FACTORY FIVE RACING

'33 Hot Rod Assembly Manual

Revision 3Q, May 2024

www.factoryfive.com 508-291-3443

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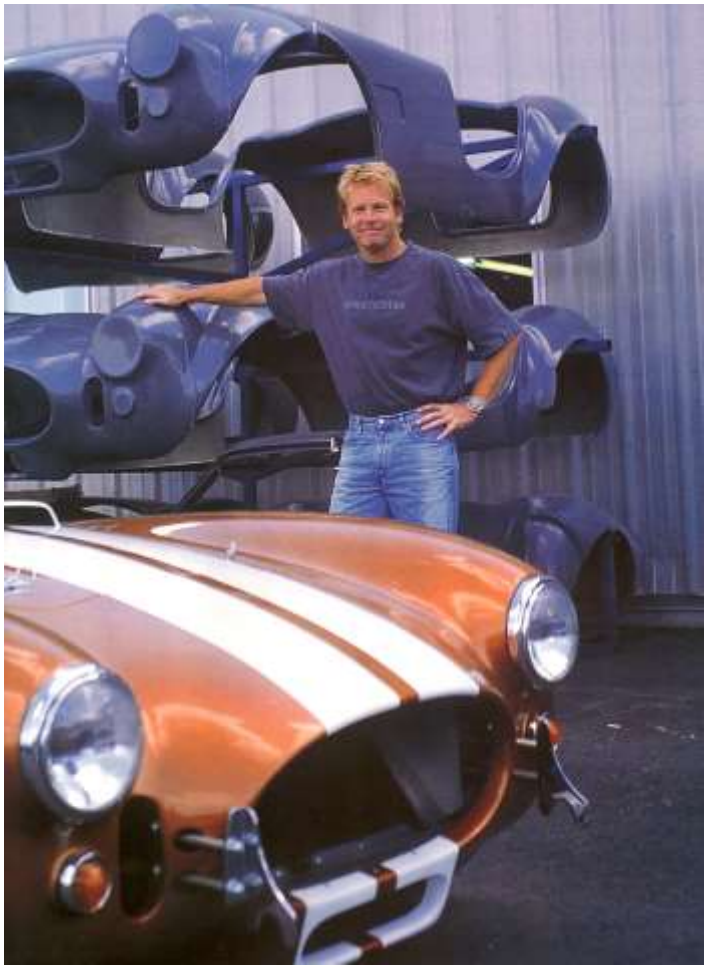
General Information

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, 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 an 8.8" rear diff 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 of 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.

What You Need

Engine:

Ford - Small block Ford 289/302/351 or Coyote modular engine.

GM – Small Block Chevy or LS engine

T5, Tremec TKO, Tremec 3550/3650, AOD, or Tremec T56.

- If using an automatic transmission, we recommend a torque converter stall speed of **3500 RPM** due to the weight of the finished car

Rear End and brakes: 87-93 width Ford 8.8" rear end and brakes

Fuel pump: External carbureted or fuel injected inline pump.

Battery: size Group 51R.

Wheels and Tires: See the Appendix for wheel/tire specifications.

Paint: Most customers will farm out the body and paint work to a professional body shop.

Optional part Instructions

Part instructions for all Factory Five parts and options can be found online at:

www.factoryfiveparts.com/instructions/

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 (3/32”-½” standard drill bits)
_____ Caulk gun (Good Quality one)
_____ 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

Helpful

_____ Cordless drill (w/clutch helpful, 12 - 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
_____ 3M Marine 5200 Adhesive/Sealant – (4) 10oz. tubes
_____ 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 1 – Kit disassembly

- **If some parts are backordered for the assembly that is being worked on, move to a different section and come back to the other assembly later. This manual is designed as a guide for the first-time builder. There is more than one way to build the kit.**

Unpacking Your Hot Rod Kit

- Please note that your 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, open each box and do a physical inventory of all the parts.
- Call and report any potentially missing parts within 45 days of receiving your order.
- Do one box at a time and replace all the contents before going on to the next box.

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. These parts are:

33218	LEFT FRONT UPPER CONTROL ARM	1.00	ea.
33222	RIGHT FRONT UPPER CONTROL ARM	1.00	ea.
33380	HOT ROD BUSHING SLEEVE ASSEMBLY	4.00	ea.
33377	LEFT LOWER CONTROL ARM	1.00	ea.
33378	RIGHT LOWER CONTROL ARM	1.00	ea.
33093	TRANSMISSION MOUNT PLATE	1.00	ea.
33122	DOOR STRICKER PLATE, LEFT	1.00	ea.

