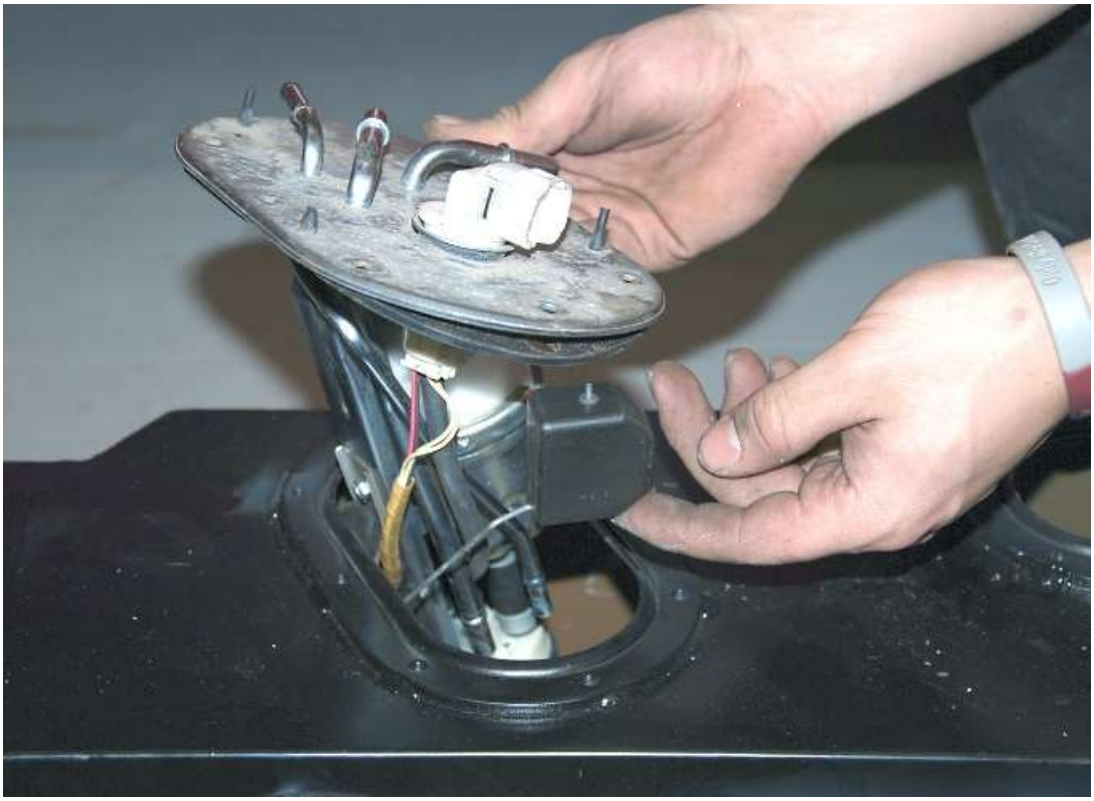
🛠 Pliers, flat head screwdriver, marker, 8mm socket, ratchet

Fuel pump

- The front of the tank is the side with the step in it.



Lift the fuel level float up on the fuel pump while inserting the pump into the tank so the pump will pass through the opening.

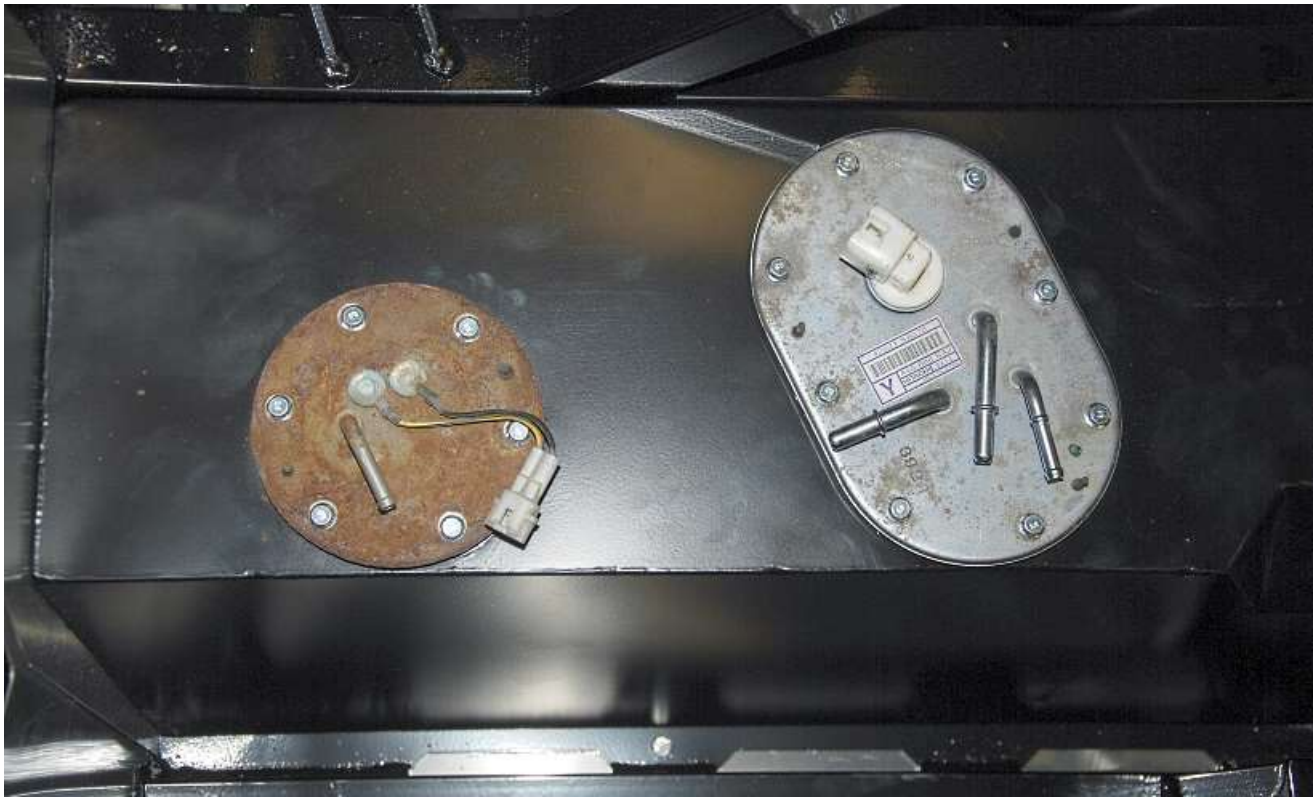


Rotate the pump and lower it onto the tank flange.

Bolt the pump to the tank with the included 5 mm bolts using an 8mm socket and ratchet.

Fuel Level sending unit

- The sending unit can only bolt up in one direction.



Install the fuel level sender into the tank so that the tube will angle forward.

Bolt the pump to the tank with the included 5 mm bolts using an 8mm socket and ratchet.

Push the rubber cap onto the fuel level sender tube.

Fuel tank

¼” x 0.75” hex head bolts and nuts, fuel line components, fuel tank components.
¼” drill bit, drill, ½” wrench, ½” socket, ratchet.
The wider part of the tank goes on the right side of the frame.

Using two people start to slowly lower the tank down into position.

If necessary push one side then the other if it is snug at the top of the frame.

Fuel tank in position on the frame.

Put two strips of the ½ moon weatherstrip on the front face of the tank, one up high and one down low.

Repeat the weatherstip on the other left front side of the tank.

Fuel Lines

Fuel line components, Fuel tank components.

🛠 Razor knife, 5/16" socket, ratchet, measuring tape, 3/16", 25/64" drill bit, rivnut tool, rivet gun, drill, 5/32" hex key, Philips head screwdriver.

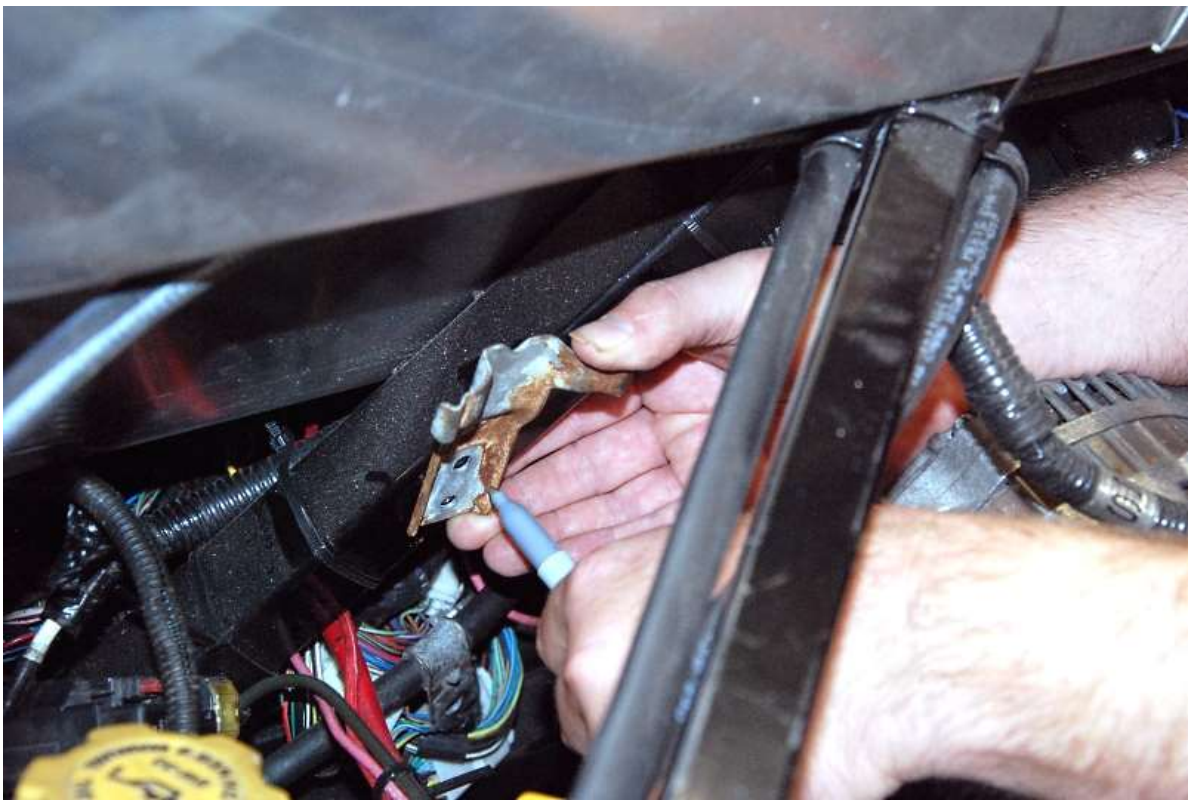
✋ Use some WD40 or similar on the hose connector before pushing the hose on if it is a tight fit.

Cut the 5/16" EFI fuel hose in half so it is 4.5 feet long.

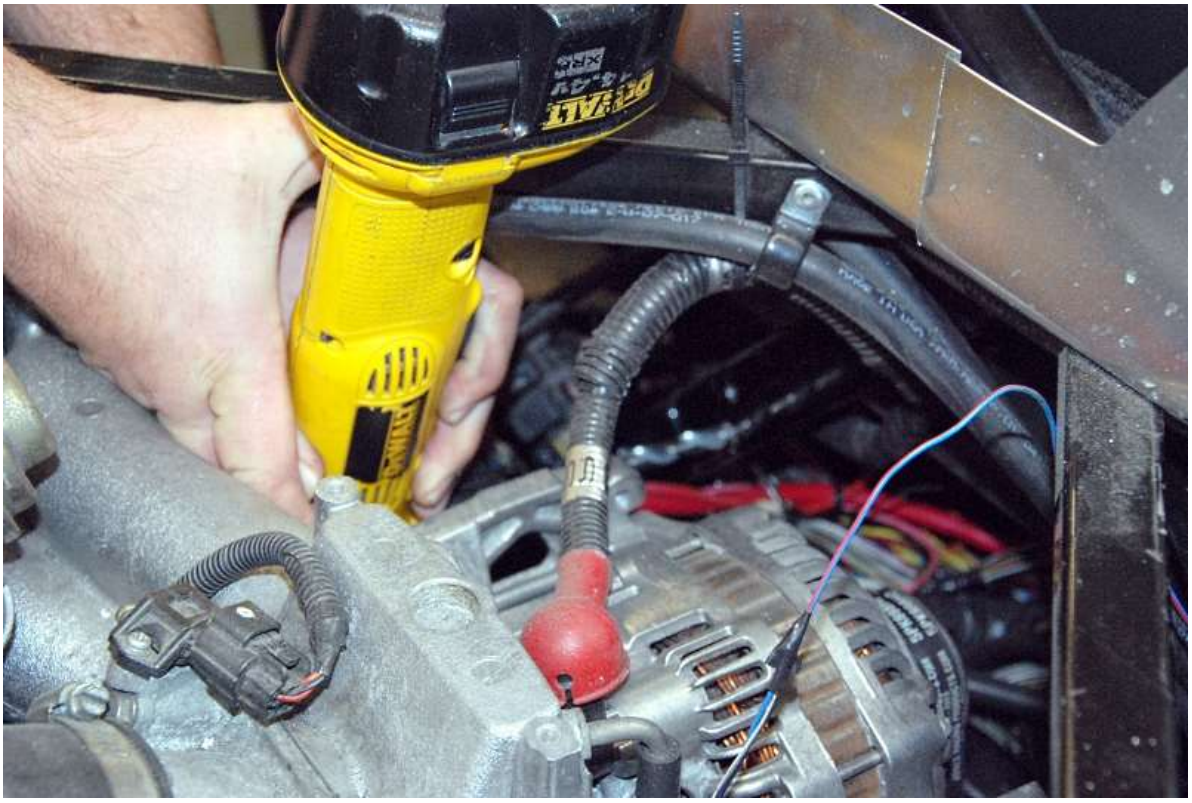
Slide a 5/16" EFI hose clamp onto one of the 5/16" hoses then push one of the white 5/16" fuel line connectors into the hose and tighten the hose clamp on the end of the fitting.

Slide a ¼" EFI hose clamp onto the ¼" hose, apply WD40 to the Barb of one of the white 5/16" fuel line connectors then push it into the hose and tighten the hose clamp on the end of the fitting.

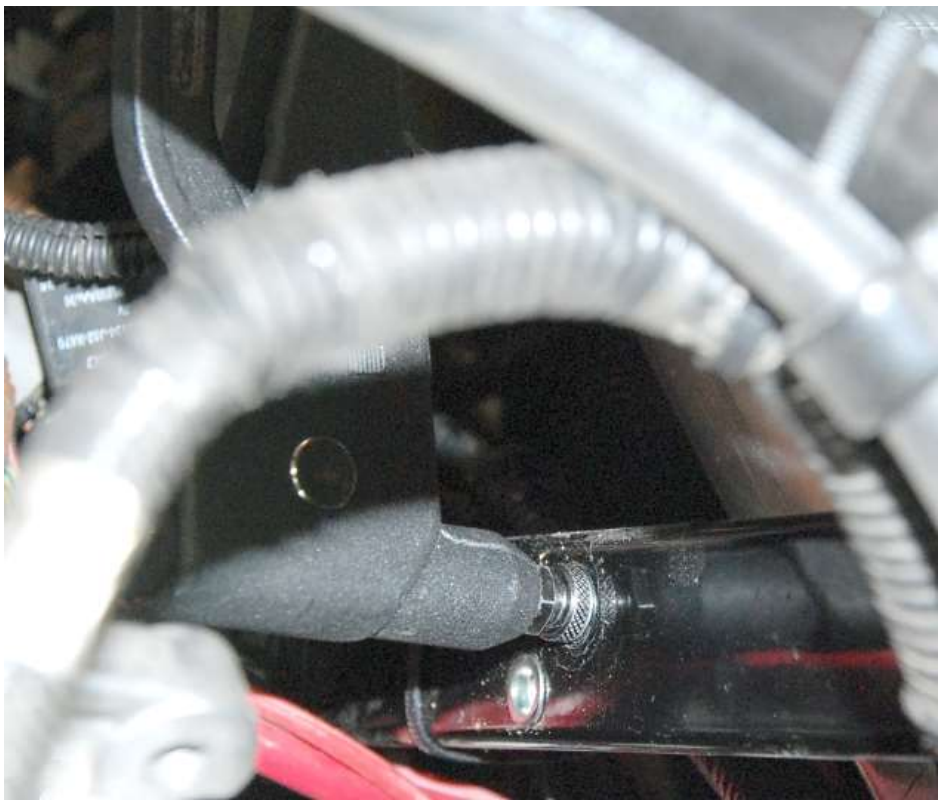
Locate your OEM fuel filter and mounting bracket. In some donors it is above the fuel pump. Now is a good time to replace the filter but it will be easy to access if you don't have the new one yet.



Remove the filter mounting bracket and use it as a template to mark mounting holes on the chassis. The most convenient mounting spot is the open area on the chassis just toward the left side of the Alternator.



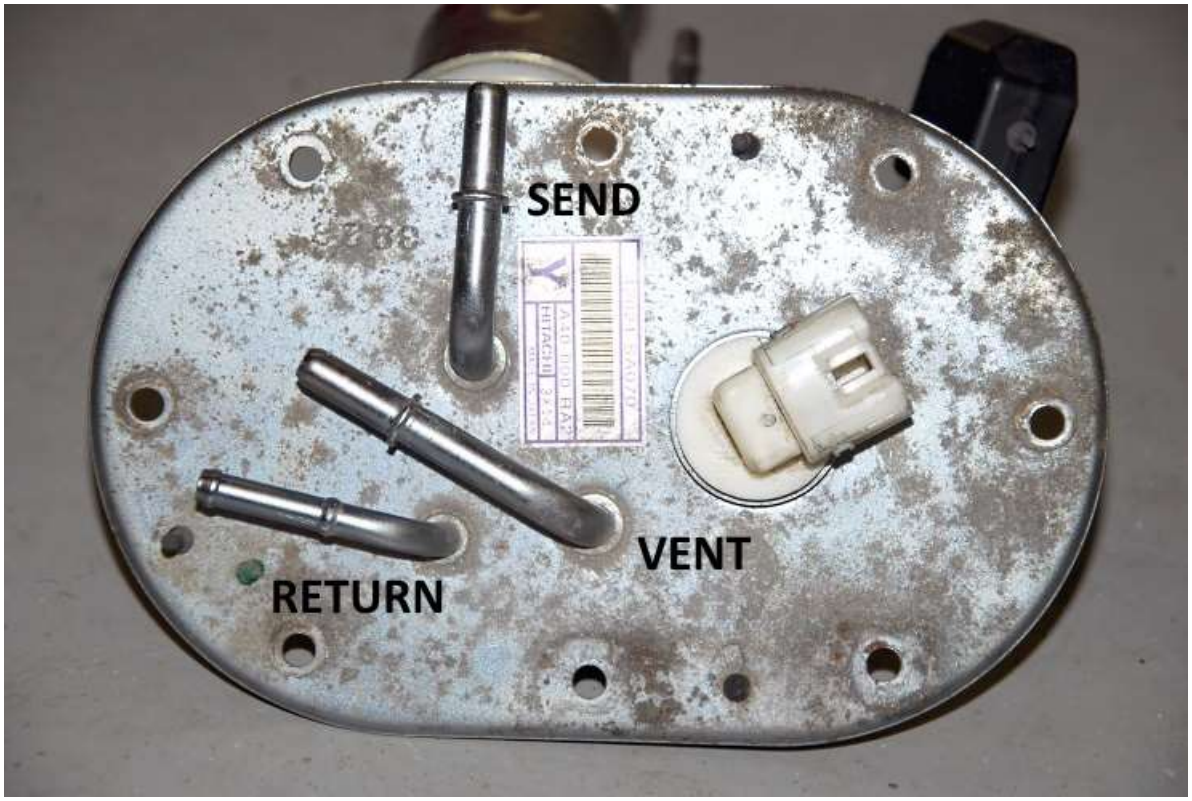
Drill out the holes you marked $^{25}/_{64}$ inch for rivnuts.



Install rivnuts in the holes to mount the filter.

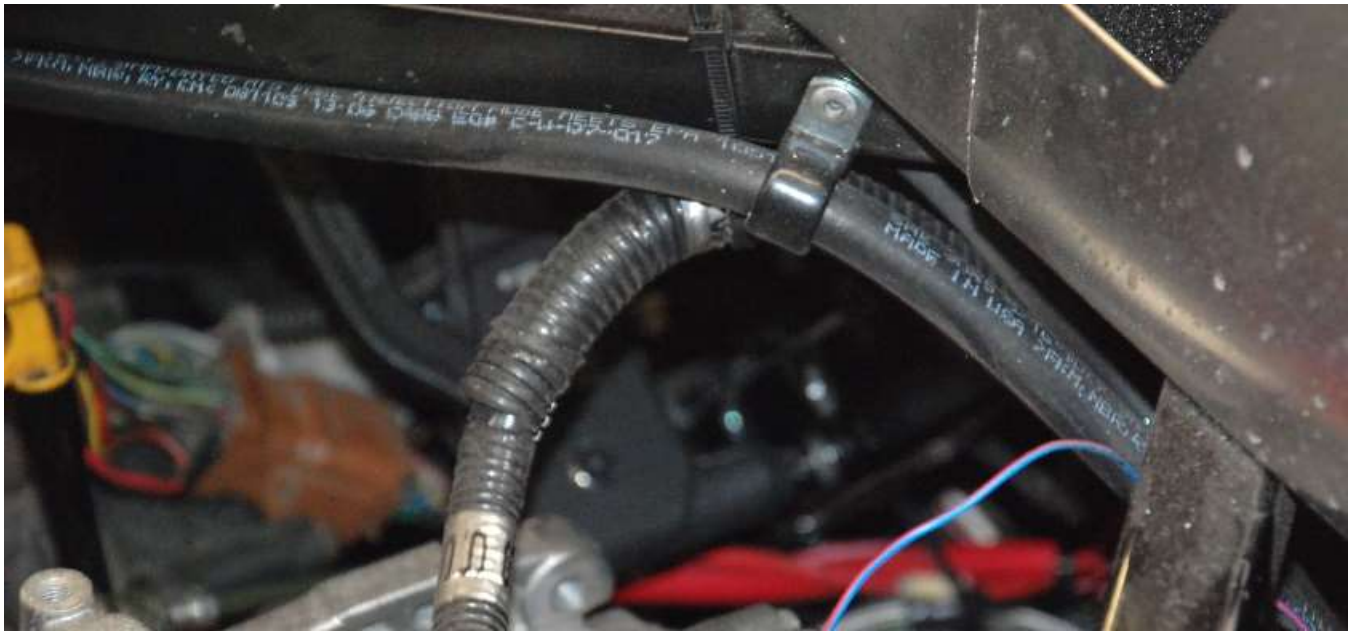
The holes in the mounting bracket need to be opened up slightly for the ¼ inch mounting bolts.

Attach the filter mounting bracket to the chassis, and clip the filter in place with the inlet pointing toward the center of the car.



Connections for the fuel pump. Some donors do not have a return as the pressure regulator is in the fuel tank.

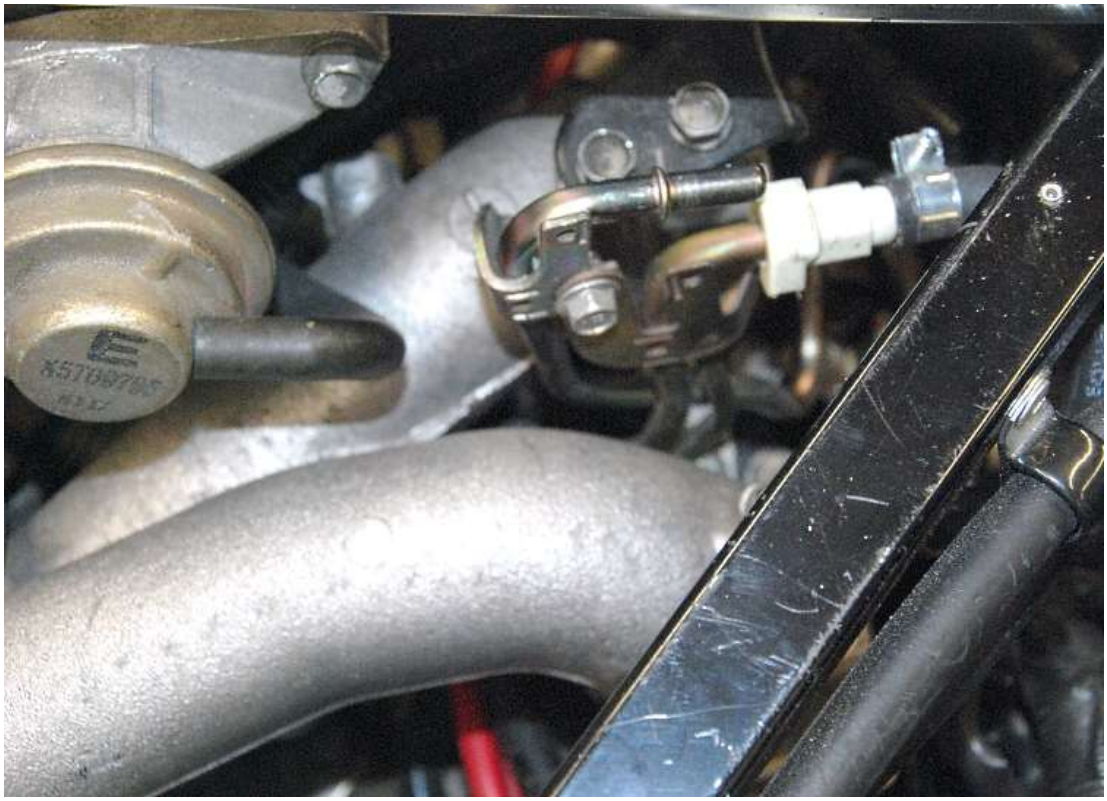

Attach the $^{5}/_{16}$" send line to the tank.



Run the fuel line back to the filter attaching the fuel line to the frame using the insulated line clips and $^{3}/_{16}$" rivets.

Attach the hose to the filter reusing the factory clamp.

Run the remaining fuel line from the outlet of the filter to the top line on the engine and connect using one of the provided quick-disconnects.



Connect the ¼” return line (attached to the $^{5}/_{16}$” connector) to the return side of the fuel rail.

Run the return line forward to the fuel tank attaching the line to the frame then cut the hose to length.

Put a ¼” hose clamp on the return hose then push the hose onto the return barb and tighten the clamp.

Fuel filler neck

🚘 Fuel tank components
🛠 Razor knife, marker, tape measure

Find the 2 inch inner diameter fuel filler tube and mark a 3.50 inch section. Cut the hose straight across where your mark is.

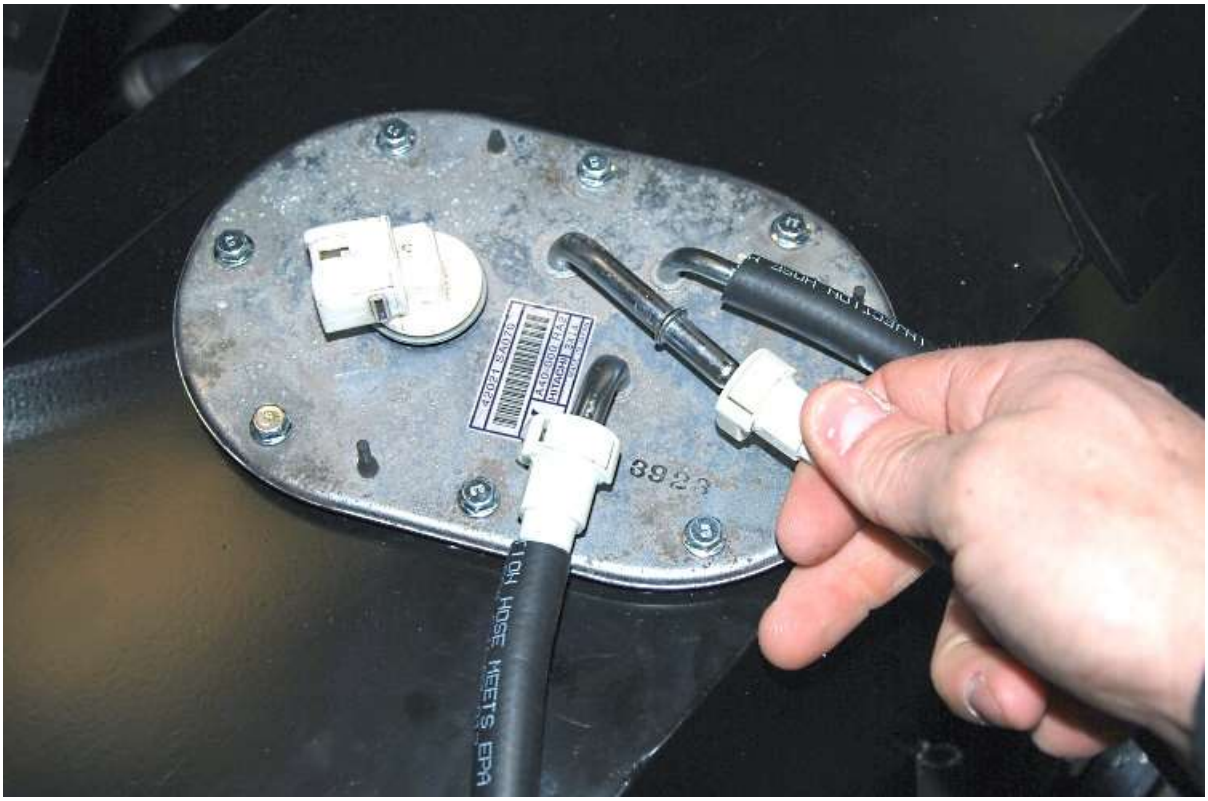
Slide the 3.50 inch section onto the bottom part of the fuel filler tube then use a hose clamp to attach it.

Attach the remaining section of hose and route the fuel filler tube so that it is almost vertical coming off the tank and goes over the upper rear trailing arm.

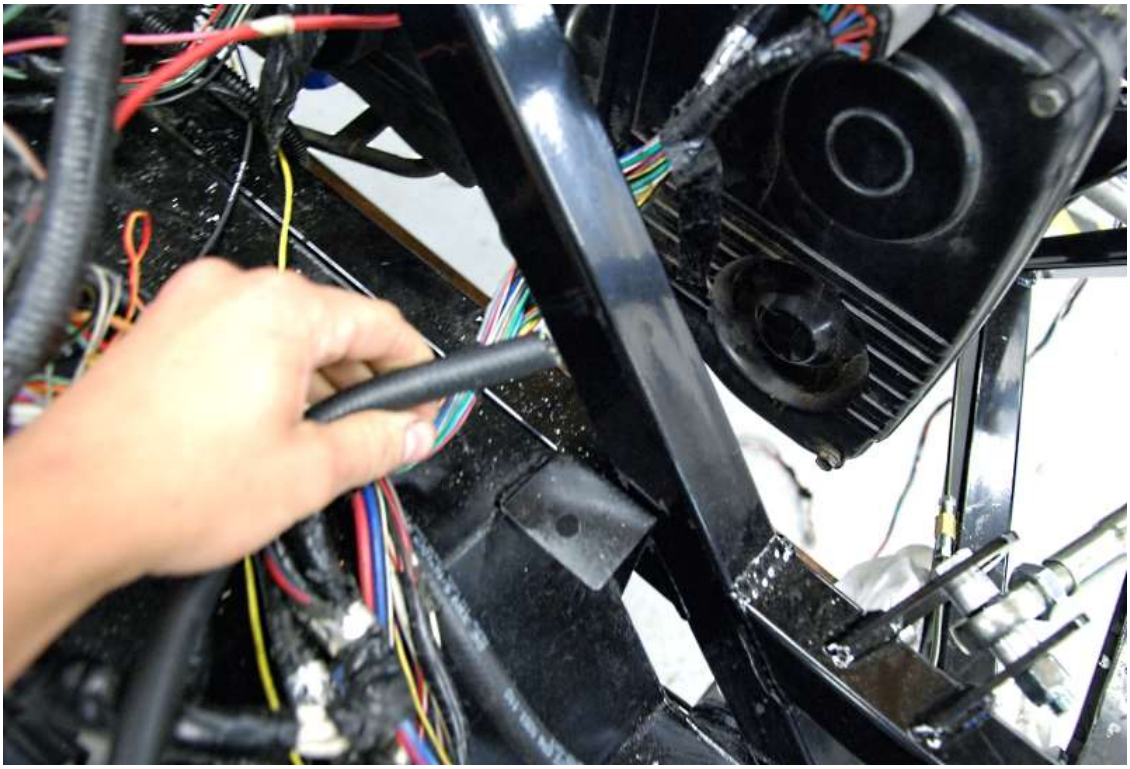
Attach the bottom fuel filler hose to the tank with another hose clamp.

Fuel vapor canister

- Subaru Fuel vapor canister and hose



Depending on the year of your fuel pump either push the stock vent hose with a white fitting onto the vent tube on the fuel pump or, with a hose clamp on the vent line push the hose onto the vent tube and tighten the clamp.

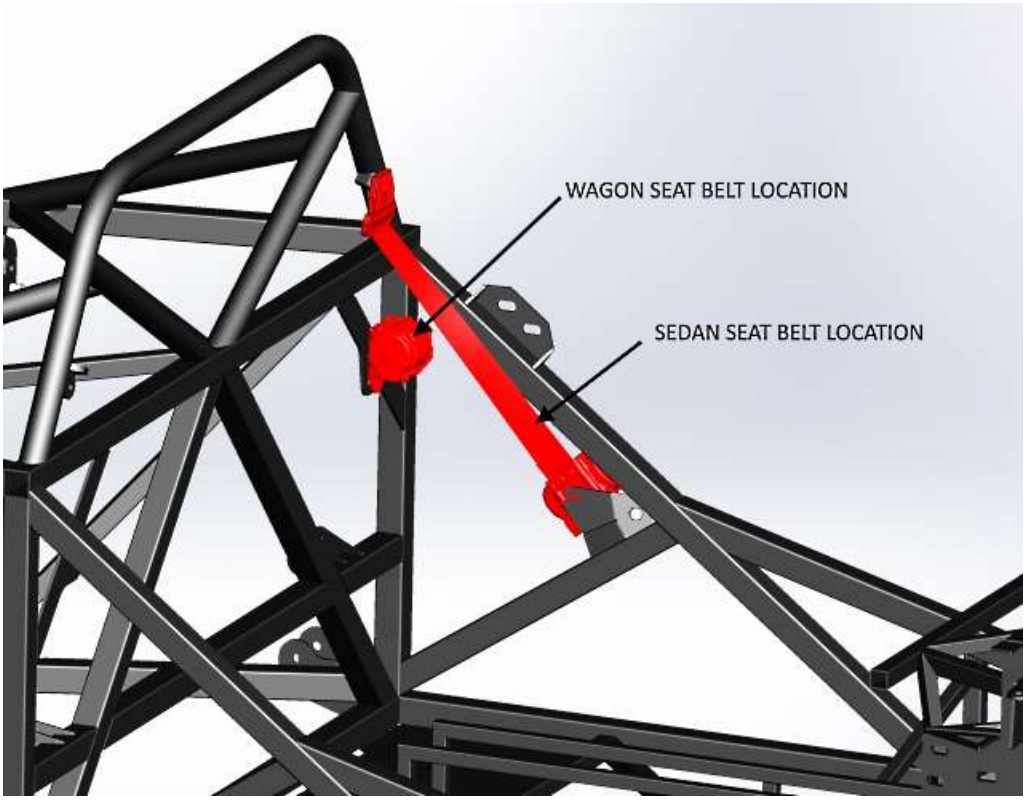


Run the vapor hose back to the engine bay.

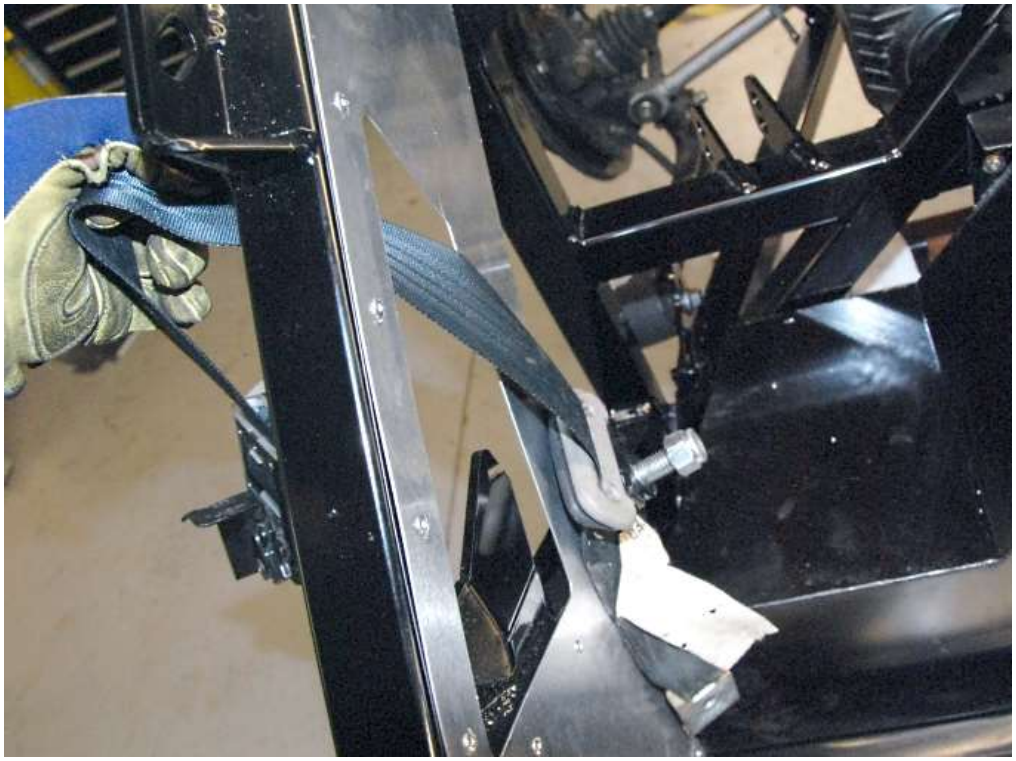
If you are using the fuel vapor canister mount it so that the stock hoses when attached reach the stock engine locations and plug the vent hose into it.

Seat Belts

🚘 Subaru seat belts, $^{7}/_{16}$”-20 locknuts, OEM fasteners
🛠 $^{11}/_{16}$” wrench, $^{11}/_{16}$” socket, ratchet



Locations for seat belt mounting



Pass the seat belt through the opening in the aluminum.

From inside the frame, hold the seatbelt spool up to the frame mount.

Make sure the locating tab goes into the slot and then attach the spool using the OEM bolts and $^{7}/_{16}$-20 locknuts. Torque the bolt to **22ftlb (30Nm)**

Upper seat belt mount

- If installing a hardtop, these will need to be removed again before the inside aluminum wall is installed.

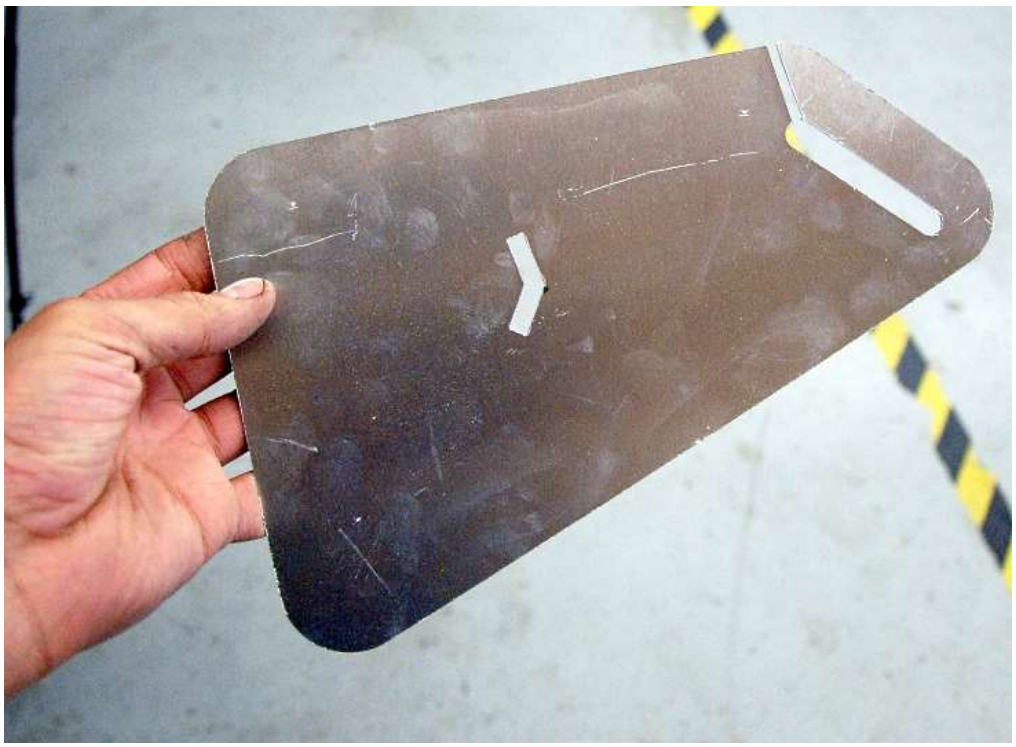
Attach the left side upper seat belt guide to the roll bar mount using the OEM bolt and $^{7}/_{16}$"-20 locknuts. Make sure the slight angle in the bracket faces out so it will not pinch the bolt. There are two bolt locations available.

Attach the right side bracket.

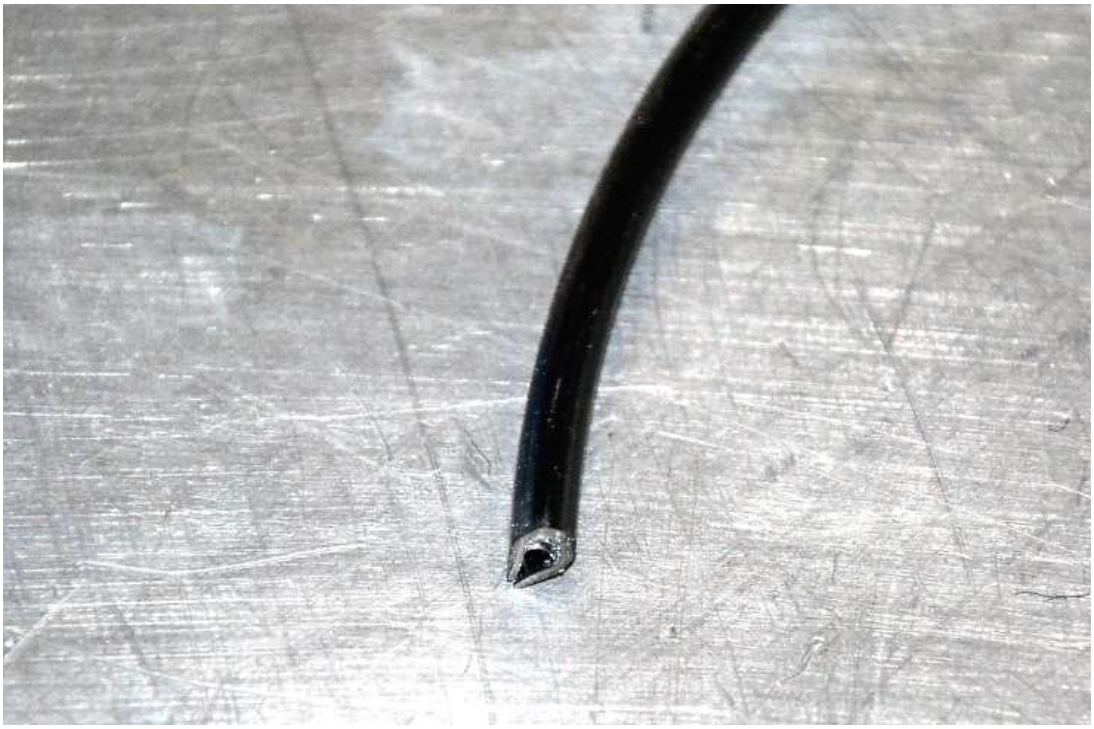
Torque the bolts to **22ftlb (30Nm).** The guides should be tight but the bracket can still move by hand.

Seat belt covers

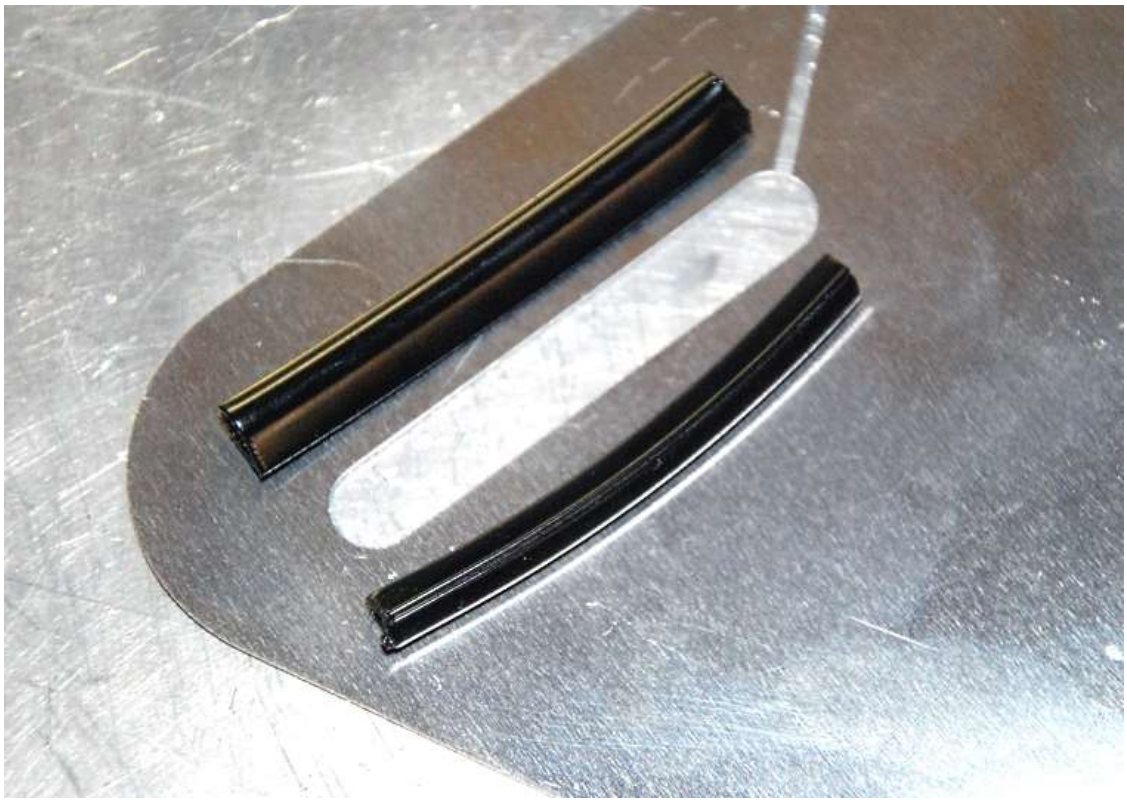
🚘 Seat belt fasteners, packaged aluminum.
🛠 wire cutters, 1/8" drill bit, drill, rivet tool



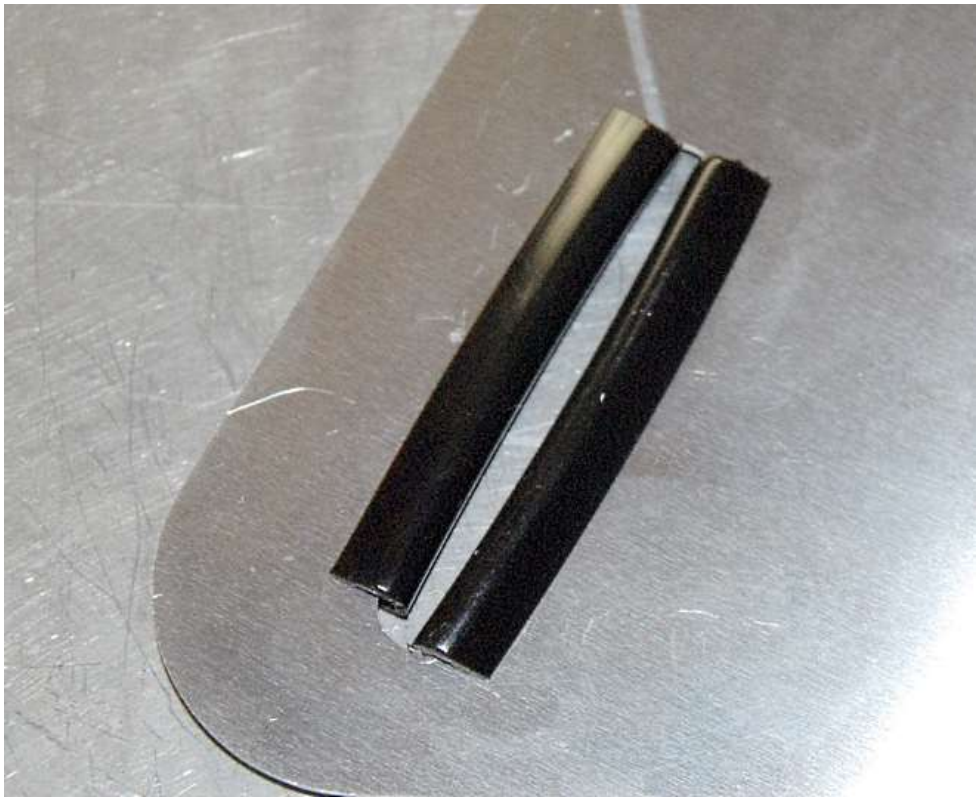
Locate the aluminum seat belt spool covers.



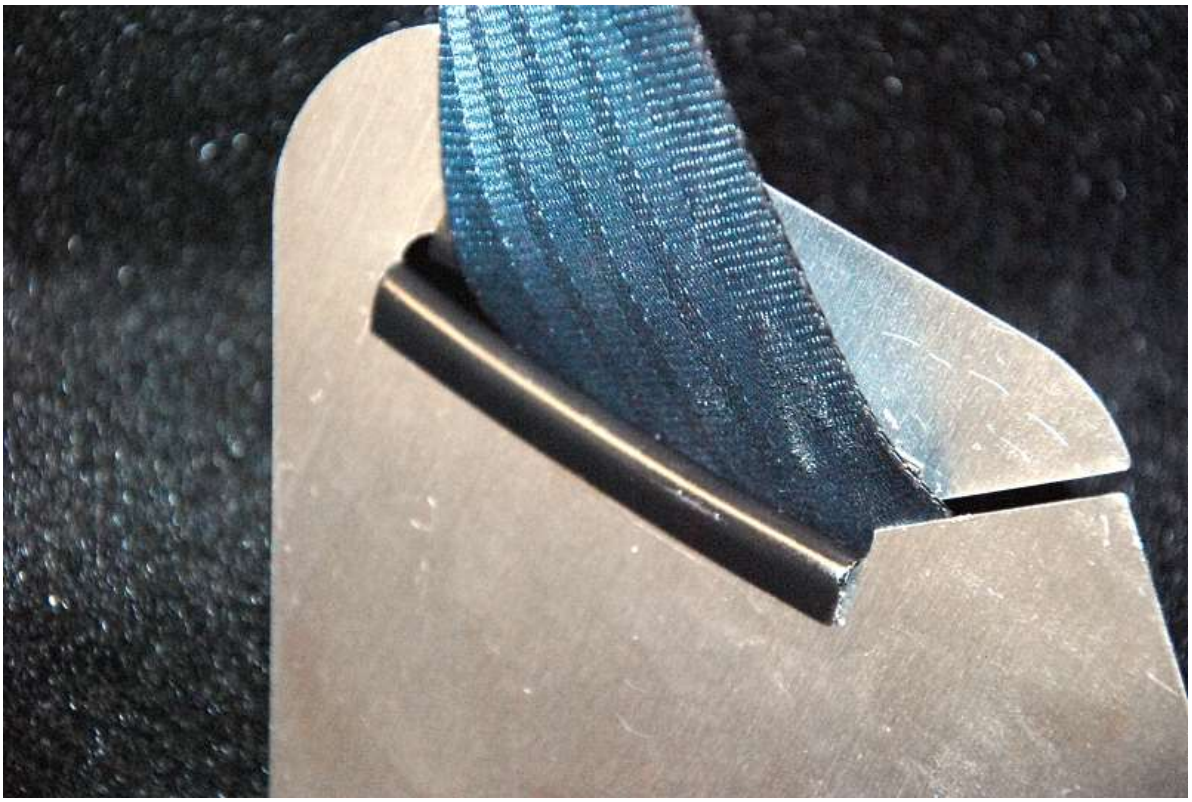
Locate the thin black plastic edge trim.



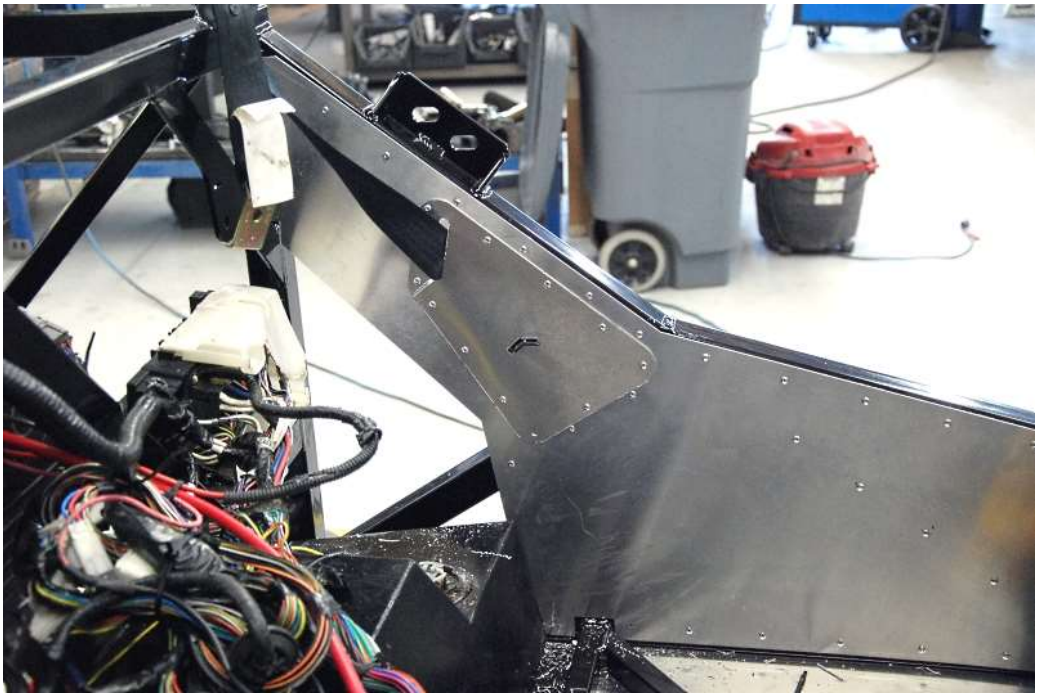
Cut four 2.5 inch sections of trim for the seat belt slots.



Slide the trim on the inside of the seat belt slot to give the belt a smooth surface to slide on.



Slide the belt through the slot in the cover before fitting it in place.



Mount the rear seat belt cover using silicone and rivets.

Brake Lines

🚘 Brake components (Box 3), Brake lines (Box 5), insulated clip hardware (Box 3).
🛠 Tubing bender, ⅜", $^{7}/_{16}$", ½", $^{11}/_{16}$" wrenches, pliers, $^{3}/_{16}$" drill bit, drill, rivet tool, masking tape, marker.

Rear Brake lines

Bend an 80° bend 3 inches from the end of one of the 60 inch brake lines and thread it through the front cockpit corner opening.

Feed the brake line through the chassis until there is enough line to reach the master cylinder.

Bend the line upwards so it can connect to the outside port on the master cylinder.

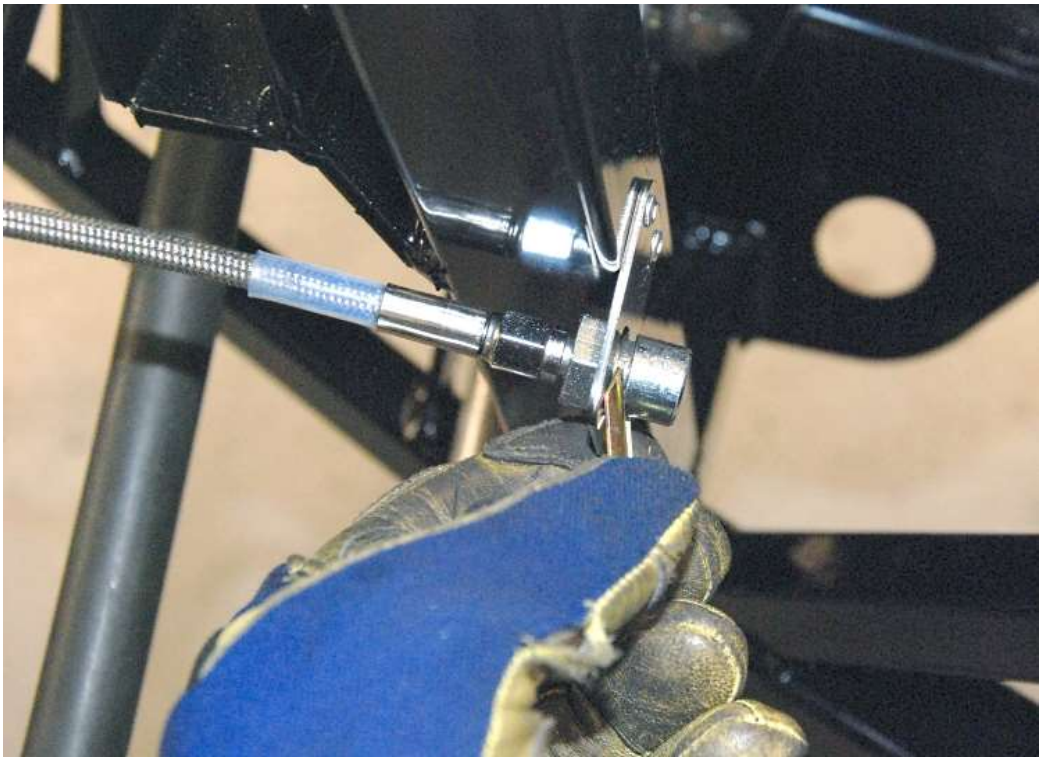
Run the brake line down the outside frame rail and attach with the insulated line connectors using $^{3}/_{16}$ inch long rivets.

Run the brake line inside the rear of the frame next to the tank.

Unpack the brake flex line mounting tabs.

- The OEM flexible brake line mounts are thinner $^{1}/_{16}$ inch material than the Wilwood brake or braided stainless line 0.074 inch brake line mounts.

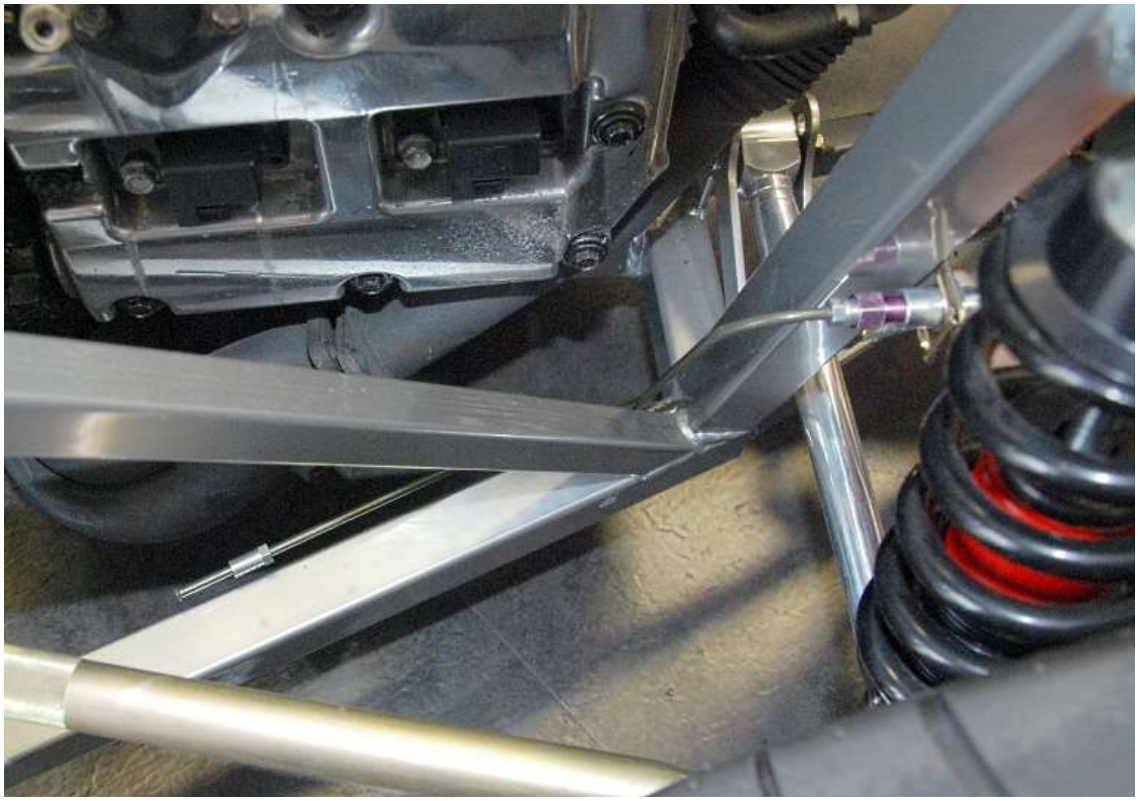
Attach the brake line mounts to the front side of the rear most 1.50 inch tube using $^{3}/_{16}$ inch rivets.



Insert the flexible brake lines and attach them with the brake line clips. This photo shows the braided lines from the Wilwood kit but the rubber lines mount the same way.

All of the connections to the OEM brake lines are a metric thread and need to be adapted to standard brake line thread.

- BE VERY CAREFUL WITH THESE LINES AS THE THREADS ARE CLOSE ENOUGH TO MISTAKE! All the factory flex lines, the master cylinder, and the clutch lines need the adapters.



Connect the medium length line to the back side of the flex line using one of the metric adapters and run it down to the bottom chassis tube and the angle toward the front of the car.

Connect the rear line to the short line coming out of the Tee. The rear suspension is removed in the picture for visibility but you can route the line with it in place.

Front Brake lines

🛠 7/16" wrench, 7/16" socket, ratchet, ¼" drill bit, drill, tubing bender, DOT 3 Brake fluid

Stainless lines (Wilwoods)

If using stainless front flex lines on the caliper, they should be attached to the spindle adapter to keep from getting tangled in the suspension or moving wheel.

Attach one of the insulated clips (or you can modify the factory strut mount on the rubber line) to the spindle adapter with a 3/16 inch rivet. Repeat on passenger side.

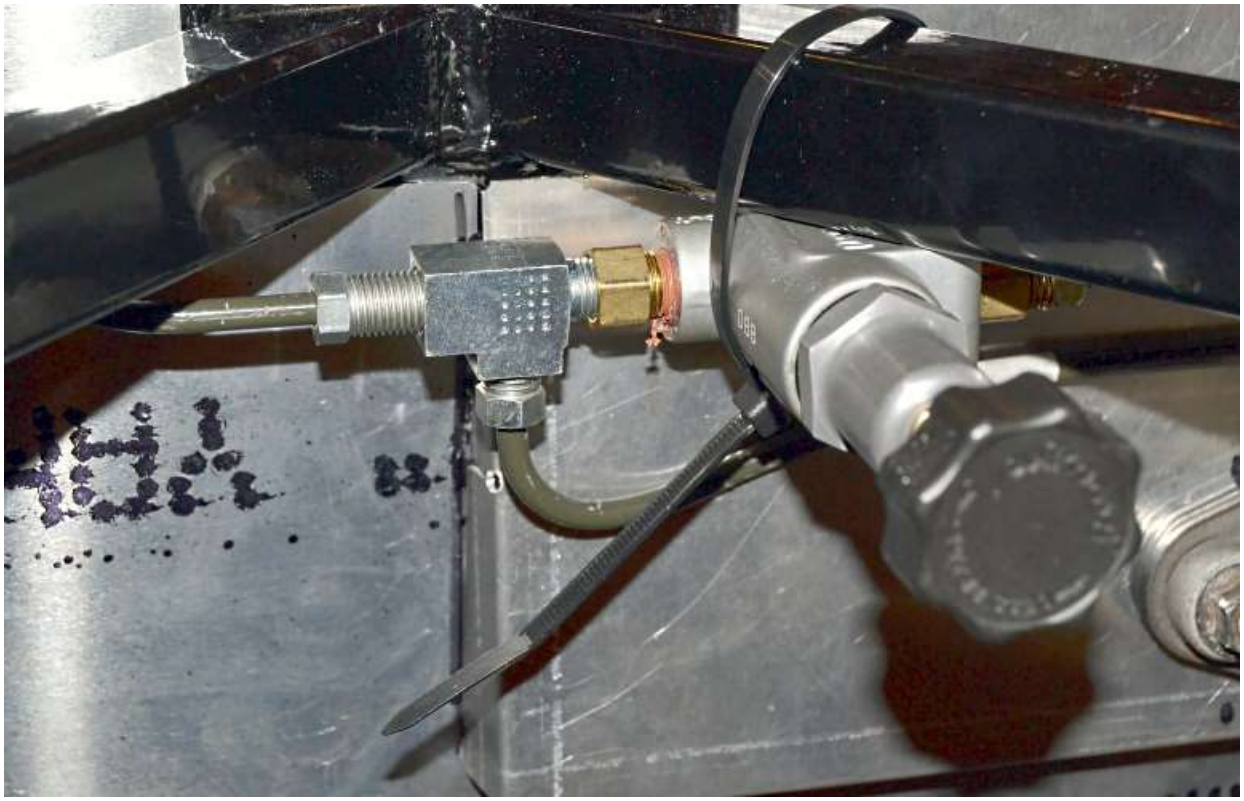
OEM rubber lines

Attach the brake line mounting tab to the 1” frame tube behind the front upper control arm using $^{3}/_{16}$” rivets.

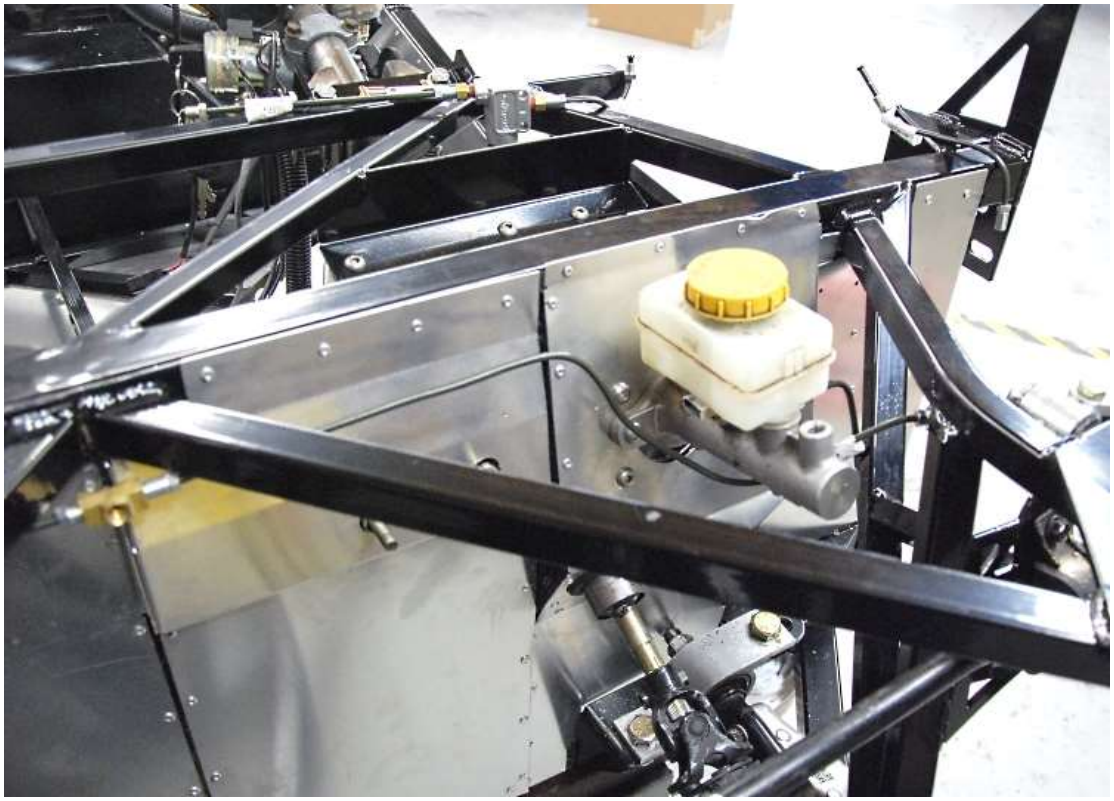
Move the suspension through its range of motion to ensure you have enough slack in the line to not put any pressure on the fittings or tension on the line.

Hard lines

Run one of the medium length brake lines from the right side tab to the center of the front cockpit wall and install a the “male on the run” brake line adapter.

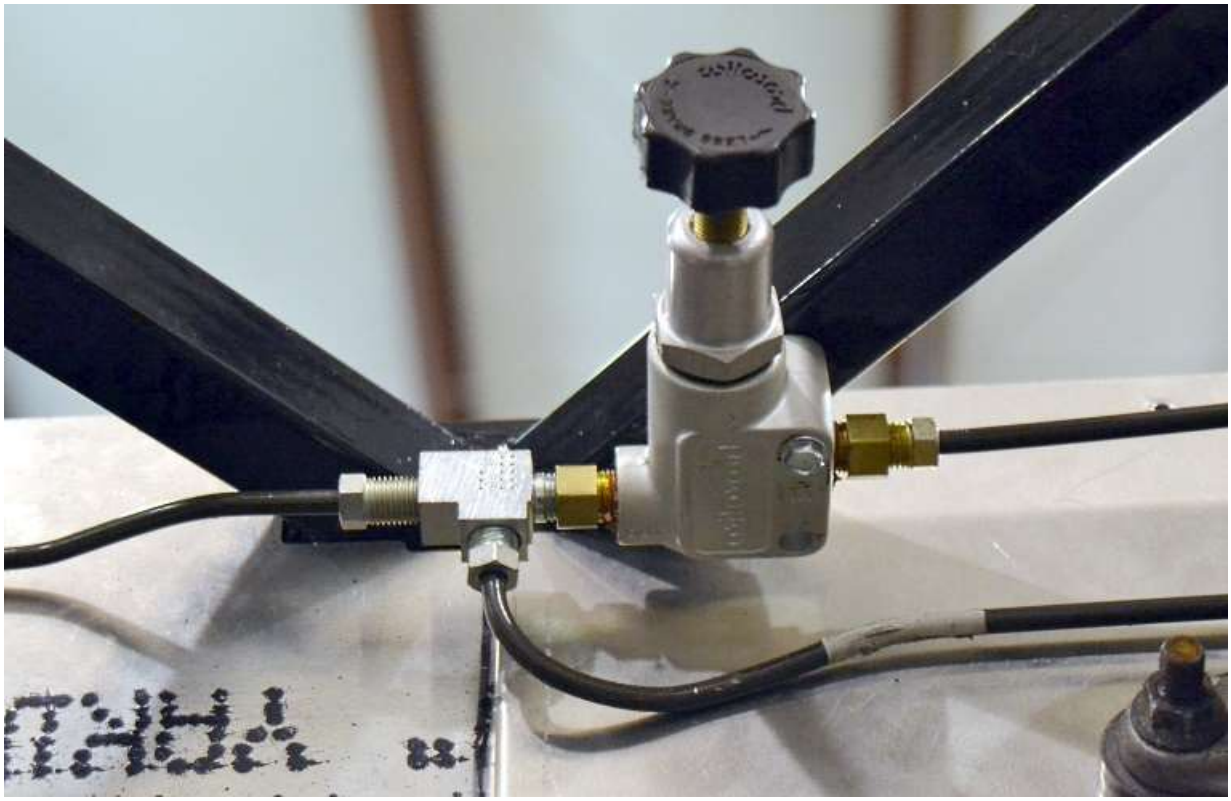


Connect the proportioning valve to the brake line adapter and line zip tie it in place for now.



From the other female on the adapter run another medium line out the left side flex line.

Run the front line from the proportioning valve to the top fitting on the master cylinder. Make sure to bend the brake line so that it is below the top of the master cylinder so it does not hit the windshield surround.



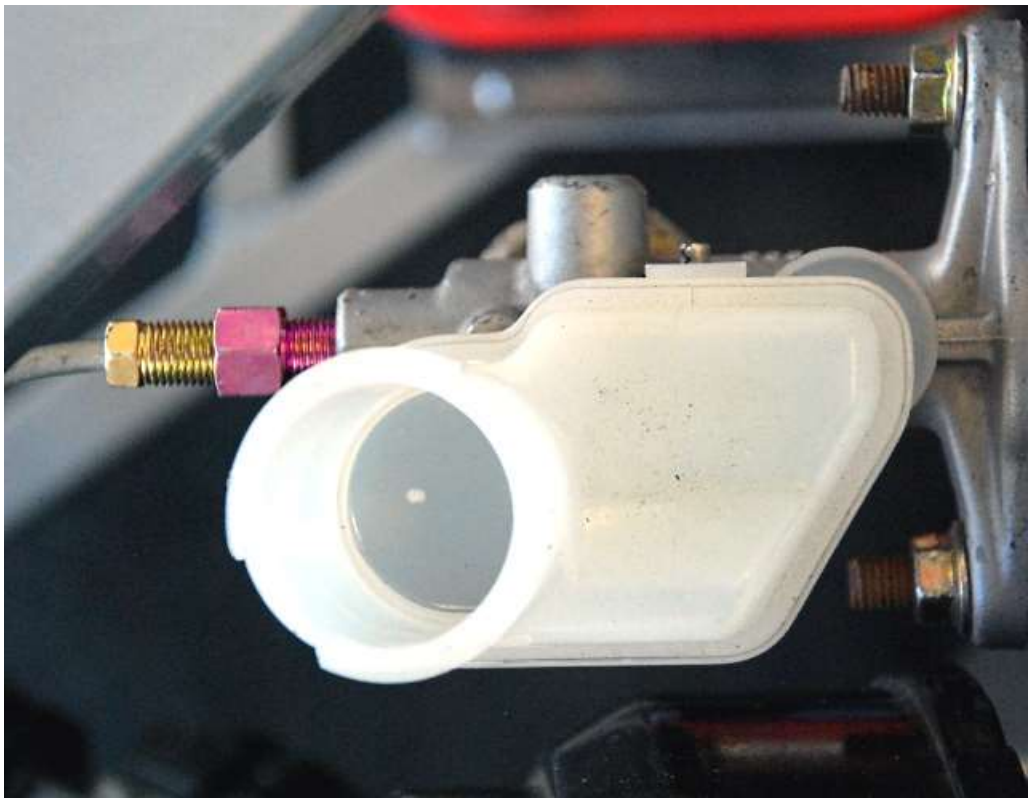
Drill and through bolt the proportioning valve to the chassis so the lines are not supporting its weight.

With all the lines run, the brakes can be bled. Start at the (right rear) caliper furthest from the master cylinder and work your way closer. Once you have pressure in the system go back to the farthest caliper and repeat the process until no more air is present.

- Once the car has been driven once it is a good idea to bleed the system again in case some air was trapped.

Clutch hydraulic lines

Pedal box hardware, Lines/Coolant tubes (box 5), insulated clip hardware, Brake components.
Tubing bender, $^{7}/_{16}$" wrenches, rivet tool, $^{3}/_{16}$" drill bit, drill

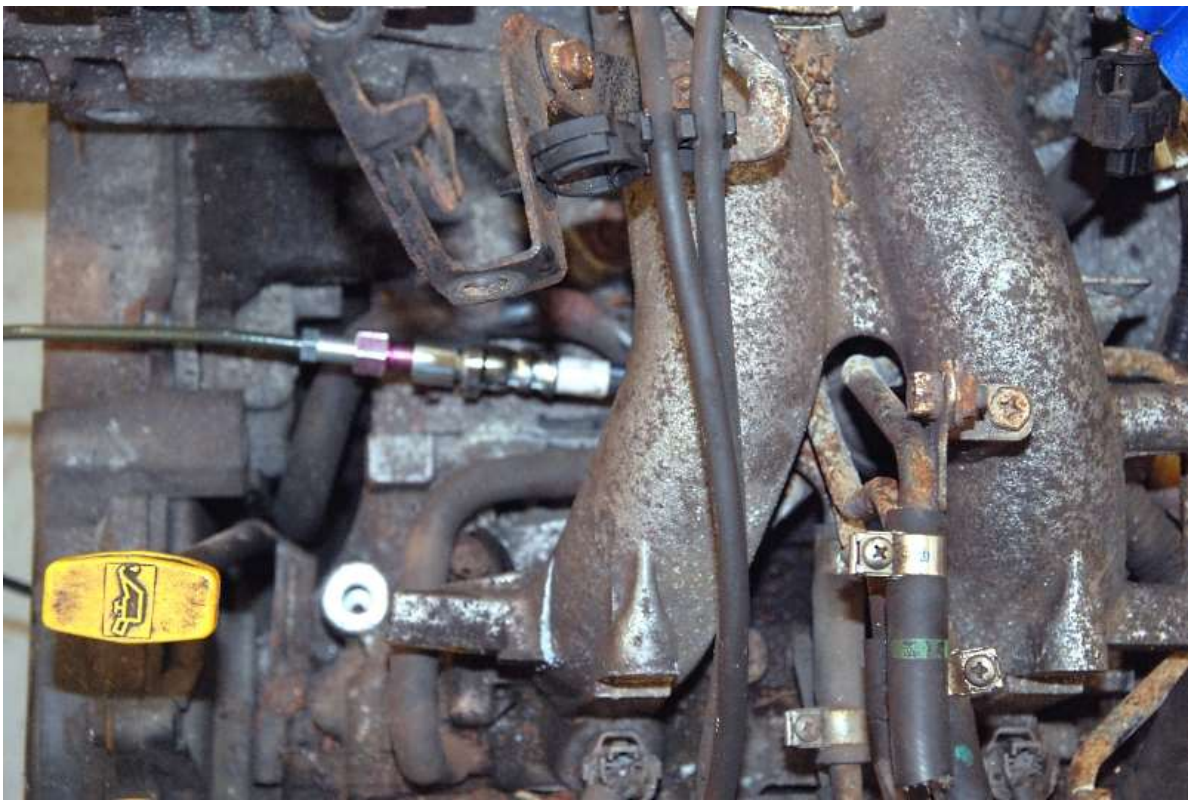


Attach a long section of brake line to the clutch master cylinder with one of the metric line adapters.

From the clutch master cylinder, route the line down the front cockpit wall toward the left side of the chassis, and through the opening for the radiator hose.

Route the clutch line along the frame next to the rear brake line. Roughly in the middle of the chassis you will need a union and then another long section of line.

Finish routing the line by following the angled frame member behind the gas tank about halfway up and then turning the end toward the engine.



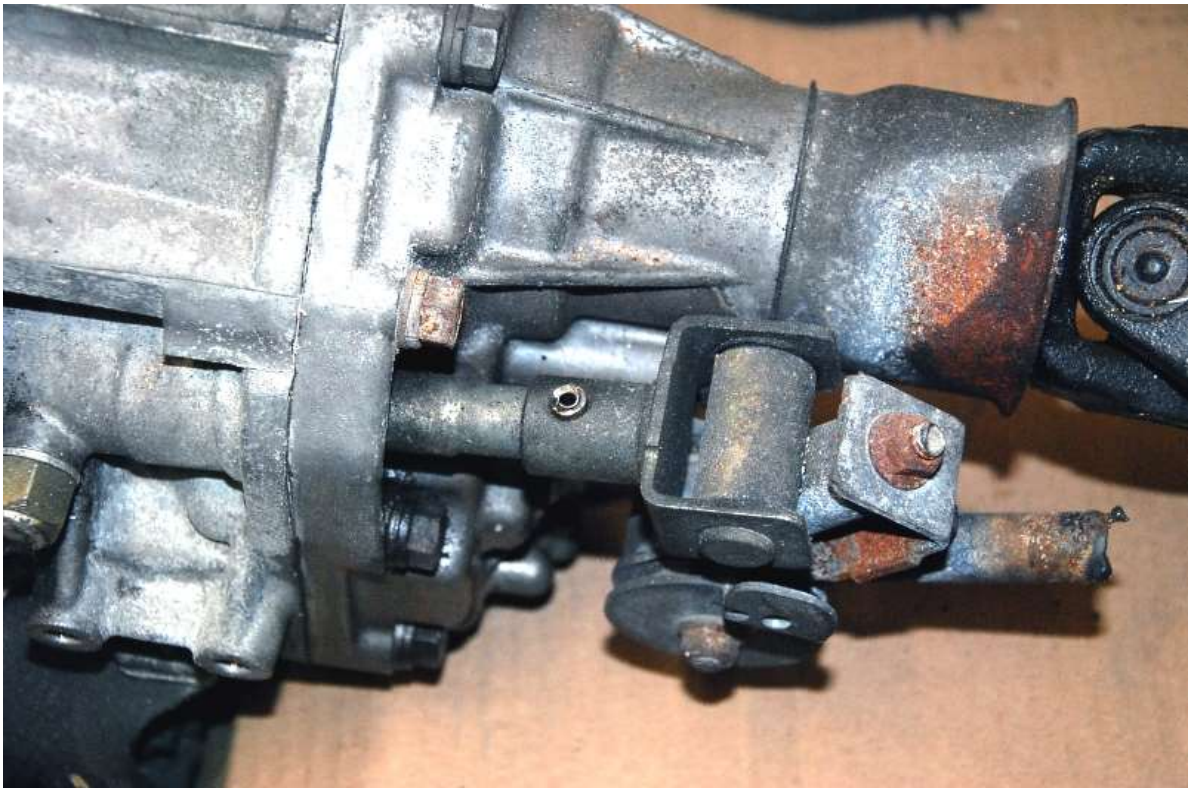
Pull the flexible clutch line under the intake manifold and out the front.

Attach the end to the hard line with one of the metric line adapters.

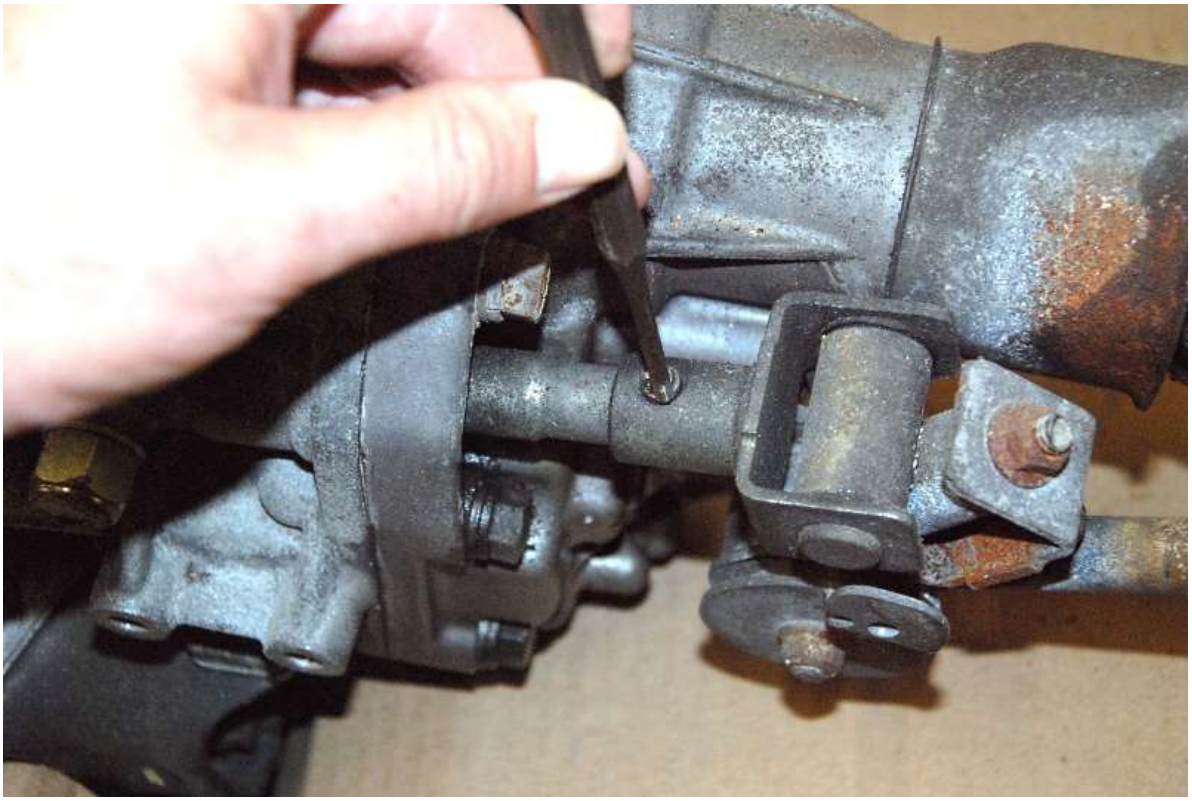
Fill and bleed the clutch.

🚘 Subaru 5 speed transaxle, IRS components, cable shift kit, ¼”-20 x ¾” flanged button head bolts, locknuts, ¼”-28 locknut, M10 x 25mm hex head screws,

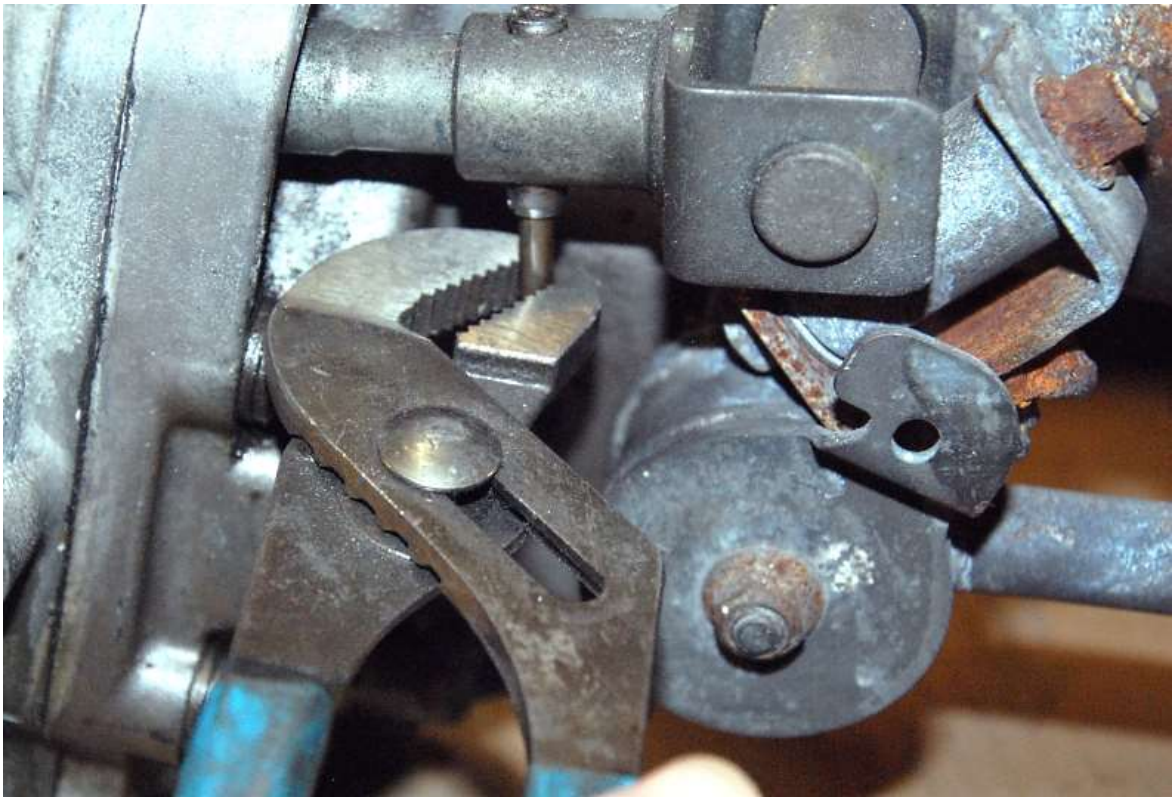
🛠 Hammer, punch, grinder or saw, drill, 1/8” ¼” drill bit, 5/32” hex key, 7/16” wrench, pliers, adjustable wrench.



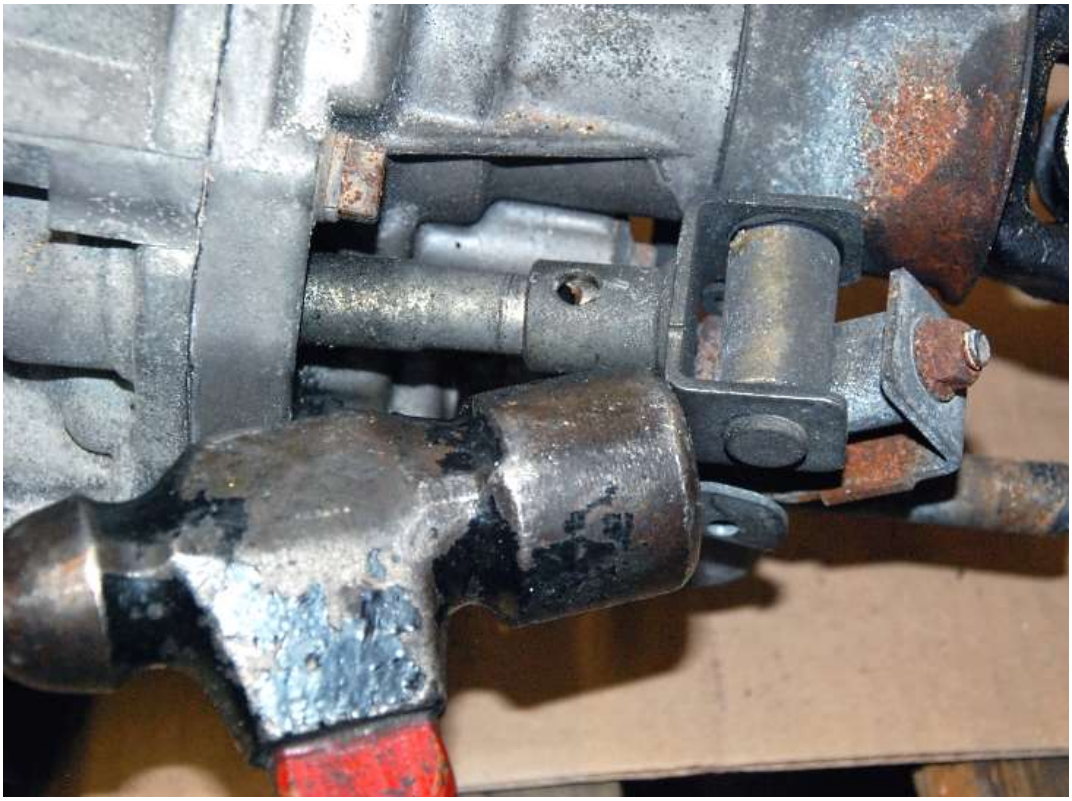
The shift linkage bar needs to be removed from the transmission.



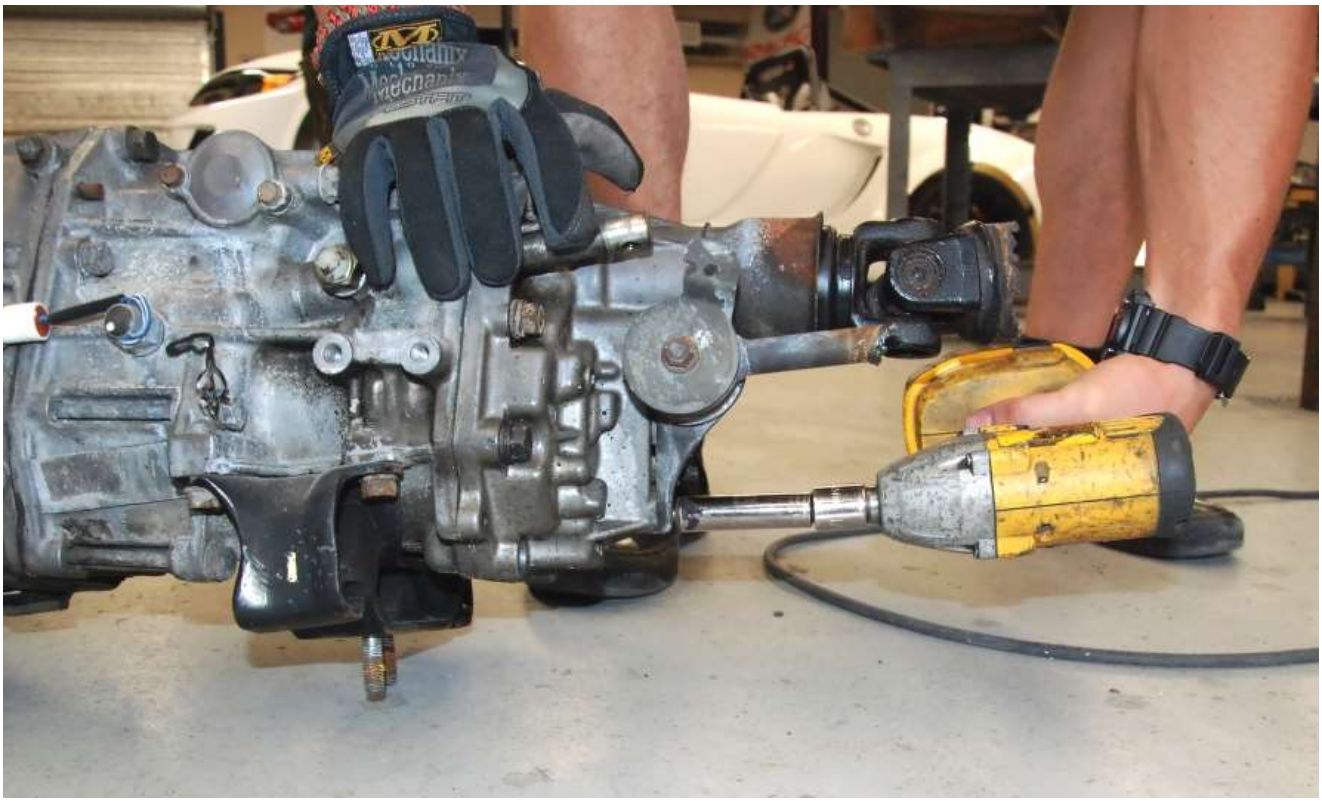
Using a punch and hammer, hammer out the center pin that holds the spring clip tight.



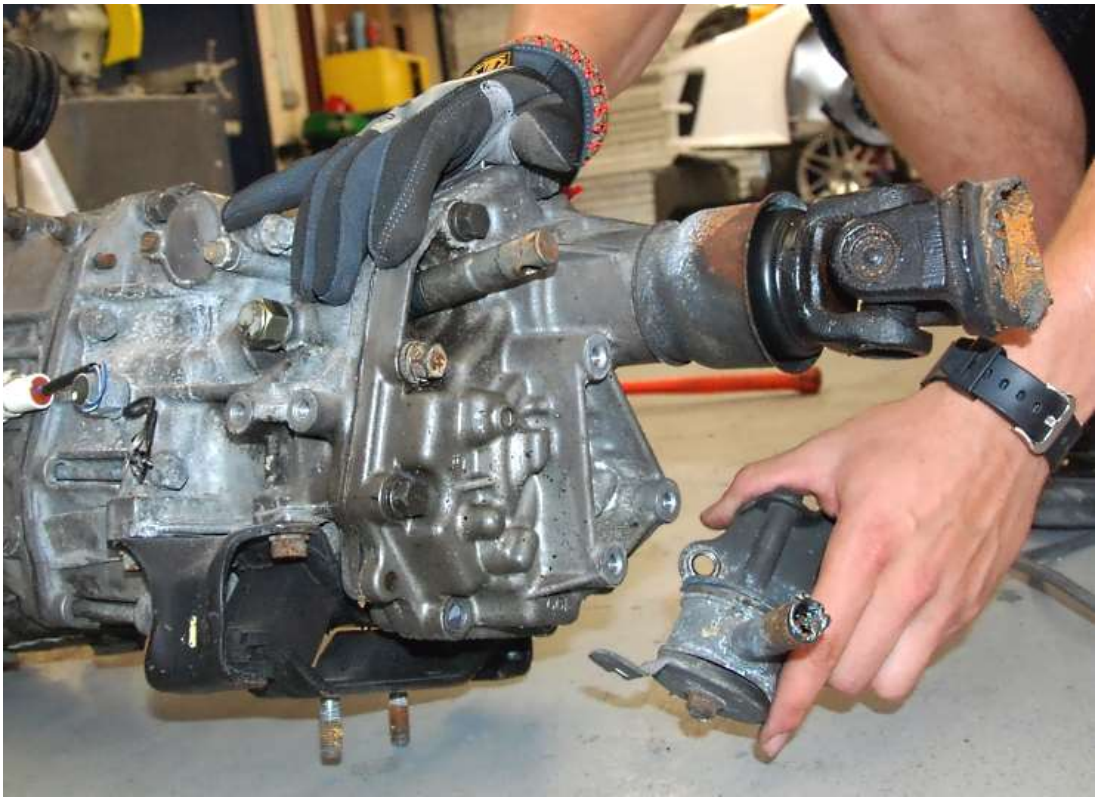
Pull the center pin down and out of the spring pin then tap the pin out with a punch.



Tap the linkage off the transmission. The first section of linkage will be re-used.



Remove the shift linkage bushing from the rear of the transaxle, save the bolts as they will be used to hold the new shift linkage in place.

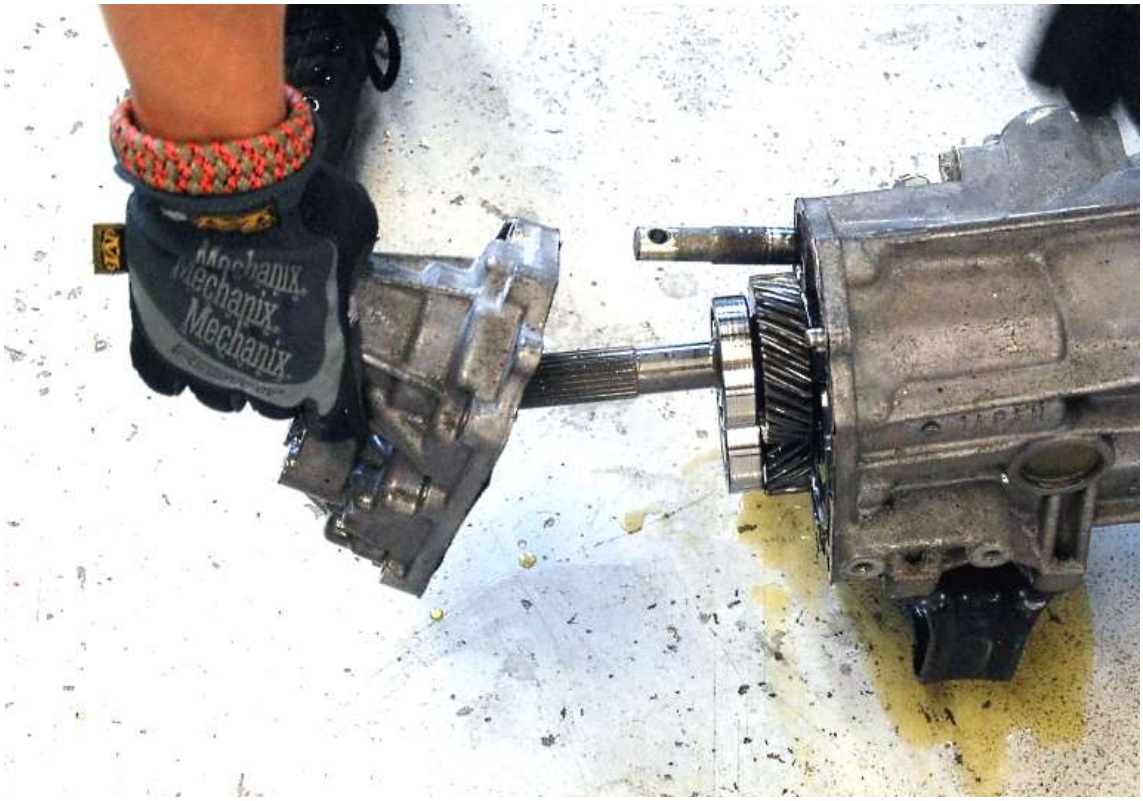


Discard what is left of the shift linkage support bushing.

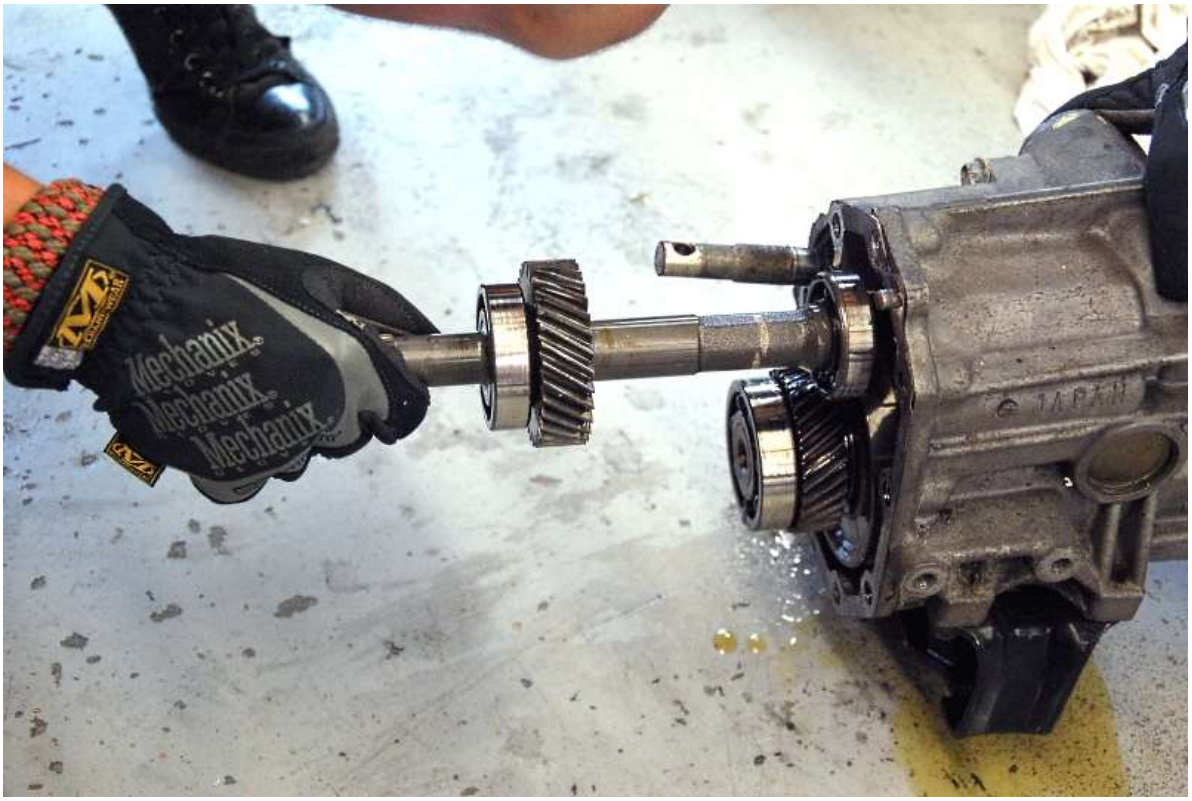
Remove the bolts that hold the rear tail shaft housing on the transmission.

Tap on the housing to get it to pop loose.

Slide the housing rearward to get it to come free of the internal bearings and shafts.

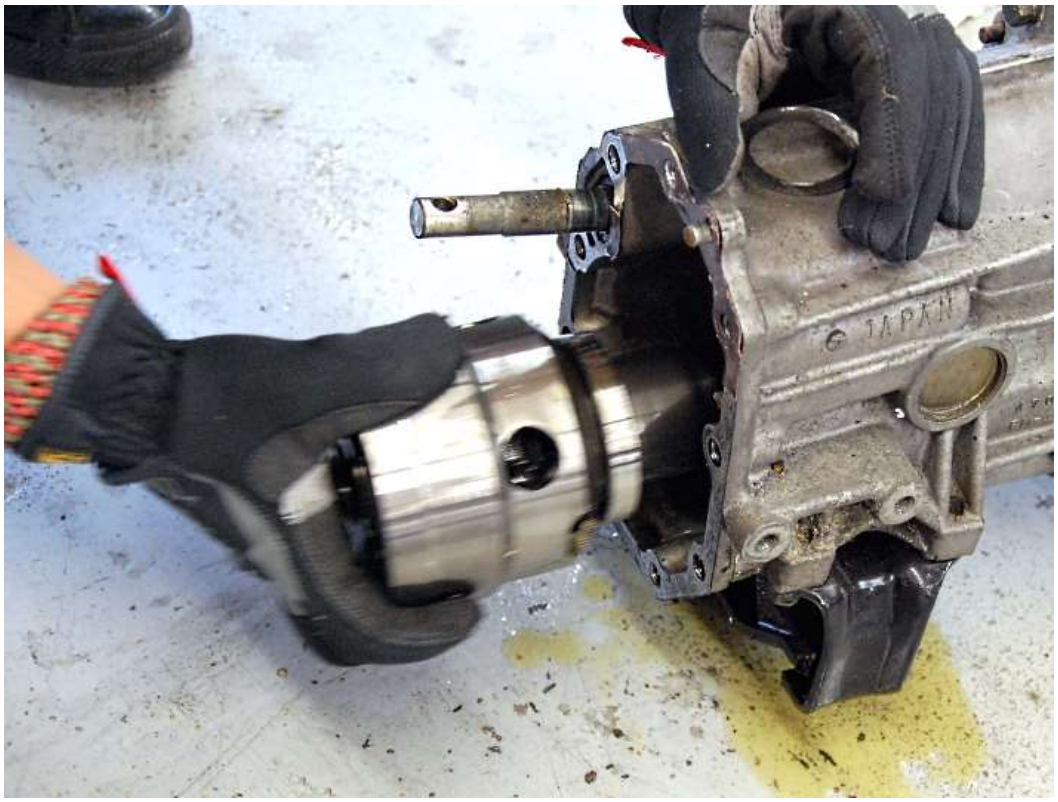


Remove the tail housing, it will not be re-used.



Pull the upper shaft out of the back of the transaxle; it should come free with just a little side to side wiggling.

Pull the lower shaft out of the center differential.



Pull the center differential out of the transaxle. It is heavy and will be slippery so make sure you have a firm grip on it. It will not be used.