33123	DOOR STRICKER PLATE, RIGHT	1.00	ea.
33121	DOOR HINGE STANDOFF ASSEMBLY	2.00	ea.
33498	LEFT SIDE DOOR FRAME	1.00	ea.
33499	RIGHT SIDE DOOR FRAME	1.00	ea.
33113	TRUNK HINGE MOUNT	2.00	ea.
33112	TRUNK HINGE ARM	2.00	ea.
33515	TRUNK STRIKER MOUNT	1.00	ea.
33516	TRUNK LATCH MOUNT	1.00	ea.
33026	HOT ROD STEERING COLUMN	1.00	ea.

Removal of the Body

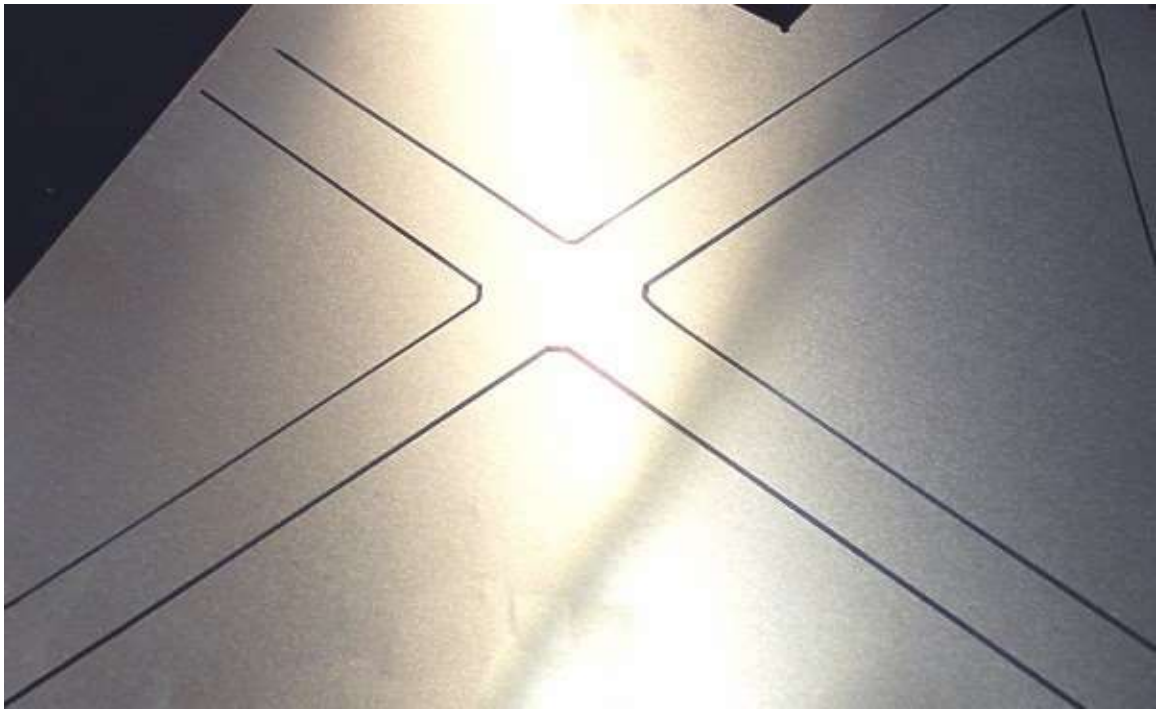
Remove the tape holding the doors and trunk in place.

Remove the doors and trunk and store them for later.

Two people can remove the body from the chassis. One person on either side located where the door openings are (if you have a third person, position them at the rear of the car. Removing the body should be done very carefully. Once the body is removed, it is fine to store it directly on the ground.

Aluminum Removal and Preparation

Before removing the aluminum from the chassis, mark each panel and take pictures of how the panels fit together (i.e. which is on top). To get straight and evenly spaced rivets, trace the underside of the aluminum panel around the frame members with a black permanent marker.



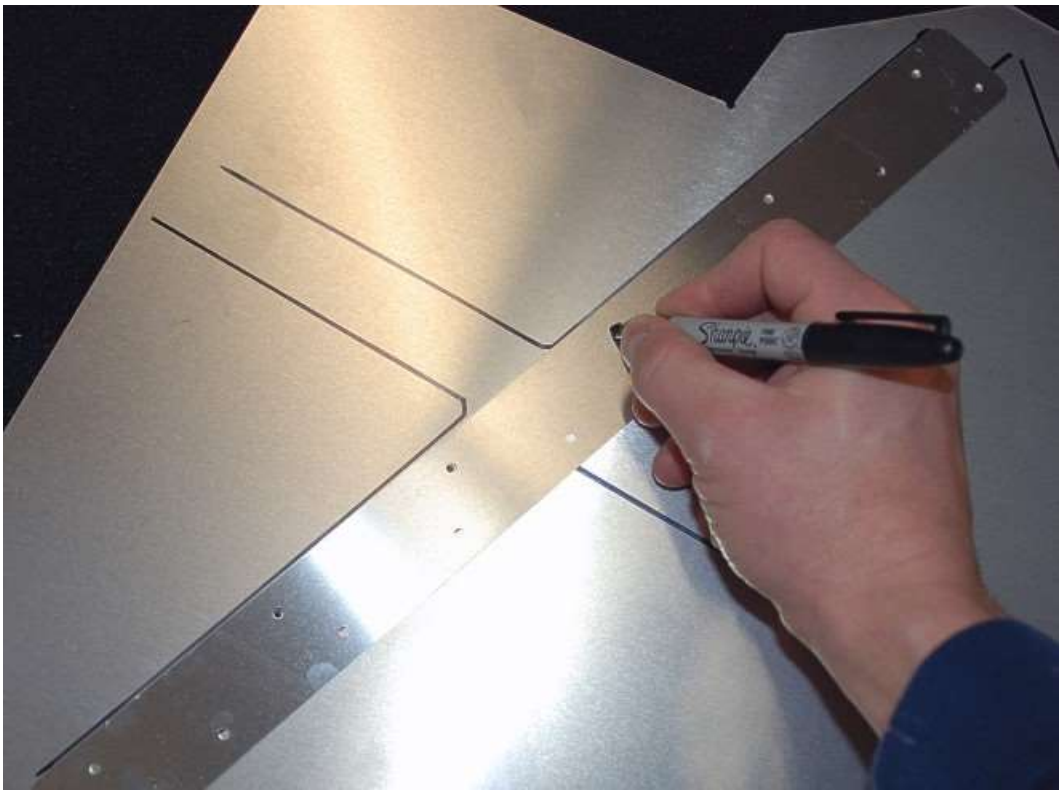
Remove any screws holding the panel to the frame and remove the aluminum panels. Keep the #6 screws to help with aluminum positioning during build-up.

Rivet Spacing Tool

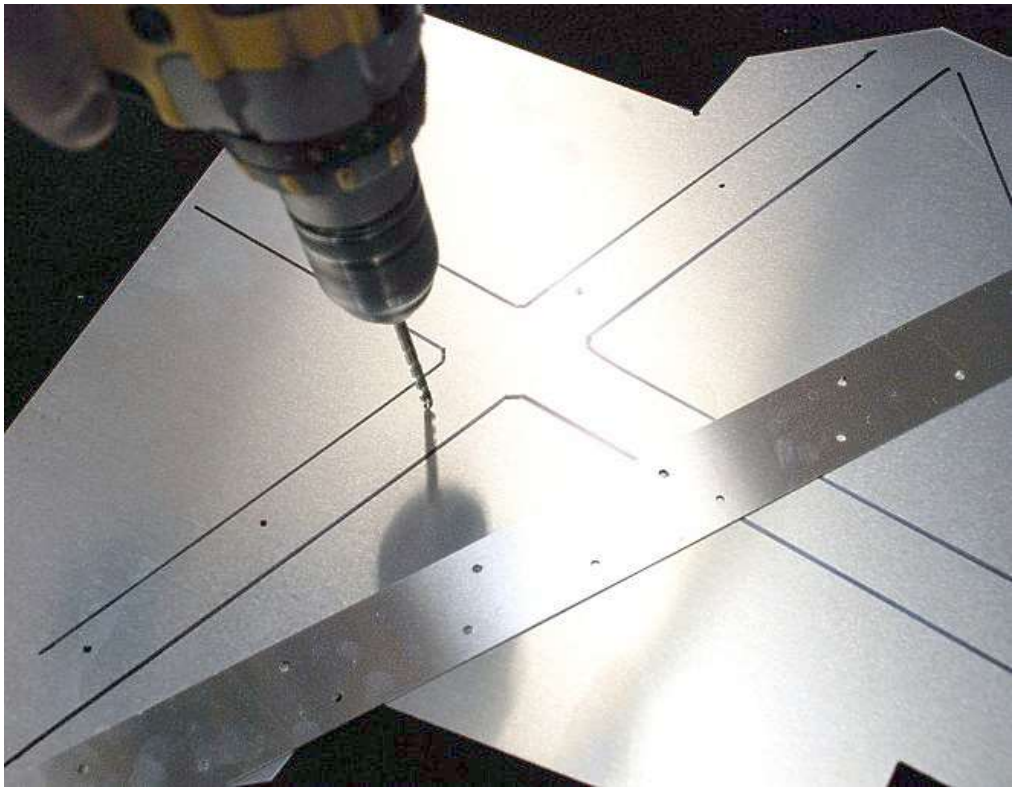
- Packaged Aluminum
- In most cases we use a 3” rivet spacing when mounting aluminum panels to the chassis and a 2” spacing when mounting panel to panel. The rivet spacing tool has this hole spacing marked. The distance from the edge of the tool to the holes is correct to center the rivets on the ¾” tubes.