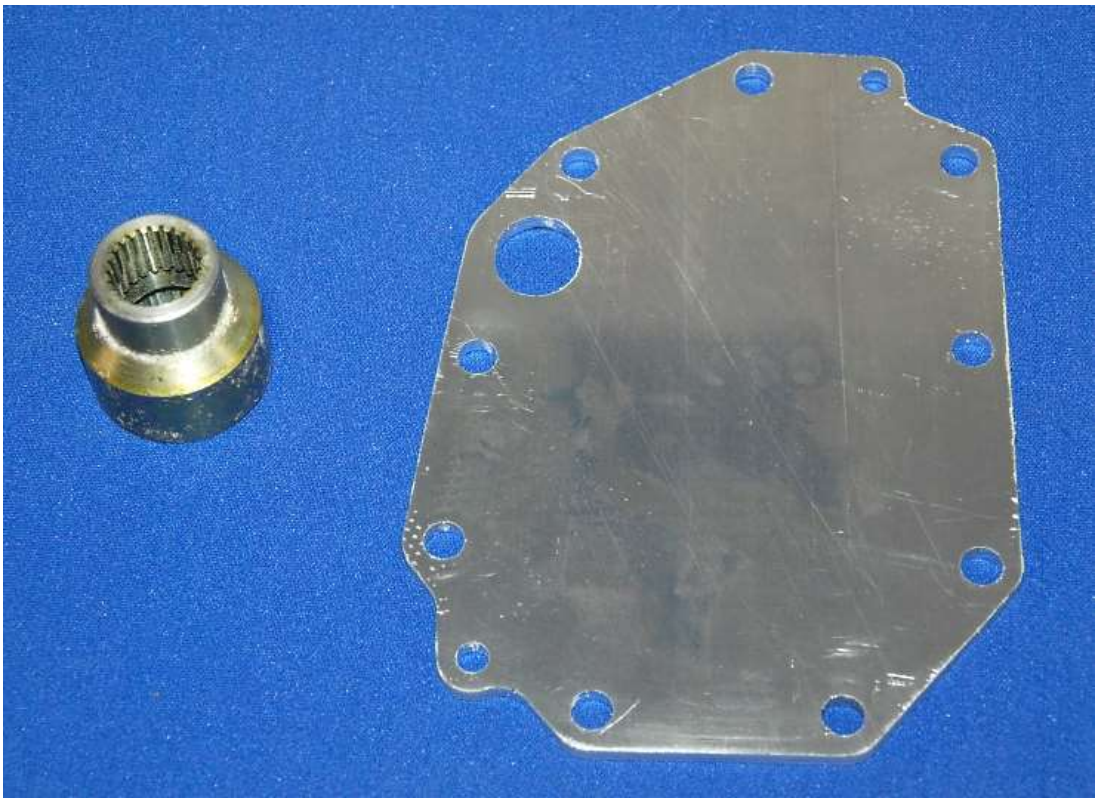
Behind the differential is a large nut that must be removed.

Remove the transmission nut either with an impact gun or with the transmission in gear and still attached to the engine. If you do not have the transmission attached to the engine wait until the engine is in the chassis and the CV axles are installed.

Save the transmission nut as it will be re-used.

Remove the outer bearing and splined collar, they will not be re-used.

Remove the inner thrust bearing, it will also not be needed.



Locate the parts to convert the transaxle to 2WD, they consist of the conversion adapter and the rear block off plate.

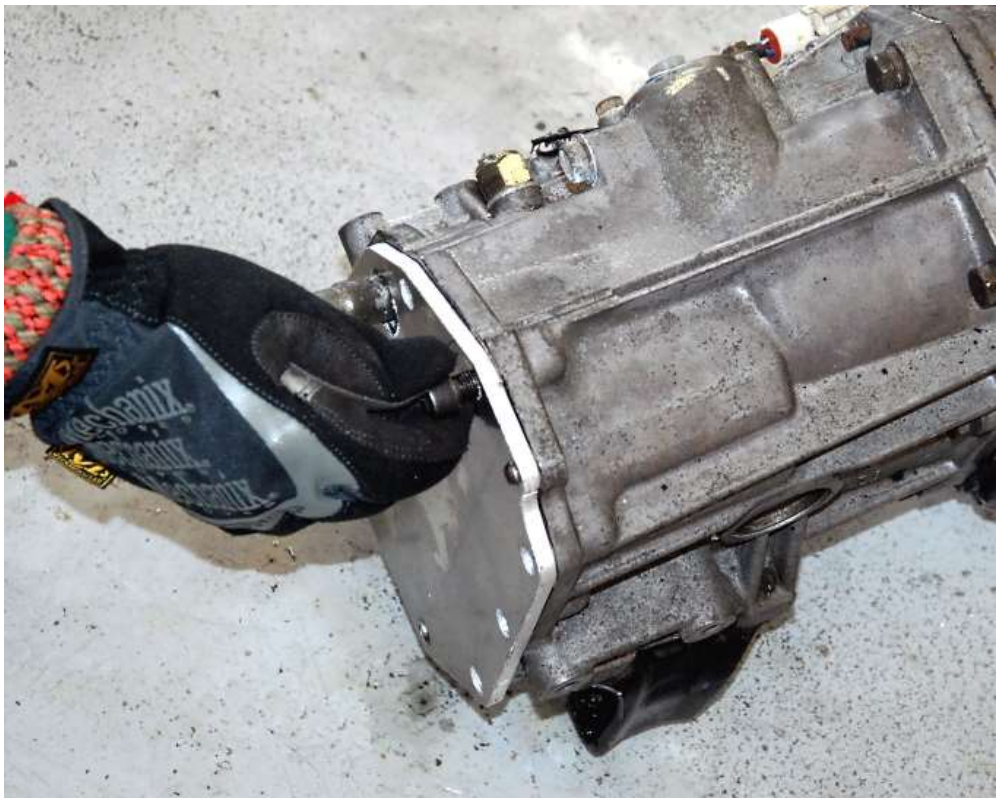
Slide the collar into the transmission; it may take some turning to get it to line up with both sets of splines.

Slide the collar on far enough to expose the mounting threads for the transmission nut.

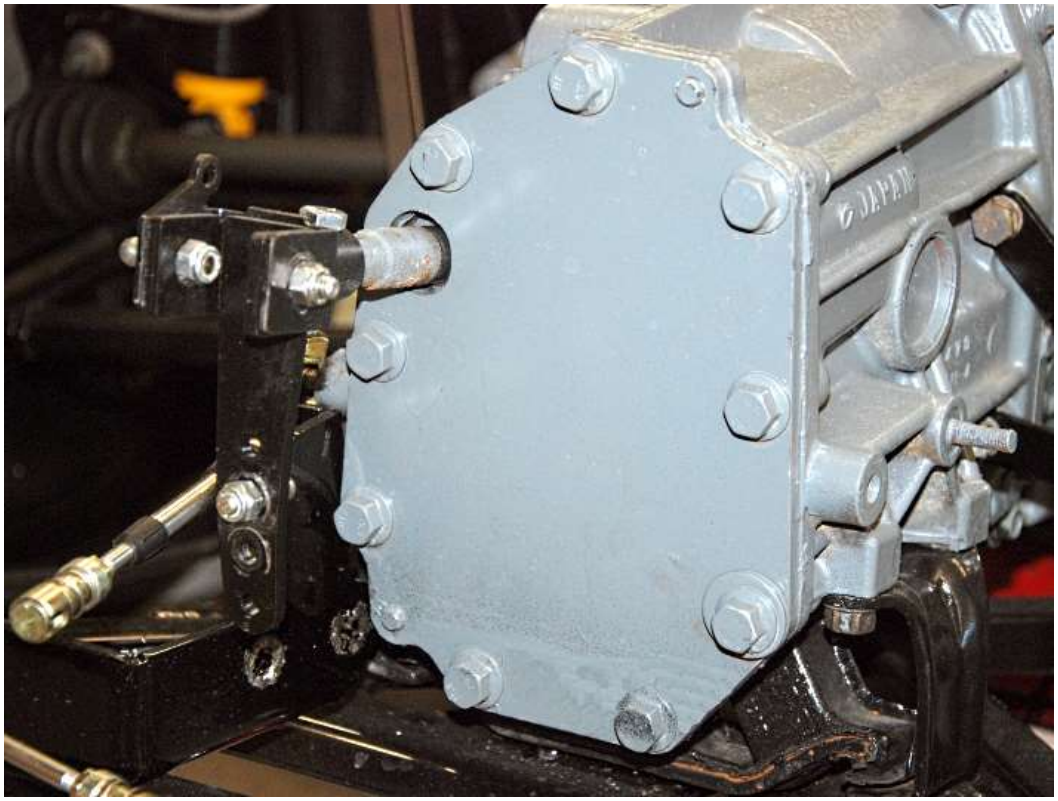
Re-install the transmission nut and the washer.

Tighten the transmission nut and use a punch or chisel to push the safety dimples back into place so the nut can’t loosen.

Apply a thin layer of RTV to the clean surface on the back of the transmission.



Install the rear block-off plate using the provided hardware.



Tighten the bolts using a crossing pattern.

Cable shift Brackets

Cable shift Transmission bracket

- Cable shift kit

The shift cable mount bolts to the transmission using OEM hardware on the threaded mounting boss at the rear of the case.

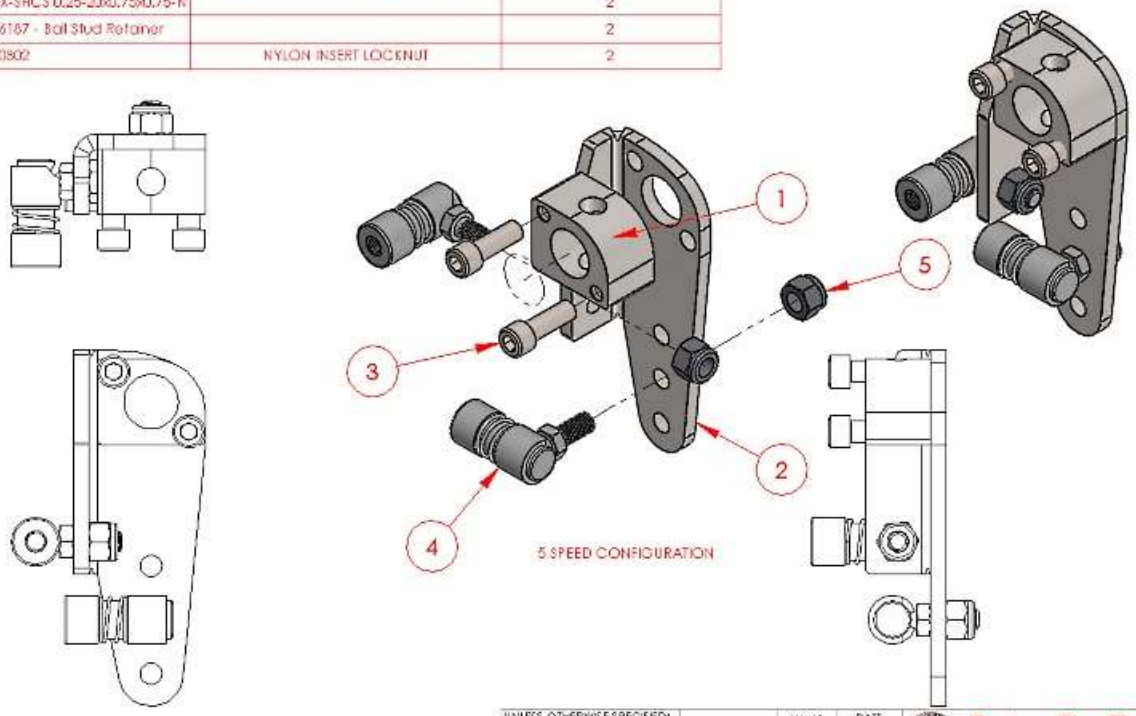
Bolt the bracket in position with the cable mount sticking up above the mount and the side cable mount lining up with the linkage shaft.

Shifter Linkage

🛠 $^{3}/_{16}$" hex key, $^{3}/_{8}$", $^{7}/_{16}$" wrenches, hammer, lock-tite.

ITEM NO.	PART NUMBER	DESCRIPTION	5 SPEED CONFIGURATION/QTY.
1	80847	TRANSAXLE SHIFTER MOUNT CUBE	1
2	80872	TRANSAXLE CABLE SHIFT MOUNT PLATE	1
3	HX-SHCS 0.25-20x0.75x0.75-N		2
4	26187 - Ball Stud Retainer		2
5	10802	NYLON INSERT LOCKNUT	2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	9/23/14	



		NAME	DATE
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN INCHES TOLERANCES TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	JI	8/8/14
	COMMENTS		
MATERIAL: STEEL			
FINISH			
APPLICATION: SUBARU TRANSAXLE	PRINTED: 1/14/2016		

818

USED ON

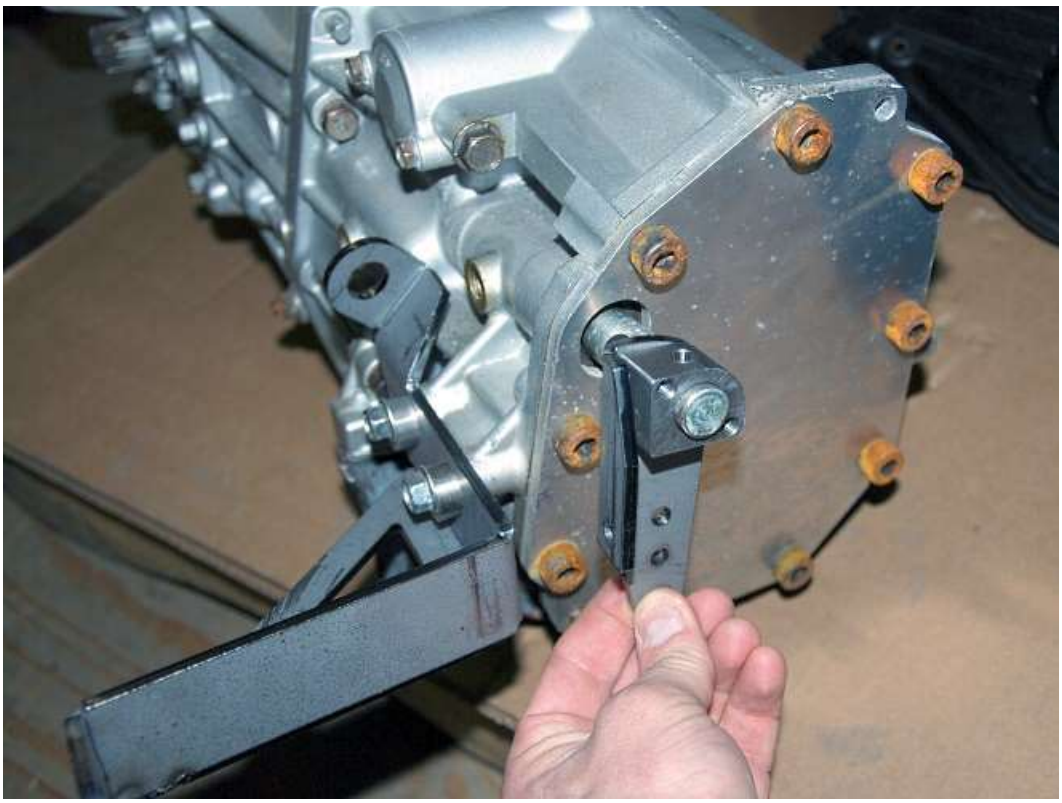
Factory Five Racing, Inc.

TITLE: TRANSAXLE SHIFTER LINKAGE

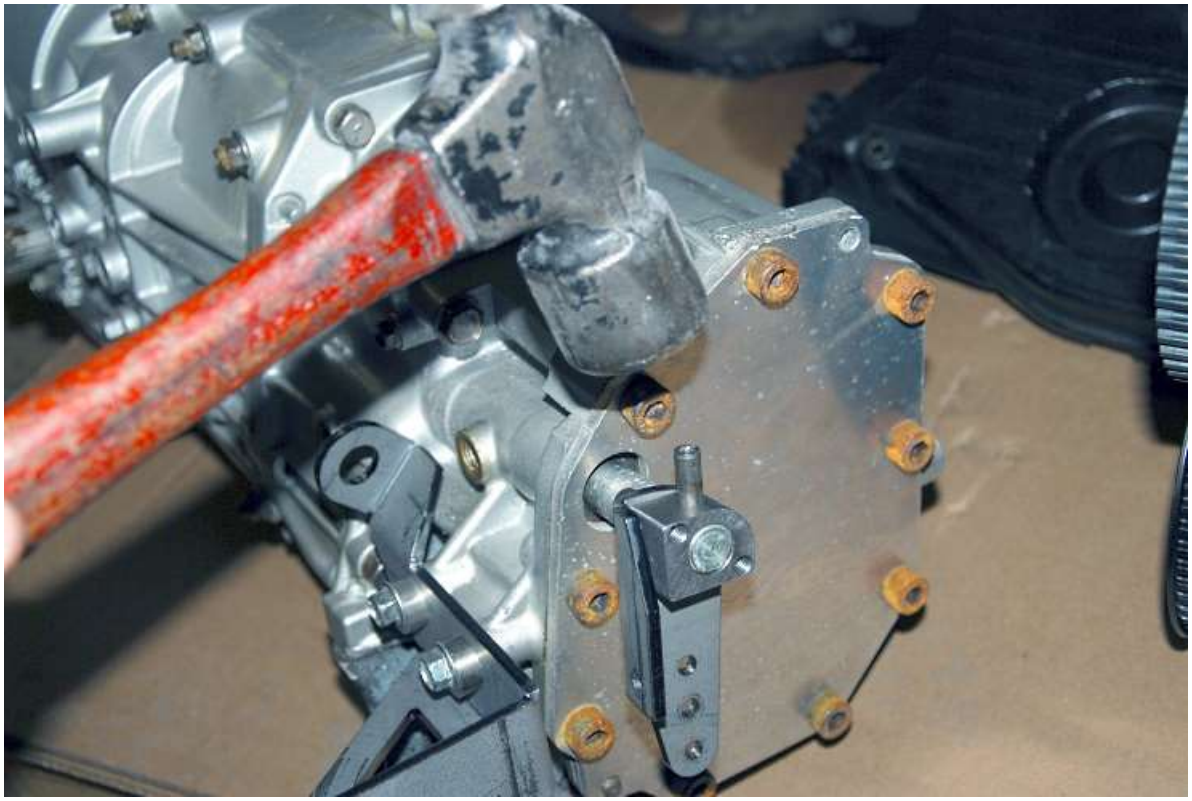
SIZE	DWG. NO.	REV
A	80873	A

SCALE: 1:1.5 | WEIGHT: | SHEET 1 OF 2

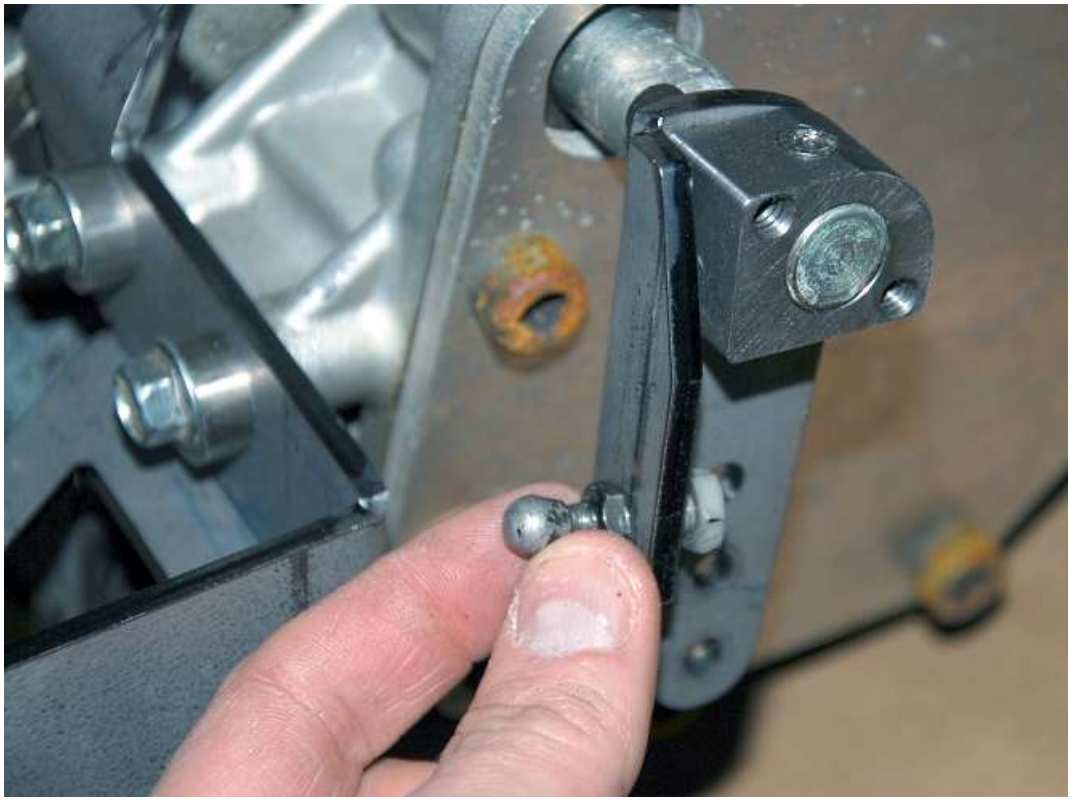
Attach the bracket to the cube as shown using the ¼" x 0.75" socket head screws, lock-tite and $^{3}/_{16}$" hex key.



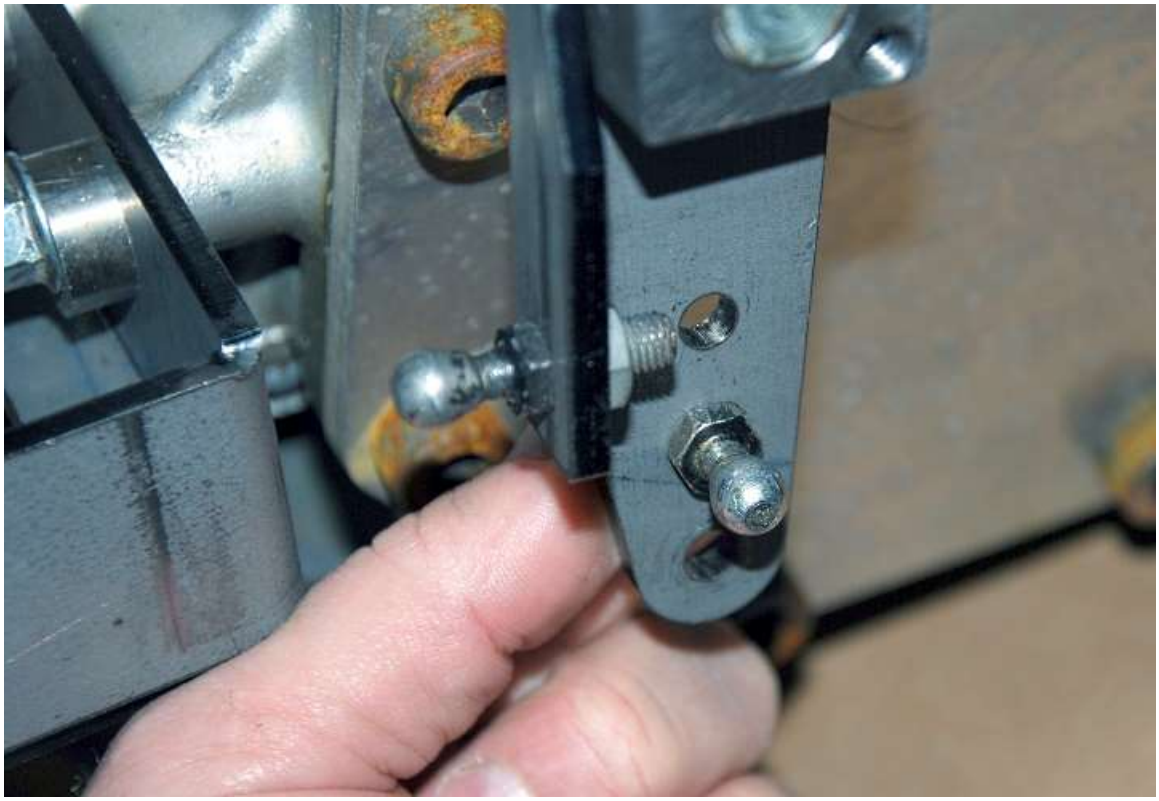
Slide the cube assembly bracket first onto the linkage shaft.



Install the original spring pins using a hammer.

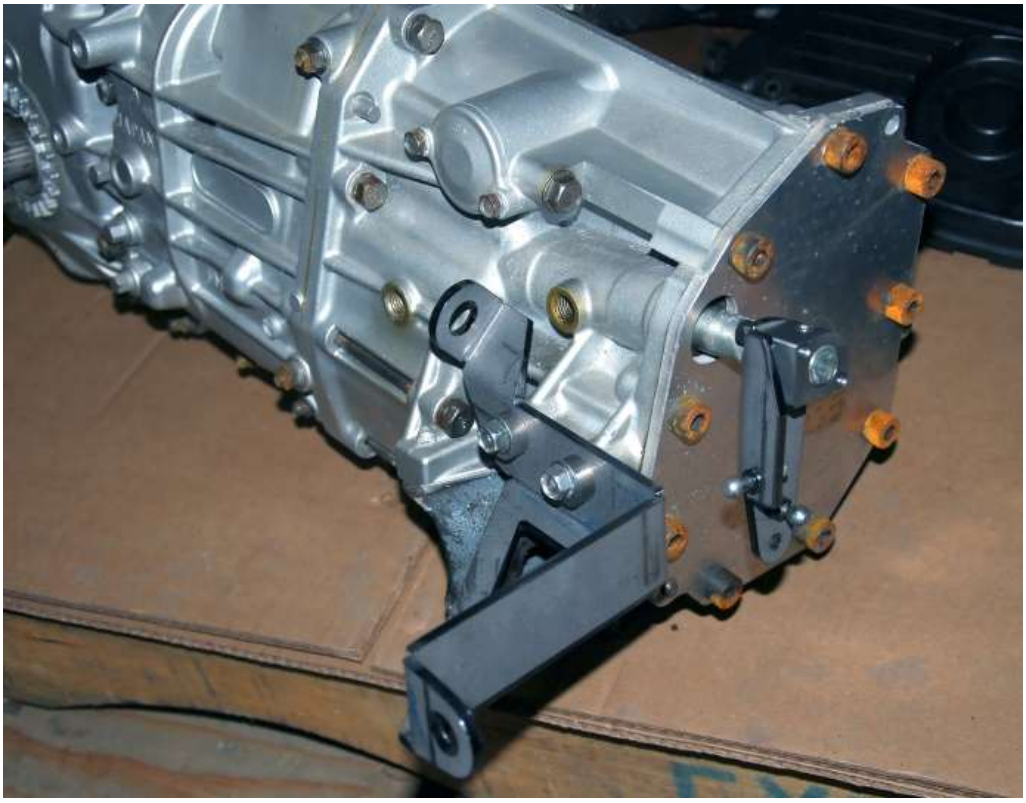


Attach the side ball stud for the shifter cable as shown in the picture using $^{3}/_{8}$" and $^{7}/_{16}$" wrenches.



Attach the rear ball stud for the shifter cable in the center hole as shown in the picture using $^{3}/_{8}$" and $^{7}/_{16}$" wrenches.

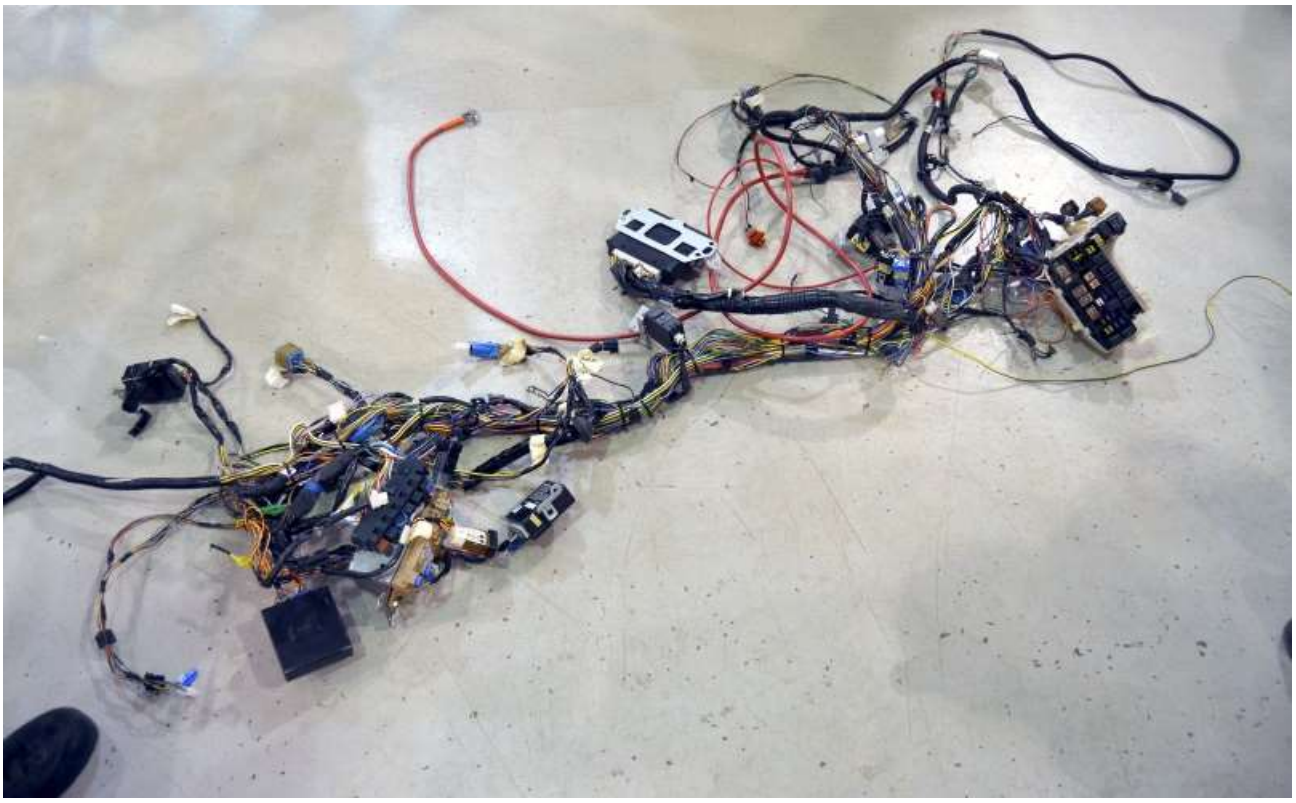
- Other hole locations have been provided that will shorten the shifter throw if desired.



Finished assembly.

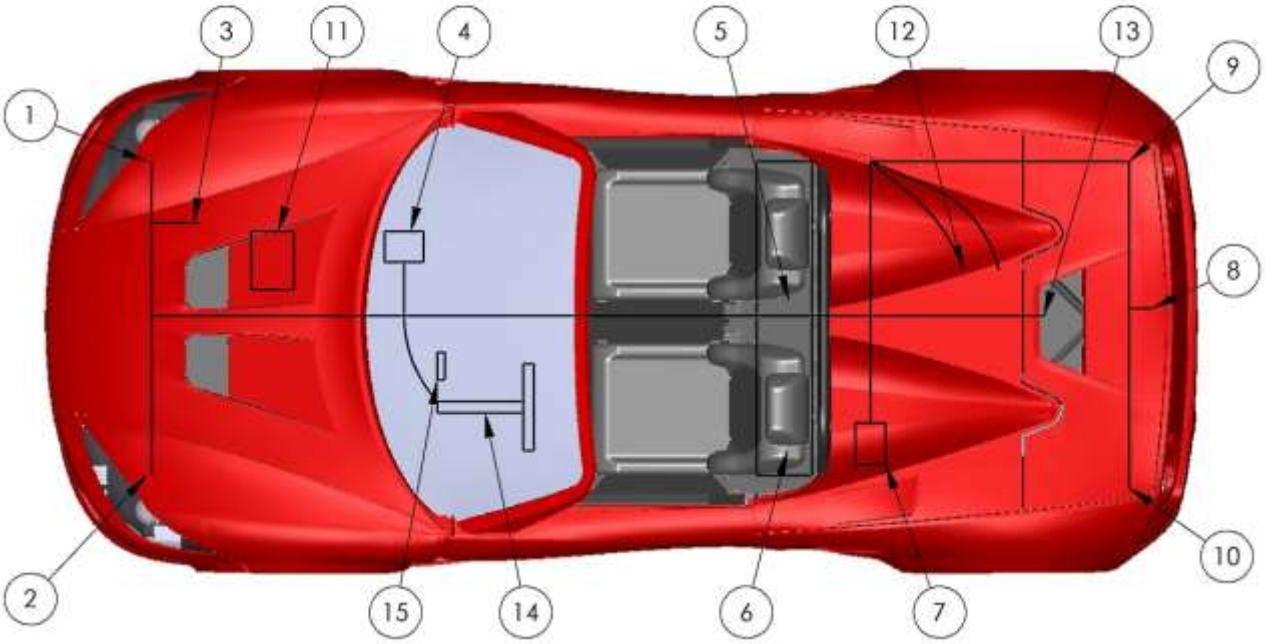
Wiring harness

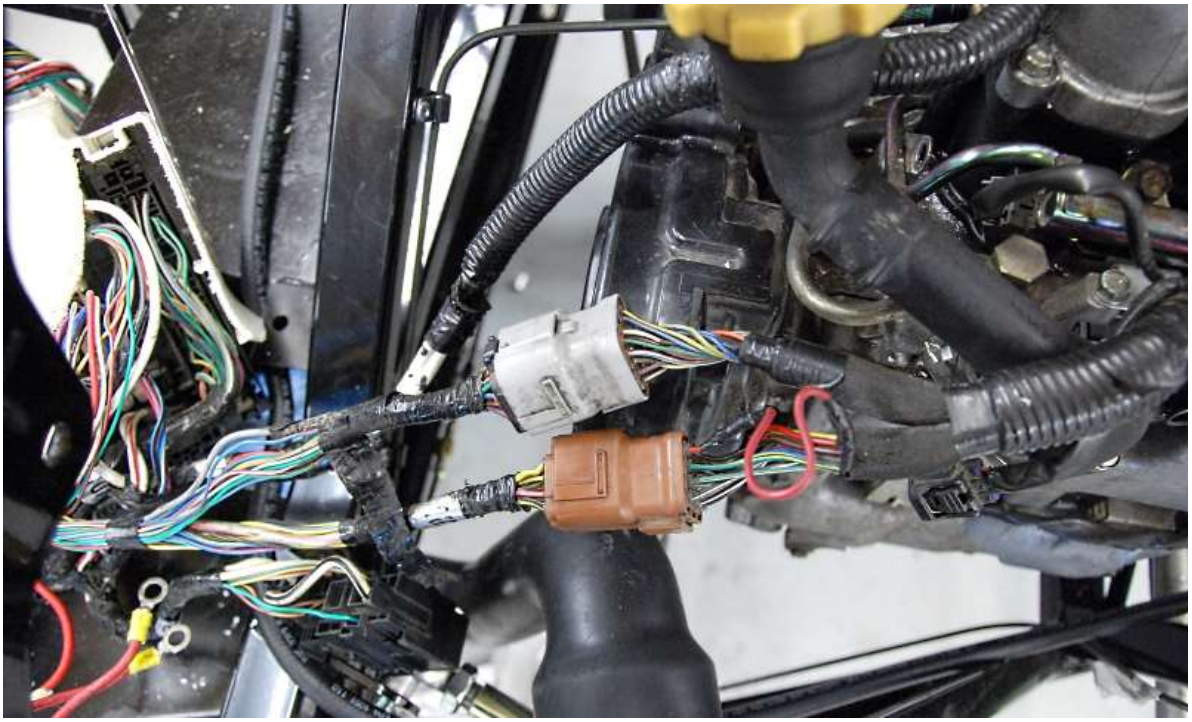
🚘 Subaru wiring harness, insulated clip hardware, wiring components.
🛠 Wire cutters, electrical tape, soldering iron, solder.



✋ If you unwrap the OEM harness, some of the wire extensions(i.e. starter wire, left headlight) may not be necessary depending on the year of the donor. The wiring harness double backs on itself in some places.

1	Right headlight/turn signal	13	Engine wiring
2	Left headlight/turn signal	14	Steering Column
3	Electric fan plug	15	OBD 2 Port
4	Fuse panel		
5	Fuel pump plug		
6	Fuel level plug		
7	Fuse panel 2		
8	License plate light		
9	Right tail lights		
10	Left Tail lights		
11	Battery		
12	Speed and O2 sensors		





Starting at the engine plug, separate the main wiring harness into the two big plugs on the engine harness.

Connect the other connectors and on the side of the engine.

Connect the alternator plug.

Connect the alternator wires to the alternator post.

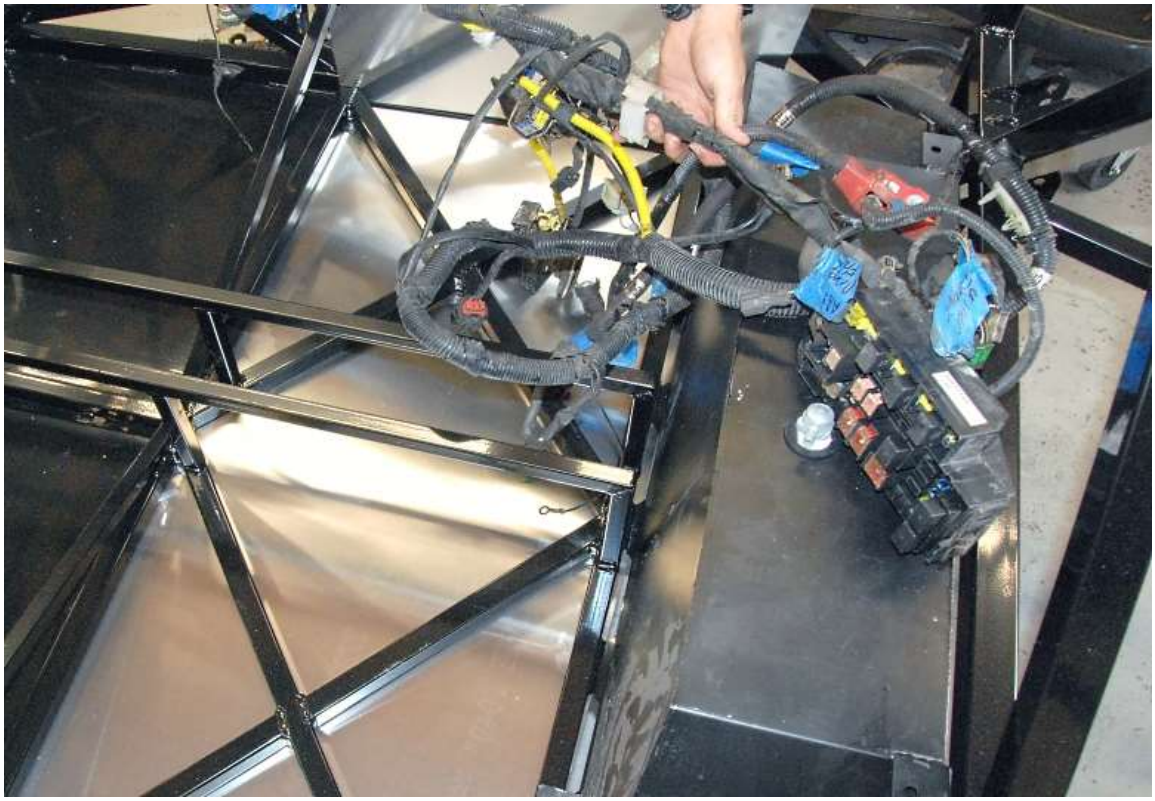
Connect the starter wires.

Pull the control boxes and fuse panels through the bulkhead and lay them out on the gas tank.

Fuel tank connectors

The Subaru used two fuel level senders. In order to work correctly both must be connected.

Connect the Subaru plugs to the connectors on the fuel level and fuel pump.

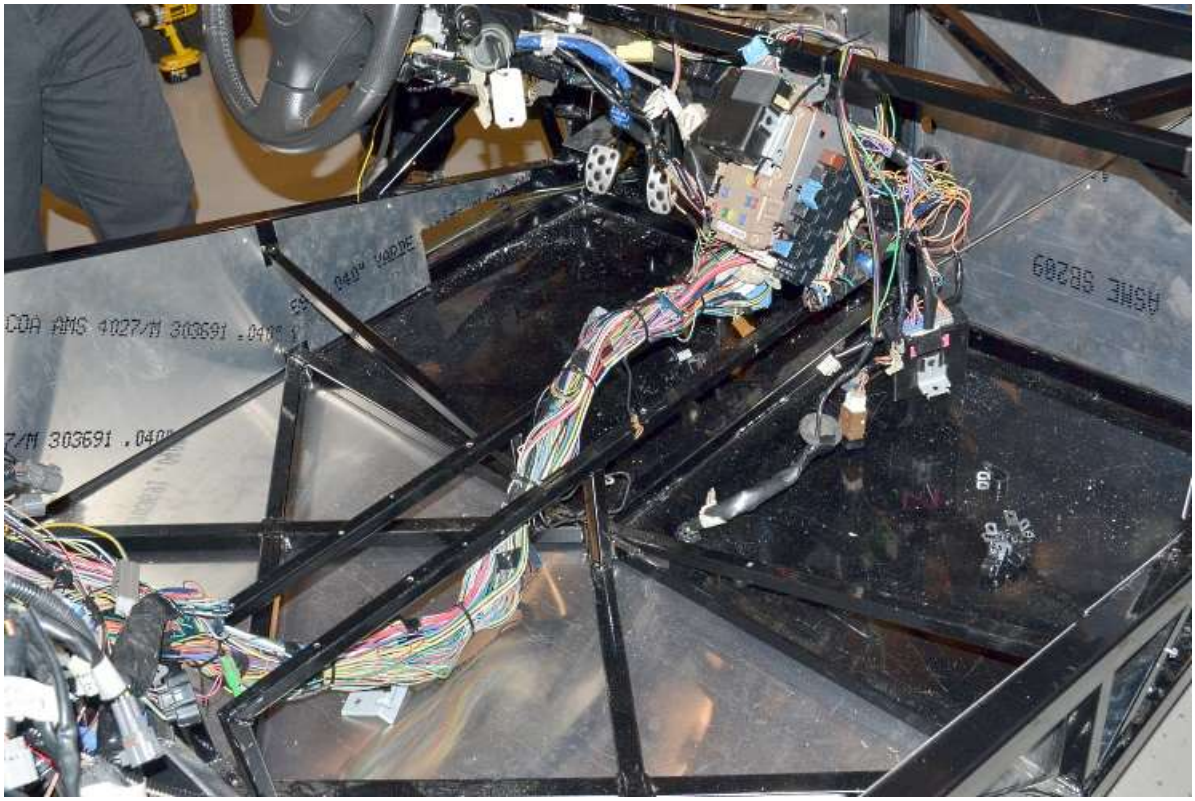


The rear fuse panel, ECM, and near-by small control boxes mount in the area above the gas tank. Leave them sitting un-mounted for now until the firewall is positioned.

The instrument cluster, control stalks, ignition switch, brake light switch and throttle pedal (if later model) wiring must get run to the front. The second fuse panel will mount at the front of the tunnel.

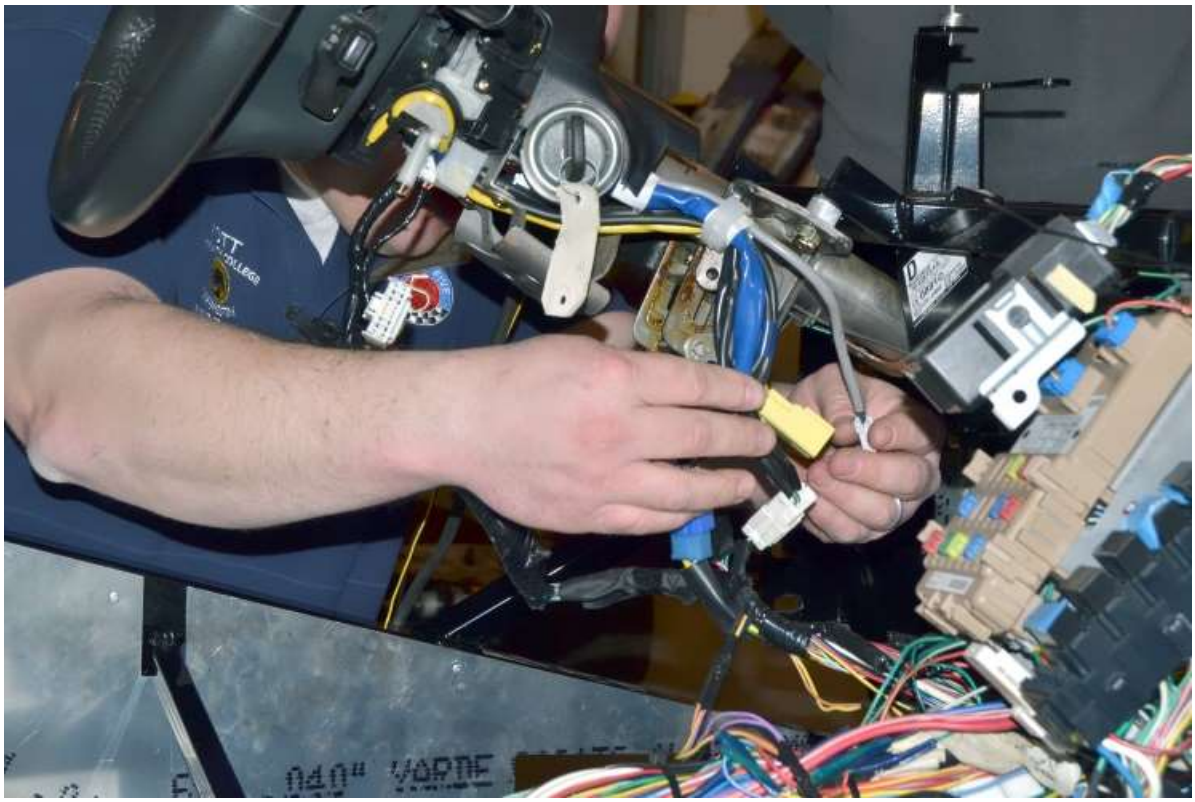
Main harness

Electrical components
Soldering iron, solder, electrical tape, wire stripper, wire cutter.
Splice one wire at a time to avoid confusion.



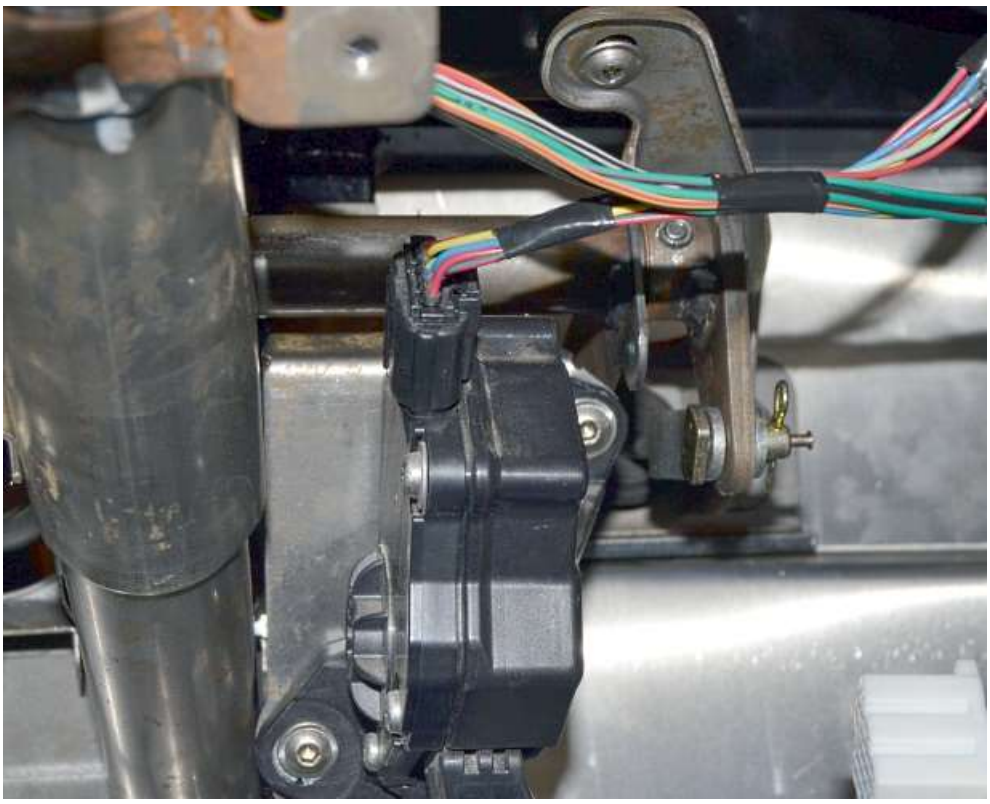
Route the front section of the harness along the transmission tunnel.

Steering column

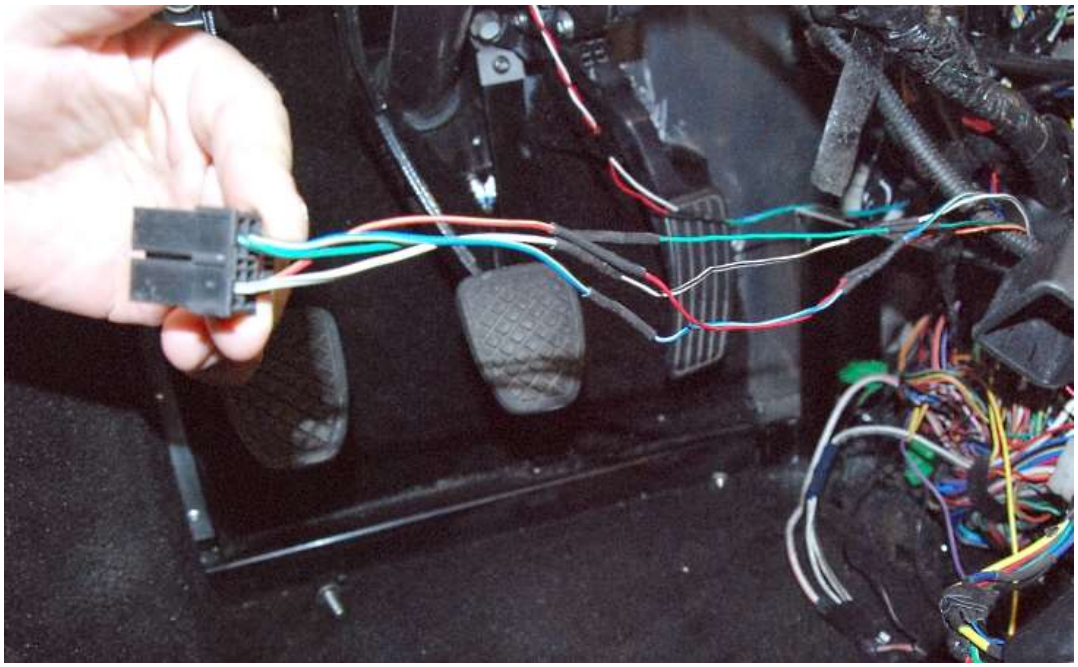


Connect the steering column connectors.

PEDALBOX



If your car has a drive by wire accelerator pedal, don't forget the plug as well.



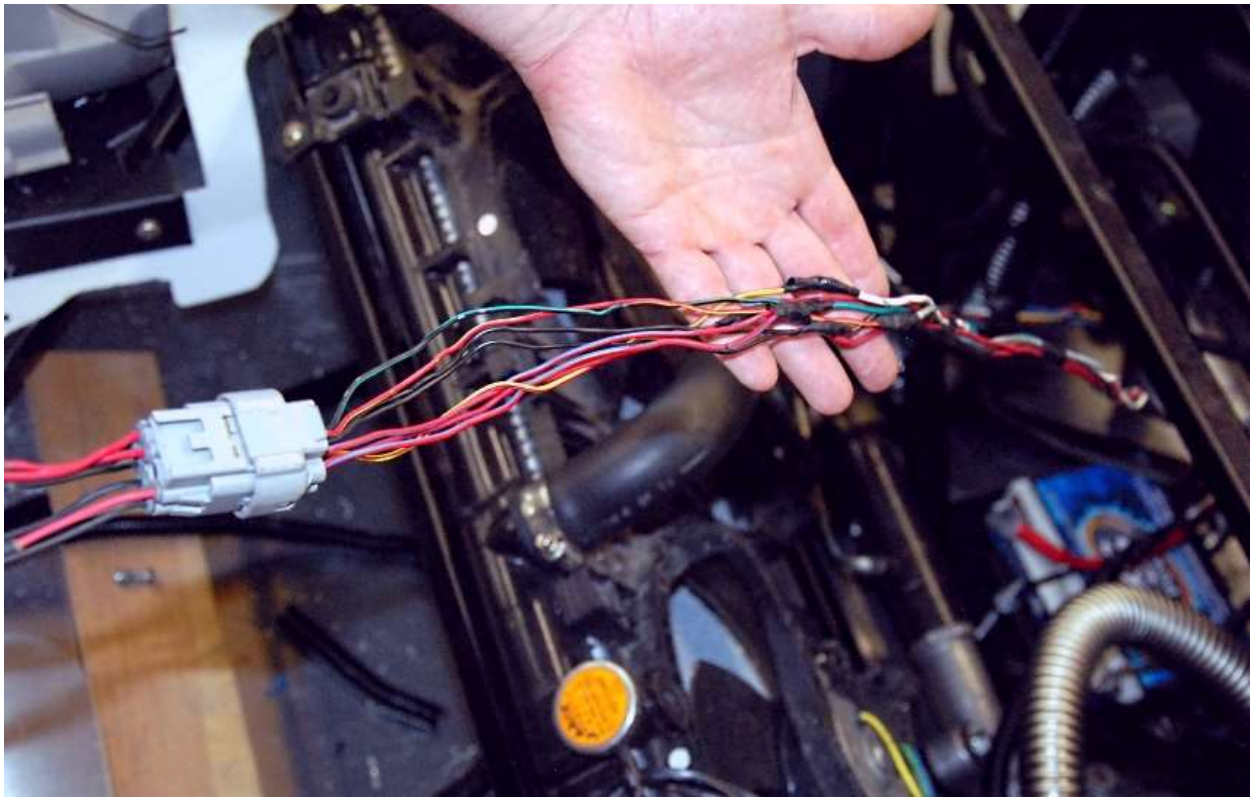
Splice 7 inches of extension wire to the clutch and brake light switch plugs.

Plug in the clutch and brake light switches.

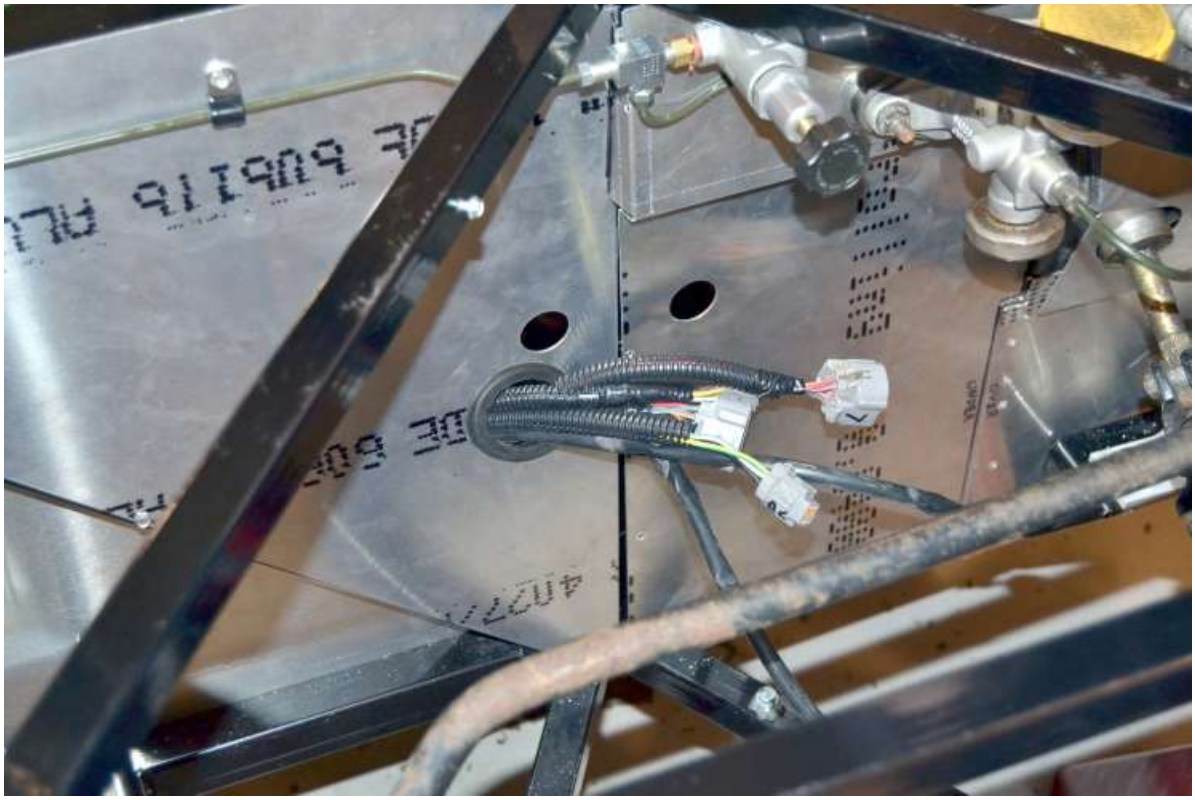
Headlight wires

Electrical components
Soldering iron, solder, electrical tape, wire stripper, wire cutter.
Splice one wire at a time to avoid confusion.

There are 8 wires for each plug; left and right. The 2 black wires can be spliced together requiring 7 wires per plug extension. The left side plug needs 90 inches of extension. The right side needs 25 inches of extension. From the main light plug cut the Subaru low beam light wires and splice in the low beam light provided in the kit.
For the 2002-03 Subaru splice in the high beam light plug provided. For 2004-07 Subaru, the high beam connector and bulb are factory Subaru.
Splice in the included turn signal connector and use the socket and bulb provided.



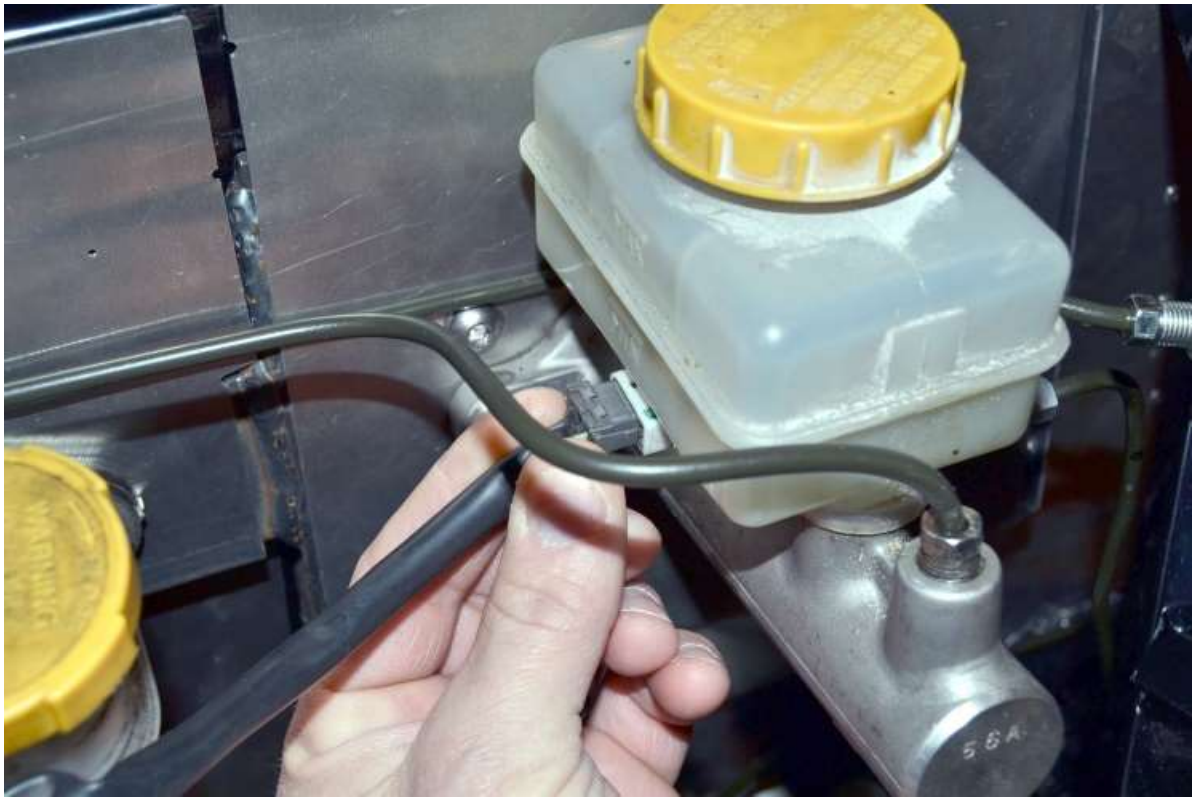
Splice extension wires between the main harness and the main light plug. Temporarily connect the light plug end of the splice.



Install the grommet in the front firewall and run the headlight harness out the front firewall.

Split the different headlight wires and run harnesses to the front corners.

Trim the headlight wires to the correct lengths then solder the connector back on.



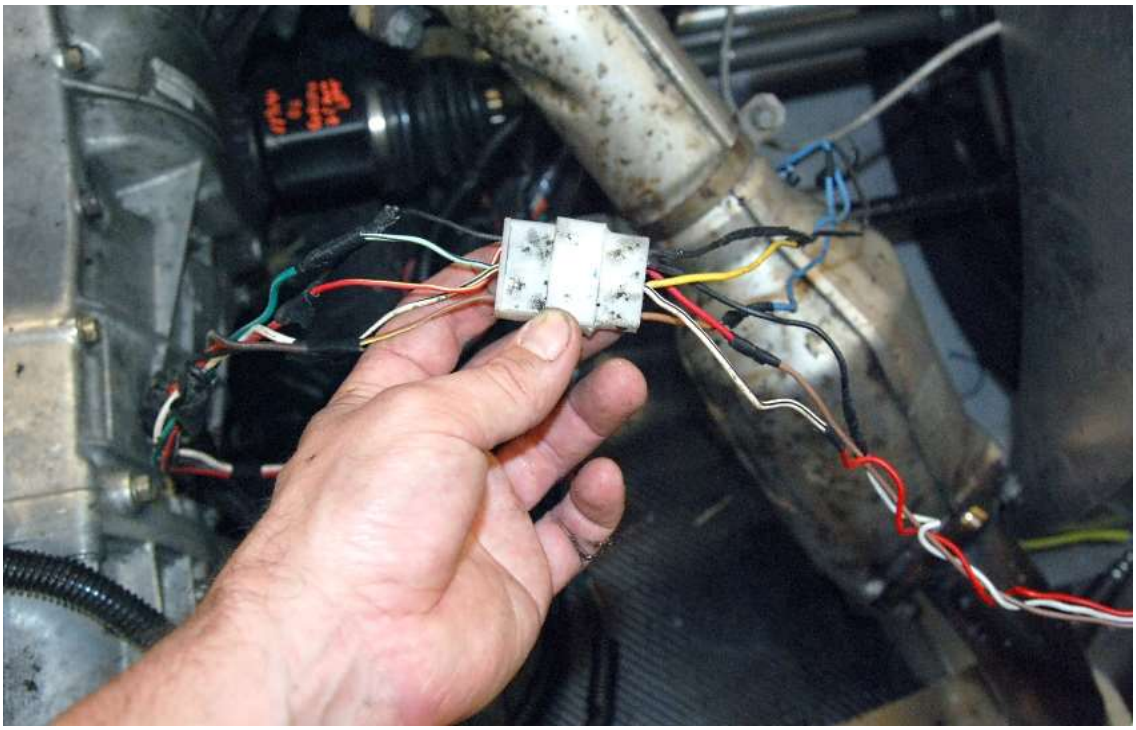
Plug the brake fluid level connector into the master cylinder.

Put wire loom back on the harness.

Taillight wires

🚘 Electrical components
🛠 Soldering iron, solder, electrical tape, wire stripper, wire cutter.
✋ Splice one wire at a time to avoid confusion.

There are 5 wires for each of the plugs; left and right. The left side plug needs 30 inches of extension. The right side needs 55 inches.



Splice extension wires between the main harness and the main taillight plug. Temporarily connect the light plug end of the splice until you run the wires through the firewall to the rear of the car and trim the wires accordingly once in place.

Control boxes/ECM

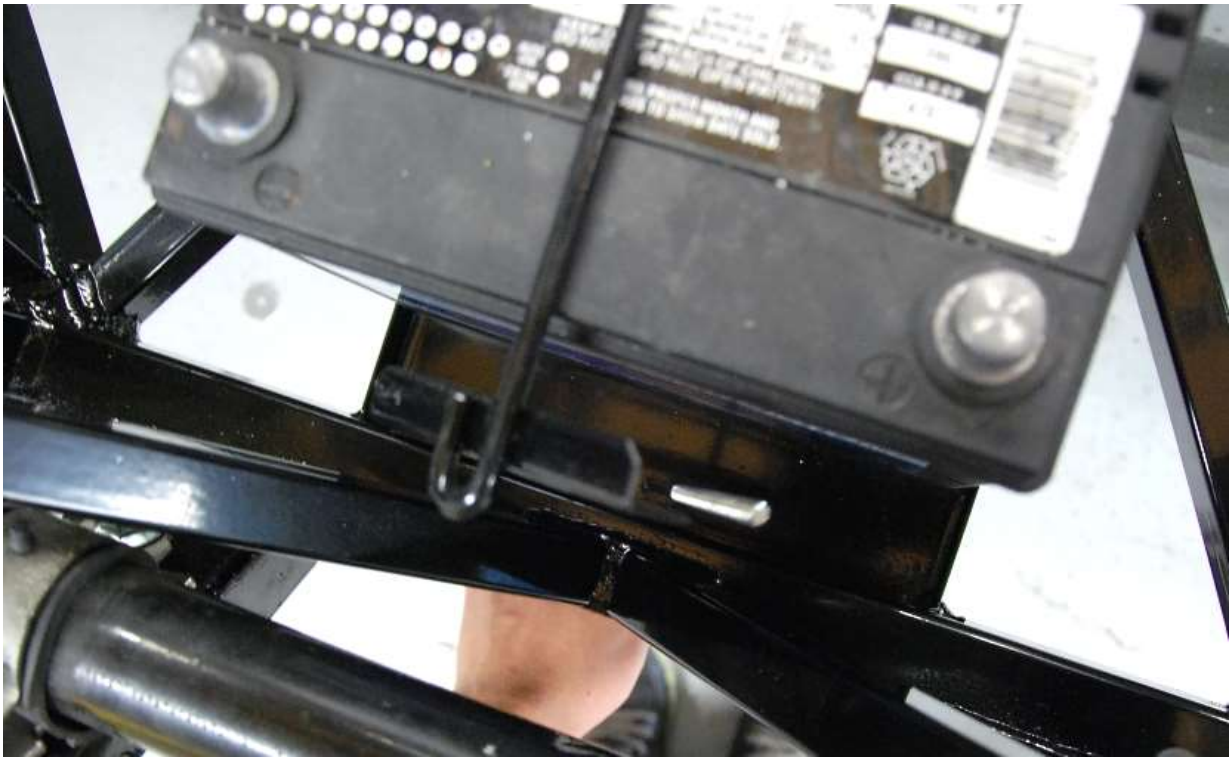
With the harness roughly laid out in place, begin mounting control boxes, fuse panels and the ECM. Mounting boxes low and above the fuel tank puts them in a good spot but test fit the firewall to make sure they will not interfere with mounting.

The ECM mounts in the upper right side corner of the engine compartment.

Battery

🚘 Battery hold down components, battery.
🛠 $^{3}/_{8}$" deep socket, ratchet

The battery mounts to the tray between the front control arms using the long J-bolts and crossbar mount. Slide the J-bolts up from the bottom on either side of the battery.



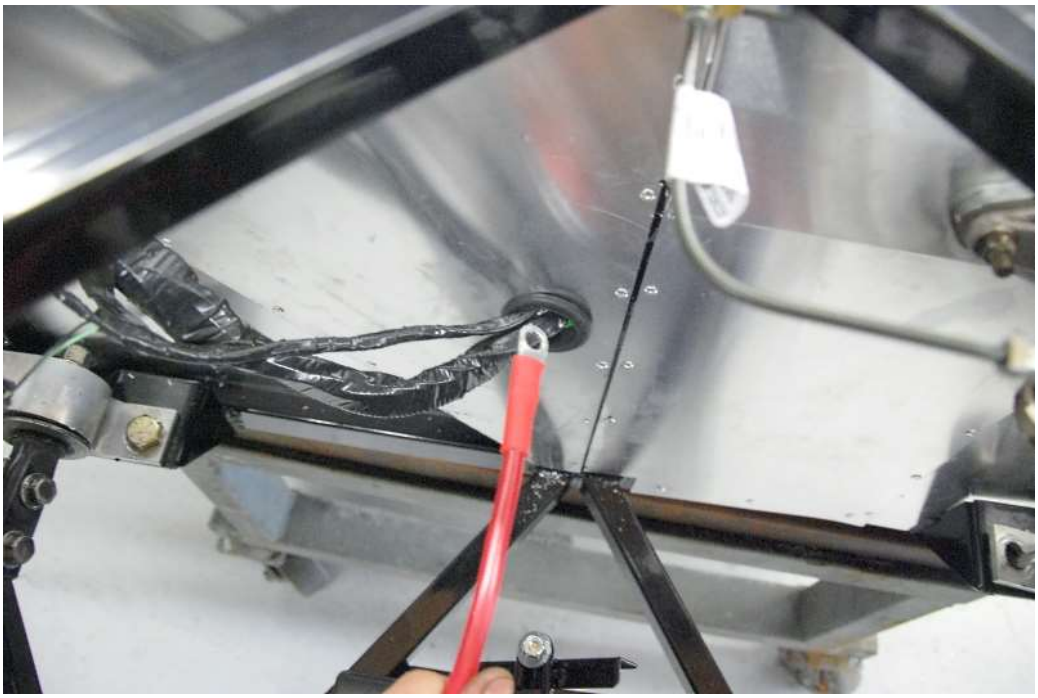
Lay the crossbar in place on top of the battery being careful to stay away from the terminals.

Insert the J-bolts up through the crossbar and install washers and locknuts to hold the battery in place.

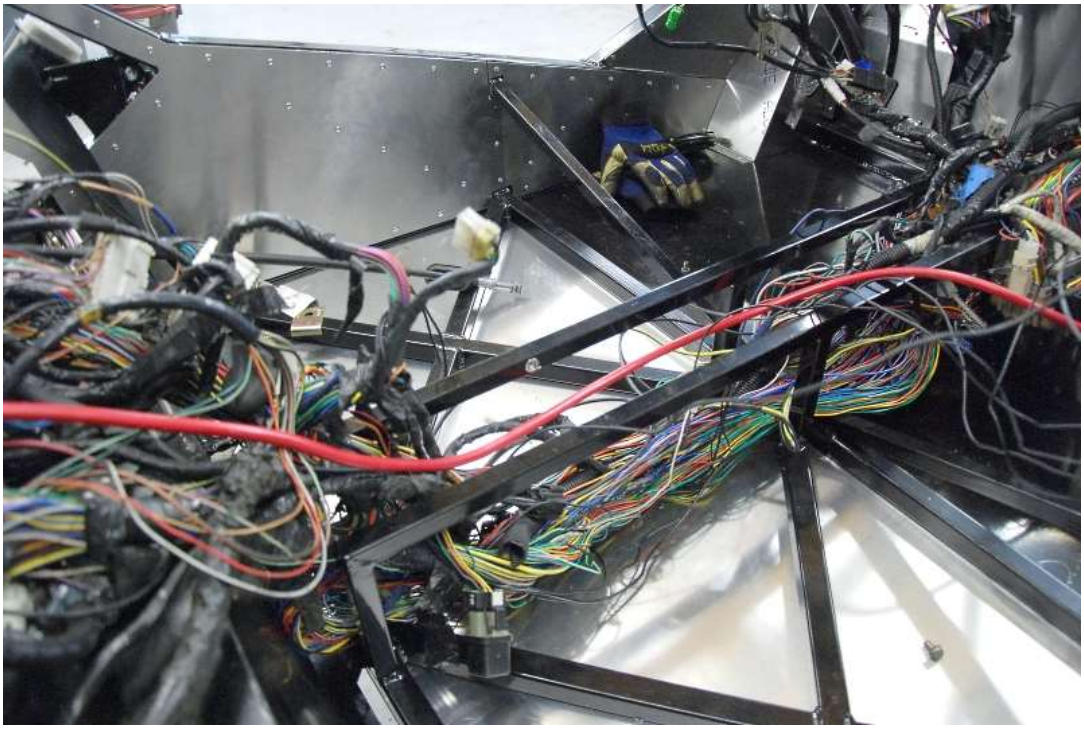
Battery Cables

- Battery hold down components

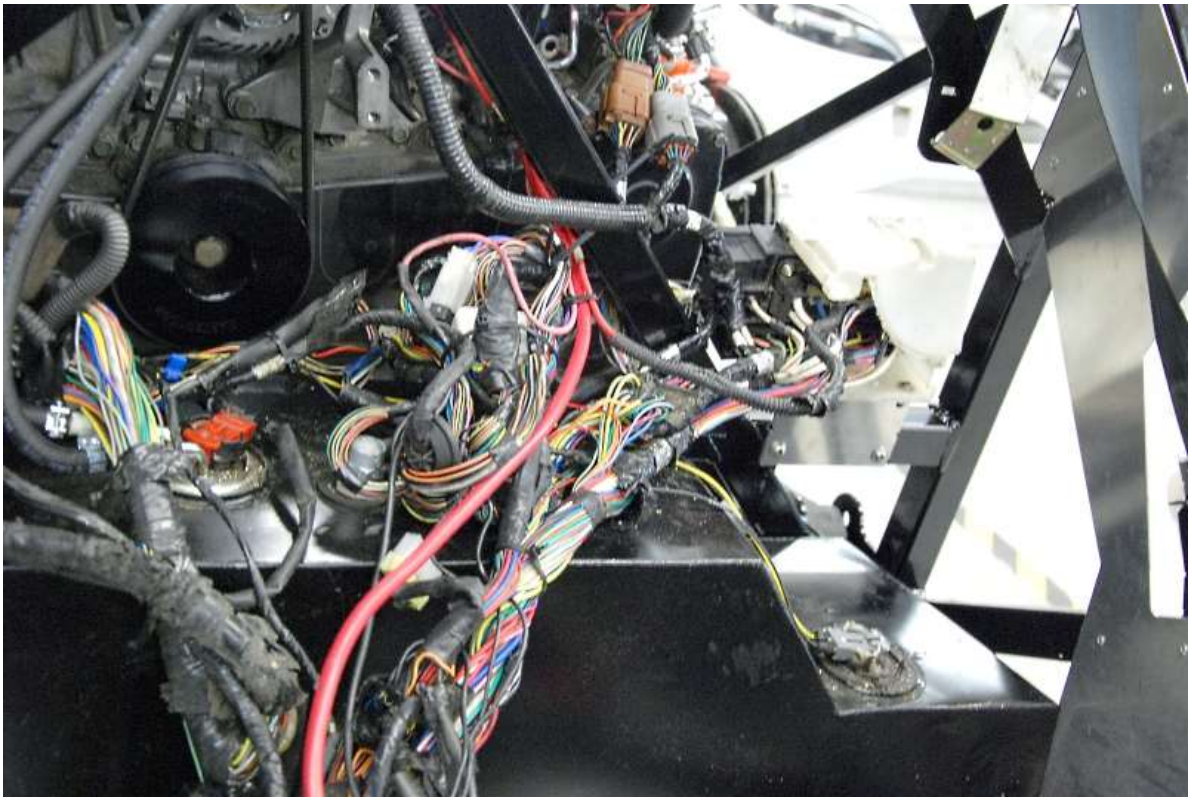
Attach the positive battery cable to the battery.



Run the cable straight back and through the wire harness pass through.



Run the battery cable back along the transmission tunnel along with the wiring harness.



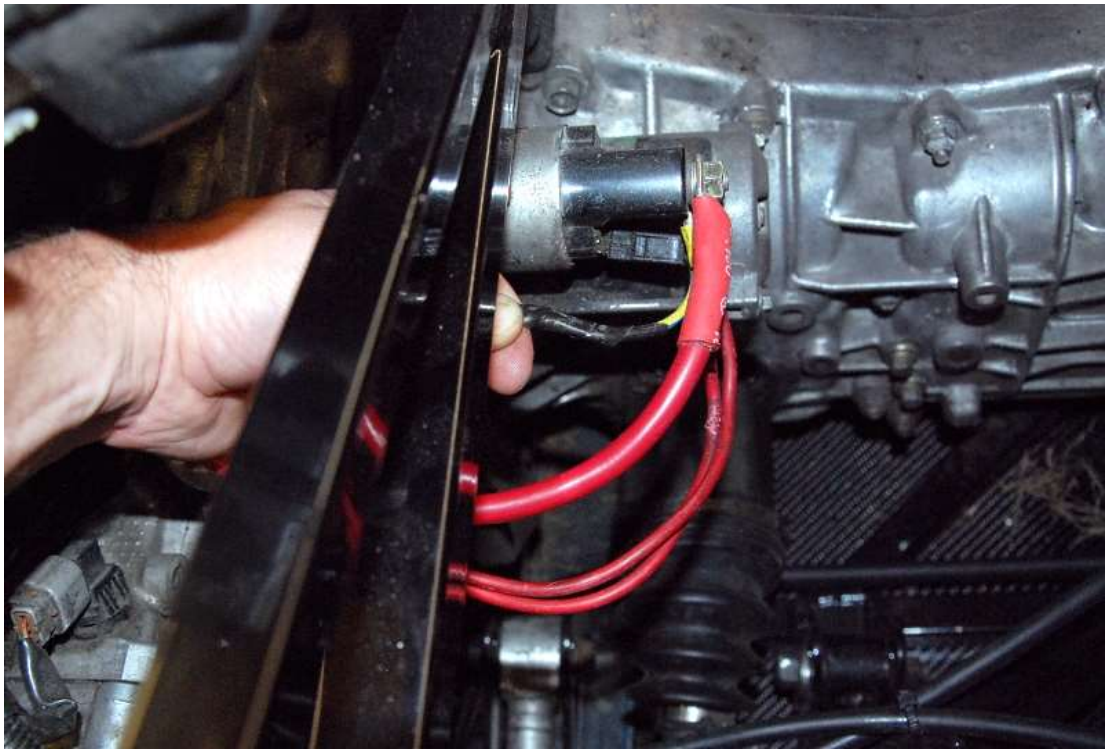
Run the battery cable over the fuel tank and back along the side of the engine.

Zip tie the battery and other starter wires to the hydraulic clutch line.

Attach the battery cable to the starter solenoid.

Starter wire

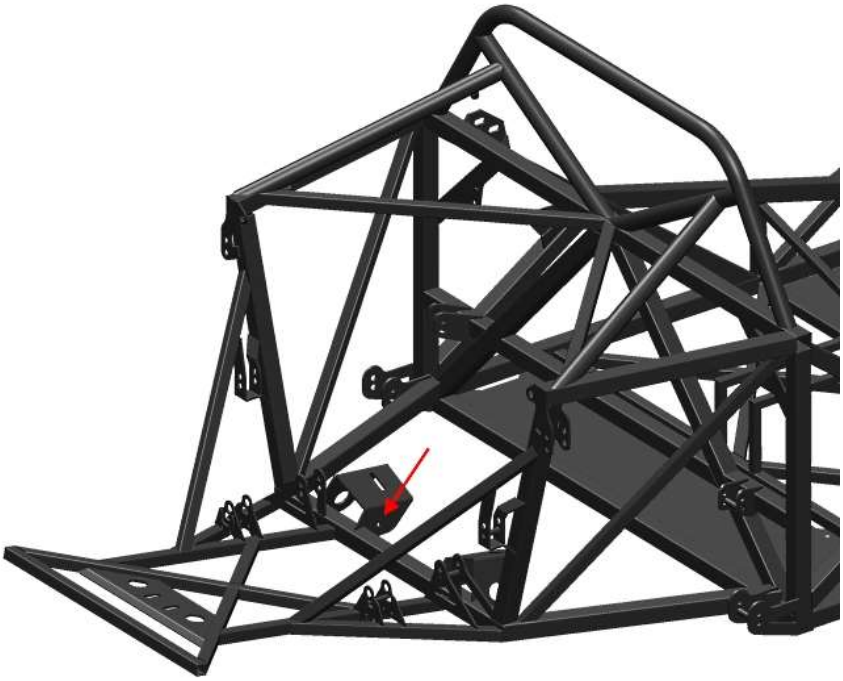
🚘 Electrical components
🛠 Soldering iron, solder, electrical tape, wire stripper, wire cutter, wire crimpers.



Splice 62 inches of 10 gauge wire to the start wire (yellow wire pictured). Splice 36 inches of 10 gauge wire to the fuse box/starter wire(double red wires pictured) and connect to the ring terminal provided with wire crimpers.

Engine ground strap

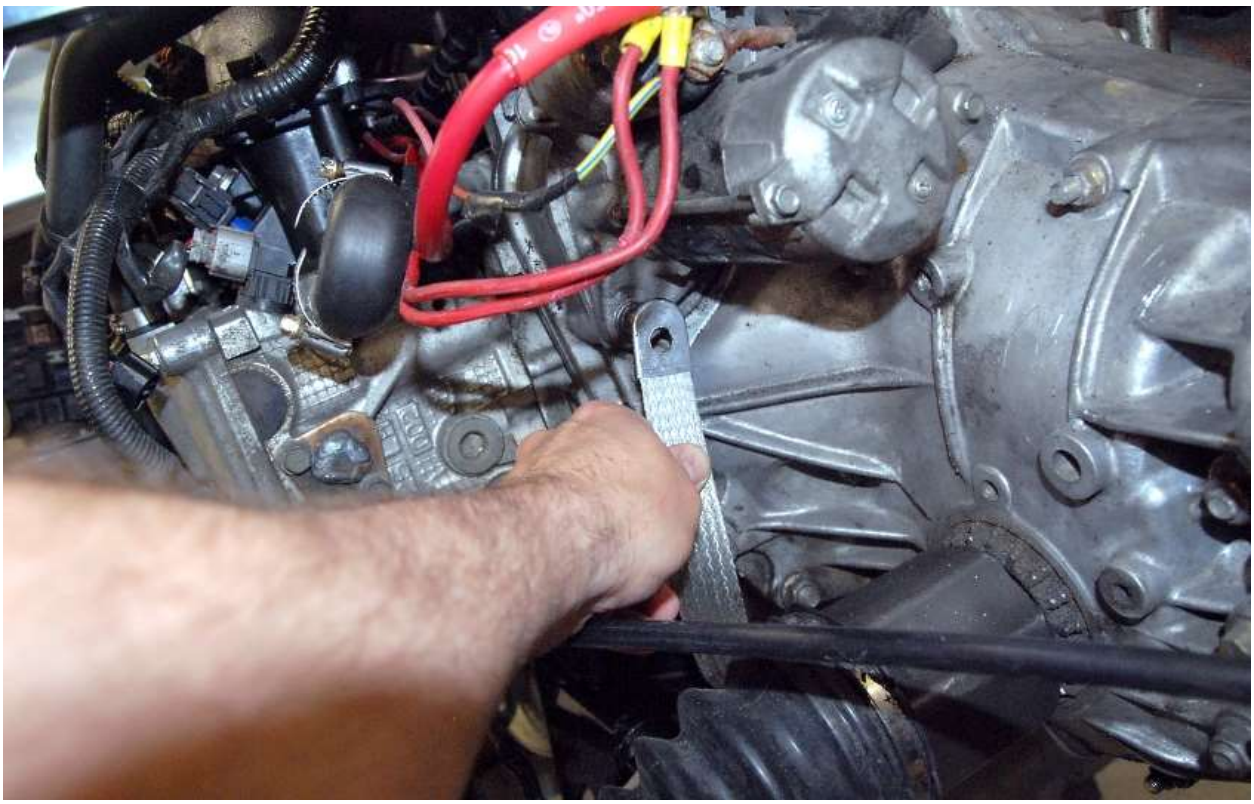
OEM ground strap, $^{3}/_{8}$” x 0.50” hex head bolt and locknut
Sandpaper, $^{9}/_{16}$” socket, ratchet, $^{9}/_{16}$” wrench



Locate the small hole on the left side engine mount.

Use sandpaper to remove any coating on the frame around the small hole.

Bolt the OEM engine ground strap to the frame through the small hole using a $^{5}/_{16}$" x 1.00" hex head bolt and locknut.



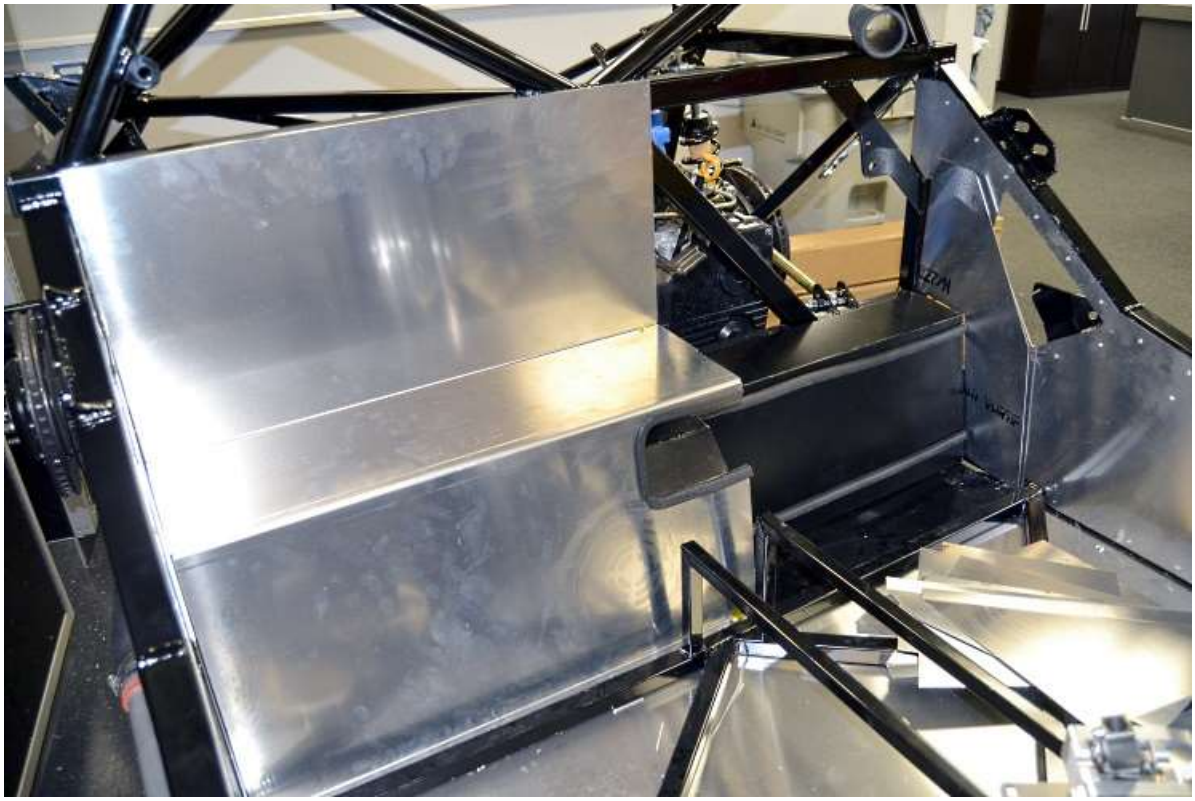
Hold the ground strap up to the engine and find a bolt that is connected directly to the engine block such as the starter bolt.

Attach the engine ground strap to the engine block.

Rear cockpit firewall

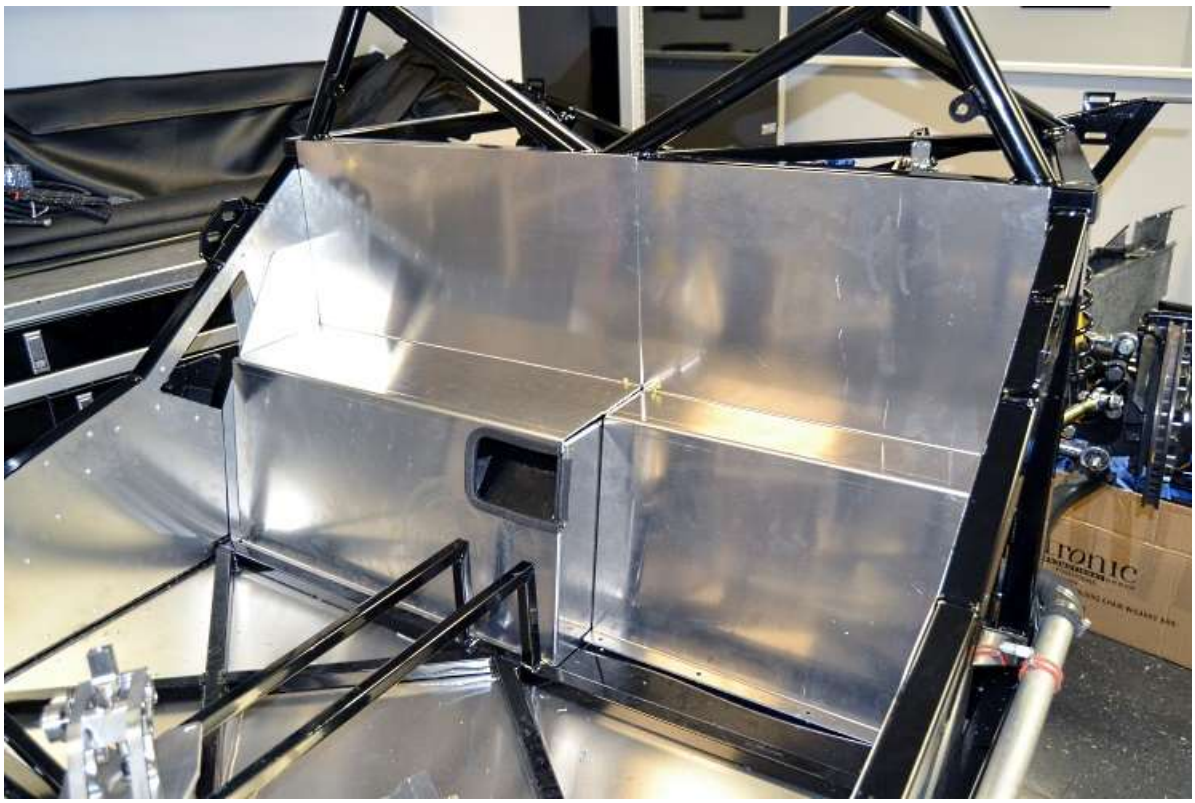
🚘 Mounted cockpit aluminum, body finish components.
🛠 Drill, $^{3}/_{16}$" drill bit, rivet tool, ½" wrench, ½" socket, ratchet, tin snips, clamp.
✋ The small flange with the holes is the bottom.

On the right firewall, push the 20” piece of weatherstrip that has the 3/8” bulb on the side onto the edge of the aluminum cut-out area. Face the weatherstrip so the bulb will be on the tank side of the panel. Cut the overhanging part off to use later.



Put the right side firewall panel in the cockpit.

Put the small center firewall from the packaged aluminum behind the left aluminum panel next to the tank as shown.



Place the left firewall panel (shallow panel with no cut-out) in the left side of the cockpit so that it lays against the flange on the center panel.

Drill one ¼" hole through the cockpit floor on each side of the cockpit using one of the middle holes in the firewall floor flange as a guide.

Fasten the firewall panels to the floor using ¼"-20 x ¾" bolts and lock nuts.
Drill and rivet the large firewall panels to the rear cockpit wall using $^{3}/_{16}$" rivets.

Clamp the center panel to the right side panel and drill and rivet the panels together.

Push the remainder of the bulb on side weatherstrip onto firewall center panel (bulb on the inside) where the hole is in the right side panel.

Cooling system

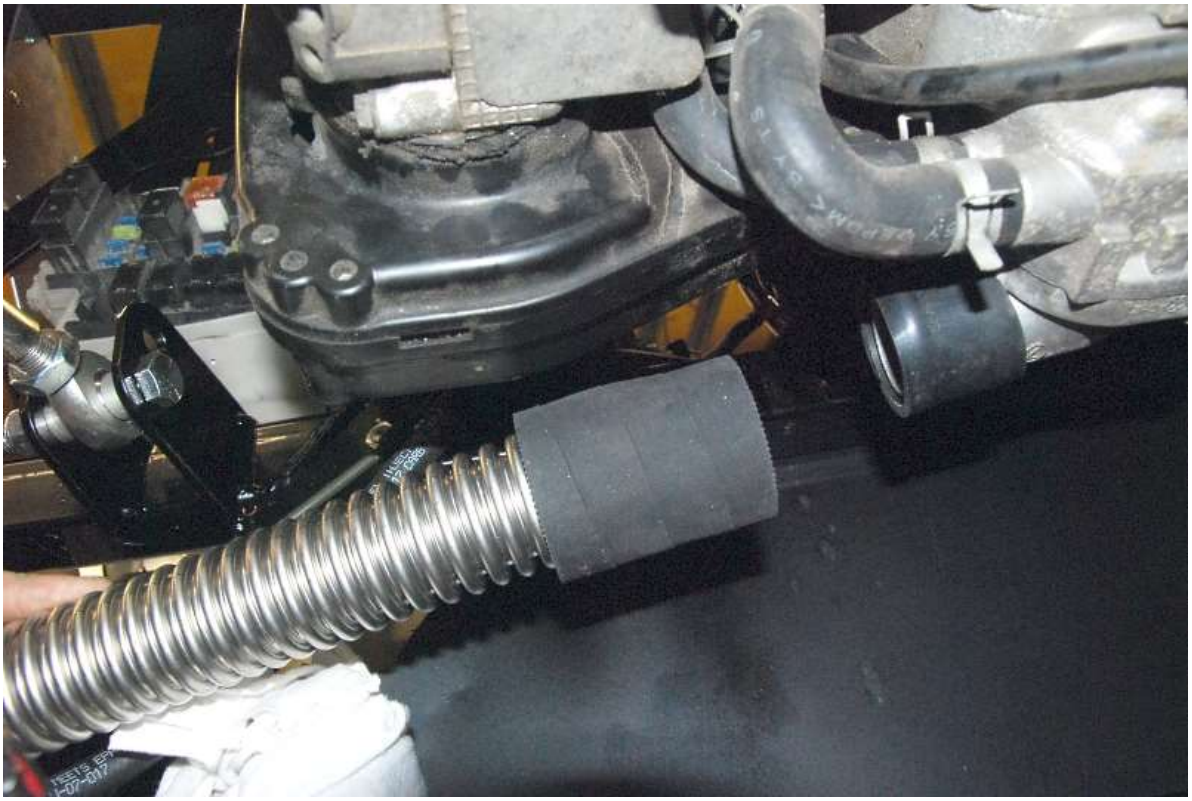
🚘 Box 5 lines/Coolant tubes.
🛠 Hack saw, $^{5}/_{16}$" socket, ratchet, $^{5}/_{32}$" hex key, marker, tape measure.

Rear coolant hoses

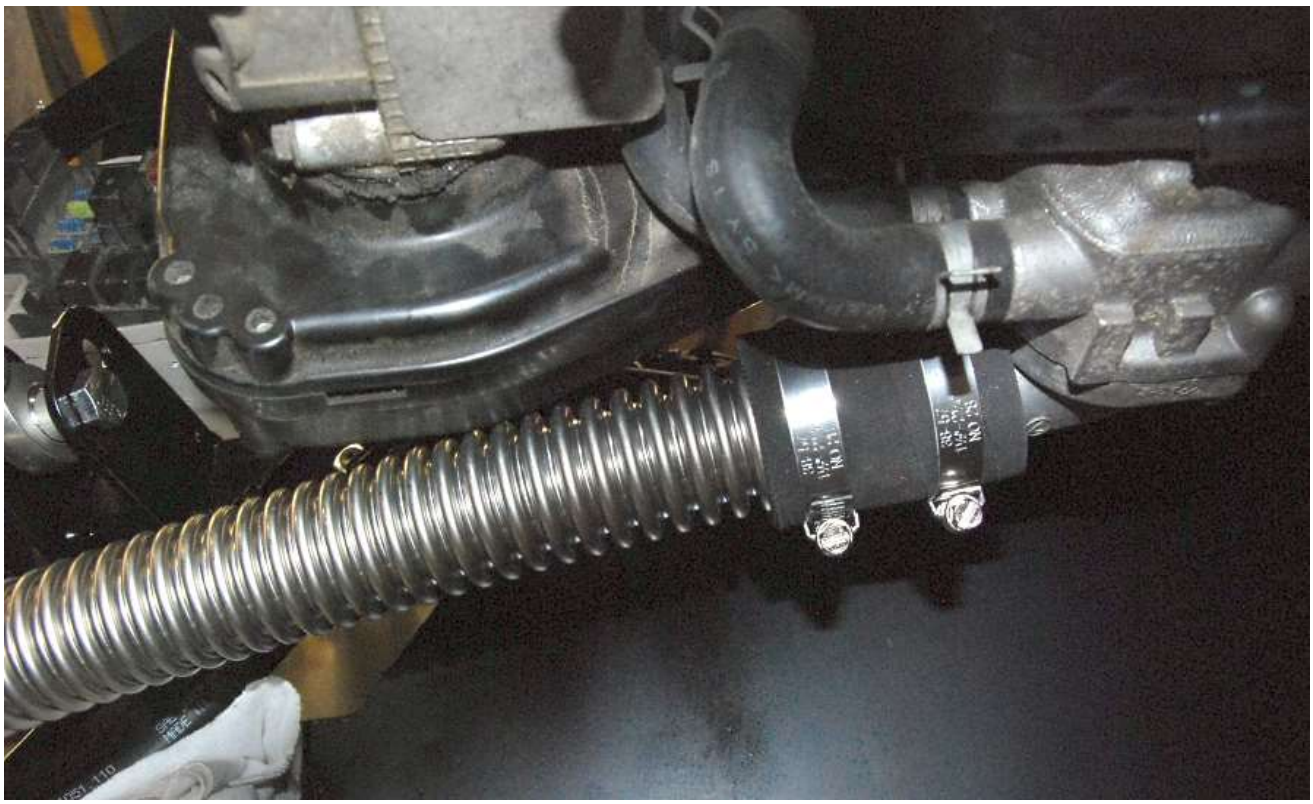
Lower hose

Slide one of the radiator hose adapters onto the water pump outlet on the bottom front of the engine.

Push the adapter down until it is on as far as it will go.



Push a large hose connector onto a section of stainless corrugated tube then slide two hose clamps onto tube and push the hose connector onto the water outlet.



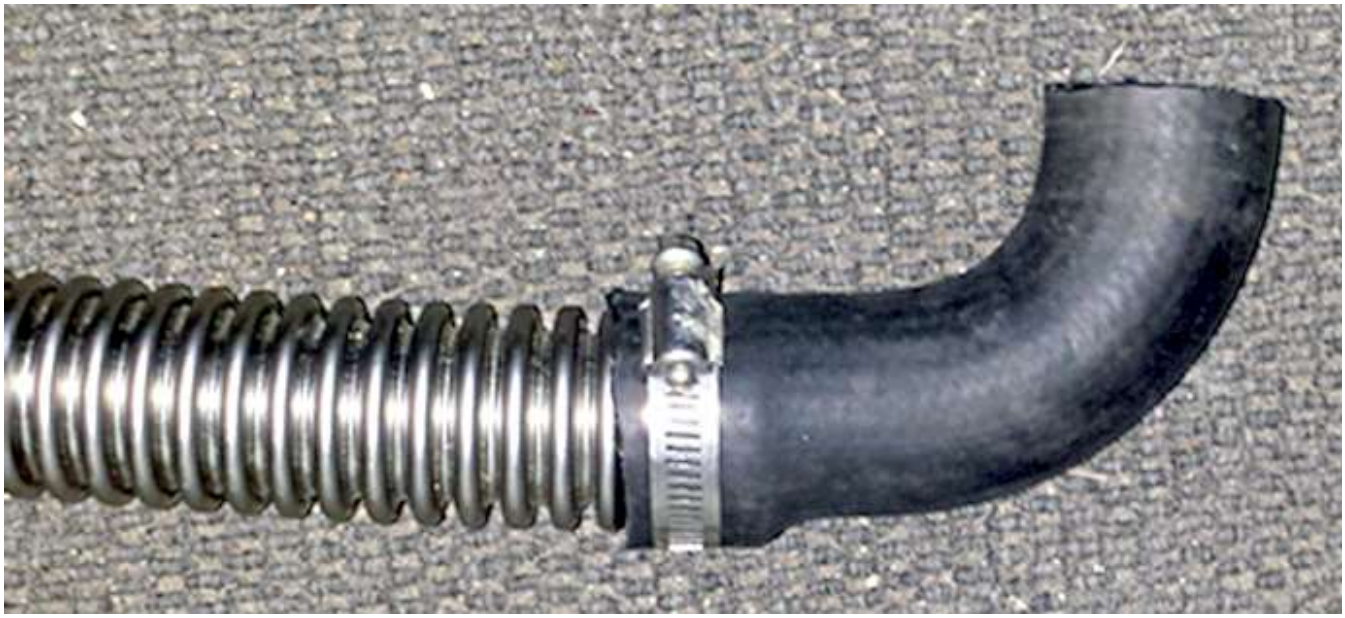
Tighten both sides of the connection with hose clamps.

Route the corrugated tube to the left side of the chassis going between the rear upper and lower trailing arms.

Cut the corrugated tube with a hack saw leaving eight inches for the line to curve around the corner.

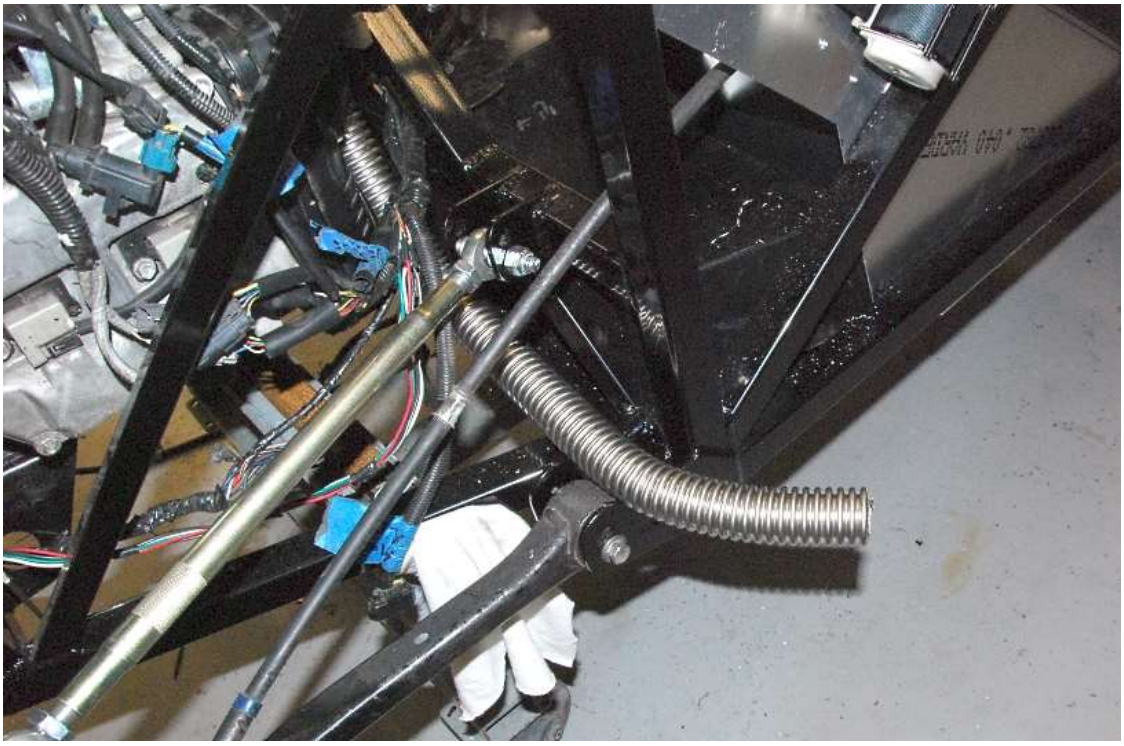
Slide one of the connecter hoses halfway onto the end of the corrugated tube.

Cut the factory lower radiator hose where it attached to the engine so that you have just the first 70° bend to use as a connector. Save the remaining hose for the front of the car.



Attach the 90° bend to the corrugated tubing with a hose clamp and slip another clamp loosely in place to attach to the engine.

Attach the upper hose to the engine with the 90° bend pointing straight down and tighten the hose clamps.



Run the corrugated tube to the right side of the chassis between the rear upper and lower trailing arms and cut it 8 inches past where it sticks out of the chassis.

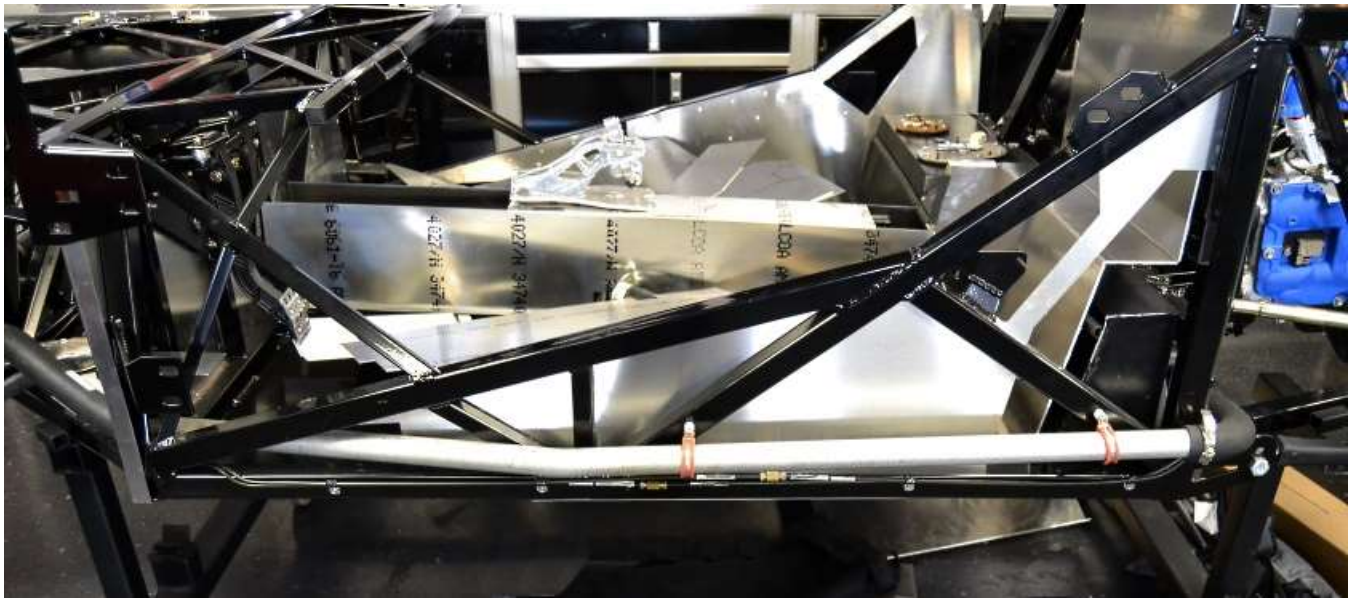
Side coolant tubes

🚘 Body finish components, coolant tubes, ¼" x 0.75" flanged button head screws.
🛠 Drill, $^{25}/_{64}$" drill bit, rivnut tool, marker
✋ If building a Right hand drive car, run both coolant tubes down the left side of the car.