- Use the ⅛” rivets for all of the aluminum panels unless otherwise directed.
- The following are the recommended sizes of the Industrial Fastener Institute and standard industry sizes for open end rivets: #30 Drill bit for the $^{1}/_{8}$” rivets, #11 Drill Bit for the $^{3}/_{16}$” rivets.

Align the edge of the tool with the marker line made around the tubes and mark the rivet holes with a marker.



Drill the marks with the correct drill bit size for the location.



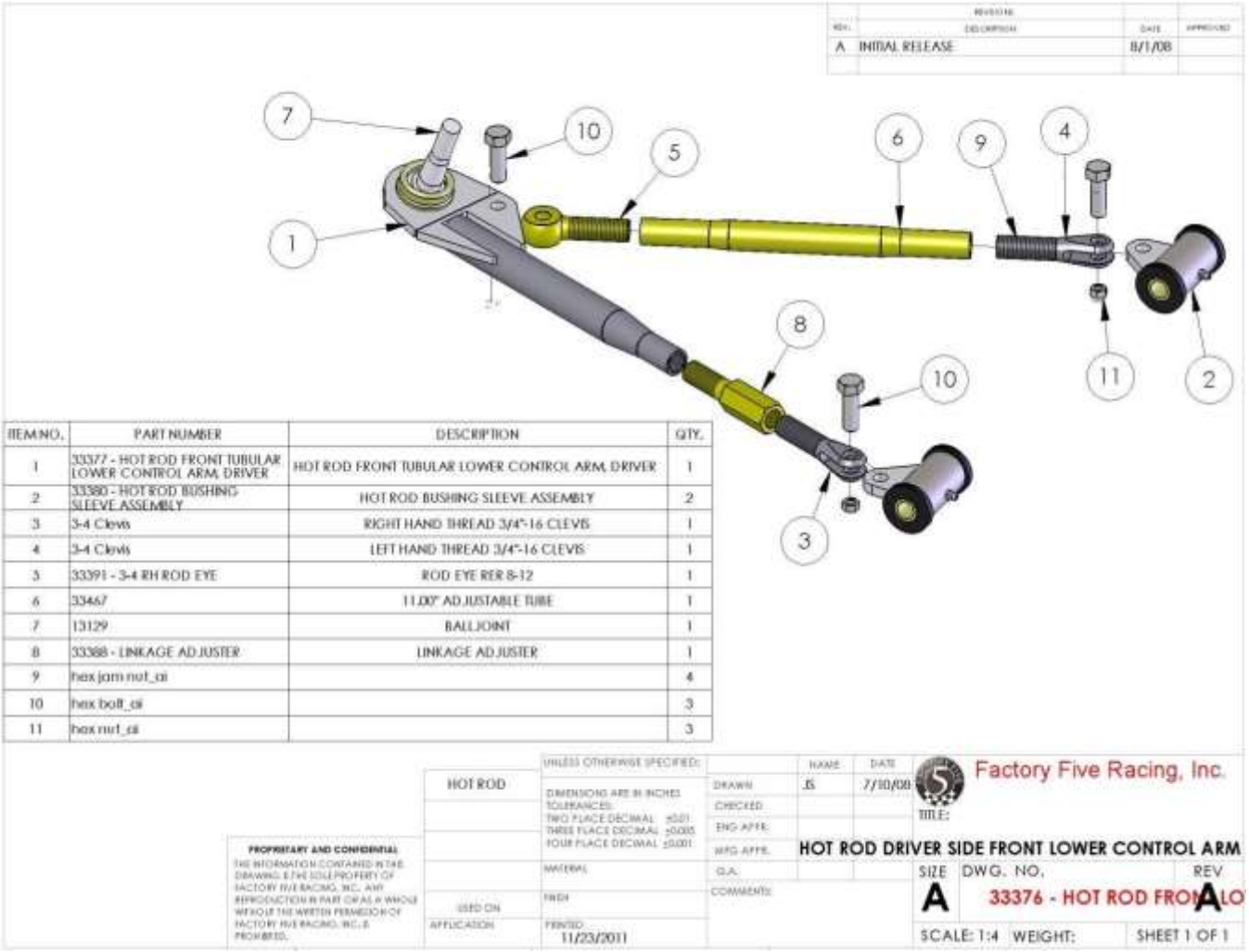
Use Acetone to remove permanent marker as well as any ink that is on the aluminum.