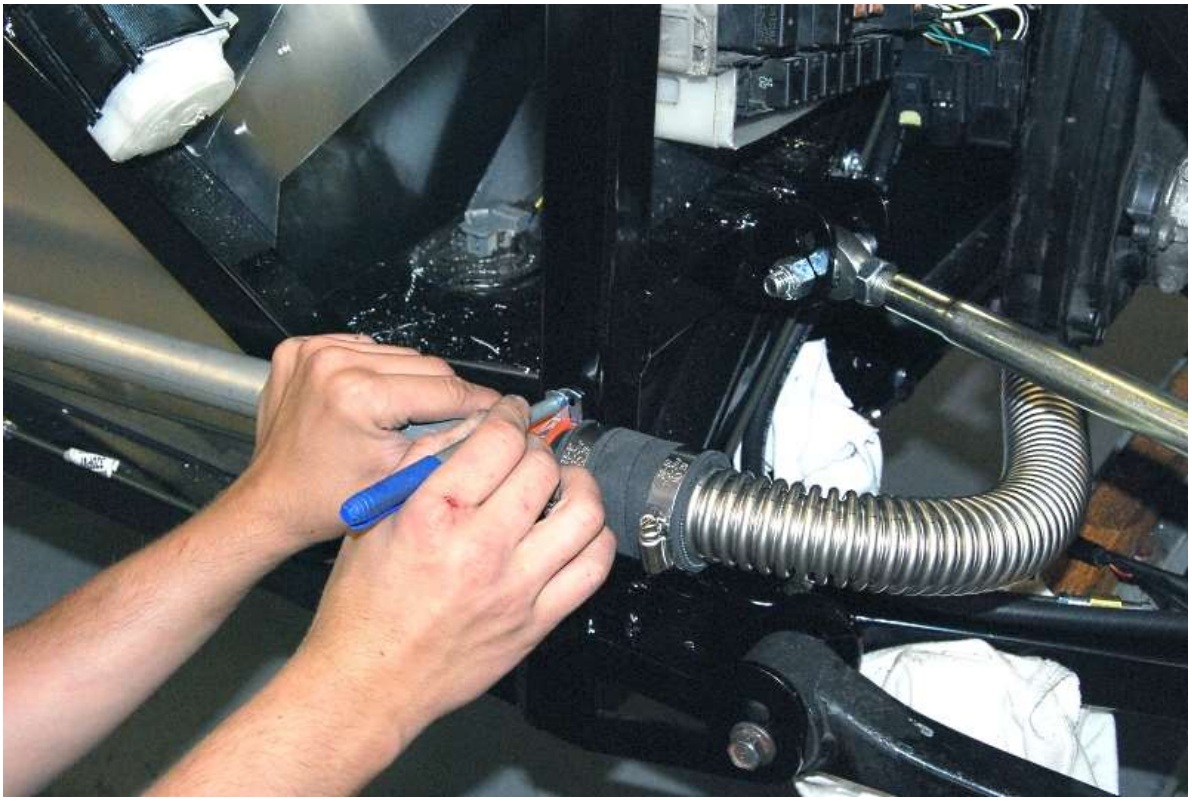
Slide the thick adapter onto the end of the longer straight section of one of the cooling tubes.

Slide two hose clamps over the connector and insert the tube end with the adapter into the hose connector.

Tighten the hose clamps holding the coolant tubes together. Make sure the adapter is seated straight and there is plenty of tubing inside the connector on both sides.



Run the bent tube along the side of the car and through the frame so that the tube comes out through the front cockpit wall.



Use the rubber lined coolant tube clamps from the kit to mark the frame for drilling along the sides of the frame. The tubes must be mounted lower than 5 inches above the bottom of the chassis to fit inside the body sides.

Drill and mount the clamps to the chassis using rivnuts with the clamp hanging below the mounting bolt.

Make sure the coolant tubes are held up tight and do not contact any moving parts.

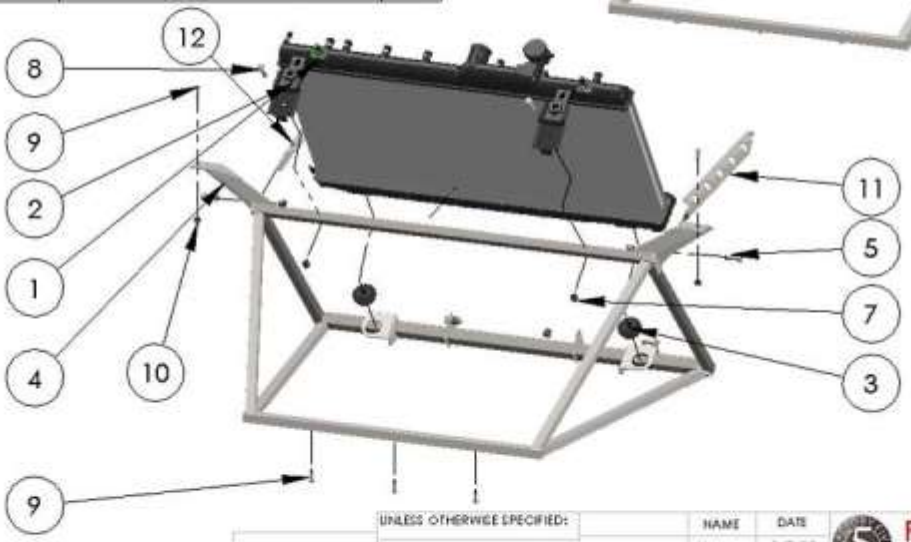
Repeat these steps for the coolant tube on the other side of the frame.

Radiator/Nose support

Radiator and nose components, radiator support, $^{3}/_{8}$" x 1" hex head bolts and locknuts
$^{9}/_{16}$" wrench, $^{9}/_{16}$" socket, ratchet

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	radiator		1
2	RADIATOR UPPR MOUNT		2
3	RADIATOR LWR MOUNT	LOWER RADIATOR MOUNT	2
4	80092	RADIATOR SUPPORT	1
5	HBOLT 0.3750-16x1x1-N		6
6	13964	NYLON INSERT LOCKNUT, 3/8-16 UNC	6
7	NLN-3125C	NYLON INSERT LOCKNUT, 5/16-18 UNC	2
8	HBOLT 0.3125-18x1.25x0.875-N		2
9	SBHCSCREW 0.25-20x0.75-HX-N		5
10	10802	NYLON INSERT LOCKNUT	2
11	80533	80535 - RADIATOR TOP MOUNT, RIGHT	1
12	80533	80534 - RADIATOR TOP MOUNT, LEFT	1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	9/5/12	
B	80092 CHANGED	6/21/13	



		NAME	DATE
UNLESS OTHERWISE SPECIFIED:	DRAWN	JI	9/5/12
DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	COMMENTS		
MATERIAL			
FINISH			
818			
USED ON			
APPLICATION: FRAME	PRINTED: 6/21/2013		

Factory Five Racing, Inc.

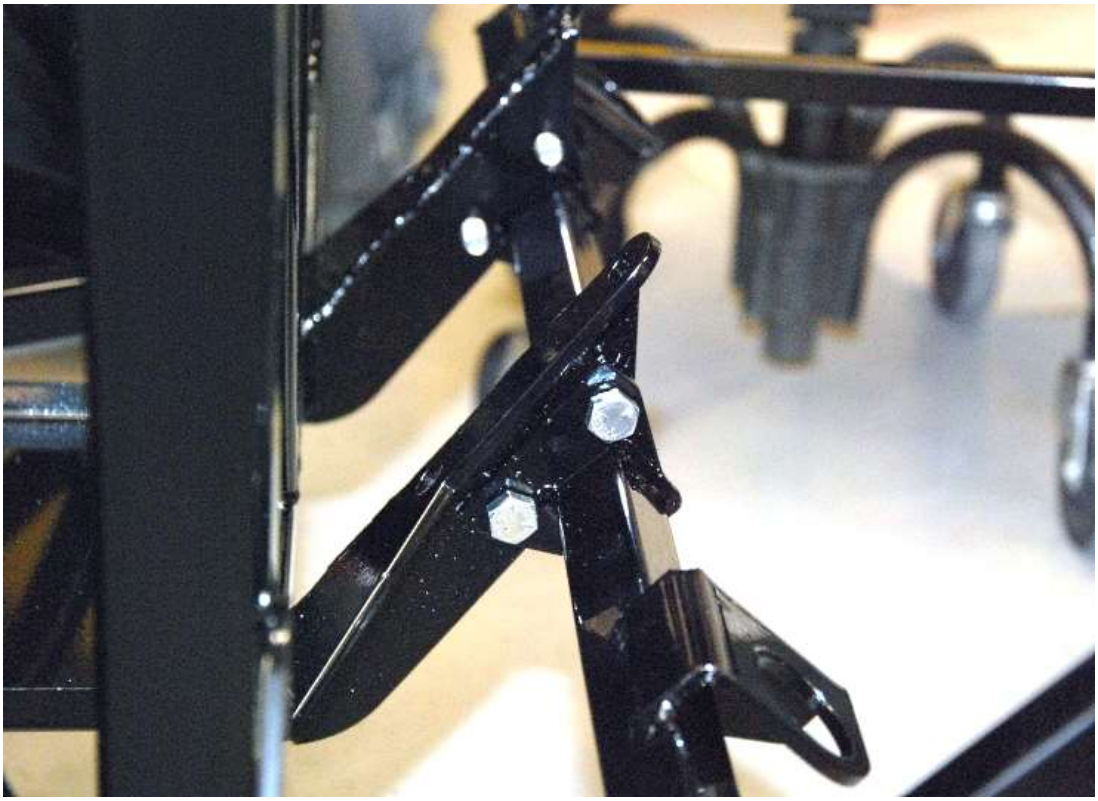
TITLE: RADIATOR AND NOSE MOUNT

SIZE	DWG. NO.	REV
A	80079	B

SCALE: 1:11 | WEIGHT: | SHEET 1 OF 1

Locate the front radiator mount. This part is separate from the chassis so it can be replaced in case of an accident.

Bolt the radiator mount to the chassis using the 3/8" x 1" hex head bolts and locknuts.



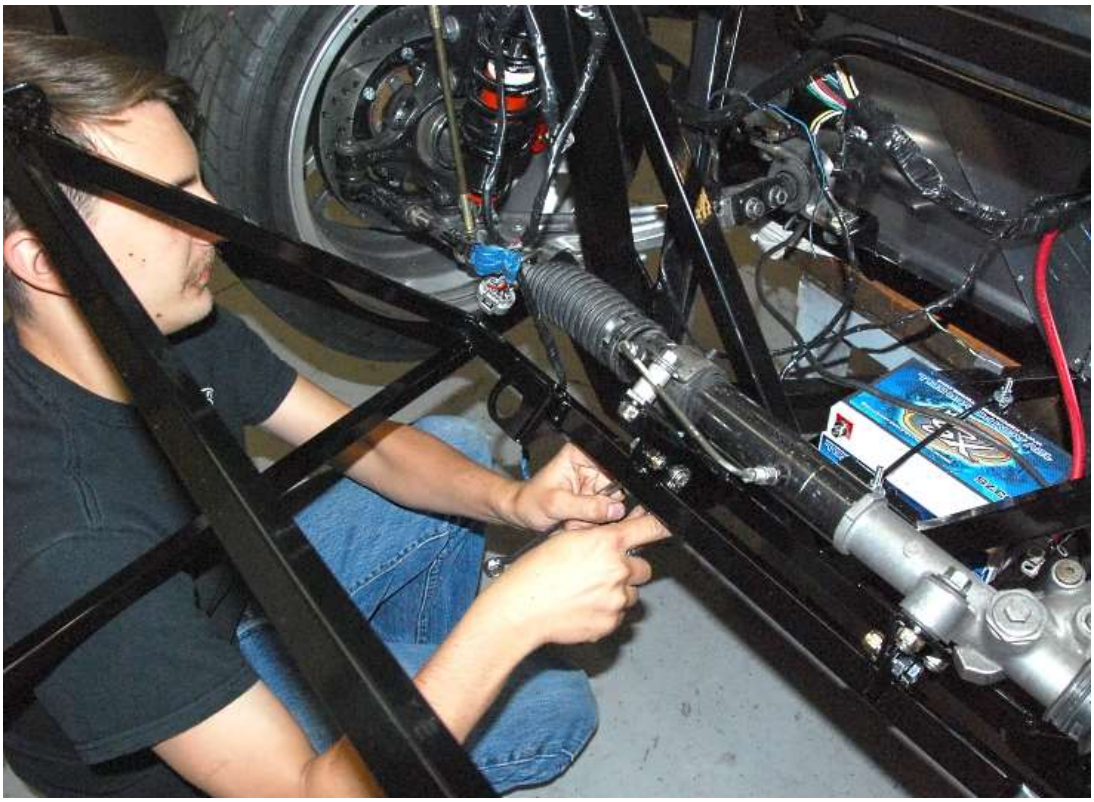
Run the four bolts into the mounts from the outside in and finger tighten the locknut on each one.

Locate the upper radiator mounting bars.

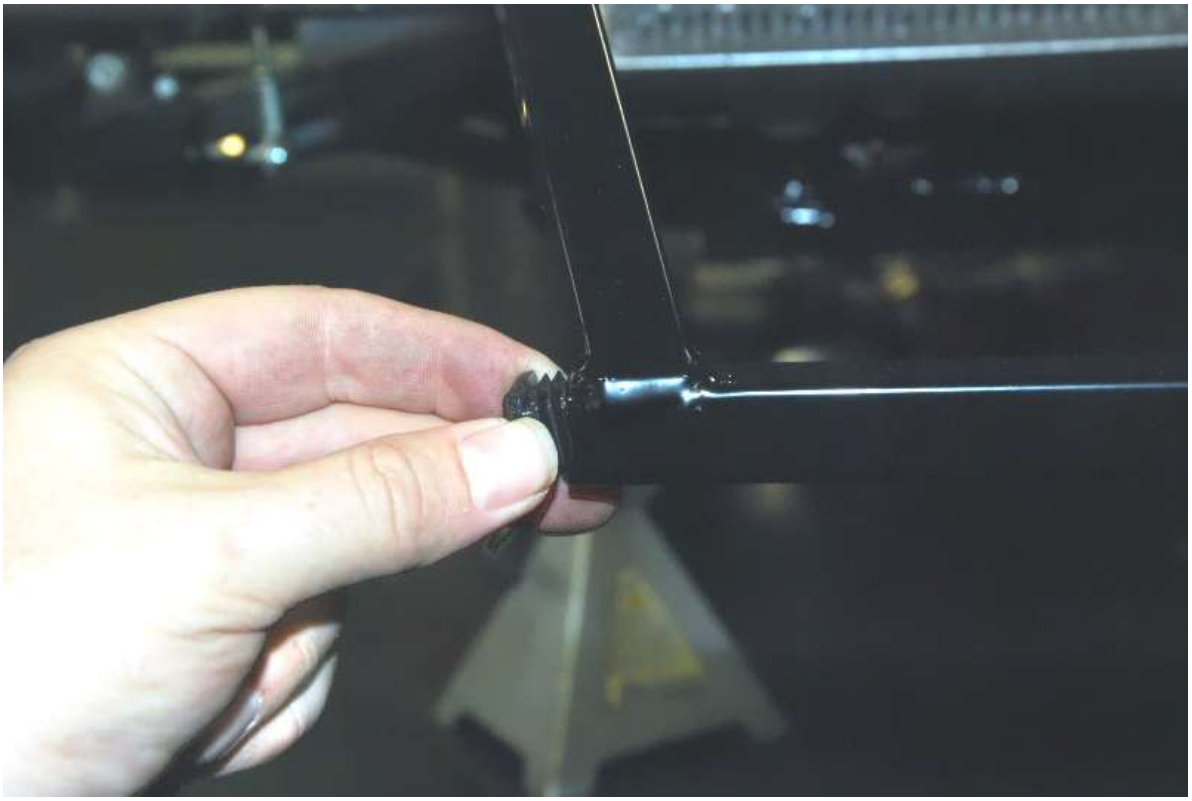
Bolt the bars to the outside of the radiator mount with the flanges facing in toward the center of the car.

Bolt the chassis end of the bar to the tab near the front control arm, the tab on the bar sits on top of the chassis tab.

The radiator support should now sit in place.



Tighten all of the hardware for the radiator support starting at the bottom mounting bolts.



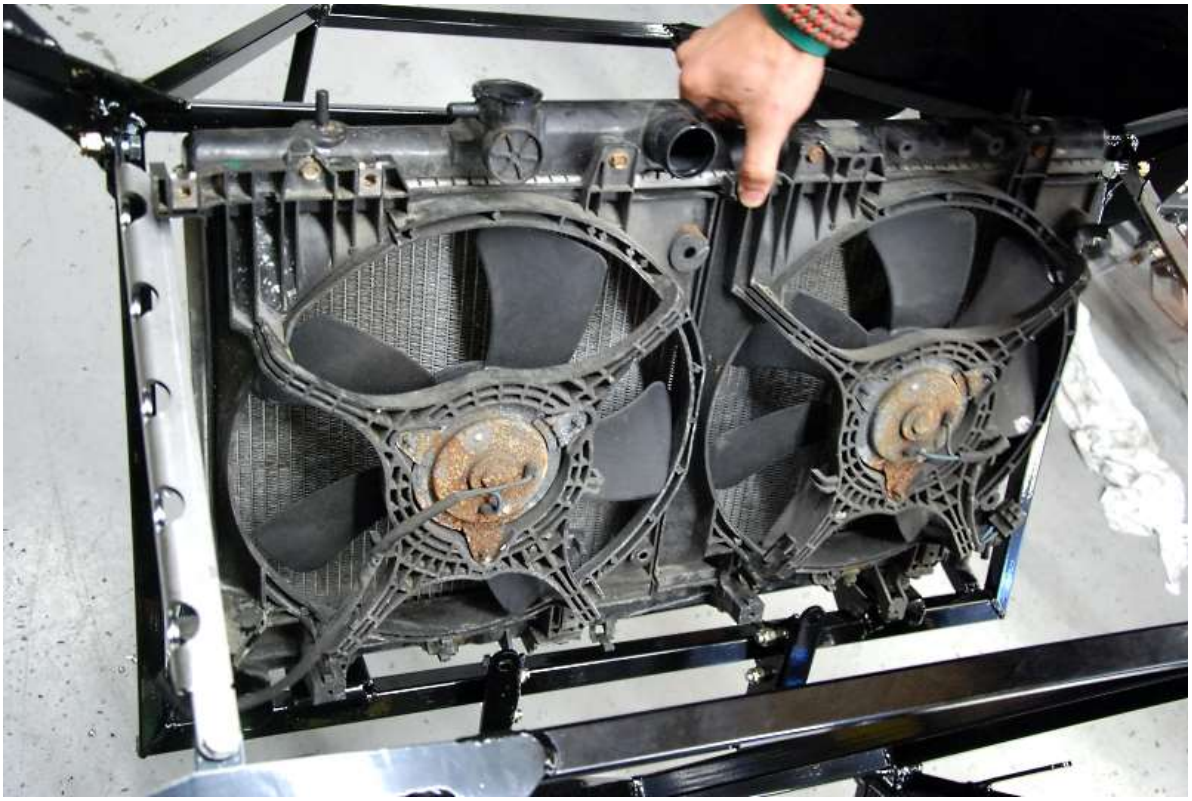
Insert the ¾” plastic plugs in the end of the radiator support tubes.

Radiator

🚘 Radiator, radiator and nose components, body finish components, ¼” x 0.75” flanged button head screws.

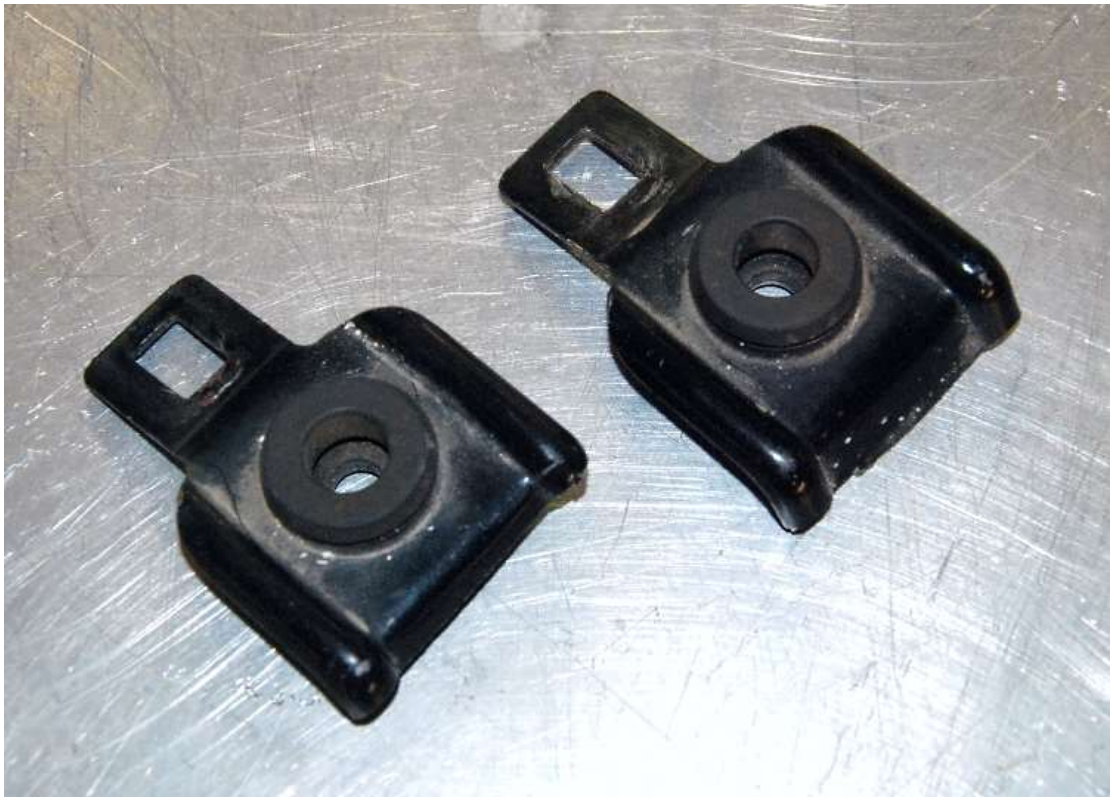
🛠 Hack saw, flat head screwdriver, ratchet, sockets, $^{5}/_{32}$” hex key, drill, $^{25}/_{64}$” drill bit

Insert the OEM lower radiator bushings into the large holes on the bottom of the radiator support.

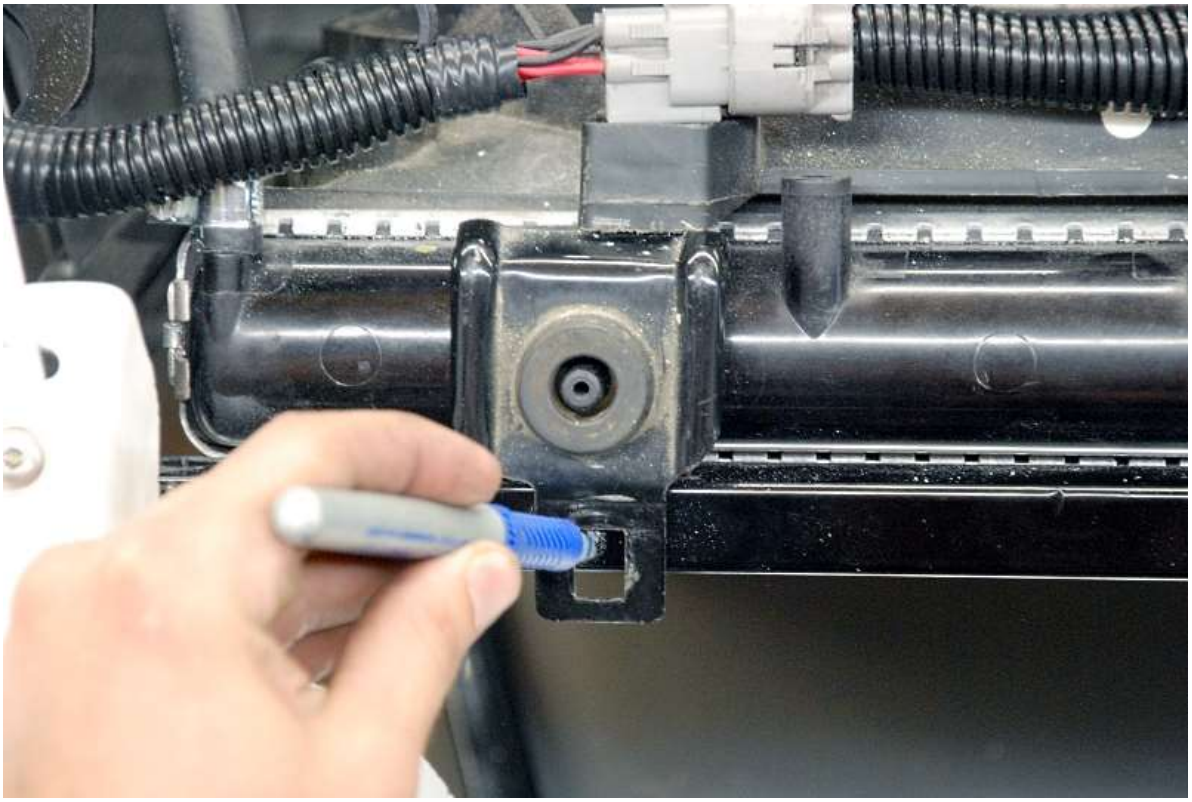


Drop the radiator in position inside the support. The two lower pegs fit inside the OEM donuts to locate the bottom of the whole assembly.

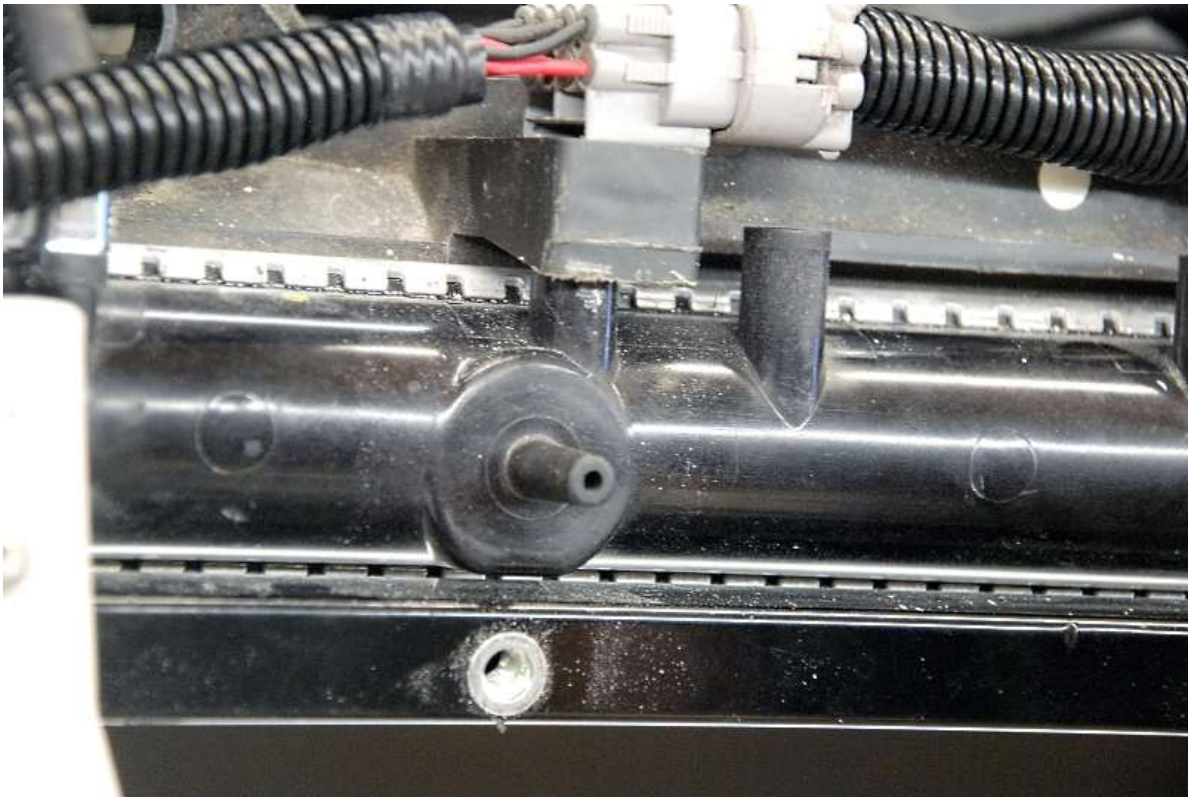
Locate the upper radiator mounts you removed from the donor car.



Test fit the mounts on the radiator to radiator support. Depending on the donor year, the radiator mounts may need to be trimmed with a hack saw to hold the radiator securely. Trim them as shown in the above picture if needed.



Slide each upper radiator mount in place on the top peg of the radiator and mark the middle of the radiator support tube for a mounting rivnut.



Drill and install a rivnut for both upper radiator mounts.

Front coolant tubes

🚘 OEM radiator hoses, corrugated metal hose (Box 5).
🛠 Razor knife, flat head screwdriver

Top hose

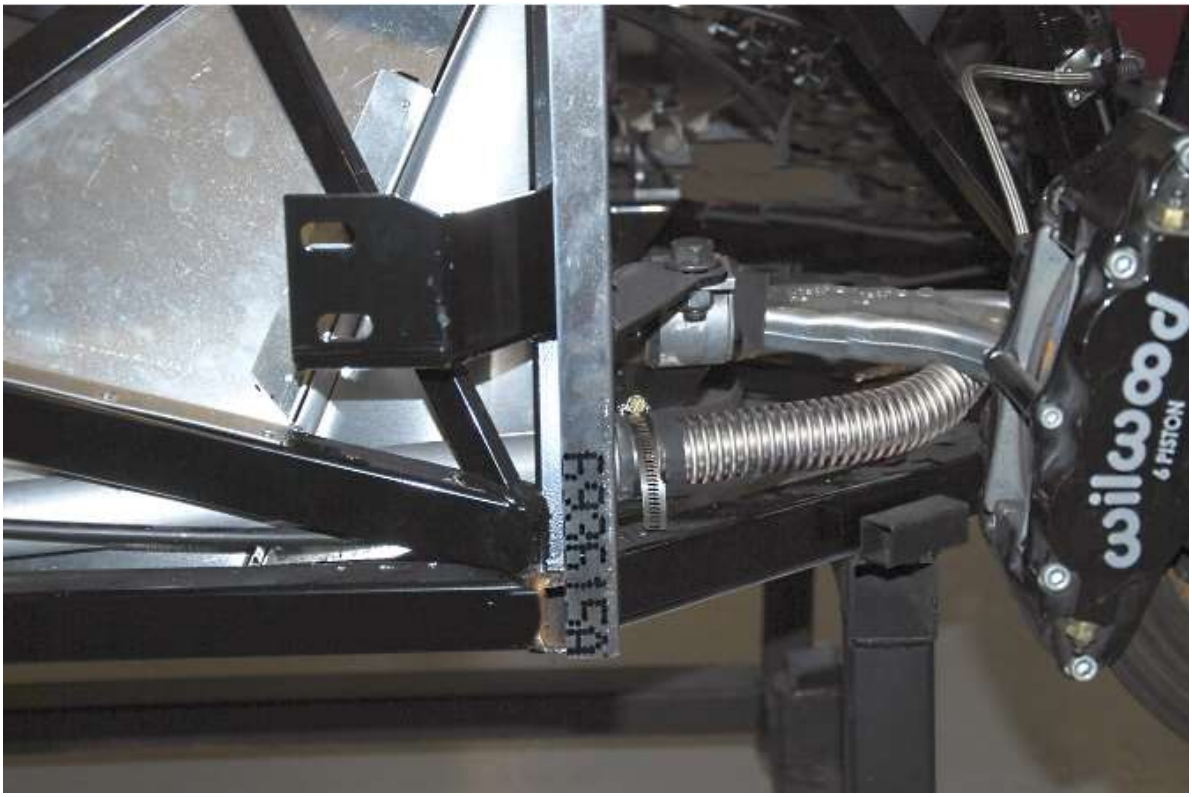
Locate the OEM upper cooling hose and mark it to match the picture above. Leave enough straight section for the shorter leg to connect to the radiator and a clamp will still sit flat.

Trim the hose on the lines you marked and slide the upper hose clamp back on.

Push the trimmed upper elbow onto the corrugated tube using WD40 if necessary.

Push the hose onto the top of the radiator.

Route a section of the corrugated tube down to the right side of the car and under the front lower control arm.

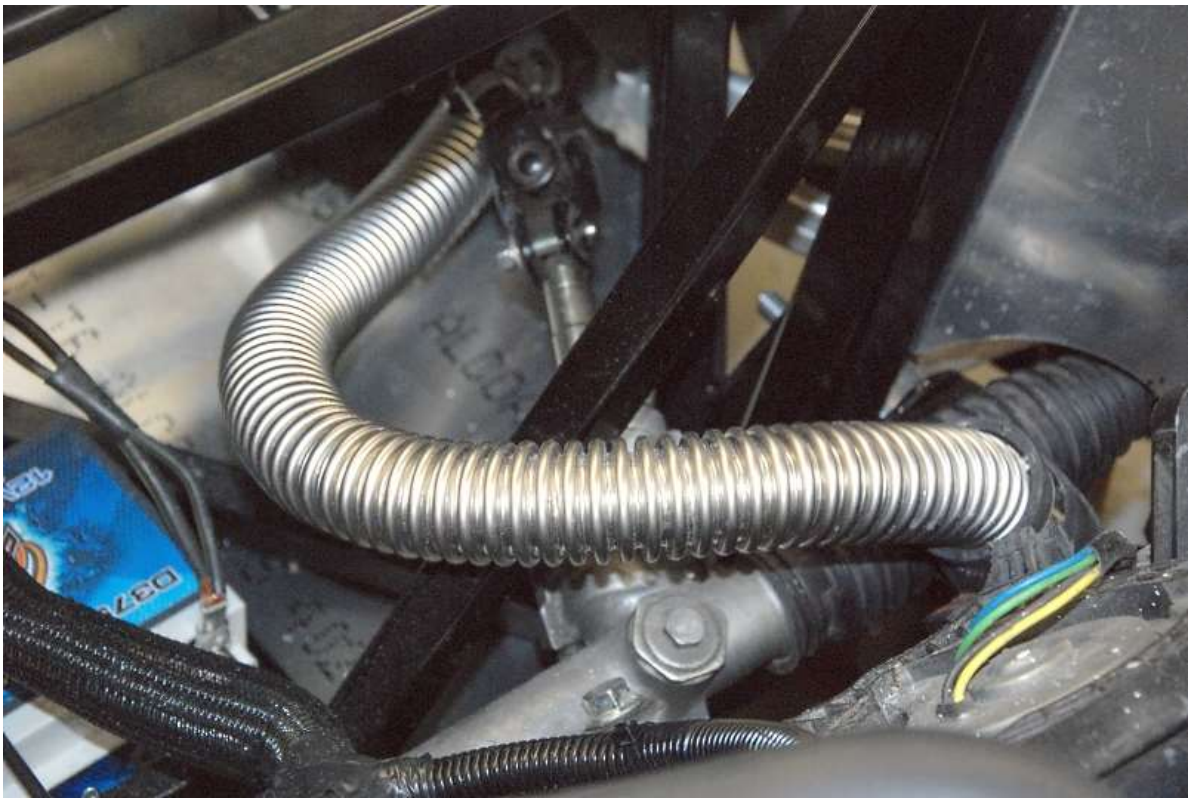


Cut off the excess hose on the right side and connect the corrugated hose to the coolant tube using the adapters like the rear of the tube.

Bottom hose

Use the remaining 60° elbow from the OEM lower radiator hose to attach the corrugated tube to the bottom of the radiator.

Connect this section with the corrugated tubing to the lower radiator outlet with a hose clamp.



Route the corrugated tube around the steering rack and out to the cooling tube on the left side.

Connect the coolant tubes to the stainless hose with the small connector hoses and clamps.

Coolant overflow tank

🚘 Coolant overflow tank, lines/coolant tubes, body finish components, ¼" x 0.75" flanged button head screws.

🛠 Drill, $^{25}/_{64}$" drill bit, rivnut tool, $^{5}/_{32}$" hex key, marker, razor knife.

Route the $^{5}/_{16}$" heater hose for the coolant overflow tube from the barb on the top right side of the radiator along the upper radiator tube back to the engine. Zip tie the hose as you go being careful not to crush it.

On the engine, connect the $^{5}/_{16}$" hose to the larger left barb on the expansion tank.

Use the smaller 1.5 foot section of overflow tube from the other barb on the expansion tank and run it to the left side of the engine bay.

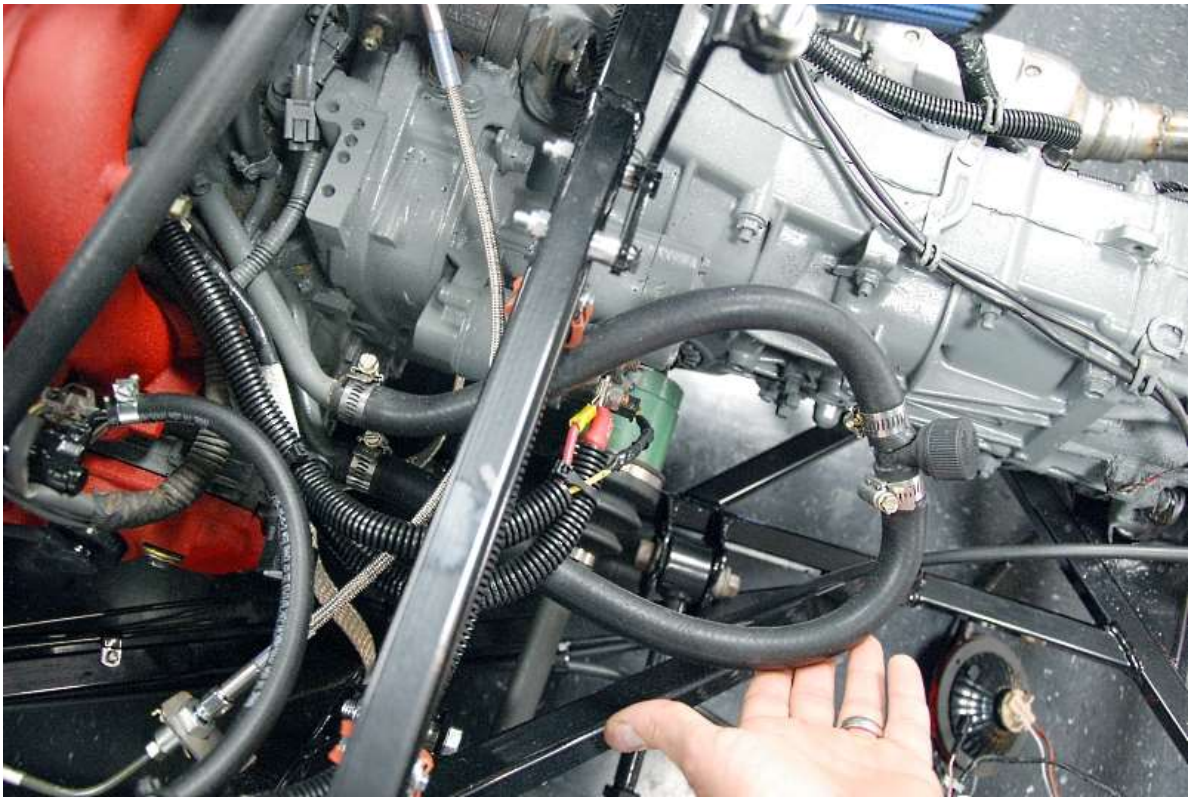
Hold the coolant overflow up to the 1.50 inch tube to the left side of the engine back near the rollbar leg and mark the center of the mounting holes. Make sure you have enough room to fit a drill in to drill the holes.

Install rivnuts at the mounting points marked.

Attach the overflow to the frame using the ¼" x 0.75 inch flange head stainless screws and insert the overflow tube so that it goes to the bottom of the tank. Cut the excess hose.

Naturally Aspirated fill location

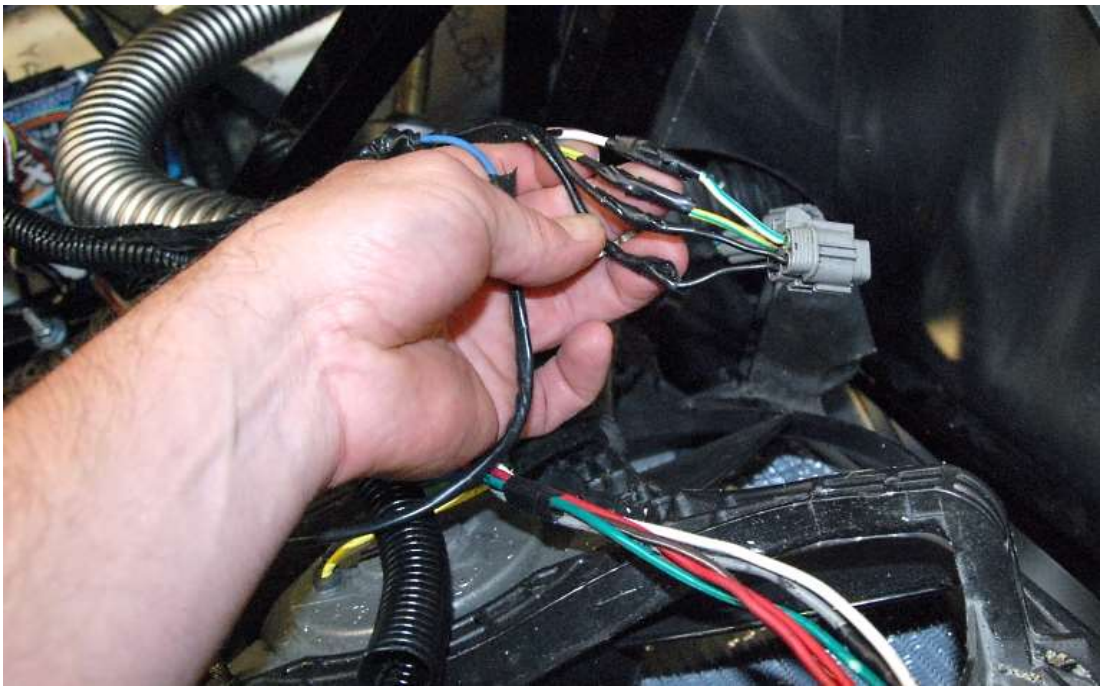
- If using a Naturally Aspirated engine, there is no rear overflow tank. It is recommended that a fill kit is used such as Peak PKF0AA.



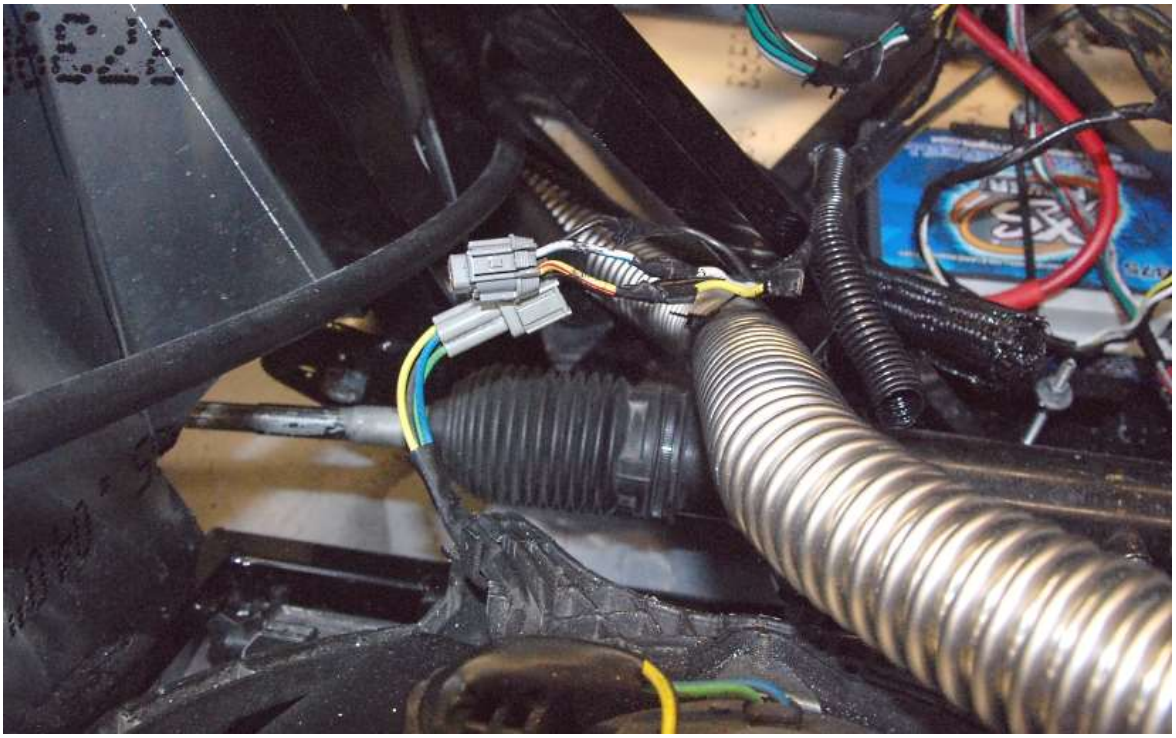
Install a filler to the left of the transaxle.

Radiator fan wiring

🚘 Electrical components
🛠 Soldering iron, solder, electrical tape, wire stripper, wire cutter.
✋ Splice one wire at a time to avoid confusion.



Splice extension wires to the radiator fans. Add 32 inches to the left side fan and 62 inches to the right side fan.



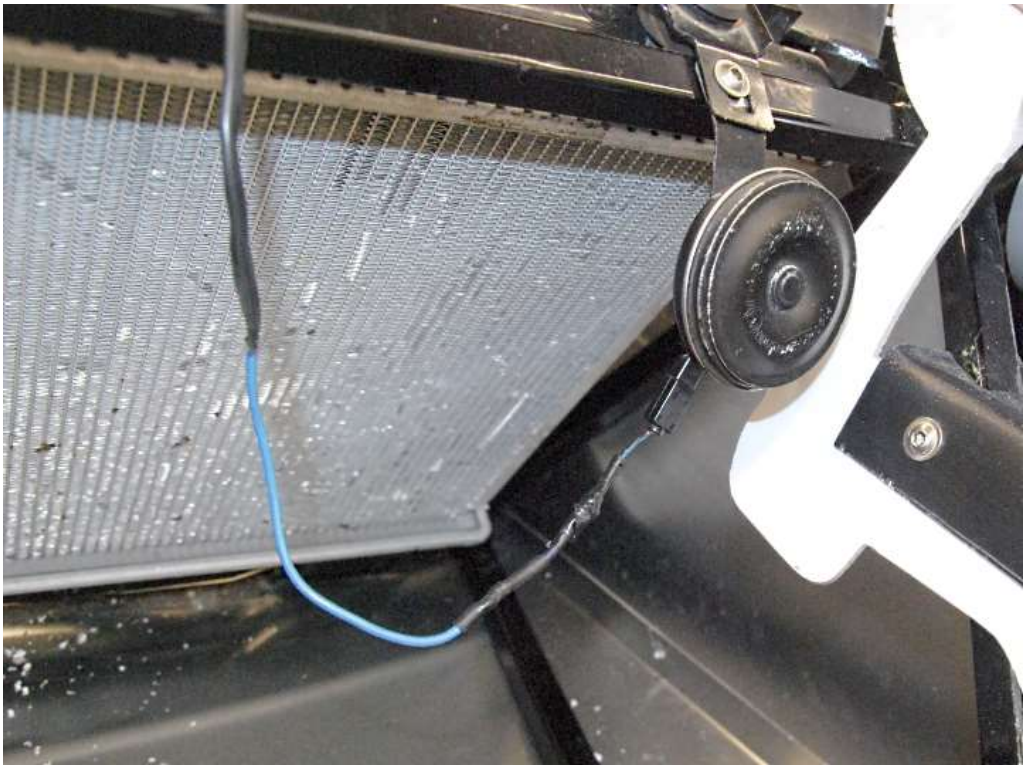
Plug in the fans.

Horns

Sandwich the OEM horn between the mount and the chassis using the included washer head bolts and $^{5}/_{32}$" hex key.

Horn wiring

Splice extension wires to the horns. Add 68 inches to the left side horn and 88 inches to the right side horn.



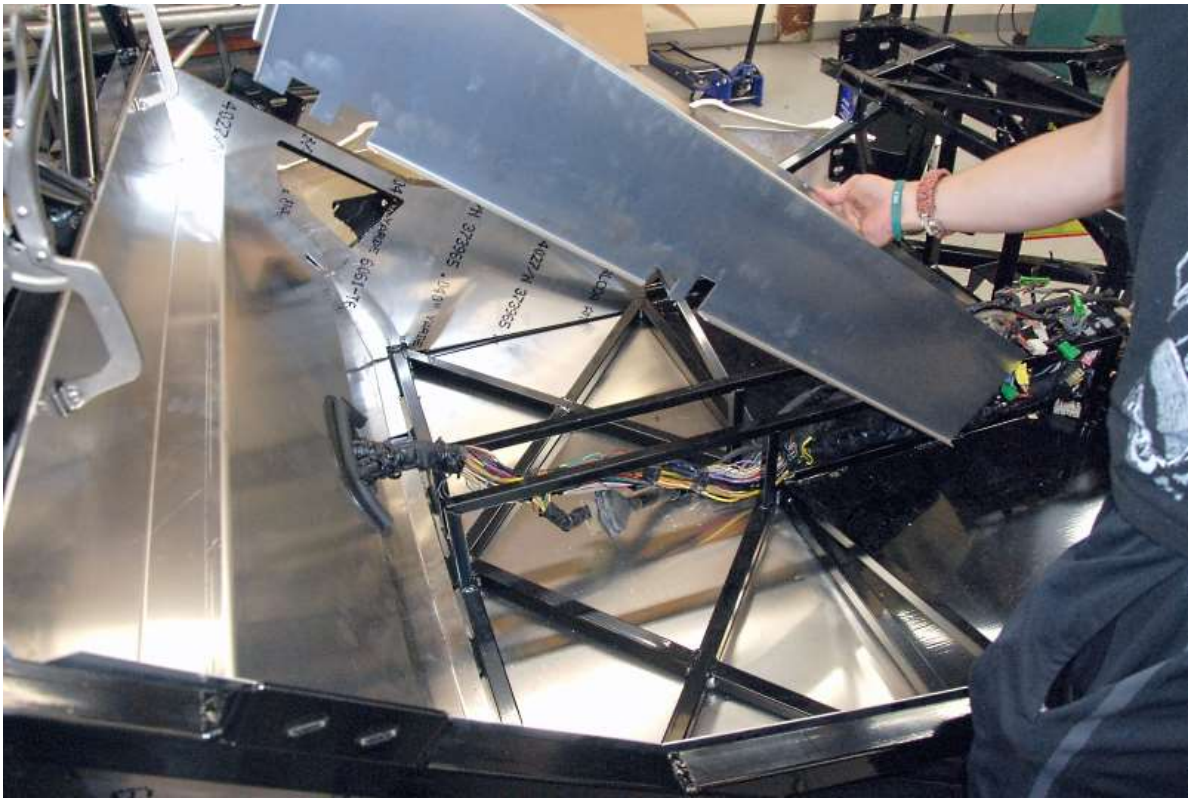
Plug in the horns.

Air box/Mass air meter

- Stock mass air meter/airbox

Plug the Mass air meter into the harness.

Transmission tunnel cover



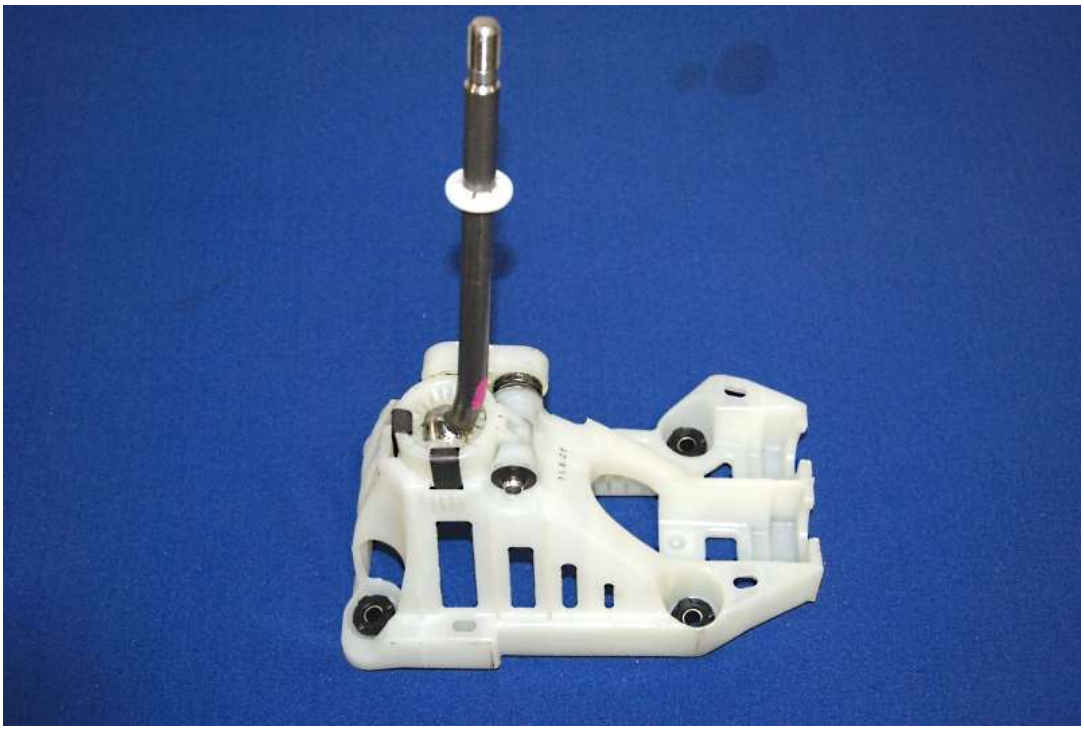
Drop the transmission tunnel down into the cockpit.

With the tunnel sitting down, rivet it in place; you do not need to silicone this panel to the chassis.

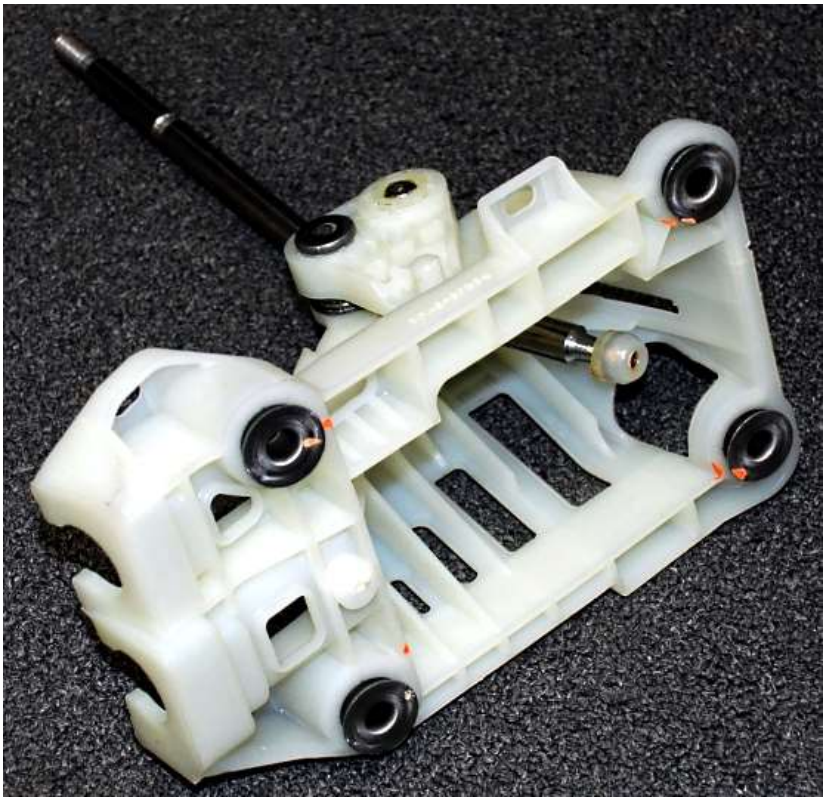
Shifter handle

Preparation

- Cable shift kit, ¼” x 1.50” hex head bolts.
- ⅜”, ½”, $^{9}/_{16}$” socket, Ratchet, Drill, $^{5}/_{16}$”, $^{7}/_{32}$” drill bit, flat head screwdriver, (2) clamps, Marker, hack saw, $^{3}/_{16}$” hex key, pliers, ¼”-28 tap, 12mm, vise.
- A Billet aluminum shifter is available if more adjustability or a shorter throw is desired.

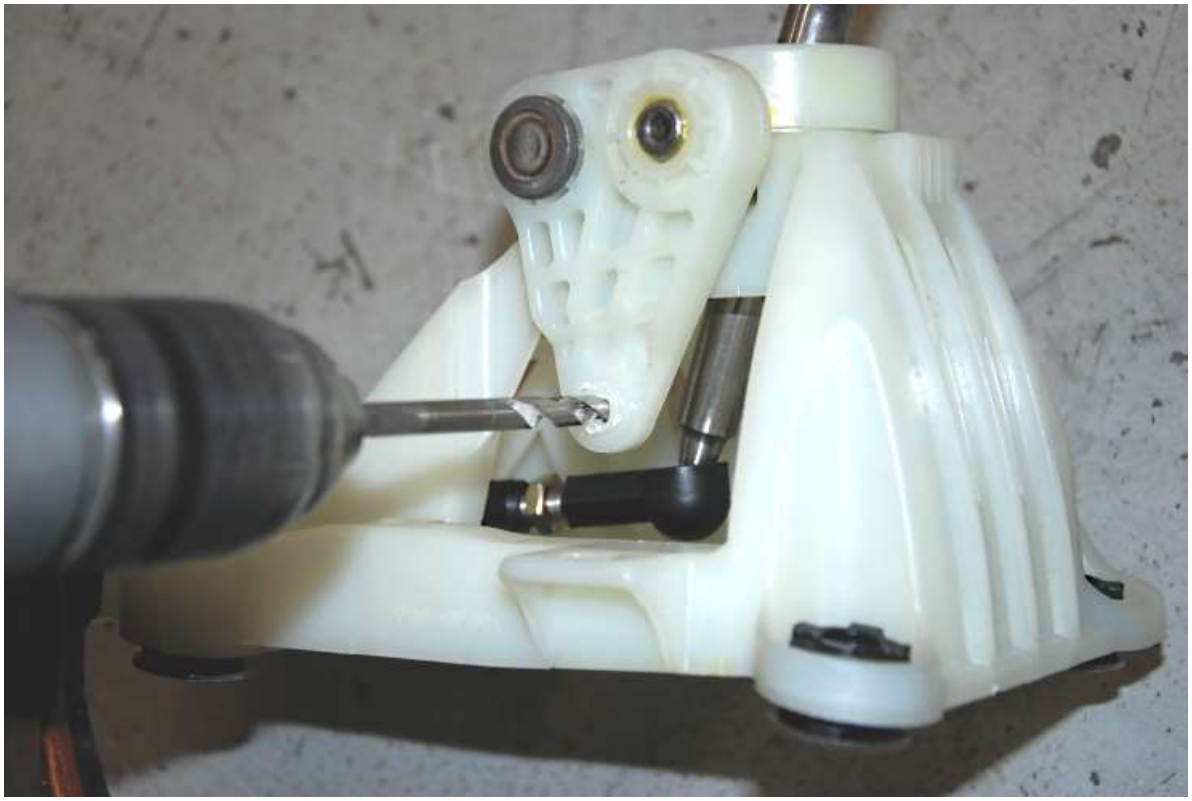


Unpack the cable shifter.



Remove the plastic cup from the shifter handle using a pair of pliers and a flat head screwdriver.

Use a saw to cut off the mounting post on the side of the shifter. This will reveal a mounting hole underneath.

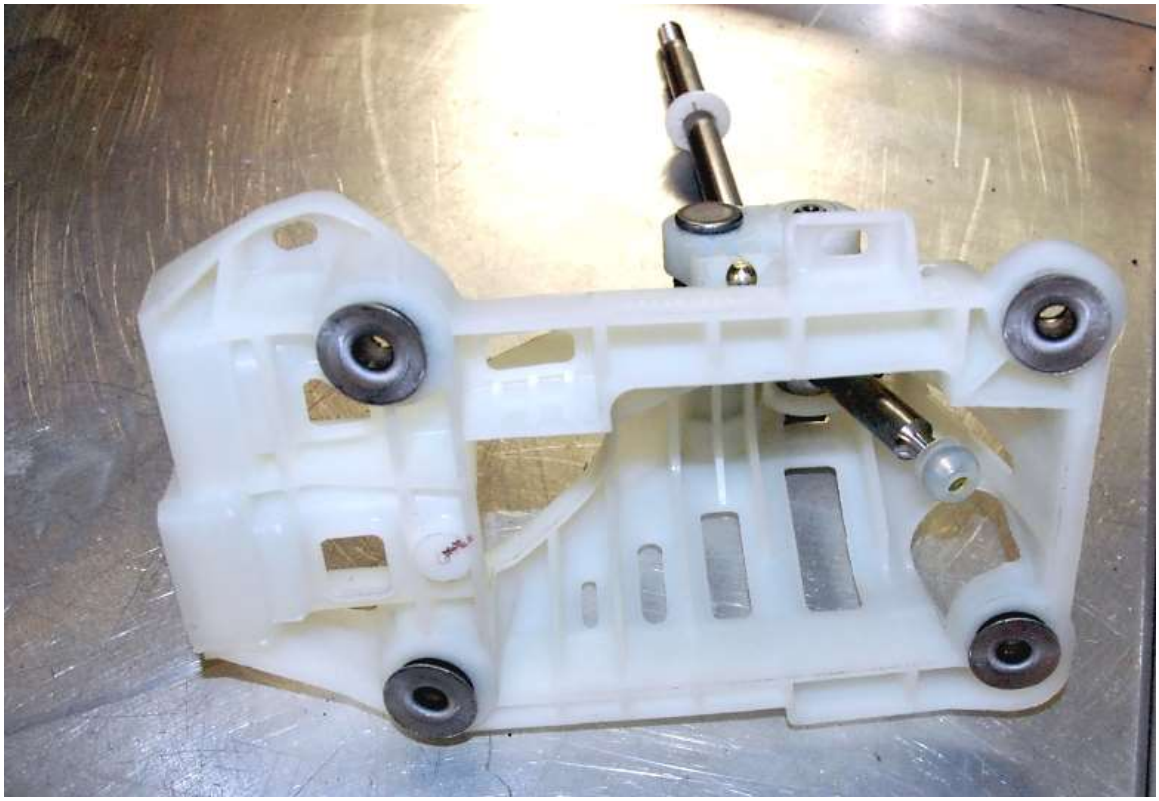


Drill the small hole out that remains with a $^{7}/_{32}$" drill bit.

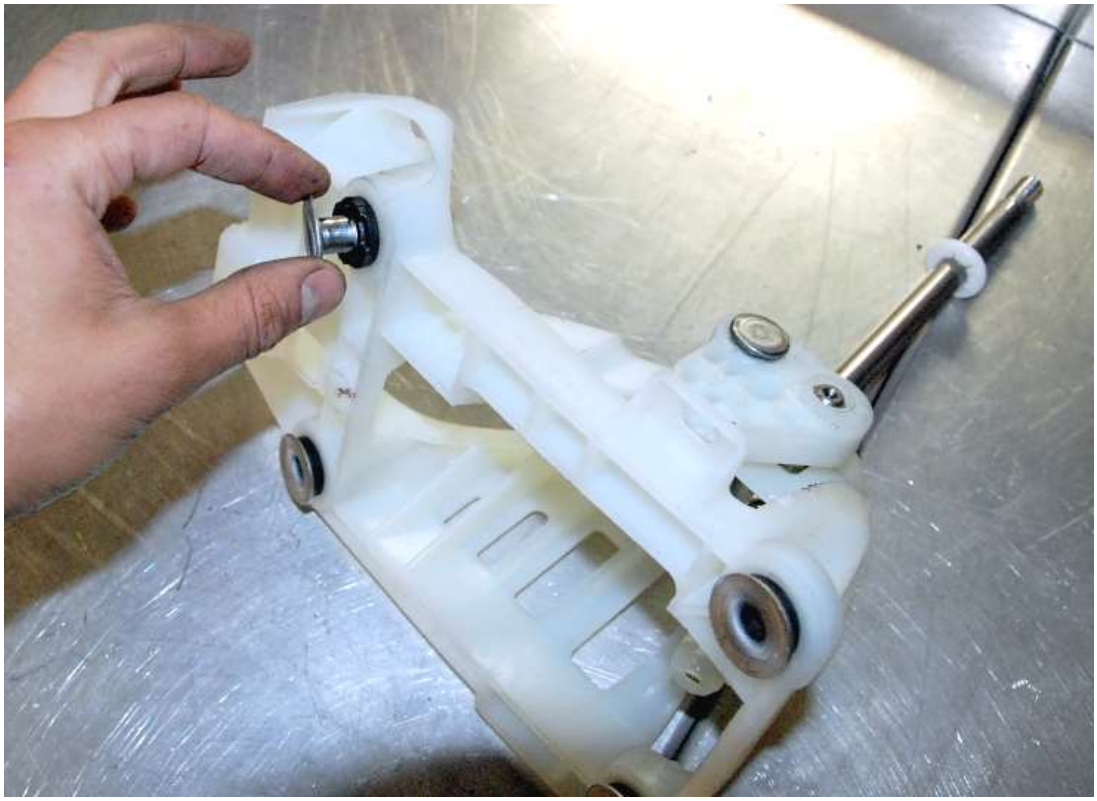
Slide the retaining sleeve down on one of the cable ends from the kit to get the ball to pop out.

The ball should come free without any tools or prying.

Attach the ball stud to the shifter using a ⅜" socket and tighten using a provided locknut on the other side.

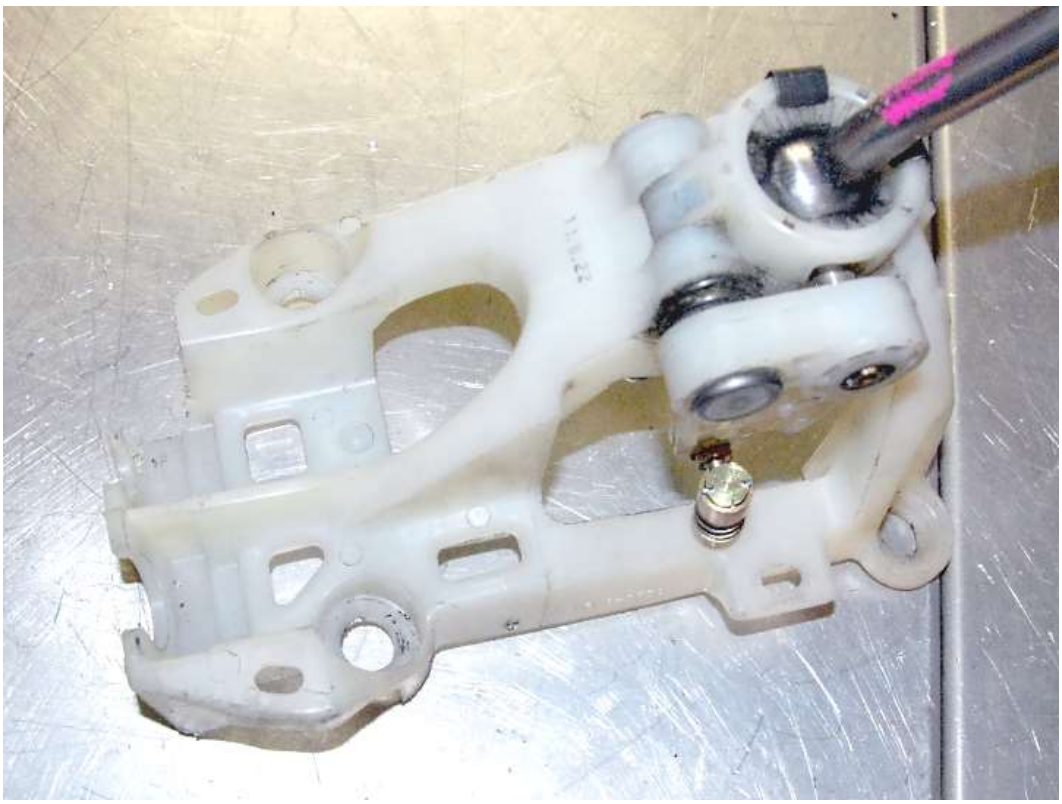


Turn the shifter on its side, revealing the metal bushing inserts.

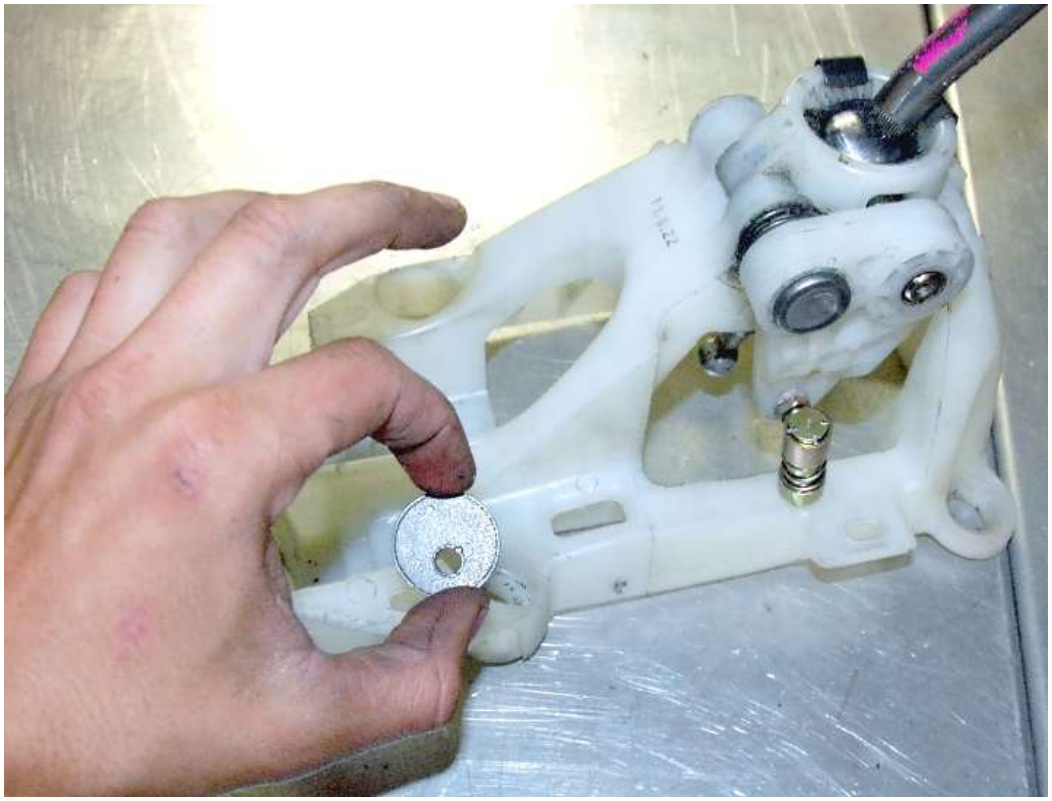


Remove the metal bushing inserts from the rubber bushings.

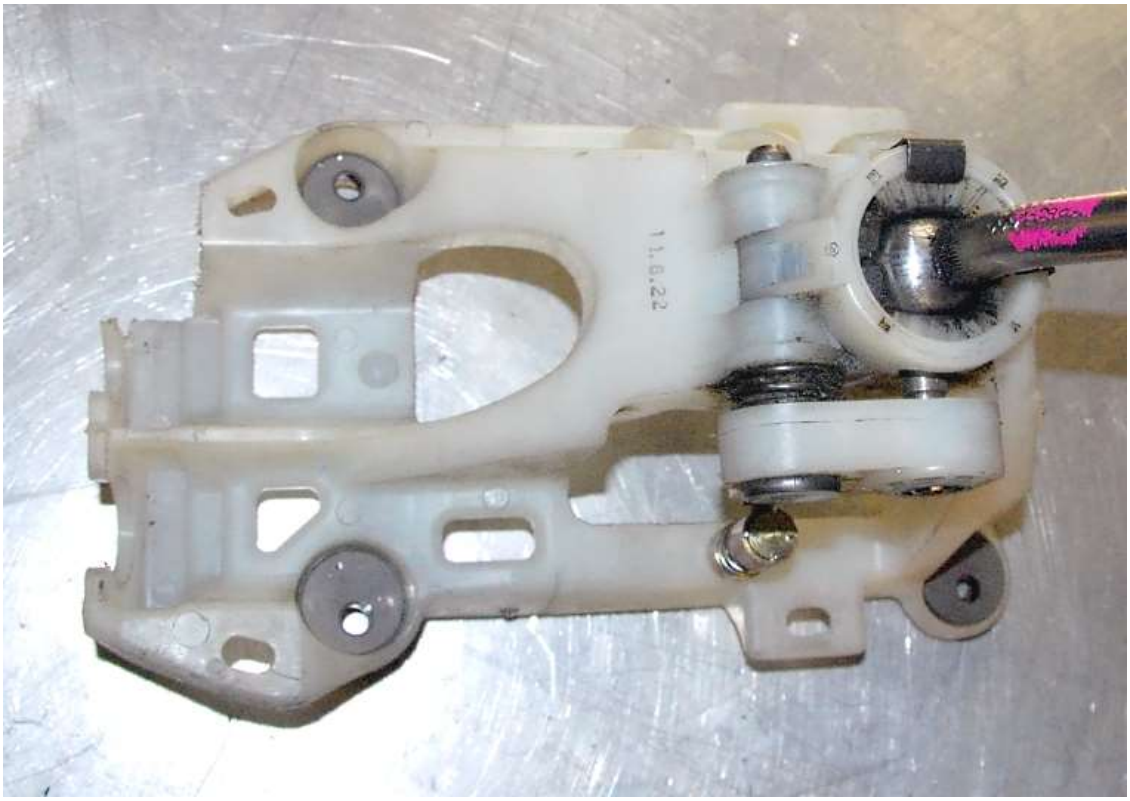
With the insert removed, it is easier to remove the rubber bushing. Remove all four inserts and bushings from the shifter.



The shifter should look like this after all of the bushings are removed.

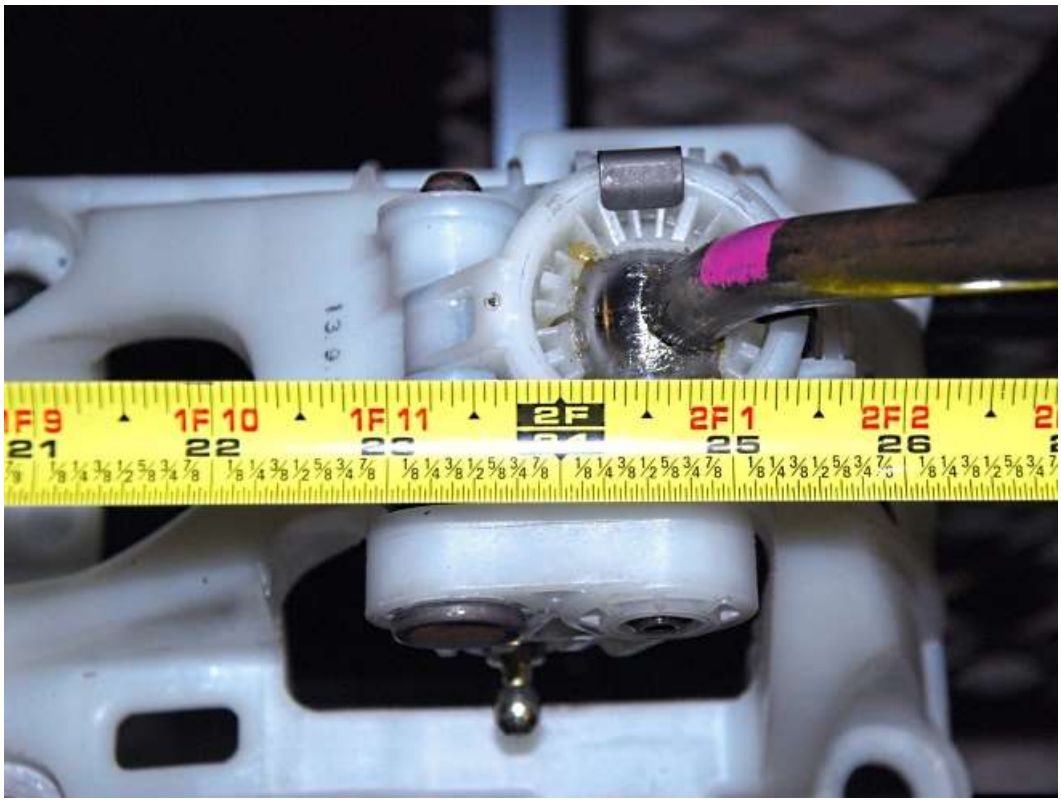


Insert the offset solid bushings with the holes facing towards the outside of the shifter.

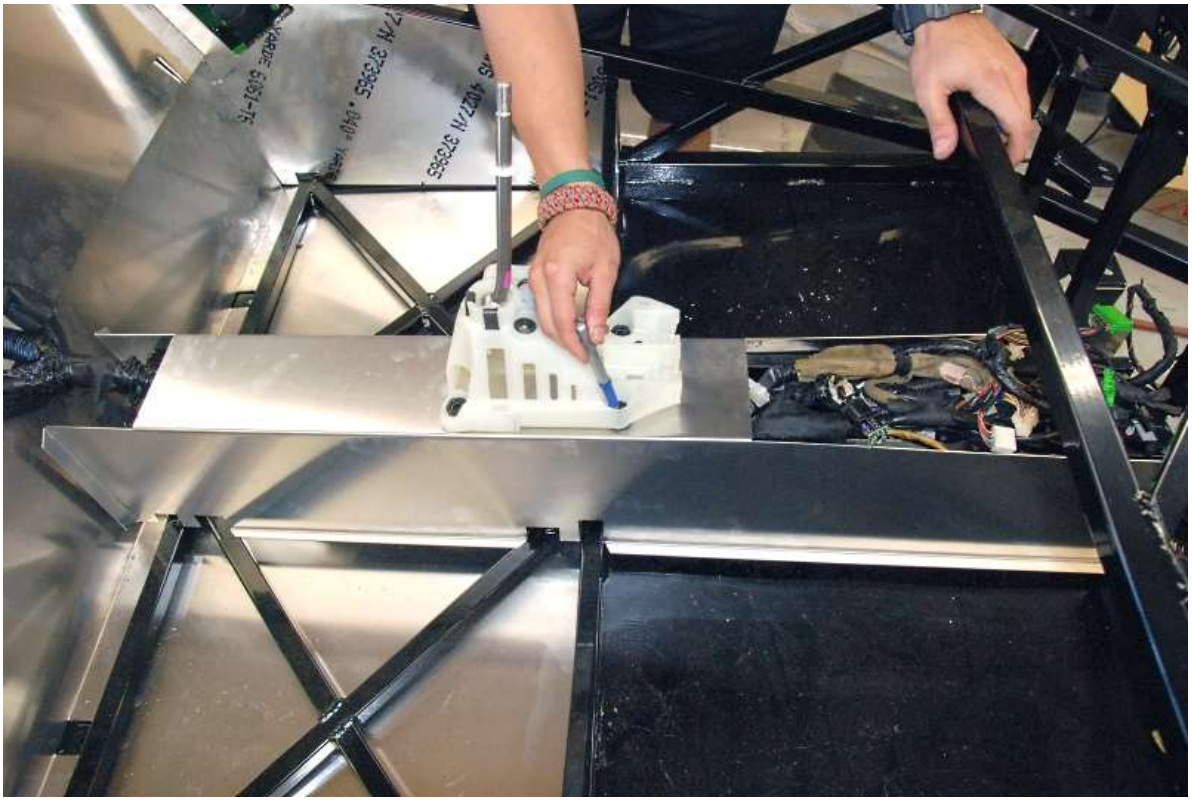


Here is the shifter with all of the offset bushings installed.

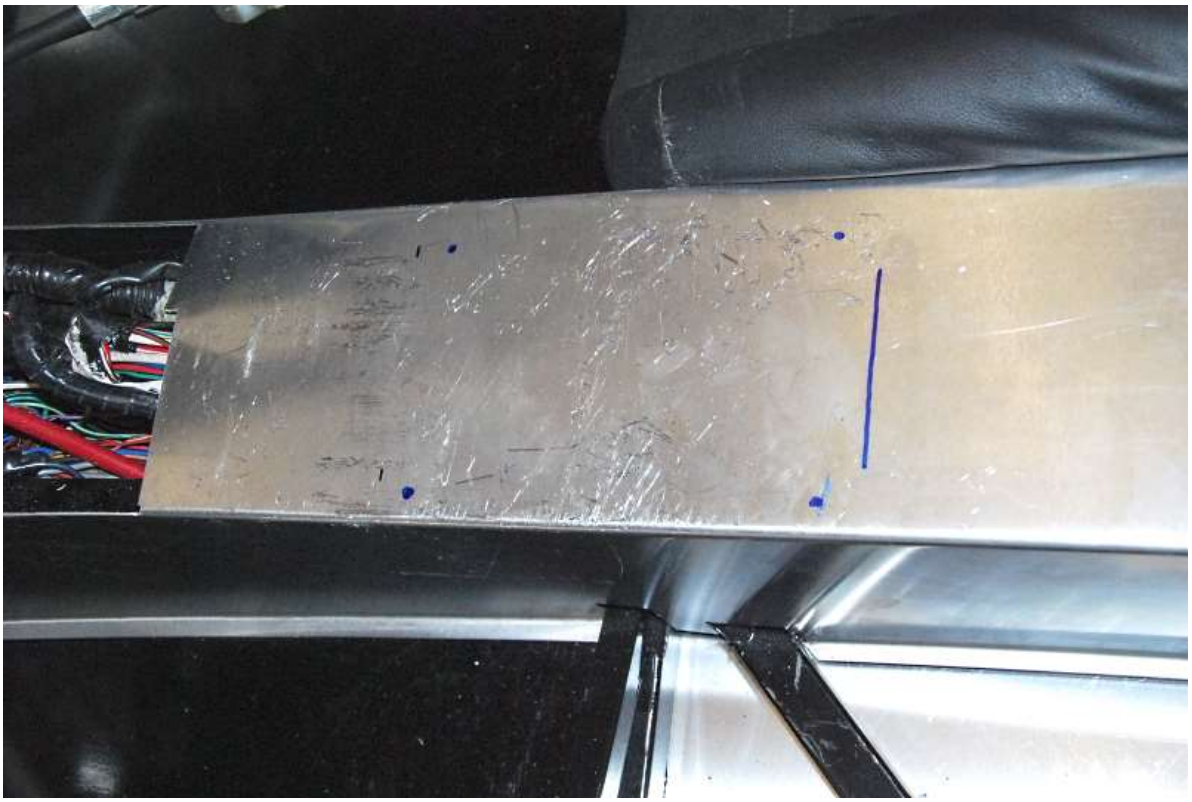
Install



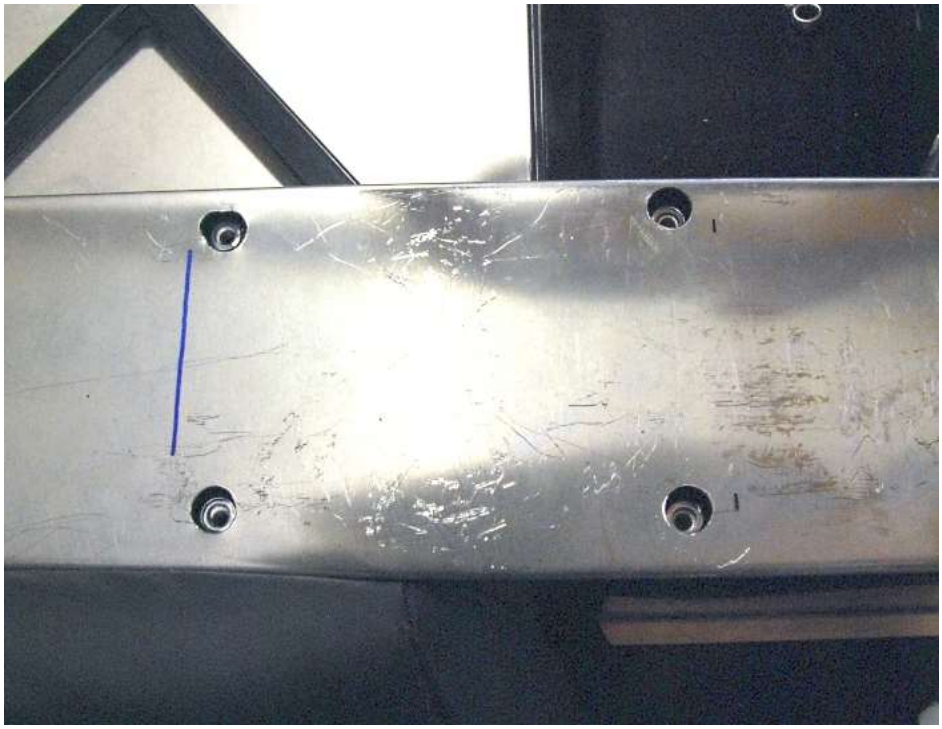
Put the shifter handle on the center tunnel and measure from the front cockpit wall center 1” tube to the center of the shifter pivot ball 24.50 inches.



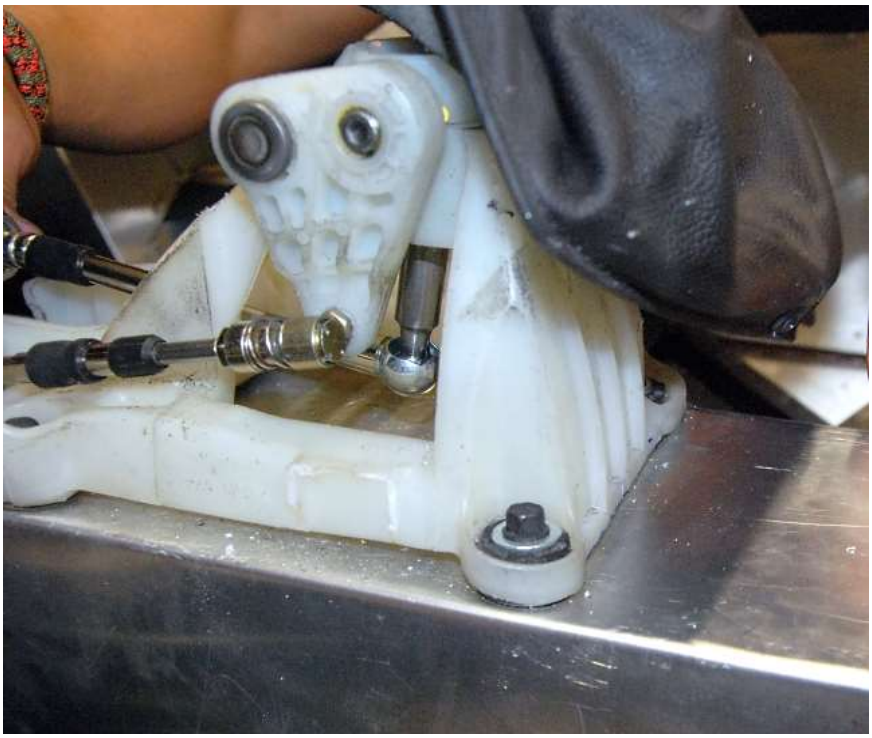
Mark through the four mounting holes in the shifter onto the tunnel.



Remove the shifter and drill the four marked holes for rivnuts. Drill slightly larger holes through the alum so the tunnel can be removed.



Install rivnuts in the top of the tunnel tubes for mounting the shifter.

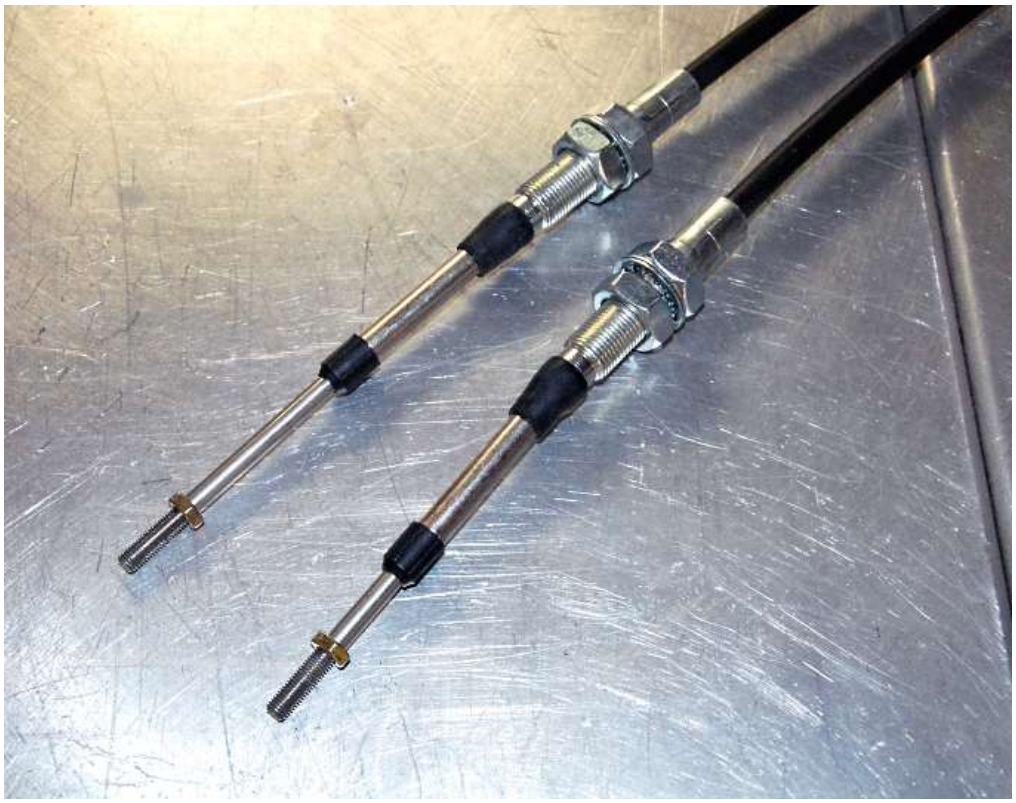


Tighten the shifter down to the transmission tunnel using ¼” x 1.50” hex head bolts.

Shifter cables

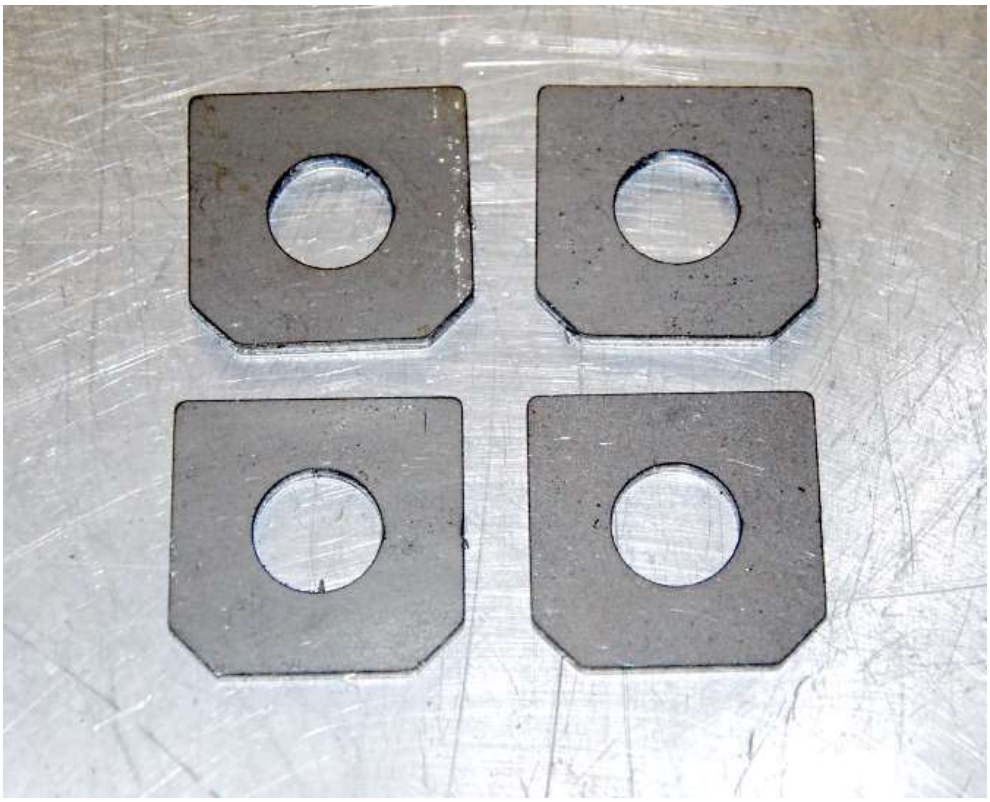
🚘 Cable shift kit
🛠 ½”, $^{15}/_{16}$” wrenches

Locate the shift cables that are provided with the kit.

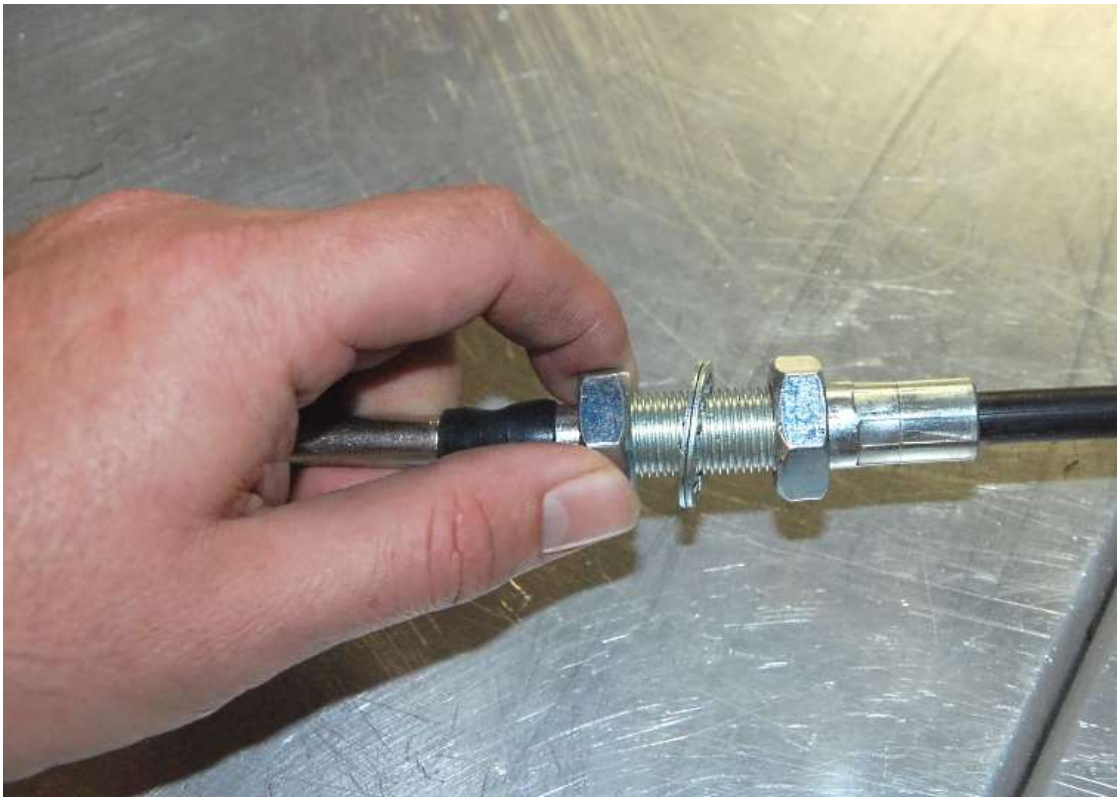


Pull the rubber boots off the threaded ends of the shift cables.

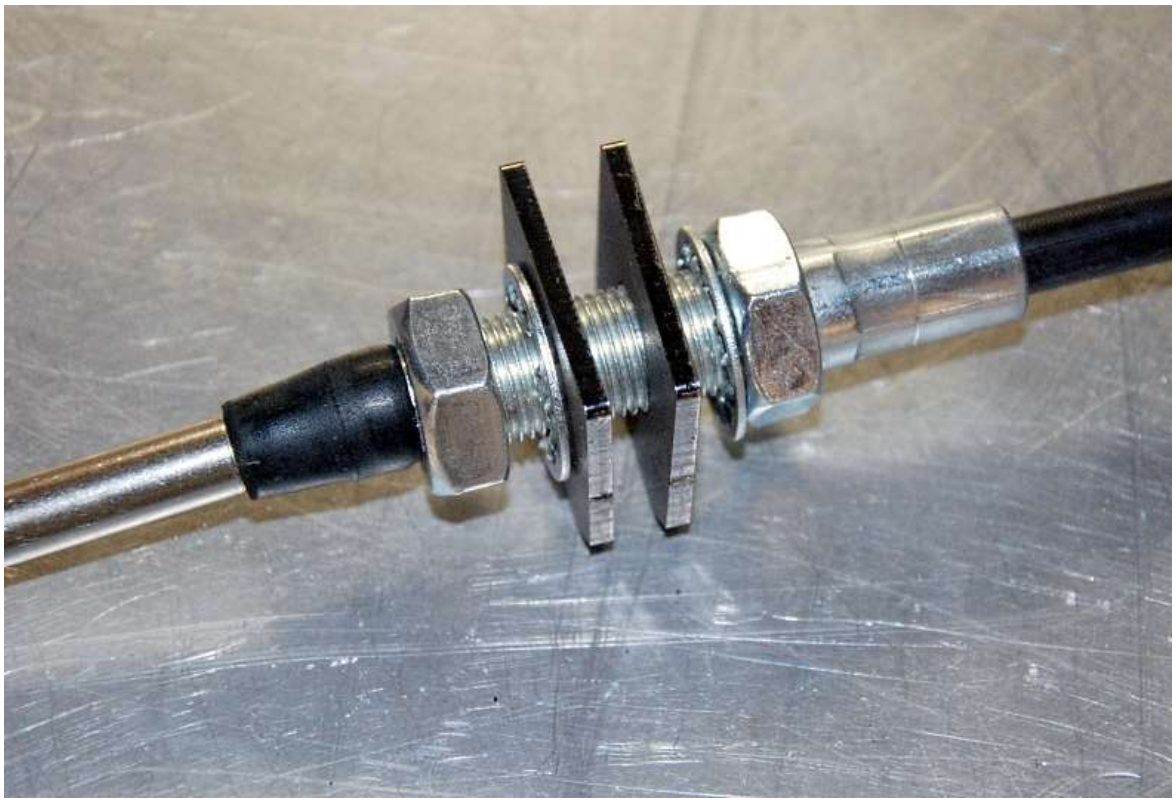
The ball pivot joint and ball socket will be installed on the ends of the cables.



Locate the shift cable washers provided in the kit.



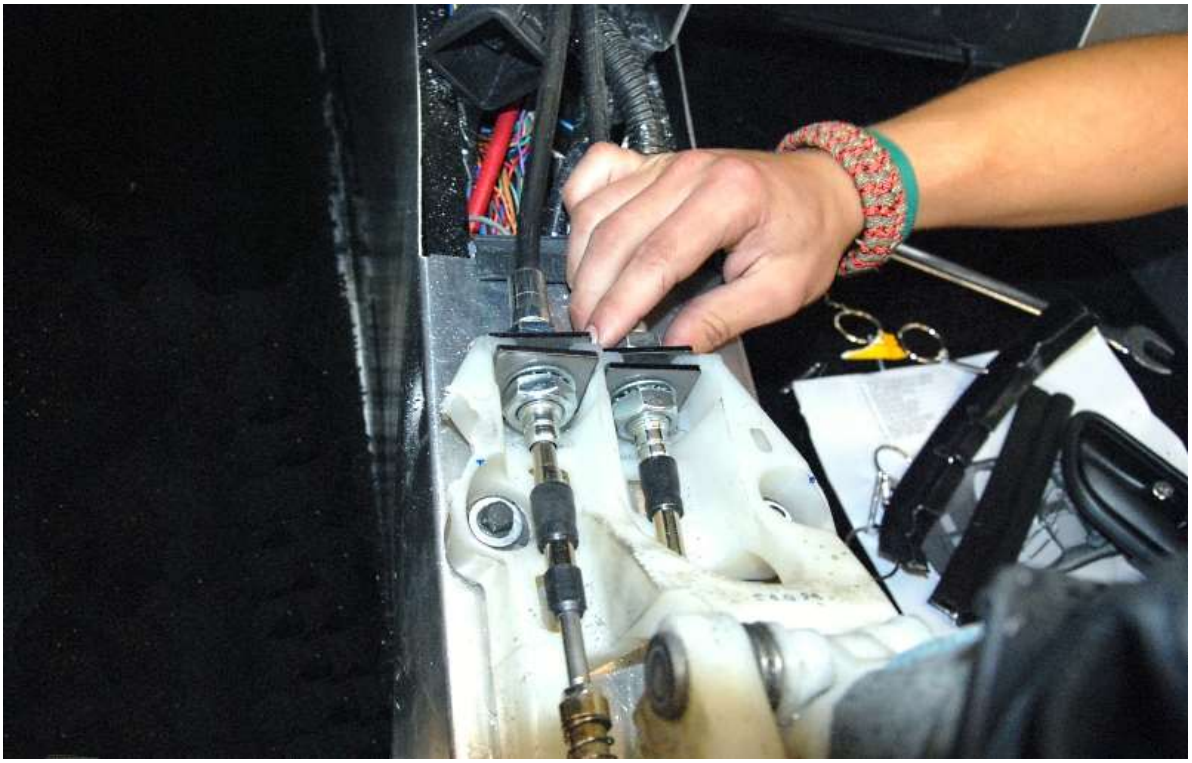
Remove the end jam nut and one of the lock washers from one end of both cables.



Slide two of the shift cable washers onto the cable then put the lock washer, jam nut and rubber boot back in place.

Thread the two ball ends onto the ends of the cable you just installed the cable washers on.

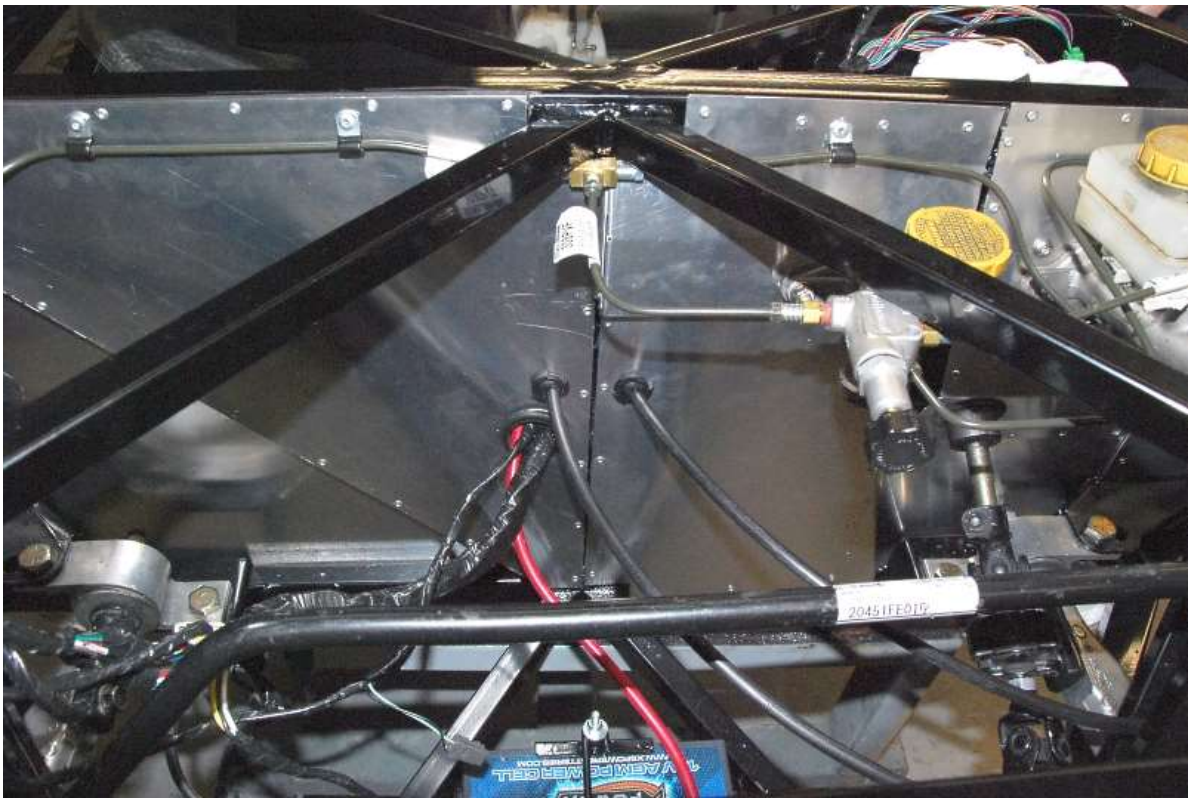
Slide the cables into the shifter with one of the cable washers on either side of the mounting tab on the shifter. The larger ball socket is the one that fits down the middle of the shifter mechanism.



The tapered side of the shifter washers points down so the cables will sit all the way down into the shift mechanism.

Locate the expandable grommets and remove the jam nuts and washers from the loose cable ends.

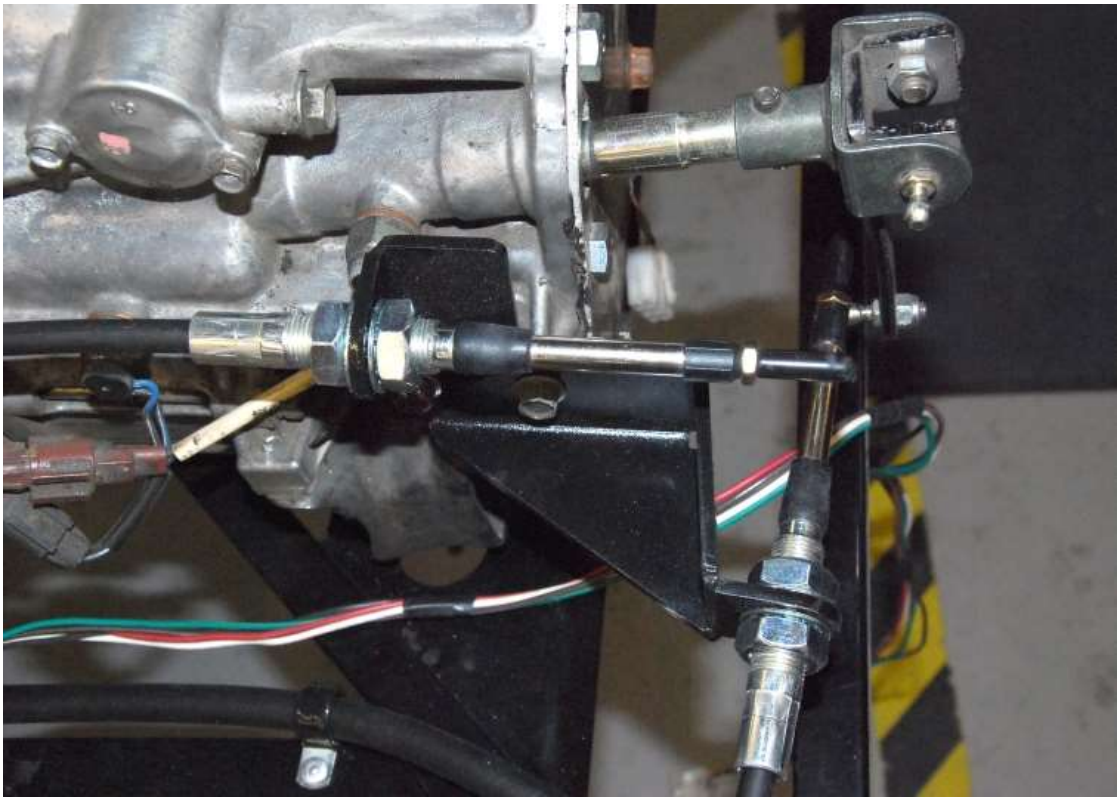
Slide a grommet onto each of the cables.