Chapter 2 - Chassis Build Up

Front Suspension

Lower Control Arm Assembly

- ⅜”, ¾” wrench, chassis grease, vise or plastic hammer, ratchet, ¾” socket
- Front lower control arm components
- The bushing sleeve for the rear (attached to the linkage adjuster) will get assembled differently depending on the frame suspension holes used.
- Frame upper suspension holes are stock height while lower holes are for full fender or Truck higher ride height.

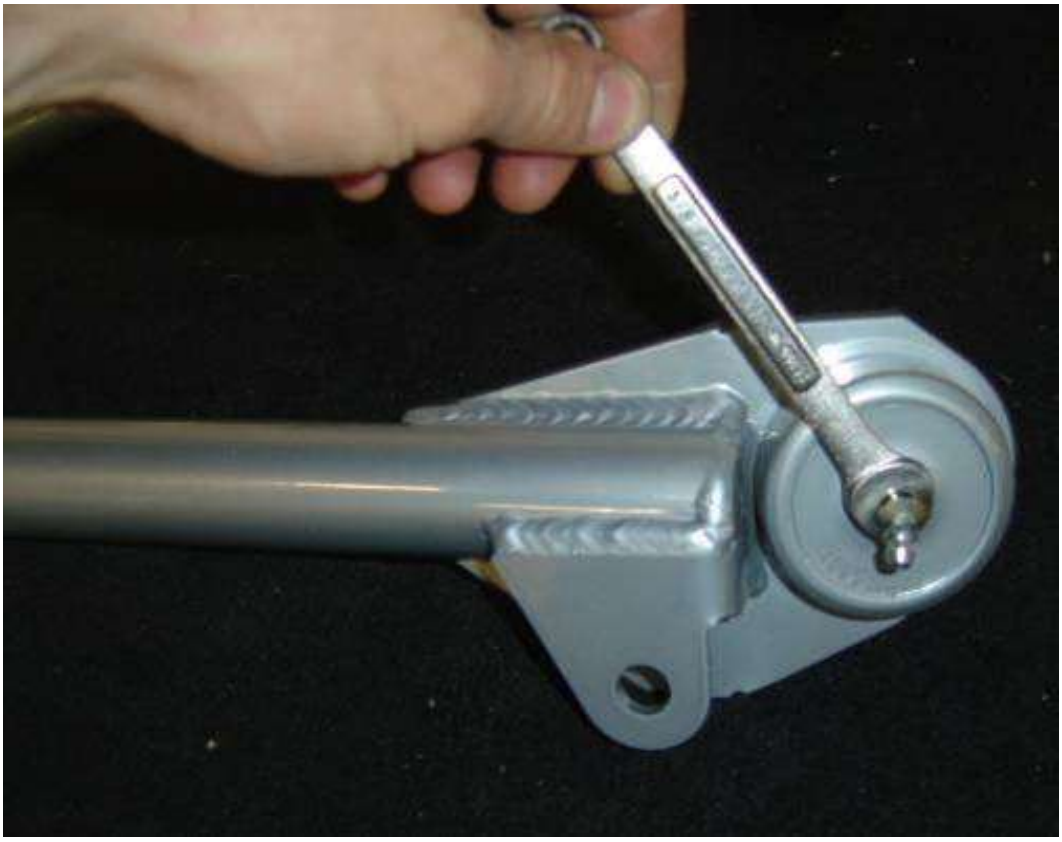


Upper/stock frame hole location rear bushing sleeve orientation.

Thread the jam nuts onto all of the clevises, rod eyes and the linkage adjuster.
Mark the Rod eyes and clevises ⅝” from the end of the threads.