Run the shift cables through the holes in the front firewall installing the grommets when the cables are through and route the shift cables to the left side of the frame.

Run the cables over the front lower control arm and through the corner opening along with the coolant tubes to the back of the frame.

After the fuel tank, route the cables in next to the engine and back to the transaxle.



Attach the cables to the linkage bracket and adjust the lengths until you are happy with the shift action and there is no load being pushed on the cables when the car is in any gear.

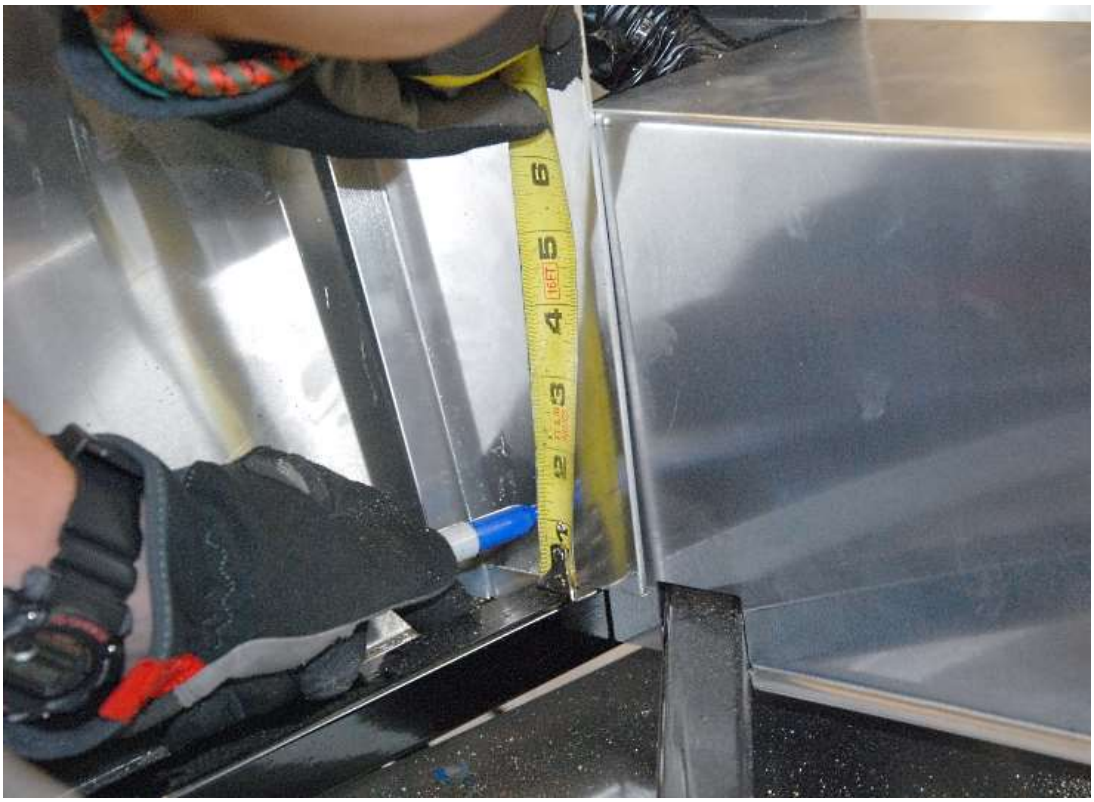
Emergency brake cables

🚘 OEM brake cables, brake components, body finish components, ¼" x 0.75" flanged button head screws.

🛠 Marker, tape measure, $^{1}/_{8}$", $^{5}/_{16}$", $^{25}/_{64}$" drill bits, Drill, $^{5}/_{32}$" hex key.

Route the E-brake cable up from the back and through the firewall.

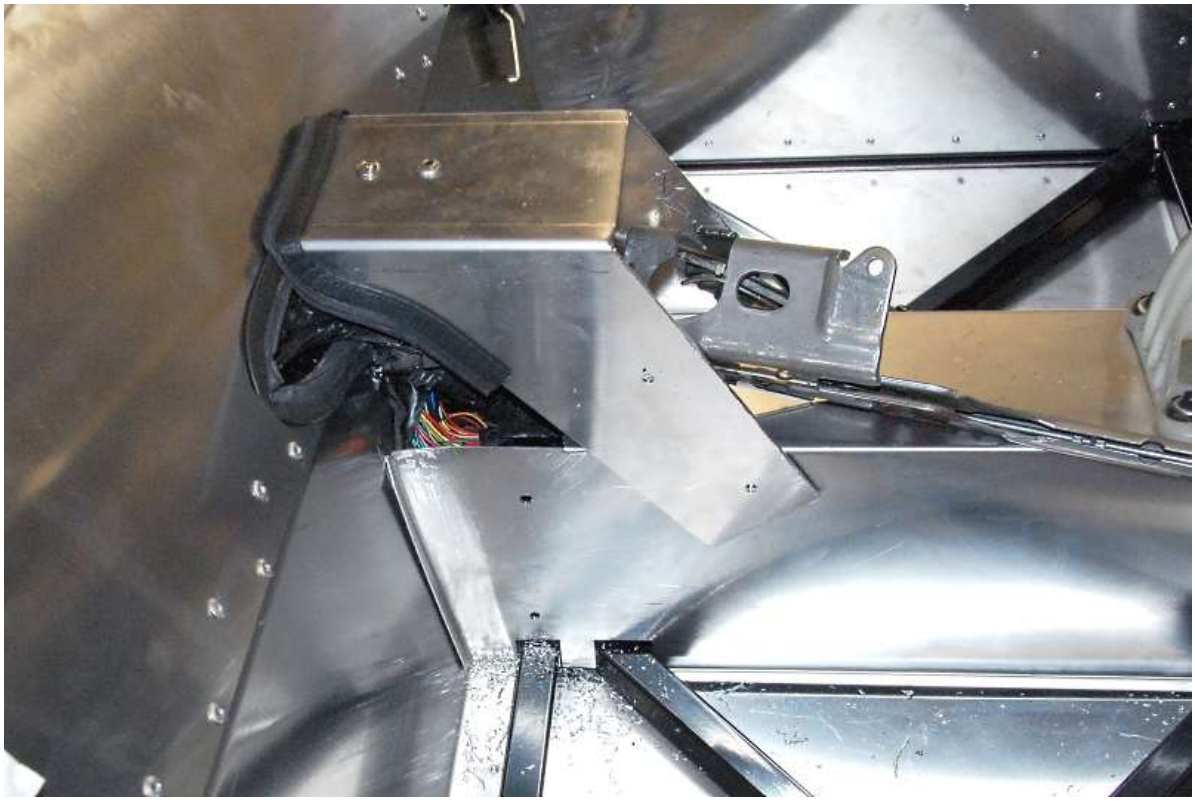
Slide the rear tunnel panel down into position until it is all the way back against the rear cockpit wall and down to the floor.



Use a ruler or tape measure centered on the rear chassis tube that runs under the panel, mark for a mounting hole 1 inch up from the top of the tube.

Mark a second hole 5 inches from the top of the tube, then check to make sure these marks line up with the vertical chassis tube that should be right behind them.

With the rear tunnel cover firmly in place drill through both the plate and the tunnel tubes with a small drill bit for marking.



Raise the e-brake panel up to allow the holes in the tube to be drilled for rivnuts.

Install rivnuts in the tube, drill the transmission tunnel aluminum panel slightly larger to allow for its removal without having to remove the rivnuts.

Route the e-brake cables up over the gas tank from the spindles and through the firewall pass through. Set them in the bottom half of the factory mounting bracket.

The top half of the OEM e-brake cable bracket should line up with the bottom bracket and capture the cables.

Line the holes up in the two brackets and bolt it to the bottom of the rear tunnel cover using two 5/16 in button head bolts.

E-brake handle

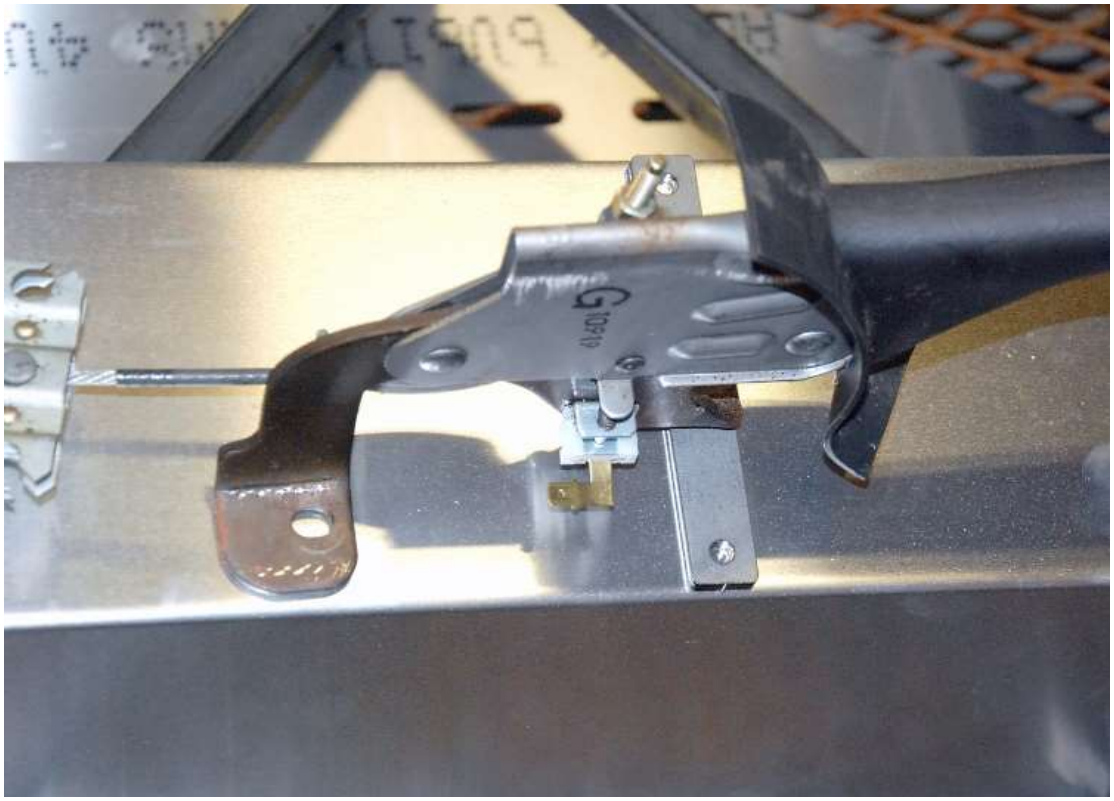
Attach the e-brake cable ends to the “T” coming off the back of the e-brake handle.

Loosen the adjuster nut until it has just a few threads showing past the end.

Cover the rear edge of the rear tunnel cover with the weather-strip and position it back into place and attach it to the tunnel.

Unpack the e-brake handle mounting plate and slide it under the front of the e-brake handle.

Line up the e-brake handle with the transmission tunnel so the rear hole is on the edge of the tube and the crossbar mount is flush with both sides of the tunnel.

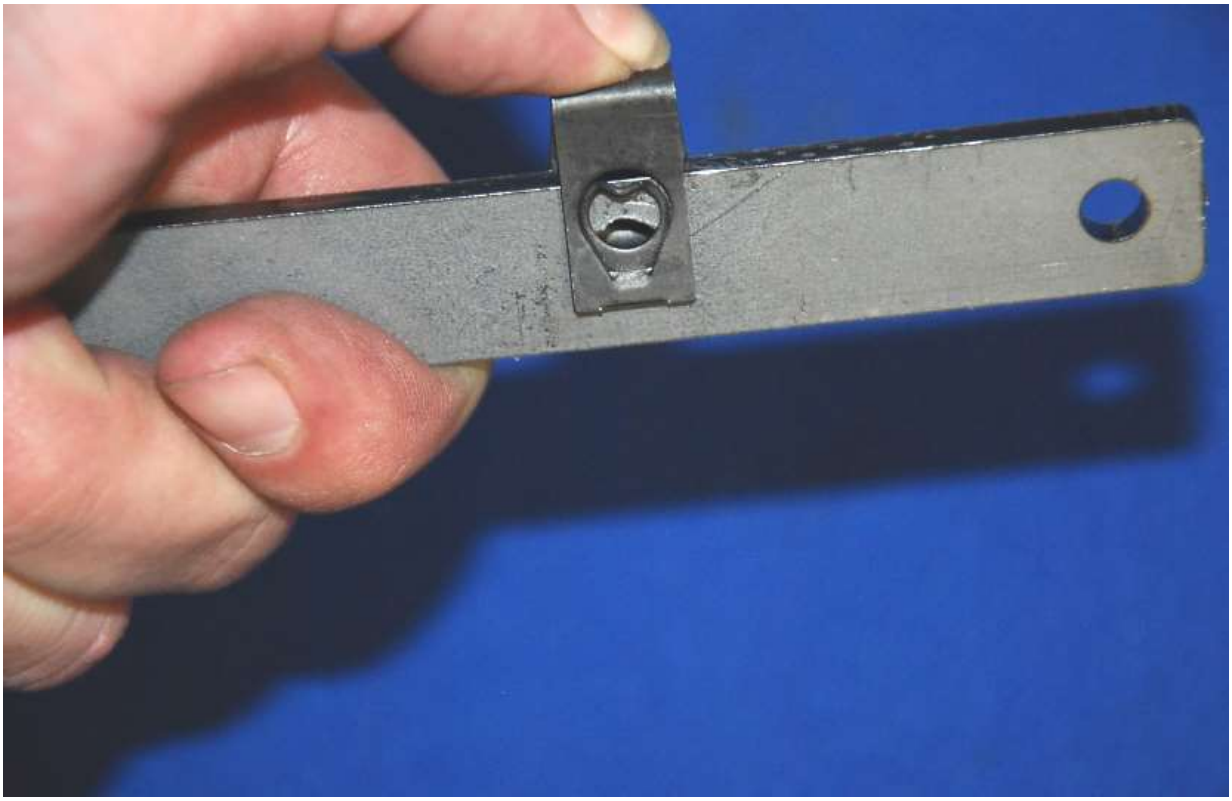


- Some models have the mounting boss facing the passenger side and at a slight angle. Flatten the boss out in a vice and line the hole up with the ride side edge of the tunnel.

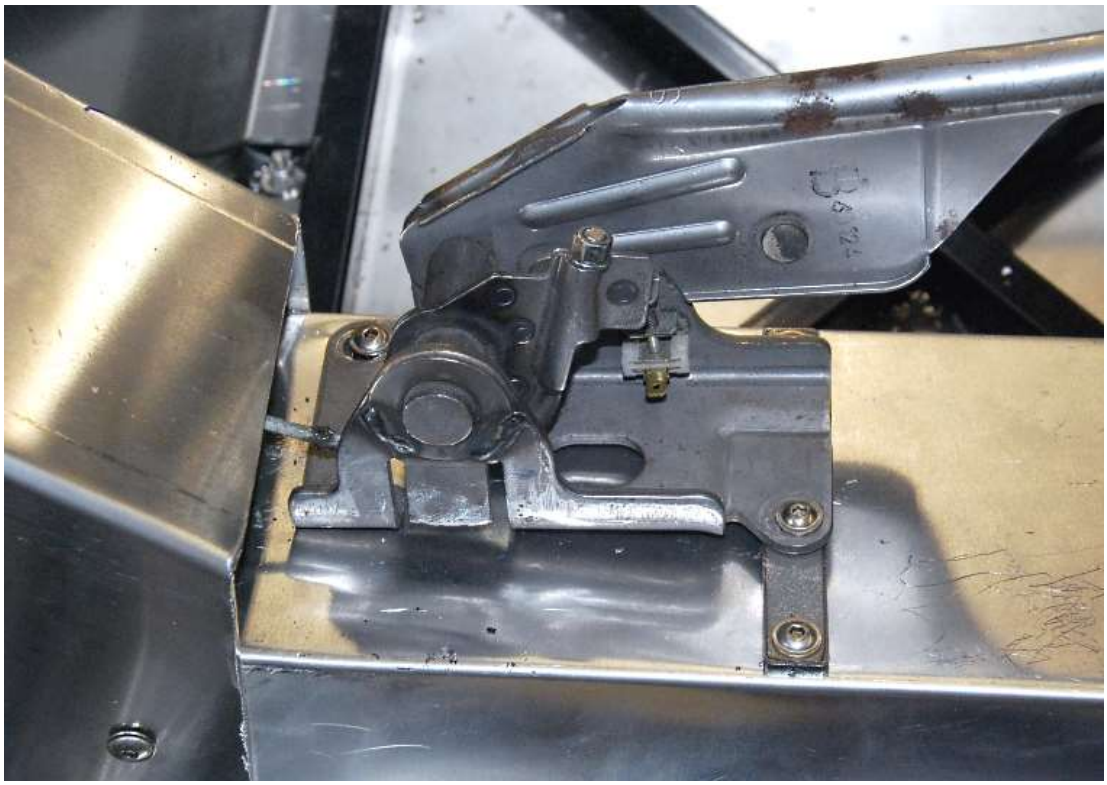
Mark the hole mounting locations on the tunnel and crossbar. Drill all 3 holes in the tunnel tubes with a $^{25}/_{64}$ inch bit for the rivnuts. Drill the holes slightly larger in the aluminum tunnel so it can be removed if needed.

Drill the crossbar out with a $^{5}/_{16}$ inch drill bit.

Unpack one of the captured nuts for mounting the e-brake handle.



Slide the capture nut on the crossbar and line the hole up so the mounting bolt can thread through.



Drill out the tunnel cover under the front handle mounting bolt so the captured nut can sit down flush and bolt the handle down to the bracket and the whole assembly to the tunnel.

You can now adjust the tension on the e-brake cables with the tensioner nut. Leave a little slack to ensure the brake does not hang up.

E-BRAKE BOOT

If it was not removed before pull the e-brake handle cover off the e-brake lever.

Locate your shifter boot from the Subaru.

Slide the boot down over the e-brake handle then install the Subaru shifter cover.

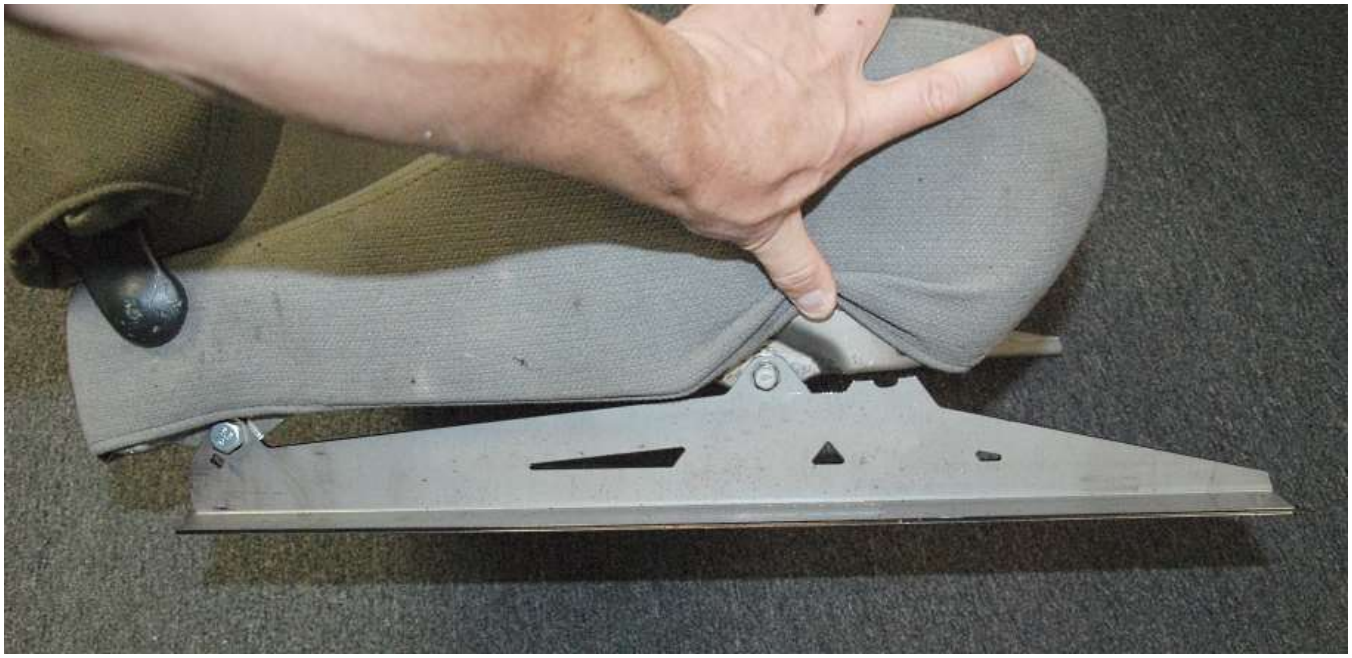
Seat mounting

- Seat mount brackets, $^{3}/_{8}$" x 2" bolts and locknuts, seats
- $^{9}/_{16}$" wrench, $^{9}/_{16}$" socket, ratchet, drill, $^{3}/_{8}$" drill bit
- The seats can be mounted now but if a hardtop is installed or full carpet set, they will need to come out again for these parts

2002-2005 Seats

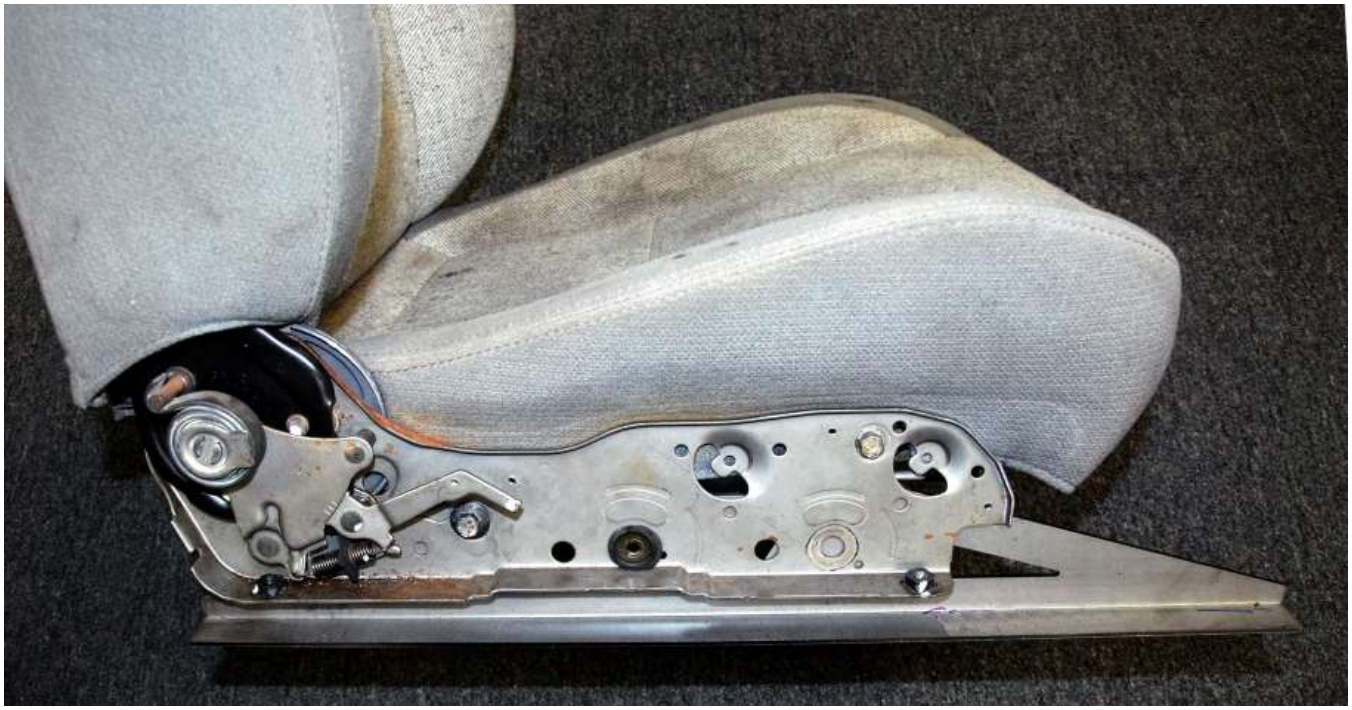
On the left seat left side, the rear bolt holding the seat hinge must be temporarily removed, because it also holds the seat bracket on.

Bolt the seat bracket on using OEM bolts in the top rear hole and the front slot.



On the right side of the early model left seat, the forward hole must be cut in addition to the two long tabs. This cut can be seen above.

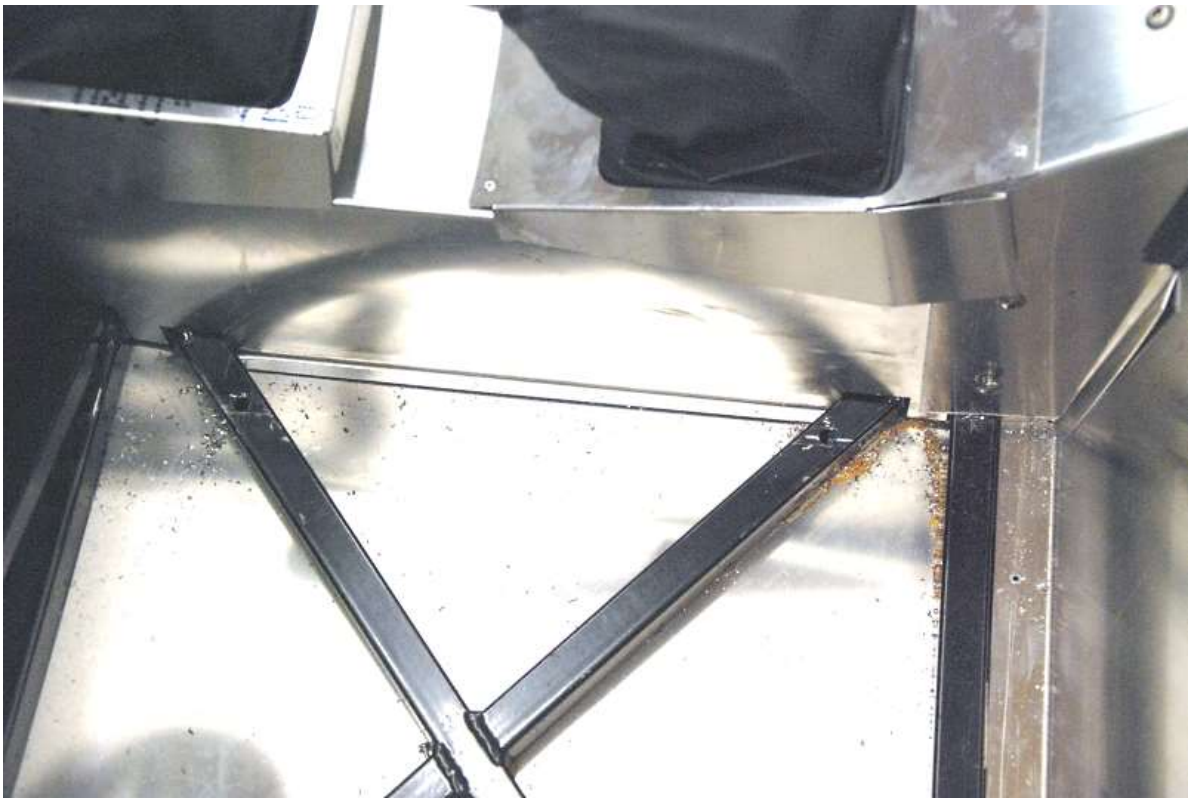
The bracket bolts to the seat using OEM hardware in the rear hole and slot of the bracket. Make sure to bolt the seat belt receiver to the seat using the rear bolt.



On the right seat, the right side bracket needs to be attached behind the stock seat bracket.

The right seat left side bracket bolts to the seat with two bolts in the front. Make sure to bolt the seat belt receiver to the seat using the rear bolt.

The rear also acts as a hinge so a bolt must be put through the hinge of the seat back into the bracket.



Mount the seat brackets to the chassis by marking where the seat fits on the “x” shape of the tubes. Then drill a hole in each tube to bolt the seat brackets through.

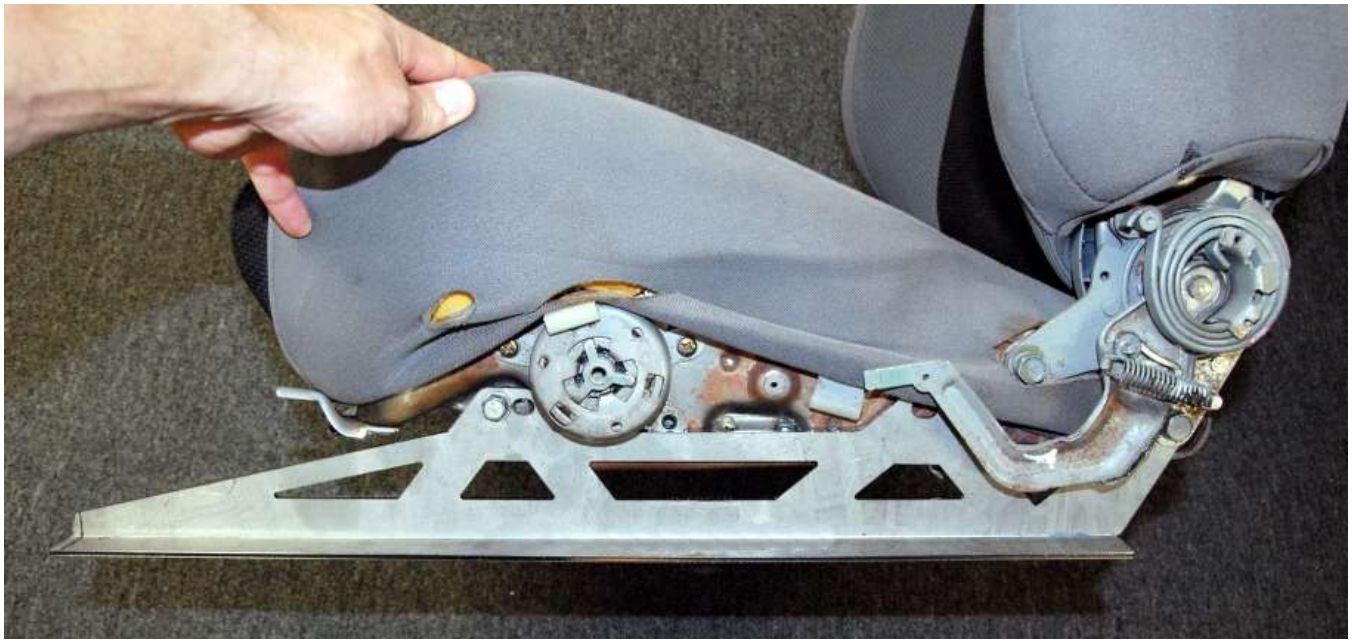
Place the bolt up through the bottom of the tube and seat bracket.

Bolt the seat to the frame.

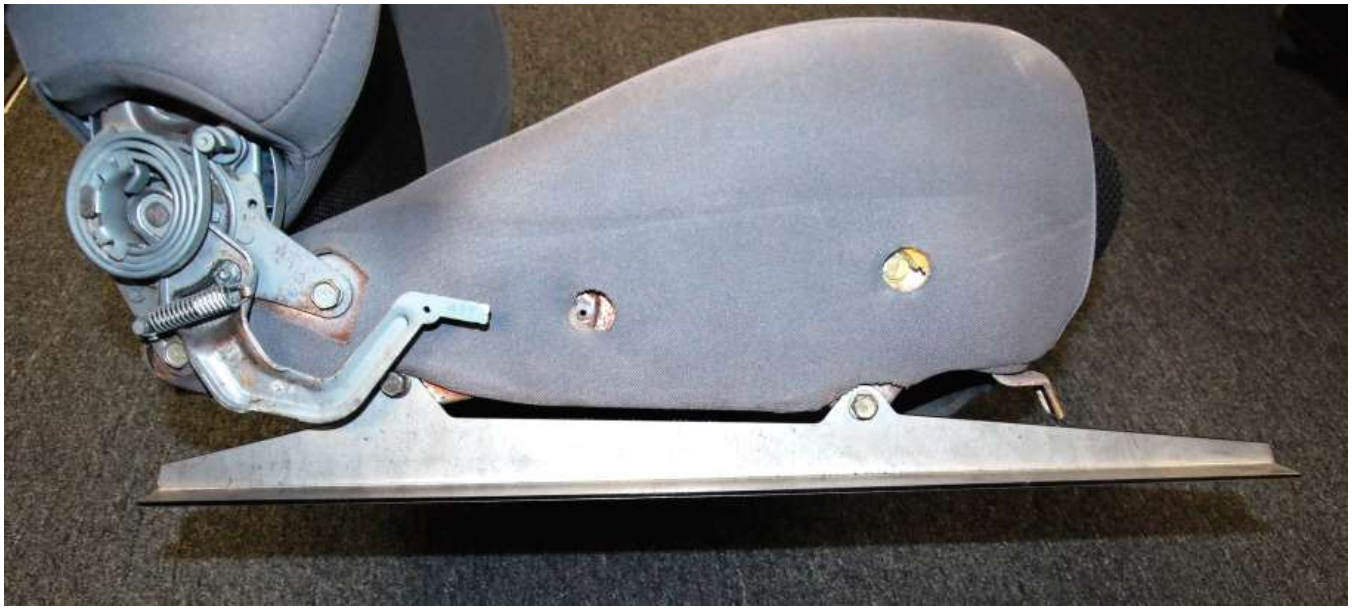
2006-07 Seats

On the right side of the left seat, after the two tabs are cut, mount the bracket using the furthest forward and rear holes using factory OEM bolts. Make sure to bolt the seat belt receiver to the seat using the rear bolt.

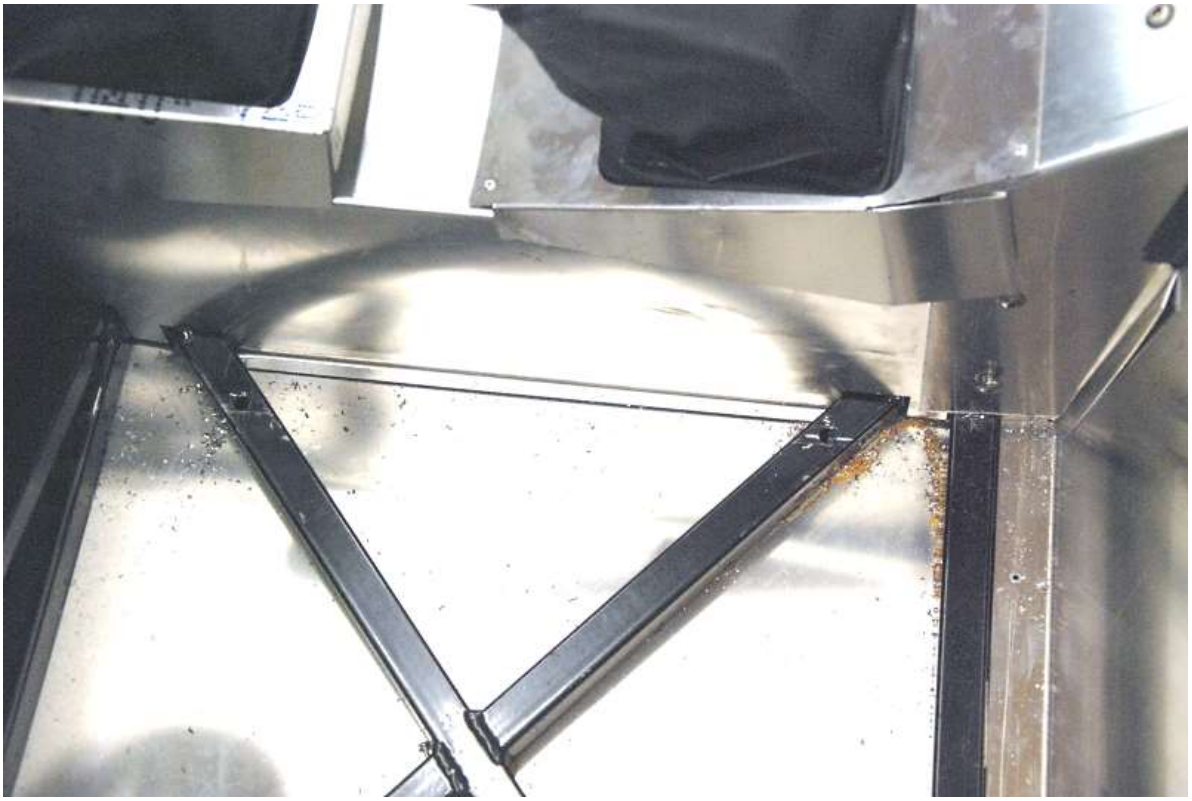
Use the provided spacer between the front hole of the bracket and seat in order for the bracket to sit flat.



The left seat left side bracket is bolted on using OEM hardware with the lower rear hole and front slot.



The right bracket needs two large tabs cut off, then the two holes bolt up using stock hardware. Make sure to bolt the seat belt receiver to the seat using the rear bolt.



Mount the seat brackets to the chassis by marking where the seat fits on the “x” shape of the tubes. Then drill a hole in each tube to bolt the seat brackets through.

Place the bolt up through the bottom of the tube and seat bracket.

Bolt the seat to the frame.

Rolling Chassis Check

- Make sure your wiring and hoses are away from extreme heat and moving parts.

Suspension

Double check of all of your suspension hardware to ensure that it is tight

Wheels

Put wheels on the chassis.

Make sure the steering turns freely lock to lock.
Make sure your brake flex lines have enough slack for the full range of wheel movement.
Set the ride height by adjusting the coil-over shocks.

Fluid Levels and Grease

🛠 Grease gun, chassis grease, ratchet, rags
🚘 Transmission fluid, engine oil, coolant, water
✋ See Appendix for quantities.

Suspension

✋ All of the suspension and steering components that have grease fittings need to be greased.

With a grease gun squeeze grease into each fitting on the front upper control arms and outer tie rods if applicable.

Transmission

Fill the transaxle with fluid.

Engine

Fill the engine with Oil.

Cooling system

- Bleeding the air out of the system is time consuming but mandatory before running the car for any extended period of time.

Fill the cooling system with a 50/50 coolant/water mix.

- To help bleed the air we usually jack up one end at a time and cycle the system, also having a funnel on the end of a piece of tubing is helpful. 10 heat cycles to get all the air out is absolutely normal.

Recheck both the oil and coolant after you have started the engine for the first time. Make sure there is some coolant in the overflow to start out, about 1/3 full is good.

After running the car for the first time once coolant is added and while the system is still warm, retighten the hose clamps used on the cooling system.

Rattle Patrol

- Review the final check list in the Appendix.

Get the engine up to temperature and check for leaks and make sure the fan is working.
If you need to you can temporarily bolt your exhaust in place to keep things quieter.
If you have the space in your driveway or have access to a small parking lot it is very helpful to drive the chassis around a little to make sure everything is working before you seal it all up.
You will be very surprised at how quickly the car responds to small inputs and it is amplified by being extra light without the body in place. Things to check for:

- Any leaks – brake fluid – transmission fluid – engine oil – rear diff fluid – coolant
- Wiring – loose wires – close to heat sources or moving parts – loose grounds
- Suspension – all hardware tight – no binding or clearance issues
- Chassis – all hardware double checked – nothing loose or sharp
- Steering – all set screws tight – steering wheel tight – tie rods and rack tight
- Brakes – Plenty of fluid; pedal not bottoming; all fittings tight to reservoir

- Brake Bias – If you have space, adjust your brakes bias with the proportioning valve. Set up your brakes so that the fronts lock up just before the rears.

Your rolling chassis is now assembled!

Chapter

5

Mounting the Body

Gas cap

🚘 Fuel tank components, left body side.
🛠 Drill, 2.50” hole saw, ¼” drill bit.

On the left side body panel, use a 2.50 inch hole saw to drill a hole in the center of the recessed portion of the panel for the gas cap opening.

Place the gas cap in the recessed area and use the cap as a template to drill the bolt holes through the body.

Bolt in the gas cap through the drilled holes using the fasteners provided. Attach the ground strap to the gas cap under one of the locknuts.

Tail lights

- Rear light components, rear bumper, packaged aluminum, #10 x 5/8" Philips head screws and locknuts, #10 x 5/8" hex head screw
- Marker, drill, 3/16" drill bit, 1.75" hole saw

Brake lights

Place the brake light in the large recessed hole in the rear bumper so the DOT numbers are at the bottom and mark the mounting holes using a marker.

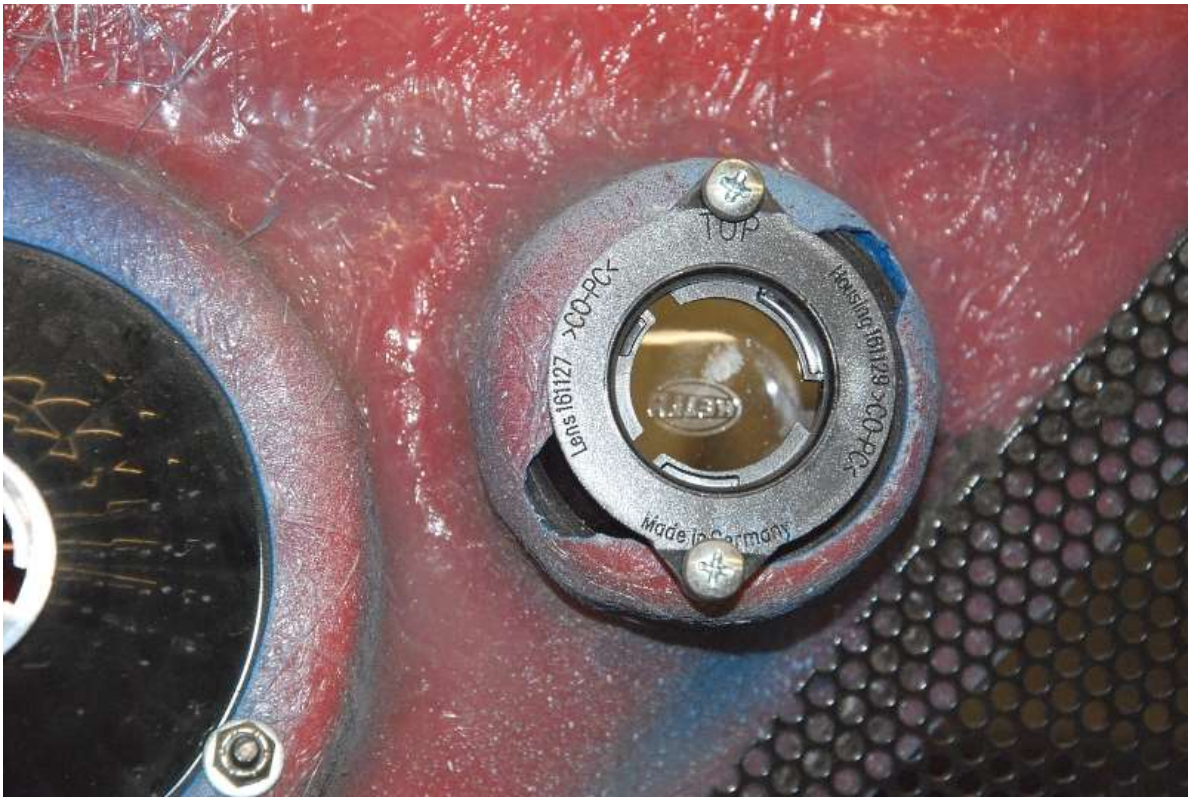
Drill out the marked out with a 3/16" drill bit, and use the #10 x 5/8" Philips head screws and locknuts to mount the tail light.

Rear turn signal lights

Place the aluminum reverse light/turn signal template in the small recessed hole in the rear bumper.

Using the template, drill out all three $^{3}/_{16}$" holes through the rear bumper. The holes should all be lined up vertically.

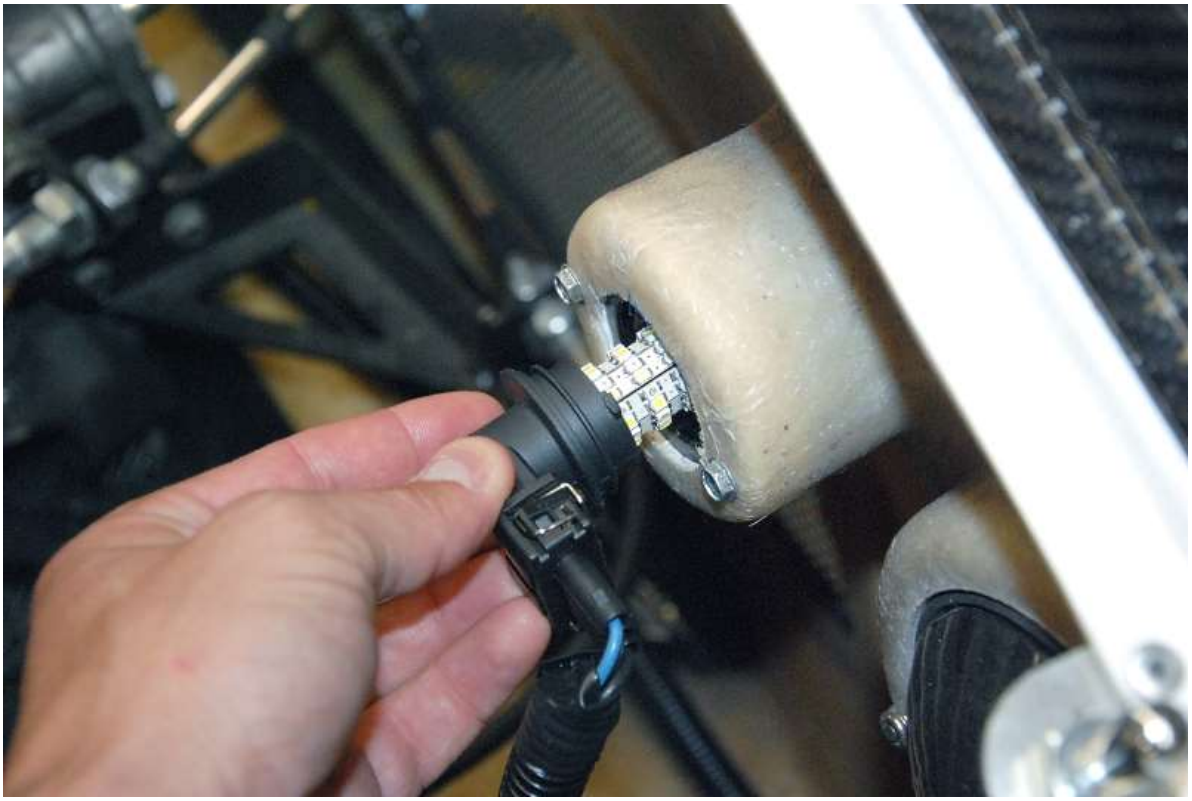
Drill the center of the recess using a 1.75" hole saw for the light. Use the middle hole you drilled to locate the hole saw.



Use the supplied #10 x $^{5}/_{8}$" hex head thread forming screws to hold the light from the backside.

Remove and throw away the gray light socket.

Put the O-ring on the black light socket.



Place the LED bulb in the black socket by lining up the tabs on the bulb with the holes in the socket, then turn the bulb in order to hold it in place once inserted.

The bulb can go in either way, check the turn signal and reverse light once the car is wired up. If the wrong color light turns on, remove the bulb, turn it around and reinstall.

Headlights

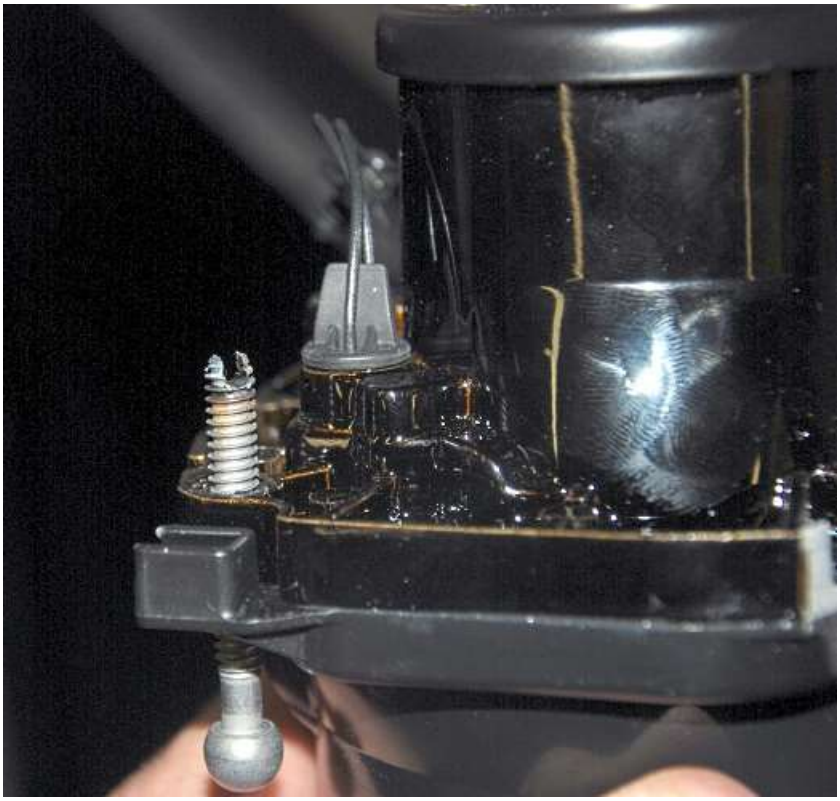
Headlight components, Nose components
Hacksaw, file, T-20 Torx, plastic epoxy, silicone.

HEADLIGHT PREP

Headlight components, nose components
Hack saw or cut-off wheel

The top outside headlight mounting ear will hit the headlight bucket so the top outside ear needs to be removed.

Cut the top inside corner off the headlamp as shown so that the headlamp will fit in the bucket.



Cut a slot in the top of the three remaining adjustment screws. These will need to fit a flat head screwdriver to adjust the headlight later.

Push the mounting cups that come with headlight onto the ends of the adjustment screws.

MOUNTING

Test fit the lights in the bucket by pushing the cups into the mounting holes. The flange on the cups should sit against the mounting surface.

Screw the adjustment screws in so that the edge of the glass is even with the front of the plastic bucket.

Use plastic epoxy to bond the sides of the mounting cups to the bucket. Be careful not to get epoxy on the ball of the adjustment screw or the threads. Let the part fully cure before continuing.

Front Turn Signals and parking lights

🚘 Turn/parking light components, headlight buckets
🛠 Lock-tite or other threadlocker, 10mm wrench

Find the front turn signal, remove the nut and from the front side of the headlight bucket insert the wires through the front inside mounting hole location.

Insert the wires through the nut put some threadlocker on the threads then tighten the nut using a 10mm wrench.

Repeat the same procedure for the three white parking lights on the outside of the bucket.

Headlight bucket

🚘 Nose components, body components, #10-32 x 1" flat head hex socket screws, #10 locknuts
🛠 Drill, $^{3}/_{16}$" drill bit, $^{1}/_{8}$" hex key, $^{3}/_{8}$" wrench, countersink bit for a #10 screw, silicone

Trim the flange in the nose headlight opening so that it does not stick out past the sides of the headlight bucket.
Test fit the bucket to the underside of the nose making sure that the bucket sits flat on the flange all around the opening.

- ✋ If there is a small gap at one location, note the location of this area. A mounting screw here will pull the bucket to the nose.
- ✋ Be careful in the next step so you do not drill into someone's hand.

With one person holding the middle of the bucket from the back of the fender hold the bucket up to the fender. Locate the bucket so the fender flange is even all the way around.
Drill five $^{3}/_{16}$" holes through the middle of the fender flange evenly all around the bucket starting at a point that needs pulling.
Remove the bucket.
Countersink the fender flange holes for the #10 screws.
Attach the headlight bucket to the fender using the #10-32 x 1" flat head hex socket screws, #10 locknuts, $^{1}/_{8}$" hex key and $^{3}/_{8}$" wrench.

Run a bead of silicone around the edge of the bucket between the bucket and the fender. Be careful not to squeeze too much into one area or it will go through into the bucket.

Headlight lenses

🚘 Headlight covers
🛠 Sandpaper, masking tape, flat black paint, double stick tape.

Check the fit of the lens. If necessary a heat gun or similar can bend and mold the lens.

Make sure there is a consistent gap between the lens and the fender. Sanding the edge of the lens is the best way to trim.
If desired, wet sand the sharp edges of the lens to smooth them.
If desired mask off the top of the lenses so that there is a boarder showing the same with or 1/8 inch more than the flange on the fender and paint the lens boarder. This will cover the adhesive, tape and bucket screws.
Use double stick tape all the way around the lens to attach the lens to the fender.

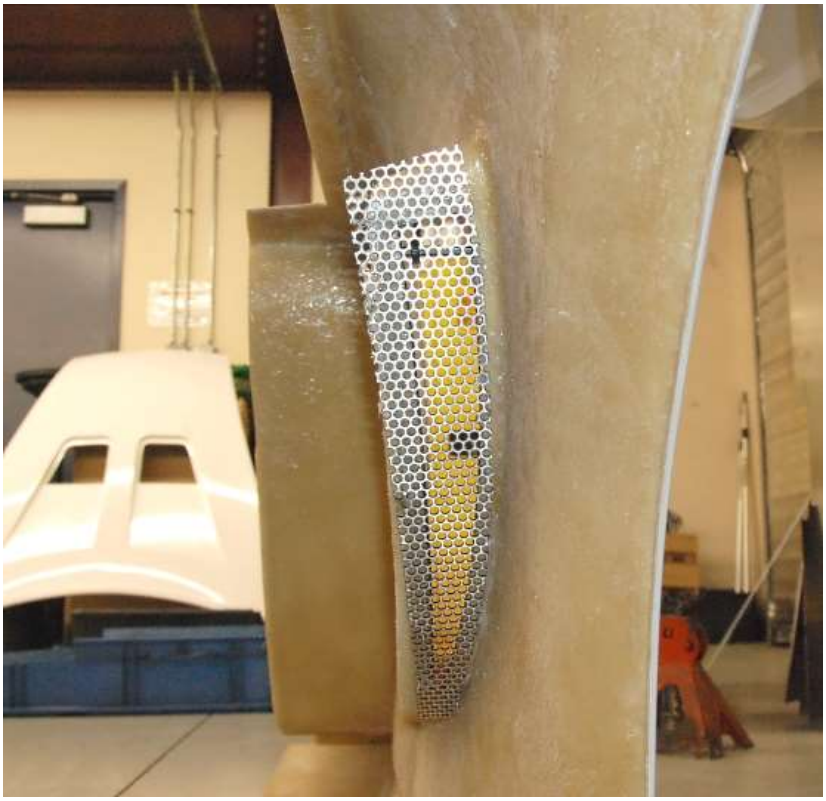
Mesh

- Packaged aluminum, insulated clip hardware, body.
- Silicone, jig saw or air saw, masking tape, marker. Gloss black paint (optional)
- The cut outs behind the mesh are optional, we only recommend cutting out the nose if you are adding ducts for brakes.

Body sides

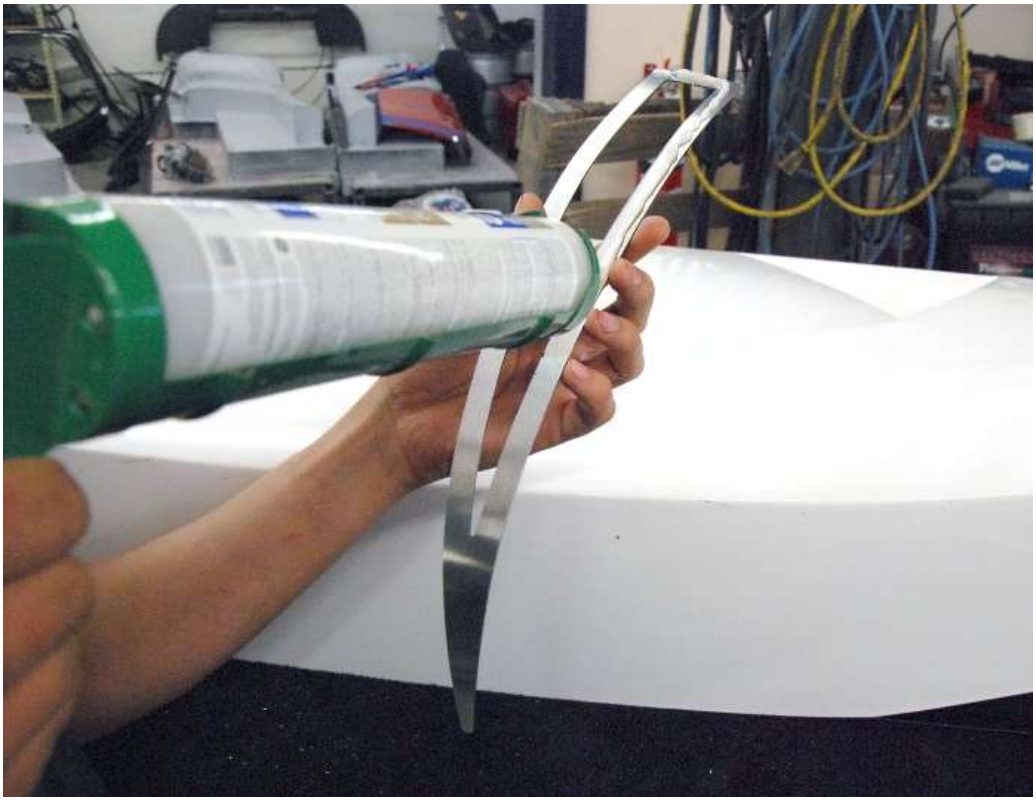
Hold the side vent trim in place and trace the inside edge onto the body.

Cut out the shape of the vent.



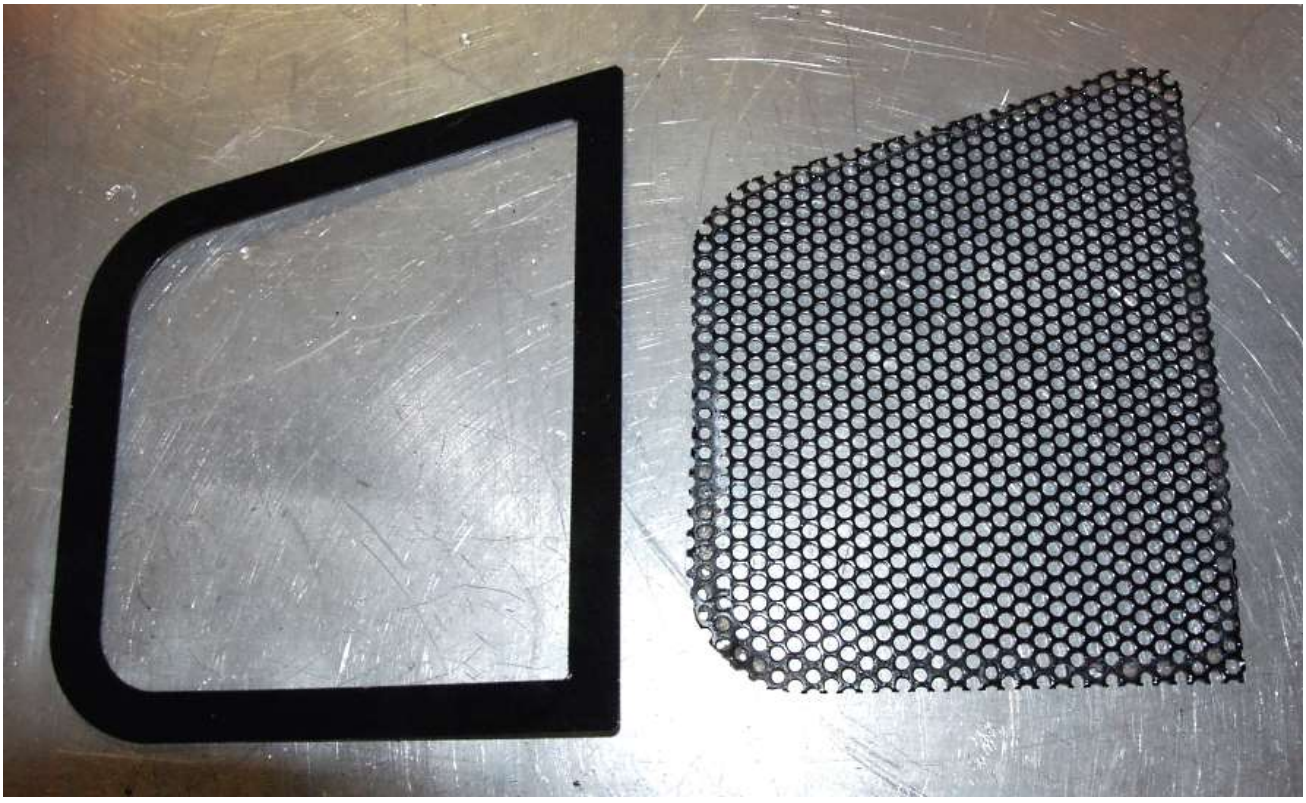
Silicone and place the mesh on the back side of the body.

Use the same method as the front bumper to hold the mesh behind the side vent cut out.



Place a silicon bead around the inside of the side vent trim and use masking tape to hold the trim in place on the body until the silicone dries.

Hood



Unpack the mesh and trim covers for the hood and paint or powder coat before installation if desired.

Lay a thin bead of silicone along the flange of the hood opening.

Push the trim cover down on the silicone. Once it is sitting flat let it dry completely.

Flip the hood over and lay a thin bead of silicone along the bottom of the vent flange.

Lay the mesh down in place making sure the smooth side is facing the top of the hood.

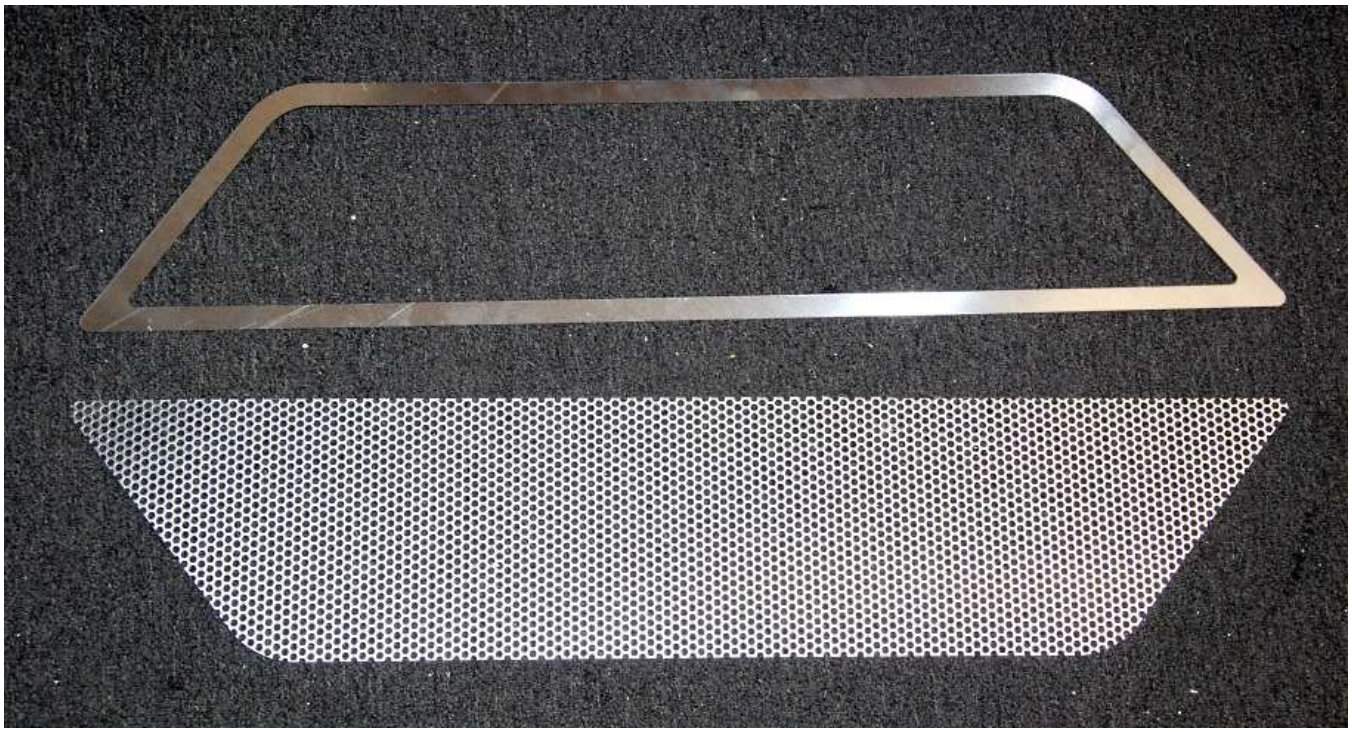
Finished hood vent, these have been painted black with gloss black engine enamel.

Engine Cover

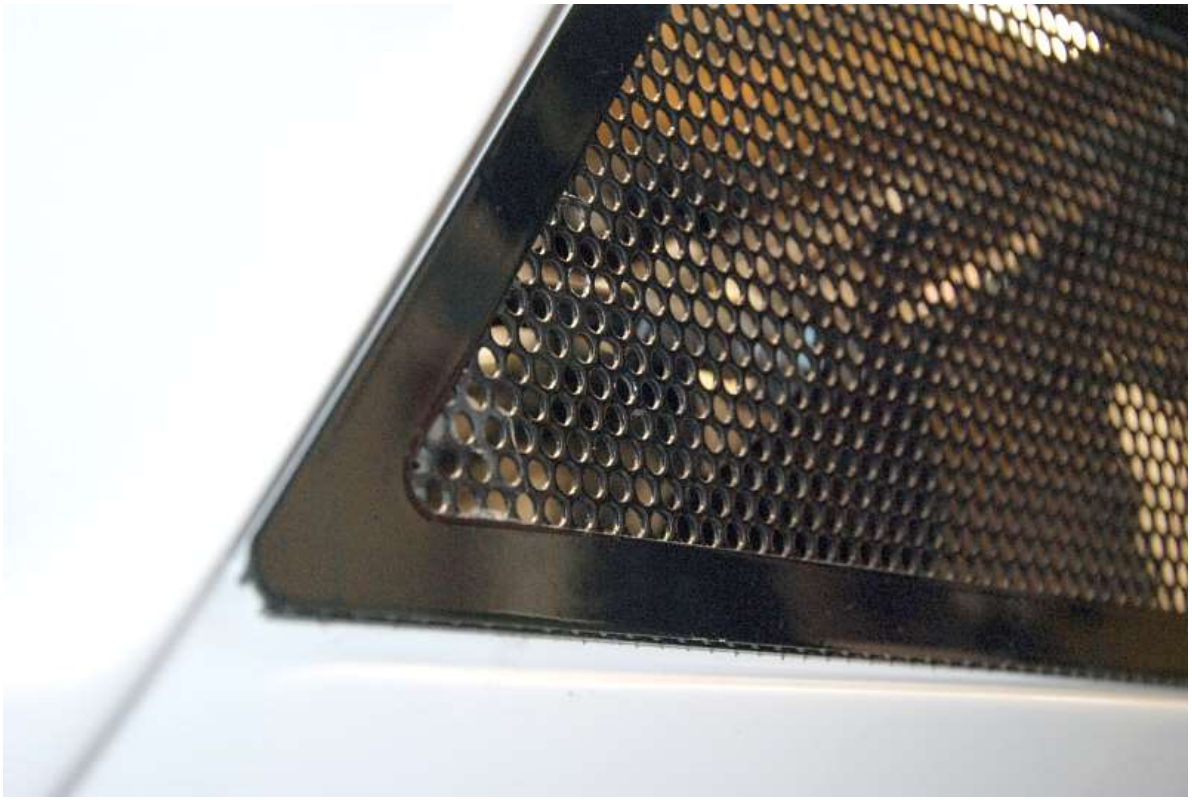
Unpack the rear intercooler exit duct.

Follow the same process as the hood vents to install the intercooler duct.

Rear Bumper

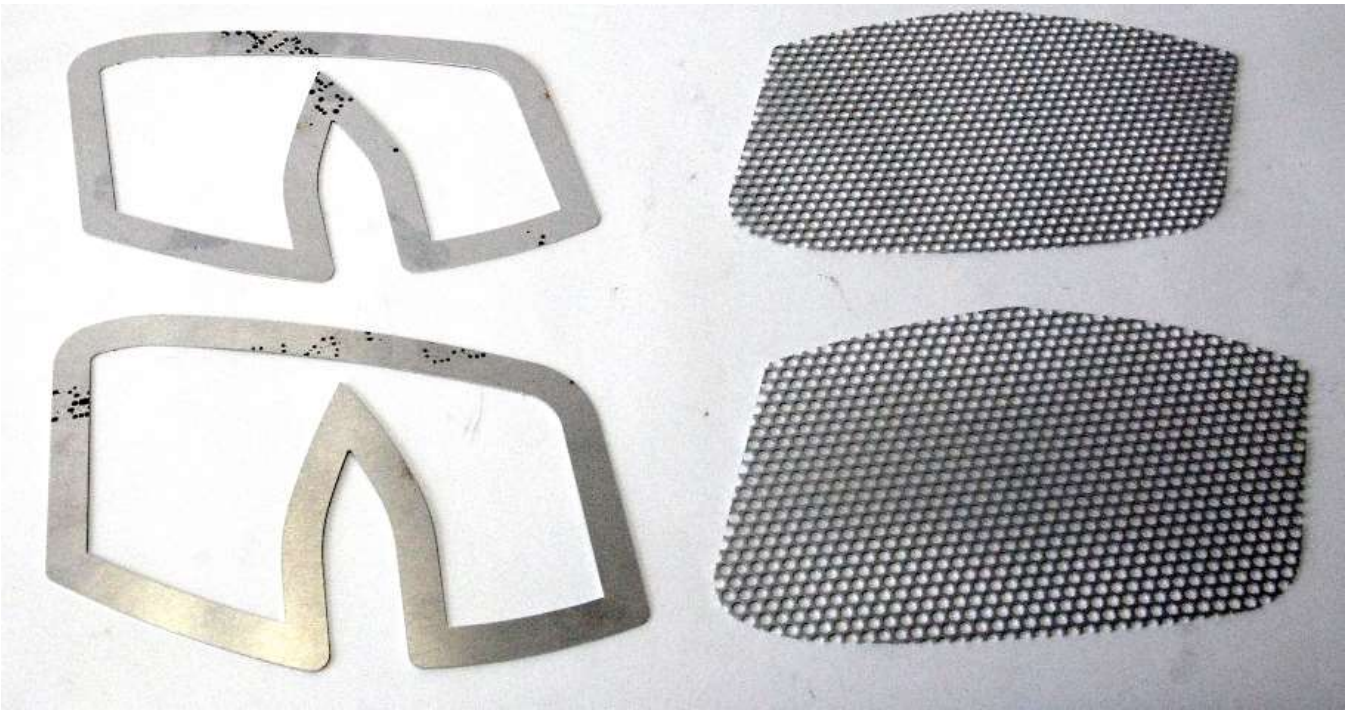


The large remaining vent and trim piece are for the rear bumper.

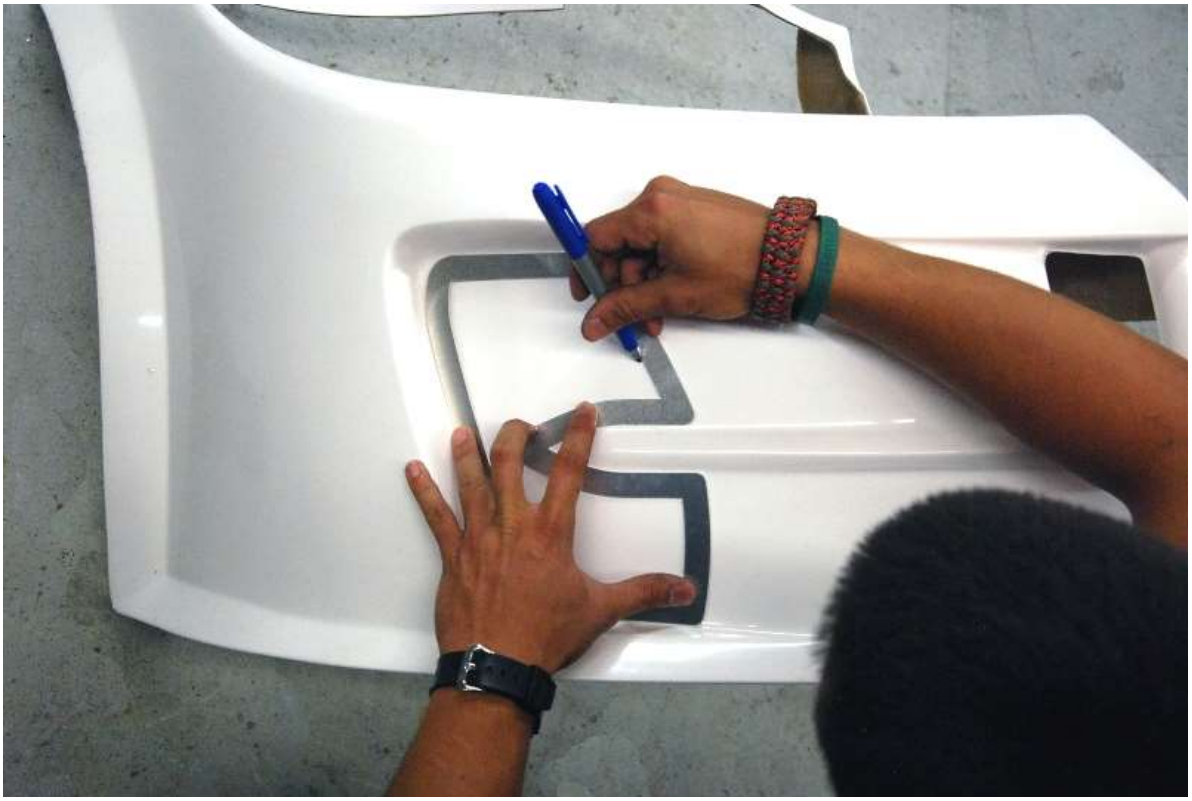


Install these pieces as you did the others except the mesh and trim both mount to the outside of the body to give extra space for the shift linkage.

Nose (optional)

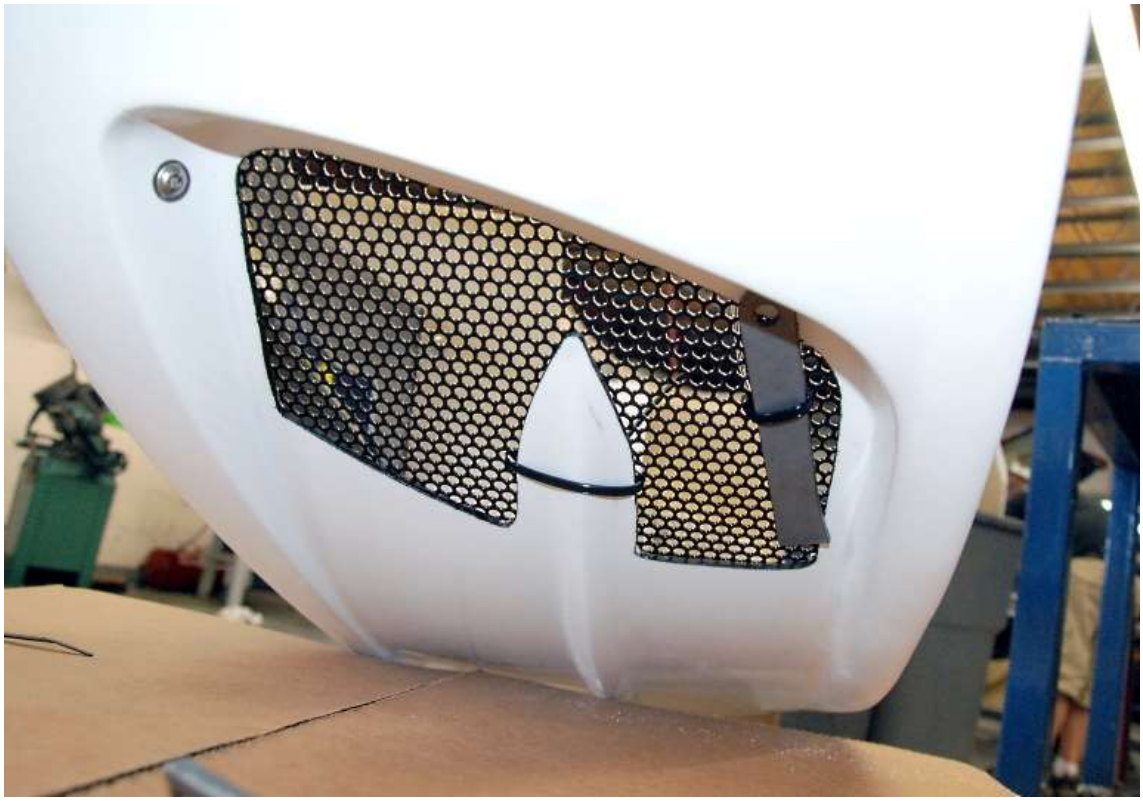


Unpack the brake duct mesh and trim.



Cut the supplied mesh to fit behind the hole in the front bumper making sure to leave a flange wide enough to silicone the mesh to the body.

Run a bead of silicon around the perimeter of the hole on the inside edge.



Use zip ties and something pressed against the outside of the bumper around the mesh to hold the mesh in place while the silicone dries.

Place a bead of silicon around the inside edge of the trim ring for the front bumper cutout.

Use weights and/or tape to hold the trim ring in place until the silicon dries. Zip ties also can help hold the center in place.

Body mounting

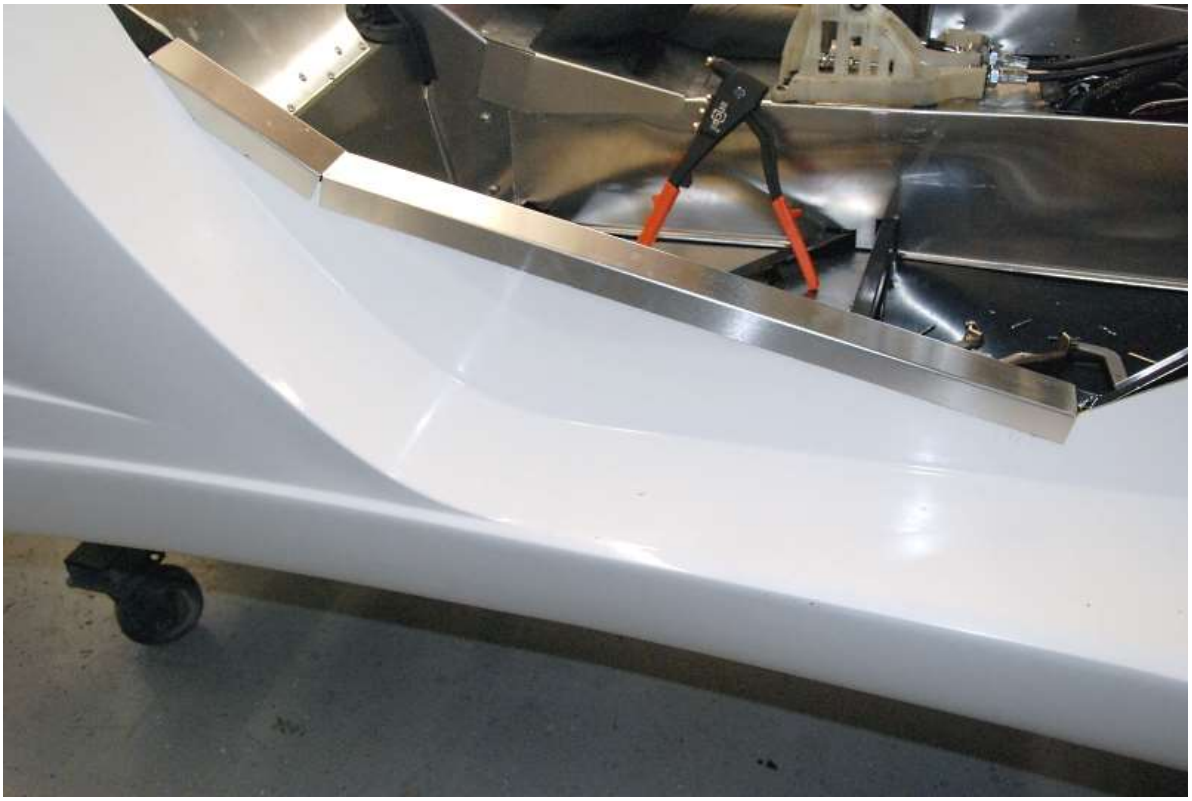
🚘 Body, body finish components, packaged aluminum.
🛠 Clamps, tape measure, drill, 1/8", 3/16", 25/64" drill bits, 5/32" hex key, ½" wrench, rivet tool

Body sides

Clamp the body side panels against the side of the frame. The bottom of the panel should be pushed up until it is against the bottom of the car. You can also use c-clamps or the original mounting screws to do this.

The bottom front of the side panel should measure $^{5}/_{8}$ inch from the front tube on the side of the frame.

Rivet the bottom of the side panel to the side tube of the chassis using $^{3}/_{16}$ inch rivets. If you are installing the optional valence panels only put a few rivets in here to hold the body in place.



Place the door sill aluminum over the side panel and side tube of the chassis as pictured above.

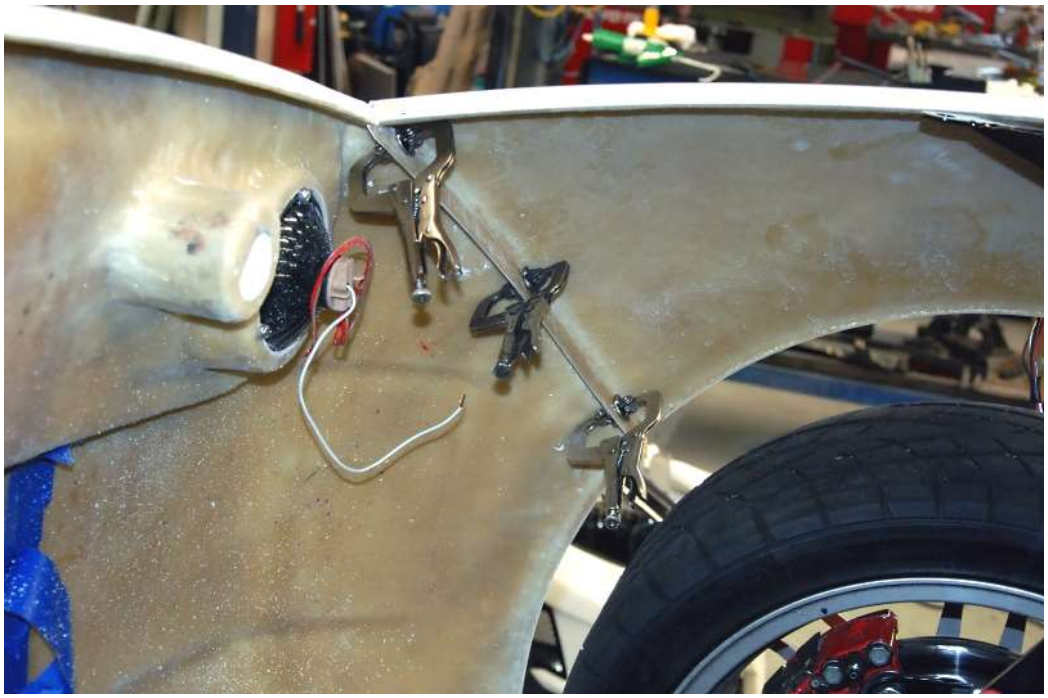
Mark, drill, silicone and rivet the side aluminum in place using 1/8 inch long rivets. If you are going to remove the body for painting or fully carpet the interior only install every fourth rivet.

Do not attach the side panel to the top of the shock tower support yet.

Rear Bumper

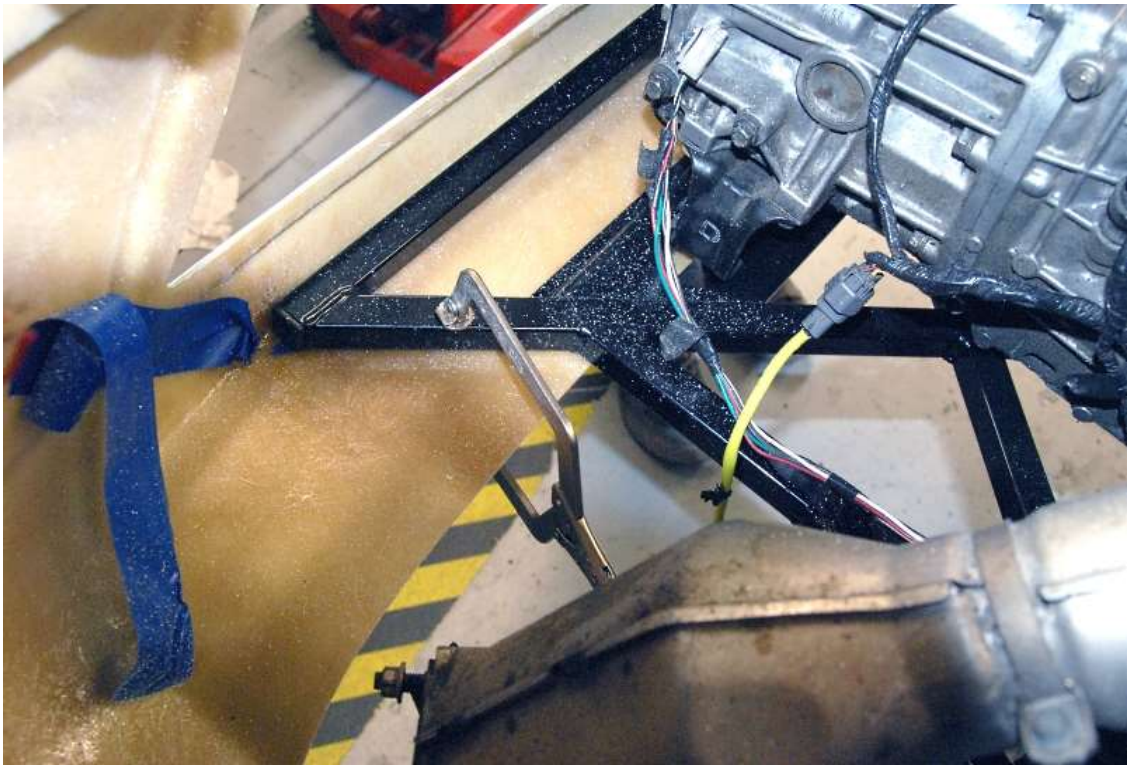
Rear bumper, Body finish components, ¼" x 0.75" flanged button head screws and locknuts

🛠 Clamps,$^{7}/_{16}$" wrench, $^{5}/_{32}$" hex key, $^{3}/_{16}$", ¼" drill bit, Drill, rivet tool



Clamp the rear bumper in place against the side panels. Vise grip style pliers work well for this.

Drill three ¼ inch holes in the tabs attaching the rear bumper to the side panels. Use ¼" x 0.75" flanged button head screws and locknuts to attach the two together.

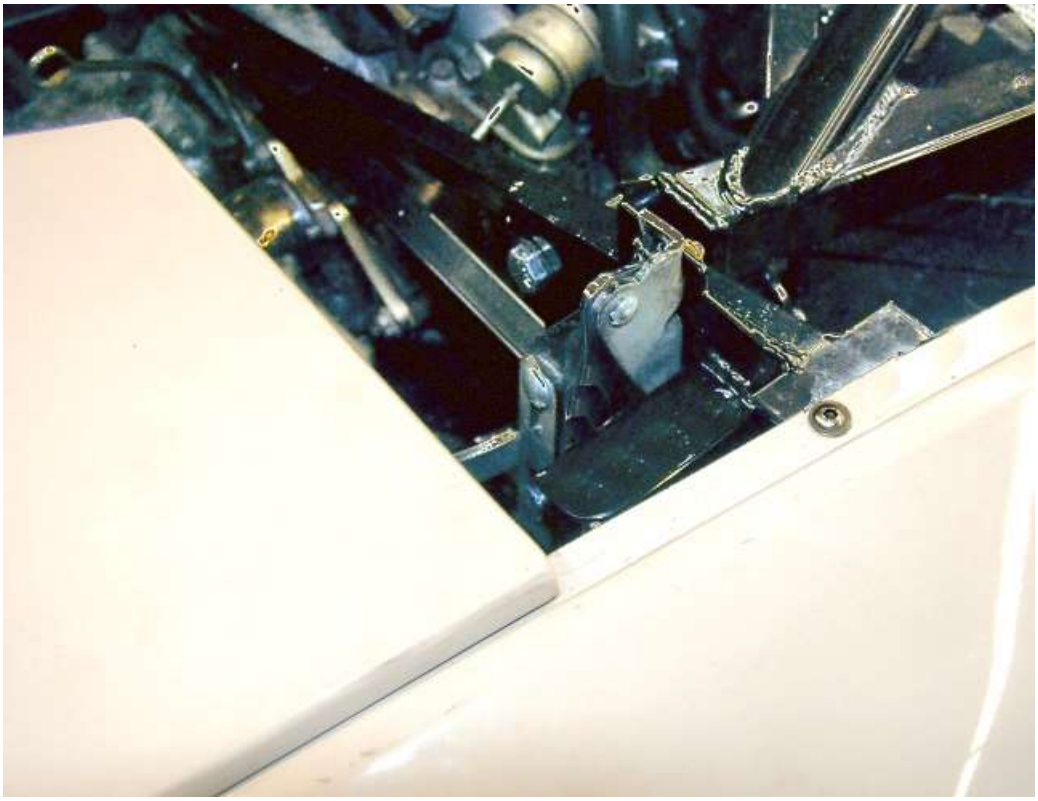


Clamp the rear bumper to the bottom tubes on the chassis, if you don't have clamps this big you can carefully pinch the body with a jack.

Measure the body from the top of the shock to ensure it is centered. Mark a spot on the body that is identical side to side and use the mounting eye of the shock to be sure you are getting the exact same measurement on each side. Setting the rear hatch in place will also help ensure you are lined up square.

Once you are sure the body is centered use $^{3}/_{16}$ inch rivets to attach the bottom of the bumper to the bottom of the chassis tubes. If you are installing a Diffuser only use a few rivets to hold the panel in place for now.

Clamp the top of the side panel to the rear bolt-in shock tower brace then drill a hole through the body that lines up with the slot in the brace.

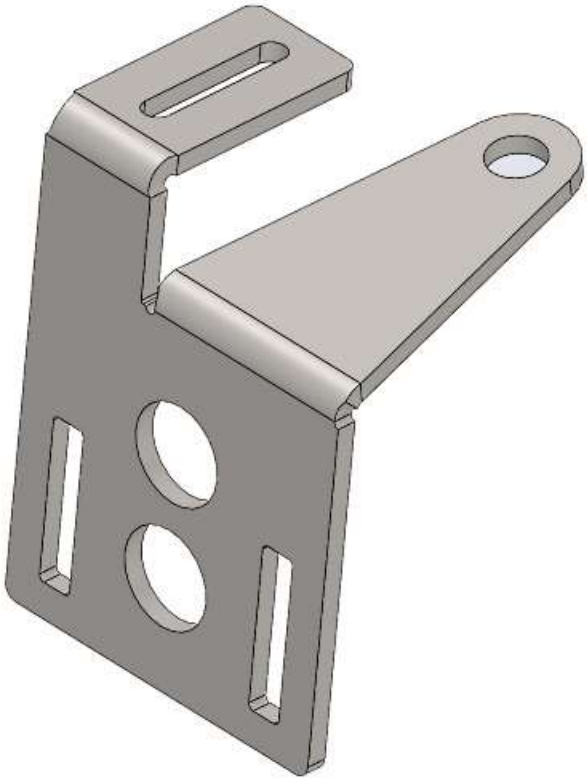


Attach the side using ¼" x 0.75" flanged button head screws and locknuts. Snug the screws so that you can just move the side for now.

Front Fender mounts

🚘 $^{5}/_{16}$" x ¾" carriage bolts, $^{5}/_{16}$" washers, $^{5}/_{16}$" locknuts, ¼" x 0.75" flanged button head screws, ¼" washers, ¼"-20 locknuts

🛠 $^{7}/_{16}$" wrench, ½" socket, ratchet, $^{5}/_{32}$" hex key, vise, large adjustable wrench or similar.

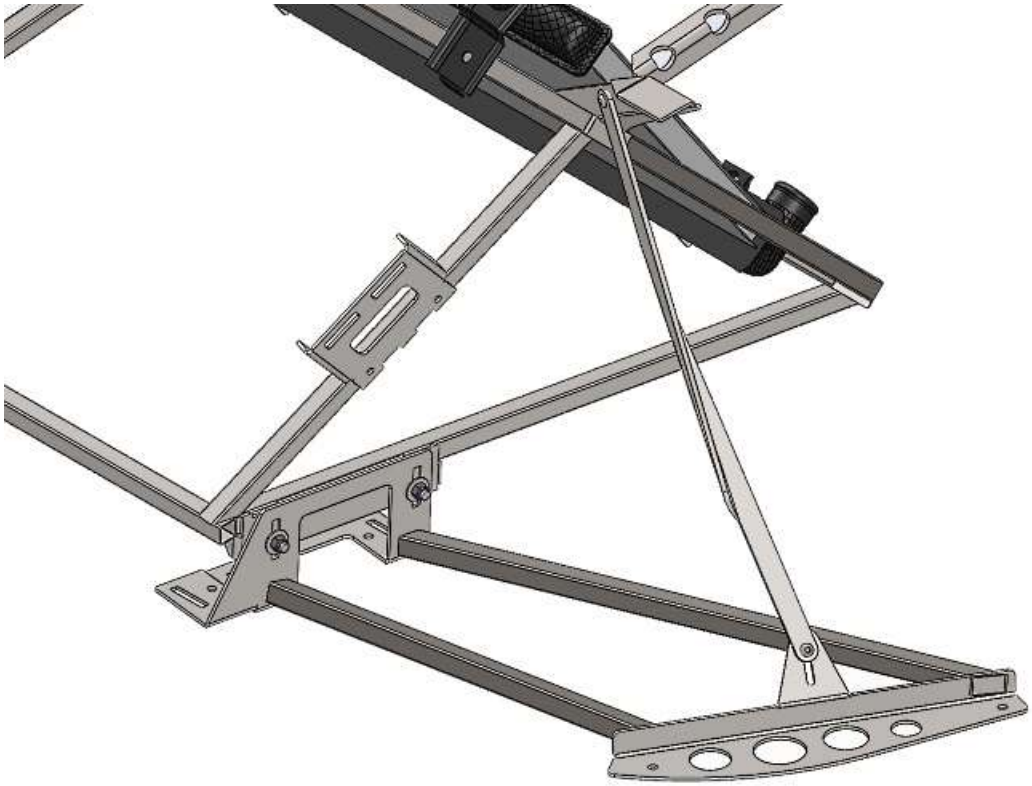


Unpack the front hood pin mounts.

Attach the brackets to the inside of the radiator nose mount using $^{5}/_{16}$" x ¾" carriage bolts and washers and locknuts. The bracket acts as both a mount for the front hood pin and as a support to locate the front fender.

Attach the lower nose support to the radiator/nose mount using $^{5}/_{16}$" x ¾" carriage bolts and washers and locknuts. Set the height so that the bottom of the inside nose mount is flush with the bottom of the chassis.

The support bars must be twisted 90 degrees in order to get mounted. Do this by sticking one end in a vise and using a large or long adjustable wrench at the opposite end. Hold where the wrench attaches and push on the end of the wrench so that the bar will twist and not bend.

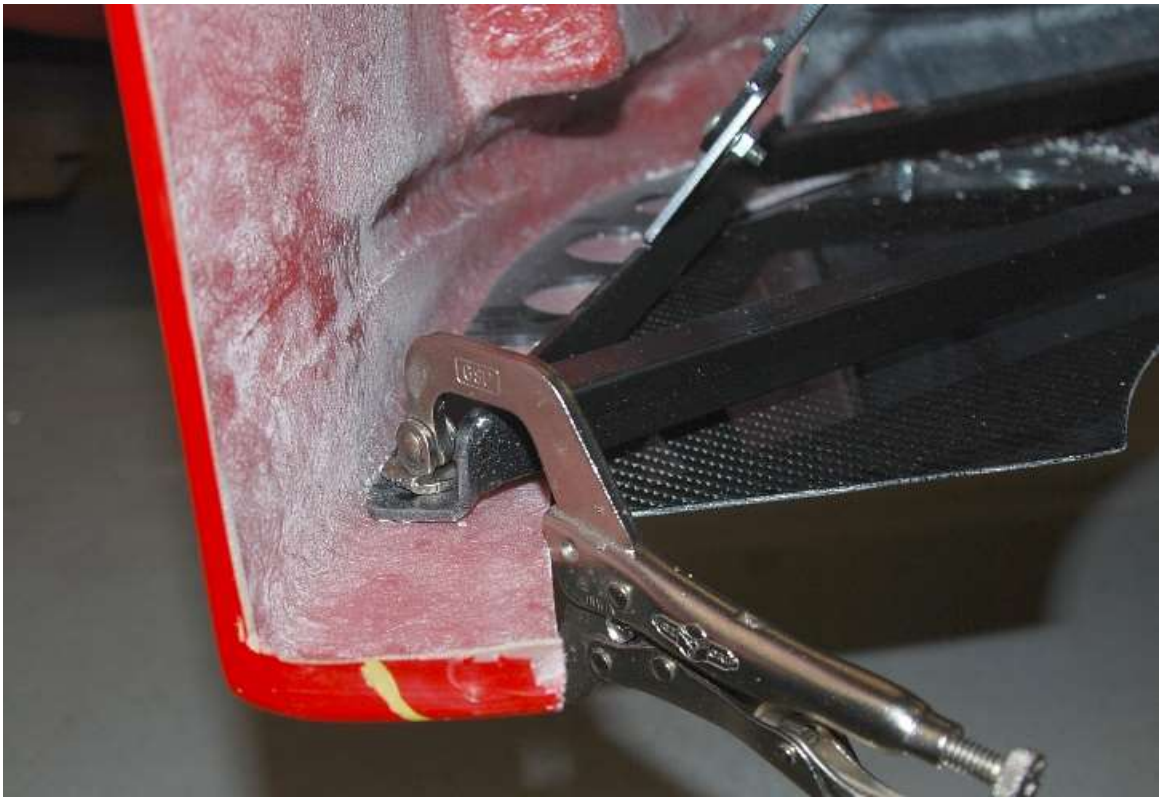


Attach the support bars from the lower nose mount to the radiator mount using the ¼” x ¾” flanged button head screws, washers and ¼”-20 locknuts.

Front fenders

¼” x ¾” Stainless flanged button head screw, ¼” locknuts, front fenders.
Drill, ¼” drill bit, $^{5}/_{32}$” hex key, $^{7}/_{16}$” socket, ratchet, clamps

Hold the fender in place and clamp the mounting tab near the front of the hood to the hood lip.

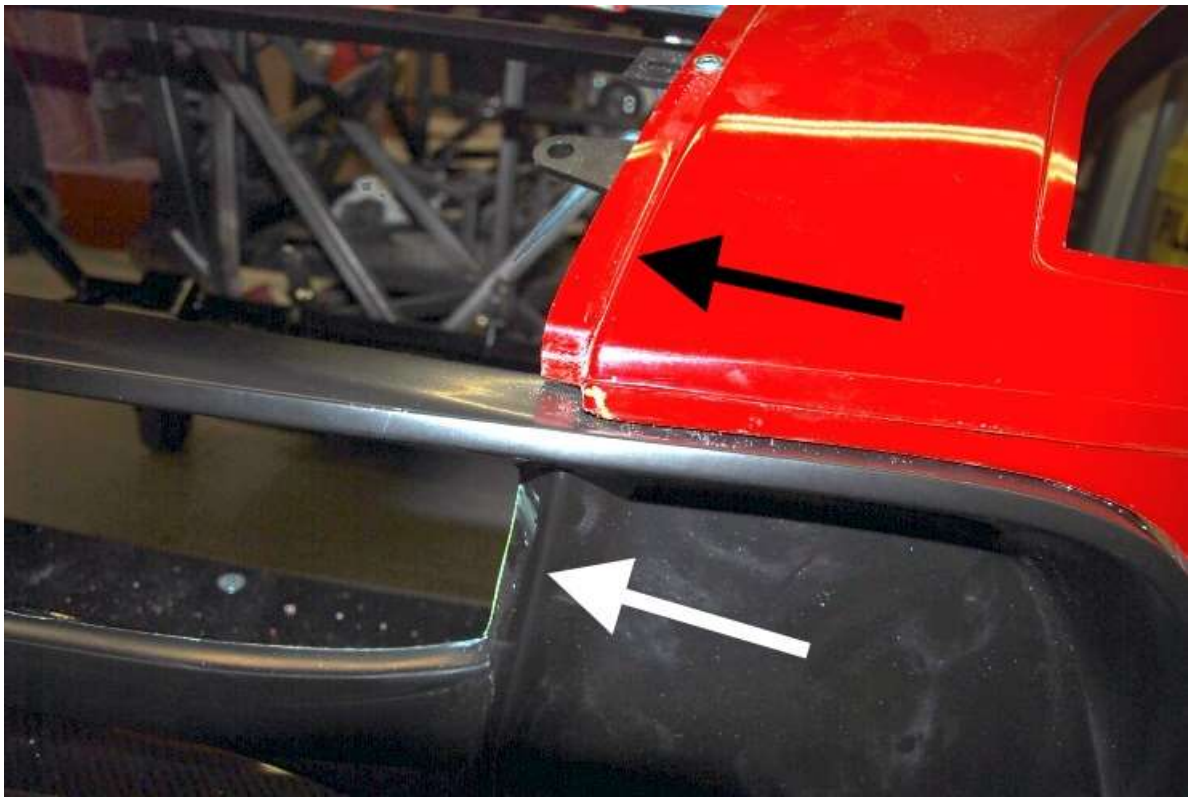


Clamp the lower outside of the fender to the bottom of the lower fender mount bracket.

Repeat for the other fender.
Do not fasten to the frame yet.

Nose Insert

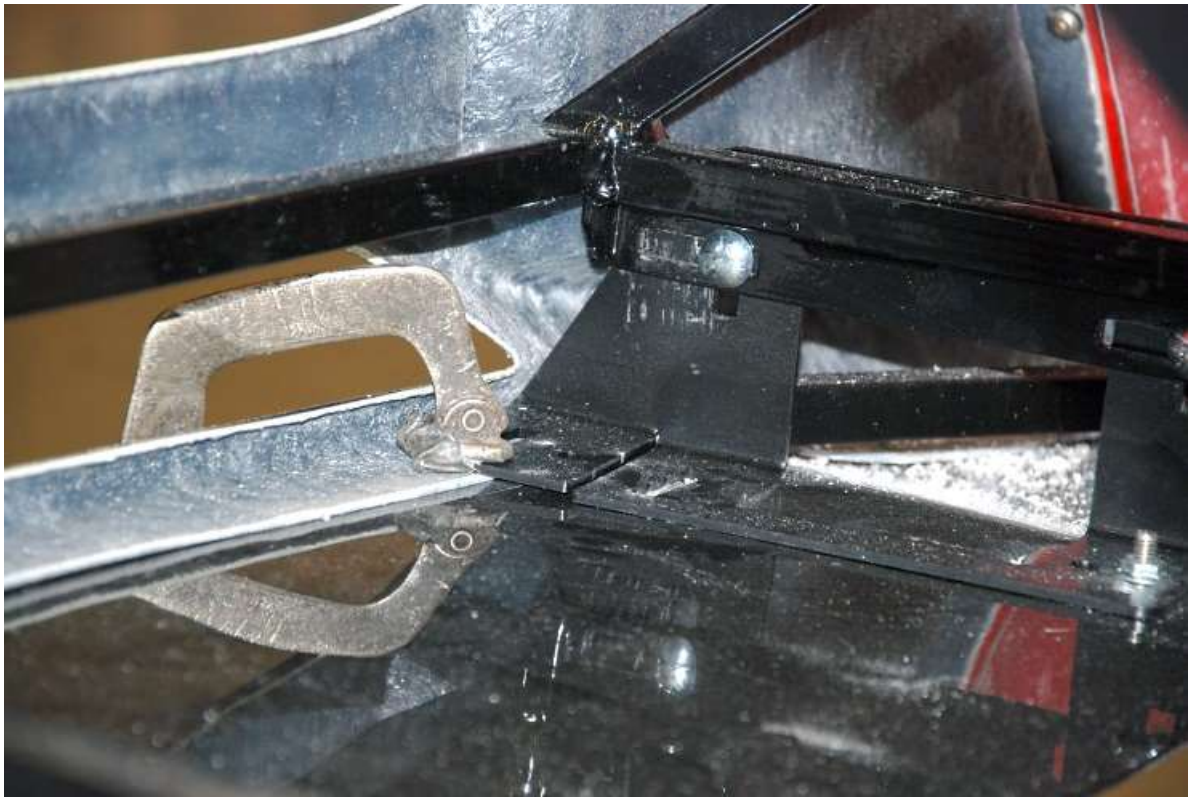
🛠 Clamps, drill, ¼” drill bit
🚘 Nose Insert, ¼” x 0.75” flanged button head screws, ¼”-20 locknuts



Clamp the nose insert to the two fenders. Make sure that the inner fender panel bend lines up with the trim line on the nose insert shown above.

Align the bottom outside corner of the nose insert with the lower flange on the fender.

There should be a fairly even part of the nose insert sticking out past the fender. The two closest points, the middle on the side and inside corner of the fender are a ¼ inch out.



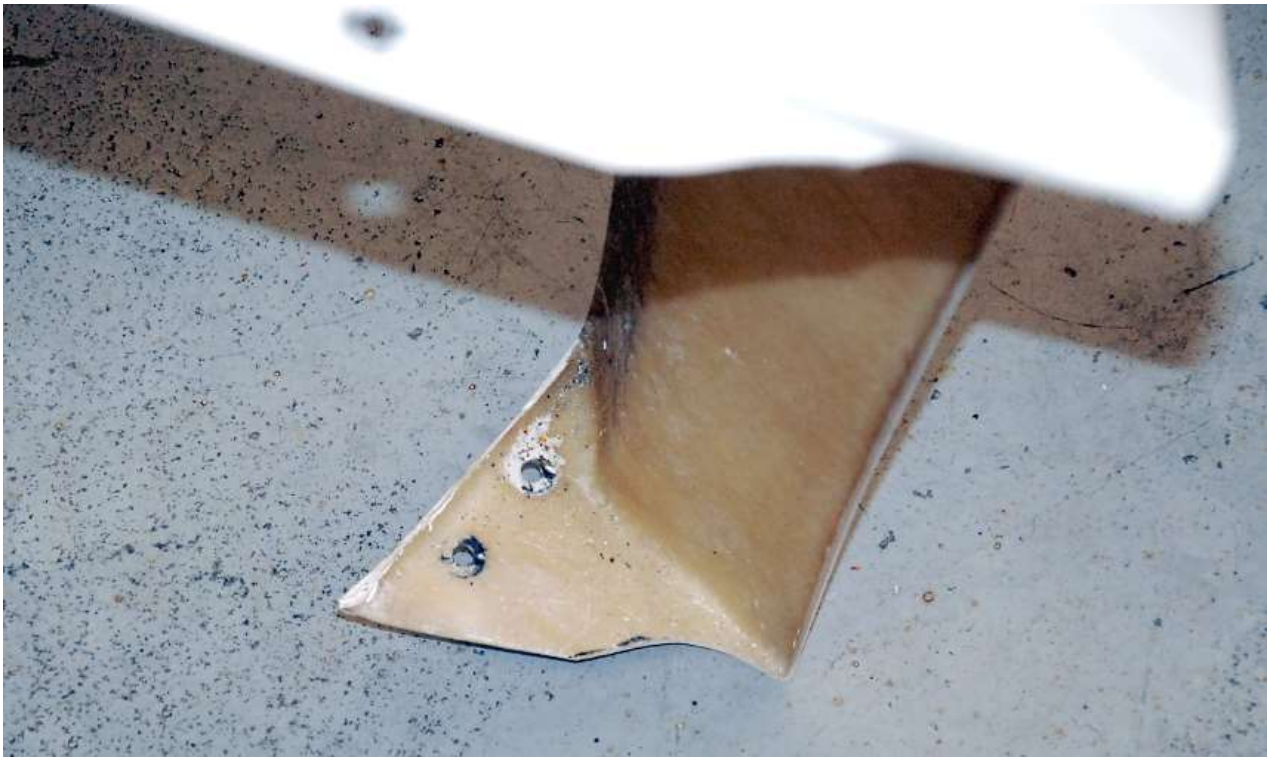
Clamp the nose insert to the lower fender mount in the middle.

Drill two holes through the side flanges of the nose insert and use two ¼” x 0.75” flanged button head screws and ¼”-20 locknuts to fasten them together.

Rear lower mount

Line up the rear of the fender and the front of the side panel. Then, drill a ¼" hole through the two. The fender has been moved in the picture to show the hole.

Drill out the hole on the side panel to $^{25}/_{64}$ inch and install a rivnut; fasten the two together using a ¼" x 0.75" flanged button head screw.



Once the fender fitment is how you like it, drill and add a second rivnut attachment point between the fenders and the body side panels.

Measure the from the fender lip in to the top shock eye to make sure the nose is centered side to side and adjust if necessary. Also setting the hood in place ensures that the opening is still square and it will fit easy later.

Once you are sure the nose is level side to side and centered side to side, drill and bolt the nose insert to the lower body mount using ¼” x 0.75” flanged button head screws and ¼”-20 locknuts.

With the fender lined up exactly where you want it drill through the flange and hood pin bracket with a ¼ inch drill bit.

Attach the fender to the bracket using a ¼” x ¾” stainless flanged button head screw and locknut.

Rear engine cover/Hinges

If installing the Hardtop, skip this section
OEM hood hinges, rear hatch hinge assembly, 5/16" x 0.75" Button head screws, 5/16" x 0.75" carriage bolts and locknuts
½" socket, ratchet, marker, hack saw, ruler, vise, drill, 5/16" drill bit

Bolt the hinges to the rear shock tower brace using the newly drilled holes on the top and the mounting flange pointing inward toward the center of the car.

Center the mounting hardware in the slots but leave the bolts loose enough so they can move with a light tap from a soft mallet.

Attach the hinge mounting arms to the rear hatch panel using the $^{5}/_{16}$ inch carriage bolts.

Center the mounts on the slots and snug the hardware to it can still move with a light tap or a little wiggling by hand.

Set the rear hatch down in place on the body and attach the hinges to the mounting arms.

Line the rear hatch up in place so it is sitting flush and the gaps are even. Leave the hardware loose so it can be adjusted to the engine cover.

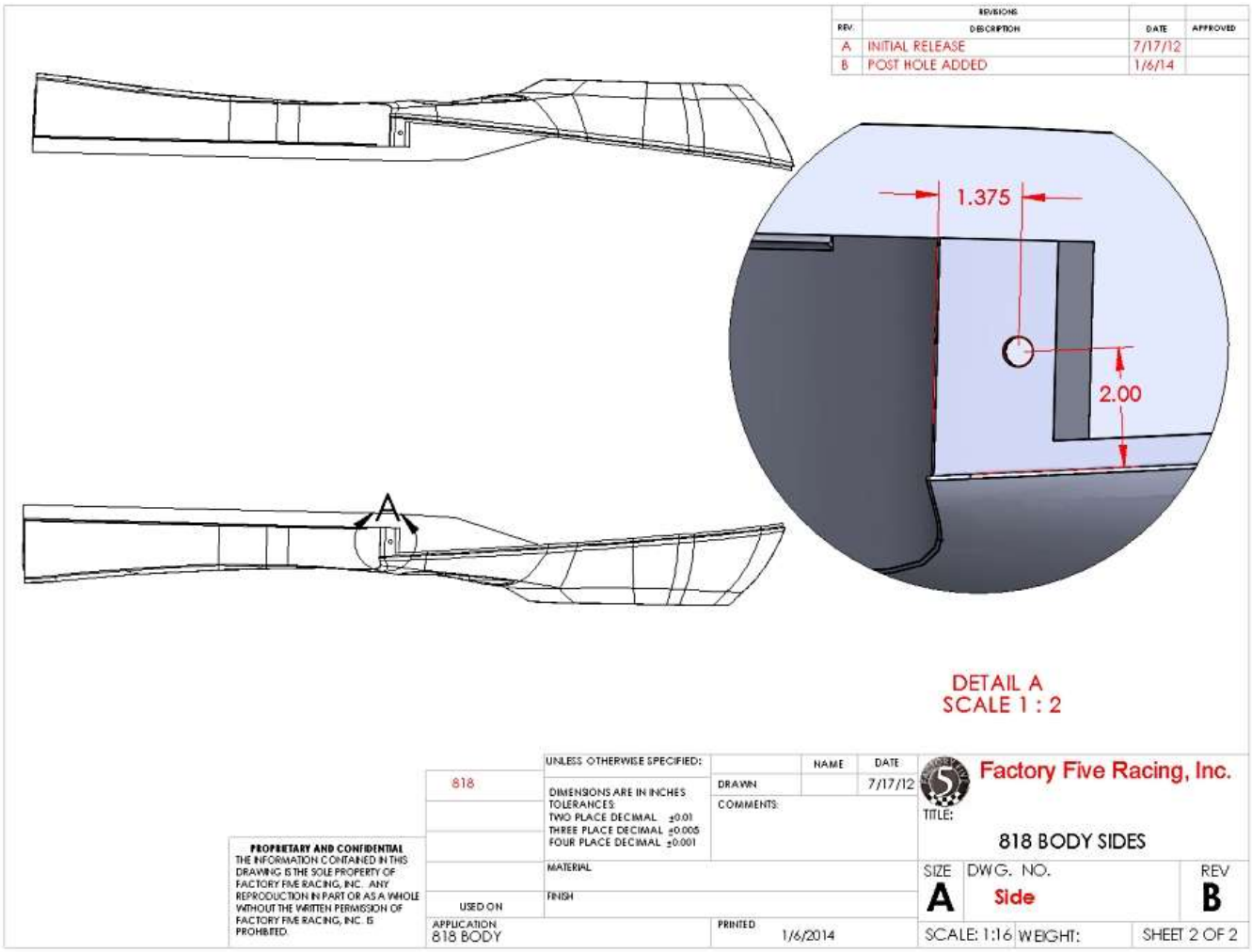
Front engine cover/Pins

Body finish components.
$^{3}/_{32}$”, $^{1}/_{8}$”, ¼”, ½” drill bits, ¾” wrenches, Philips head screwdriver, silicone, marker, ruler.
If installing the Hardtop, skip this section

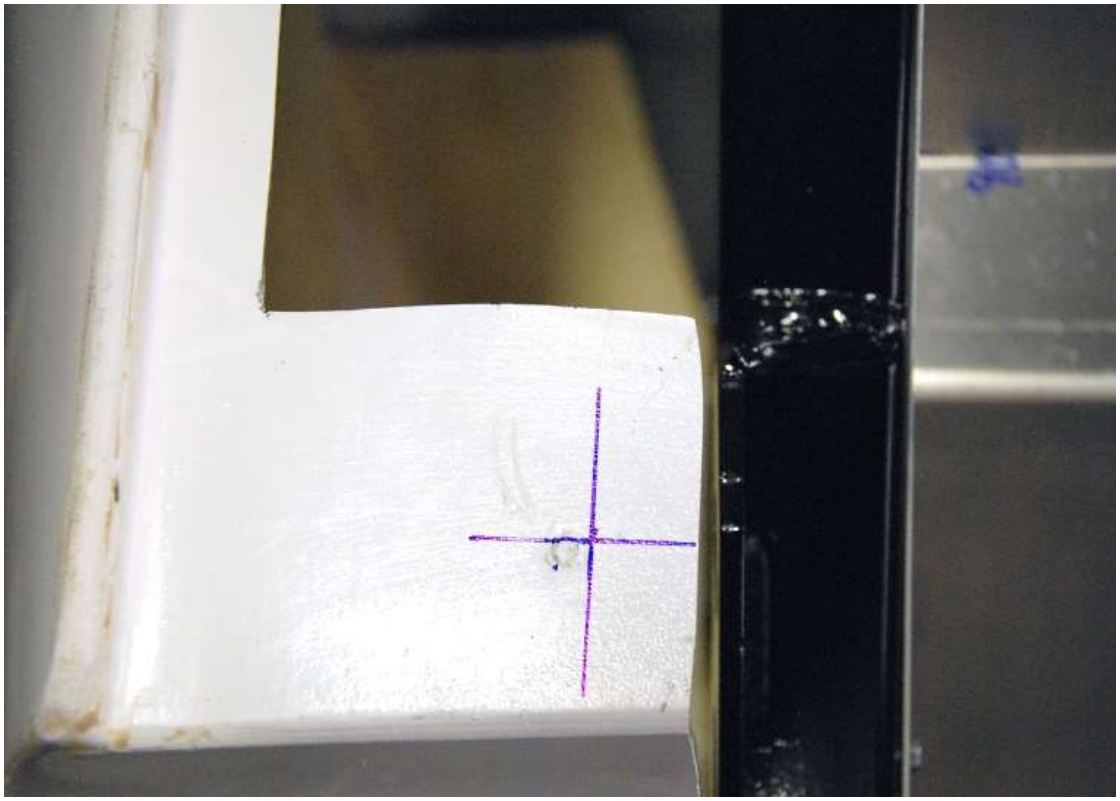
- There are a few ways that the hood and other panels can be held in place, hood pins (shown left) are provided in the kit but we have also found the “Quik-Latch Mini” (shown right) to work well.
- If the Quik-Latches are used, smaller holes should be drilled to mount the parts.

Set the front engine cover in place and check the gaps on the back and sides.

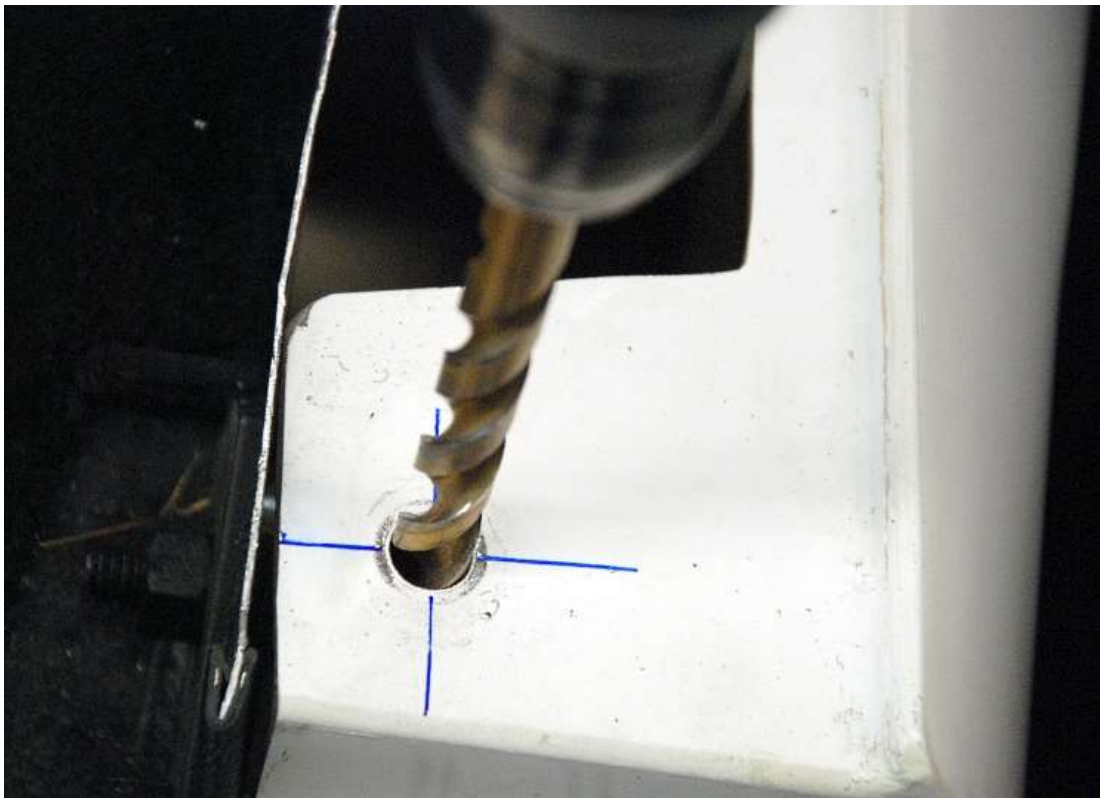
If necessary have one person hold the side then tighten the shock tower screw. These mounts may require some washers as shims to help align the side to the deck lid.



Measure in $1\frac{3}{8}$ inches from the door opening and 2 inches in from the body seam and mark a line on the mounting pad.

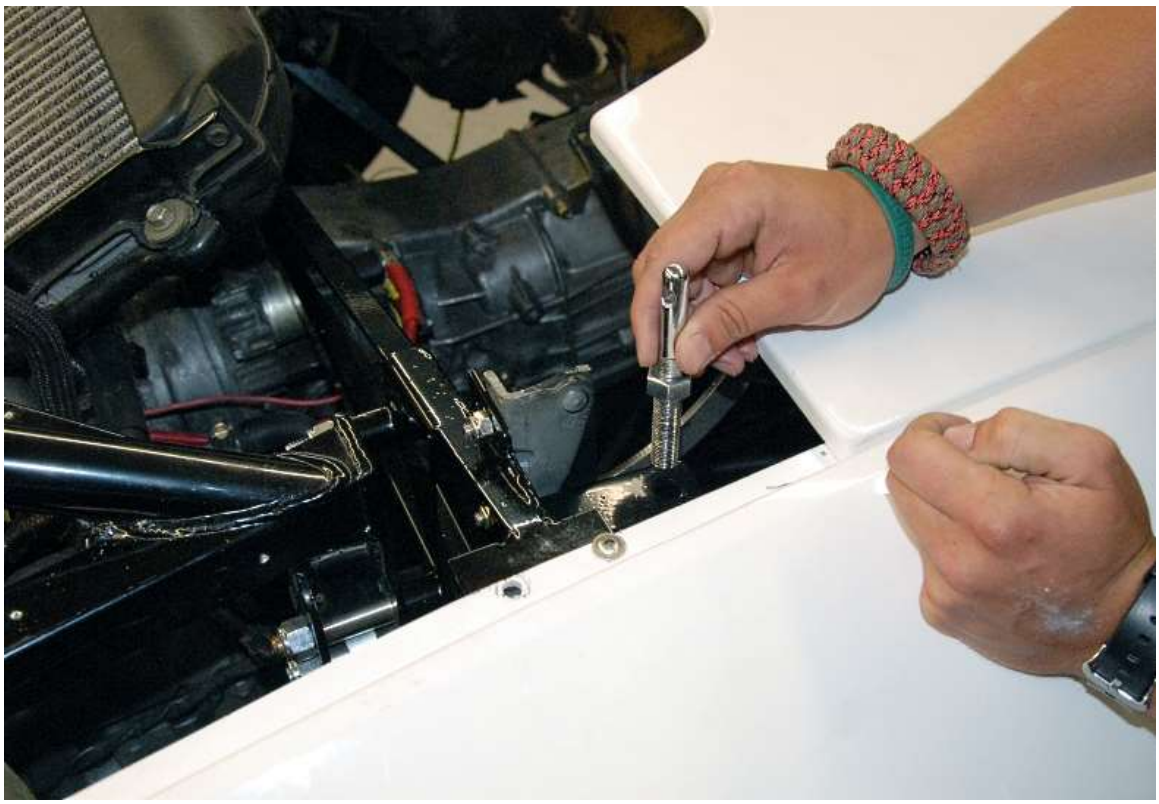


Extend the lines until the cross, the intersection is the location for the body mounting pin.



Drill out the hole for the hood pin with a ½ inch bit.

Install the front body mounting pins in the holes sticking up far enough to contact the rear deck lid when it is sitting in place.



Install the rear body pins in the shock tower brace making sure they stick up enough to contact the deck lid when it is set in place.

Mark the top of the mounting pins with anti-seize or silicone making sure to not leave a large blob that would throw off the marking.

Set the rear deck lid in place carefully not smudging the marked pins. With the deck lid lined up evenly and all the seams where you want them push down on the lid to mark where all four pins are.

Drill out the marked locations with a ½ inch bit for the body pins.

Install the deck lid over the pins and fit the hood pin plates. Use the plate as a drilling template and do one mount at a time to make sure the plates don't move.

Use either rivets or the provided screws to hold the cover plates in place.

Rear engine cover pins

🚘 Packaged aluminum, Body finish components, ¼”-20 x 1.50” button head screws, ¼” locknuts.
🛠 5/32” hex key, 3/32”, ¼”, ½” drill bits, ¾” wrenches, Philips head screwdriver, silicone.
✋ If the Quik-Latches are used, the nylon spacers many need to be cut.
✋ If installing a hard top, still install the rear cover pin mounts.

Position the engine cover rear mount in the corner of the side and rear body panels as shown with the small bent area (bending upward) on the side panel and mark the side mounting location.

Drill the marked location using a ¼" drill bit.

Mount the bracket to the side body panel using the 5/8" nylon spacers ¼" x 1.50" stainless button head screws, locknuts, 5/32" hex key and 7/16" wrench. Leave the nut loose enough so you can swing the bracket into position for the rear body flange.

From the underside of the body, put the ¼" drill bit through the bracket and spacer and drill through the mounting flange.

Fasten the bracket to the back body panel and tighten the side mounting bolt.

Close the rear engine cover and from the underside use a ¼" drill bit to drill up through the bracket center hole and rear engine cover.
If using hood pins to hold the engine cover closed, drill out the center hole in the bracket using a ½" drill bit.
Attach the hood pin post to the bracket and check the alignment with the ¼" hole in the engine cover. Slot or open up the hole as necessary.

Close the engine cover, adjust the post height so it sticks through the engine cover and mount the hood pin plates.

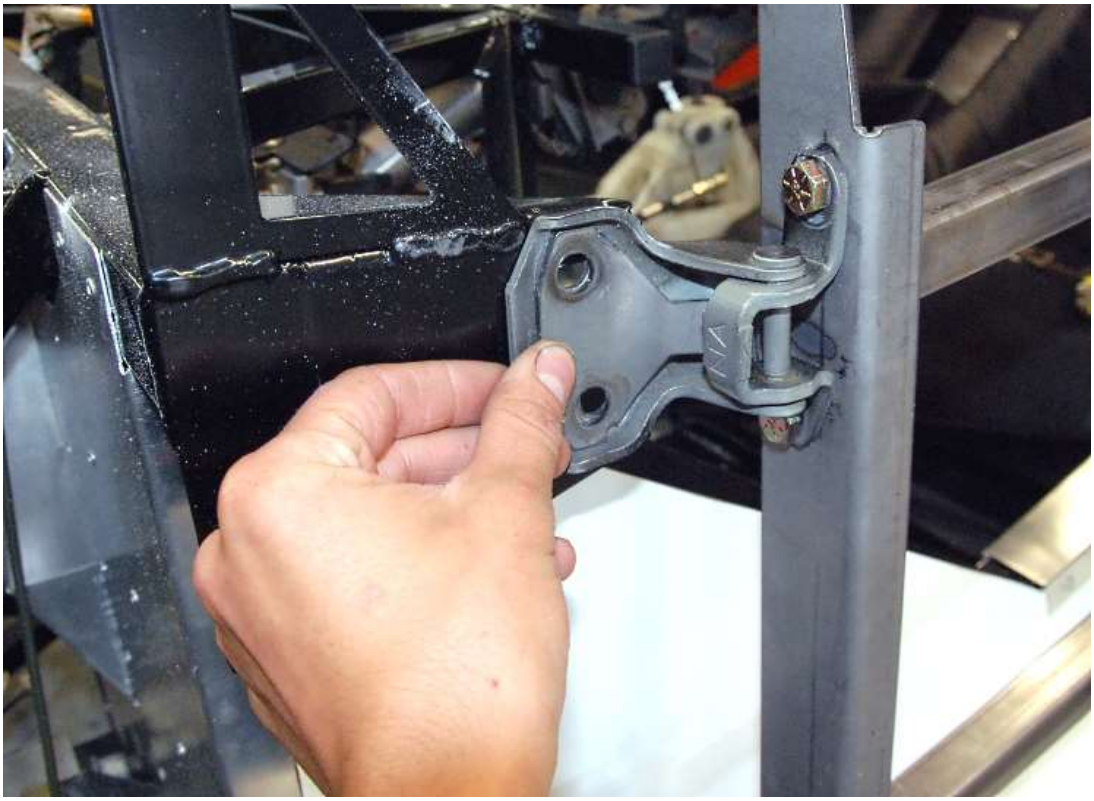
Doors

Door hinges

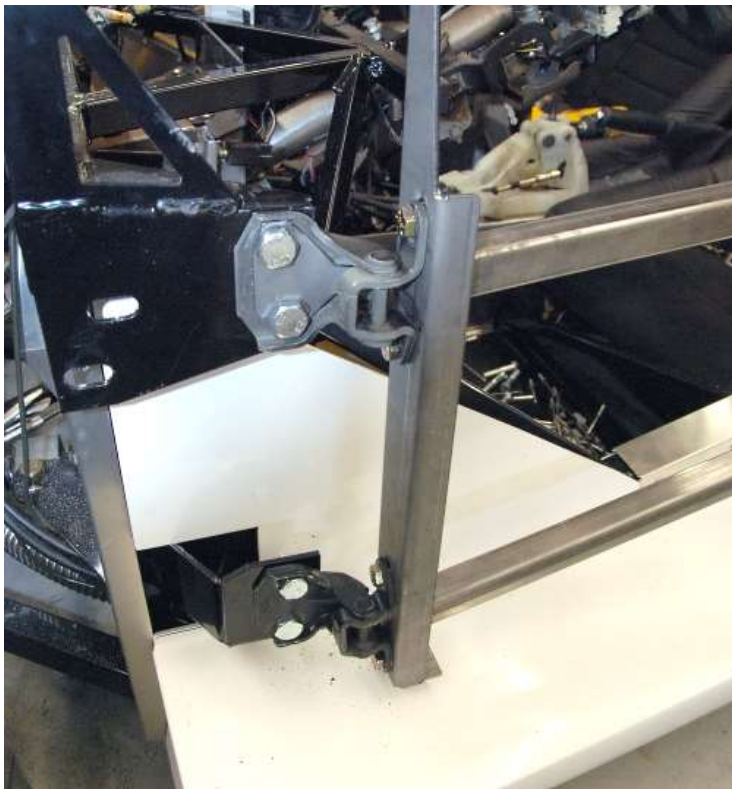
🚘 OEM door hinges, Door hinge and latch hardware, Door frame components, $^{3}/_{8}$" x 1.25" hex head bolts and locknuts, M12 x 25mm and locknuts.

🛠 $^{9}/_{16}$" socket, ratchet, $^{9}/_{16}$" wrench

Attach the door hinges to the door frame in the same orientation as they were on the Subaru using supplied 3/8"-16 bolts and lock nuts, centering bolts in the vertical slots in the door frame.



Insert the door stop on top of the door hinge as shown above.



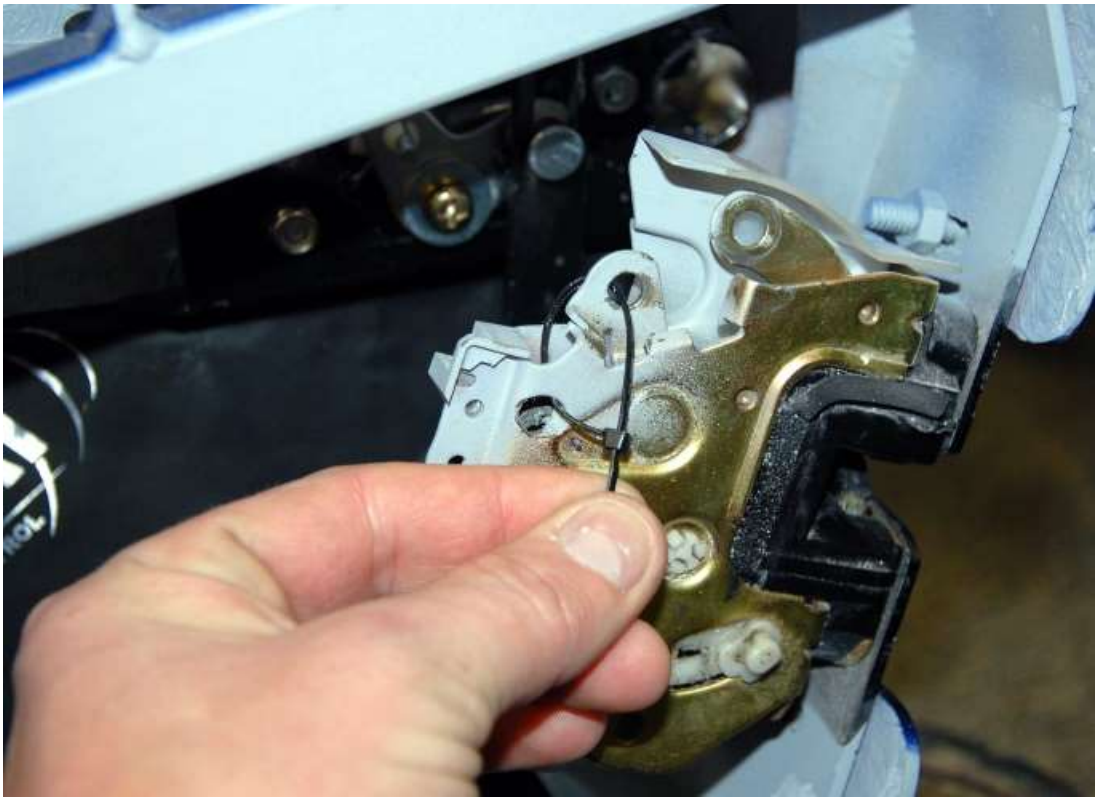
Bolt the door hinges to the frame using supplied M12 x 25mm bolts and lock nuts, centering bolts in the horizontal slots in the car frame.

Door latches/strikers

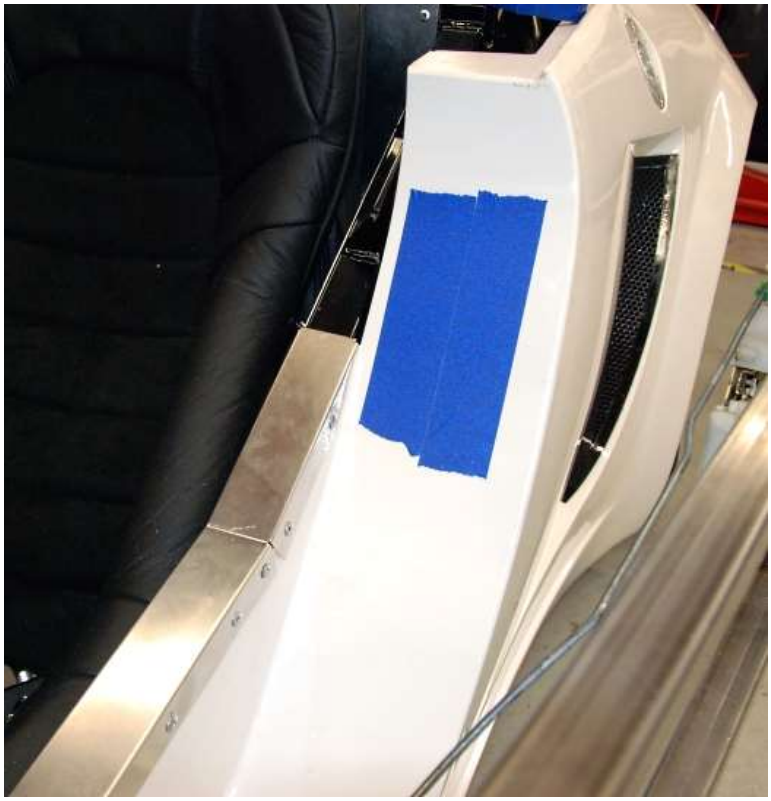
- OEM latches, OEM fasteners, packaged aluminum.

🛠 Marker, masking tape, drill, drill bits, 10mm socket, ratchet

Attach the door latch to the door frame using supplied hex head screws. Sandwich the aluminum spacer between the outside of the door bracket and screws.



Use a small zip tie to lock the door lock in the unlocked position.



Cover the area where the door latch sits on the side panel when the door is closed using masking tape.

Place a door striker on the tape with the arrow on the striker pointed out.

With the striker attached to the door, close the door and mark where the side and bottom of where the striker fits on the side panel.

Remove the striker from the latch and using the marker lines to position it, mark the center of the two holes on the tape.

Drill out the marked holes then attach the door striker to the panel using the original bolts and Subaru locknuts.

The bolts holding the striker should fit through a bracket on the back side of the panel as pictured above.

Door skin

🚘 Doors, packaged aluminum, black Philips truss head ¼" x 1" bolts, ¼" x 0.75" flanged button head screws and lock nuts.

🛠 Tape measure, marker, jig saw or air saw, drill, ¼" drill bit, Philips head screwdriver, $^{5}/_{32}$" hex key, $^{7}/_{16}$" wrench, Paint sticks.

Set the door skin in place. Space up the bottom about $^{1}/_{8}$ inch. Paint sticks work well for this.

With the fiberglass door in place, mark where it hits the door striker.

Measure how far off the frame the striker sits.

Mark this same measurement on the door, from the inside edge out.

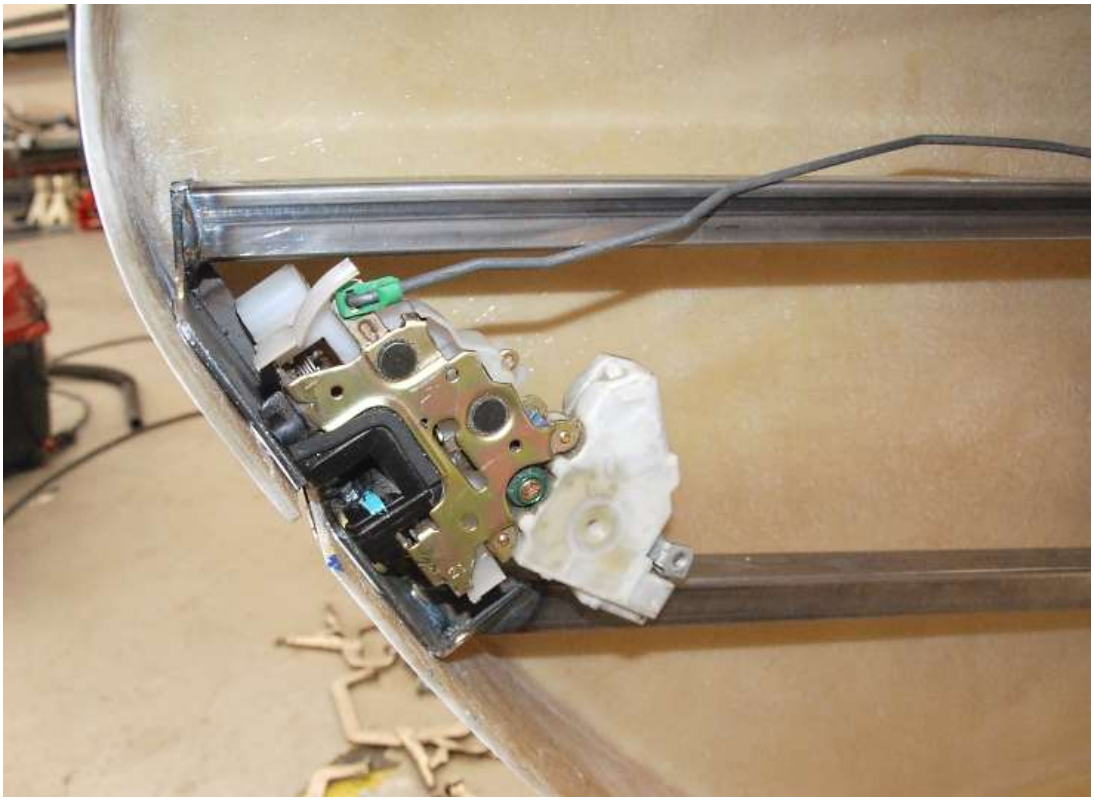
Using this measurement, trace the inside edge of the door latch trim piece onto the inside of the door skin.

Using the end of the trim piece, mark the end of the cutout as pictured above.

Test fit the door, latch and striker together. Make sure the cutout is deep enough for the door to fit correctly.

Place the latch trim piece around the cutout, and then drill the three mounting holes out of the door skin.

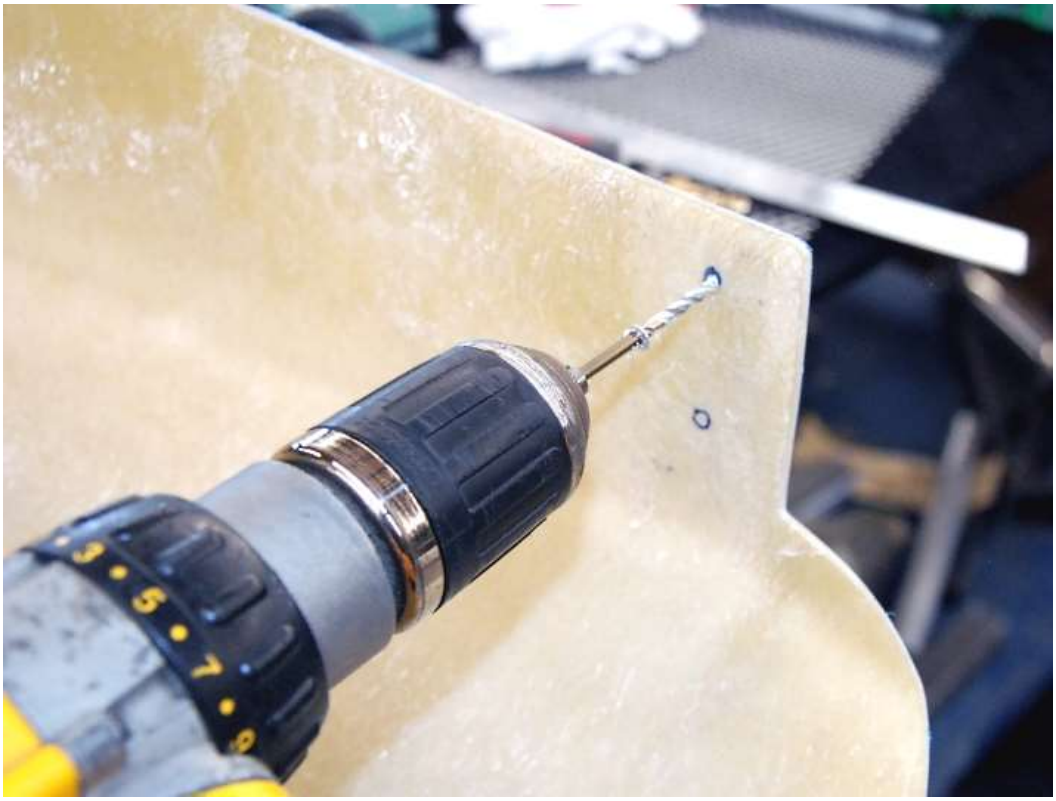
Attach the door skin to the latch with the supplied hex head screws.



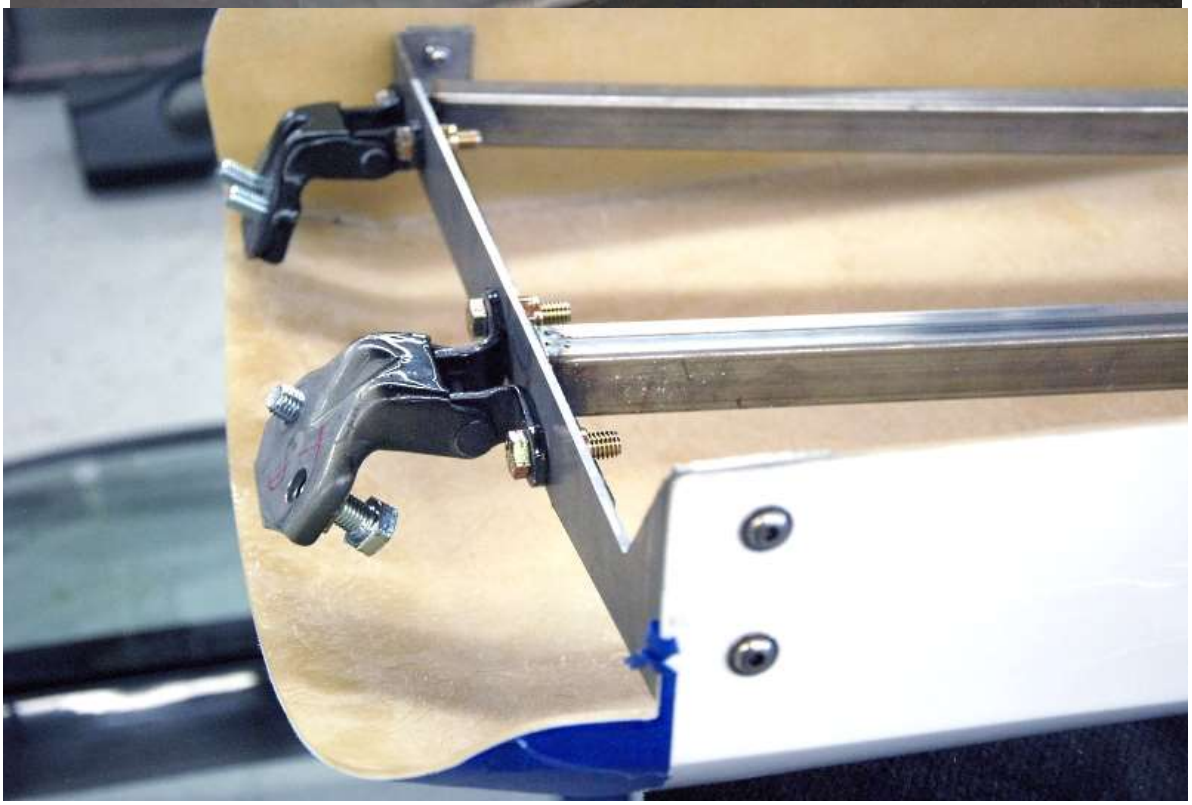
Close the door, lining up all body lines. Space the door $^{3}/_{16}$ inch (paint stick thickness) from the body.

Trace the holes in the front of the door frame on the top and bottom onto the inside of the door skin.

Remove door skin and drill ¼ inch top holes where the door frame mount was marked on the door liner.



Drill ¼ inch for the two bottom holes.



Remove door frame from car and bolt the top of the door skin to the door frame through the drilled holes with black flat head ¼” x 1” bolts and lock nuts and the bottom with the ¼” x 0.75” flanged button head screws and locknuts.

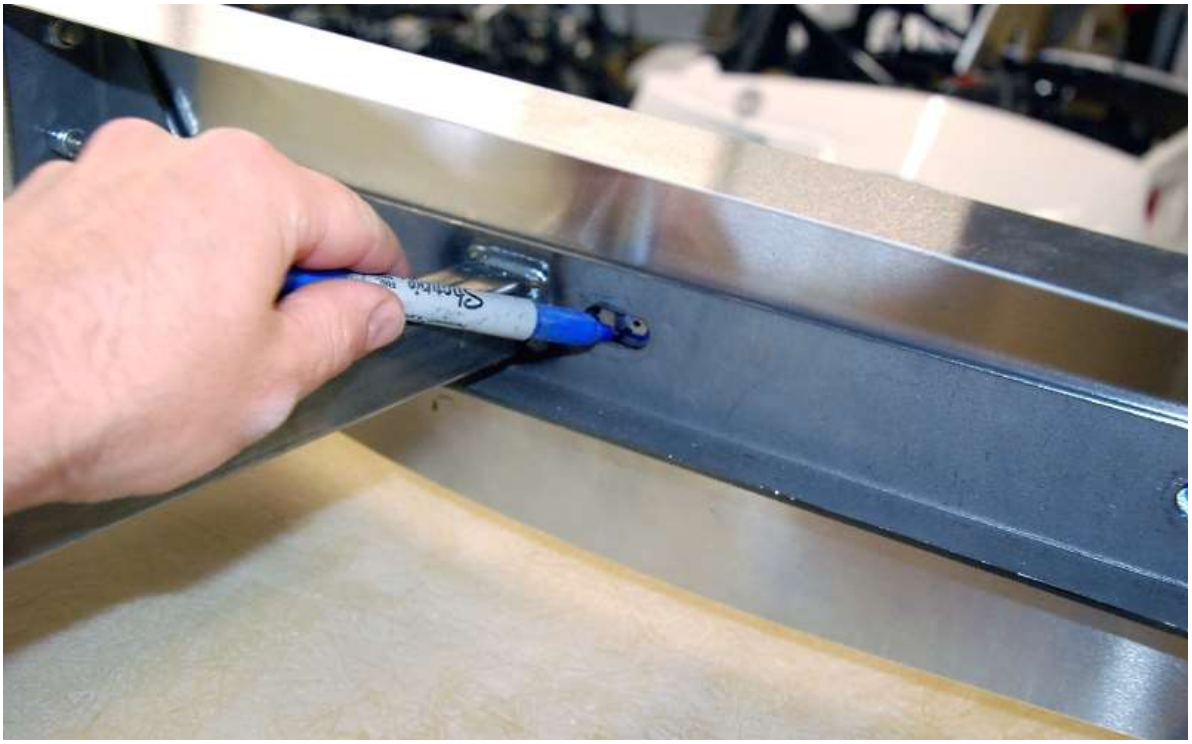
Door front

🚘 Body finish components, packaged aluminum.

🛠 Marker, drill, 3/8" drill bit, 9/16" socket, 9/16" wrench, ratchet, tin snips.

Remove the door frame from the door hinges.

Place the front piece of the inner door aluminum against the door frame with the aluminum flange pointed towards the back of the door.



Trace the holes on the front of the door frame onto the front door aluminum.

Cut the traced holes out of the aluminum as pictured using a drill bit or Dremel tool.

Place a piece of bulb seal on the outside edge of the front aluminum then bolt it into place between the door hinges and door frame.

Reattach the door hinges and door to the frame.

Chapter

4

Finish Assembly

Hardtop prep

🚘 Hardtop
🛠 Ruler, marker, saw

If not already done, trim the width of the door area flange and the hatch area flange to 0.75” wide.

Windshield/Hardtop front

🚘 Windshield, windshield surround, ½” x 1.25” carriage bolts and locknuts
🛠 ¾” socket, ratchet, digital level or measuring tape, paint sticks.
✋ We recommend having a professional install the windshield in the surround **after** the windshield surround has been attached to the frame. They usually have a selection of different trims that can be used around the edge of the glass. Use a small “T” trim to hide the seam but not stand out from the surround.
✋ For the Coupe, the windshield area installs the same way.

Fit the windshield surround on the car between the two fender/hood mount brackets that stick up from the frame.

Keep about 1/8 inch (paint stick) between the windshield frame and door to prevent rubbing. Note, the side mirrors are not mounted yet.

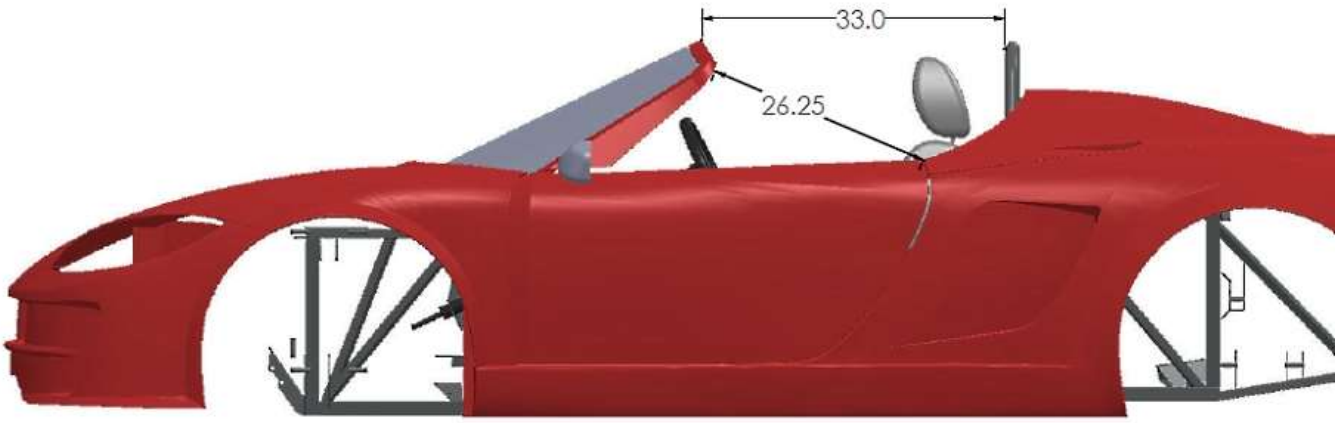
Insert the ½” x 1.25” carriage bolts and locknuts in the chassis bracket from the inside out so the square head of the bolt goes into the square slot. Tighten them so that you can change the angle of the windshield but it will not drop.

Locate the area in front of the master cylinder.

Cut the area out using the rear hood support aluminum as a maximum guide. The taller part of the aluminum should be centered on the windshield.

Soft top preparation

- If not installing the convertible top skip to the next section.
- The flat mounting flange on the front of the surround sets the angle for the windshield but there is a little bit of play to adjust it to your preferred look (a little steeper helps if you are over 6 foot tall).



Set the angle of the windshield to match the dimensions shown.

Measure both corners from the floor to make sure the windshield surround is even then tighten the mounting hardware.

Windshield and surround

Rivet the front lower flange of the windshield surround to the frame tubes.

Have the windshield installed in the surround.

Some windshields have the rear view mirror mount already glued in place, if yours does not, have the glass guy attach it while he is there fitting the windshield. Once the glass adhesive is dry, install the OEM Subaru mirror onto the mount.

Rivet the rear hood support aluminum in-place.

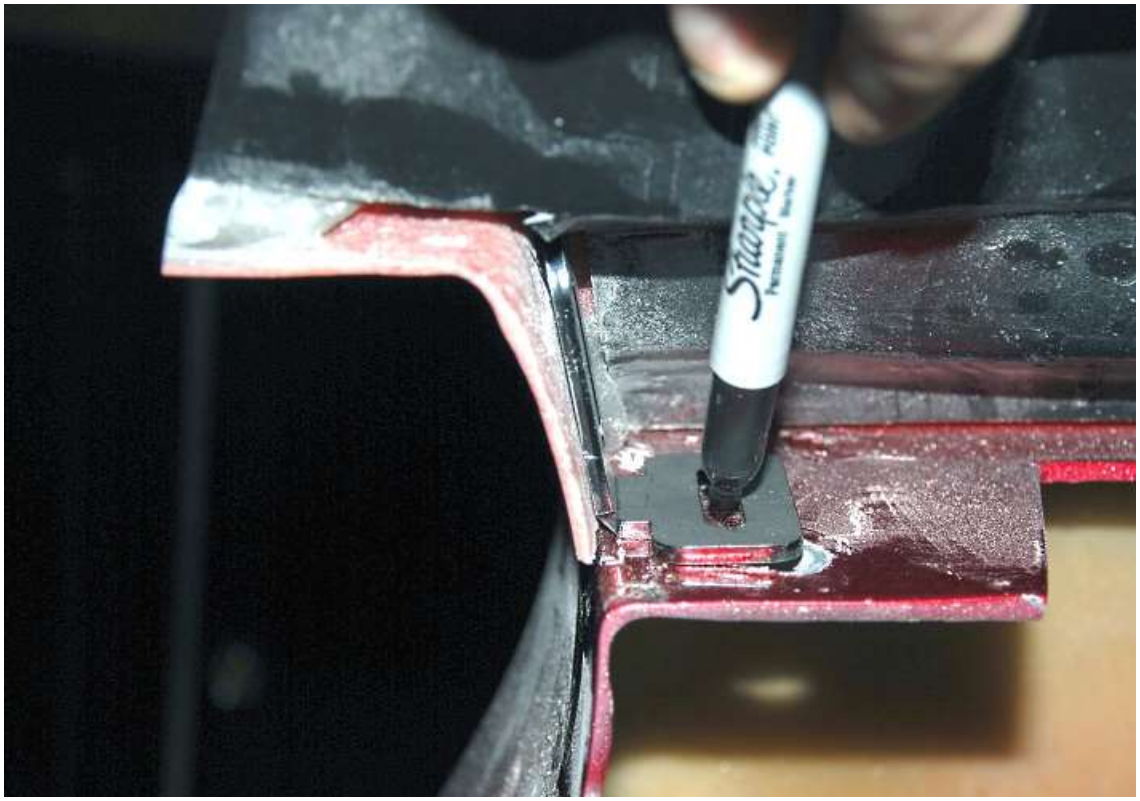
Push some of the push-on weatherstrip onto the tall part of the aluminum.

Hardtop

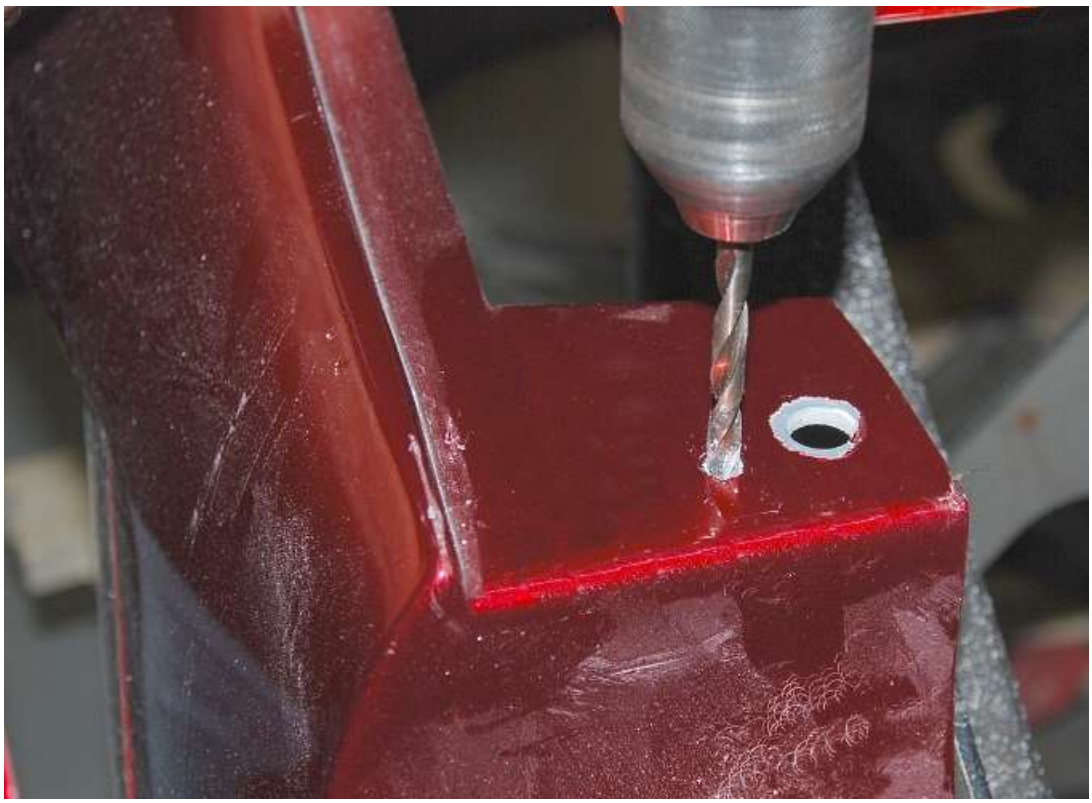
Rear mounts

Behind the door

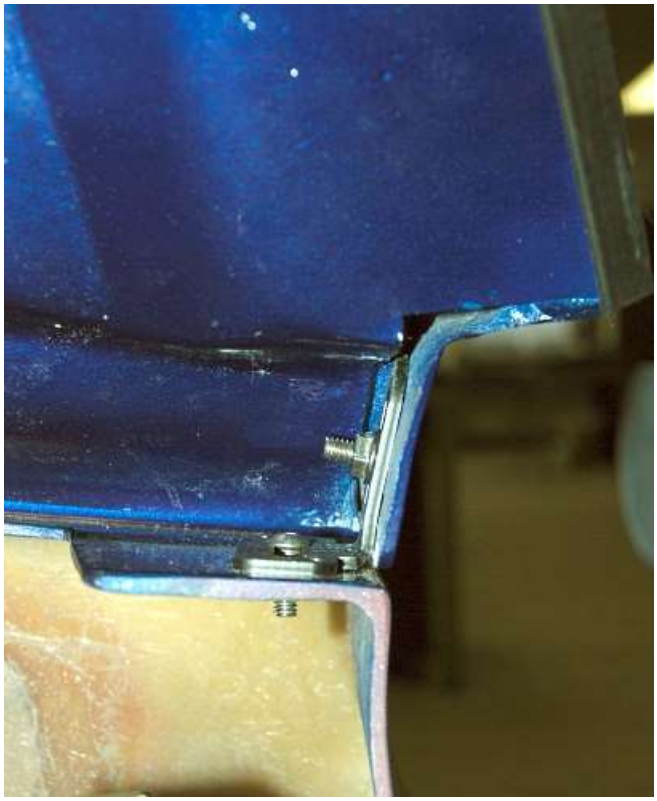
🚘 Hardtop mount tab, ¼”-20 x 0.75” flanged button head screws, ¼” locknuts
🛠 Drill, $^{7}/_{16}$” wrench, marker, ¼” drill bit, $^{5}/_{32}$” hex key



Place the hardtop mount tab behind the hatch on top of the body side behind the door and mark the bottom and front screw hole locations.



Remove the bracket and drill the hole locations



Attach the hardtop mount using the ¼" flange head screws and locknuts.

Rear

🛠 Drill, ¼", ½" drill bit

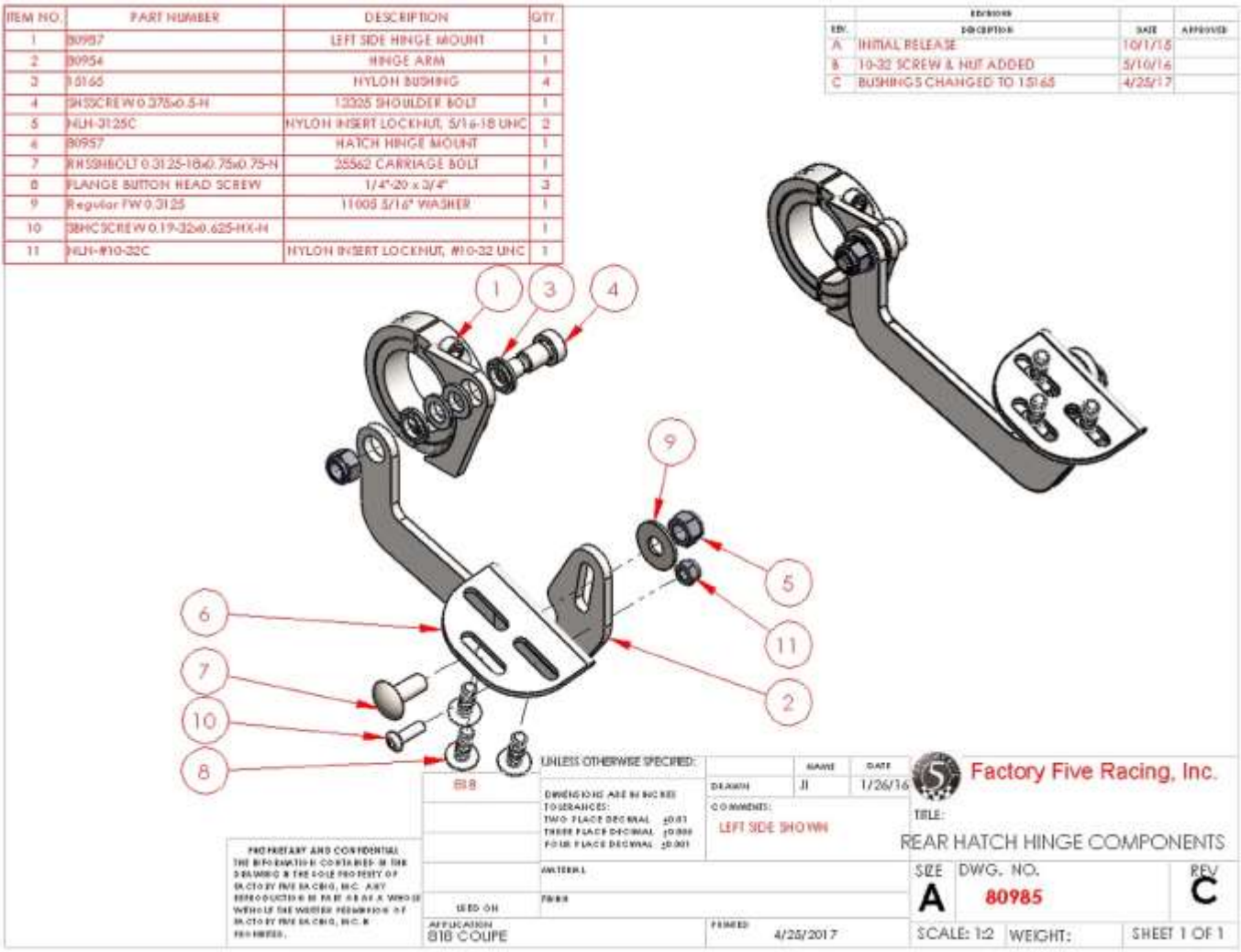
From the underside use a ¼" drill bit to drill up through the rear engine cover mount bracket center hole and the hardtop.
If using hood pins, drill out the center hole in the bracket using a ½" drill bit.
Attach the hood pin post to the bracket and check the alignment with the ¼" hole in the hardtop. Slot or open up the hole as necessary.

Rear Hatch

🚘 Hardtop components
🛠 $^{3}/_{8}$", ½" socket, ratchet, $^{1}/_{8}$", $^{5}/_{32}$" hex key, 1¼" hole saw, $^{3}/_{16}$" drill bit, wire or angle cutters, paint sticks, marker, masking tape, tape measure, countersink tool, slip joint pliers.

Hinges

Starting in the bottom middle of the hatch area push the weatherstrip with the bulb on the side onto the edge of the hatch area.



Assemble the hatch hinges as shown. Note: Left side hinge shown. The arms should be snug so there is no play but they can pivot.

Loosely attach the hinge mounts to the rollbar so the hinge arm attachment bracket is located on the outside. Left side shown.

Mask around the hatch opening if the body is painted so the paint does not get scratched.

Place the hatch in the opening and use paint sticks to set the gaps along the sides and bottom.

The gap along the top should be larger than the sides and bottom so the glass does not hit the body when opening.

Note, the following picture is shown with the hatch open, this is not possible yet.

From inside the car, move the hinges and attach the hinge arm mount to the hatch using the ¼”-20 x ¾” flanged socket head cap screws leaving the screws just loose enough so that the mount can slide.

Rotate the rollbar hinge mount up so that the hinge arm pivot point is touching the underside of the roof then tighten the rollbar hinge mount screws.

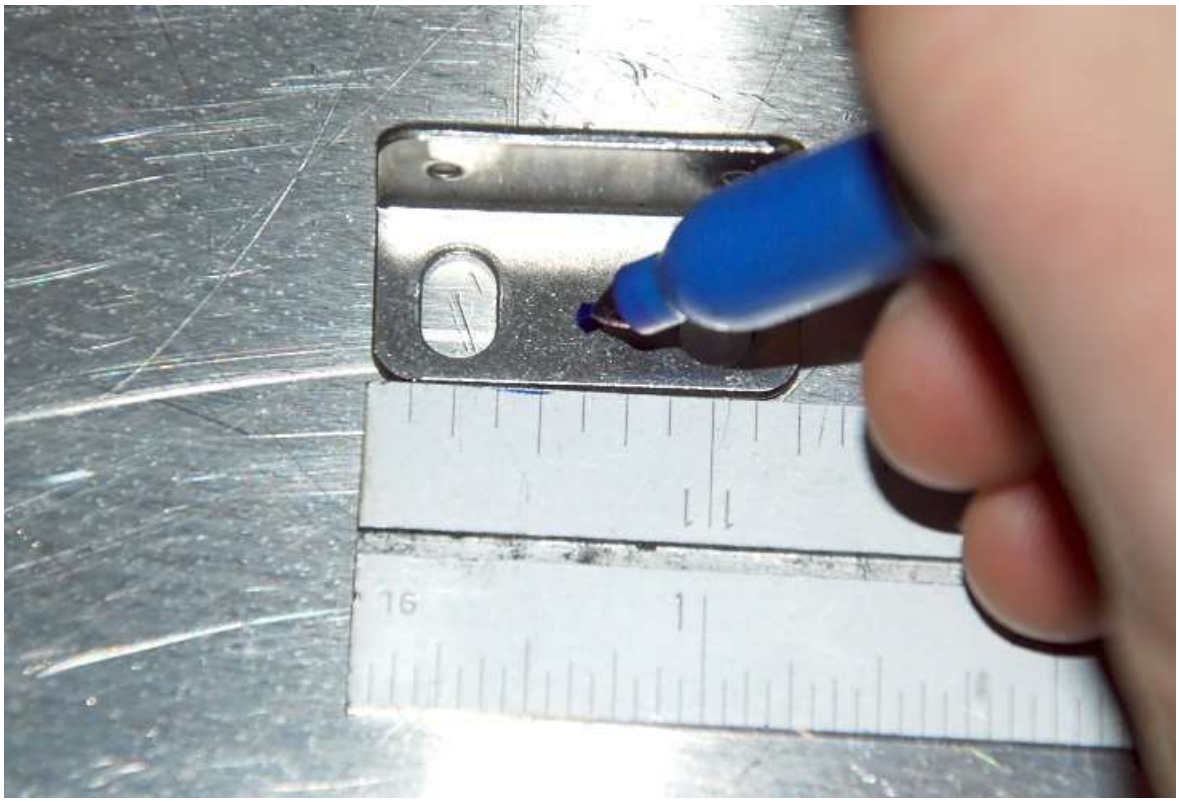
From outside the car make sure that the top hatch area near the hinges is at the height desired. If necessary shim the hatch up or have someone push the hatch down while the hatch hinge mount and the carriage bolt attaching to the hinge arm are tightened.

Carefully open the hatch checking the glass to roof clearance. If necessary loosen the screws in the last step and reposition the whole hatch lower.

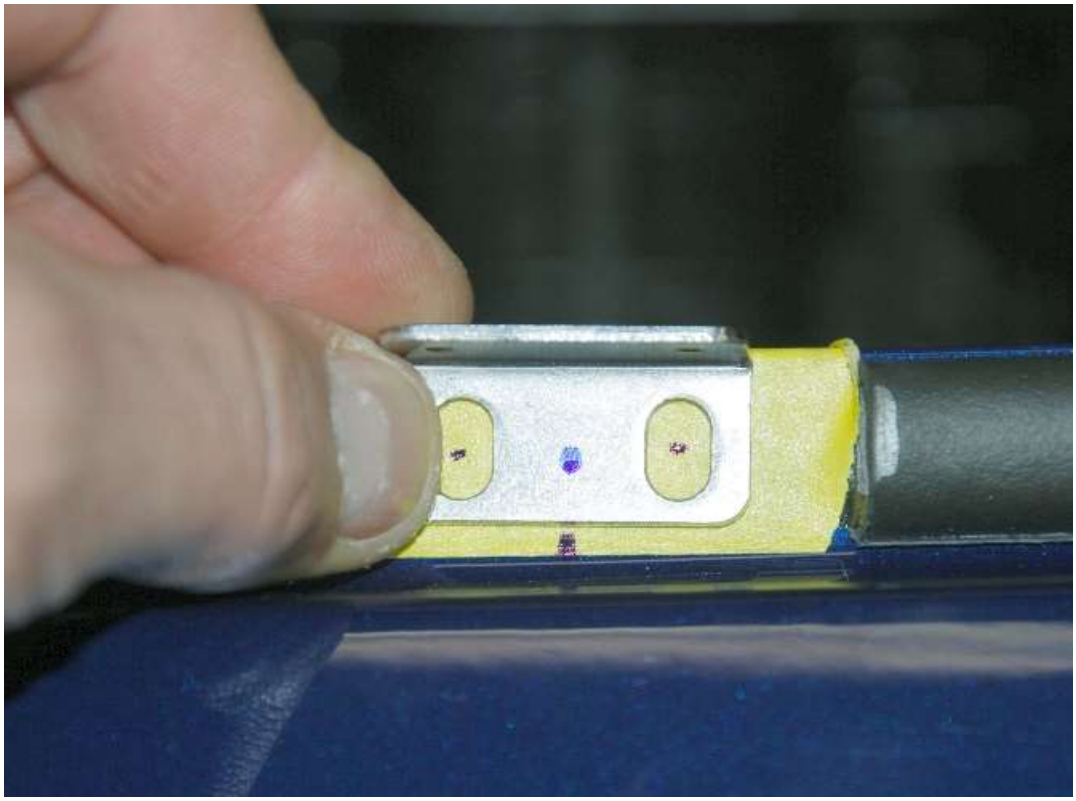
Hatch latch

Put masking tape at the rough center of the lower hatch flange then measure and mark the center of the lower flange.

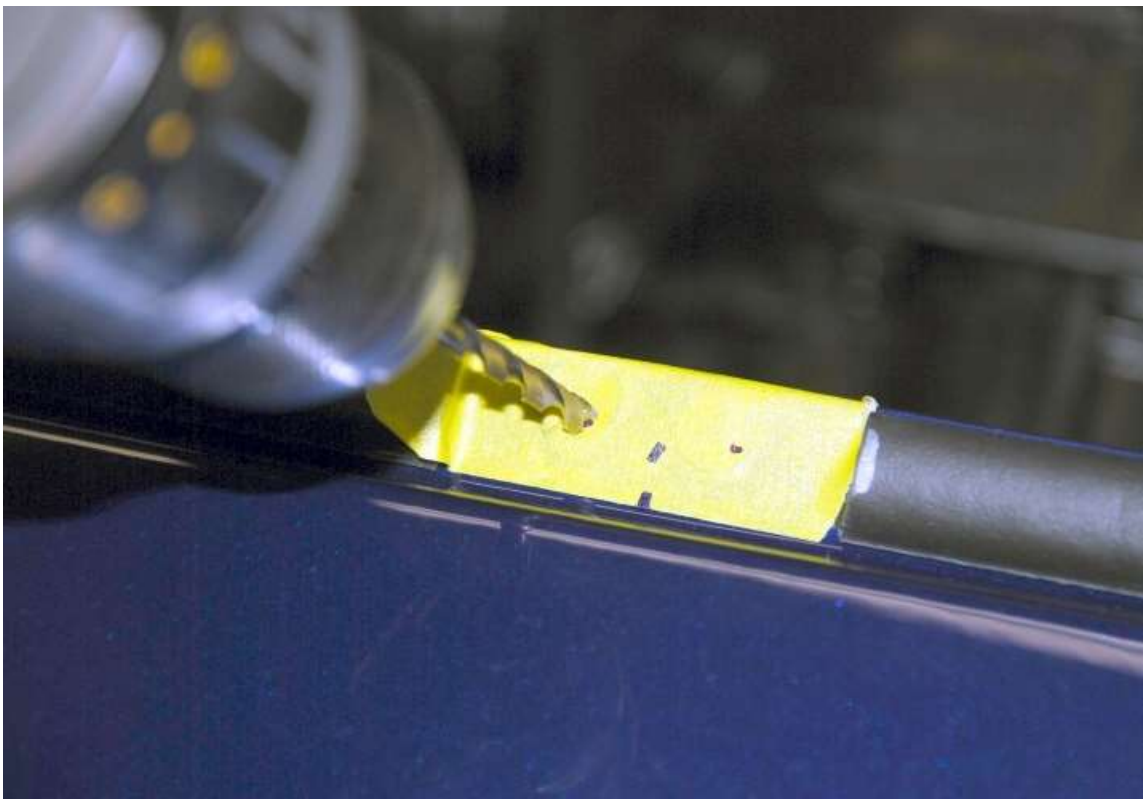
Find the hatch latch and its striker plate



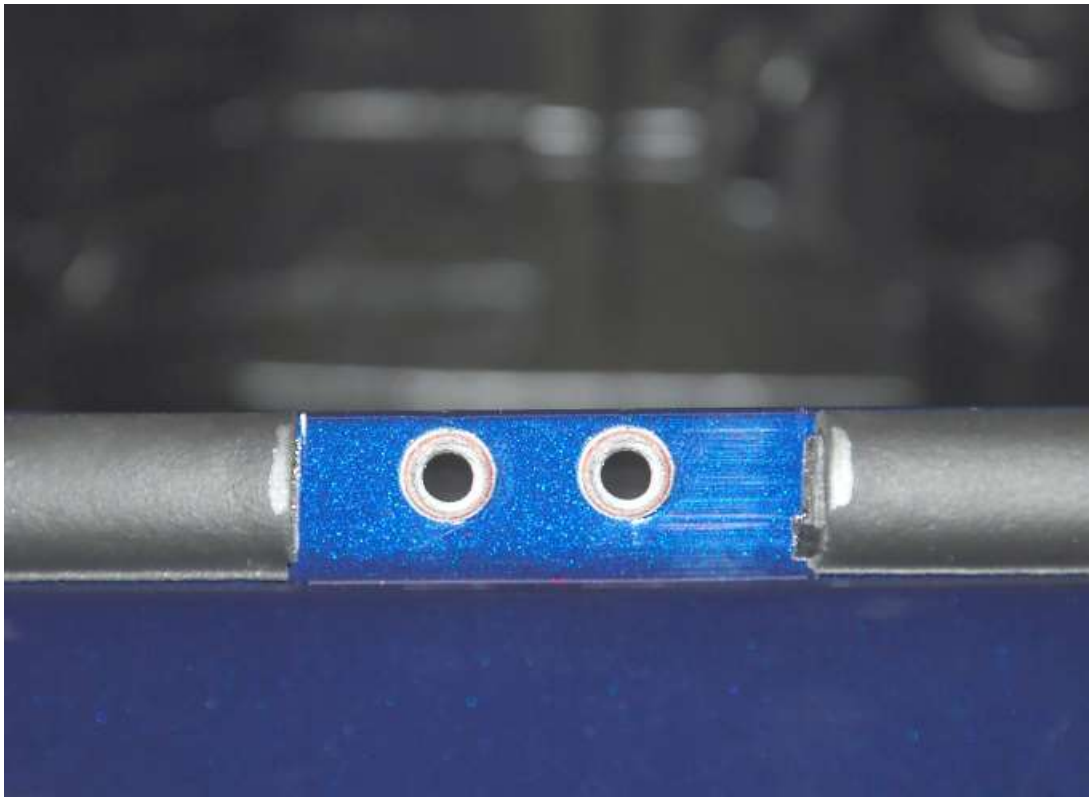
Use a marker and ruler to mark the center of the striker plate between the holes.



Hold the striker plate at the center hatch flange location marked earlier, align the bent part of the striker plate with the edge of the hatch flange and mark the center of the slotted holes.

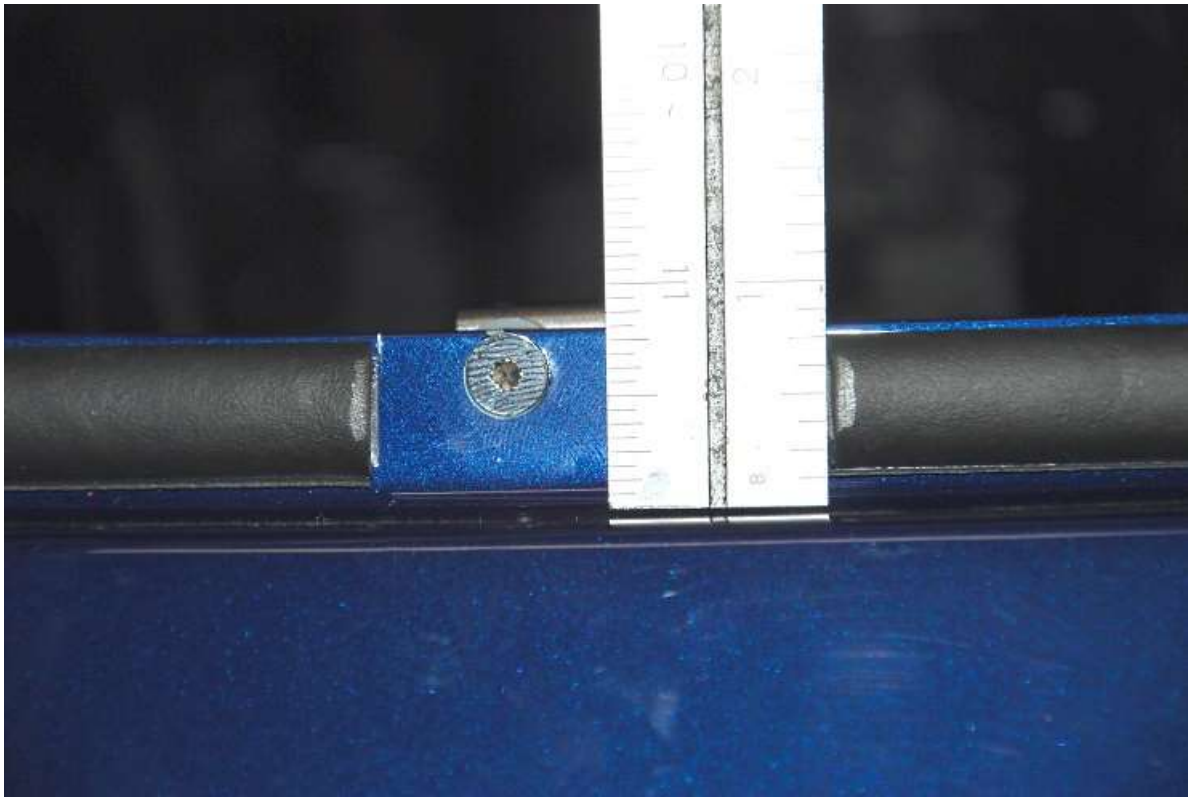


Use a $^{3}/_{16}$" drill bit to drill the hole locations on the hatch flange.

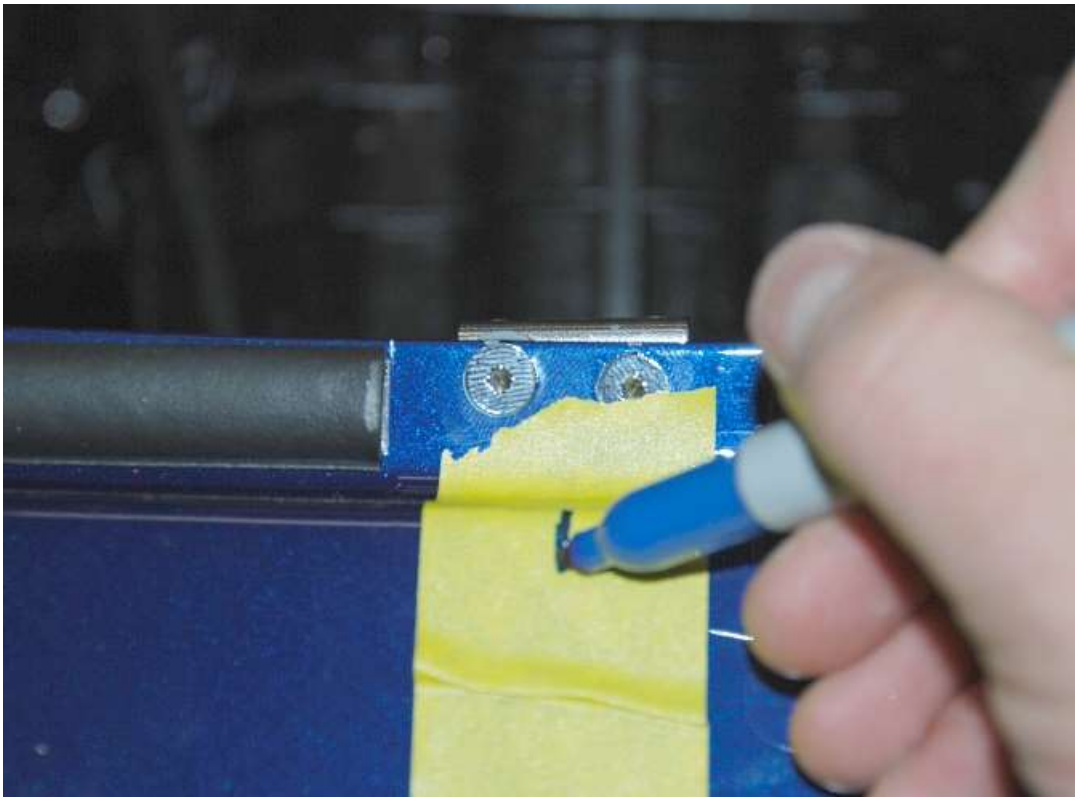


Use a drill countersink to countersink the flange for the #10 flat head mounting screws.

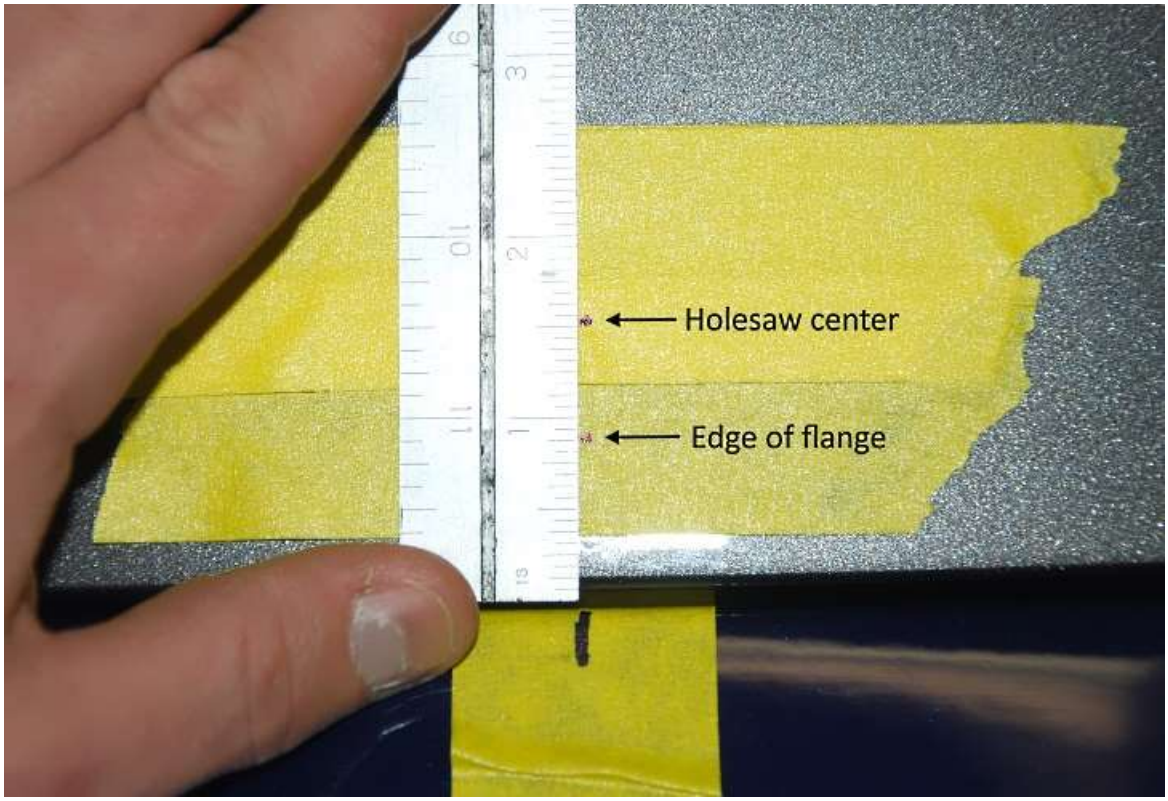
Attach the latch striker plate to the hatch flange using the fasteners and spacers provided.



Measure the height of the hatch flange.



Use another piece of masking tape on the body behind the hatch area and mark the center of the lower hatch area.



Close the hatch, place a piece of masking tape on the lower hatch at the center then measure up from the lower hatch flange marking the edge of the hatch flange location then mark another $^{5}/_{8}$" up which is the center of a 1.25" hole saw.

Use a 1.25" hole saw to drill through the hatch at the hole saw center location marked.

Insert the hatch latch into the hole.

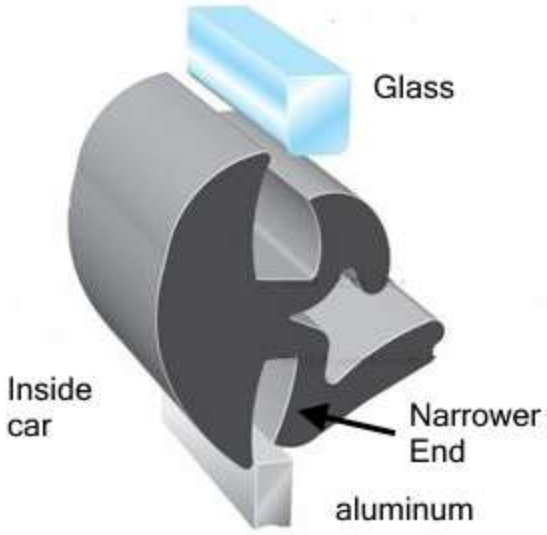
Screw the plastic nut onto the latch and orient the latch so that the striker points towards the back of the car then use a set of slip joint pliers to tighten the nut.

Cockpit inside rear wall

Hardtop components, body finish components
7/16" drill bit, 11/16" wrench, 11/16" socket, ratchet, WD40, Window cleaner, paper towels, level.
Be careful using the gasket tool while installing the glass so that the glass does not break.
If the rear wall is going to get painted or coated now is good time to do this

Push the 81114 weatherstrip onto the inside rear wall.

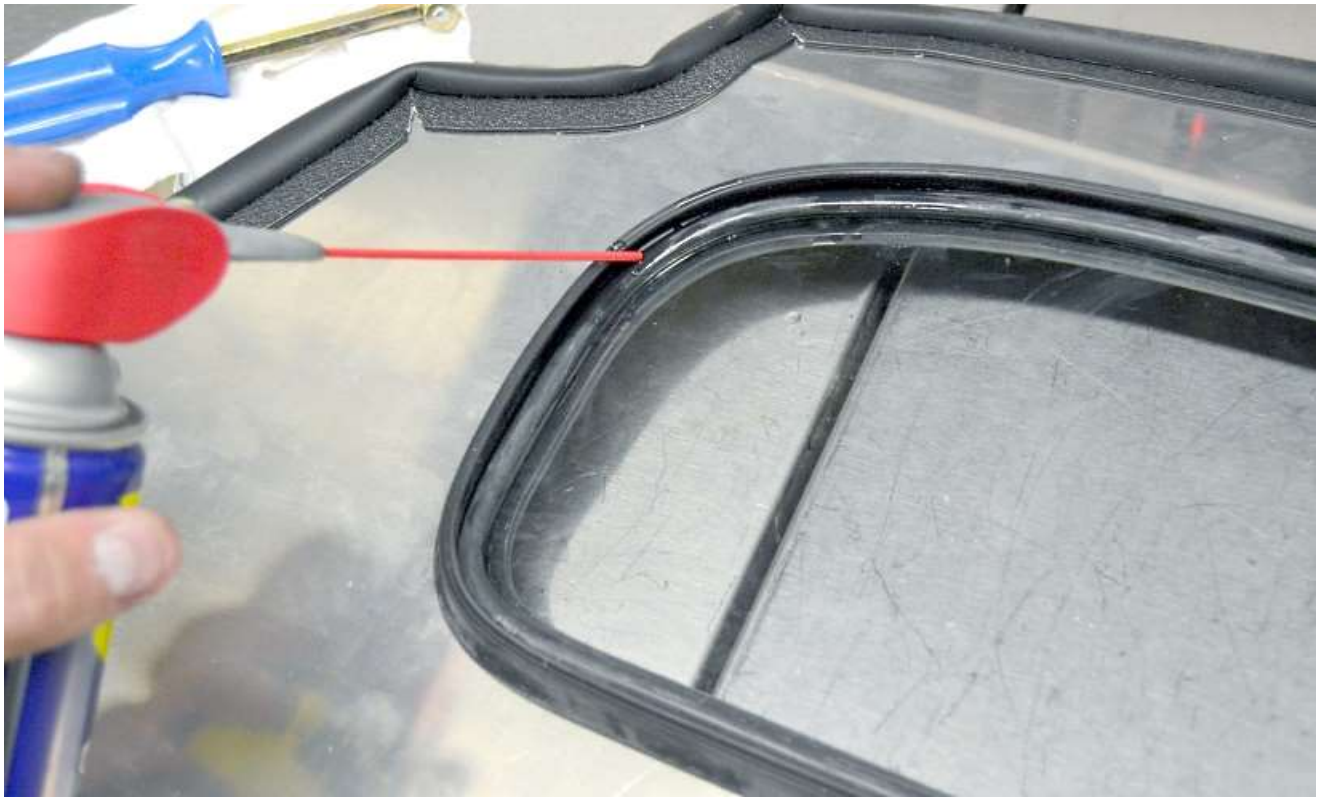
- The inside wall will mount in the car with the top angled part pointed forward.



- The gasket will get installed so that the inside of the car has the smooth side and the engine bay has the lock seam.

With the rear wall face down (angle part down) start at the bottom middle and push the rear window gasket onto the aluminum.

Push the glass into the gasket as much as possible then WD40 the end of the install tool and use the install tool as shown above to lift the gasket around the glass.



Spray WD40 around the middle area of the gasket.

Use the install tool angled slightly as shown to lift the small section of gasket with the end which will allow the roller part to push the locking tab down under the small section.

Finished gasket install, use window cleaner and paper towels to clean the WD40 off the assembly.

If installed, remove the upper seat belt mounts.
Use a level to make sure the chassis is level or note the location of the level bubble.

The next steps requires two people.

With one person inside the car, hold the inside rear wall up to the roof and the rollbar so that the weatherstrip seals to the roof.
Hold a level against the bottom edge of the inside rear wall and rotate the inside wall so that the level bubble is in the same location as the chassis measurement just made.
Have a second person use a $^{7}/_{16}$" drill bit and drill to drill through the preferred upper seat belt mount hole on the frame and mark the hole center location on the aluminum inside wall.
Remove the inside rear wall and drill $^{7}/_{16}$" holes at the marked locations.
Reinstall the inside rear wall using the upper seatbelt bolt to locate and hold the inside rear wall. Pass the bolt from the inside through the rear wall then through the 33203 (0.21") spacer and then the frame mount.

Push the flocked weatherstrip around the hardtop door opening.

Reinstall the seats. Optional aluminum seats and harness bar shown.

Power windows

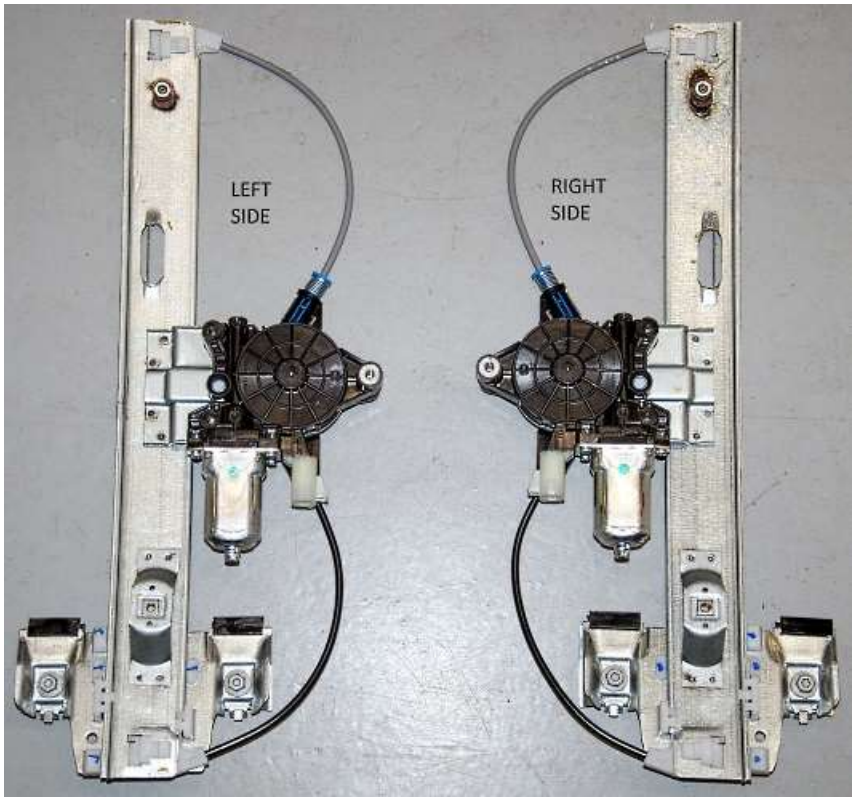
- Power window components, Hardtop glass set.

🛠 Drill, 7/64", 1/8", 3/16" drill bits, 3/8", 7/16" wrenches, 3/8", 7/16" sockets, ratchet, air saw or jig saw, masking tape, marker, Philips head screwdriver.

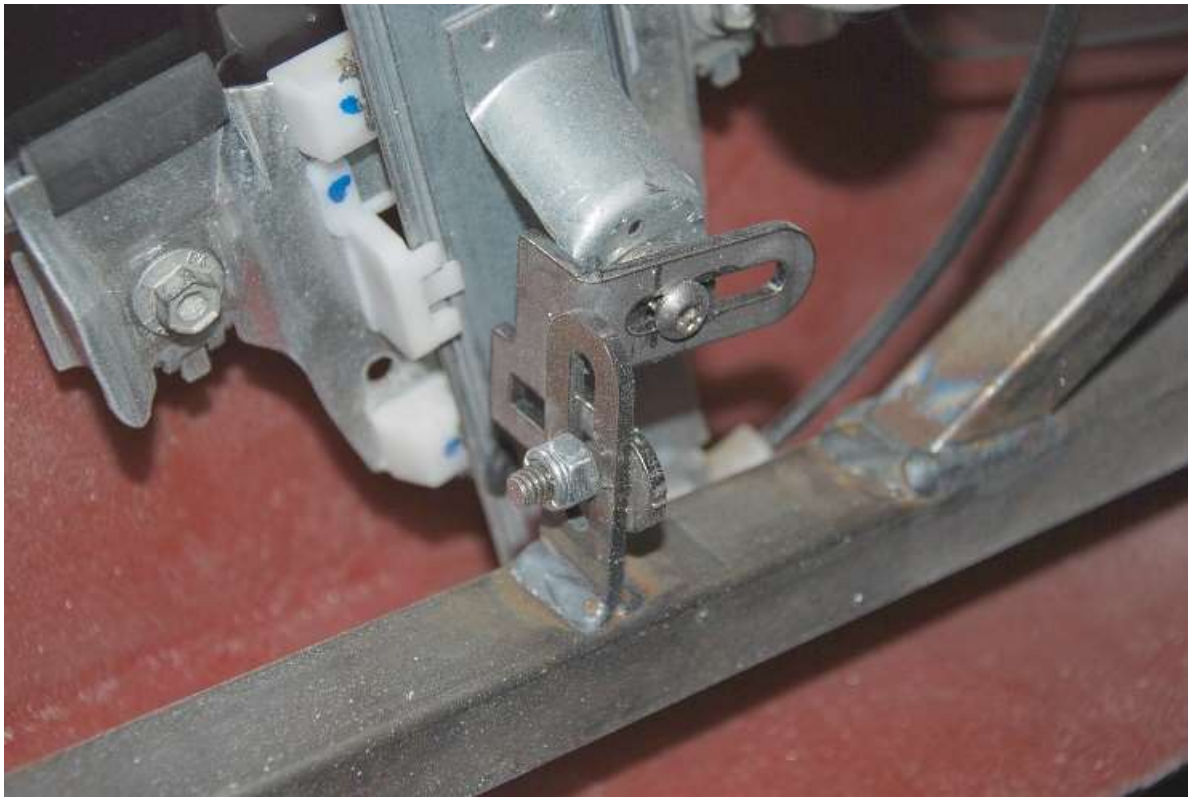
Put masking tape along the top of the door.

With the door closed, measure 0.50" forward from the hardtop and mark the tape. Also mark 0.50" back from the front of the hardtop and mark the tape.

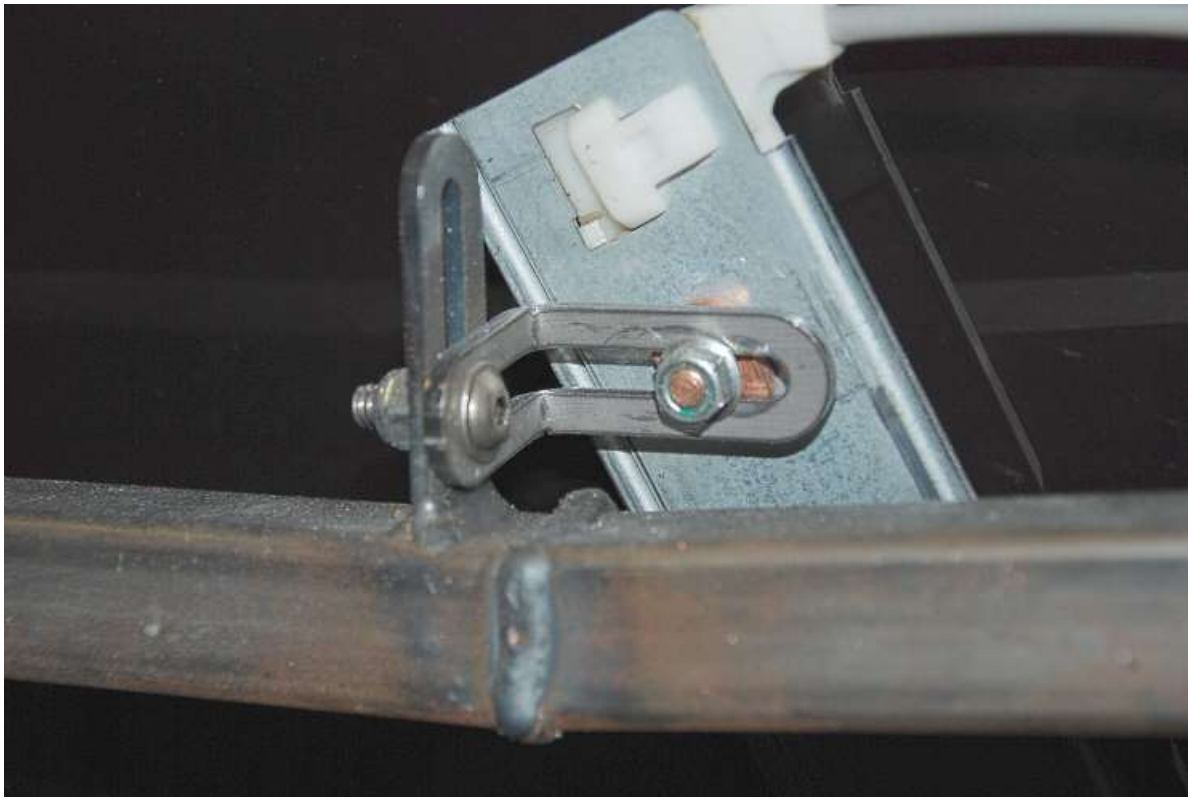
Cut the top of the door.
Push the hard flocked weatherstrip onto the outside of the window slot.



Locate the power window motors and tracks.



Attach the lower window track to the front side of the door frame bracket as shown using the M6 button head screw to attach the track to the bracket and the ¼"x ¾" bolt, washers and nut to the door frame. The Left side is shown. Leave the fasteners loose enough so that the window track can move around.



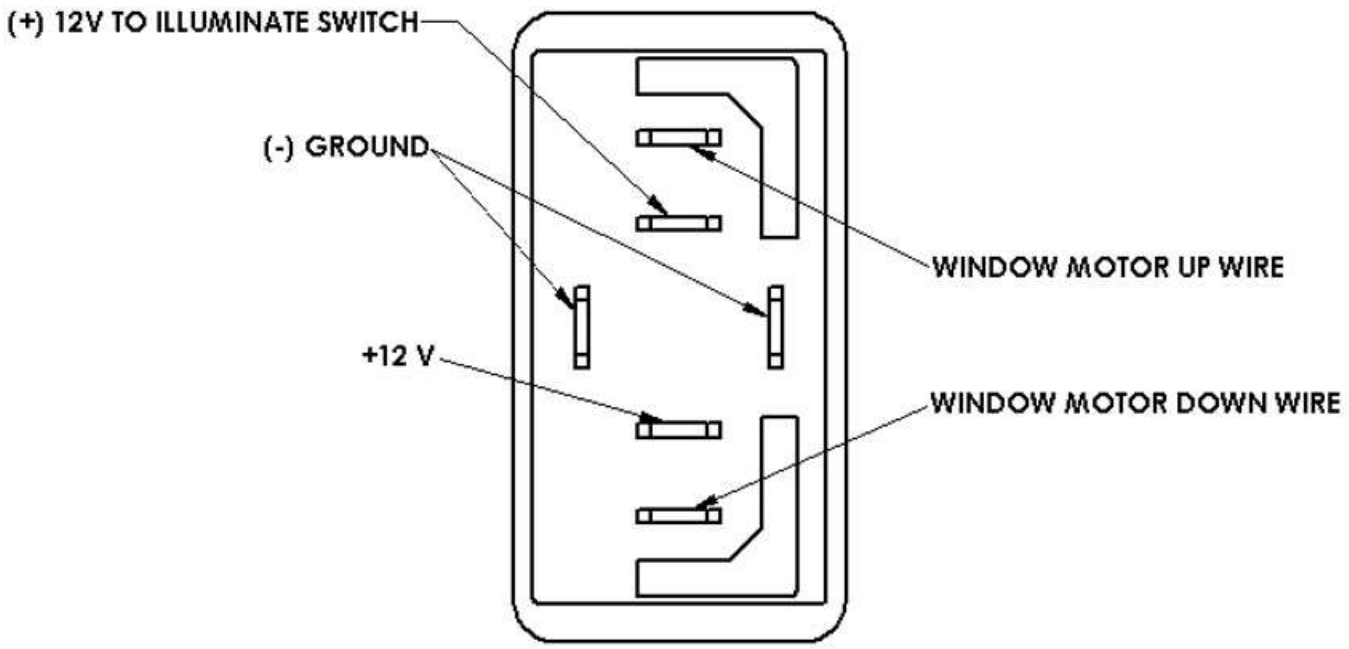
Attach the upper window track to the door frame using the window track nut, ¼”x ¾” bolt, washers and nut.

Mounted left side window track.

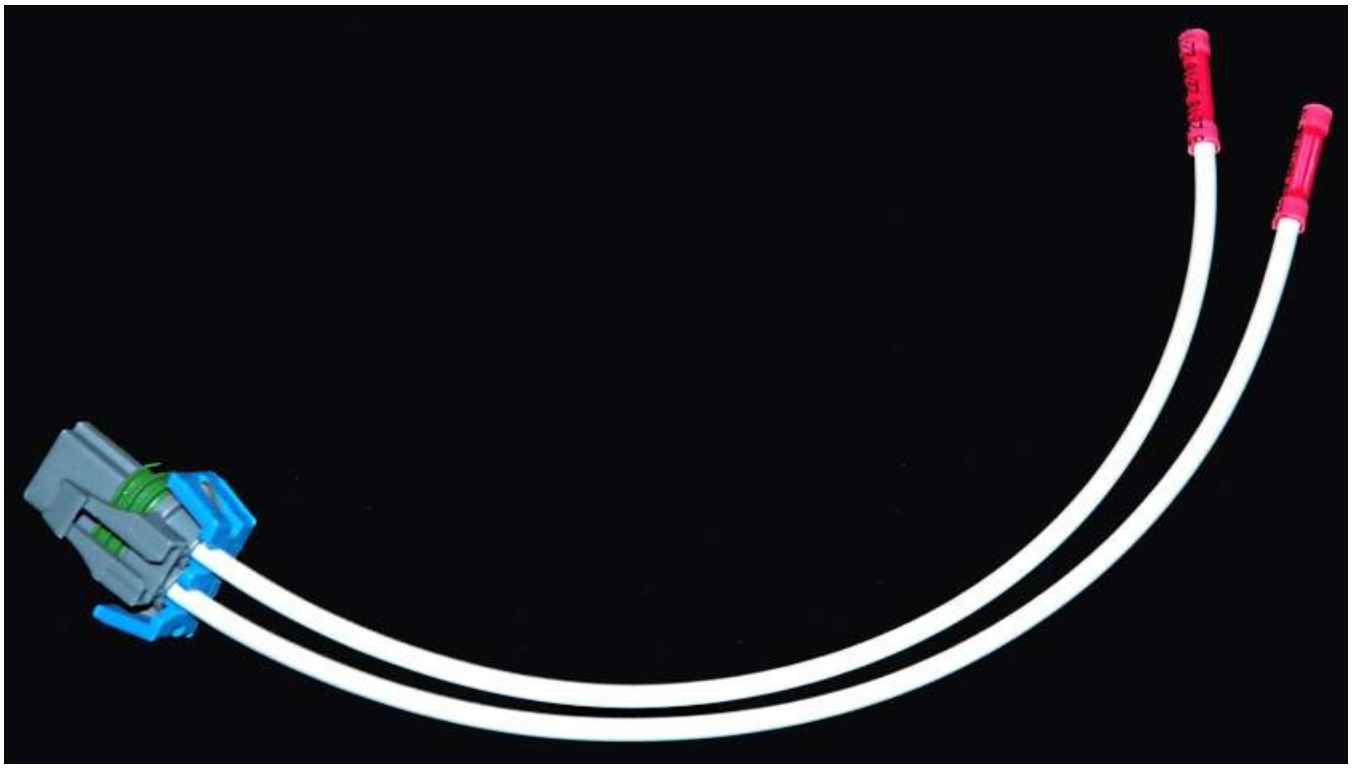
Power window switch template.

Use the template above to mark the switch location where desired, we mounted it between the seats. Wire has been included for this mounting location.

Cut the hole for the power window switch.



Use the diagram above to connect the power window switches to the chassis harness. Use the OE Green/black power window wire for the power.

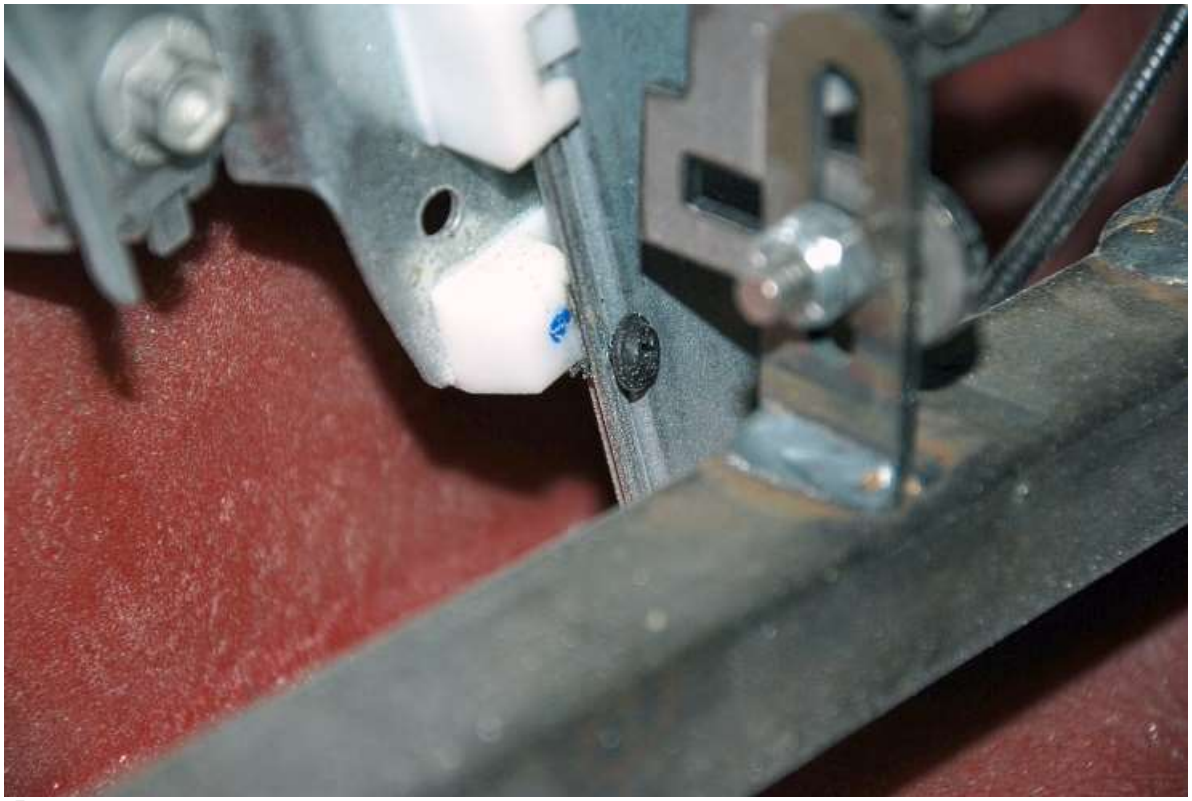


Use the red butt connectors to attach the included wires to the window motor pigtails.