Assemble the front leg of the lower control arms as shown screwing the threads in to the marks on the threads made earlier. Note, the clevis (left) is left hand thread.

Dust boot placed over lower control arm ball joint.



Grease fitting in lower control arm ball joint.

Thread adjuster into lower control arm

Screw the Clevis into the adjuster in the lower control arm.

Insert a rod eye into the front of the lower front control arm with the jam nut in place.

- Check the rod end lengths within the tubes and make sure there is $^{5}/_{8}$" at least within the tube.

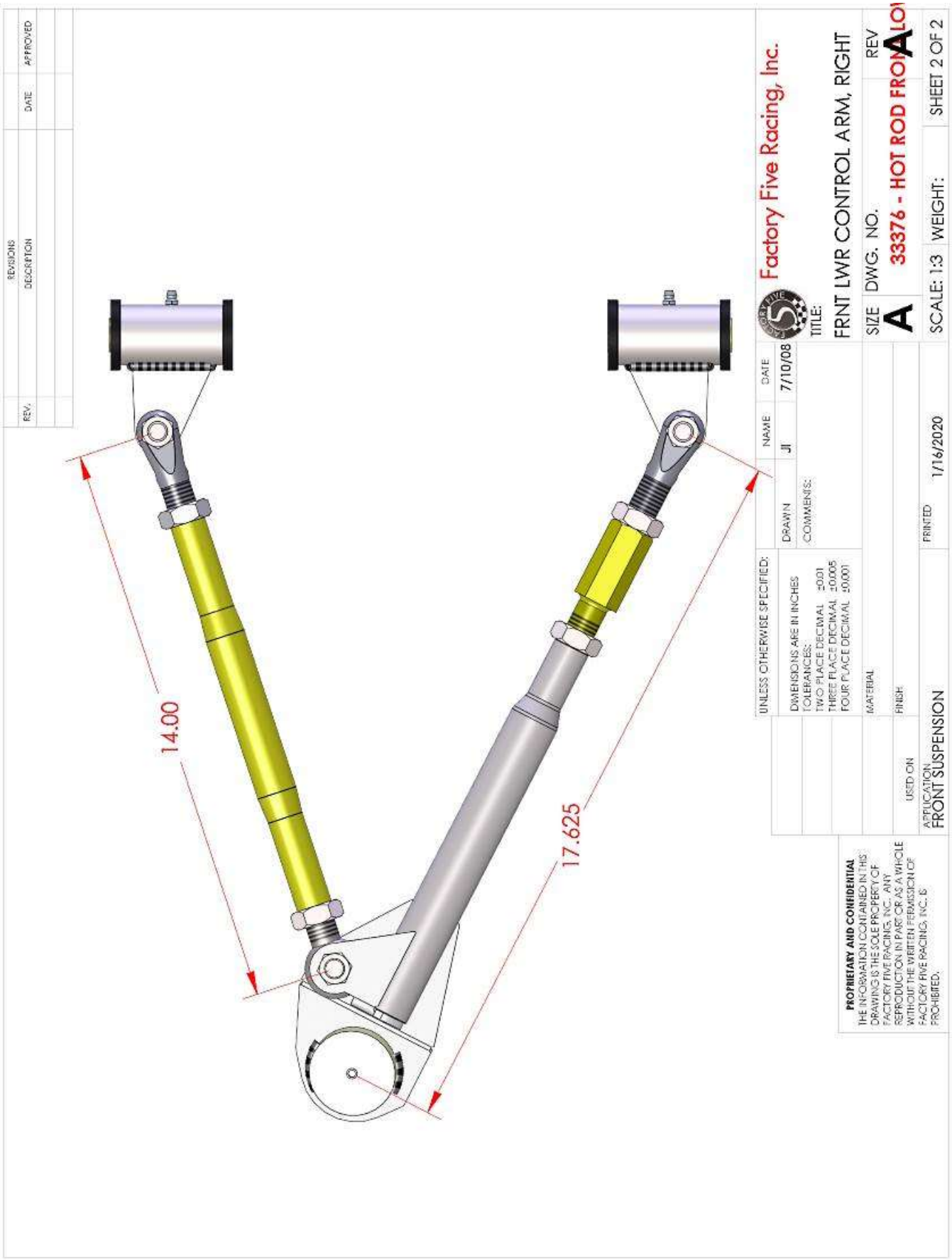
Apply grease to front lower collar sleeve.