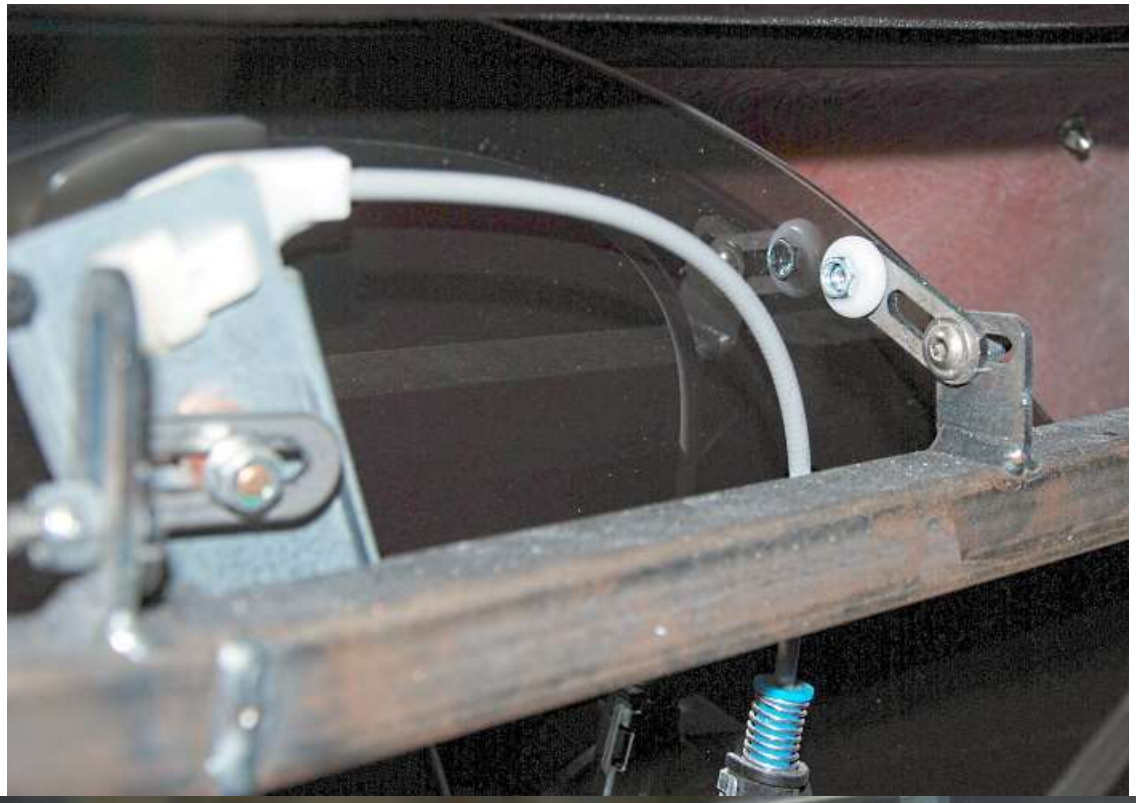
Push the connector onto the motor and run the wires to the switch.

Attach the included wires to the switch using the un-insulated connectors and push them into the correct holes in the plug so that the switch works the desired way when pushing the button.
Insert the glass down through the door window slot and into the holder on the window track and snug the bolts up.

Raise or lower the window so that the glass sticks up about ½" up out of the door.

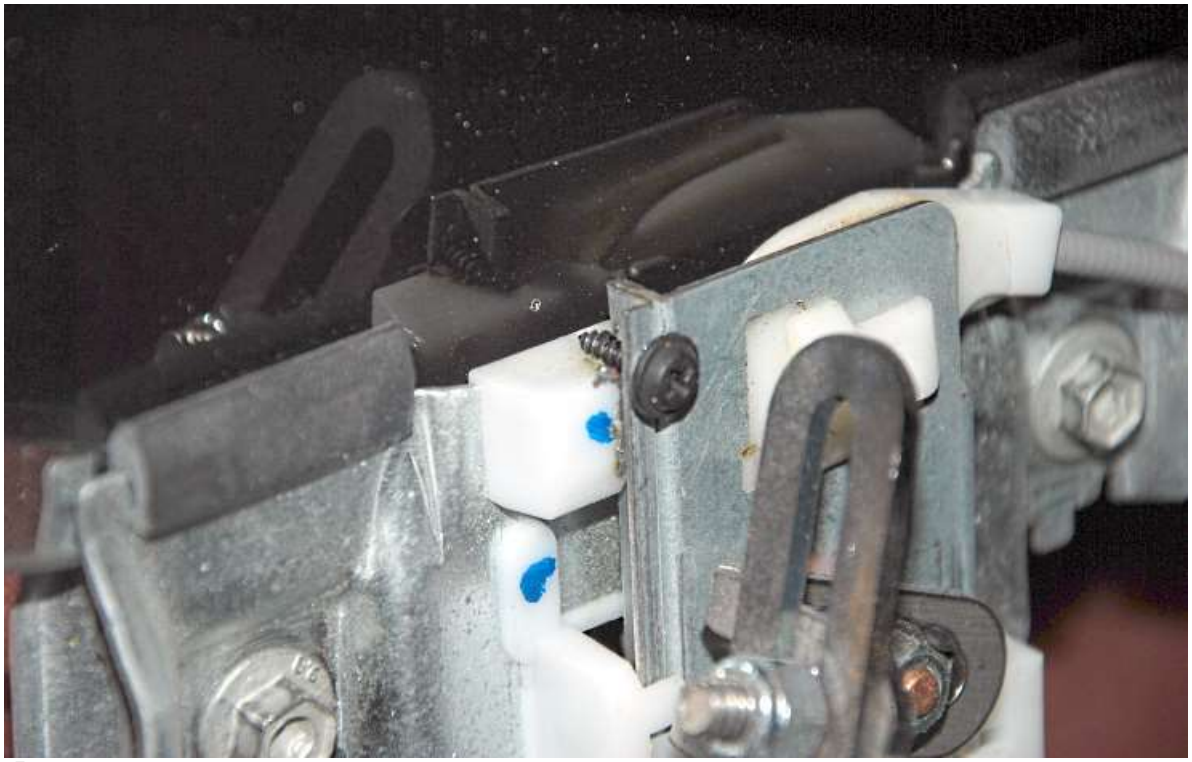


Drill a $^{7}/_{64}$" hole through the window track just under the white plastic piece on the window track holding the glass and screw a black #6 x ½" screw into the hole to stop the window from going down more.



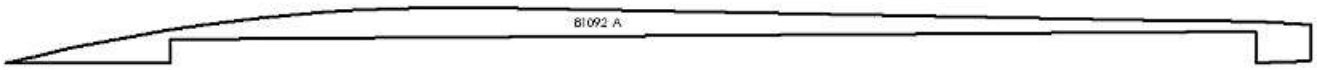
Use one of the small white window roller guides on the guide bracket along with a ¼”x ¾” bolt, washers and nut and attach it to the door frame bracket on the upper tube. Rest the wheel against the glass and tighten.

With the door open, carefully raise the window, adjusting the roller guides if needed then carefully close the door. Center the glass front to back and lower the glass as necessary so that there is an even gap all around.



Drill a $^{7}/_{64}$" hole through the window track just above the white plastic piece on the window track holding the glass and screw a black #6 x ½" screw into the hole to stop the window from going up more.

Adjust the window track holders so that the glass seals all around the window area and it will go up and down smoothly.



Locate and fit the aluminum window inside trim piece to the inside of the window. Cut the part as needed. Paint or coat the aluminum.

After the door liner is installed the window trim piece will go under the liner.

Outside door handles (hardtop only)

Exterior door handle components.

Small flat head screwdriver, wire cutters, masking tape, saw, 10mm, $^{7}/_{16}$", ½" sockets, ratchet, $^{7}/_{16}$", ½" wrench, file, silicone, pliers, $^{5}/_{32}$" hex key.

Use masking tape on the rear upper part of the door where the door handle will go.

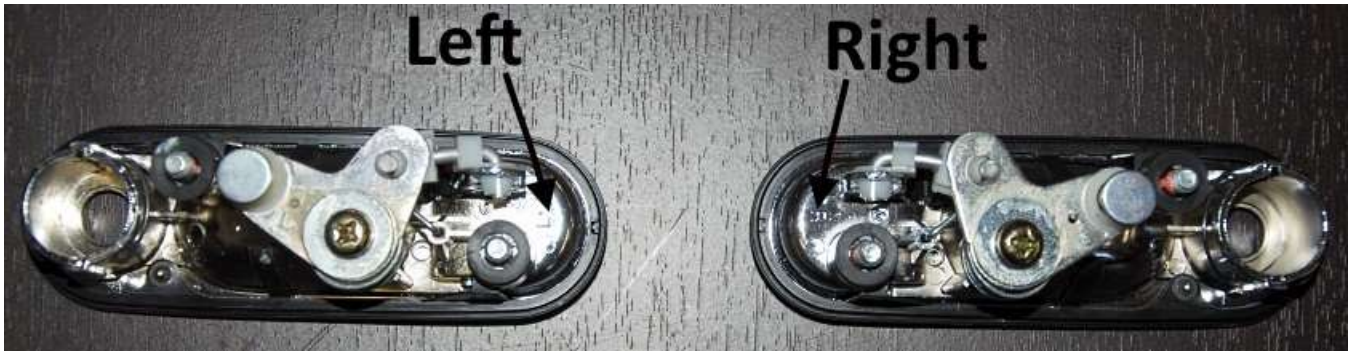
Use the door handle template provided to locate the positions for the outside door handles, the template should line up with the edge of the door at the top back and on the bottom. This should put the door handle at the top of the flat part on the door.

Mark the template opening.

Cut the door handle hole out.

Repeat this for the other door.

Door handle prep



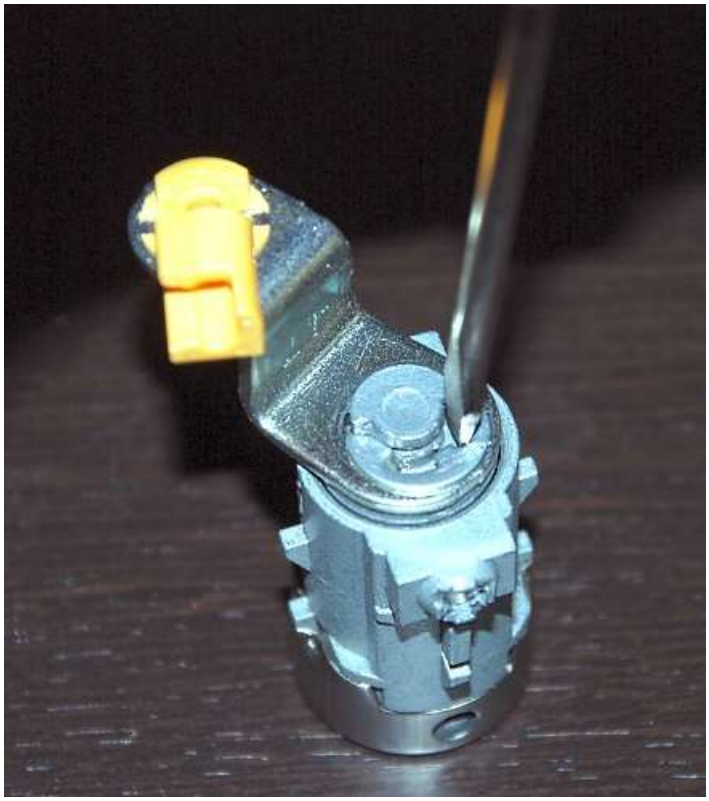
Door handles are marked “L” and “R” for left and right.

Use a pair of wire cutters to remove the threaded shaft on the door handle, it is not used in our application.

Driver door handle

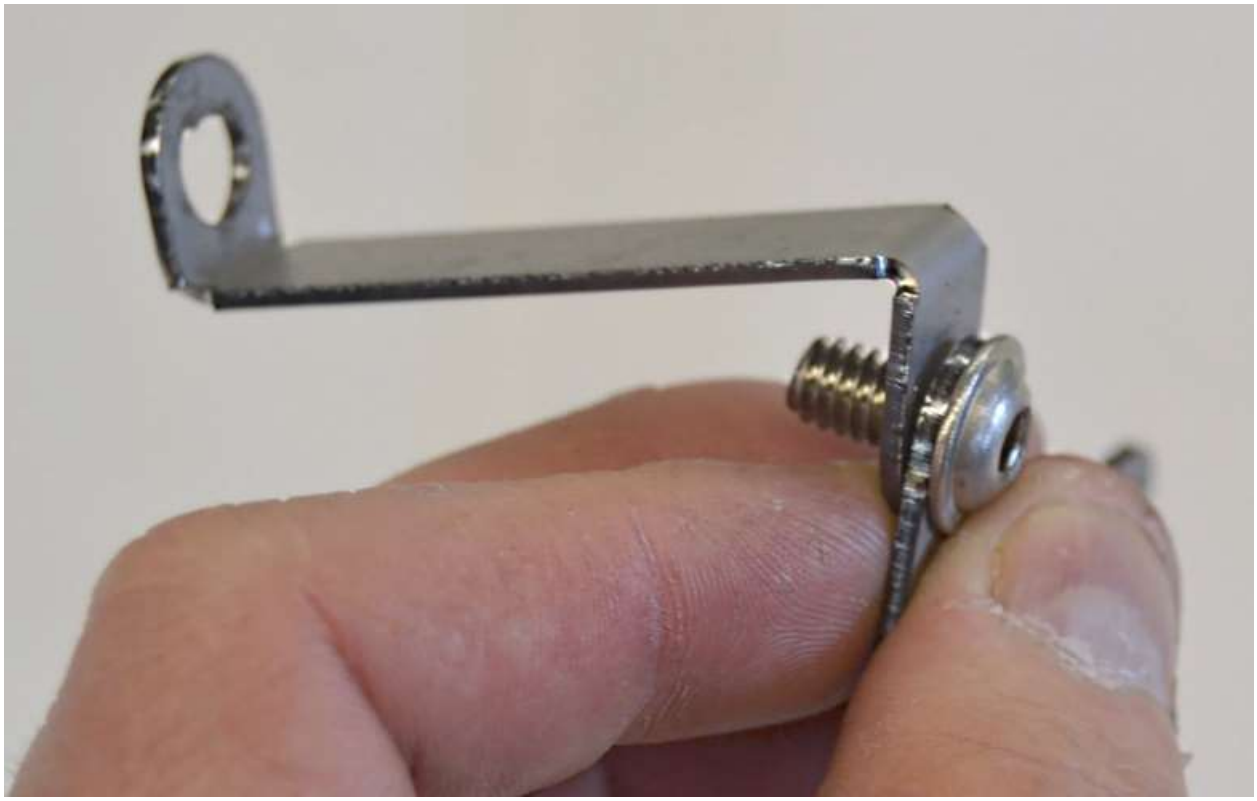
Door lock

- Only the driver side door will get a lock, the other side will get a block-off



Use a small flat head screwdriver to remove the E-clip from the back of the door lock.

Remove the lock actuator bracket.



From the outside, insert the small ¼” x 0.50” flange button head socket screw through the actuator to lock lever (L bracket) and door lock actuator.

Use a $^{5}/_{32}$” hex key and $^{7}/_{16}$” wrench to put the ¼” locknut on the screw just so the end of the screw is flush with the end of the locknut. The parts will still be loose on the screw. This is correct.

Insert the lock into the driver door handle as shown so that the round casting mark on the lock is oriented as shown.

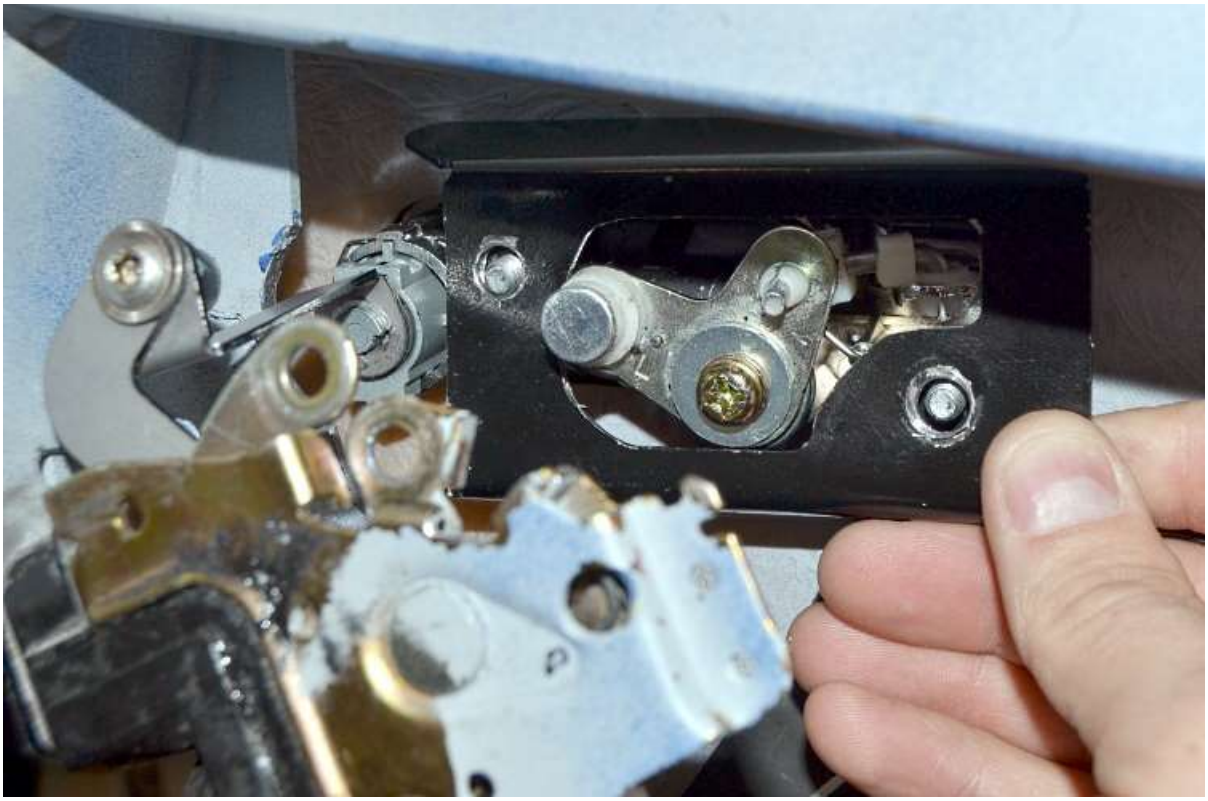
Put the new actuator bracket on the lock

Use a pair of pliers to squeeze the E-clip back onto the lock.

Handle

Insert the handle into the door with the lock towards the back of the car.

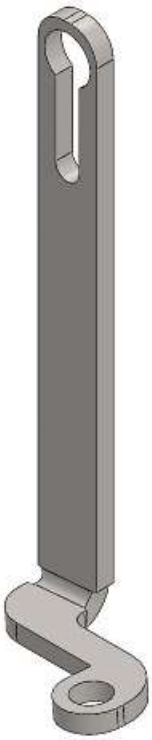
If the lock hits the door frame, it is necessary to mark and cut the area.



Attach the handle to the door using the door handle bracket, M6 lock nuts, 10mm socket and ratchet.

Release levers

Insert the $^{5}/_{16}$” x 1.50” bolt through the Subaru latch release lever.



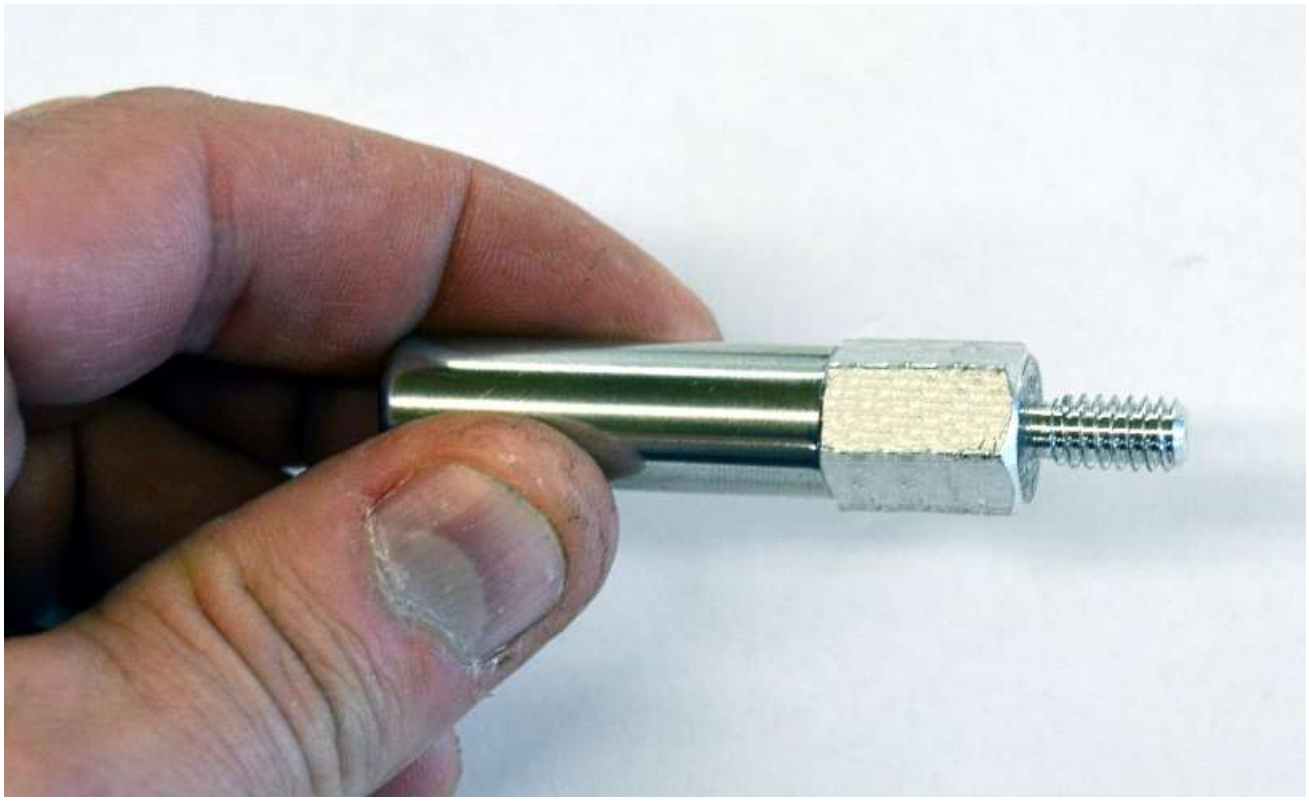
Left side latch link.

Put the latch link on the door handle so that the bottom bent tab points forward and push it up so the bolt on the Subaru latch goes through the hole.

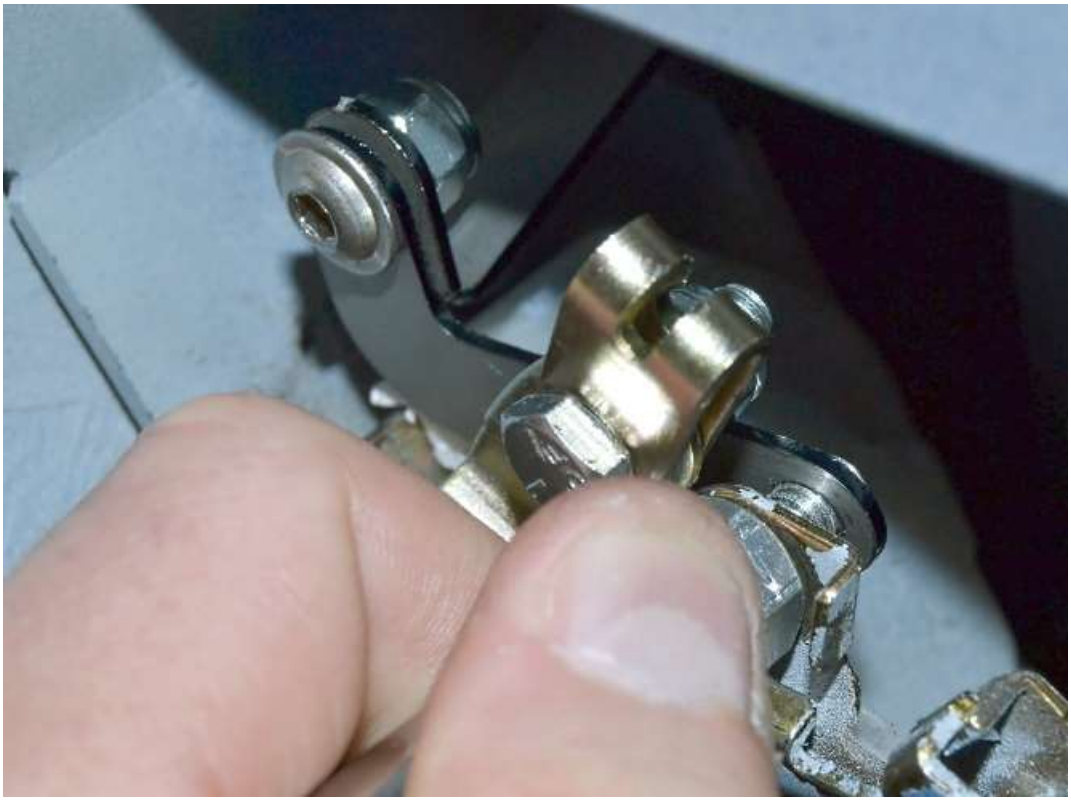
Attach a $^{5}/_{16}$" locknut to the bolt using two ½" wrenches so that the end of the locknut is flush with the end of the bolt and the bolt is through the nylon. Do not screw on further unless adjustment is needed later.

Attach the clevis to the curved release lever at the top of the Subaru latch using the ¼" x 0.75" bolt, lock nut, $^{7}/_{16}$" wrench, socket and ratchet. You can squeeze the clevis together if you like just make sure that the clevis can rotate freely.

Put a drop of thread locker on the polished release lever.



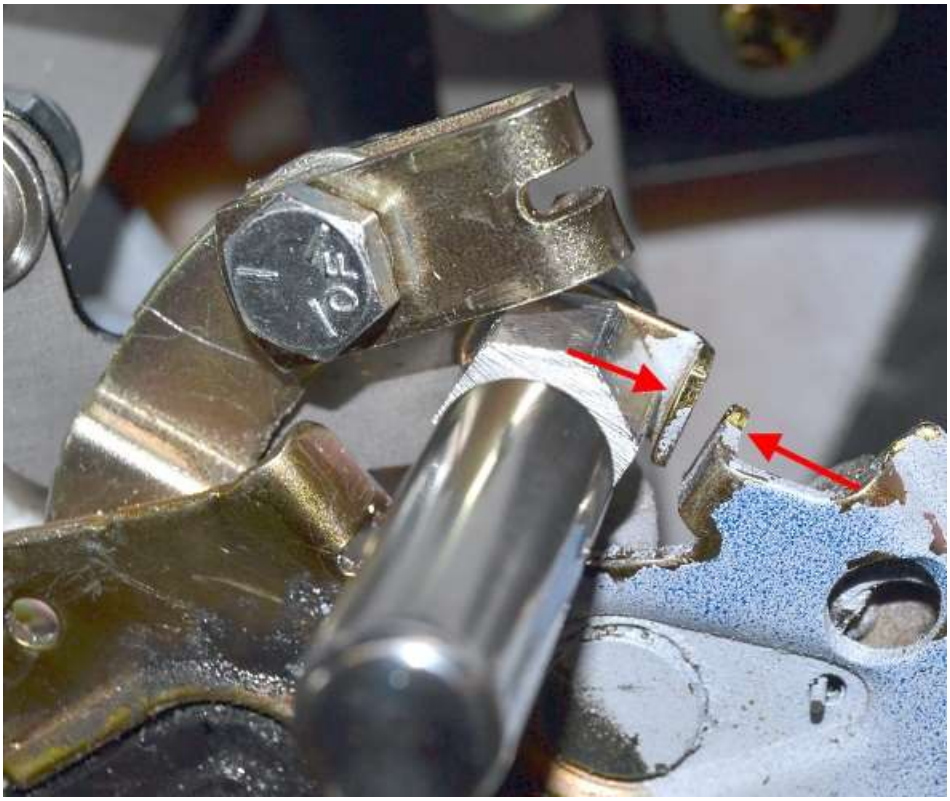
Insert the release lever into the standoff.



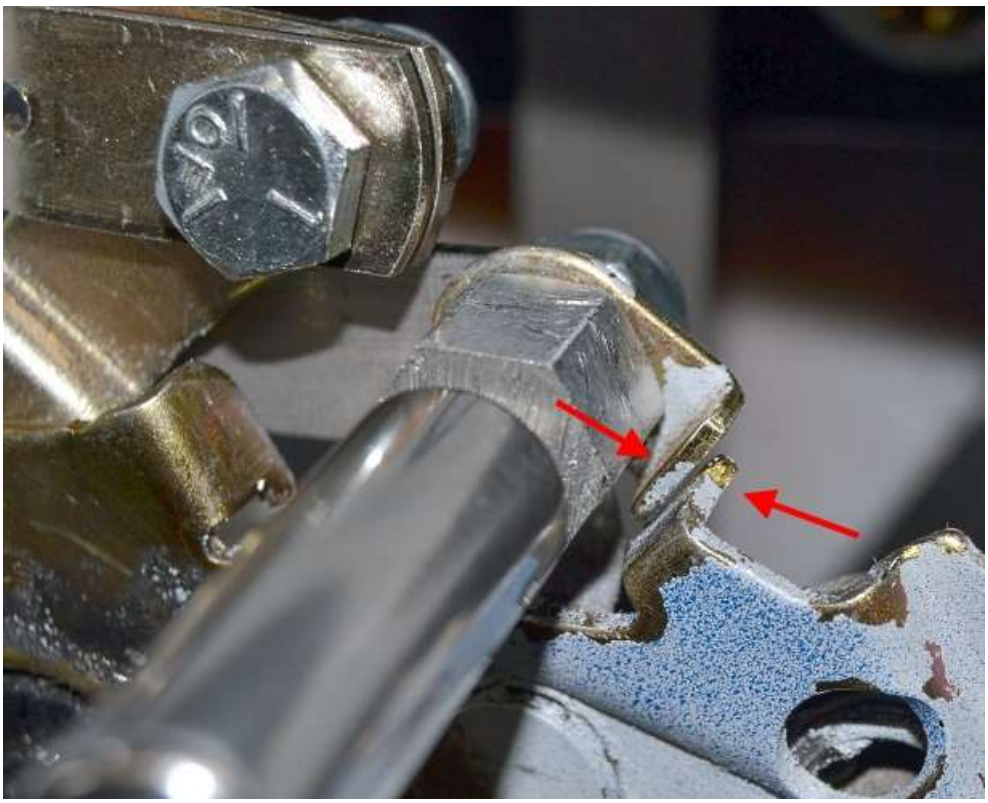
Insert the hex shaped standoff through the Subaru latch lock and the L bracket.

Fasten using a ¼” lock nut, $^{7}/_{16}$” and ½” wrenches. Tighten the locknut then back off ½ turn.

Test the lock actuator using the outside key.



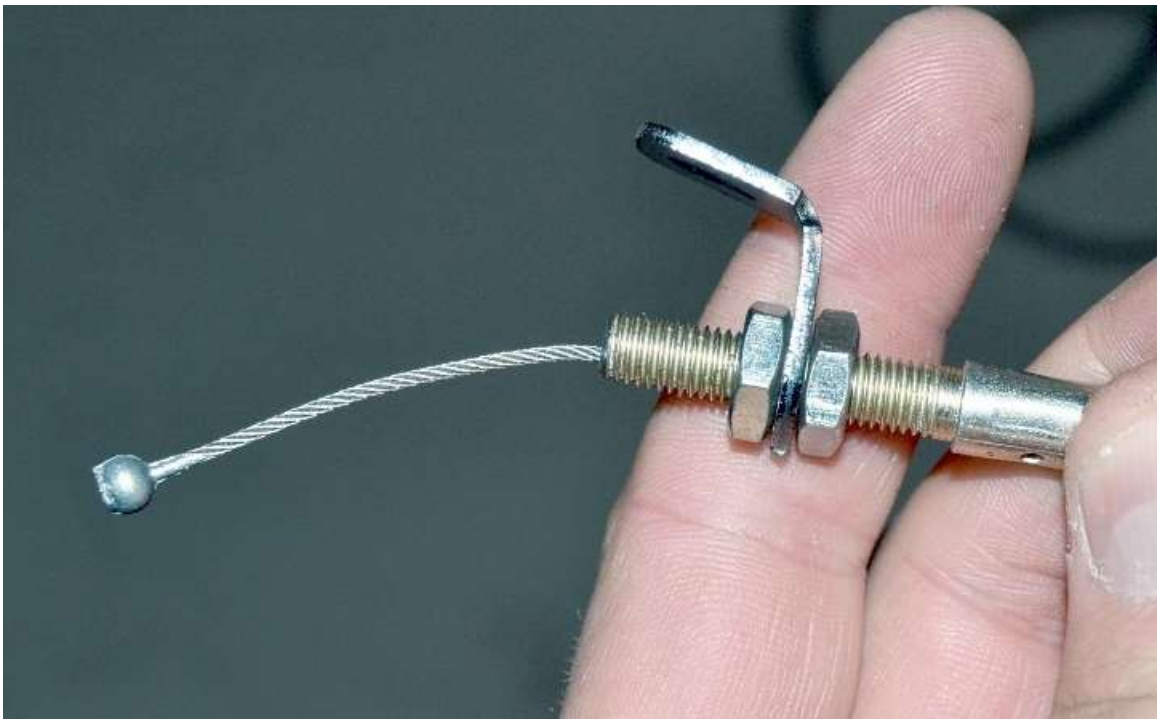
If the lock lever will not unlock and touch the stop like shown above, loosen the standoff locknut another ½ turn.



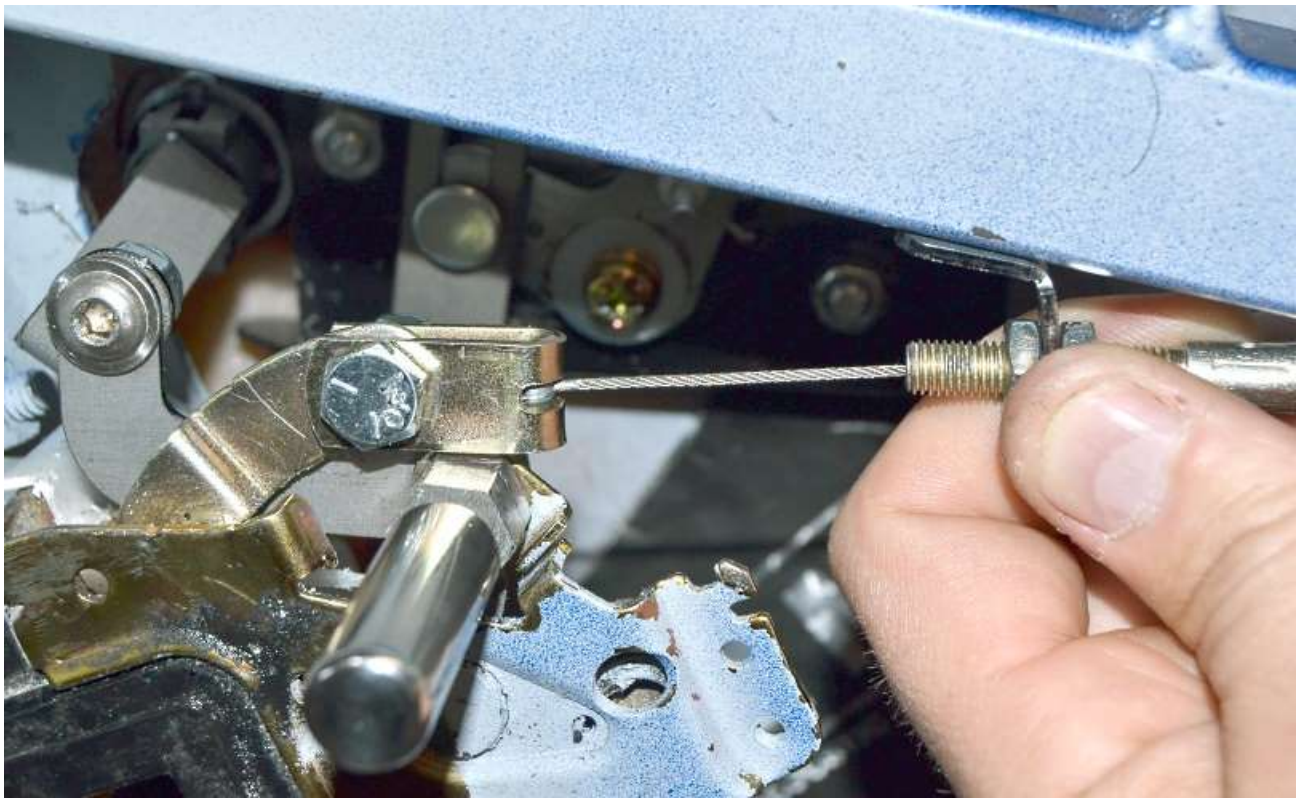
The lock lever should now come closer to the stop as shown.

Inside handle (hardtop only)

- The window glass gets in the way of the inside door handle so different ones are required.



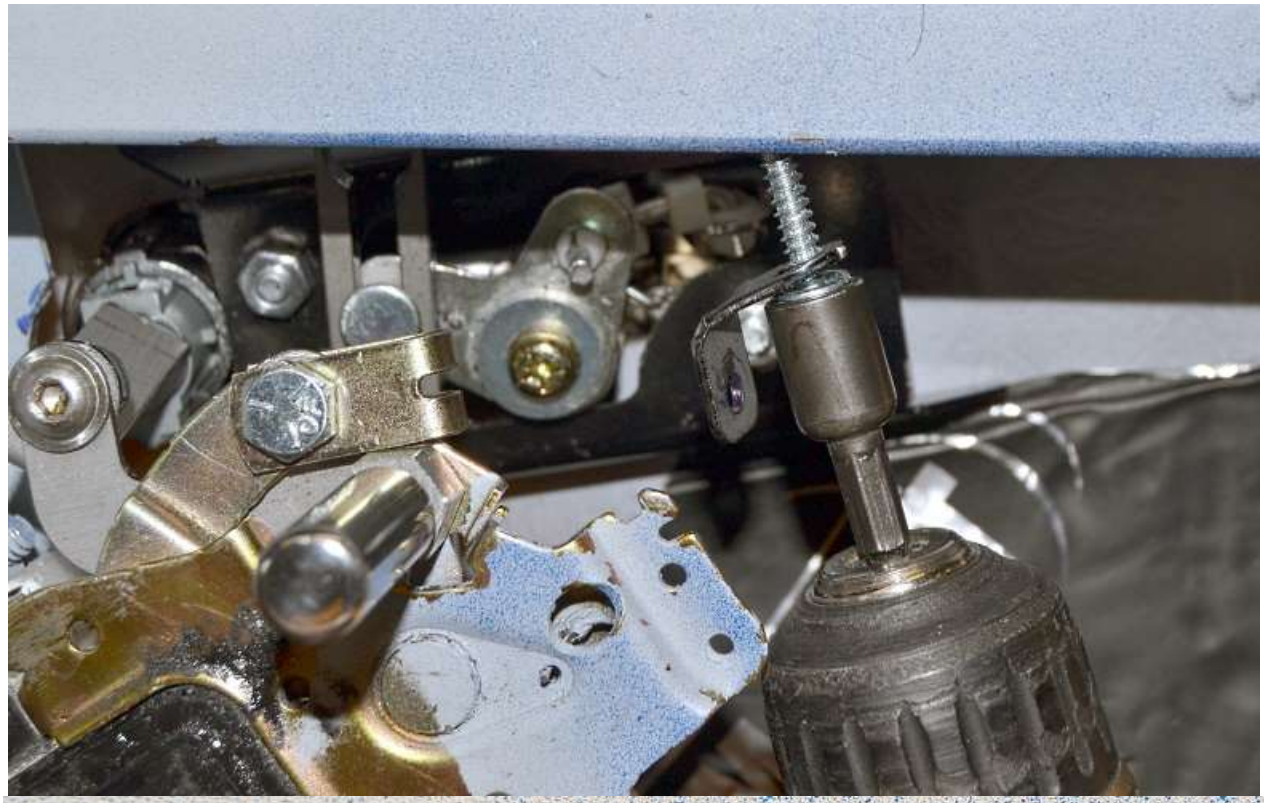
Thread on one of the ¼" jam nuts followed by the release cable mount and other ¼" jam nut onto the threaded end of the inside door handle cable. Center the parts on the threads to allow adjustment later.



Insert the ball of the cable into the clevis through the side opening and pull the cable back so that the cable is tight but is not starting to engage the opener.

Mark the underside of the tube for the mount bracket. Also note where on the tube the bracket should be so that the cable is pulling straight on the lever.

Remove the cable/bracket from the car and remove the bracket from the cable.



Attach the mount bracket to the tube using a #10 x 1” self-tapping screw. If screwing at an angle because of the lock, drill a $^{1}/_{8}$” pilot hole first to allow the screw to grab.

Reattach the cable end to the bracket on the frame.

Reattach the cable to the clevis.

The handle will get installed after the liner is installed.

Passenger door handle

- Only the driver side door will get a lock, the other side will get a block-off

Use a file to remove the laser tab from the right side of the stainless steel key block off.

Insert the block-off into the passenger door handle so the top and bottom tabs are in the slots.

Look at the front side of the handle to make sure the logo is the correct way up then center the logo.

Place the handle face down and run a bead of silicone around the block-off to hold it in place and prevent water from getting in the door.

Insert the door handle into the door.

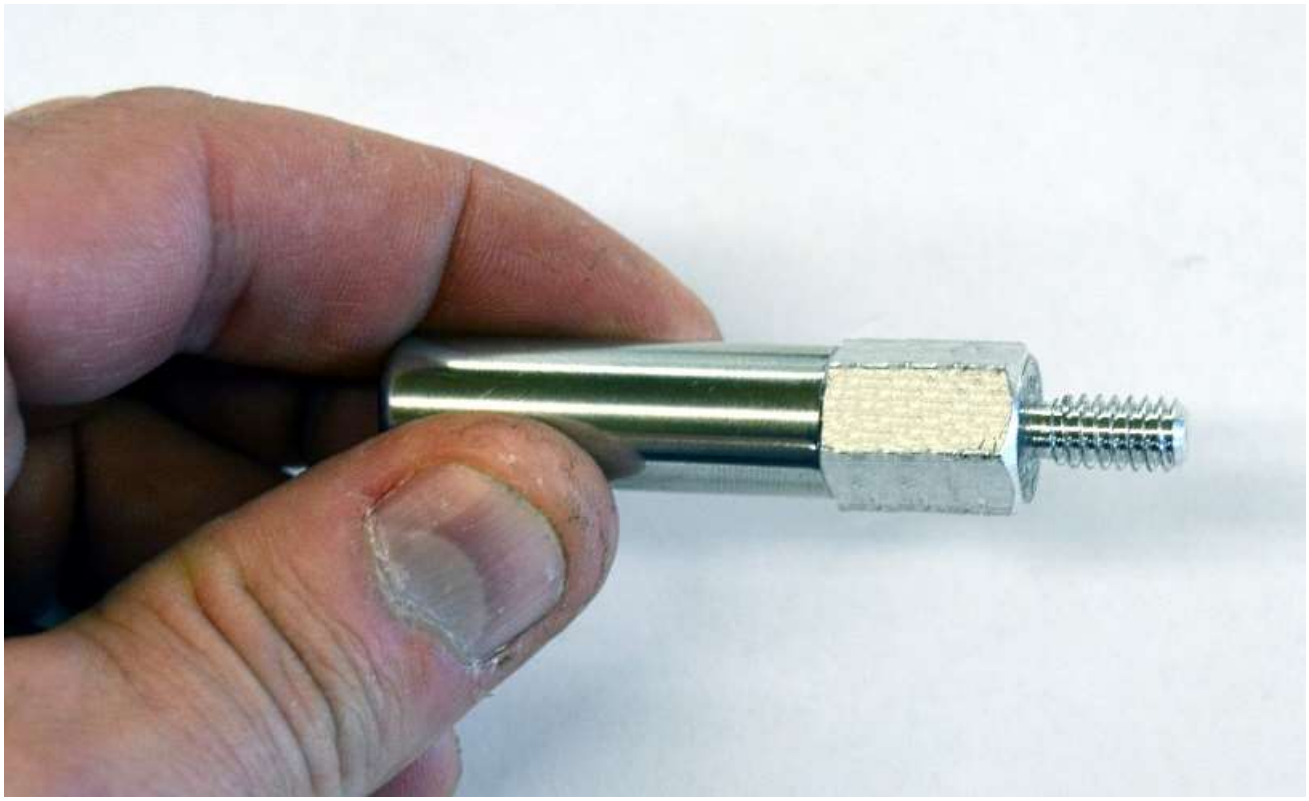
From inside the door, attach the door handle bracket to the handle using the 6mm locknuts and a 10mm socket and ratchet.

Slide the door latch link bracket onto the door handle.

Attach the latch link bracket to the underside of the door latch as shown using the ¼" x 1.50" bolt and lock nut with a ½" wrench, socket and ratchet.

- Only tighten the nut so that the nylon engages. Test unlocking the door and if necessary tighten a couple of turns and recheck.

Put a drop of thread locker on the polished release lever.

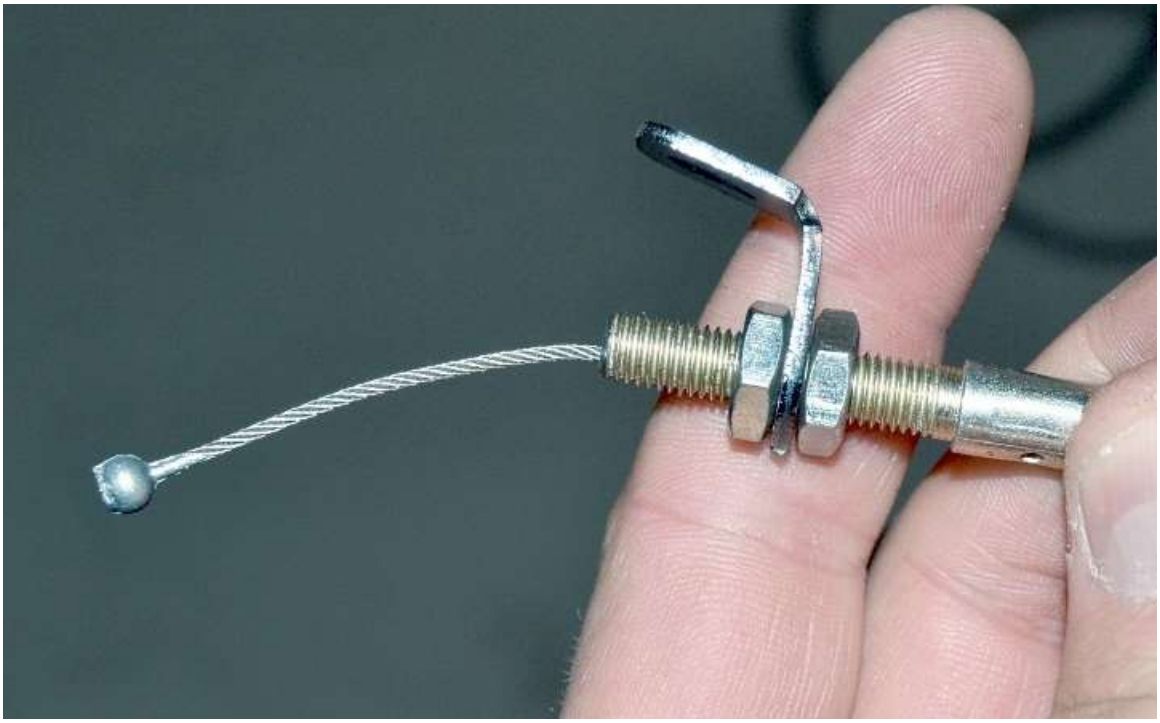


Insert the release lever into the standoff.

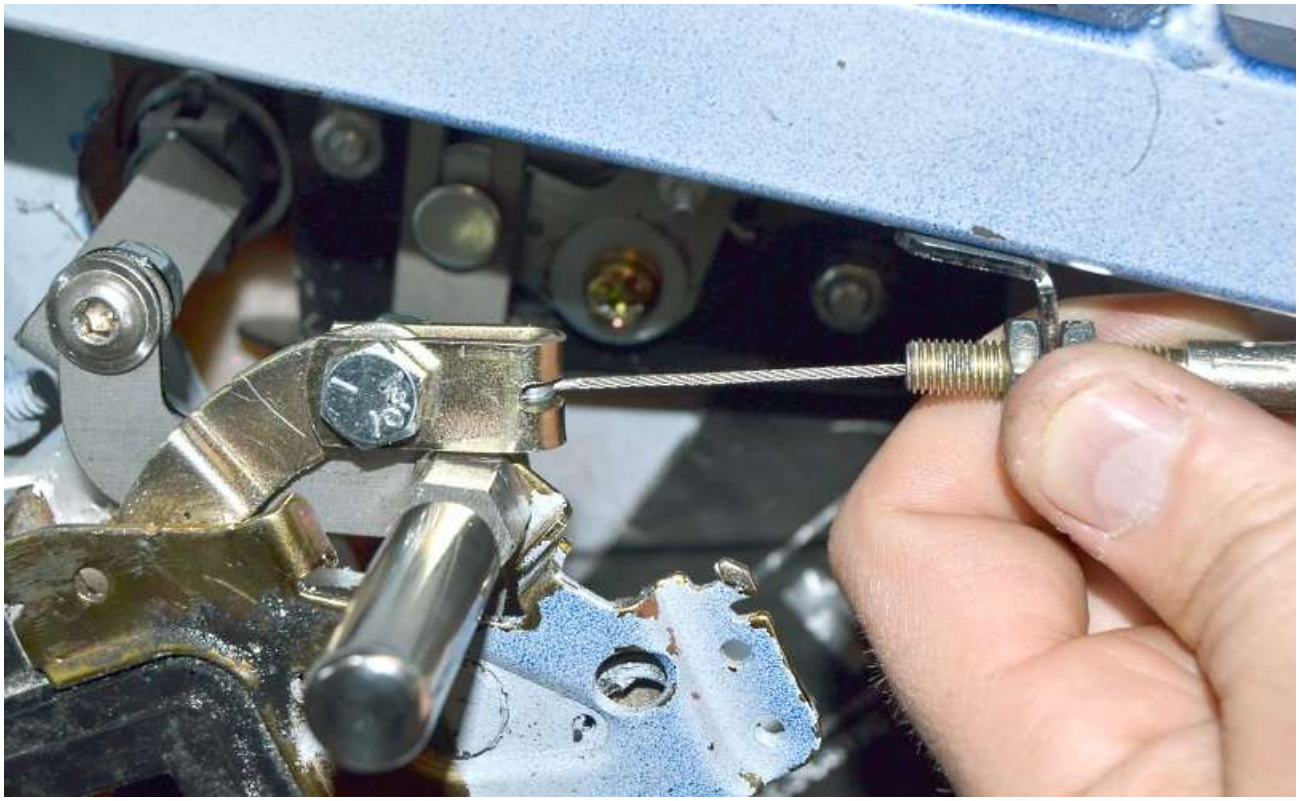
Attach the standoff/lever to the lock lever on the Subaru latch.

Inside handle

The window glass gets in the way of the inside door handle so different ones are required.



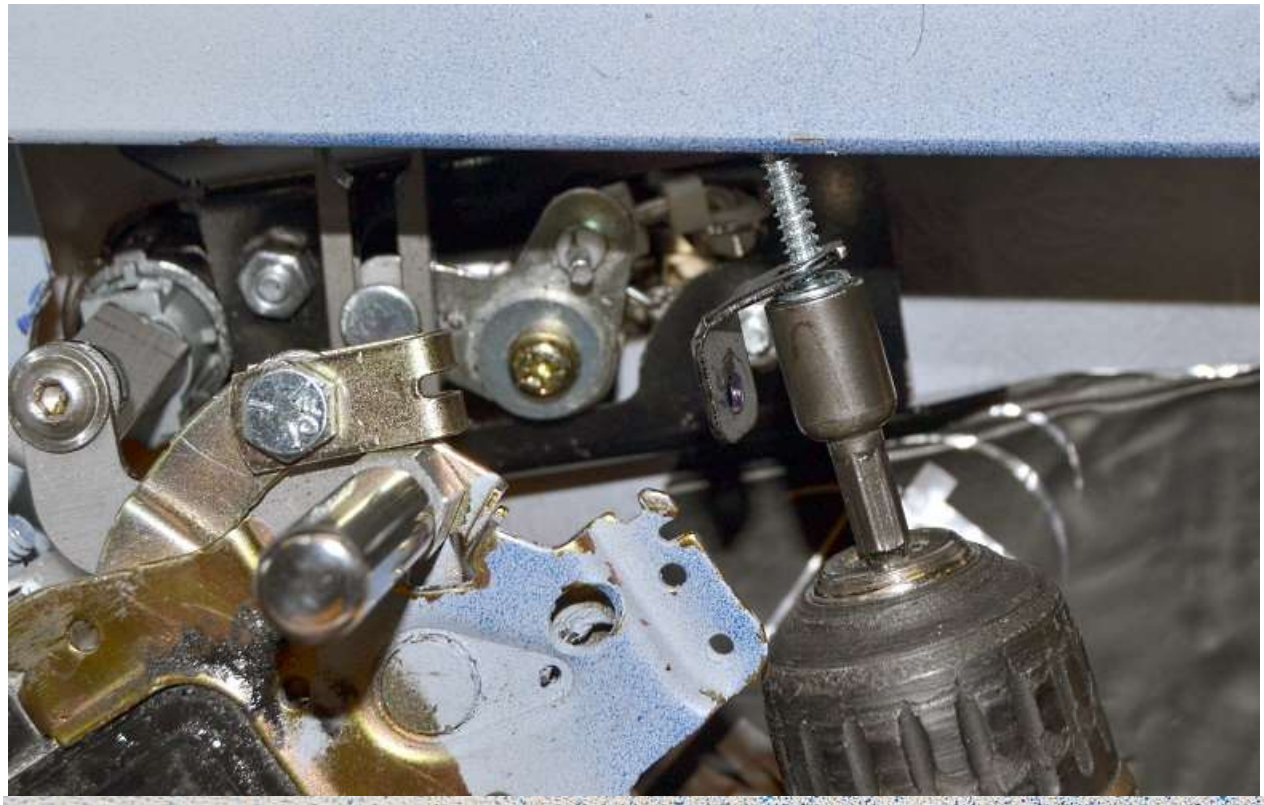
Thread on one of the ¼" jam nuts followed by the release cable mount and other ¼" jam nut onto the threaded end of the inside door handle cable. Center the parts on the threads to allow adjustment later.



Insert the ball of the cable into the clevis through the side opening and pull the cable back so that the cable is tight but is not starting to engage the opener.

Mark the underside of the tube for the mount bracket. Also note where on the tube the bracket should be so that the cable is pulling straight on the lever.

Remove the cable/bracket from the car and remove the bracket from the cable.



Attach the mount bracket to the tube using a #10 x 1” self-tapping screw. If screwing at an angle because of the lock, drill a $^{1}/_{8}$” pilot hole first to allow the screw to grab.

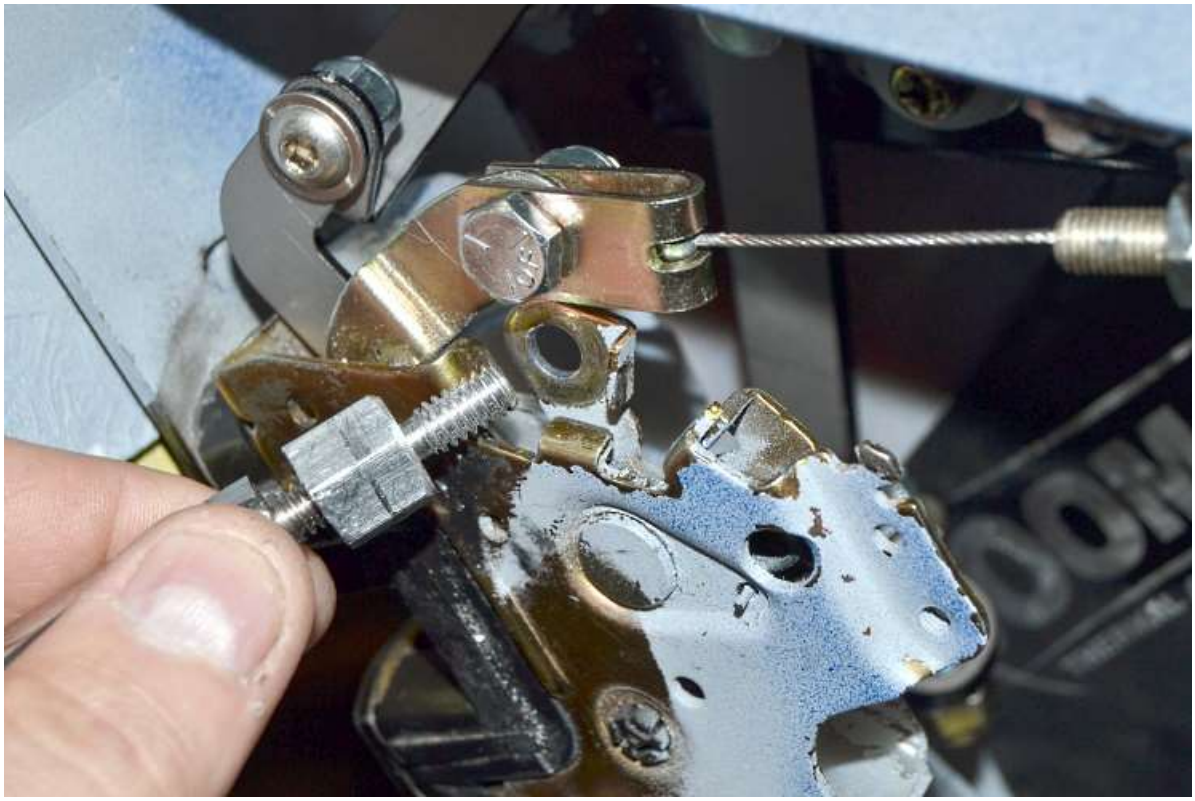
Reattach the cable end to the bracket on the frame.

Reattach the cable to the clevis.

The handle will get installed after the liner is installed.

Door Liner

- Door hinge and latch hardware, door liners, Black #8 x ¾" oval head screws, black countersunk washers.
- Drill, 1/8", 3/16", ¼", 25/64" drill bits, Philips head screwdriver, marker, ruler/square, saw, M2.5 hex key, rivnut tool.



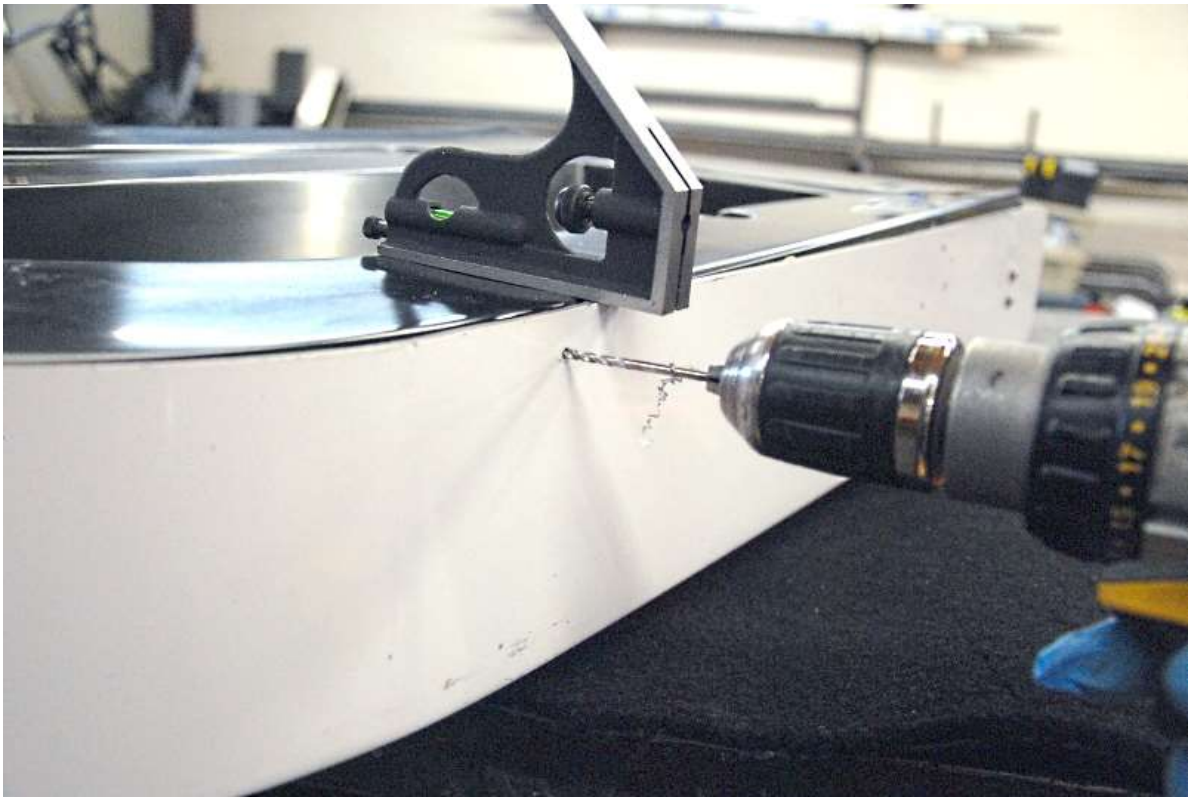
If building a coupe, remove the inside door lock lever.

Place door liner on door with bottom flange inside outer shell.

If the top flange does not sit down on the top of the door, use a heat gun or hot air dryer to bend the liner over more.

Either the liner or the door skin will need to get sliced so that the door liner can make the transition from the outside of the panel to the inside.

Trim front of door liner to the front aluminum.



Set the door liner height so that it is flush with outer shell then drill $^{1}/_{8}$ inch holes through the outer shell and the liner for #8 black oval head screws and countersunk washers around the bottom and back of the door. Pull the liner out then drill oversized $^{3}/_{16}$ inch holes in outer shell so the screws pass through outer shell easily.

Install screws and countersunk washers.

Mark and cut a notch for the door striker.

Mark the top of the door where the door liner ends.
Remove the door liner.
Reattach the door to the chassis.

Side mirrors

🚘 OEM side mirrors, side mirror components, M5 x 12mm Black Philips pan head screws.
🛠 Philips head screwdriver, $^{7}/_{16}$" wrench

Unpack the side view mirror mounts. We usually spray these with semi-gloss black paint.

Attach the rear view mirrors to the mounting brackets using the provided black Philips head screws.

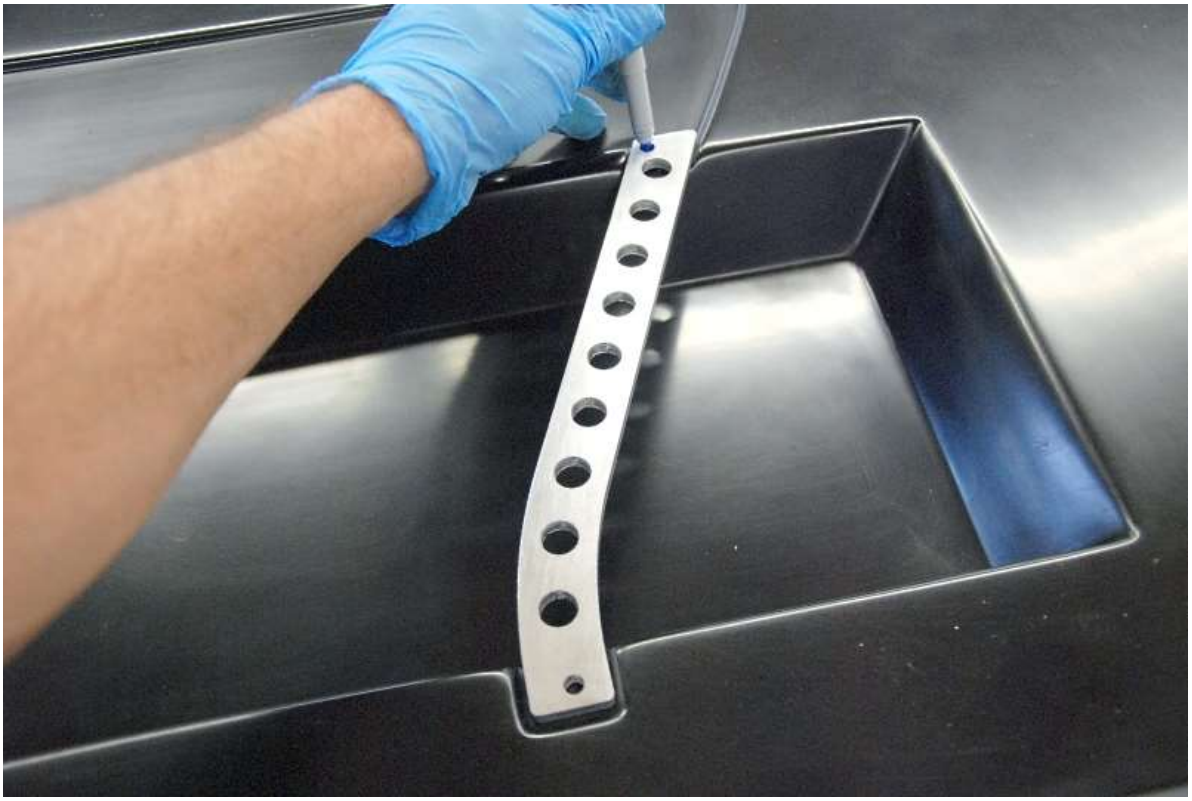
Fit the mirrors to the doors making sure to check the clearance on the windshield surround.

Mount the side view mirror bracket to the door using the two top existing black ¼” x 1” mounting screws that hold the door frame to the door.

If necessary, trim the top door liner flange to the side view mirror bracket.

Door pulls

- M6 x 20mm button head screws, M6 locknuts, ¼”x 2” round head Philips head screws.



Mark and drill one ¼ inch hole at each end of the door pull to mount them.

Install one M6 x 20mm button head nut and bolt.

Use the door pull as drill template to drill the remaining holes.
Install the remaining M6 nuts and bolts.

Drill 1/8" mounting screw holes along the top flange.

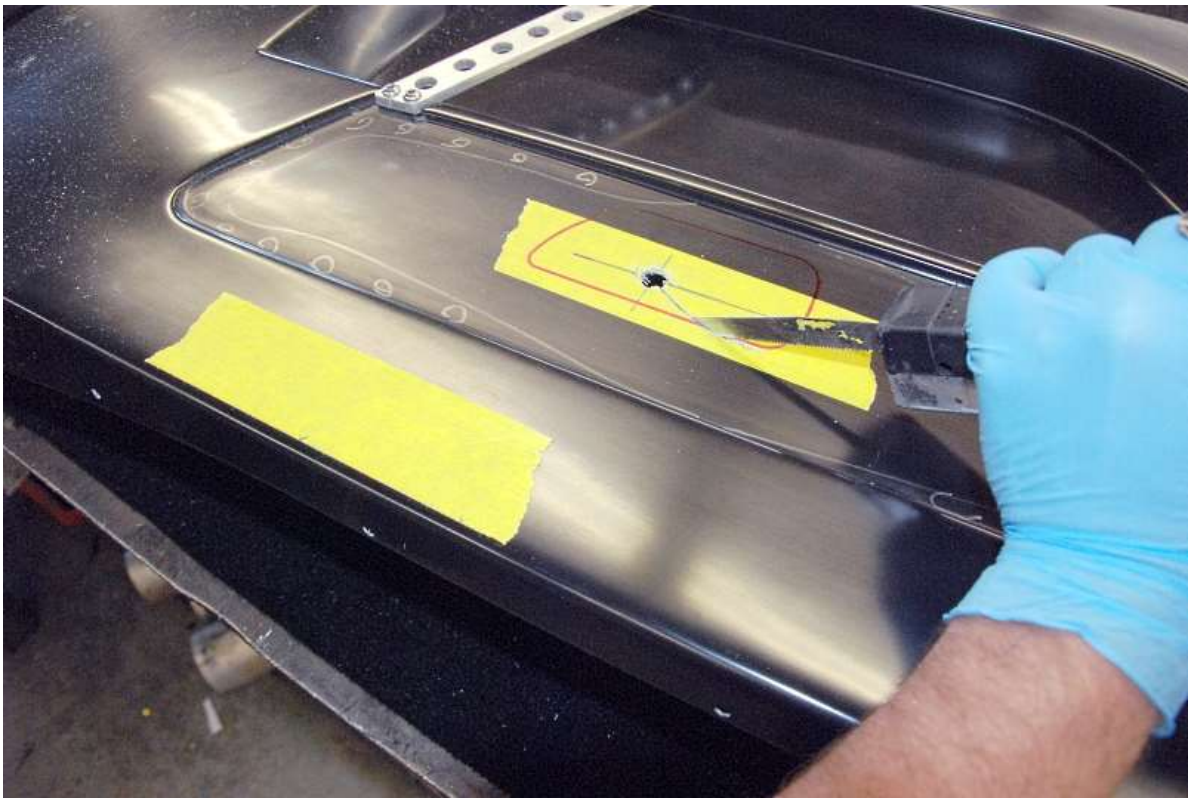
If desired install oval head screws and countersunk washers all along the top flange. If not, Put one at each end of the top flange.

- There are two ways the door handle can get mounted, with the included aluminum inlay or without depending on the look you are going for with the car.
- If you are not going to use the aluminum inlay the handle can be located anywhere as long as the latch linkage reaches.

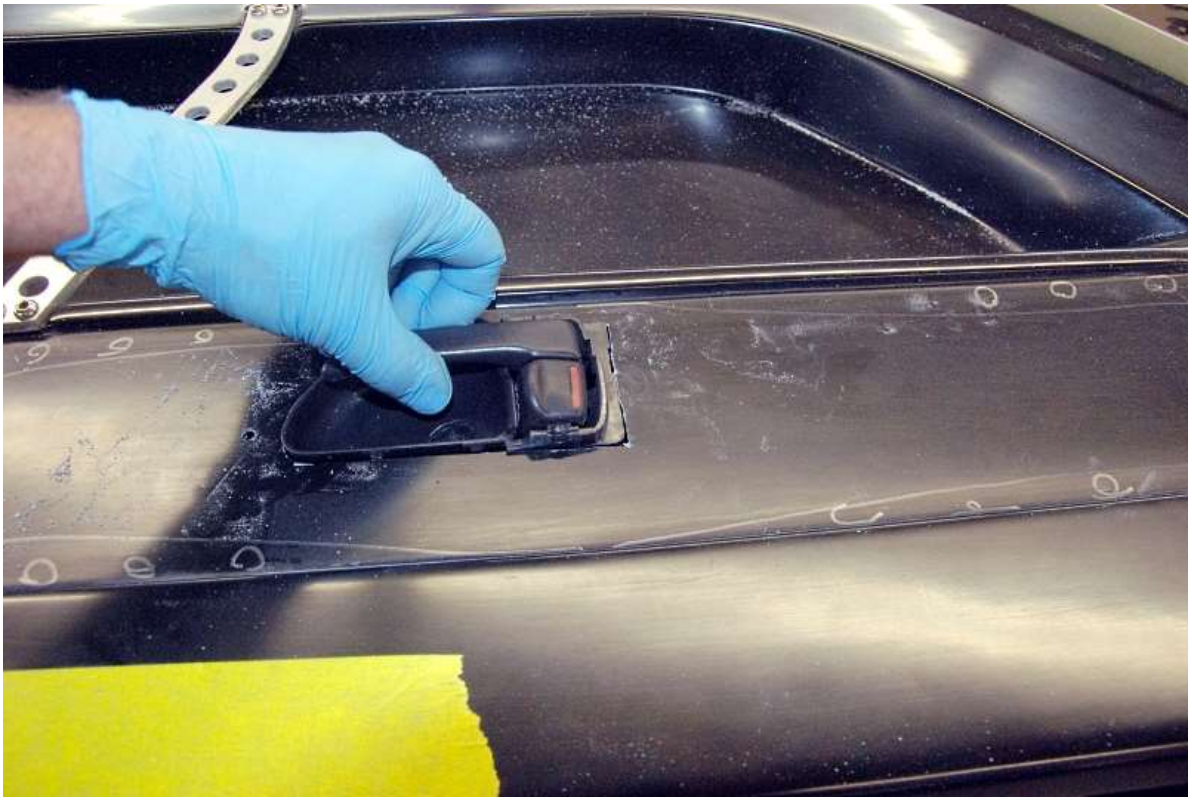
Inside door handles (Street)

- If building a coupe and using the side windows the inside door handles included with the Coupe must be used. Skip to the next section for Coupe door handles.

Place the aluminum inlay on the door liner and trace the door handle cut out.



Use a saw to cut to the outside of the marker on the door liner.

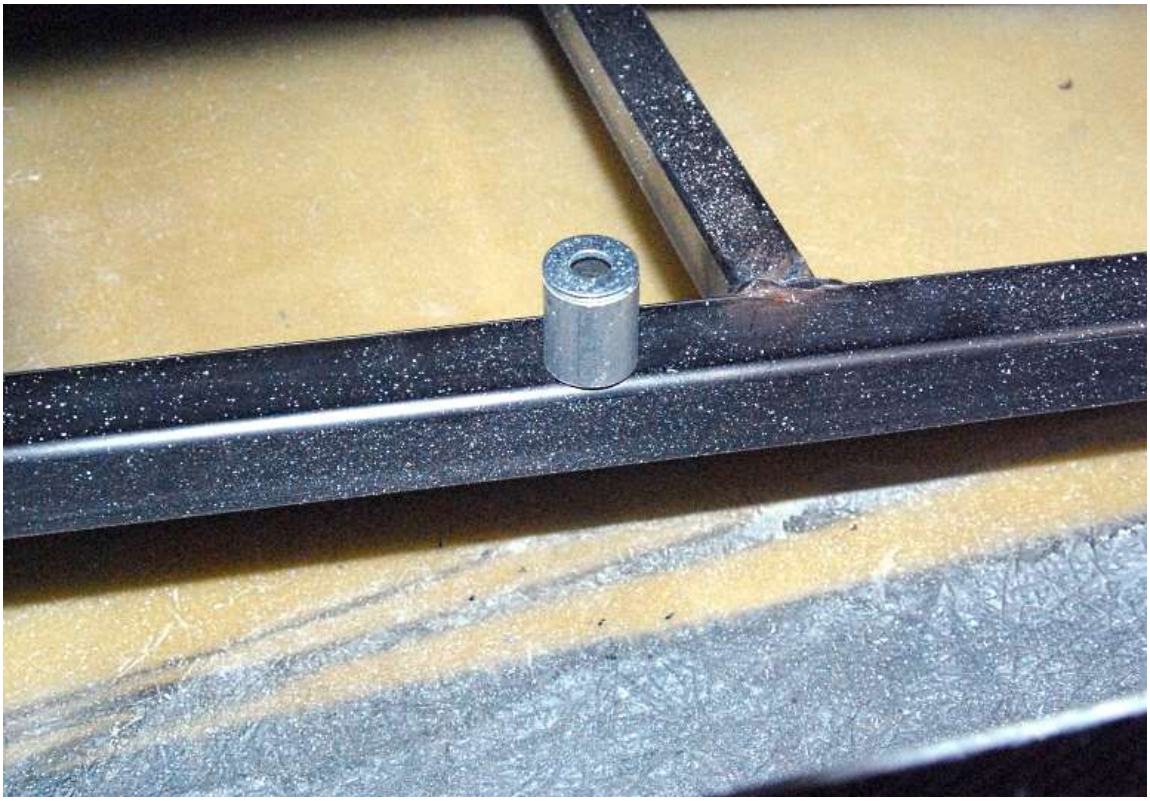


Make sure the door handle fits with room for bezel.

Place the door handle bezel in the aluminum and snap the opener to it, sandwiching the aluminum. Place the assembly on liner and mark mounting hole on door frame.

Unscrew and remove the door liner.

Drill a $^{25}/_{64}$ inch hole and install a rivnut at the point marked.



Use spacers to set the door handle to the desired height, flush with door liner.

Hook the latch linkage to door handle.

Install the door handle and bend/cut the linkage to the correct length so the latch will actuate.

Re-install the door liner with the door handle bezel to check for fitment attaching them with the ¼ inch x 2.00 inch round Philips head screws.
Remove liner, inlay and bezel.
Remount the door assembly to car and set the gaps.
Remount liner assembly to door.

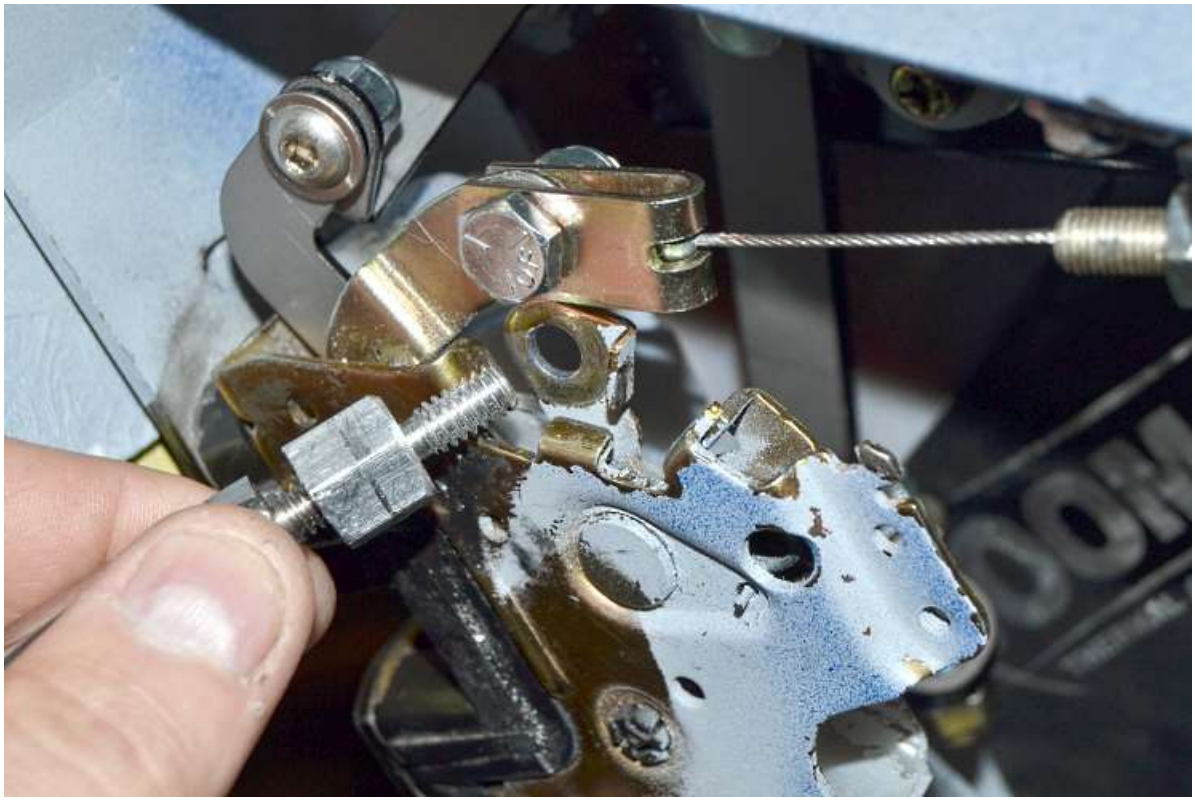
Back off the screws along the bottom of the liner and install the edge guard weather stripping along the bottom and back edge of door skin to door liner seam.

Completed door without aluminum inlay.

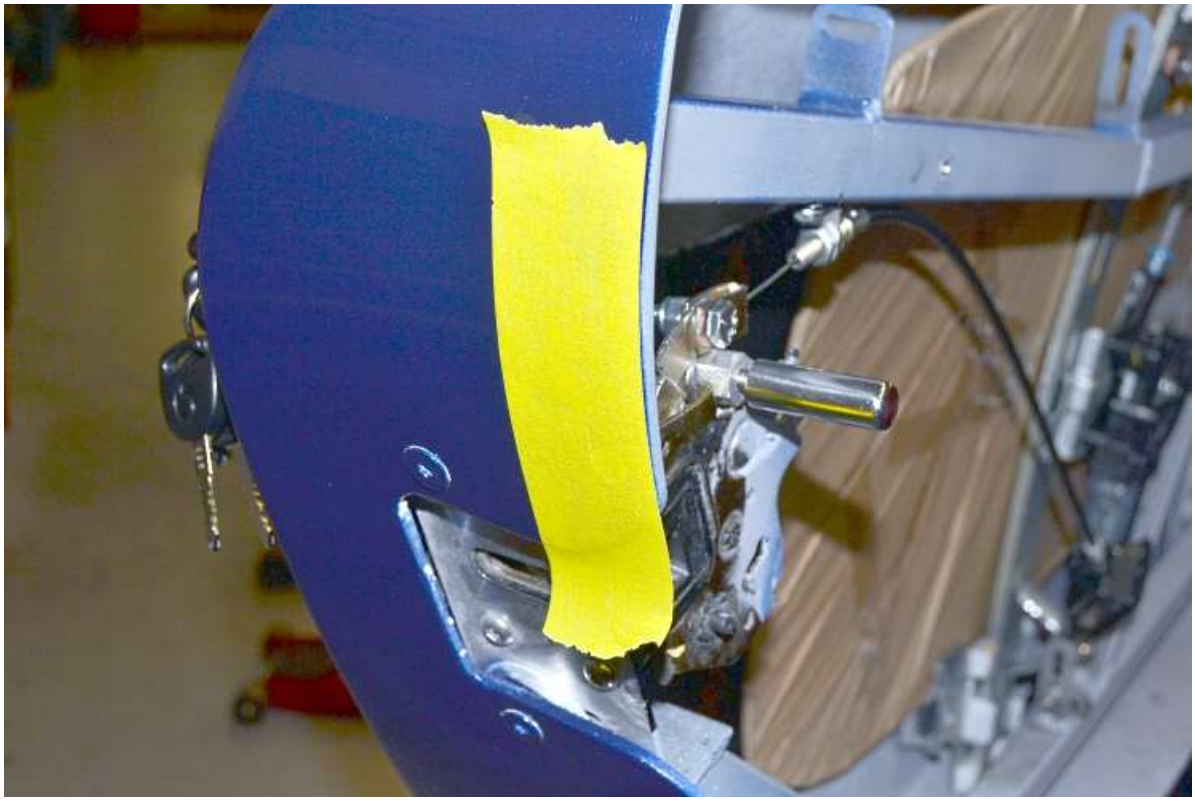
Coupe inside door handles and lock lever.

Masking tape, marker, tape measure, drill, paper pen

Unscrew and remove the door liner.



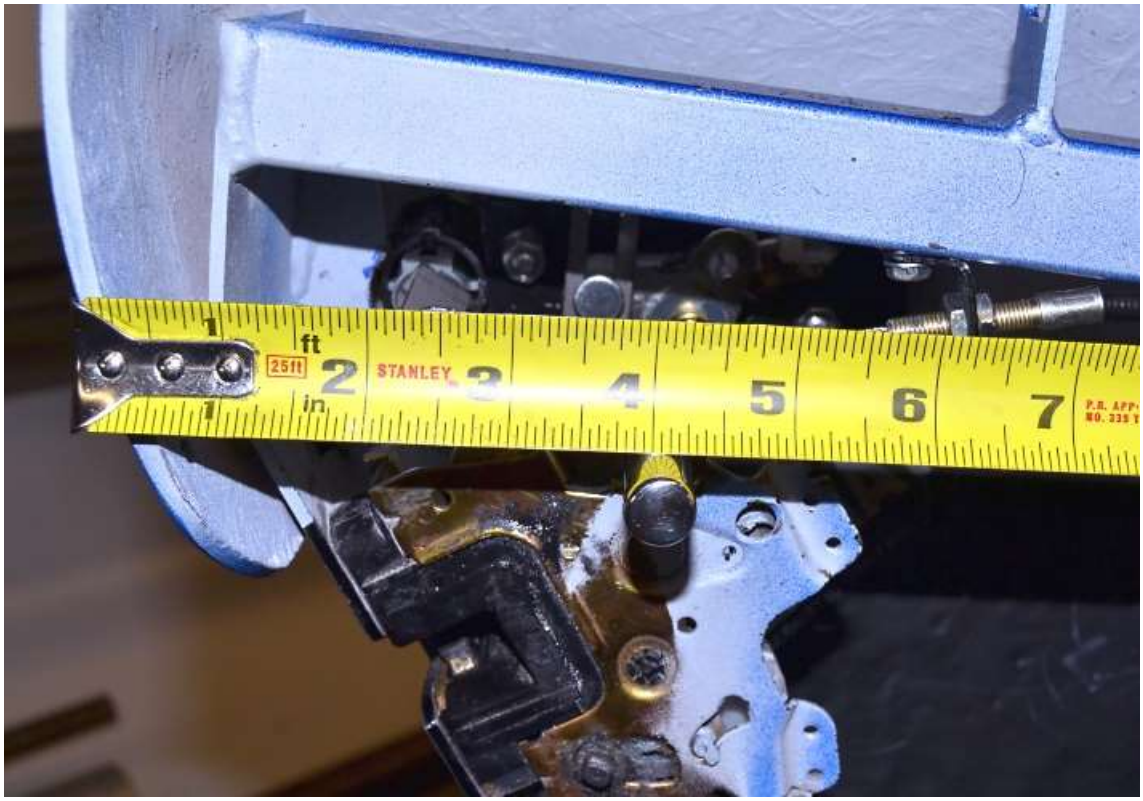
Reattach the inner door lock lever temporarily.

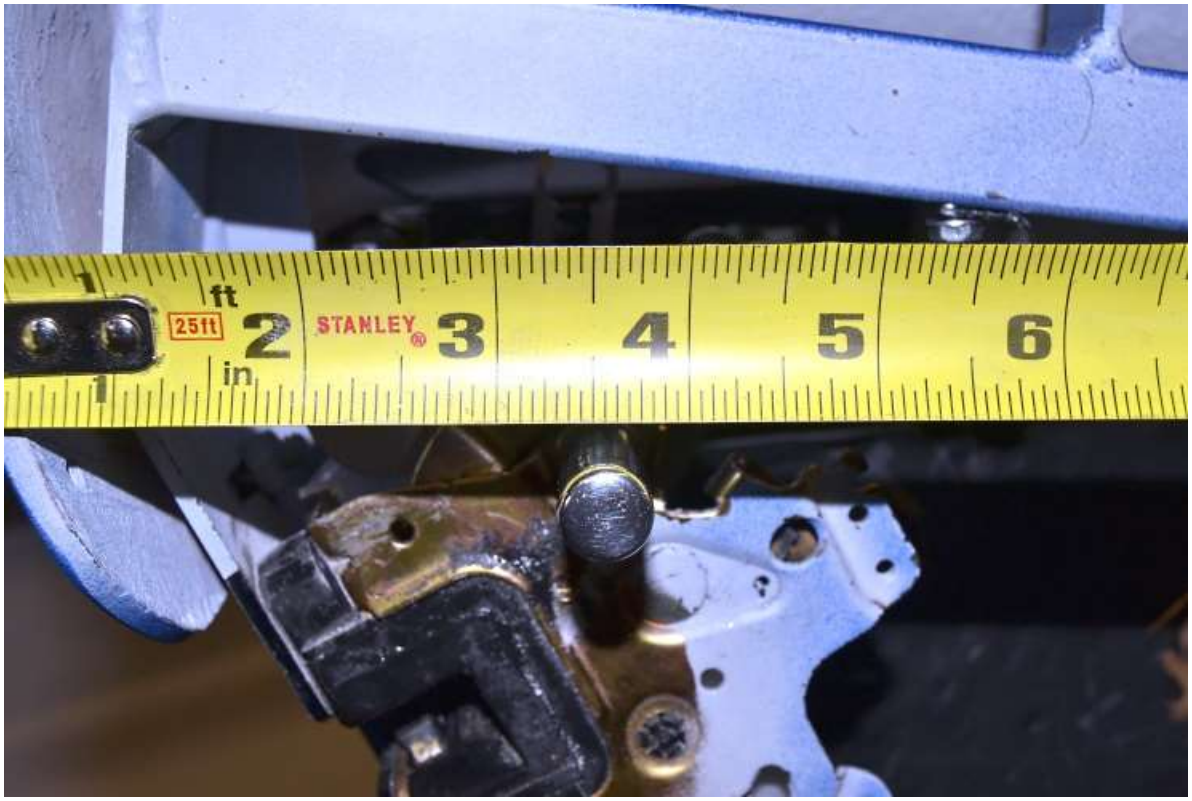


Put masking tape above the door latch on the back of the door.

From the back of the door, put the tape measure on top of the lock lever and to the front of the door so the bottom of the tape measure is at the bottom of the top door tube where the inside door handle will reach to.

Mark the back of the door on top of the tape measure.

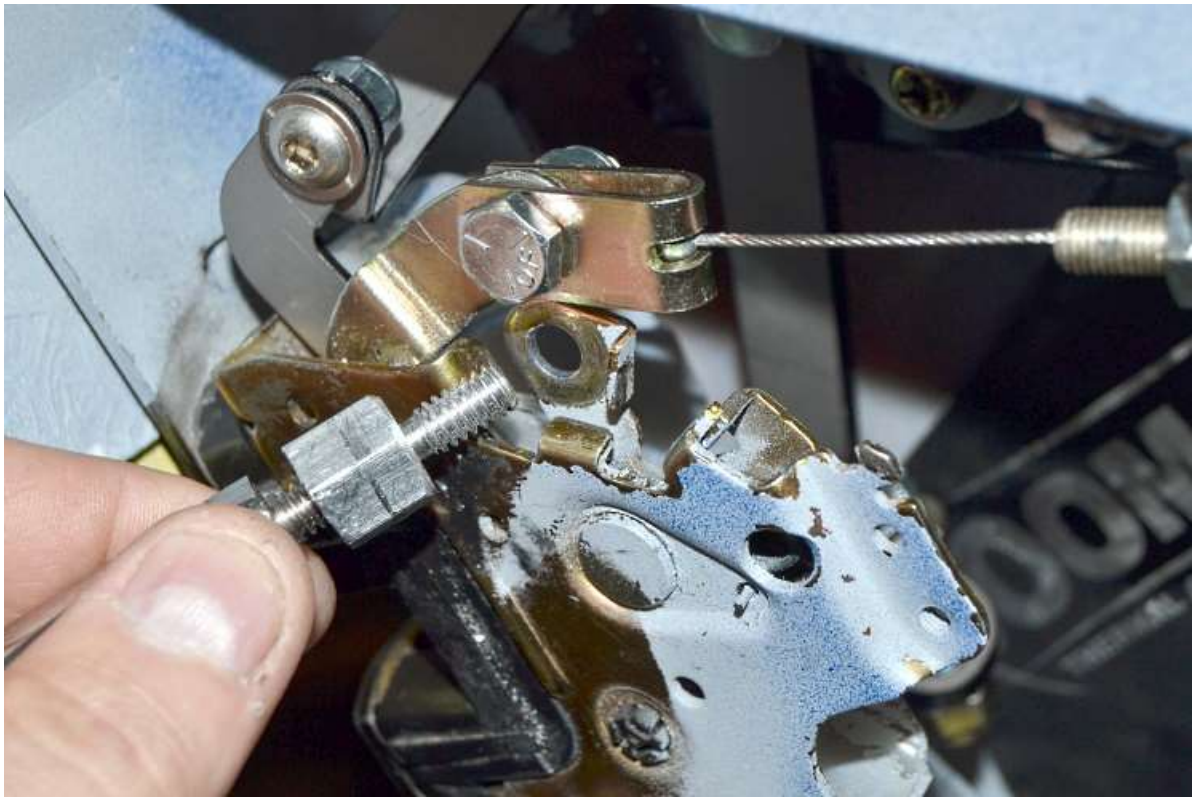




Write down the locked and unlocked dimensions to the center of the lock lever.

Hold the handle up so that the top of it is even with the bottom of the top tube and write down the location of the rear bolt hole.

Measure down at the handle location and write down the height down to the top of the latch. Put a piece of masking tape on top of the door at the tape location and mark the tape end.



Remove the door lock lever.

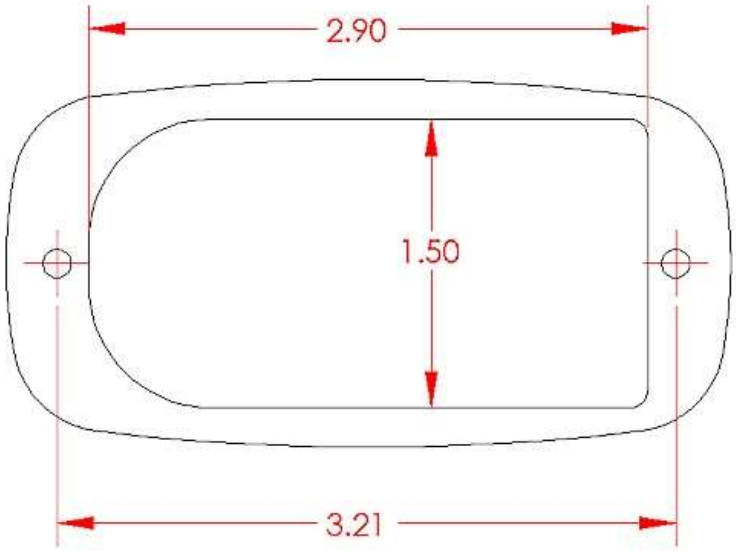
Put the door liner back on the door and put the rear screws in to make sure the liner is in the correct position then put tape in the rough locations of the lock lever and handle.

Mark the locations of the lock lever.

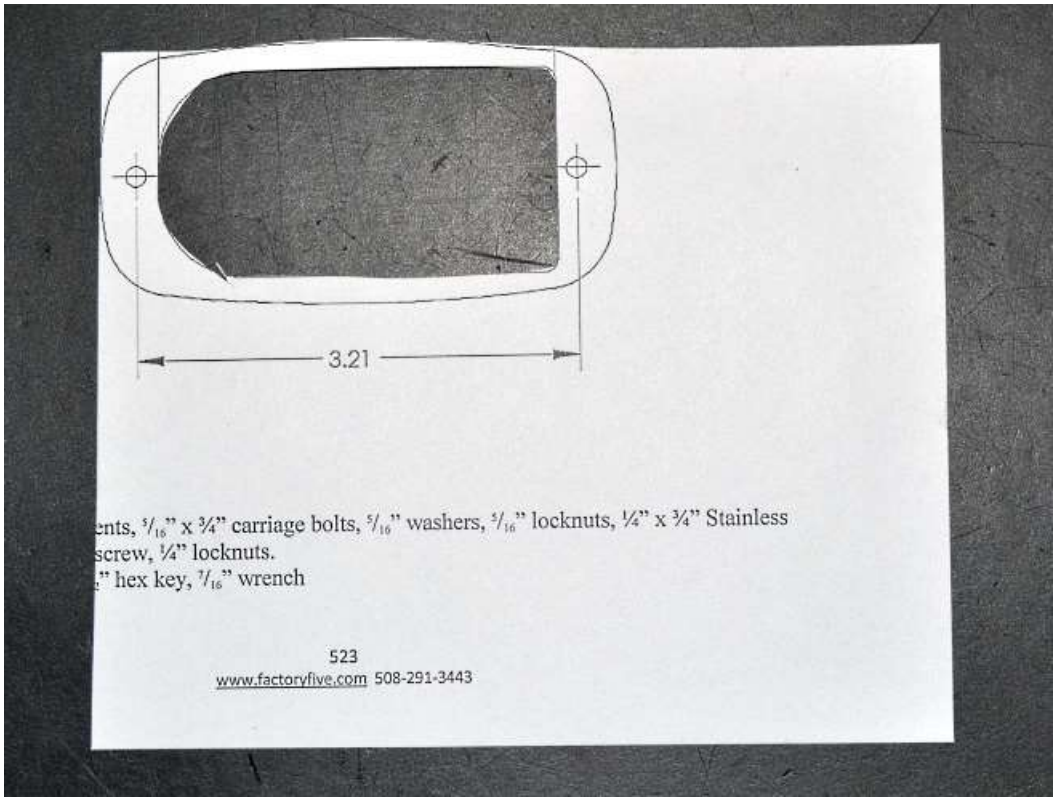
Mark the location of the door handle hole.

On top of the door in the rough location of the door handle measure the height of the liner without any screws in the area, the natural door skin location.

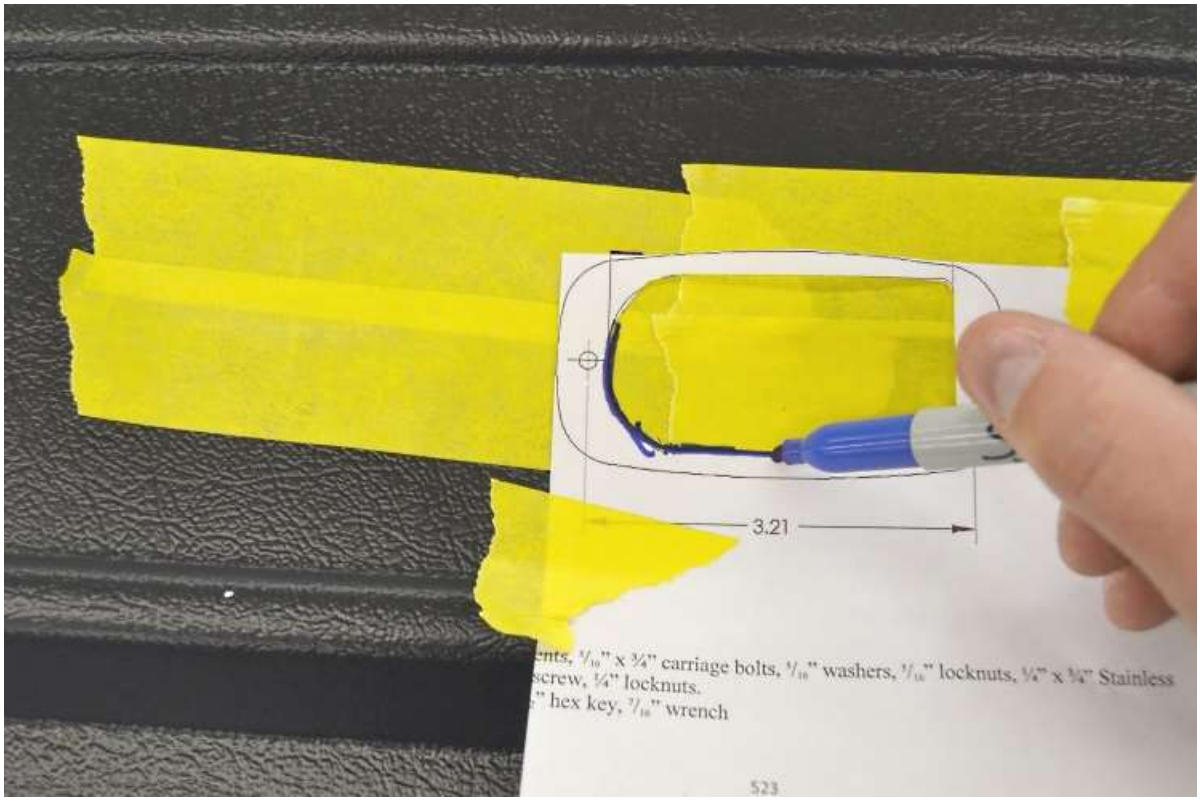
Add the height of the liner to the height measured before then measure down and mark the liner.



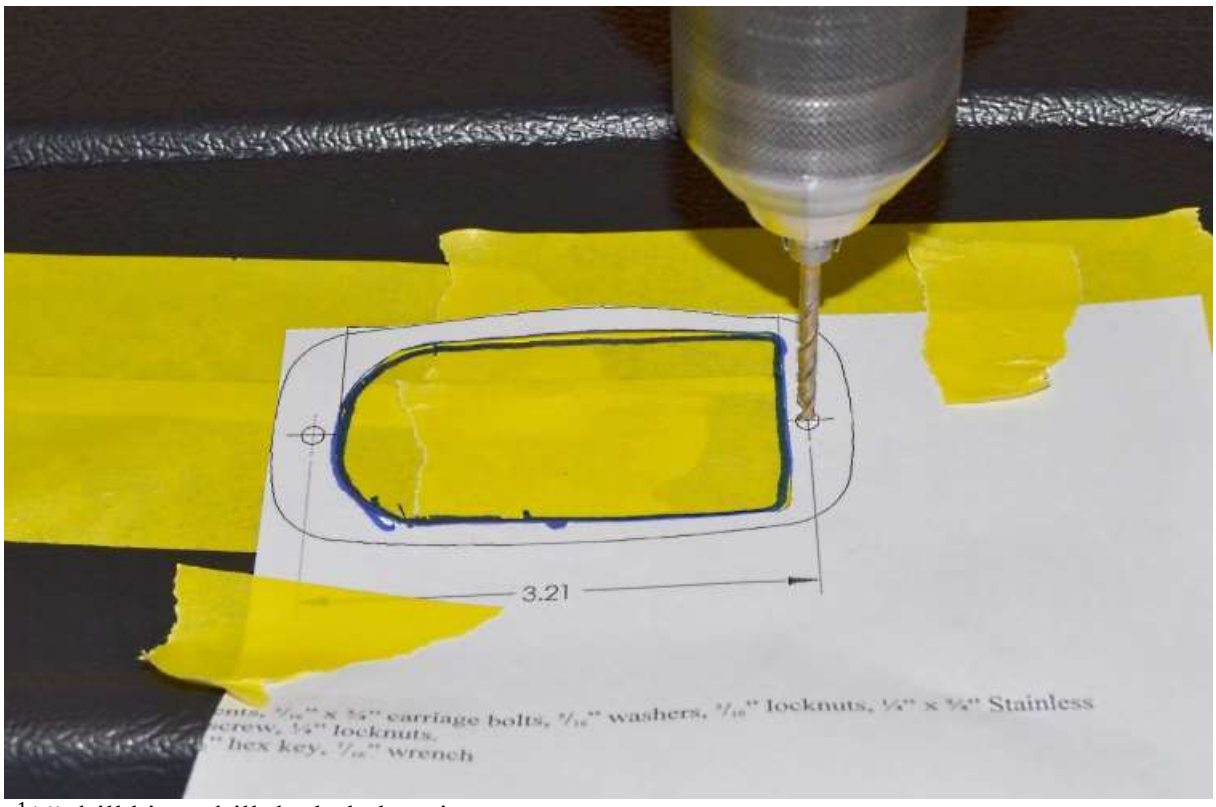
Photocopy the template above.



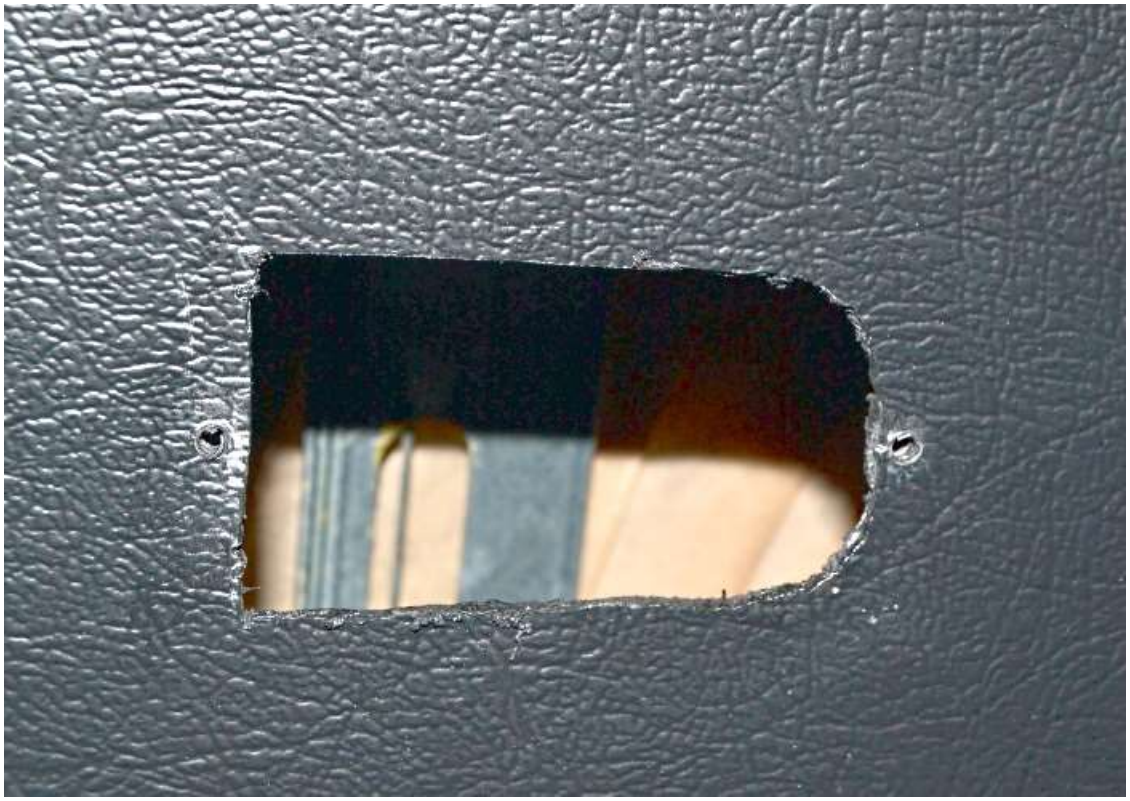
Roughly cut the outside bottom and right sides. Cut the left, top and inside close to the lines so they can line up with the marks made earlier on the liner.



Locate the template using the vertically made mark and align the mounting hole with the back to hole measurement. If unsure about the front to back location move the template and cutout backwards, the cable can bend shorter but cannot stretch longer. Tape the template in place and mark the inside of the template.

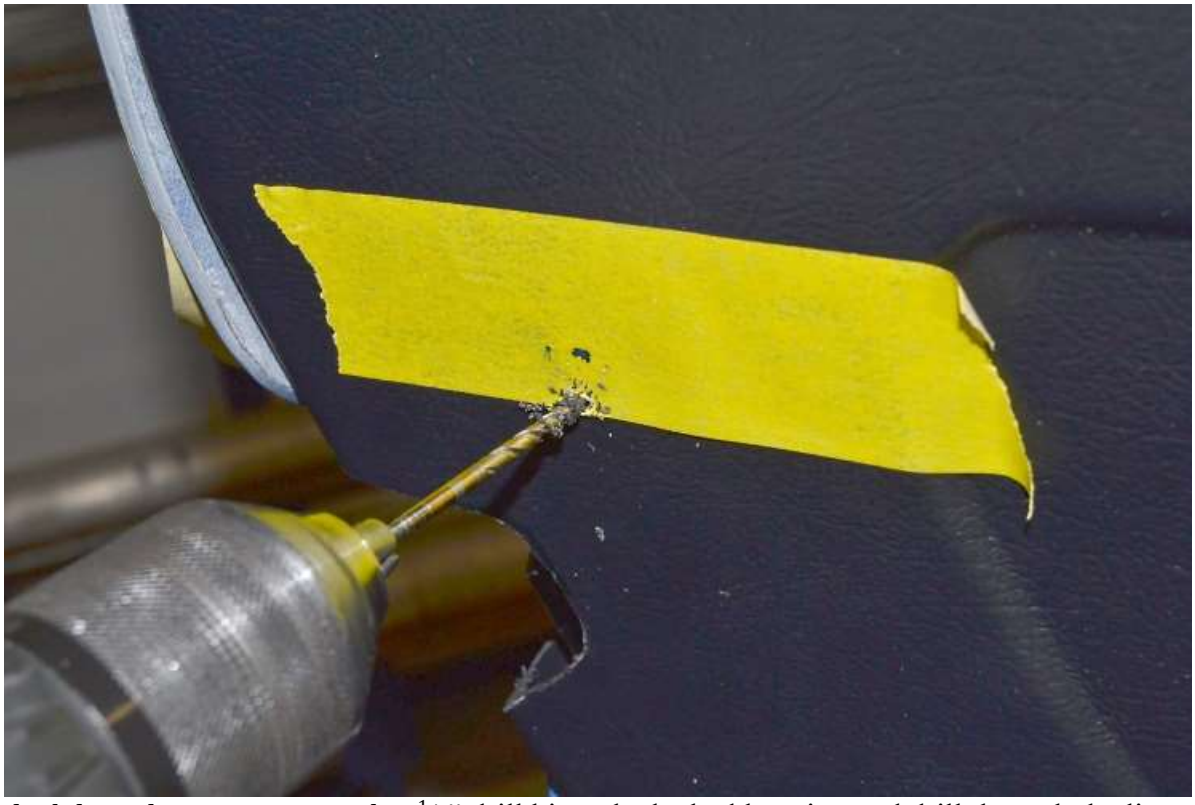


Use a $^{1}/_{8}$" drill bit to drill the hole locations.



Use a jig saw or similar to cut out the inside area.

Put the lock lever in the locked (back) position then attach the liner to the back of the door to do the lock lever slot.



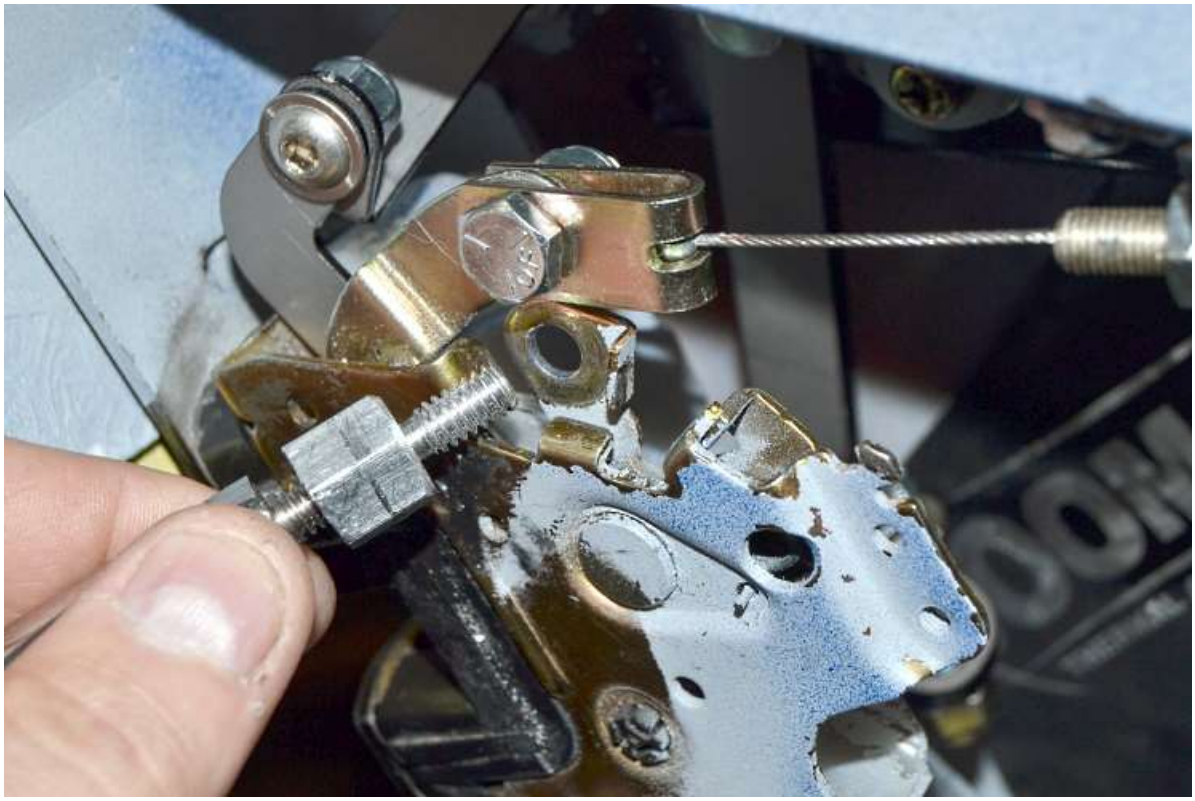
At the lock lever location, start with a $^{1}/_{8}$" drill bit at the locked location and drill through the liner and try to see if the drill will go through the lock lever straight. Drill another hole if necessary.

Use a ¼” drill bit to enlarge the hole made and run the drill bit through the lock lever.

With the ¼” drill bit going through the lock lever, use the drill bit as a router and push the drill in the direction the lock lever will go so that it removes the plastic. Make sure to keep the drill straight.

Enlarge one end of the slot with a ½" drill bit.

Use a ½" grinding bit to make the slot ½" wide everywhere. Do not use a ½" drill bit, it doesn't work well.

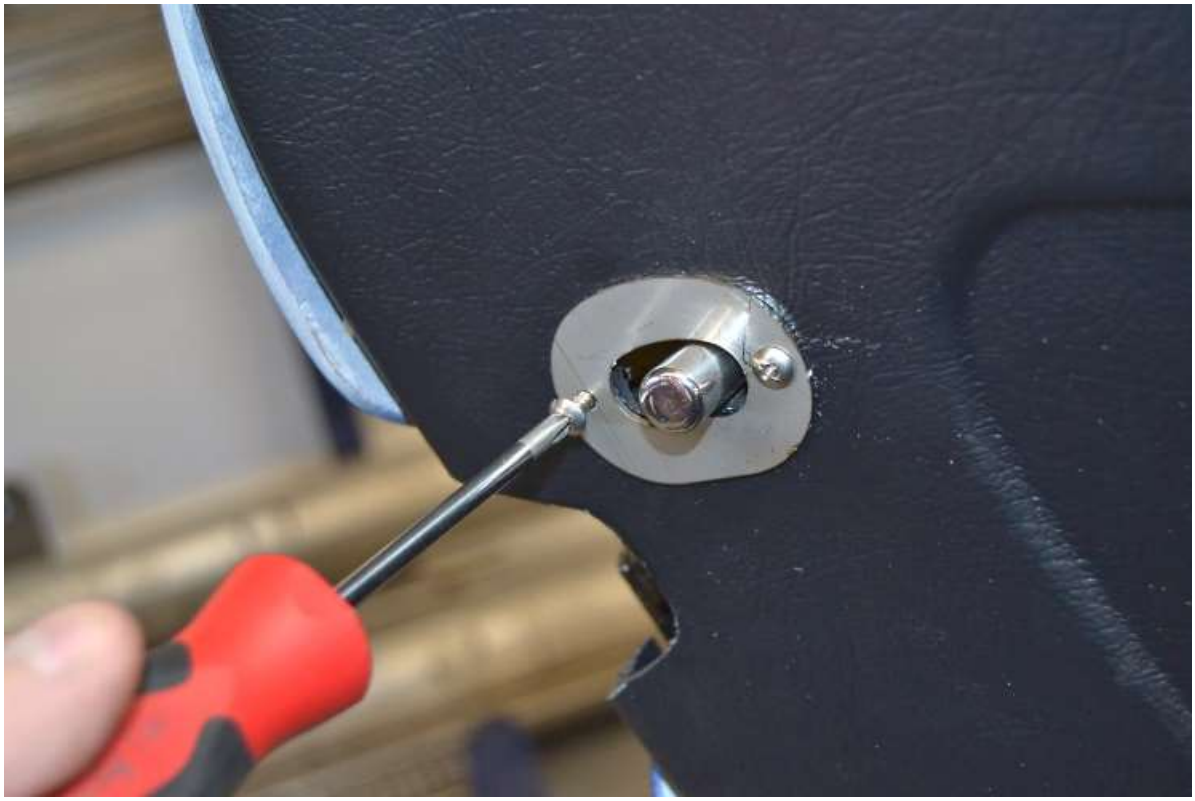


Remove the liner and reattach the lock release lever.

Test fit the liner over the lock release lever. Remove the liner and grind more as needed.

Test fit the lever cover plate. Mark and drill the mounting holes using a $^{7}/_{64}$" drill bit.

Mark and remove any "extra" material that you can see inside the cover hole.



Screw the cover plate to the door liner using a Philips head screw driver and the #6 x ½" truss head screws.

Insert the handle through the hole and attach using the #8 x ¾" screws.

Repeat for the opposite door.

Hood

- 🛠 Body finish components, $^{5}/_{16}$" x ¾" carriage bolts, $^{5}/_{16}$" washers, $^{5}/_{16}$" locknuts, ¼" x ¾" Stainless flanged button head screw, ¼" locknuts.
- 🛠 Drill, ¼" drill bit, $^{5}/_{32}$" hex key, $^{7}/_{16}$" wrench

Install the hood pins in the front brackets hand tight and just under the surface of the fenders.

Install the rear hood pins in the brackets hand tight and just level with the surface of the fenders.

Mark the hood pins with anti-seize or silicone and set the hood in place to mark the pin locations. Push down on the corners to get the pin to leave a dab of the marking material on the bottom surface of the hood.

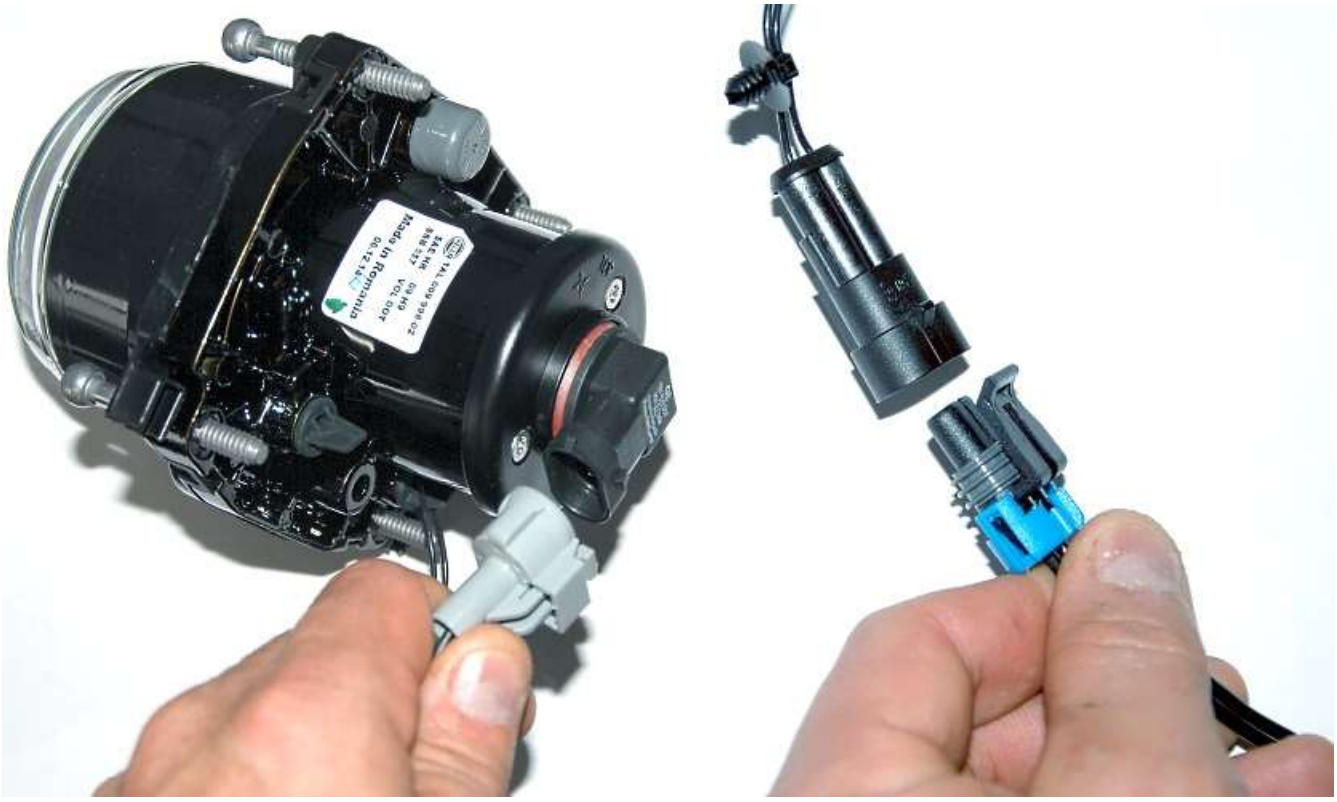
Install the hood pins and protection plates and tighten everything up tight. The hood pin retaining nuts are not locknuts so use some Loctite to keep them in place.

Headlight wiring

🚘 Headlight components, electrical components
🛠 Soldering iron, solder, electrical tape, wire stripper, wire cutter.
✋ Splice one wire at a time to avoid confusion.

Cut and attach the headlight wires from the low beam Subaru plug to the gray headlight plug.

Attach the high beam Subaru headlight wires to the smaller shutter connector plug. When the high beam lights are turned on, the shutter will change the beam pattern.



Plug the connectors into the headlight.

Turn signal/Parking light wiring

🛠 Wire stripper, soldering iron, electrical tape, blue locktite
🚘 Turn/Parking light components

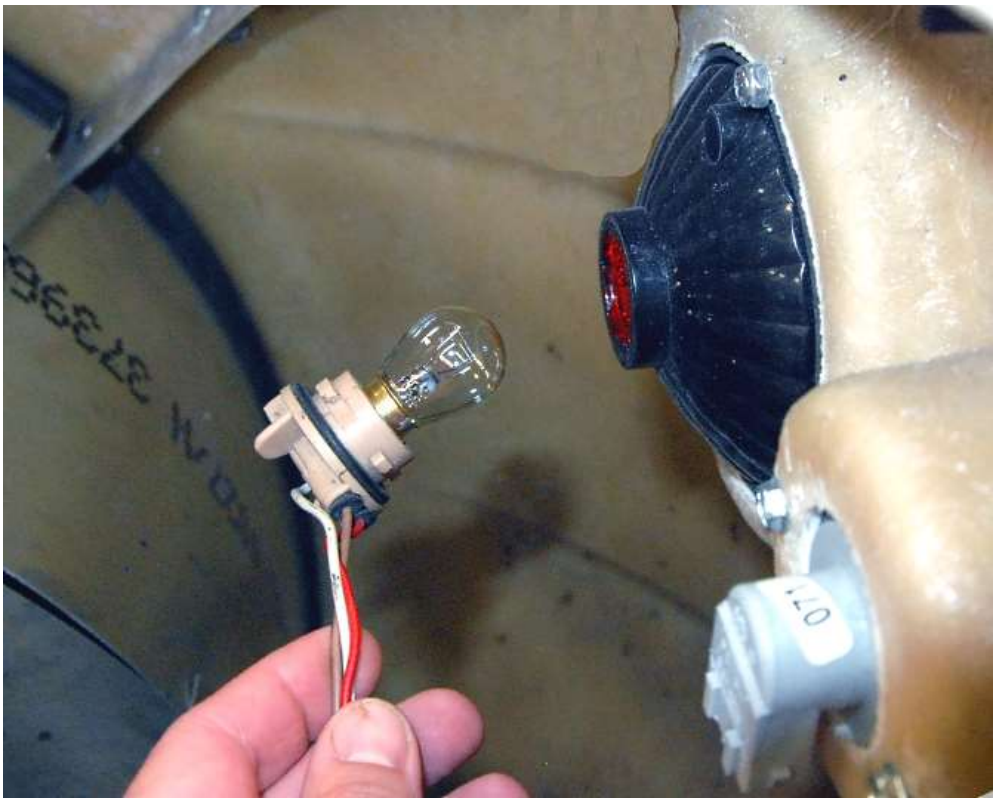
- Splice one wire at a time to avoid confusion.

There are a couple of options for wiring on the lights, direct soldering/connections to the Subaru wires like the top picture or use a trailer plug like the lower picture which would allow removal of the fender without wire cutting if desired.

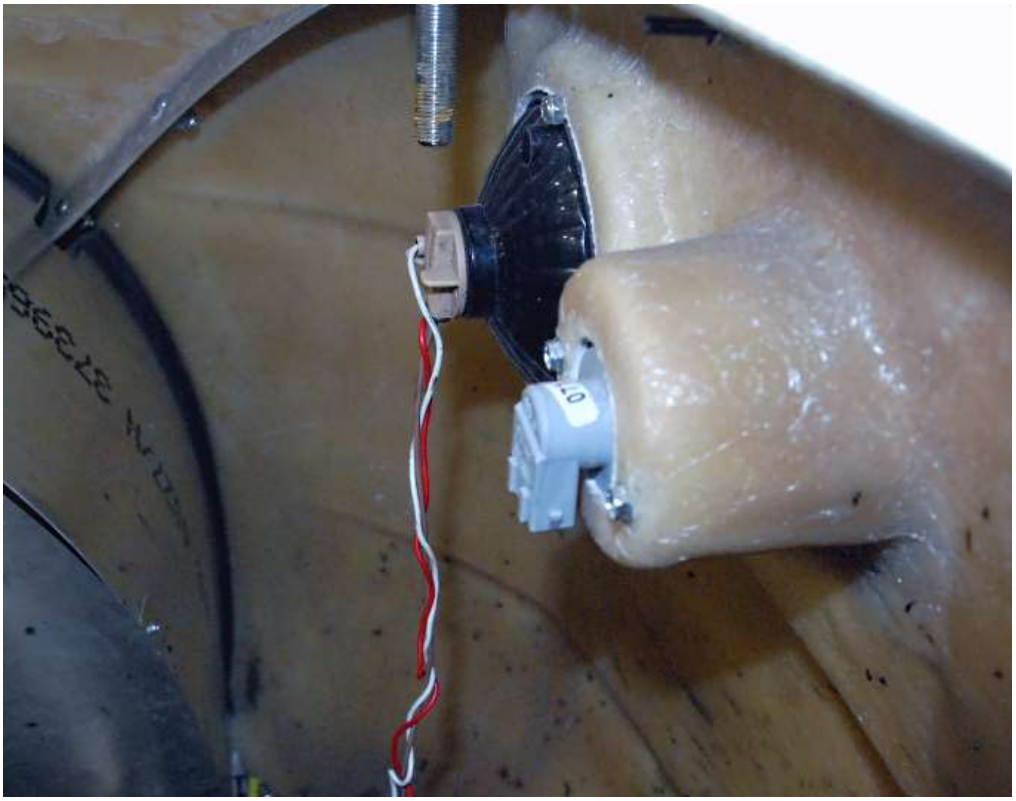
Solder all of the ground wires from the lights together then connect to a Subaru ground wire.
For the parking lights, solder all of the positive wires together then connect to the Subaru parking light wire.
Connect the turn signal positive wire to the Subaru turn signal light wire.

Taillights

- Taillight components
- Soldering iron, solder, electrical tape, wire stripper, wire cutter.
- Splice one wire at a time to avoid confusion.
- Check the location of each wire within the plug by touching the wires to the bulb plugged into the socket.
- The large light does the brake and running lights. The small light does the turn signal and reverse lights.



From the main light plug, cut the Subaru taillight and reverse plugs off and splice in the lights provided in the kit.



Insert bulbs, twist to lock.

With all the wires in place, wrap and secure all wires clear of any moving parts.

Dash close-off aluminum

- Packaged aluminum, body finish components

🛠 Tin snips, drill, 1/8" drill bit rivet tool, silicone

Push bulb seal weather-strip onto the curved edge of the dash close-off panel. Apply silicone to the bottom of the bent mounting flange.

Push the bulb seal against the windshield surround with the bent flange on top of the 1.50 inch tube. Use a few of the mounted aluminum sheet metal screws to hold the panel in place.

Drill and rivet the panel in place.

Carpet

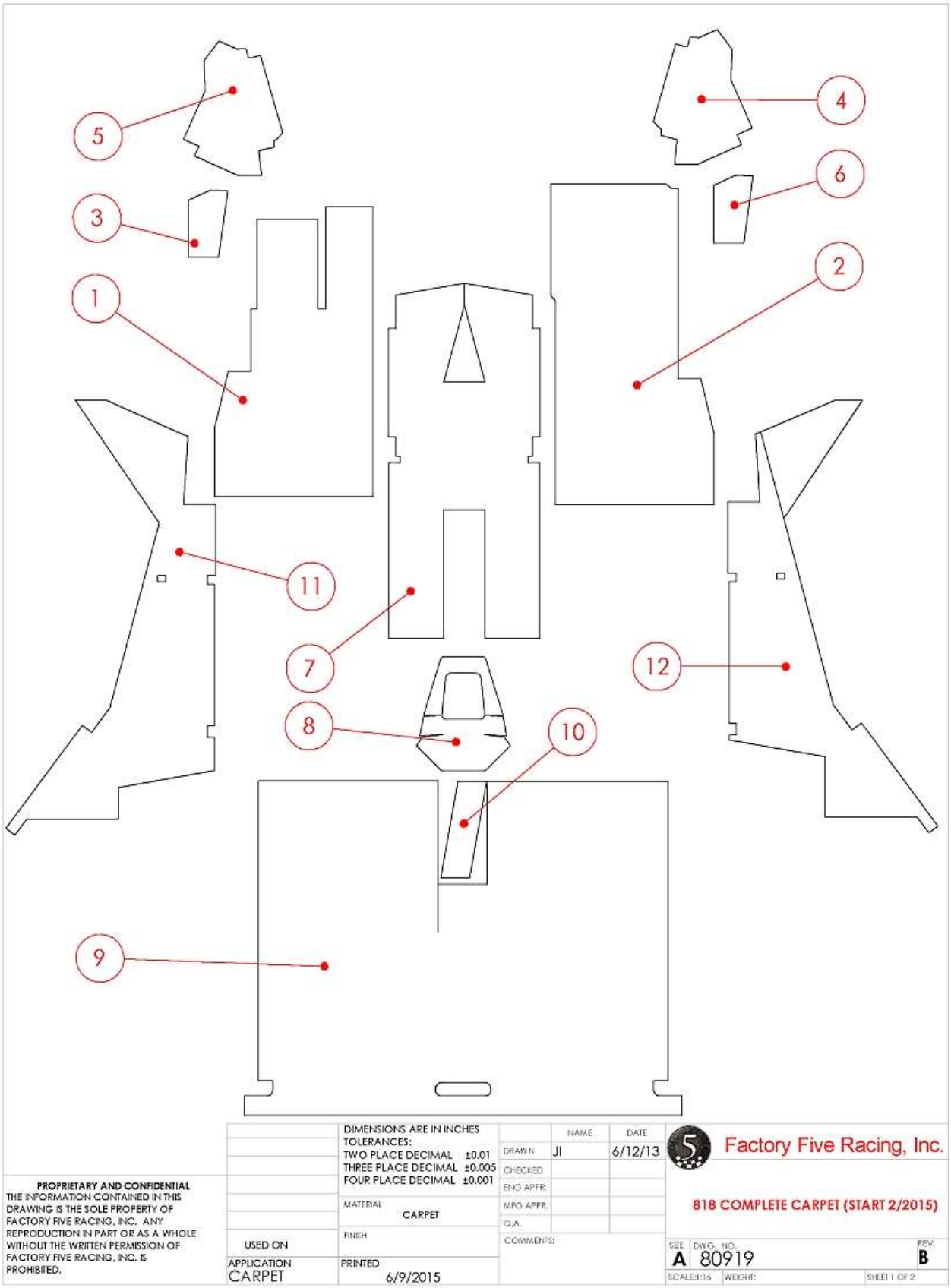
- Silicone, caulking gun, spray glue, brake cleaner or acetone.
- Carpet components
- The adhesive used to hold the carpet down is 3M® Super77™ or Super90™ work best.
- Factory Five also has a complete carpet set available that would cover the whole inside of the cockpit.

Wipe down the bare aluminum with acetone or brake cleaner for good adhesion.

Double check the aluminum edges and corners for any areas that look like they are not sealed. Run a small bead of silicone in these corners and seams.

Test fit the carpet squares in the footbox area. Trim if necessary.
Spray the adhesive to both the carpet and floor for maximum adhesion, wait a minute or so then press the carpet into the floor areas.

Optional Carpet set



See ID list on next page.

	80919	**818 COMPLETE CARPET SET (START 2/2015)**	EA	1.00
1	80621	LEFT FLOOR/FRONT CARPET	EA	1.00
2	80735	RIGHT FLOOR/FRONT CARPET	EA	1.00
3	80626	LEFT COOLANT TUBE COVER CARPET	EA	1.00
4	80736	RIGHT COOLANT TUBE COVER CARPET	EA	1.00
5	80628	LEFT FOOT REST CARPET	EA	1.00
6	80737	RIGHT FOOT REST CARPET	EA	1.00
7	80630	TRANSMISSION TUNNEL CARPET	EA	1.00
8	80631	E-BRAKE COVER CARPET	EA	1.00
9	80748	REAR COCKPIT WALL MAIN CARPET	EA	1.00
10	80749	REAR COCKPIT WALL SIDE CARPET	EA	1.00
11	80750	LEFT SIDE COCKPIT CARPET	EA	1.00
12	80751	RIGHT SIDE COCKPIT CARPET	EA	1.00

Dash

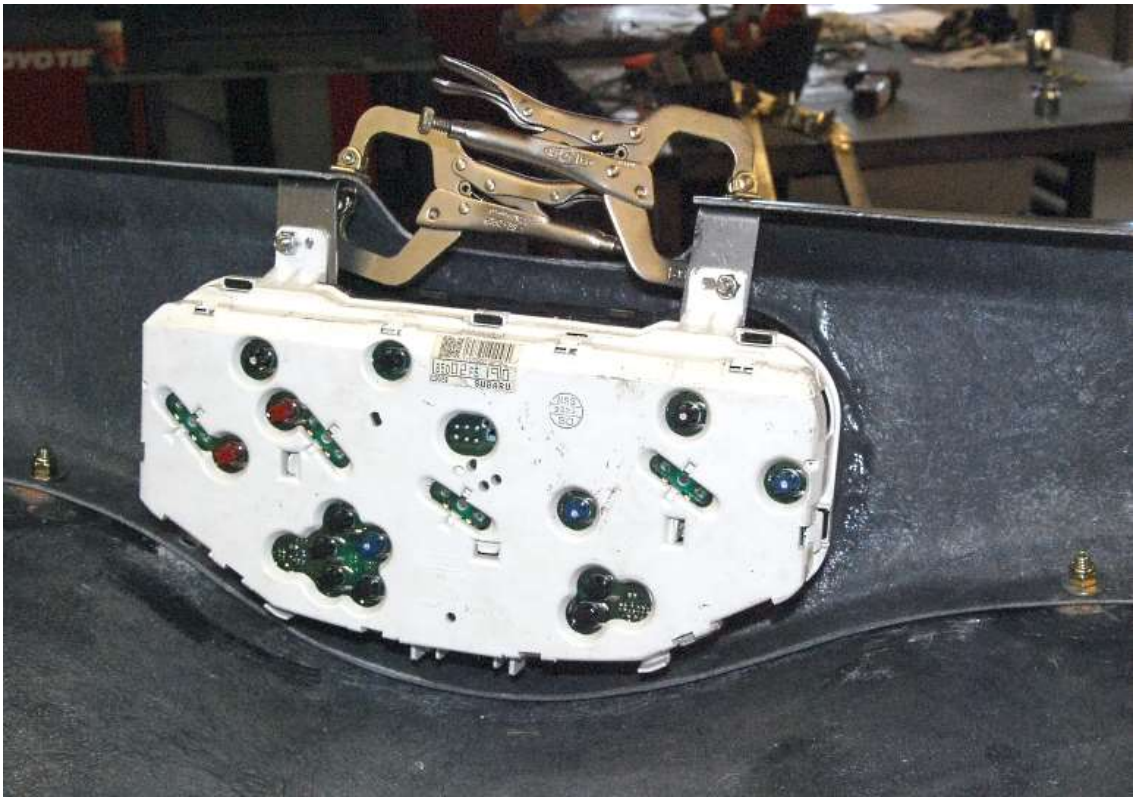
🚘 Body finish components, center console.
🛠 Drill, $^{3}/_{16}$" drill bit, rivet tool

Gauge pod

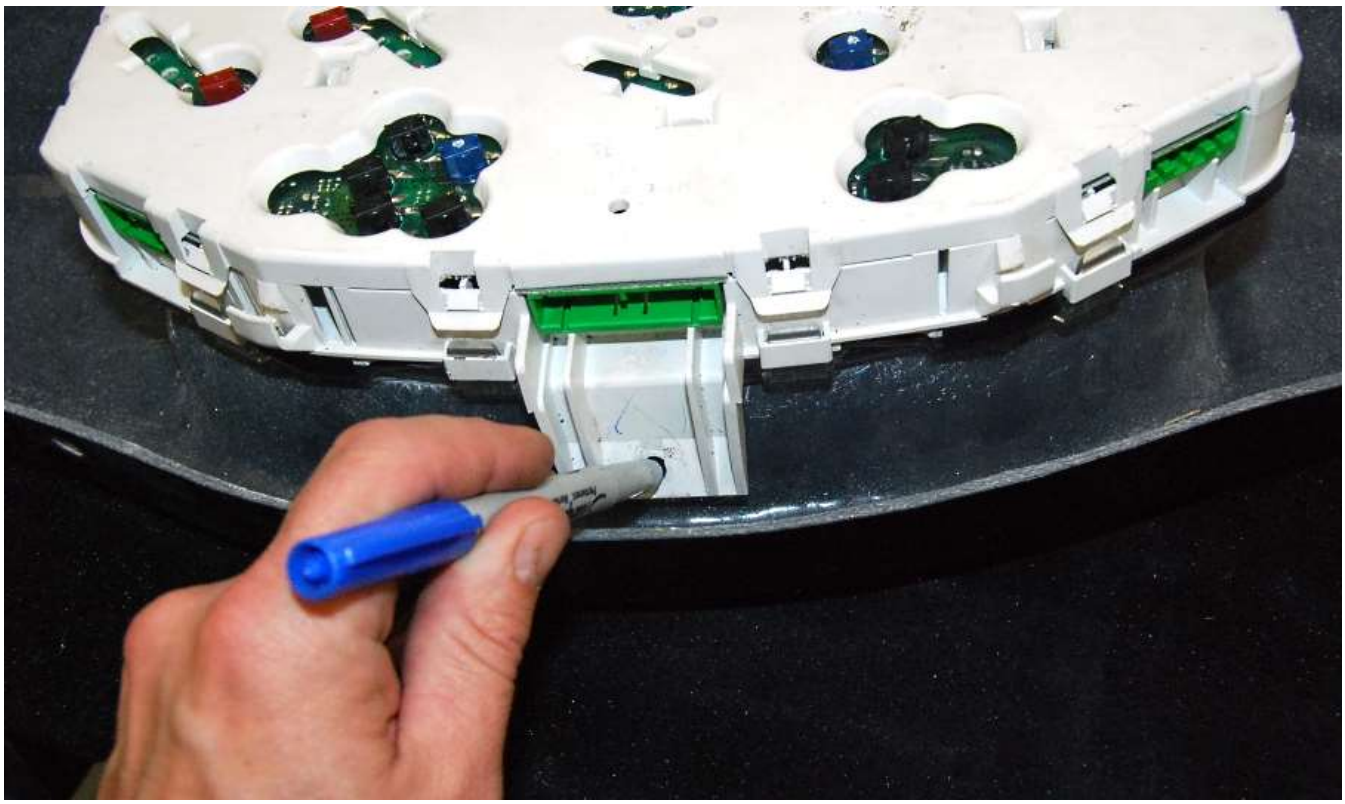
🚘 OEM gauge pod, body finish components (box 4), ¼" x 0.75" flanged button head screws and locknuts
🛠 $^{5}/_{32}$" hex key, ½" wrench, drill, ¼" drill bit, marker

Locate the aluminum brackets in the packaged aluminum, ¼ inch U nut in the body finish components and ¼” x 0.75” flanged button head screws and locknuts.

Attach the two brackets to the bottom of the gauge pod as shown using the ¼” x 0.75” flanged button head screws and locknuts.

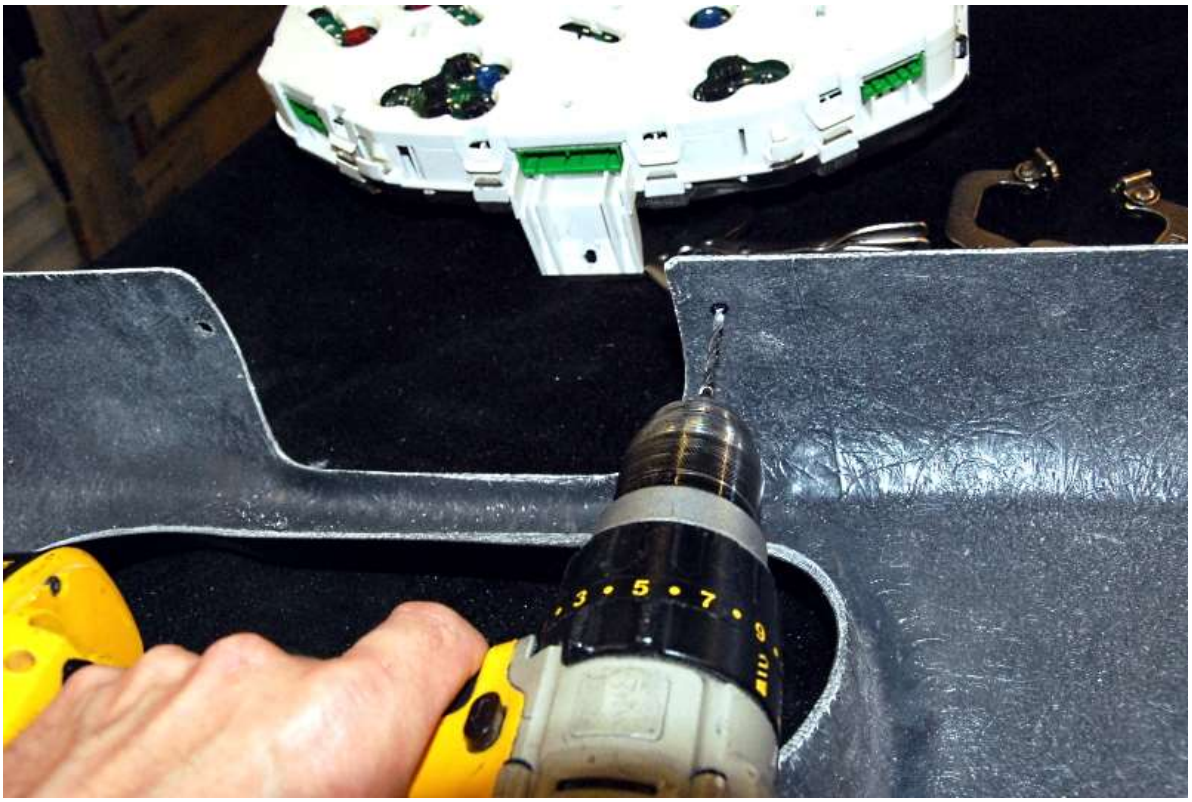


Hold the gauge pod up to the dash so that it touches the recessed area of the dash then clamp the bottom tabs to the bottom of the dash.

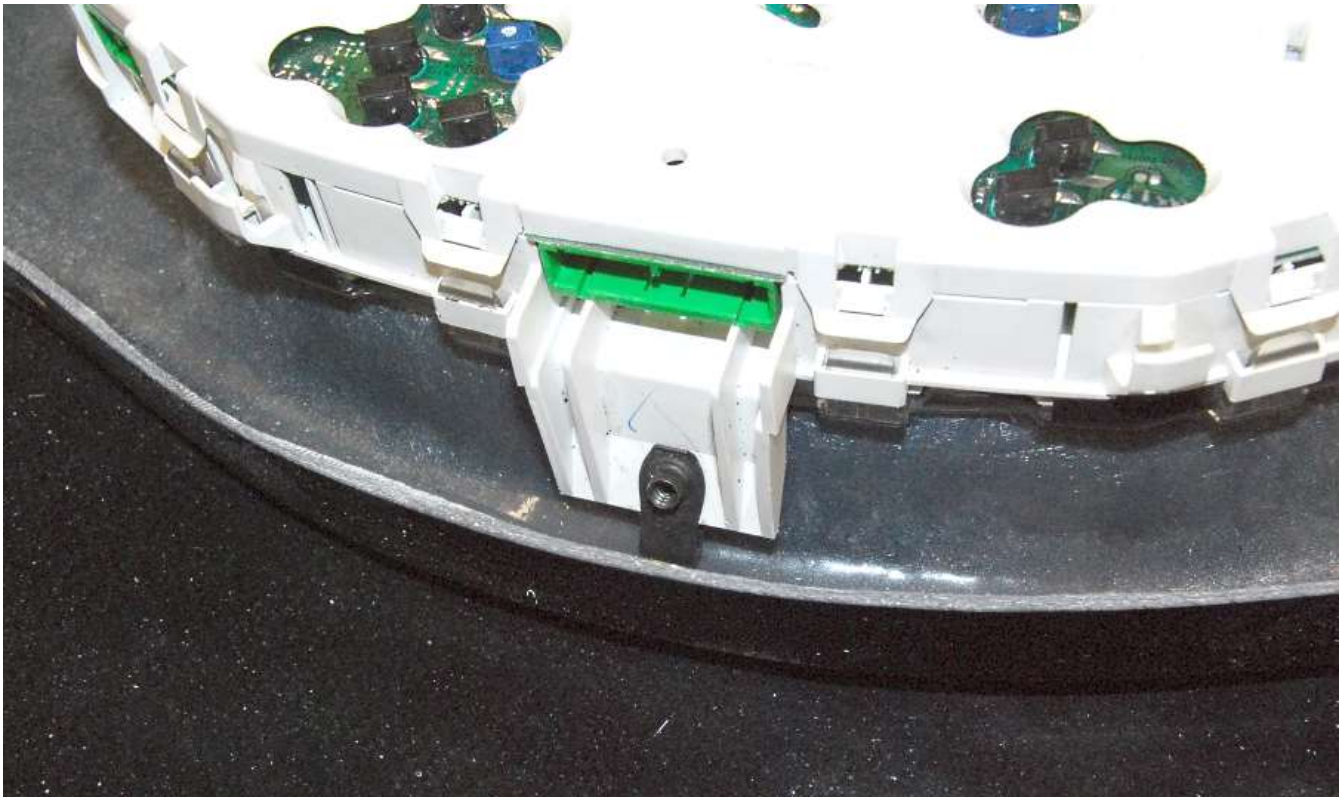


Mark the back of the dash in the center of the top gauge hole.

Mark the hole locations of the bottom mount tabs.



Remove the gauge pod and drill ¼ inch mounting holes at the three points marked.



Push the U nut onto the top gauge pod mount.

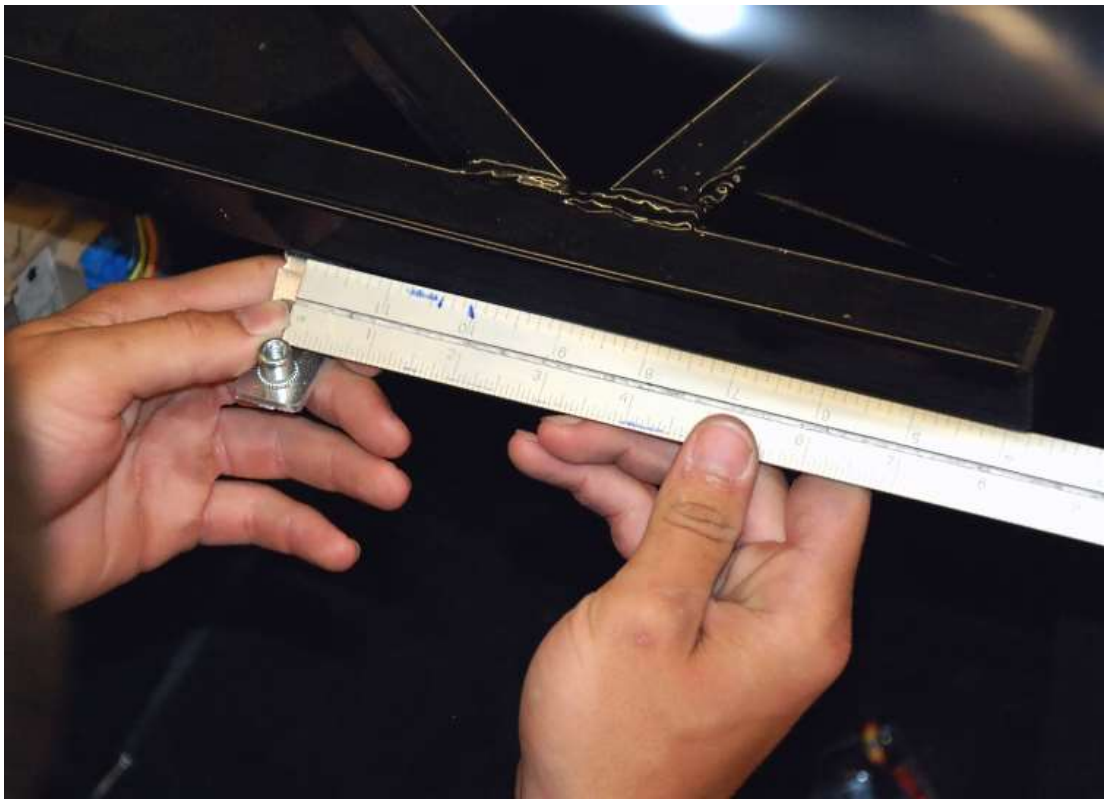
Attach the bottom gauge pod tabs to the dash using ¼” x 0.75” flanged button head screws and locknuts.

Turn the dash over and attach the top of the gauge pod using ¼" x 0.75" flanged button head screw and locknut.

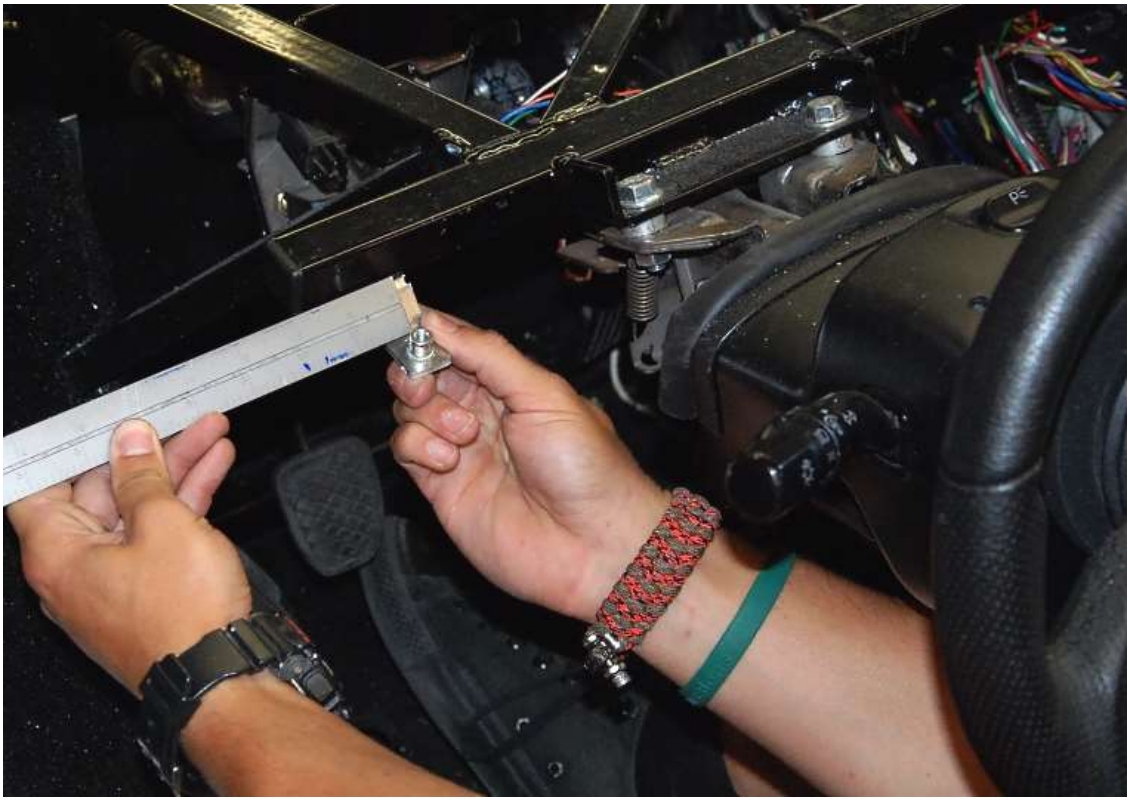
Dash installation

Unpack the dash mounting brackets.

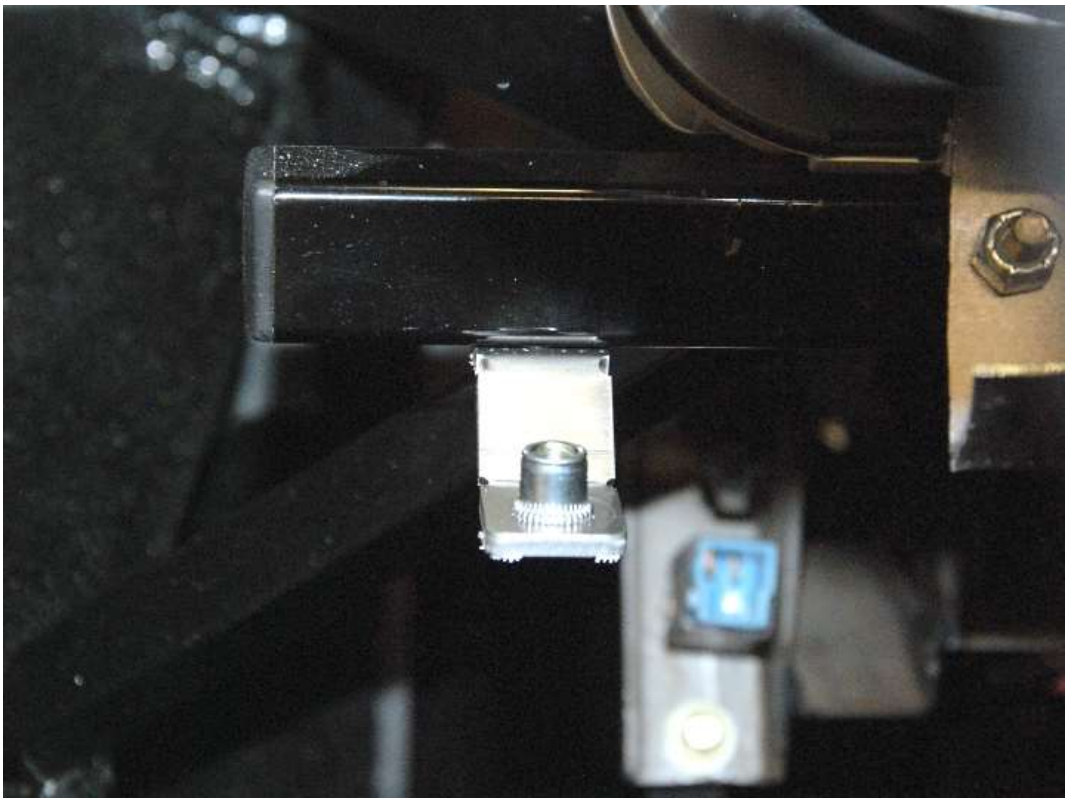
Drill one side of the mounting brackets out to $^{25}/_{64}$ inch and install a rivnut from the top.



Locate the passenger side bracket on the dash support tube. The bend in the bracket should sit all the way up around the bottom corner of the tube, then measure in eight inches from the end of the tube (this doesn't have to be exact).



Repeat the same procedure on the left side but measure in two inches from the end of the tube.

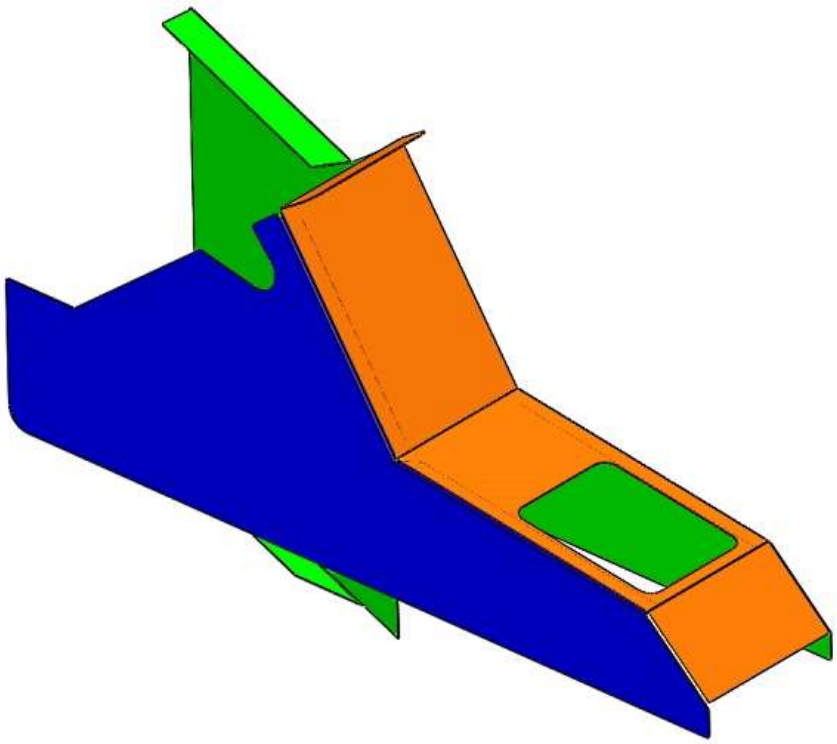


Mark through the holes onto the chassis then drill out $^{25}/_{64}$ inch for rivnuts and install the brackets using ¼ inch flanged button head screws.

Test fit the dash down into the car, the leading edge should sit in the wedge formed between the windshield and the windshield surround.

Center Console

🚘 packaged aluminum, body finish components (box 4)
🛠 , drill, $^{1}/_{8}$”, $^{3}/_{16}$” drill bits, marker, rivet tool, clamps



Mark the top of the center console along the edges for rivets.

Clamp and screw the aluminum panels together using the self-taping screws.

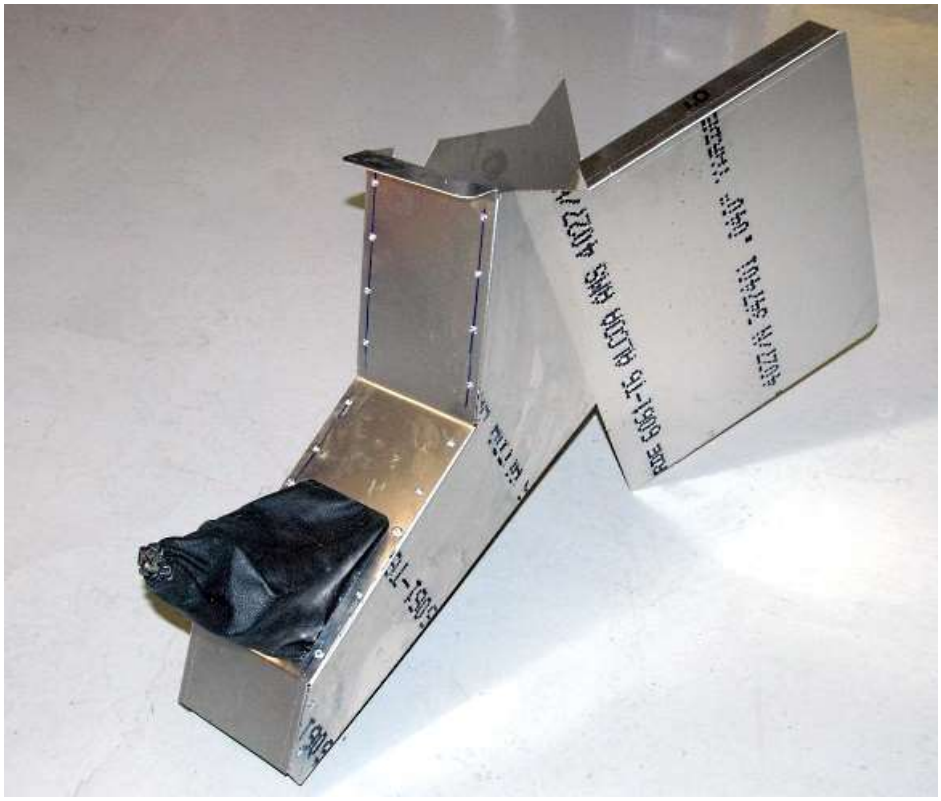
Drill and rivet the console together.

Push and hold the shifter boot up in the shifter hole noting where the corners of the boot and hole are for attaching the boot.

Do the next two steps one corner at a time to make sure that the boot does not move out of place.

From the underside, use a 3/16" drill bit to drill through one of the corners of the boot and the aluminum.

From the top side, use a 3/16" rivet in the aluminum hole drilled with a #10 washer under the boot. Push the washer against the boot while tightening the rivet so that the boot is squeezed against the aluminum.



Finished console.

Cover the center console.
Install the center console so that the top center tab is tucked up behind the dash.
Attach the dash to the center console.
Attach the left side of the center console to the center cockpit tubes.

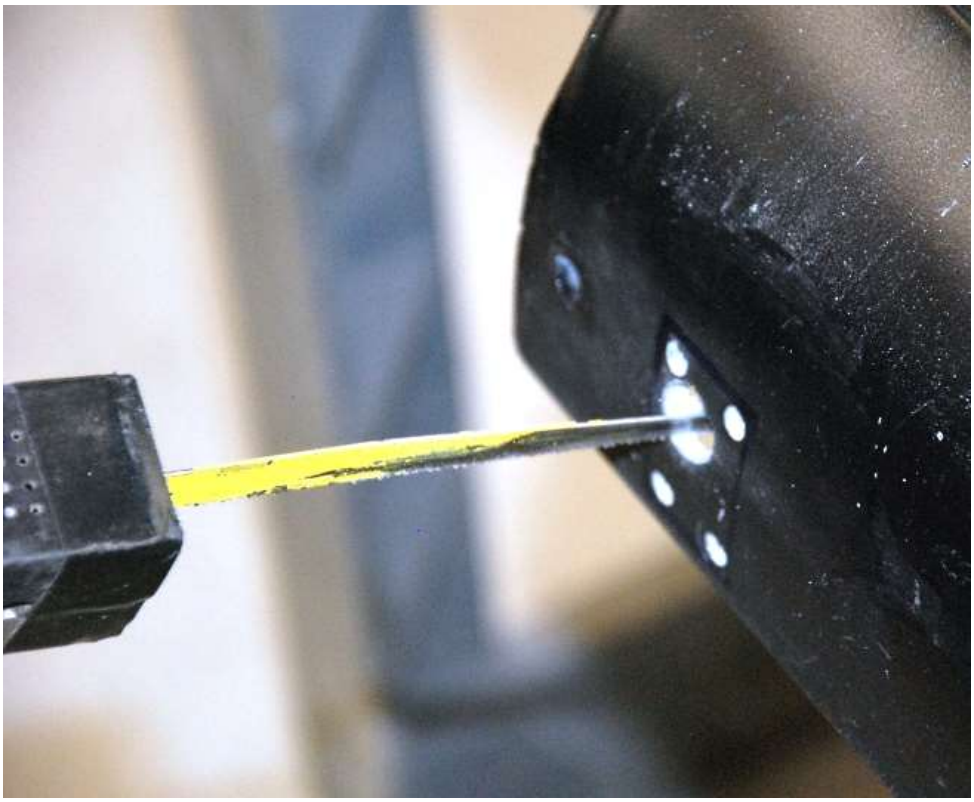
Hazard Switch

🚘 OEM hazard switch
🛠 Marker, saw, drill, $^{3}/_{16}$", ½" drill bit, ruler

Locate the OEM hazard light switch, this will mount to the bottom side of the dash between the steering column and the center console.

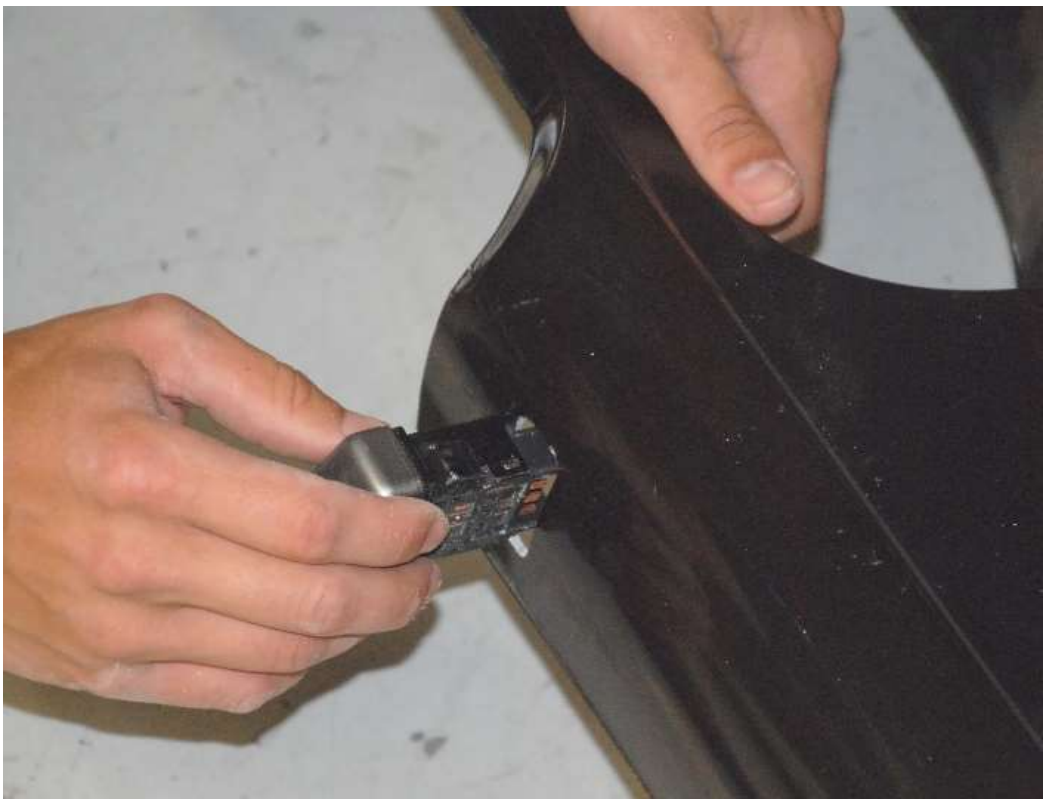
Sit in the car and mark the location of the switch where it will not interfere with your knees or any wiring behind the dash. Then remove the dash and mark for a 7/8in. x 1-3/8in. hole.

Drill a ½ inch hole in the center and $^{3}/_{16}$ inch holes in the four corners of the area marked.



Use a saw to cut the switch area out.

Clean the edges of the hole with a file.



Install the hazard switch in the bottom of the dash.

Re-install the dash and plug in the hazard switch at the same time.

Install the assembled dash and plug in all connections to the instrument cluster and hazard switch.

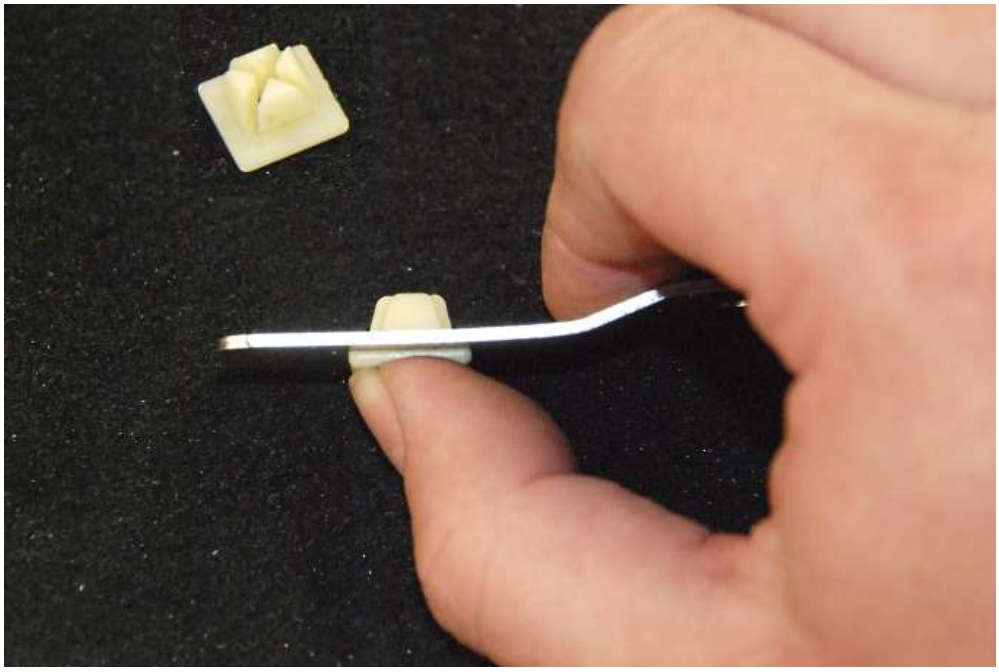
Screw the bottom of the dash into the lower mounting brackets using the ¼ inch mounting screws.

Drill an 1/8 inch, hole through the cover, the console, and the tunnel, at the top corner of the tunnel so the hole goes through the support tube.

Screw the shift boot and console to the tunnel with a small black trim screw from the Subaru.

License plate bracket

🚘 License light/bracket components.
🛠 Rivet tool, 3/16" drill bit, drill



Push the plastic nuts into the license plate bracket.

Center the license plate bracket in the middle of the bumper then drill the mounting holes out of the rear bumper using a $^{3}/_{16}$ inch drill bit.

Use $^{3}/_{16}$ inch rivets to fasten the bracket to the bumper.

Exhaust

- OEM catalytic convertor pipe, exhaust components (Box 8), M10 x 35mm flange head bolts and locknuts.

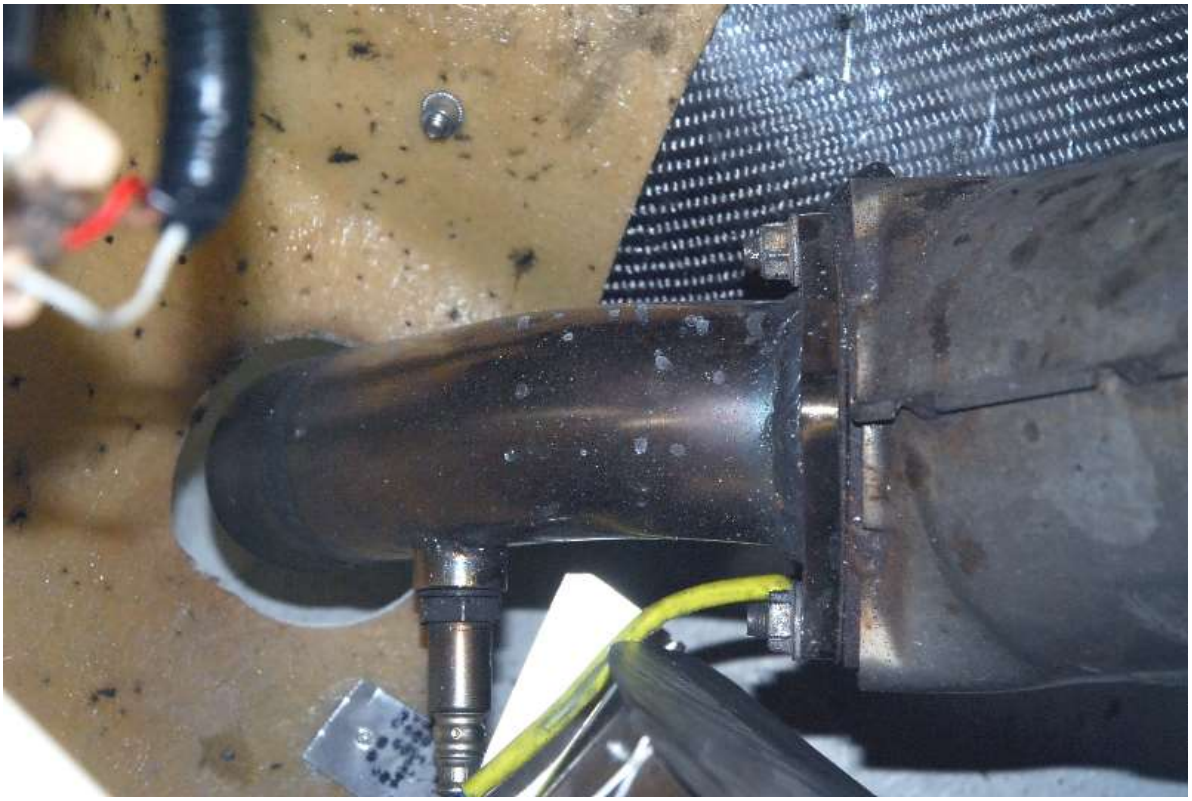
Turbo

Assemble the parts for the exhaust system. The down tube connector and tailpipe need to be unpacked from the kit.

The angled adapter needs to be installed between the turbo and the downpipe.

Install the adapter and downpipe using the gaskets and hardware provided as well as the OEM nuts off of the turbo.

The tailpipe section has two flange patterns to fit both early and late model catalytic converters.

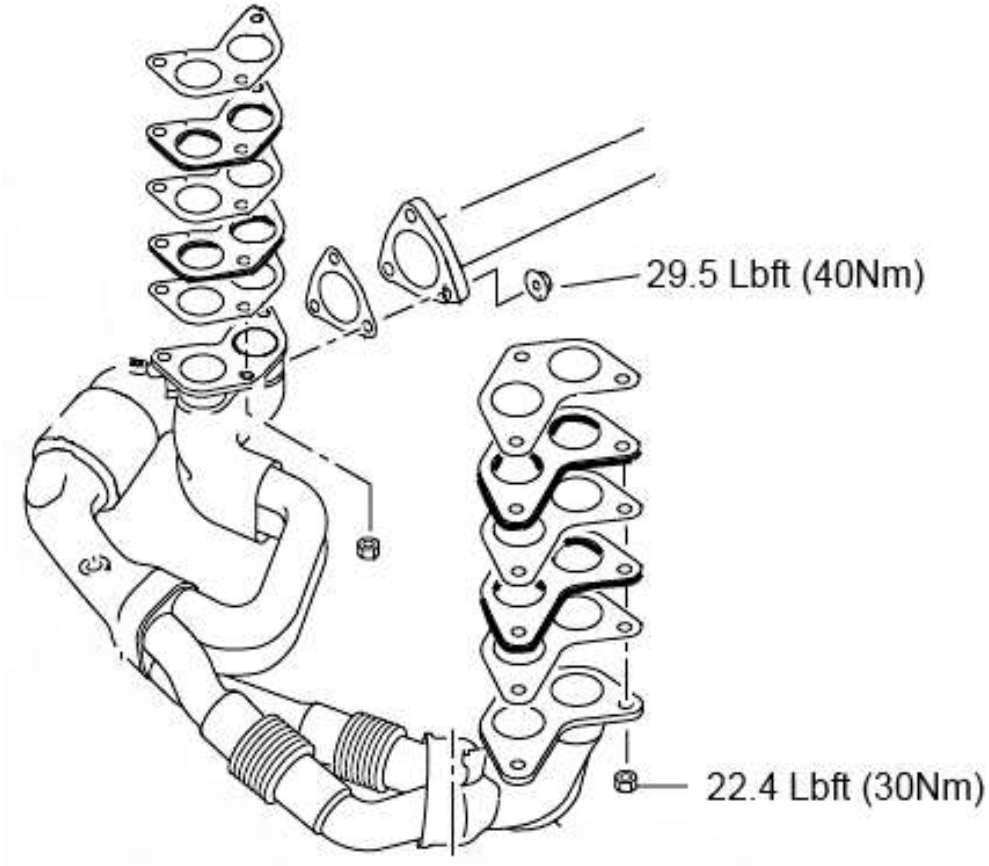


Fit the tailpipe to the converter and mark where it exits the body. These pipes are left intentionally long so you can cut them to fit the angle they exit the body or change the location of the exit with a custom tip. Once you are happy with the location cut the body and mount the tip.

2002-05 Naturally Aspirated

Locate your OEM exhaust system.

Unbolt the catalytic converter and trim the exhaust 6 inches from the convertor.



Then bolt the remaining Y-pipe up to the engine using the spacers and bolts provided to lower the pipe away from the chassis.

Unpack the adapter and fit it between the catalytic converter and the y-pipe.

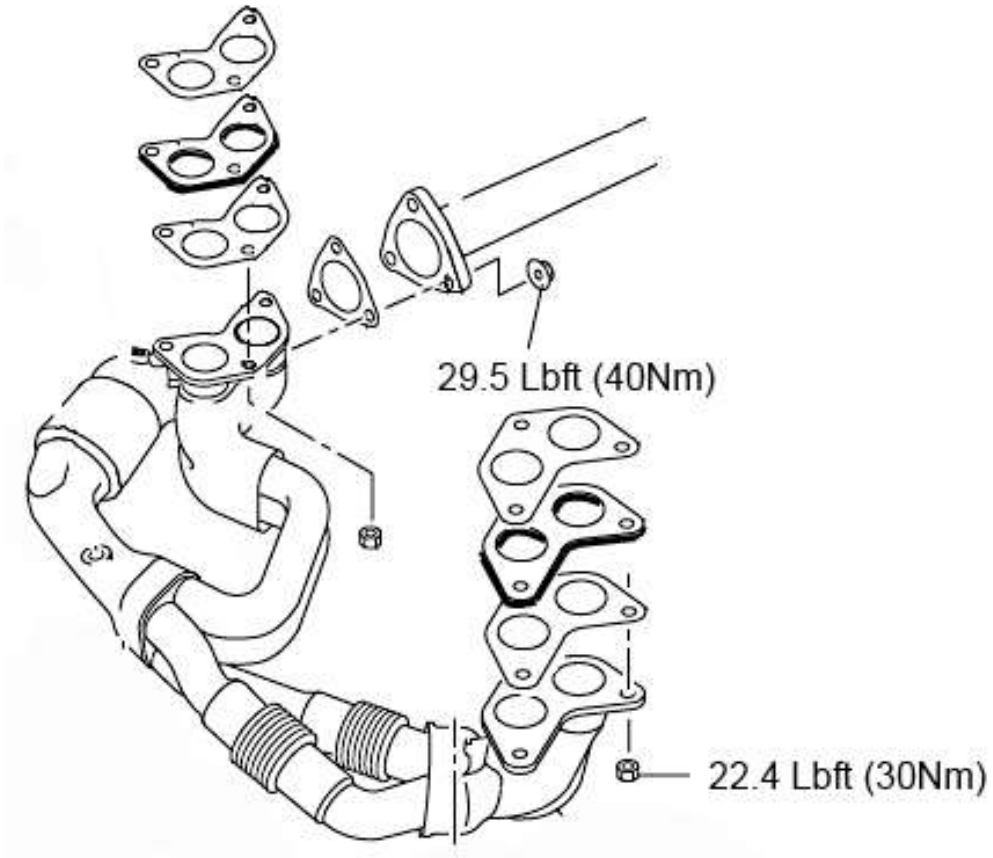
Fit the catalytic converter to the adapter tube and mark the body for the cutout. The assembly will go together as shown in the picture when underneath the car.

2006-07 Naturally Aspirated

The OEM manifold and kit provided tailpipe make up the complete exhaust system.

If you are re-using your factory catalytic converter, cut it out of the factory pipes leaving enough tube on the convertor for clamps.

If you are installing the converter, fit the exhaust system first and mark where it fits away from any other components or the chassis. Then cut the tailpipe and clamp the converter in place.



Fit the exhaust into the car, the manifold may need the provided spacers to clear the frame. If spacers are used, use bolts from the Subaru such as the rear differential bolts.

Then the tailpipe runs from there out the bottom.

Radiator Aluminum

🚘 Packaged aluminum, body finish components
🛠 Rivet tool, drill, 1/8" drill bit, tin snips

Sides

Unpack the front inner splash panels

Slide the splash panel forward in the fender of the car. Angle the front down below the bumper to get the back in, then slide the panel back into place.

Here is the splash panel set in place.

Mark the top and front if necessary to allow ⅜”- ¾” gap to the nose.
Remove and trim the panel if necessary.
Push weatherstrip onto the edge of the panel then reinstall.

Mount the rear of the splash panel to the chassis frame tubes.

FLOOR

Unpack the nose floor aluminum, if you are using the optional splitter then this piece is not needed as the splitter forms the floor.

Fit the nose floor in place with the flanges facing upward, the floor should fit all the way up against the framework of the radiator support. There are gills in this panel that can be opened if you need extra cooling for a larger engine.

Splash guards

Front

🚘 Packaged aluminum, body finish components
🛠 Rivet tool, drill, 1/8" drill bit, tin snips

Locate the front wheel well rear splash guard.

Fit the panel on the car as pictured above.

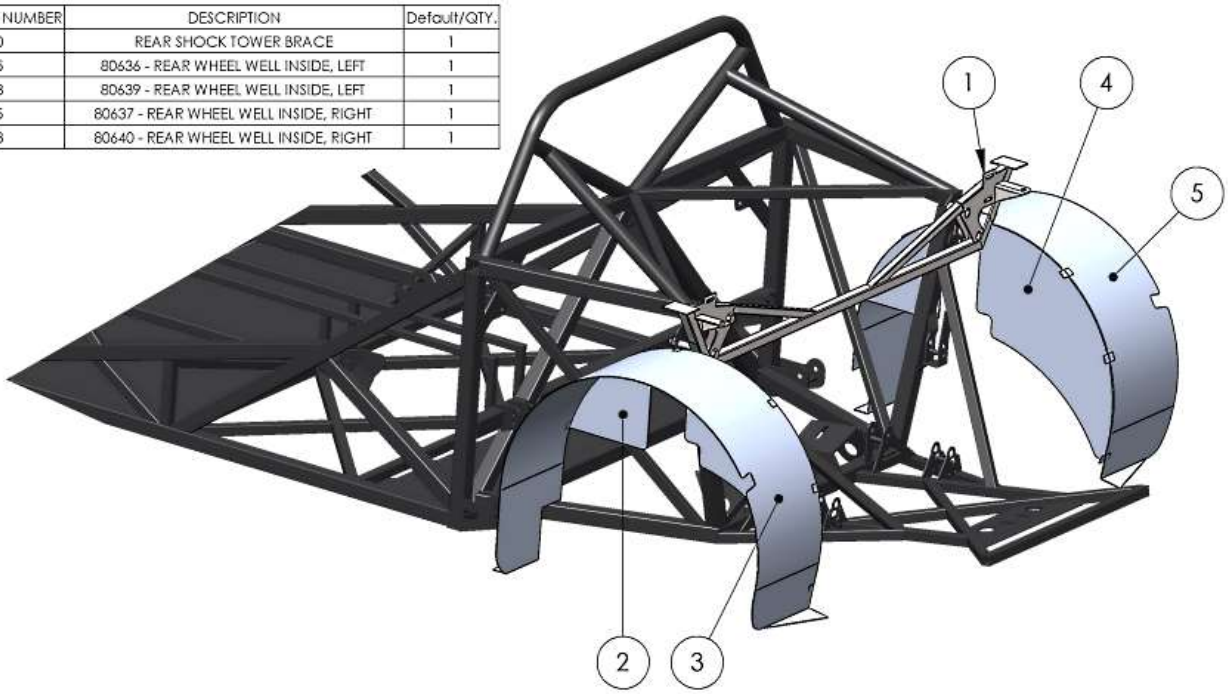
The outside of the splash guard is covered with bulb seal as pictured above.

Locate the front wheel well inside splash guard that fits to the inside of the rear splash panel.

Fit the splash panel as pictured above. The rear flange attaches to the rear splash panel. The front edge attaches to the frame tube in front of the rear control arm mount.

Rear

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	80300	REAR SHOCK TOWER BRACE	1
2	80635	80636 - REAR WHEEL WELL INSIDE, LEFT	1
3	80638	80639 - REAR WHEEL WELL INSIDE, LEFT	1
4	80635	80637 - REAR WHEEL WELL INSIDE, RIGHT	1
5	80638	80640 - REAR WHEEL WELL INSIDE, RIGHT	1

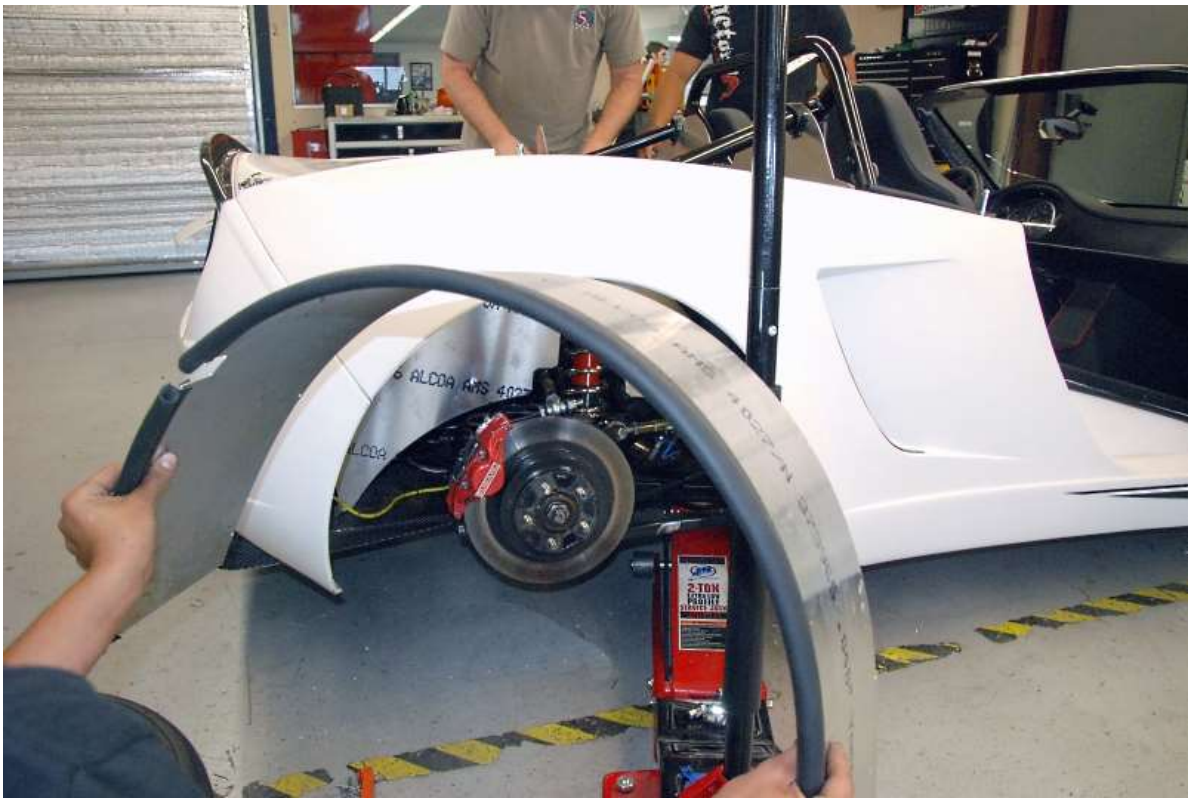


Locate the inner rear splash panel.

The inner rear splash panel fits in the car as above. There is a cutout for the rear shock and upper control arm. The bent ear on the top of the panel fits against the shock tower brace on the frame.

Rivet the top bent ear of the panel to the shock tower brace on the frame.

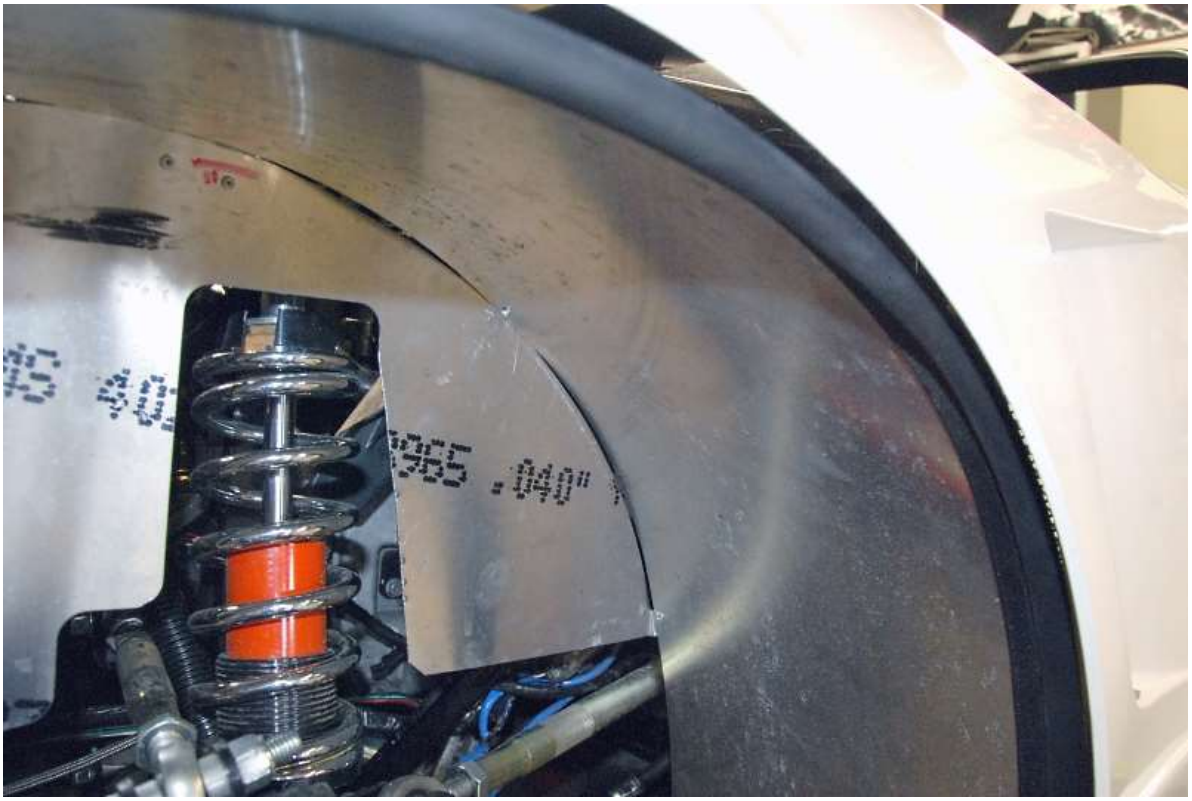
Locate the rear outer splash panel. Run bulb seal along the outside edge of the panel, with a break around the cutout for the body.



Bend the outer splash panel as pictured in order to fit it inside the wheel well.

Fit the outer splash panel into the wheel well.

The outer panel fits inside the bent tabs on the inner panel. The rear of the outer panel has a cutout that fits around the body seam from the rear bumper.



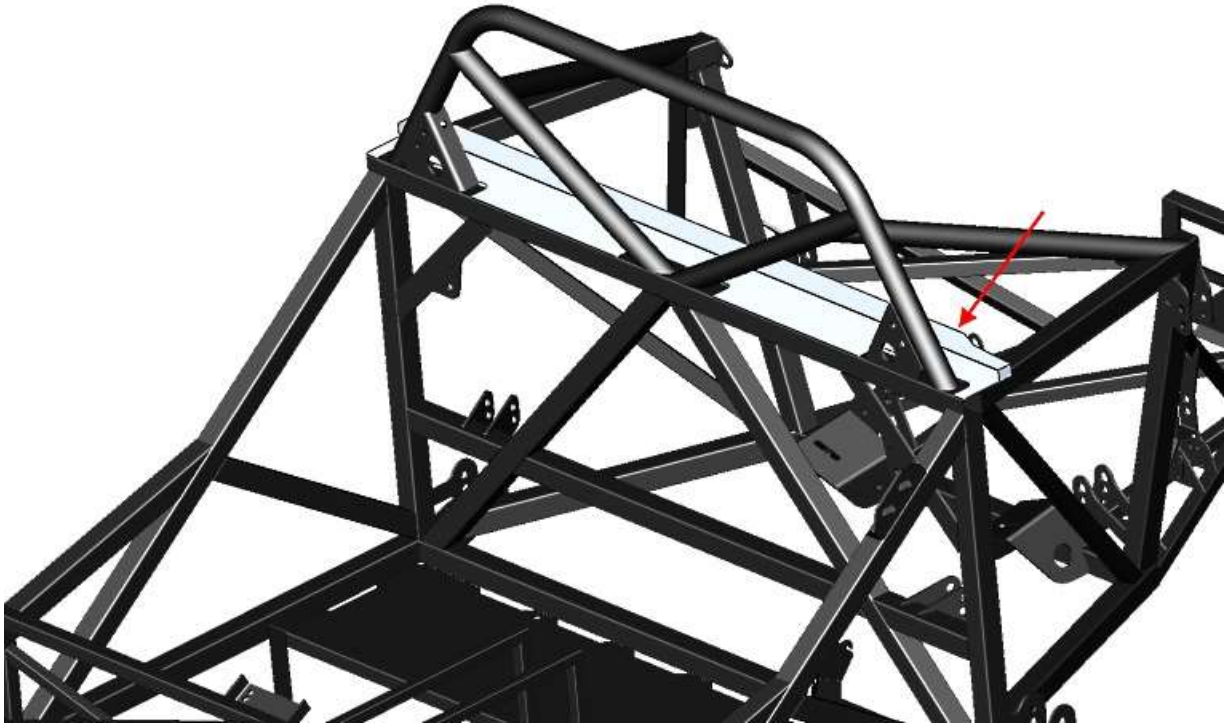
Rivet the outer splash panel to the bent ears on the inner splash panel.

Rivet the splash guard where the front and rear of the outer splash panels meet the body.

Engine cover block off

- Packaged aluminum, body finish components

🛠 1/8” drill bit, drill, tin snips, rivet tool, silicone.



Insert the bottom engine cover block-off (FFR 80602) between the rollbar and the rear legs.

Insert the vertical engine cover block-off (FFR 80578) between the rollbar and the rear legs.

Silicone and rivet the vertical engine cover block-off to the bottom block-off.

Position the bottom engine cover block-off so that the vertical aluminum seals around the rollbar legs and the bottom seals the engine bay from the cockpit.
Silicone and rivet the bottom engine cover block-off to the frame.

Intercooler aluminum

🚘 Packaged aluminum, body finish components
🛠 $^{1}/_{8}$" drill bit, drill, tin snips

Unpack the intercooler duct panels.

Push some of the bulb seal weather-stripping onto the top of the rear flange on both pieces.

Fit the ducts in place by sliding them under the roll bar and into position around the intercooler. The longer panel mounts on the right side as the intercooler is offset toward the left.

Clamp the panels in place to check the fit with the rear deck lid. Since the intercooler moves with the engine leave a ¾ inch gap between it and the ducts.

Test fit the rear deck lid. If needed trim material off the top of the ducts, the trimmed edge will be hidden by the weather-strip. These panels should support the center of the deck lid and hold its shape against the rear hatch so make sure the hatch is in position and closed during fitting.

Drill and rivet the ducts to the chassis.

Troubleshooting

Some of the areas that can cause problems are:

Wire connections – Tape connections are not recommended. The best connection is a soldered connection that has heat shrink tubing over it. If this is not possible, a well crimped connector is recommended.
Grounds – Make sure that the ground wires are connected to clean bare metal surfaces. Battery grounds must be attached to the battery.

Finishing Touches

Review the Final checklist in the appendix.
Align the headlights using the instructions in the Appendix.

Appendix A: Donor Parts

2002-2007 Subaru Impreza and Impreza WRX

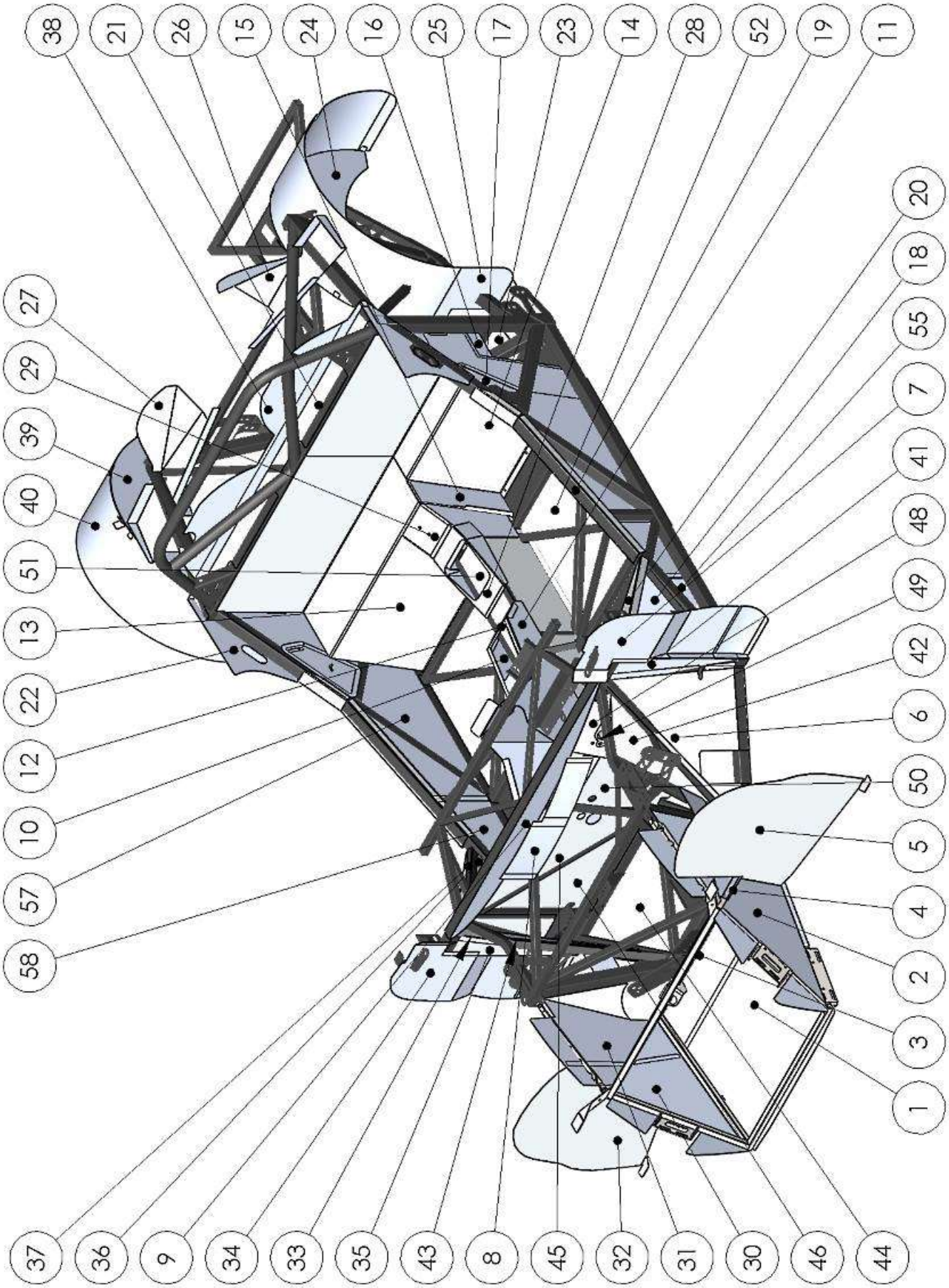
Keep all the fasteners from the donor until the car is, the spares can come in handy.

	Part Name	Check
Front Suspension	Front Lower Control Arms	
	Front Spindles	
	Front brakes (complete)	
	Front Flexible Brake lines	
	Front CV joints complete with axle nuts	
	Strut to Spindle mounting hardware	
Steering	Steering rack with outer tie rods	
	Steering shaft complete	
	Steering Column with switchgear	
	Steering Wheel	
Rear Suspension	Rear Spindles	
	Rear Brakes Complete	
	Rear Flexible brake lines	
	Emergency Brake Cables	
	Lower Trailing Arms	
	Lower forward Control Arms	
	Rear Toe Links	
	Rear Outer CV joint	
	Rear Sway bar with chassis mount bushings and brackets	
	Strut to Spindle mounting hardware	
Drivetrain	Complete Engine with Alternator and Air box	
	Transmission with Flywheel and Clutch	
	Shift Linkage mount to Transmission	
	Engine and Transmission mounts	
	Wheels and Tires	
	Starter	
Exhaust	Exhaust manifold and Y pipe	
	Up-pipe (if turbo)	
	Down-pipe with cat (if turbo)	
	Catalytic converter (naturally aspirated)	
	Oxygen sensors	
Interior	Instrument Cluster	
	Seats	
	Emergency Brake Handle	
	Rear seat belts with receptacles	
	Interior Door Latches	
	Shift Knob and Boot	
	Rear View Mirror	
	Complete pedal assembly	
	Throttle pedal	
	Brake Master Cylinder	

	Clutch Master Cylinder	
	Hazard flasher switch	
	E-brake cable mount bracket	
Cooling	Radiator	
	Fans with mounting bracket	
	Upper and Lower Radiator hoses	
	Fill/Burp Tank	
	Overflow Tank	
Electrical	Complete Vehicle Wiring Harness	
	Battery Cables	
	Battery	
	Brake light Switch	
Fuel System	Fuel Pump with Sock	
	Fuel vapor canister and lines	
Body	Rear Door Hinges	
	Rear Door latches with catch	
	Hood Hinges	
	Side Mirrors	
	Horn	
	Charcoal Canister	
Optional	Windshield Wiper Assembly	
	Brake Booster	

Keep all the fasteners from the donor until the car is, the spares can come in handy.

Appendix B: Aluminum Panels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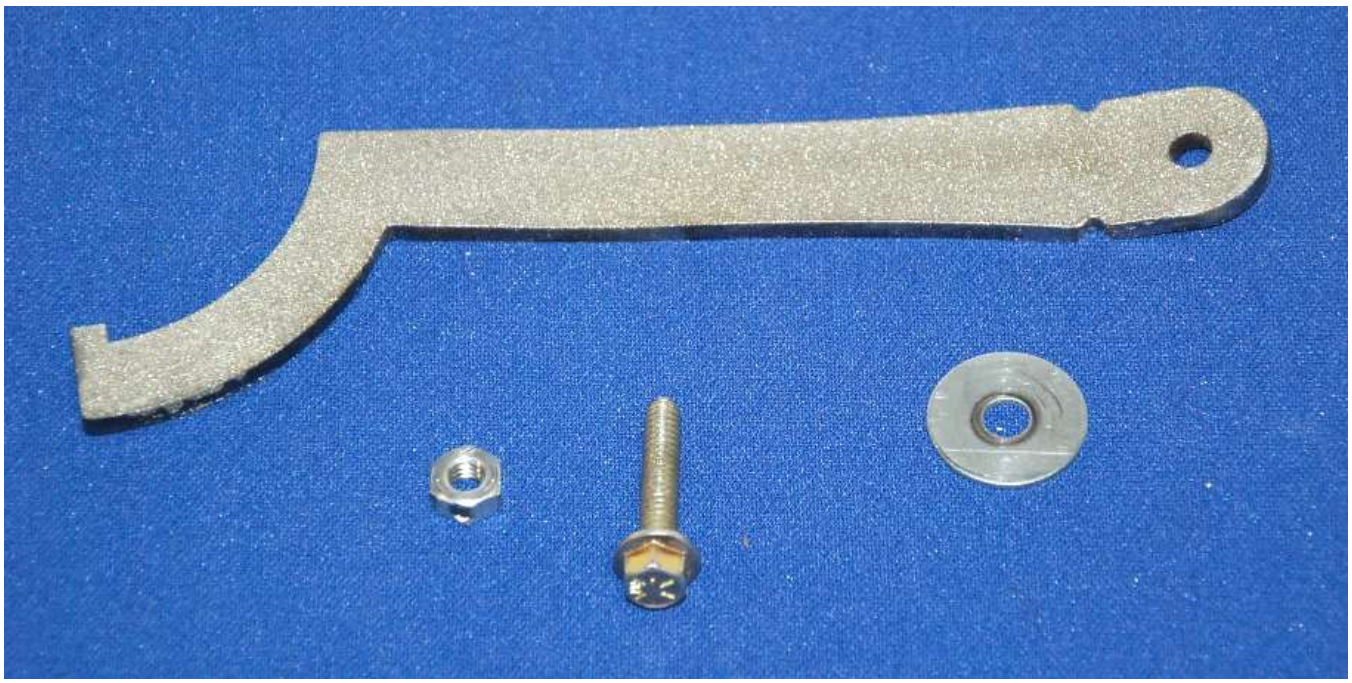
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	81085	NOSE ALUMINUM FLOOR	1
2	81086	NOSE ALUMINUM FRONT SIDE, LEFT	1
3	80606	NOSE FLOOR TO UNDER BATTERY ALUM	1
4	81082	81083 - NOSE ALUMINUM BACK SIDE, LEFT	1
5	81087	81088 - FRONT WHEEL INSIDE SPLASH, LEFT	1
6	80171	80171 - FRONT WHEEL WELL INSIDE, REAR, LEFT	1
7	80148	80149 - FNT WHEEL REAR SPLASH GUARD, LFT	1
8	80587	REAR HOOD SUPPORT/MASTER CYLINDER COVER	1
9	80546	DASH CLOSE OFF ALUMINUM	1
10	80822	CONSOLE RIGHT SIDE	1
11	80823	CONSOLE LEFT SIDE	1
12	80824	CONSOLE MIDDLE	1
13	80910	FIREWALL, RIGHT SIDE	1
14	80911	FIREWALL, LEFT SIDE	1
15	80912	FIREWALL CENTER	1
16	80941	COCKPIT SIDE COVER	1
17	80426	SEATBELT COVER	2
18	80449	80461 - COCKPIT SIDE TOP, LEFT SIDE	1
19	80132	DOOR SILL REAR	2
20	80129	80130 - DOOR SILL FRONT, LEFT	1
21	80578	80602 - ENGINE COVER BLOCK-OFF, BOTTOM/BEND	1
22	80177	REAR COCKPIT SIDE COVER	2
23	80059	UNDER ENGINE ALUMINUM	1
24	80635	80636 - REAR WHEEL WELL INSIDE, LEFT	1
25	80638	80639 - REAR WHEEL WELL SIDES, LEFT	1
26	80289	INTERCOOLER DUCT SIDE, LEFT	1
27	80369	INTERCOOLER DUCT SIDE, RIGHT	1
28	80545	E-BRAKE HANDLE TRIM PLATE	1
29	80373	E-BRAKE CABLE MOUNT	1
30	81086	NOSE ALUMINUM FRONT SIDE, RIGHT	1
31	81082	81084 - NOSE ALUMINUM BACK SIDE, RIGHT	1
32	81087	81089 - FRONT WHEEL INSIDE SPLASH, RIGHT	1
33	80171	80173 - FRONT WHEEL WELL INSIDE, REAR, RIGHT	1
34	80148	80150 - FNT WHEEL REAR SPLASH GUARD, RT	1
35	80126	80128 - RT FNT WHEEL REAR SPLASH GUARD	1
36	80449	80462 - COCKPIT SIDE TOP, RIGHT SIDE	1
37	80129	80131 - DOOR SILL FRONT, RIGHT	1
38	80578	ENGINE COVER BLOCK OFF, VERTICAL	1
39	80635	80637 - REAR WHEEL WELL INSIDE, RIGHT	1
40	80638	80640 - REAR WHEEL WELL SIDES, RIGHT	1
41	80126	80127 - LFT FNT WHEEL REAR SPLASH GUARD	1
42	80174	80175 - FRT WHEEL WELL INSIDE, FRT, LEFT	1
43	80174	80176 - FRT WHEEL WELL INSIDE, FRT, RIGHT	1
44	80581	UNDER BATTERY TRAY COVER	1
45	80123	COCKPIT MIDDLE RIGHT FRONT	1

46	80124	RIGHT SIDE COCKPIT FRONT	1
47	80416	LEFT SIDE COCKPIT FRONT LOWER	1
48	80417	LEFT SIDE COCKPIT FRONT UPPER	1
49	80511	POWER BOOSTER COVER PLATE	1
50	80448	RIGHT SIDE COCKPIT FRONT	1
51	80118	TRANSMISSION TUNNEL COVER	1
52	80447	UNDER SEAT ALUMINUM	1
53	80424	80459 - DEAD PEDAL ALUMINUM, LEFT SIDE	1
54	80424	80460 - DEAD PEDAL ALUMINUM, RIGHT SIDE	1
55	80603	80604 - COOLANT TUBE COVER, LEFT	1
56	80603	80605 - COOLANT TUBE COVER, RIGHT	1
57	80425	COCKPIT SIDE, REAR	2
58	80427	COCKPIT SIDE, FRONT	2

	PART NOT SHOWN IN PICTURE

Appendix C: Rivnut Tool Instructions



The shock coil-over wrench and nut, bolt, and washer also function as the rivnut installation tool.

Thread the nut about ¾ of the way onto the installation bolt.

Next slide the washer onto the bolt down to the nut.

Insert the bolt with the nut and washer through the hole in the rivnut tool from the side where the handle angles up.

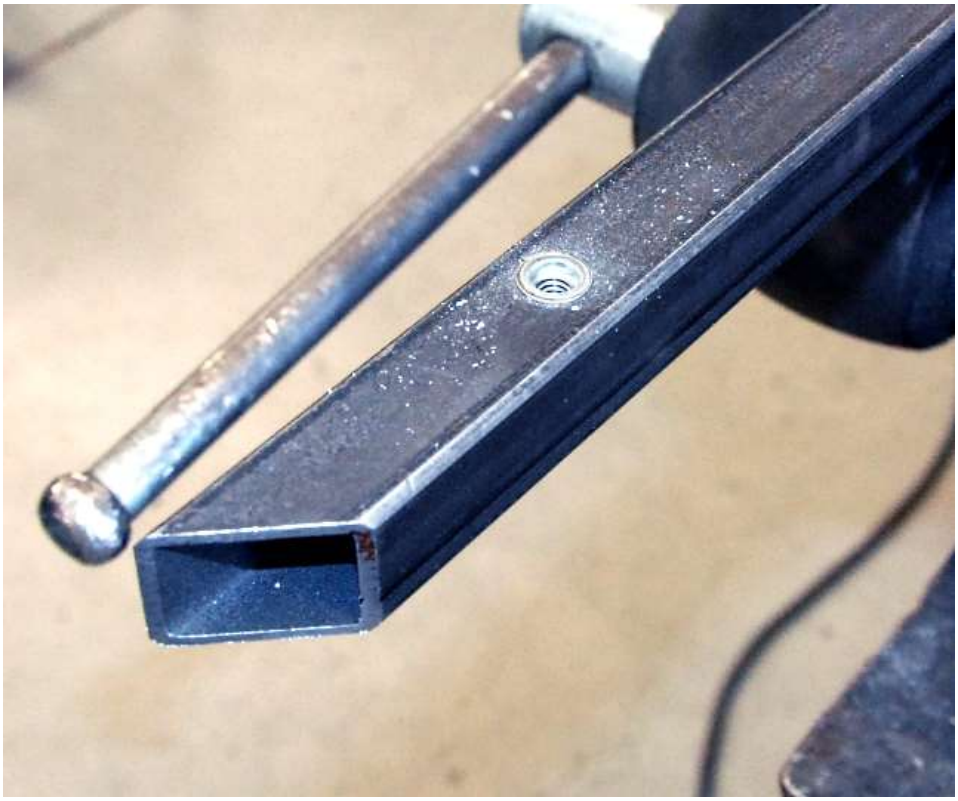
Thread the rivnut onto the bolt until it is snug against the tool. The bolt threads should just stick out of the bottom end of the rivnut. Adjust the bolt depth if needed.

Using a closed end wrench hold the bolt from turning by clamping the wrench and the install tool in one hand.

Drill a 25/64 inch hole where you want to install the rivnut.

Insert the rivnut in the hole holding onto both the tool handle and the wrench.

Tighten the clamping nut until the resistance changes as if it were a nut getting tight.



Unscrew the Bolt from the rivnut and you are done!

Appendix D: Alignment and Ride Height

Alignment Specifications (street)

	Toe In (inches)	Camber (degree)	Caster (degree)
Front (manual steering)	1/16 total	-0.5 to -0.75	+3 to +4
Rear	3/16 total	-0.25 to -0.5	NA

Ride Height

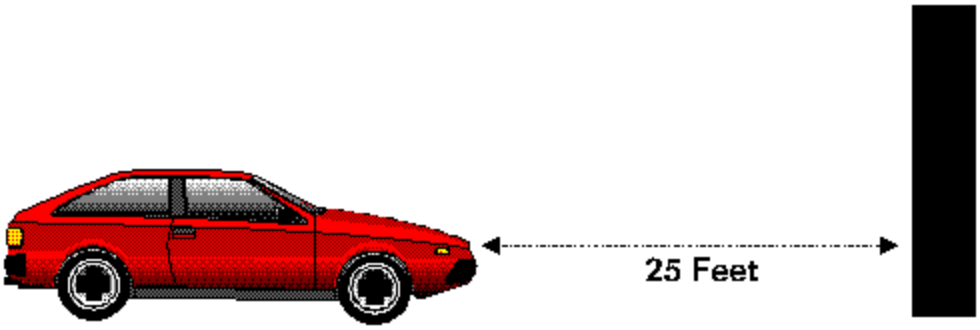
Front	4.50”
Rear	4.50”

Measured from the ground to the bottom of the frame under the cockpit.

Appendix E: Headlight Alignment

- Masking tape, marker, tape measure
- Make sure that the car is at the correct ride height before the alignment procedure is done.
- It is important that the headlights are aimed properly in order for it to perform at their best. Lights that are aimed incorrectly will not only perform poorly but may also offend oncoming traffic. When replacing bulbs, it is a good idea to verify that your lights are properly aimed. Slight variances in filament position can translate to large variances in beam pattern. The following procedure does not require special aiming equipment and ensures proper aim.

Find a flat level surface next to a vertical white wall where the car can be parked (a garage door is an ideal location at home).
Pull the car straight up to the wall as close as possible.
Using masking tape and a marker, draw a vertical line on the wall corresponding to the centerline of the vehicle.
Pull the car straight back until the headlights are 25 feet from the wall.



Headlight distance from wall

Make the following two measurements:
Measurement A: From the ground to the geometric center of one of the headlight lenses
Measurement B: From one of the low beam headlights to the vehicle centerline.
(Also measure from high beam center to vehicle centerline for 4 headlight systems)
Note these measurements.

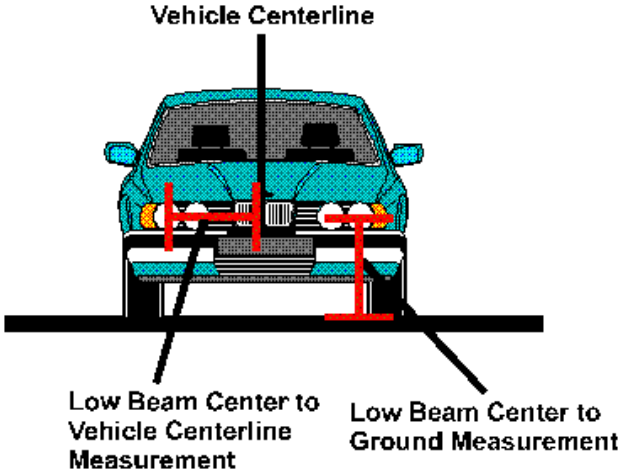


Figure 1: Headlight alignment (centerline)

On a piece of masking tape, draw one horizontal line on the wall at a height exactly 2 inches lower than Measurement A.
On the line, make vertical marks both to the right and left of the vehicle centerline mark at the distance of Measurement B from the vehicle centerline vertical line.

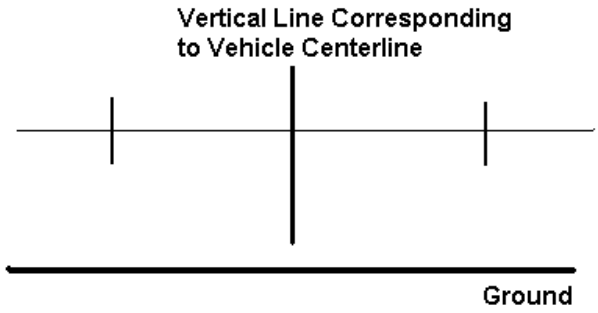


Figure 2: Headlight alignment

Turn the headlights on and adjust the vertical aim of the headlights so that the top horizontal cutoff of each of the beams is located along the horizontal line drawn on the wall.
Adjust the horizontal aim of the low beam headlights so that the point at which the top cutoff of the beam begins to slope upwards is located at the vertical marks.