Install sleeve in front lower collar.

- The bushing sleeve for the rear (attached to the linkage adjuster) will get assembled differently depending on the frame suspension holes used. Note the direction of the bushing sleeve tab.

Install collar onto adjuster clevis. If running the lower suspension holes, run the rear bolt from the bottom up as well as turning the bushing sleeve.

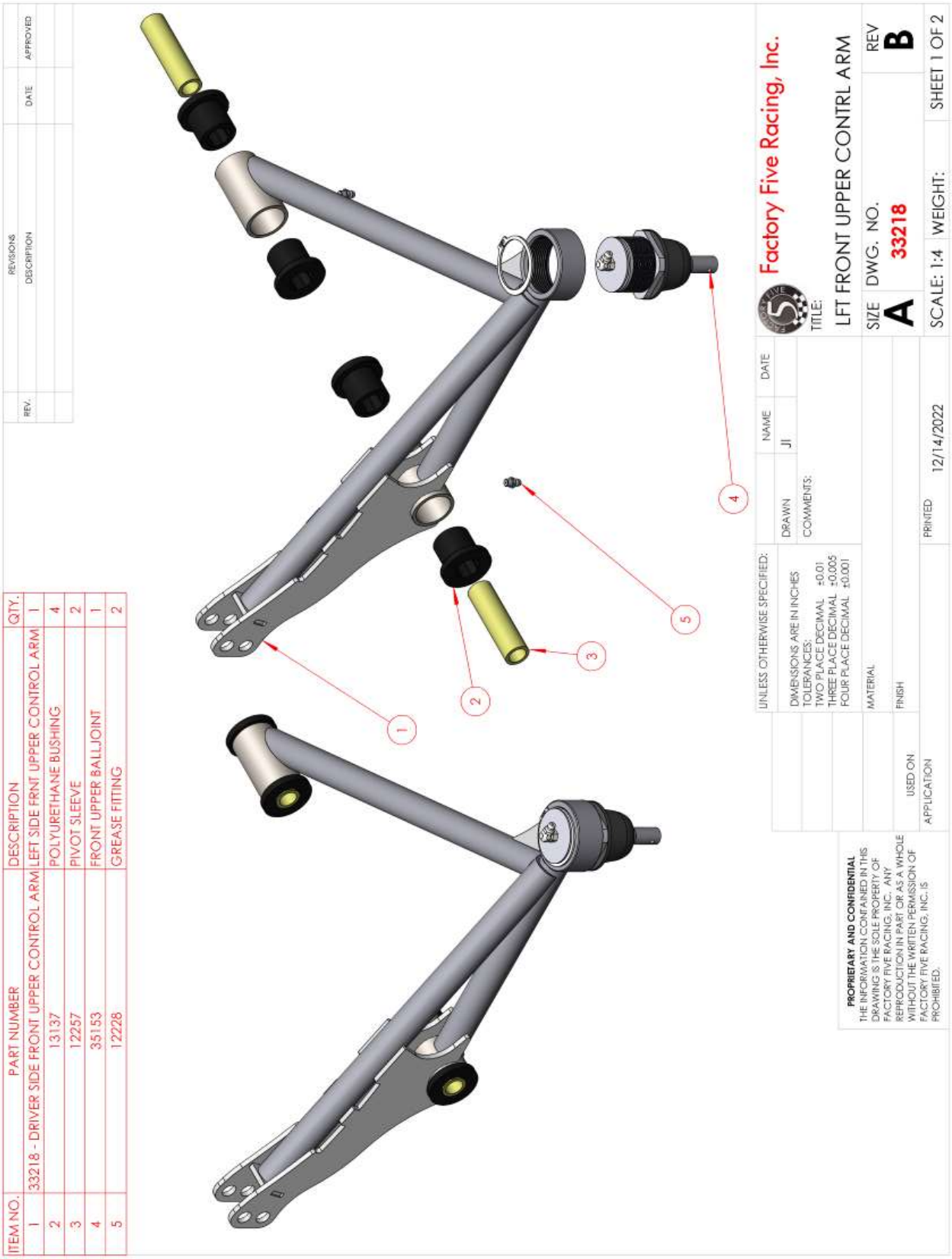
Rod end install on lower control arm.