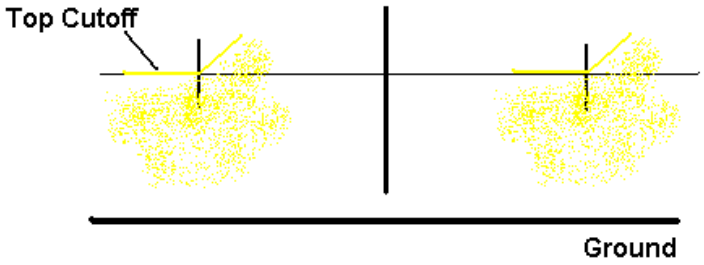


Figure 3: Headlight alignment aim

Appendix F: Final Check

The following are general guidelines we when we are finished building a vehicle. It is by no means to be considered a complete list but gives a good starting point for anyone checking over their own car before leaving the garage bay.

Steering	
Steering wheel tight	___
Universal joint set screws tight	___
Rack mount bolts tight	___
Tie rod ends tight	___
Tie rod to spindle bolts tight	___
Steering free lock to lock	___
Front Suspension	
Front wheel bearings tight	___
Upper and lower ball joints tight with cotter pins	___
Upper control arm bolts tight	___
Upper control arm jam nuts and clevis nuts tight	___
Lower control arm bolts tight	___
Shock mounting bolts tight	___
Spring collars tight	___
Air pressure set	___
Lug nuts tight	___
Brakes	
Front Caliper bolts tight	___
Rear caliper bolts tight	___
Rotors clean no cracks or groves	___
Brakes bled/bleeder screws tight	___
No leaks under pressure	___
Master cylinder bolts tight	___
Reservoir full	___
Flexible lines tied up	___
Cockpit	
Seat securely bolted	___
Harnesses securely bolted	___
Pedals travel freely and bolts secure	___
Throttle return spring hooked up	___
Brake push rods secure	___
Interior wiring tight	___
Shifter tight and free	___
Mirrors tight and adjusted	___
Electrical	
Battery charged	___
Battery mount and connections secure	___
Brake lights functioning	___
All wires free and clear of moving or hot parts	___
Rear Suspension	
Shock mounting bolts tight	___
Spring collars tight	___
Axles free play checked	___

Air pressure set	___
Lug nuts torqued	___
Transmission	
Clutch height /free play adjusted	___
No leaks	___
Universal joints no bind or wear	___
Output shaft snug no bind	___
Drive shaft bolts tight	___
Transmission mount bolts tight	___
Bell housing bolts tight	___
Starter tight	___
Engine	
Oil level checked/cap tight	___
Water level checked	___
Plug wires tight including coil	___
Belts tight	___
Engine mount nuts tight	___
Fuel lines no leaks under pressure	___
No coolant or oil leaks	___
Exhaust tight	___
Fuel level checked	___

Appendix G: Six Speed Conversion

Rev B

- Parts Needed
  - 2006-2007 US Model Subaru WRX STI Transmission
  - Complete clutch and flywheel from same years STI
  - WRX CV joints with male inner joints (transmission attachment point)
  - Clutch Slave cylinder from Same model years STI
  - Pilot bearing, throw-out bearing, and clutch fork from same model years STI
- Supplies Needed
  - Permatex #51813 Gasket maker
  - Permatex #20539 Indian head shellac
- Adapter Kit Contents
  - 2WD adapter Flange
  - Shift Linkage bracket
  - Rear drive block-off plate
  - Oil Passage plug
  - Tamper-proof T45 Torx bit
- Rubber/plastic hammer, hammer, punch, ratchet, metric sockets, large flat head screwdriver, band saw or reciprocating saw, tape measure, marker, T-40 Torx bit, ½" wrench, ½" socket, file
- Earlier Models (2004-mid 2006) of the 6 speed transmission had oil pumps built in and this feature is retained during the conversion. If you have an early model (2004-mid 2006) then the pump need to be left operational. If you have the later model then the oil routing plastic need to be retained in order to get the fluid to the right places.
- Gearing on the different models varied slightly which does not affect the conversion but does have an effect on how the car drives. The later model (2007) transmissions have less rpm drop-off between the higher gears and are slightly better for track days or higher speed events.

Disassembly

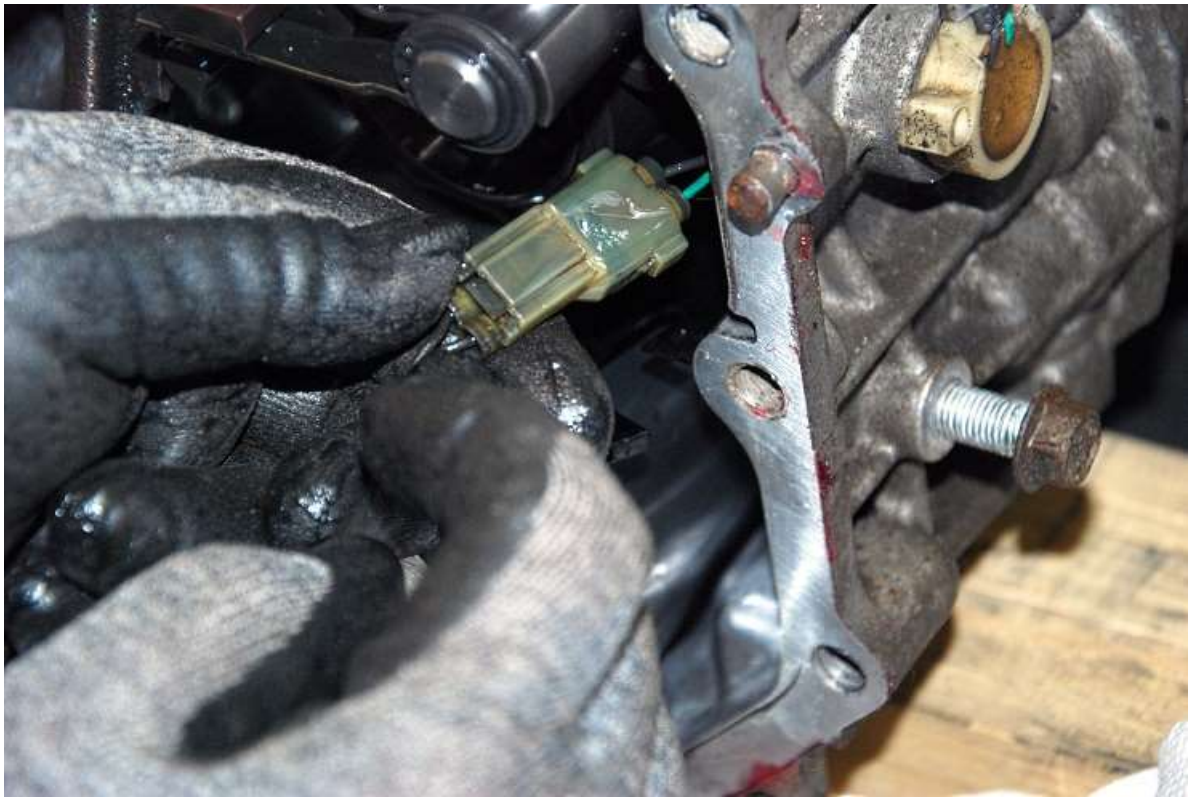
Tailhousing

Using a hammer and punch remove the spring-pin from the shift linkage and pull the linkage off the transmission.

Remove the bolts that hold the tail housing to the transmission, save the bolts as they will be re-used.

Slide the tail housing off the back of the transmission, it may take a few whacks with a soft mallet to get it free of the locating dowels.

Center Differential



If the center differential is the electronic type, unplug it before removal.

Slide the center differential out the back of the transmission. Be careful as it will be slippery and is heavy.

Remove the c-clip that holds the differential together.

Separate the differential and all the clutches until just the center section is free.

Pry the oil pump drive gear off the remaining differential center piece. You will need to re-install this gear unless your transmission doesn't have a pump.

Using the Tamper proof Torx bit and a T40 regular bit remove the drive flange from the differential.

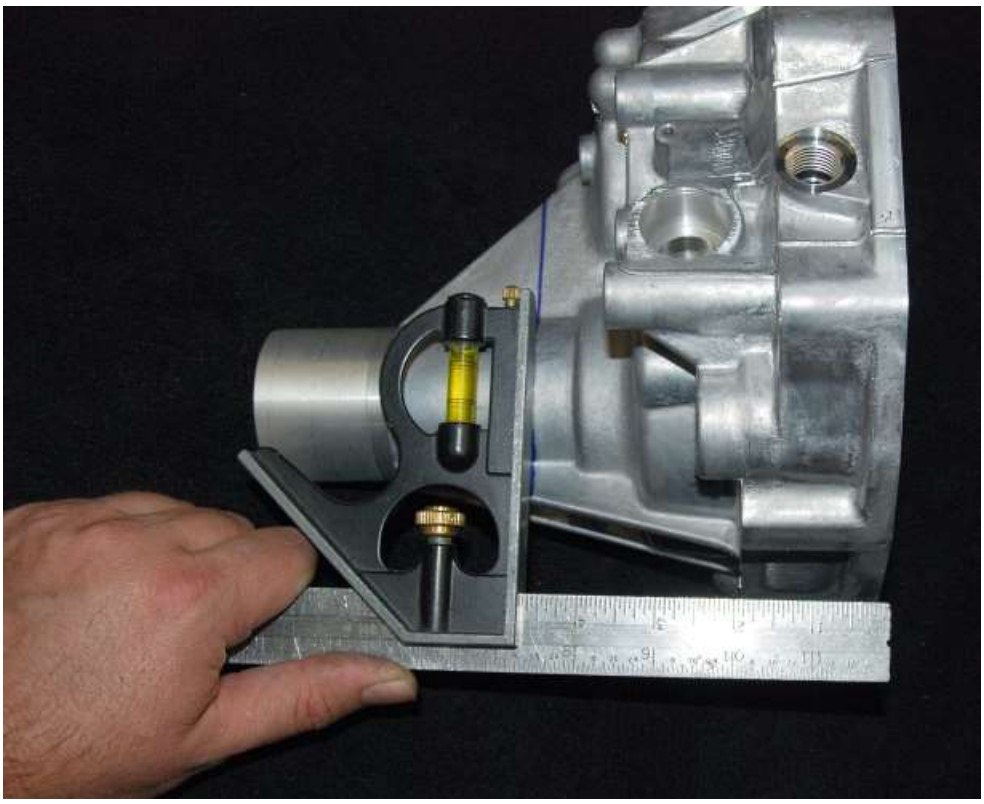
Tailshaft

Remove the tail shaft from the tail housing, it will not be re-used.

2WD Adapter

Using the provided hardware, bolt the drive flange to the provided adapter flange. Test fit the complete assembly with the bolts just snug to ensure proper alignment and then tighten. If your transmission has the oil pump then fit the ring back into position with a hammer and punch.

Tailhousing



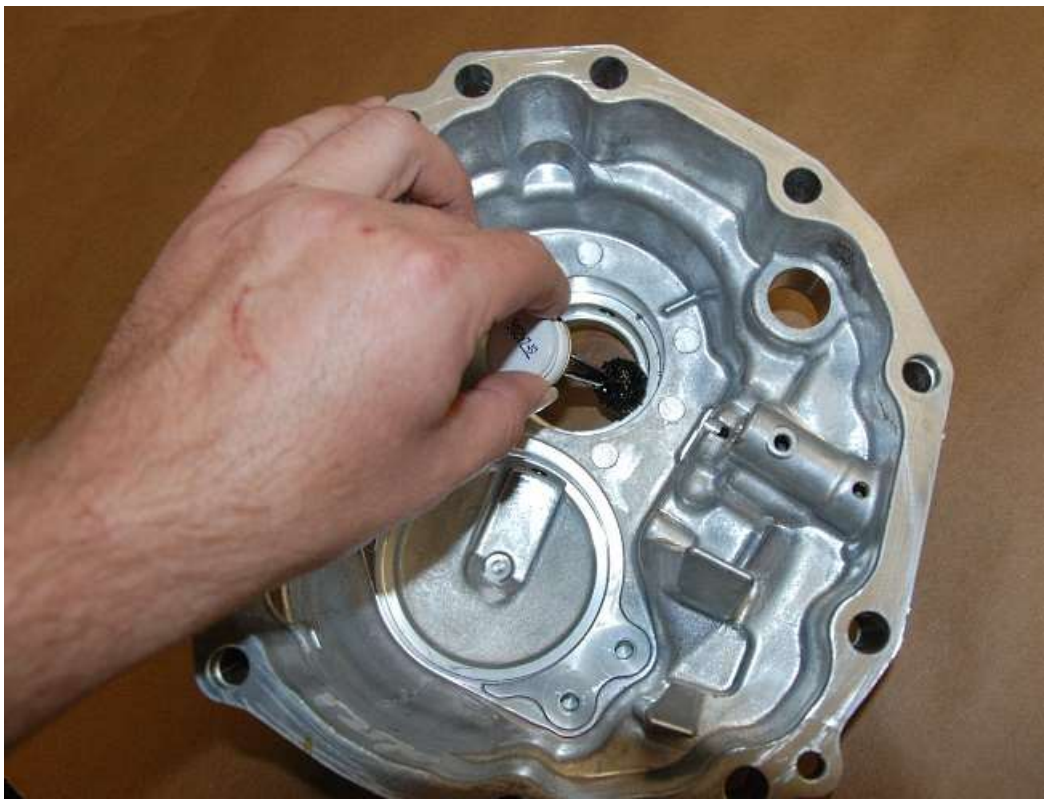
Mark the transmission 4¾ inches from the mating surface for trimming off the excess tail housing.

Make sure the mark made will not have you cutting through the cast in bump under the tailshaft and only goes through the two ribs.

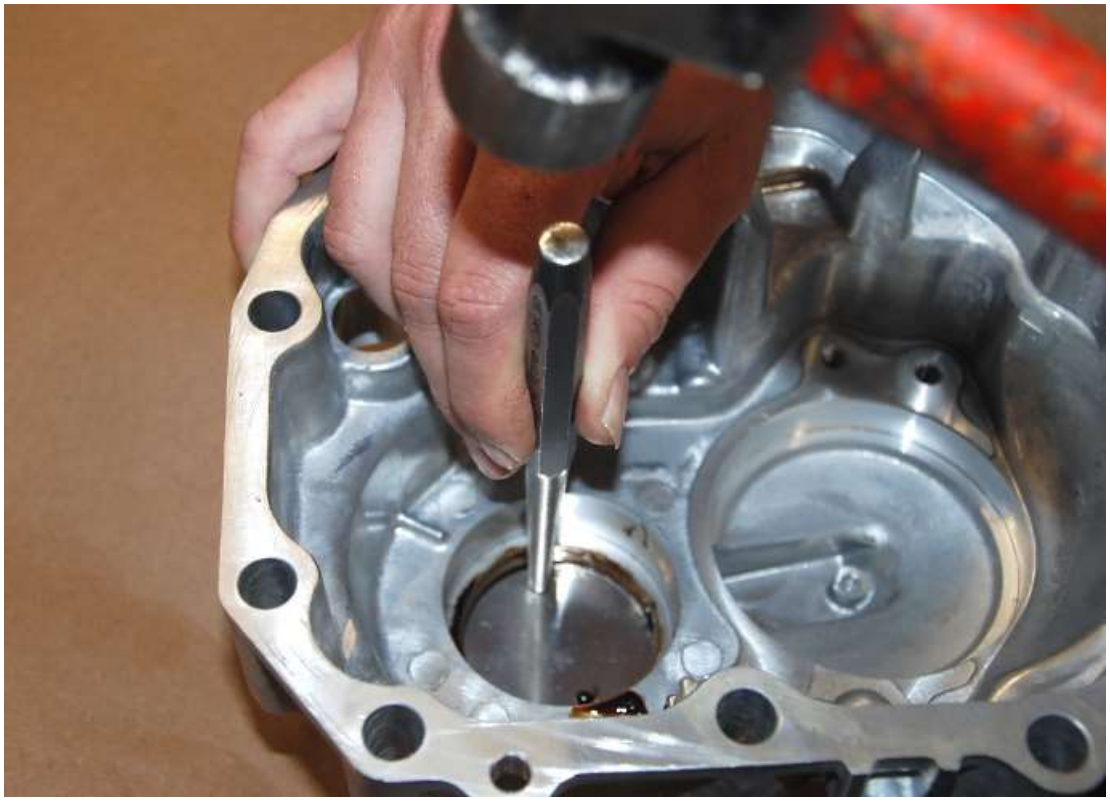
Using a band saw, reciprocating saw or a hack saw, cut the tail housing being careful to maintain a straight cut.

Locate the laser cut aluminum plates that block off the rear openings. If there is any bur left on it, remove it gently with a file.

To be sure that you get a good seal we recommend using a gasket shellac compound like the one above from Permatex. This is their #20539



Using the applicator, coat the inside edge of the tail housing where the round plug will sit.



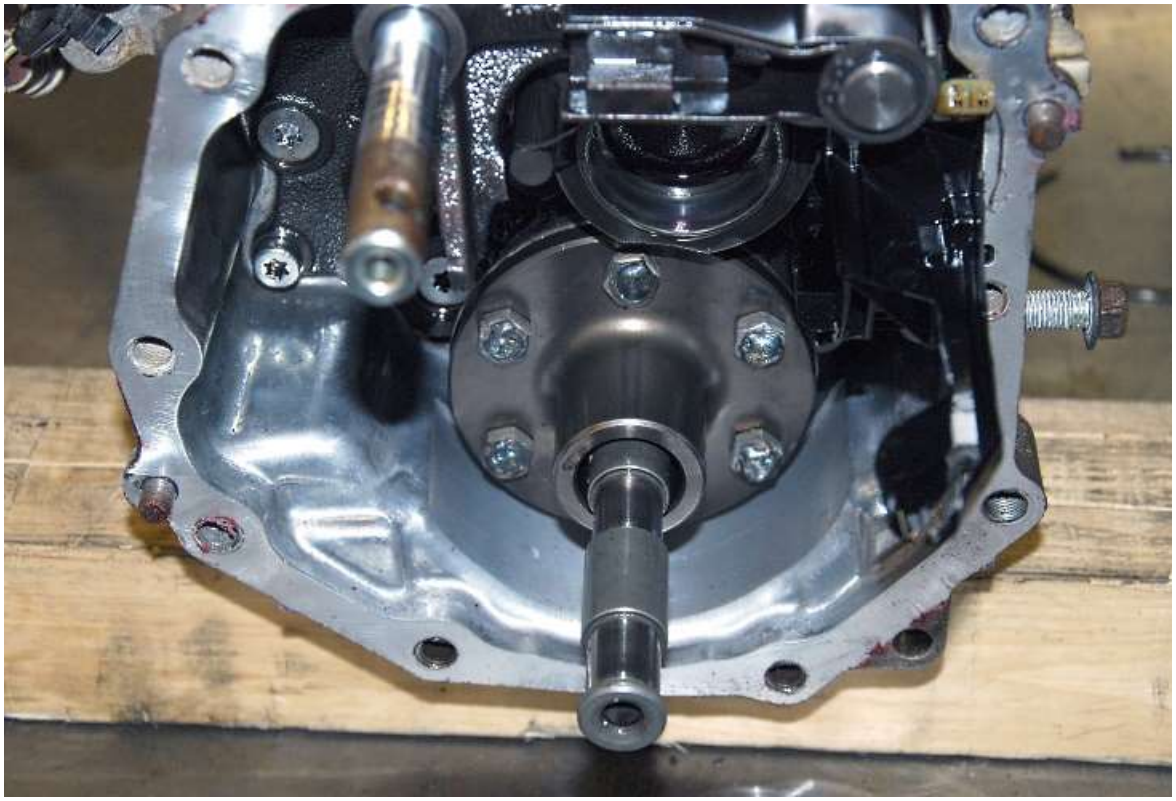
Using a flat punch, tap the plug into place until it sits on the step. Make sure it goes all the way into place or it will leave the passage from the lower part of the housing open.

Apply the gasket maker to the small rectangular shaped passage, if it makes a mess it will wipe off but make sure you don't wait for it to set.

Use a Punch to tap the smaller plug into position, the passage is tapered so it will only go down in a little way.

Apply more gasket shellac to the backside of the plugs to help seal and prevent them from popping inward.

2WD Adapter



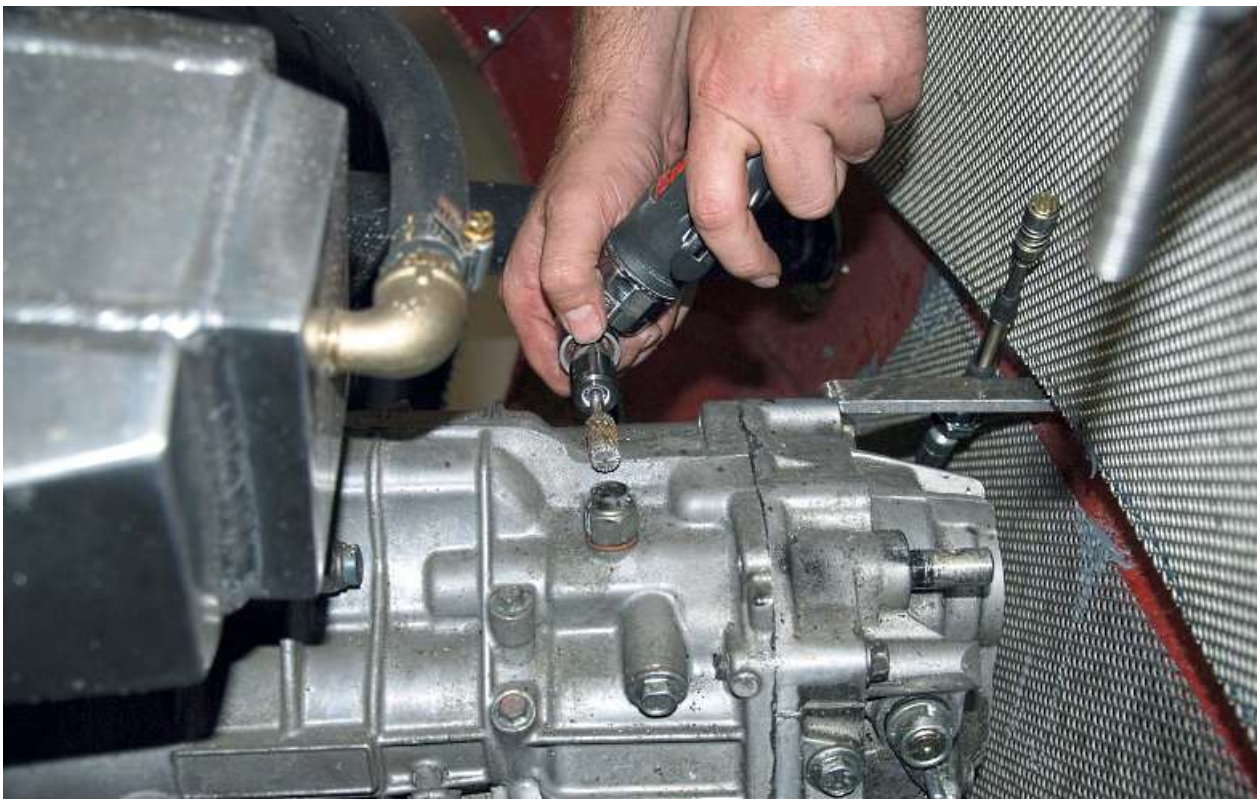
Slide the finished 2WD Adapter into place with the factory drive flange forward and the adapter flange toward the rear of the transmission. It may take some light tapping with a mallet to make sure it is all the way in position.

Tail housing

Use an Anaerobic gasket maker such as Permatex #51813 (used above) to seal the tail housing back to the transmission.

Bolt the tail housing back onto the transmission using the original hardware. If you have the model with the plastic oil splash tray make sure it is in place before the halves go together. Torque the bolts to 35 lb-ft (48Nm).

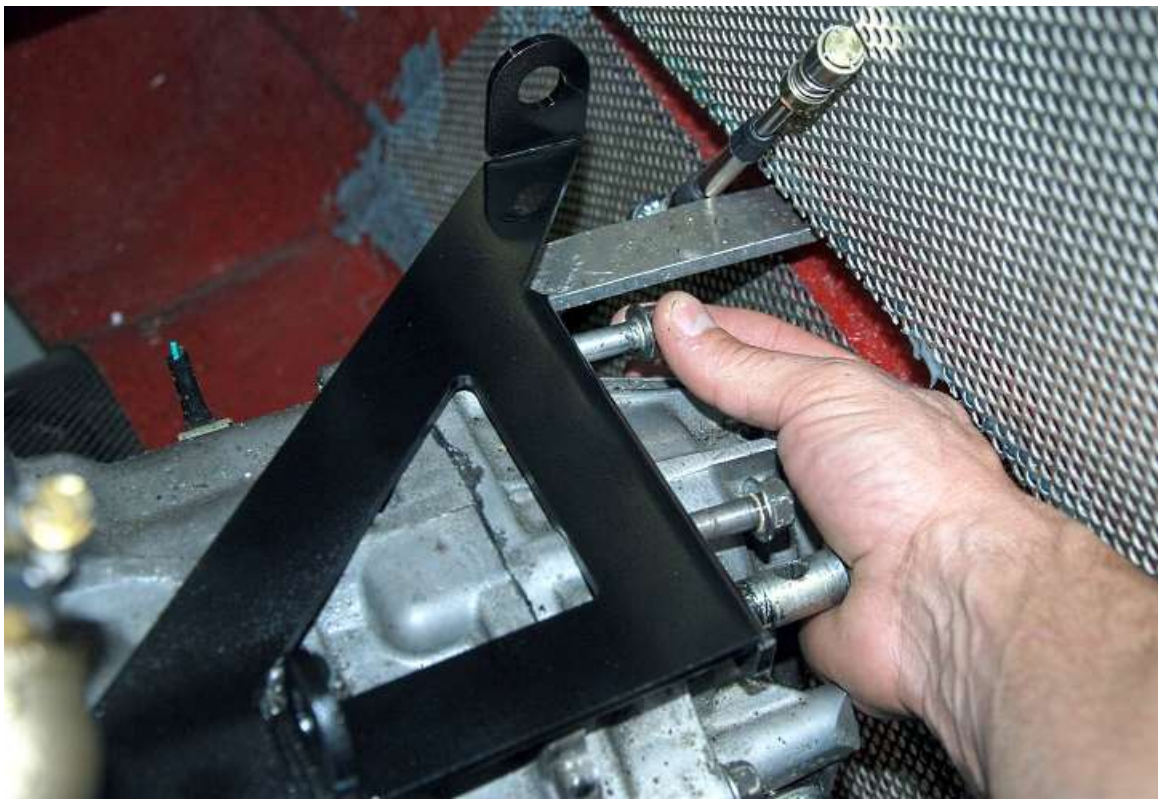
Cable shift Transmission bracket



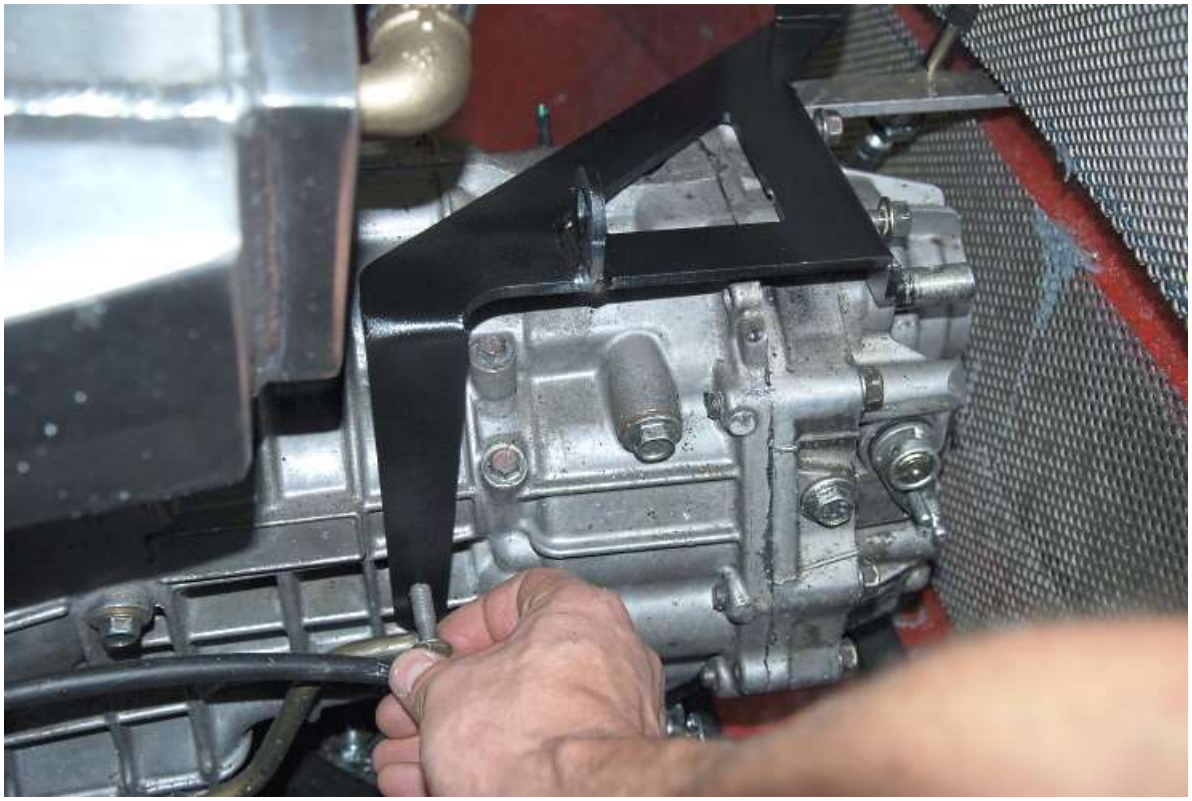
The top rib on the rear of the transmission will need to be ground for linkage bracket clearance.

Use the bracket as a guide for how much material to remove. it is ok if the bracket just touches the transmission housing when it is tightened down.

Fit the bracket in from the top side. You will have to remove the two upper tailhousing bolts and slide them through the bracket to hold it in place.



Loosely mount the bracket using the factory bolts; just turn them in a few threads to allow for alignment.



With the upper bolts loose move the bracket until the lower threaded boss in the transmission lines up with the slot. There was a factory bracket in this location that needs to be removed if it is still in place and one of the original bolts will be re-used for the linkage bracket.

Mount the shift cables to the linkage bracket leaving the jam nuts loose enough to adjust by hand. The bracket is shown unmounted in this picture but it should be in place on the transmission.

Use the small hole on the bottom corner of the bracket for a zip tie to hold the reverse lockout mechanism in place.

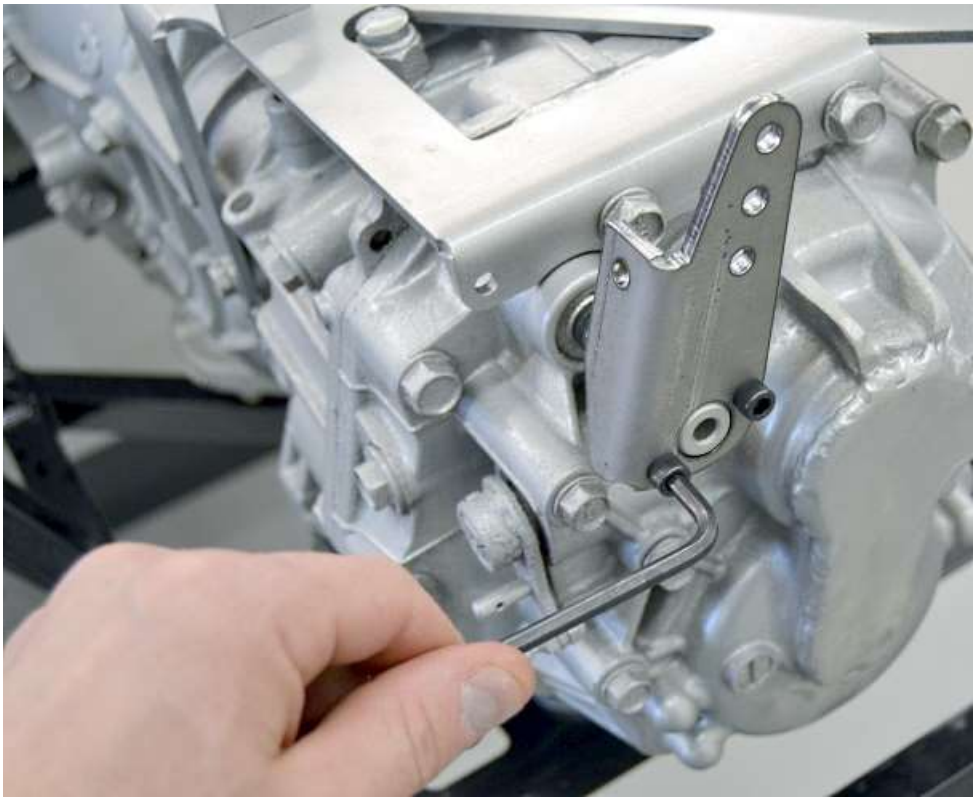
- The mechanical lockout for reverse is now bypassed. Extra care should be taken putting the car into 5th gear to ensure that you don't grind the reverse gear during the shift.

Pull the zip tie until the lockout arm is at the 1 o'clock position. Test the transmission linkage to make sure it will pop into reverse.

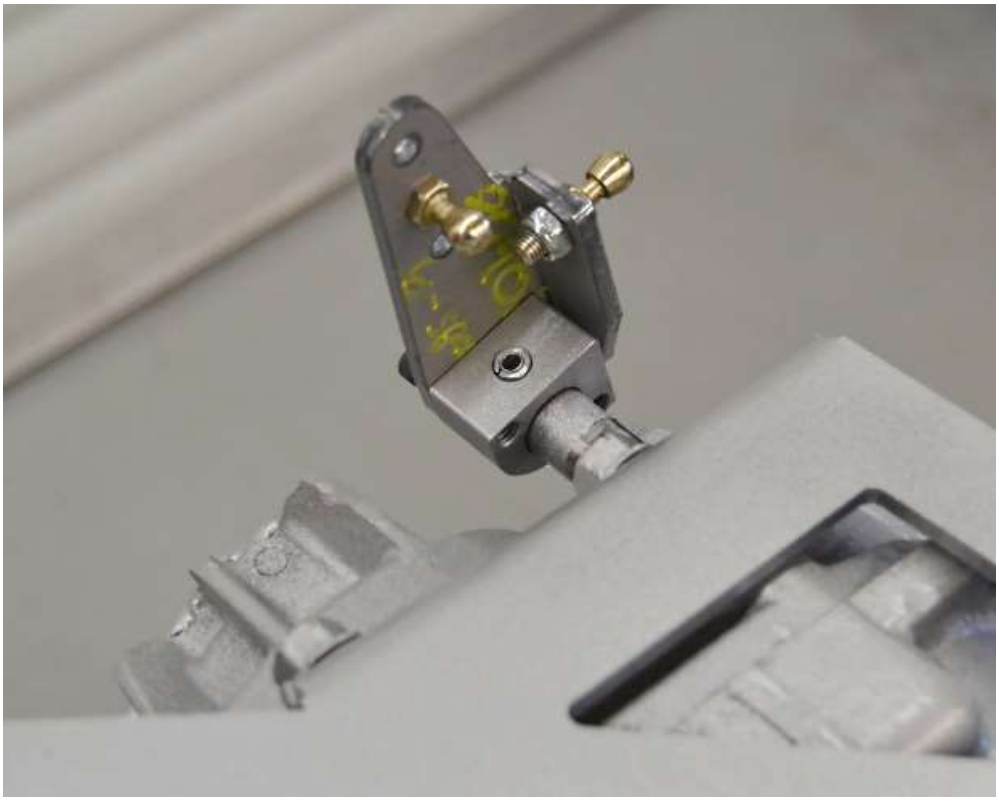
Shifter linkage

🛠 $^{3}/_{16}$" hex key, $^{3}/_{8}$", $^{7}/_{16}$" wrenches, hammer.

Attach the mount cube to the linkage arm as shown using the stock spring pins.



Attach the mount plate to the cube using the ¼”-20 x 0.75” socket head screws and a 5/32” hex key



Attach the ball studs for the shift cable to the mount plate as shown. Start with the center hole on the back.

Appendix H: 818R Supplement Instructions

Rev A

- The 818R assembly is unique in that it can be built for track use, for street use, or for dual purpose. The information in these instructions is provided as a supplement to the standard assembly manual where the R model is different than the S as well as covering information about building a more track specific car. After the assembly section there is also a set-up section to get a good baseline for track use. For street use the settings in the assembly manual are the same for the R or the S models.
- It is highly recommended that you read these instructions in full before beginning your build so that you will know where the assembly procedure is different for the R model from the assembly manual when you get to that step in the build.

Suspension

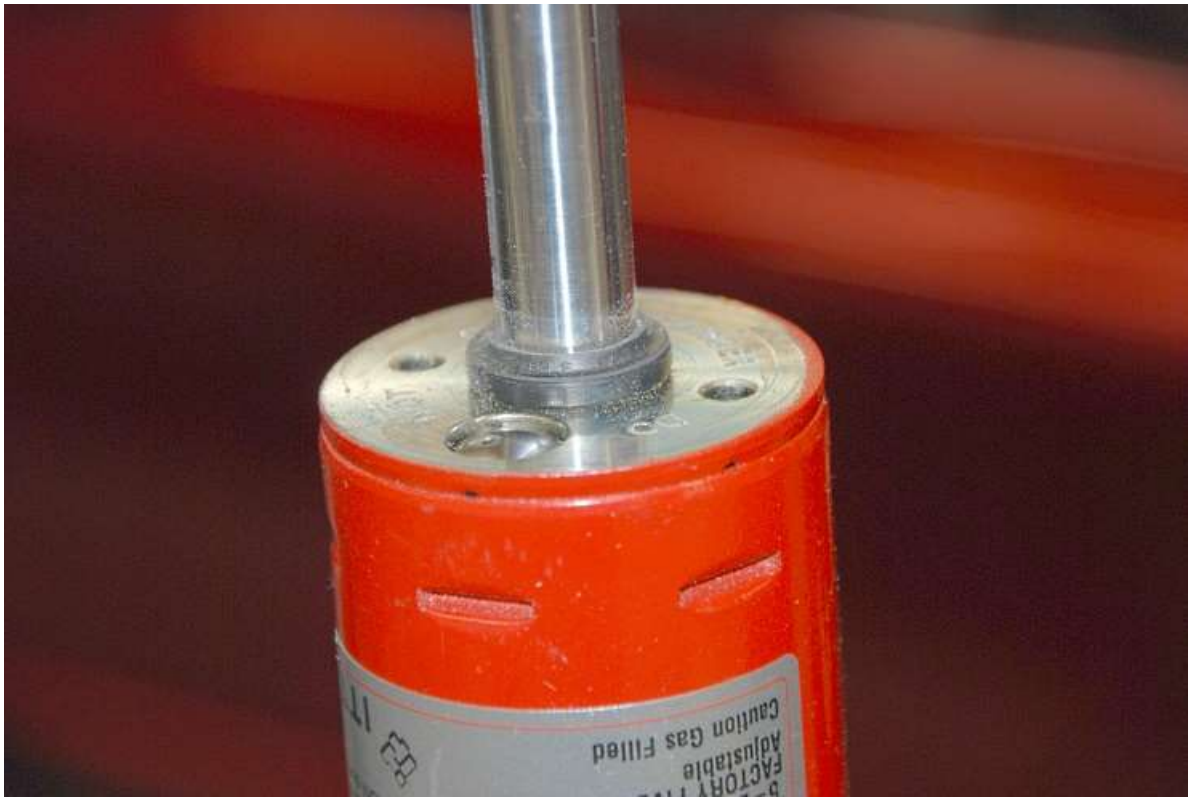
Spring rates

These were set from the factory based on the most aggressive combination for the R model. Since a mid-engined car will tend to understeer at low speeds and then switch to oversteer at higher speeds the spring set-up is very important. The rates that come in the kit are optimized for high downforce and are a compromise in stiffness for a car with little or no aero. If you are not running a rear wing then we highly recommend swapping the springs and running the 500lb coils in the front of the car. This will make the car understeer at low speeds but gives much better drivability at higher speeds on track. If you are doing mostly auto-crossing and the speeds are lower, running the stock 500 rear/300 front is most likely going to be faster as a baseline but further spring tuning is recommended based on your tire sizes and driving style. Also on a low downforce setup where the spring rates are swapped for softer ones then we recommend keeping the front sway bar for tuning as well.

Shock adjustment

- The Coil overs that come with the R model are a mono-tube shock and are stiffer than the twin tube shocks that come with the S model. They should be set from the factory on the softest setting out of the box but we recommend double checking them before installing and leaving them on the base setting until you are comfortable with the car.

To adjust the shocks pry the plastic cap off the main body that surrounds the shock shaft.



The metal button under the collar needs to be pushed in for the shock to adjust.

Holding the button down, twist the shock shaft to adjust the valving. You will feel clicks at each setting and the final setting is where the shaft stops turning. With the body of the shock down (as shown in the vice) turning *Clockwise* will stiffen the valving while turning *Counter-Clockwise* will soften the valving.

Sway bar

Due to the heavier spring rates provided with the R chassis we do not generally run the front sway bar. If you are building the car as a street car and switch to the softer spring and shock package of the S model then the sway bar is still recommended.

Ride Height

The R chassis along with the S chassis is designed to run at an approximate 4.5 inch ride height using standard OEM suspension parts. The chassis was also built to easily allow a track only ride height while maintaining the same geometry but this requires some extra parts and will only work with the front control arms from the sedans and not the wagons.

For the standard ride height the suspension install is the same as in the assembly manual.

TRACK ONLY LOWER RIDE HEIGHT - FRONT

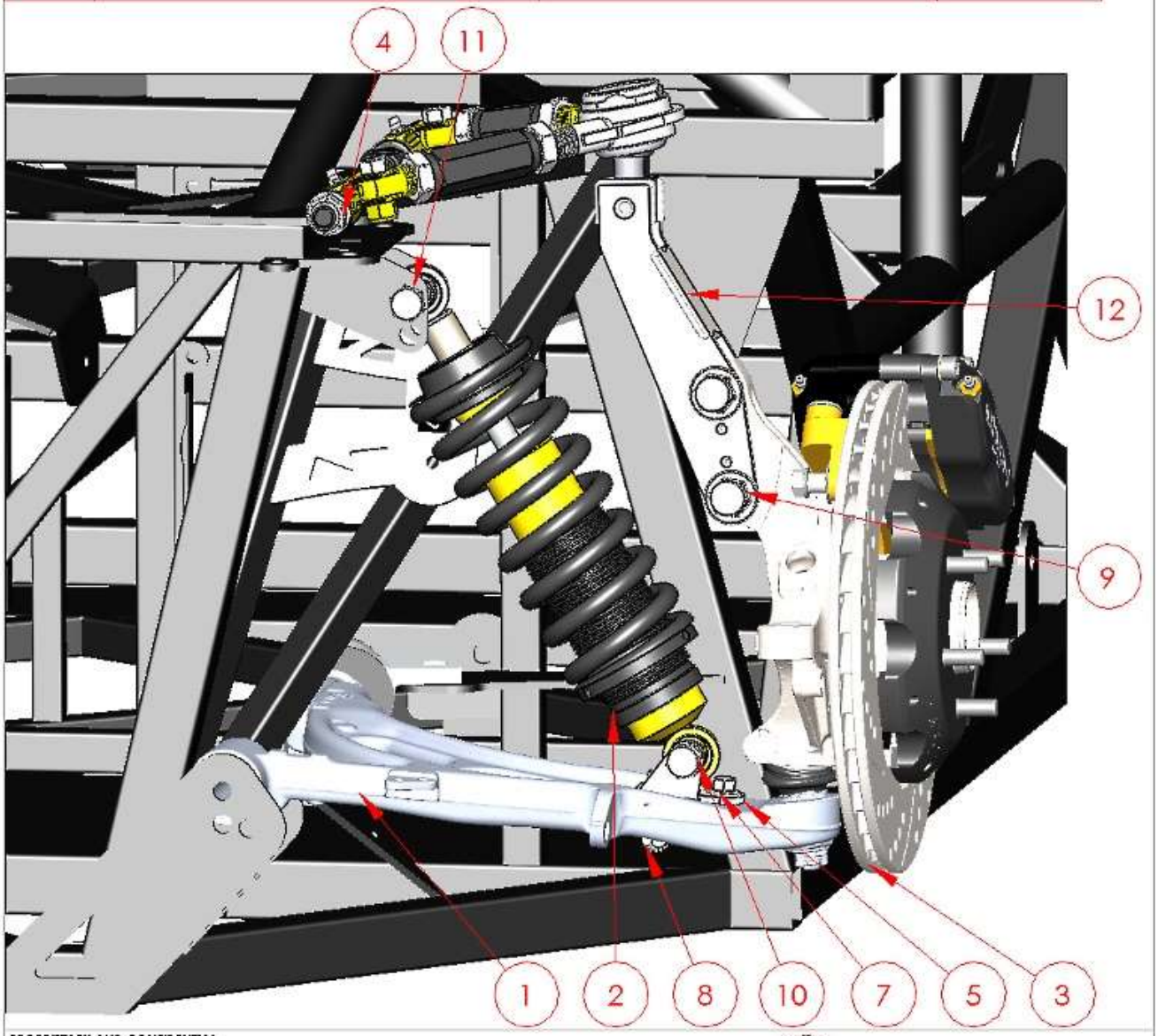
Recommended parts

- 2 Spacers $^{5}/_{8}$ inch inner diameter ¾ in tall (Washer stack is fine)
- 2 Spacers $^{5}/_{8}$ inch inner diameter $^{5}/_{16}$ in. tall (Washer stack is fine)
- Aftermarket Bump Steer Kit for 2002-2007 WRX
- 2 Grade 8 bolts $^{5}/_{8}$ inch x 5½ in. long
- 2 Spacers 2¼ inch $^{5}/_{8}$ Inner diameter (.125 wall min)
- 4 Upper Control arm spacers, ½ in. I.D. x 0.8 in. long (or stack shims or washers)

- 4 Grade 8 bolts ½ inch by 2¾ inches long
- $^{5}/_{8}$ inch Washers

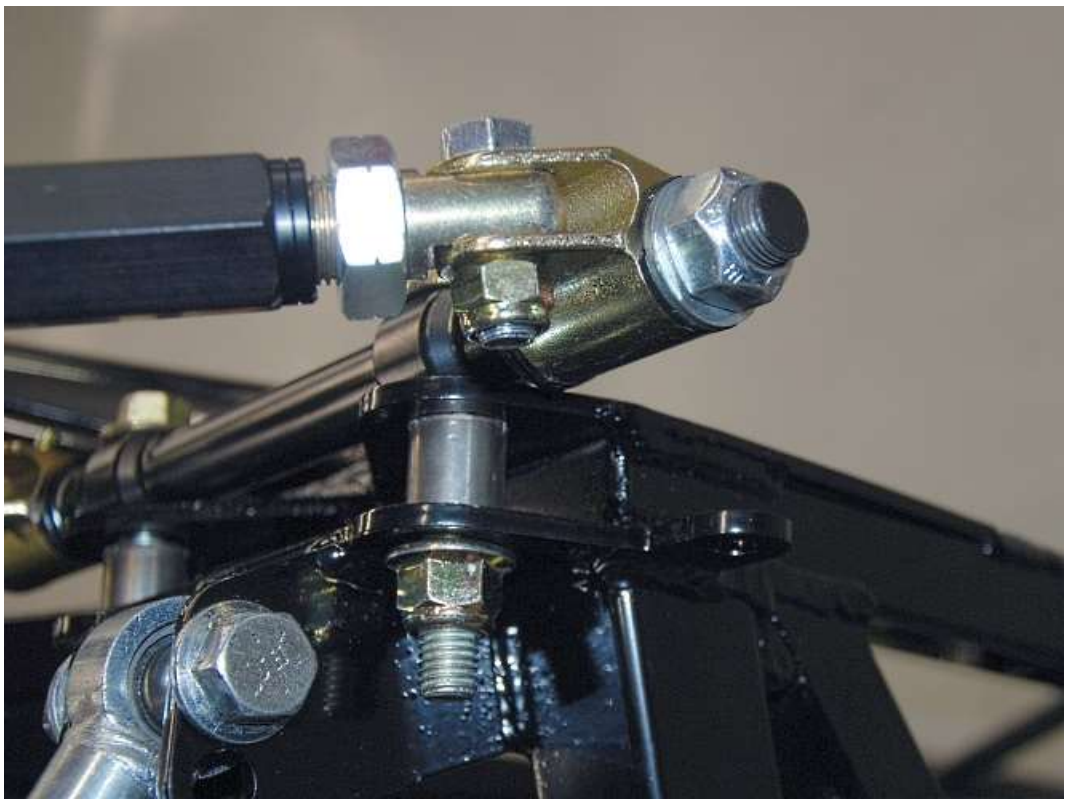
Track Height Front Suspension

ITEM NO.	PART NUMBER	DESCRIPTION	Competition/QTY.
1	Front Lower Control Arm		1
2	818 koni Shock	818 KONI FRONT SHOCK	1
3	Front Spindle		1
4	15501	FRONT UPPER CONTROL ARM	1
5	80267	FRONT LOWER SHOCK MOUNT BRACKET	1
6	B18.2.3.4M - Hex flange screw, M10 x 1.5 x 40 --26N		1
7	B18.2.3.4M - Hex flange screw, M10 x 1.5 x 35 --35N		1
8	AM-M10-N		2
9	B18.2.3.4M - Hex flange screw, M16 x 2.0 x 60 --38N		2
10	HBOLT 0.5000-13x2x1.25-N		1
11	12385	HBOLT 0.5000-13x2.5x1.25-N	1
12	80051	IFS BRACKET ASSEMBLY	1



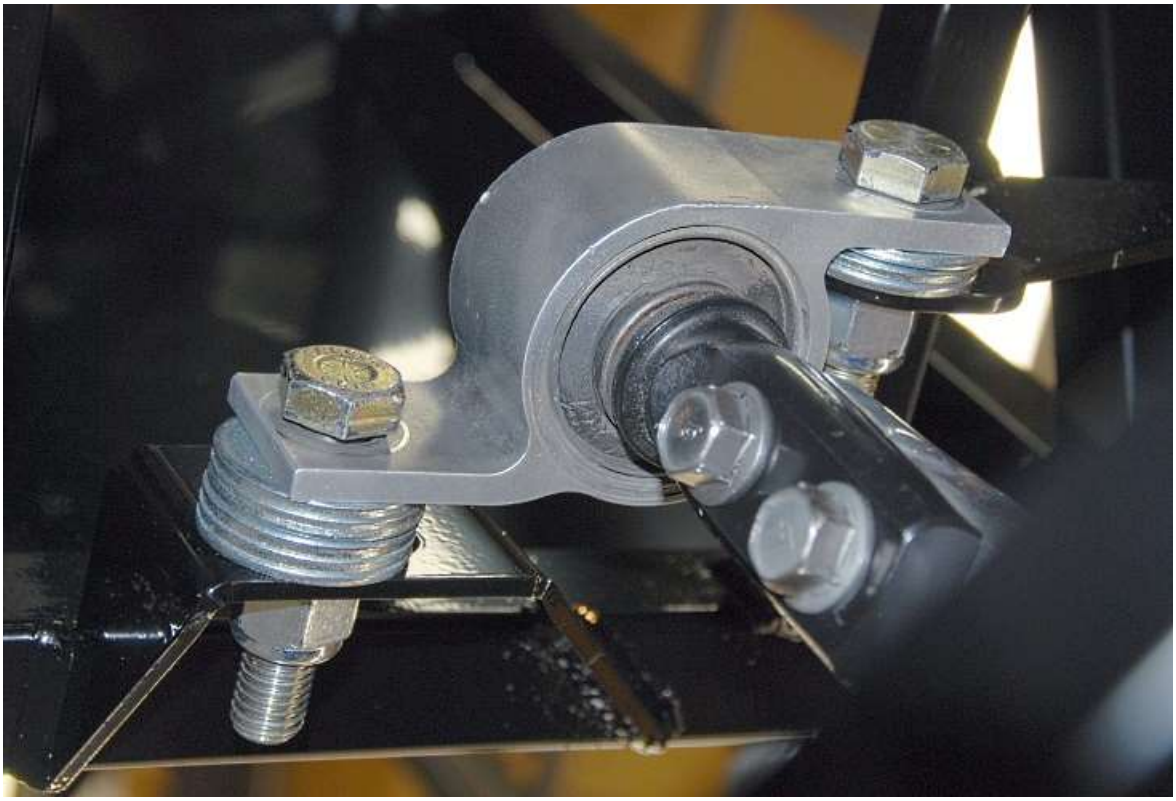
Factory Five Racing, Inc.

The front upper control arm will now mount on top of the top set of frame tabs. In order to maintain the full strength of the mount use longer bolts that still reach both mounting tabs.



Either with washers or spacers take up the 0.80 inch height between the two mounting tabs so the frame doesn't crush when you tighten the bolts.

On the lower control arm the front mounting bolt moves to the upper hole. The aluminum arms often have a casting bump that can touch the frame in this position; it should be removed with a grinder or file so that the arm pivots freely and does not contact the tube.



The rear mount for the control arm is spaced up using spacers or washers to be even with the front mount. The lower bolt requires ¾ inch of spacing and the upper mount switches to being on top of the frame and needs about a $^{5}/_{16}$ in. spacer. The thickness of these aluminum mounts can vary so the upper

bolt spacing may be a little different. If you tighten the lower bolt and measure the distance at the top it will give you the exact distance you need.

Because the steering rack does not move, a bump steer kit is required. Most of the aftermarket kits will not reach the distance needed so we drill out the spindle and use a $^{5}/_{8}$ inch grade 8 bolt instead of the tapered mount usually provided. A $2^{7}/_{16}$ inch total spacer should get you close to optimum bump steer, but we cut the long spacers a little short to allow for adjustment in both directions.

TRACK ONLY LOWER RIDE HEIGHT - REAR

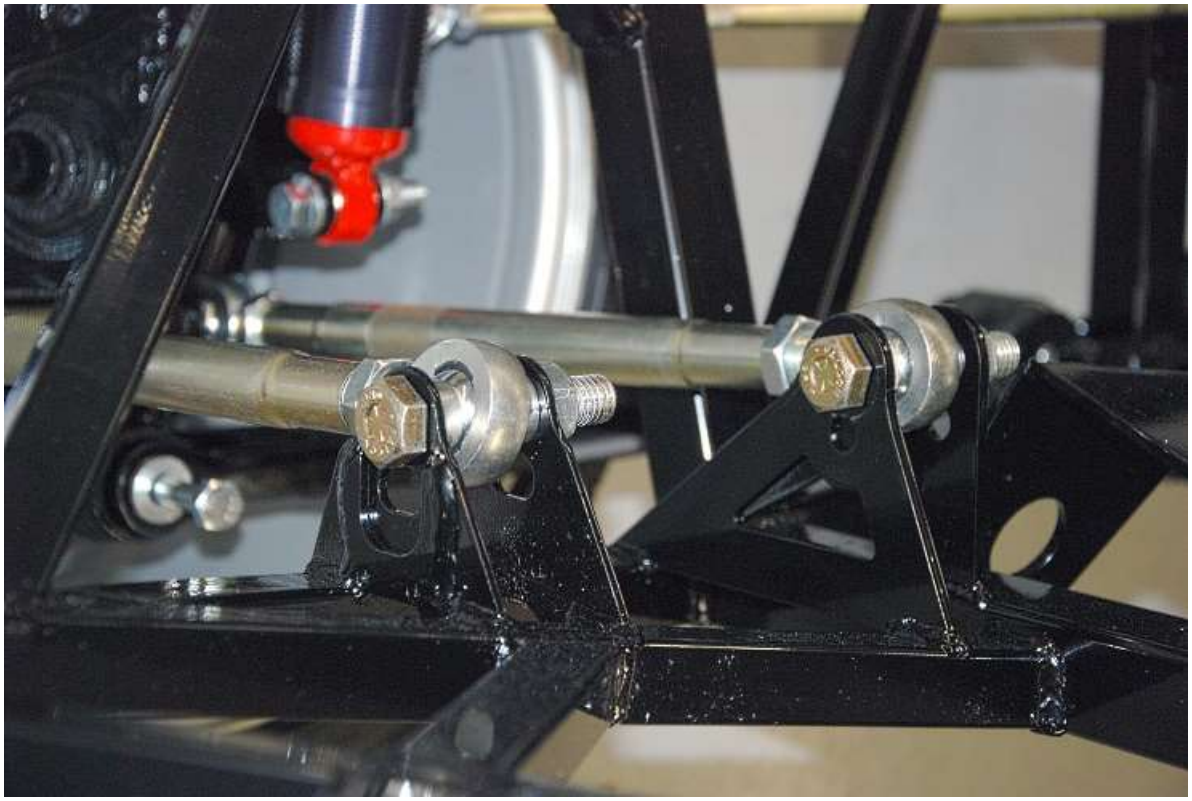
Recommended parts

Heim Joint lateral links consisting of:

- (4) Swaged link tubes 12 inch long with ¾ fine thread (left hand/right hand)
- (2) 8.5 inch long $^{5}/_{8}$ bolts for attaching rod ends to spindle
- (4) Left hand thread ¾ inch shank $^{5}/_{8}$ inch bore rod ends w/jam nuts
- (4) Right hand thread ¾ inch shank $^{5}/_{8}$ inch bore rod ends w/jam nuts
- (4) 2¾ inch long $^{5}/_{8}$ inch bolts
- (6) $^{5}/_{8}$ inch nuts
- (8) $^{5}/_{8}$ inch inner diameter by $^{3}/_{8}$ inch long spacers for rod ends.
- (2) Longer ½ inch grade 8 bolts for upper shock mounts.
- $^{5}/_{8}$ inch Washers

Assemble the lower lateral arms using the factory arms as a guide for length. Double check the arm length with each other to make sure they are the same side to side.

The rear spindles need to be drilled out for the $^{5}/_{8}$ inch bolt that holds the rod ends. Drilling through the cast iron is not hard if you run the drill slow and use some oil or cutting lubricant.



Bolt the lower lateral links to the upper holes on the chassis tabs.

Bolt the outer end of the lower links to the spindle using the long $^{5}/_{8}$ inch bolt. Because these rod ends are mounted on the outside of the spindle use washers that are bigger than the inside roller on the rod end for safety. (In the event of a rod end separating, the arm is still captured)

The upper link mounts to the upper hole in the chassis as well.

Upper and lower trailing arms mount in the upper mounting holes.

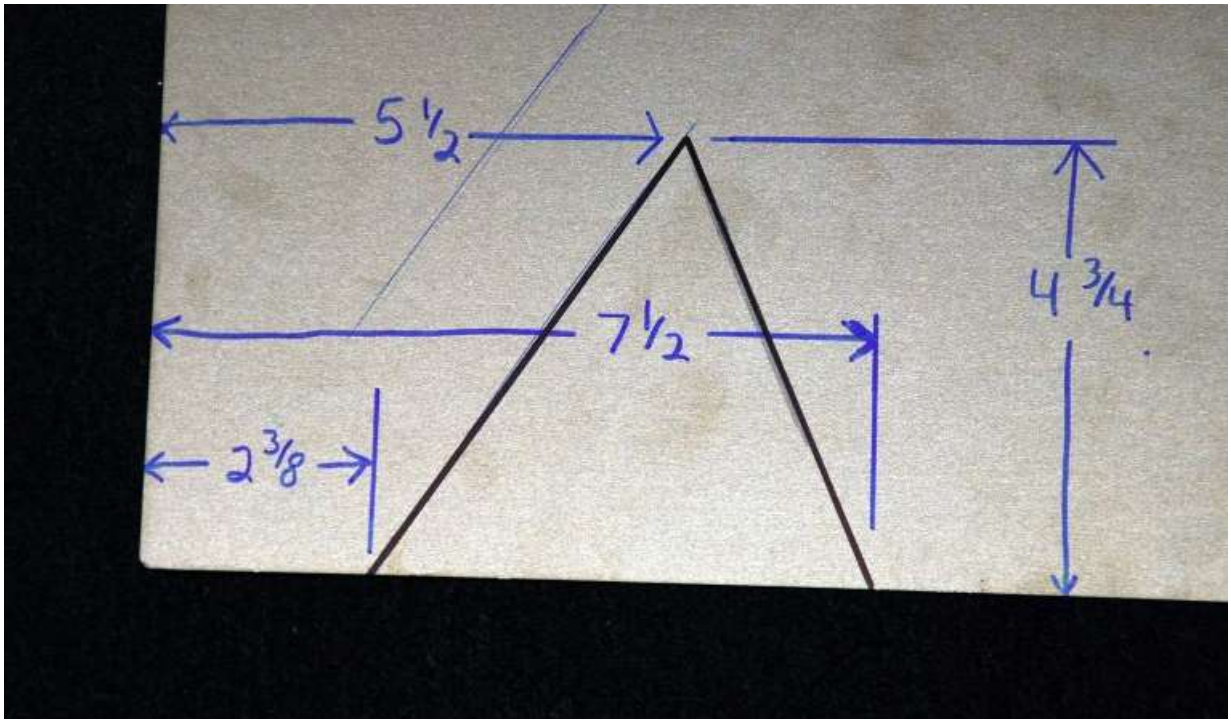
The upper shock bolt now runs through the chassis brace and in the upper set of holes. The shock bolt and chassis brace bolt will need to be replaced with one long ½ inch x 4½ inch long bolt.

Lowered ride height rear suspension completed.

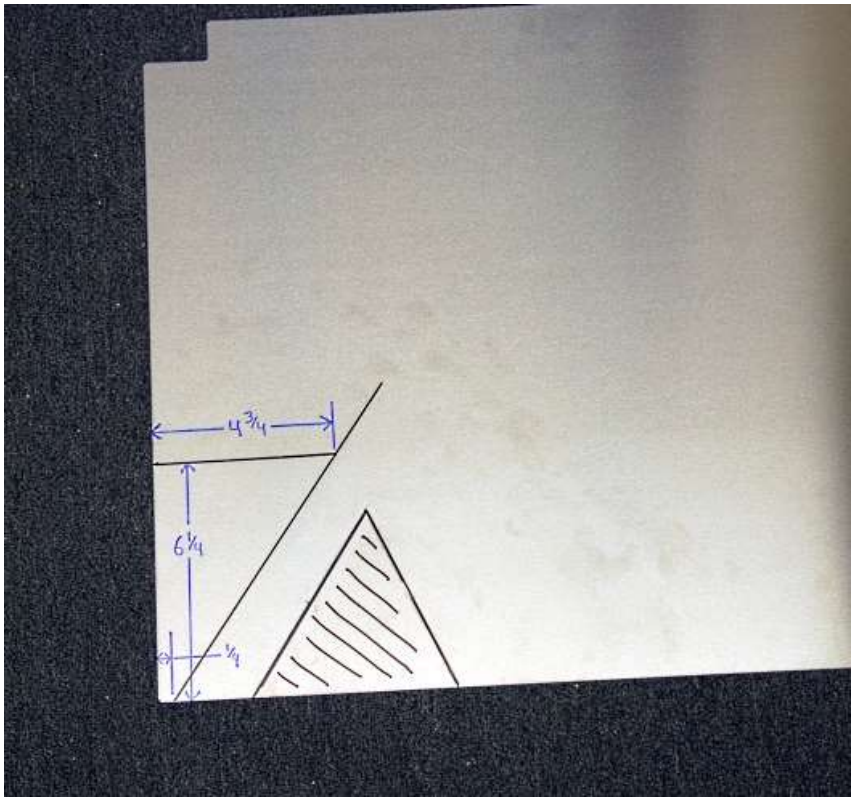
Cockpit Side Aluminum

- For Wheel to Wheel racing it is required by many sanctioning bodies to have anti-intrusion plates on at least the drivers' side. This can be done by either supplementing the aluminum driver side panel or using it as a template to cut an entire panel out of thicker material.

The cockpit side panels mount on the outside of the frame. Hold them up by hand or with a few rivets and trace them from the inside to locate the tubes. The radiator hose pass through is not cut on these panels giving the option of running the hoses one on each side or both down the passenger side.



If you plan to run one coolant hose down each side use the template above to cut both side panels in the lower front corner.

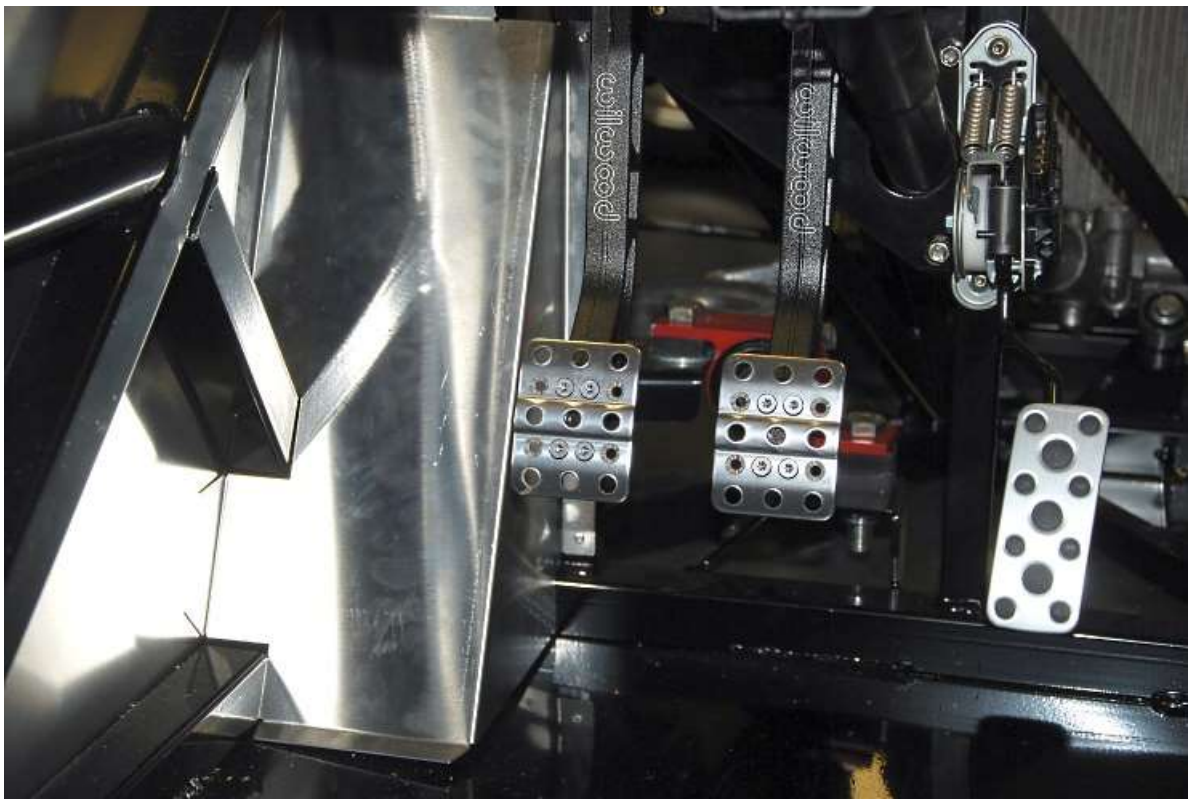


If you plan to run both coolant tubes down the passenger side, (for a car that only has one seat it helps balance out the weight) then cut the passenger side panel out for both tubes. The lower cut from the previous template and the additional cut from the picture above. The driver's side will not be cut at all.

Panel cut for two coolant tubes. (note: Only the lower triangle is needed for single coolant line per side)

Finish rivet the side panel in place and test fit the dead pedal for coolant hose routing.

With the panel in place make sure there is room to route the hoses. Note that the body tunnel is 5¼ inches above the bottom of the frame so you must keep both hoses below this height.



Finish rivet both dead pedals in place. Even if you don't run the coolant tubes the dead pedal panel is still needed to complete the front wall and useful as a footrest. Some rivets or grip-tape on the panel add a nice touch and keep your foot from slipping off.

Door Mounting

- Doors for the R are bolted firmly into position. We generally use riv-nuts because some of the back side areas under the body are tight to access but you can get a nut and bolt to work if you prefer that method of attachment.

In order to get an even gap the door should be spaced up on the bottom. If you are using riv-nuts to attach then use $^{3}/_{8}$ inch ID washers so they can be permanently attached by the riv-nut. Stack the washers until you get the fitment you want on the door.

With the door spaced into position tape it in place using some painters tape or duct tape if the body isn't painted. Keep the rear gap even with the body while taping and use enough so that the door won't move while drilling.

Mark the inside of the door for drilling the mounting holes. We will usually run 3 across the bottom and two up the back side. This can be done with the door still taped in place; the door has just been removed here for a clear view.

With the door taped firmly in place drill out the holes you marked with a ¼ inch bit. After each hole is drilled slide a bolt into it to keep the door from moving. If you start at the front it is easier to keep the bolts in place while you drill.

Drill out the holes in just the body to $^{25}/_{64}$ and install riv-nuts. Use the washers you had as spacers under the nuts and they will hold the door at the correct lined up position.

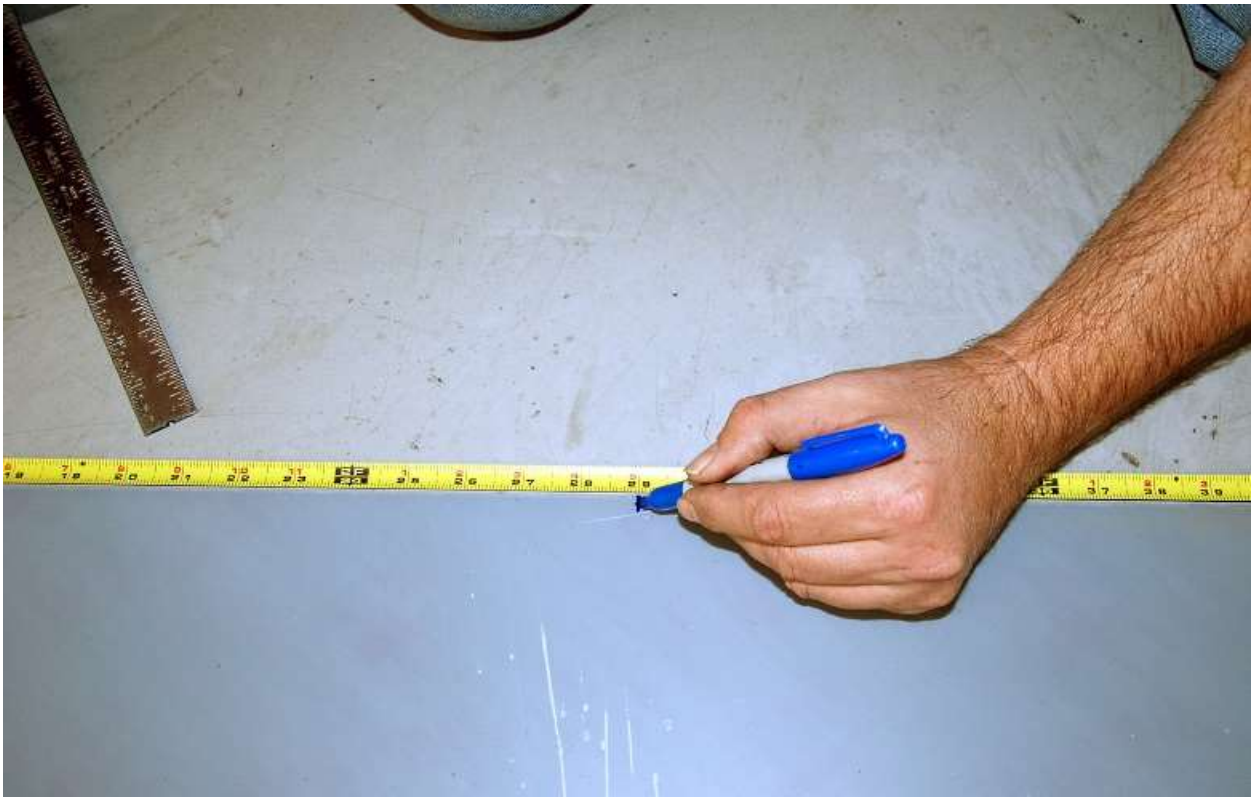
Screw the door into position using button head screws. If needed open the holes in the door up to $^{5}/_{16}$ inch to help line up the screws with the riv-nuts.

The front of the door is held in place using the angled steel brackets and rivets. If you are running the full windshield then only one of these is used per side. With the race windscreen there will be two.

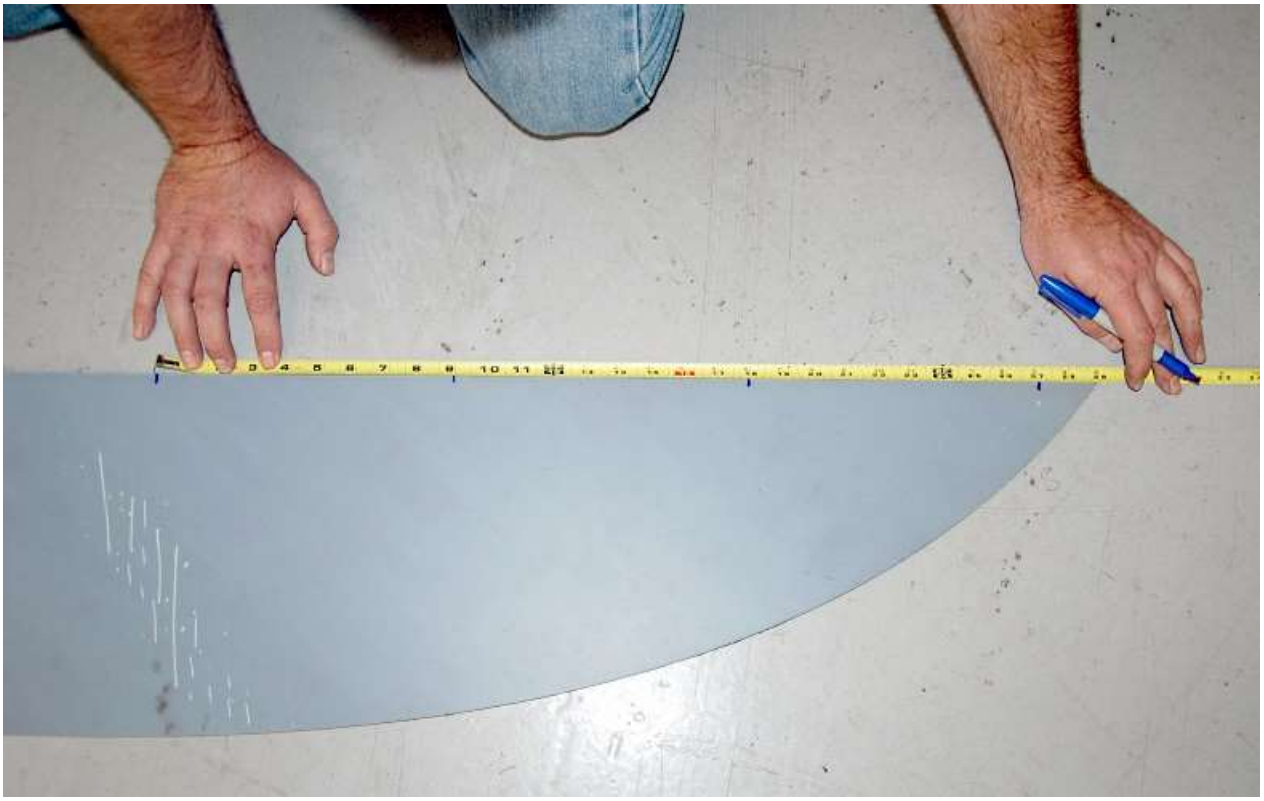
Clamp the bracket in place on the frame and drill the rivet holes. This bracket should be as low as possible if you are running the full windshield. If running the race windscreen , add the second bracket higher up on the door near the top of the mounting pad.

Windscreen

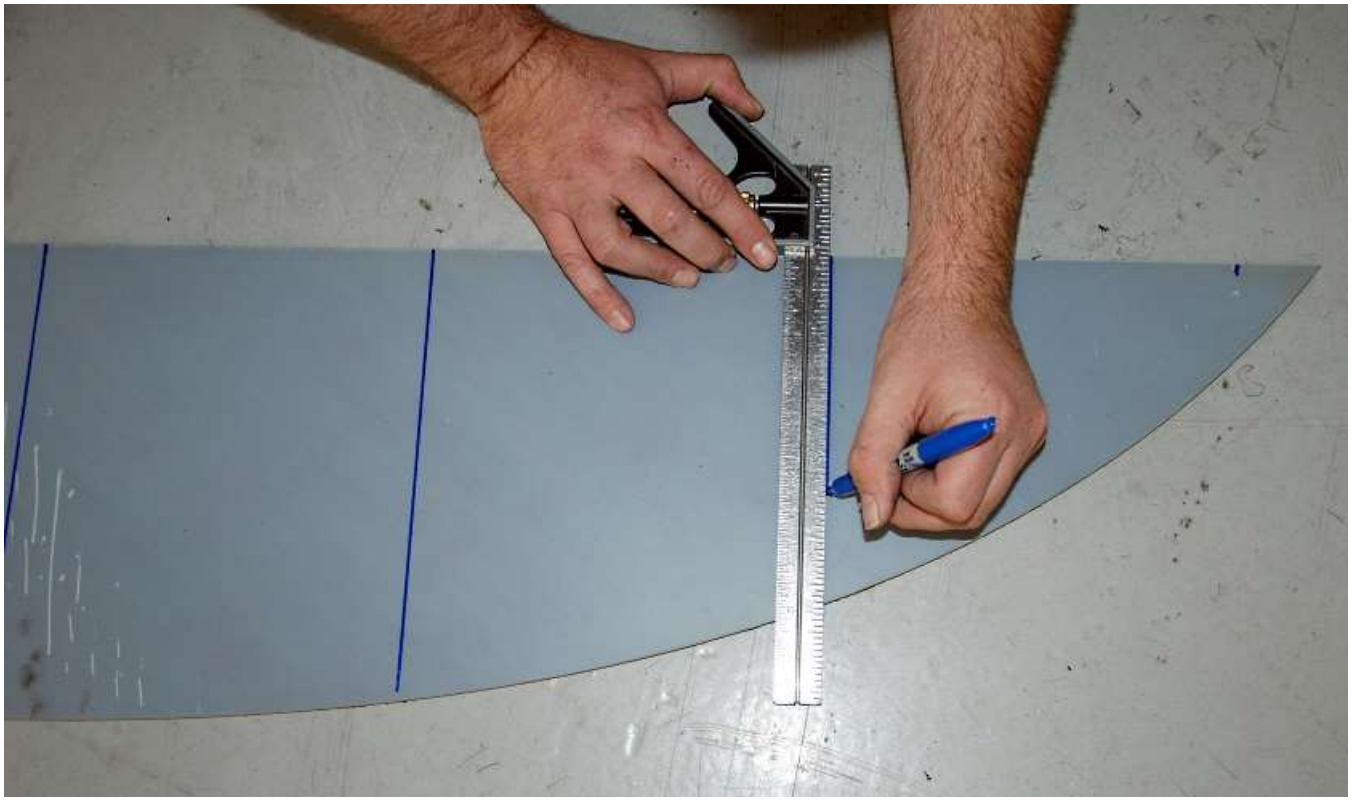
The race windscreen is built from the fiberglass mount and the pre-cut clear plastic. Leave the protective covering in place as long as you can to prevent scratches.



Mark the center of the windscreen using a tape measure along the straight edge.



Starting at the center, mark for the mounting hardware every nine inches.



Using a square draw a line straight down from each mark to the curved edge.

Center the windscreen on the mount and clamp or tape it in place. You want an even edge around the bottom to show below the screen, we usually leave ¼ inch of mount showing but you can raise the windscreen up as high as you want as long as there is enough material for the mounting hardware.

With the windscreen where you want it, drill the mounting holes using a ¼ in. bit. After drilling each hole slip a bolt down into the hole to keep the two pieces from sliding apart and the holes aligned.

Bolt the windscreen down using the hardware provided.

Once you are ready to drive remove the protective covering.

Center Console

- The R model does not come with the center console and the entire tunnel can be removed for extra space. If you do remove the tunnel, you will still need a raised platform to mount the shifter.

Setup Info

- Car set-up can vary a good deal based on the experience and style of the driver. These set-up tips help get a good idea of both a decent baseline setting to start from and to help save some time in the initial trial and testing phase by listing what has worked well for the factory cars and customer cars that have shared their feedback.

Front Suspension

- The key to any good suspension is getting the moving parts to move with as little bind or friction as possible so that the shock and spring combo can do their job and be consistent. Using polyurethane bushings can be a big help in terms of maintaining the geometry under hard loads but any time that style mount is used it should be checked for freedom of movement when tight. Likewise the upper control arms should be well greased and the end nuts set so the arms will fall down to vertical under their own weight. If the arms stay horizontal then the nuts are too tight. Like any race car suspension all the joints need to be greased and inspected regularly, with race tires this means before every event.

Front camber settings can be tire dependent but in general we dial in more and more camber until it starts to take away front grip under braking. Usually this occurs around 3.0° - 3.5° negative camber.

Front caster settings can vary depending on driver size and strength as well as tire size, steering rack ratio, and even steering wheel size. Adding caster can add front grip and stability but eventually

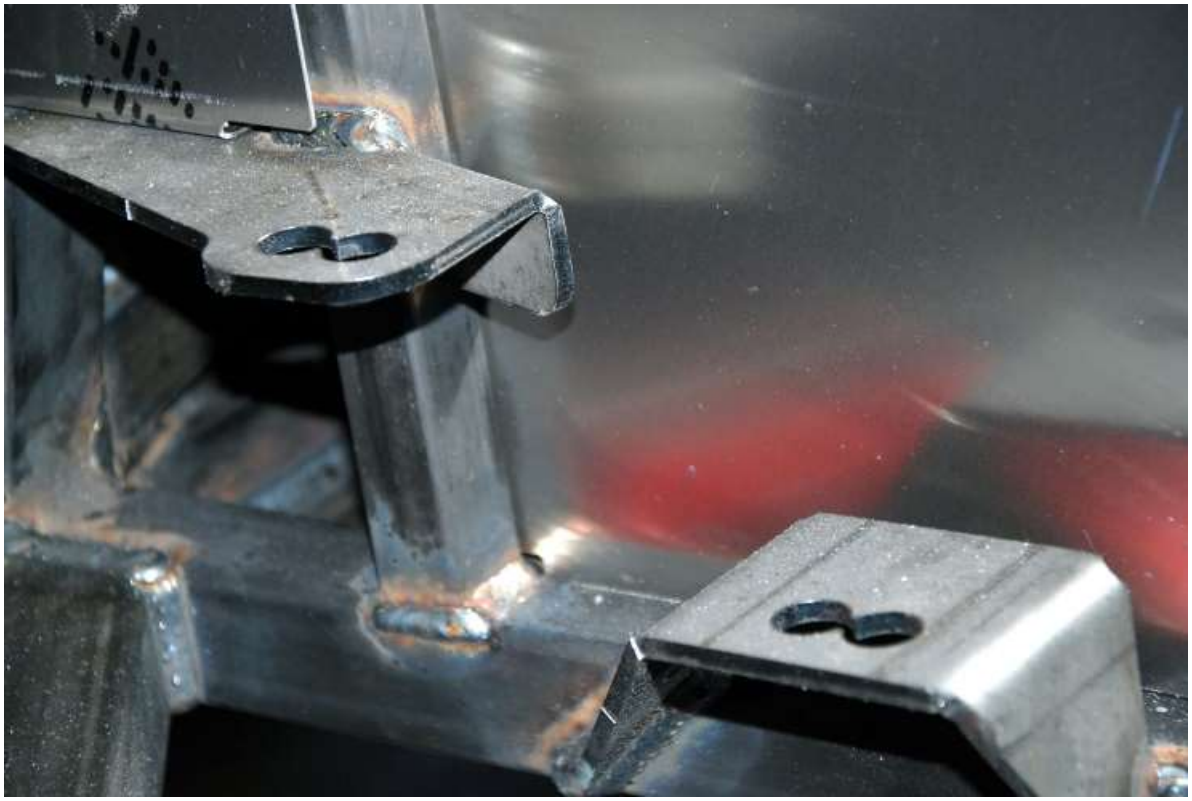
the steering becomes heavy and the car can weight jack (the corner weights get thrown off when the wheels are turned). For the standard racks, 3.5° is a good starting point and 3.0° for the later WRX (2006+ and all STI) quicker ratio racks. If you are running power steering then you can raise the caster up to the 5°-7° range and this will help the over-assisted feel from the front end being so light as well.

Front Toe and Bump steer should be run to keep good steering feel and prevent the car from darting on initial turn in. We usually run just a little bit of toe in, $^{1}/_{16}$ inch total, in the front and set the bump steer as close as possible to zero. Since you will have a little bit of bump steer you want it to toe the wheels out under compression and our baseline setting for that (on the lower ride height) is to space the rod end $2^{7}/_{16}$ inches down off the spindle. Having the car toe out in bump will stabilize the feel under turn in, but too much will make the car feel unstable under braking. Small increment will also make big changes here, so when experimenting change $^{1}/_{16}$ inch shims and feel the difference in the car. The amount of caster affects the bump steer as well by raising or lowering the steering arm, so if your range of caster is far off the baseline then you may want to start with your own measurements for bump steer spacers.

Front Lower control arm length plays a big role in the adjustments you can make to the suspension, both in terms of alignment and also for tire fitment. There are 3 different ways to adjust the track-width to get to the setting you want. The front bushing carriers on the factory arms have offset holes so spinning them 180° from how they are shown in the assembly manual will bring the inner pivot inboard $^{3}/_{8}$ inch when flipped.

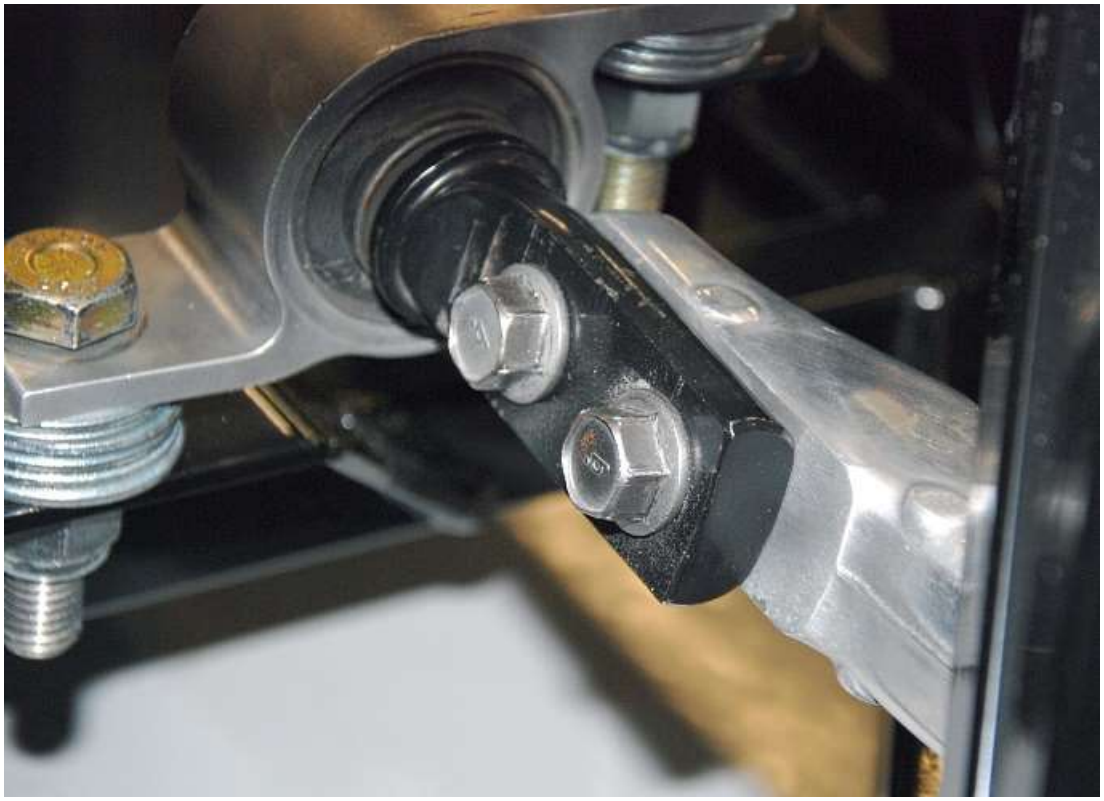
The arms on the bushing carrier look different to make it easy to differentiate which is the long one. The flat side is the shorter side and the indented side is longer.

The chassis also has two sets of holes in the mount for the bushing carrier. Just moving the wider arms to the outer mount would most likely be too large of an adjustment, but pivoting the bushing sleeve as shown above to move the arm back some of the distance gives a good setting.

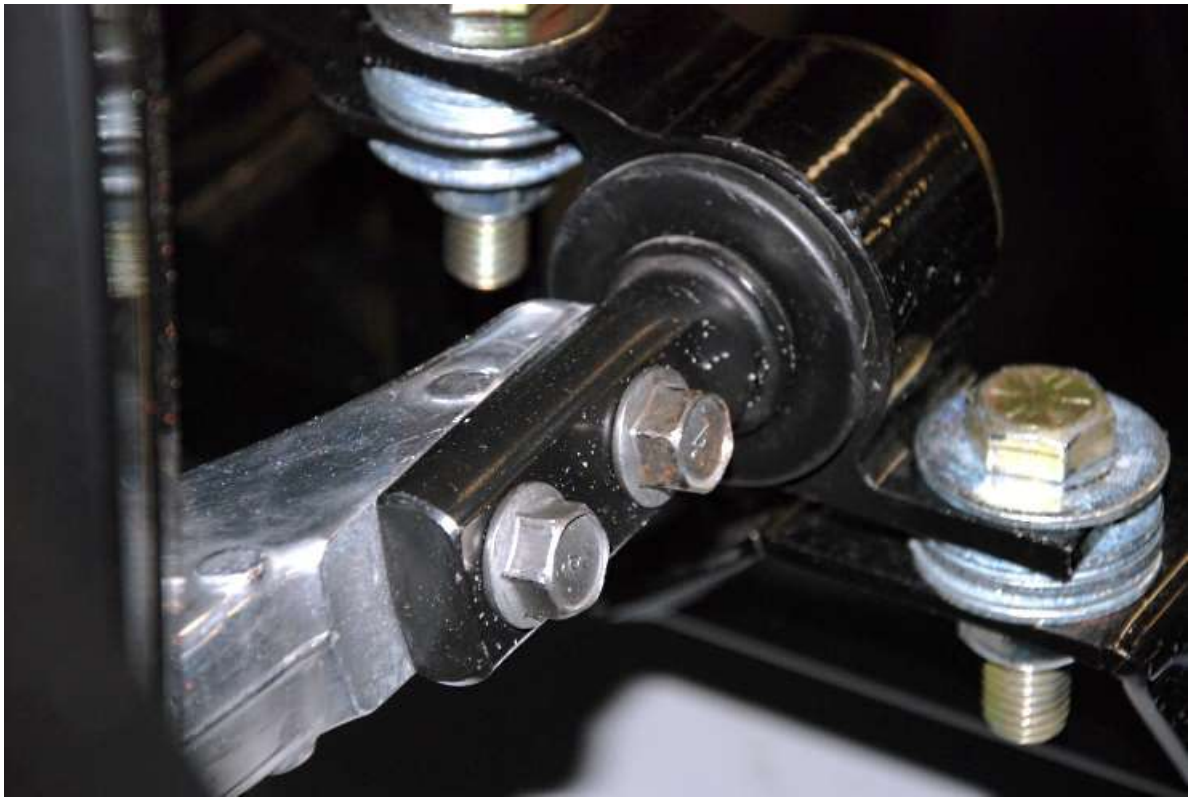


Moving just the rear of the arm to the outer holes works to add more caster if you spin the bushing mounts to avoid going too far.

One more method to add Caster is to unbolt the two bolts that hold the control arm to the pivot stem and flip the stem 180 degrees and bolt it back to the arm. This will put the smaller flat surface against the control arm and the larger flat on the bolt head side.



Standard OEM mounting location



Stem spun 180 degrees for more caster.

Rear Suspension

Rear Toe in is a very critical setting on all of the 818s. Running a good amount of rear toe in will stabilize the car and make it much more fun to drive hard and much more stable exiting corners. Baseline setting for rear toe should be 5/16 in. total toe in. If you want to experiment from there then we recommend going in 1/16 inch increments.

Rear Camber setting should be similar to the front and is also tire dependent. -2.5 degrees is a good starting point and taking tire temperatures and watching tire wear patterns will allow you to adjust from there. On a full racing slick with a slightly softer sidewall start at -3.0

Rear Roll-Steer is adjustable by lengthening or shortening the upper trailing link. Roll steer is equally important to rear toe in as it has the same effect as the suspension rolls through its travel. The baseline setting for rear roll steer is zero which means the lower lateral links are parallel when viewed from the front. In order to adjust the roll-steer park the car at ride height on flat ground and measure from the ground up to both ends of each lateral link. Subtract the difference in height from the inside to the outside on each link to get the total amount the inner pivot is higher than the outer. To adjust to zero rear roll-steer change the length of the upper trailing arm until both lateral links change by the exact same height. Another way to describe this is the long bolt in the bottom of the spindle that attaches both lateral links should be parallel to the flat bottom of the car.

General

Oiling is a critical area and one that is slightly more complex on the Subaru engines than on most inline or "V" configurations. Because this car is capable of very high lateral corning forces you have to pay very close attention to make sure and not starve the engine in the long corners. Using a road race style oil pan is a good start along with a windage tray and pickup, and if you are running sticky tires and full aero then we recommend an Accusump. For full track duty (and to help with underbody aero) a dry sump system is the ultimate form of protection from oil starvation. No matter which system you use monitoring the pressure is the key to a healthy engine. If you don't have any data logging then something as simple as a camera on the oil pressure gage for the first few sessions is a good idea.

Scaling the car is essential to making sure the car is balanced handling wise and under heavy braking. Getting the cross weights even is the most important thing as it is difficult due to the driver position being offset to get the two sides to be equal both front and rear. If you are running the sway-bar then disconnect it to scale. If you don't have scales or any method to set cross-weights then it is worth taking the car to a race shop to get it done. Just be sure your ride height and alignment are set first. If you can't get anywhere to scale the car then measure the spring collars to get them even across the front and even across the back. Then if you have one front wheel that consistently locks up under braking raise that corner by a half turn at a time until they are even.

Aerodynamic balance also can play a big role in how the car handles and ultimately how fast it will go. It is easy to overdo one end of the car and end up with a car that is slower and harder to drive even though it has more total downforce than before. Matching components and having built in adjustment (usually rear wing angle) is the key to finding the perfect set-up. As a starting point these are good baseline combinations we have used.

Tires and tire sizes. With the large percentage of weight on the rear wheels it is best to run staggered sizes front to rear. Front tires are generally limited to 215 widths but if the overall diameter is small enough then some 225s will fit as well. Some of the combinations we have used:

Hoosier A7/R7:
Front 225/40/17
Rear 255/35/18

Toyo R888
Front 215/45/17 (This size requires the front lower arms be mounted for extra caster)
Rear 255/35/18

Yokohama Advan Radial Slicks
Front 210/610/17
Rear 240/640/18

Appendix i: Technical Support

Our success depends on you being able to build your kit without problems or frustration. We are counting on you to build and drive this car and in so doing, provide us with the most important advertising of all.

If you have purchased a kit, we want to make sure that you know that you are not alone. Although we know our kit is the most straight forward assembly around, there may be a time when you need to speak to us. We will be there for you to make sure you are successful. No question is too simple. We are easily reached in a number of ways.

The Web:	www.factoryfive.com
	www.thefactoryfiveforum.com
Phone:	508-291-3443
Fax:	508-291-3883
E-mail:	Tech@factoryfive.com
Mail:	9 Tow Rd, Wareham, MA 02571

Appendix J: Registration and Titling

You are building a race car. It was designed with closed course competition as its focus. If you choose to use this vehicle on a public road, you are responsible for complying with all State and Federal regulations governing Home-built vehicles.

Regulations vary from state-to-state. Your best source of information about titling and registration is from your State Department of Motor Vehicles. Most of these agencies have specific regulations and steps for you to complete when seeking registration of your vehicle.

Provided with your Factory Five Racing kit is a Manufacturer's Certificate of Origin. This document records the origin of the kit and is not a vehicle title. **The component kit that we manufacture has no VIN number.** The number stamped on the frame matches the Certificate of Origin and is the kit serial number.

In most States, upon completion of your kit, you need to bring this certificate along with receipts for any parts used on your car and a copy of our invoice to your State DMV. Some states like Massachusetts have a separate vehicle inspection division for specialty cars and custom built cars that assigns the VIN numbers. Often times this division handles "salvage" vehicles as well.

Appendix K: Subaru Specifications

Subaru's by year

Year & Model	Engine	HP*	Torque*	Wheels
02-05 Impreza	2.5L, 4-cyl	165@5600	166@4000	16"x6.5"
04-05 Impreza Outback	2.5L, 4-cyl	165@5600	166@4000	16"x6.5"
02-05 WRX	2.0L, 4-cyl turbo	227@6000	217@4000	16"x6.5"
06-07 Impreza	2.5L, 4-cyl	173@6000	166@4400	16"x6.5"
06-07 Impreza Outback	2.5L, 4-cyl	173@6000	166@4400	16"x6.5"
06 WRX	2.5L, 4-cyl turbo	230@5600	235@3600	17"x7"
07 WRX	2.5L, 4-cyl turbo	224@5600	226@3600	17"x7"

5 speed Transaxles

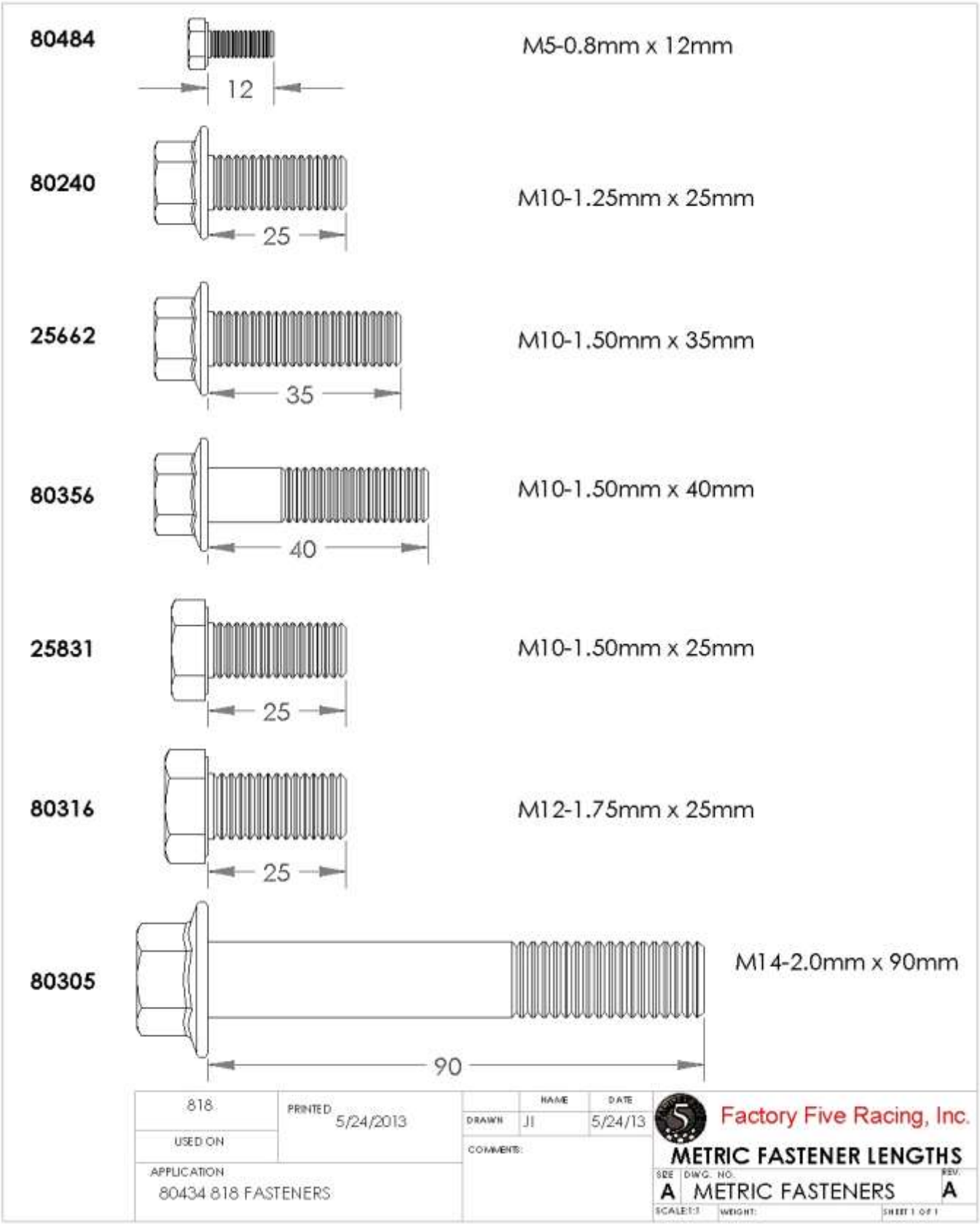
Year		1st	2nd	3rd	4th	5th	R	Front Final Drive
2002-05	2.0L Turbo	3.454	1.947	1.366	0.972	0.738	3.333	3.90
	2.5L NA Sedan	3.454	2.062	1.448	1.088	0.78	3.333	4.111
	2.5L NA Wagon	3.454	2.062	1.448	1.088	0.78	3.333	3.90
2006-07	2.5L Turbo	3.454	1.947	1.366	0.972	0.738	3.333	3.70
	2.5L NA	3.454	2.062	1.448	1.088	0.78	3.333	3.90

Appendix L: Wheel/Tire Specifications

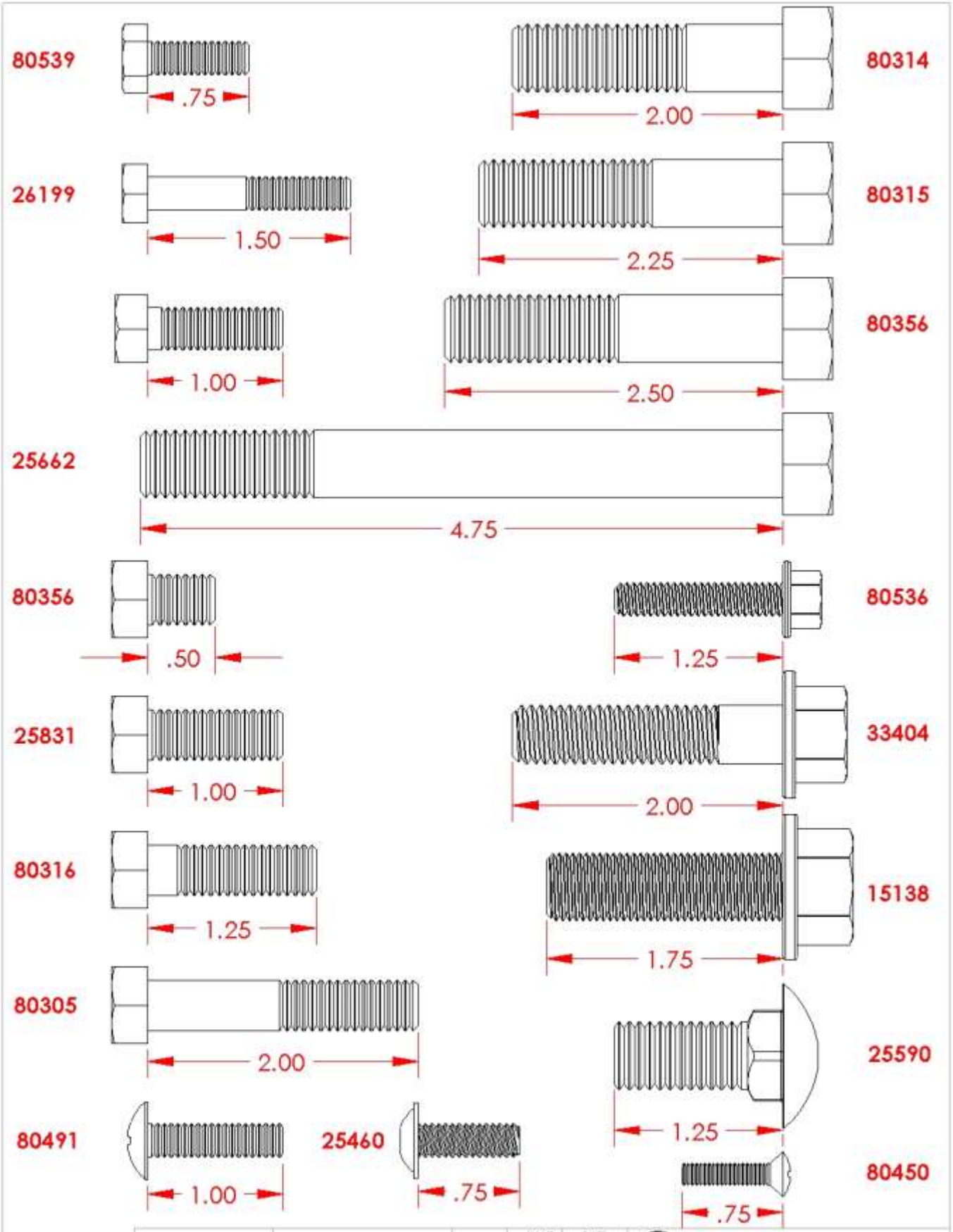
These values represent wheels and tires used by Factory Five on the 818. Anyone referencing this information can be confident that using a wheel of the size listed below will work, but that other sizes may also fit.

Front maximum wheel width and offset: 8 inch wide with 40mm offset
Front maximum tire width: 215mm
Front maximum tire diameter: 24.00"
Rear maximum wheel width and offset: 9.5 inch wide with 40mm offset
Rear maximum tire width: 255 (some brands are wider and may only fit a 245)
Front / Rear optimum sizes: 215/40/17 Front and 255/35/18 Rear

Appendix M: Metric Fastener Lengths



Appendix N: Standard Fastener Lengths



818	PRINTED 6/12/2013		NAME	DATE	Factory Five Racing, Inc.
USED ON		DRAWN	JI	6/11/13	STANDARD FASTENER LENGTHS
APPLICATION		COMMENTS:			SIZE A DWG. NO. STANDARD FASTENERS REV. A
					SCALE:1:1 WEIGHT: SHEET 1 OF 1

Appendix O: Additional Torque Specifications

General Bolt torque specifications (standard)

Thread	SAE English
	Zinc Plated
	Ft-Lb.
¼ -20	8
¼ -28	10
5/16 -18	17
5/16 -24	19
⅜ -16	30
⅜ -24	34
7/16 -14	48
7/16 -24	54
½ -13	75
½ -20	83
9/16 -12	100
9/16 -18	100
⅝ -11	100
⅝ -14	100

General Bolt torque specifications (metric)

Thread	Metric
	Zinc Plated
	Ft-Lb.
M8	18
M10	33
M12	61
M14	98
M16	120

Appendix P: Fluid Specifications and Capacities

Engine

	Oil Type	Capacity
2.5L NA	5W-30	4.4 qts. (4.2 liters)
2.0L Turbo	5W-30	4.5 qts. (4.3 liters)
2.5L Turbo	5W-30	4.5 qts. (4.3 liters)

5 speed transaxle

Oil Type	Capacity
75W-90	3.7 qts. (3.5 liters)