Use the diagram above to roughly set the caster and camber alignment on the front suspension until a real alignment can be put on the car.

Upper Control Arm Assembly

🛠 $^{5}/_{16}$" wrench, chassis grease, vise or plastic hammer, External snap ring pliers.
🚘 Front upper control arm assembly.

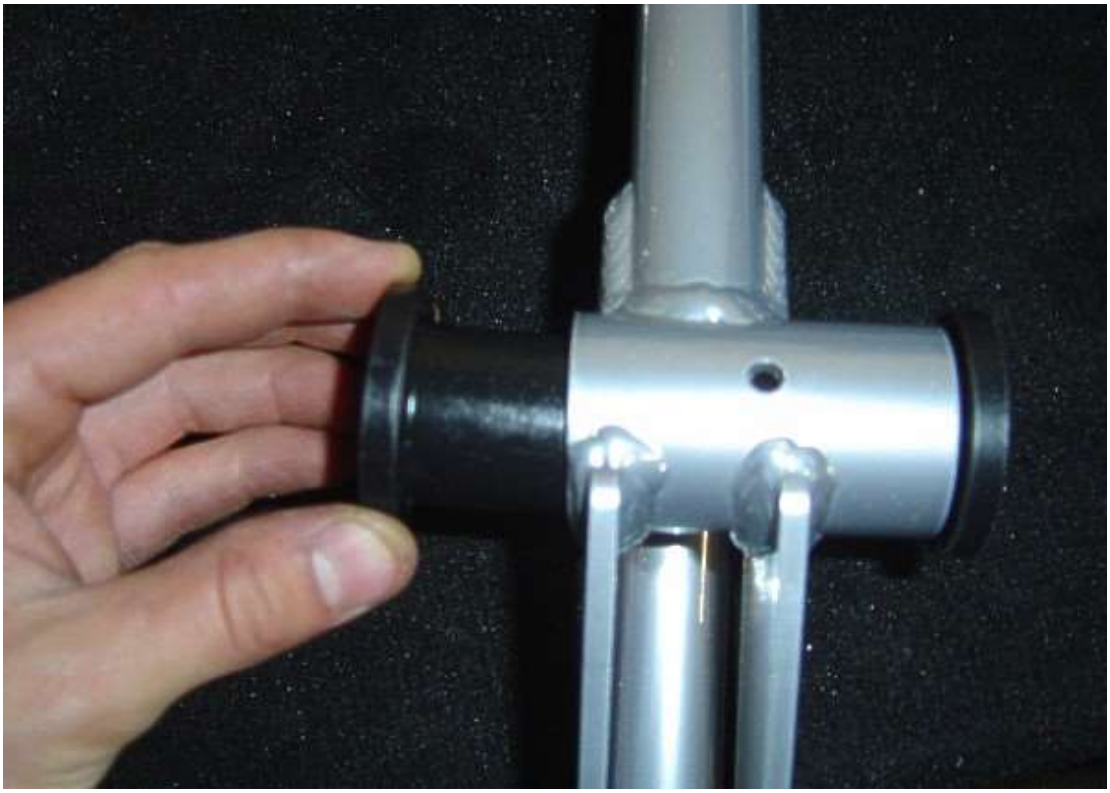


Put thread locker on the upper balljoint threads.

From the bottom side screw the balljoint up into the balljoint mount.

Use snap ring pliers to install the snap ring into the groove on top of the balljoint.

Install silicone dust boot packed in the kit, on the front upper control arm ball joint.



Insert the poly bushings into the control arm.

Grease the pivot sleeves.

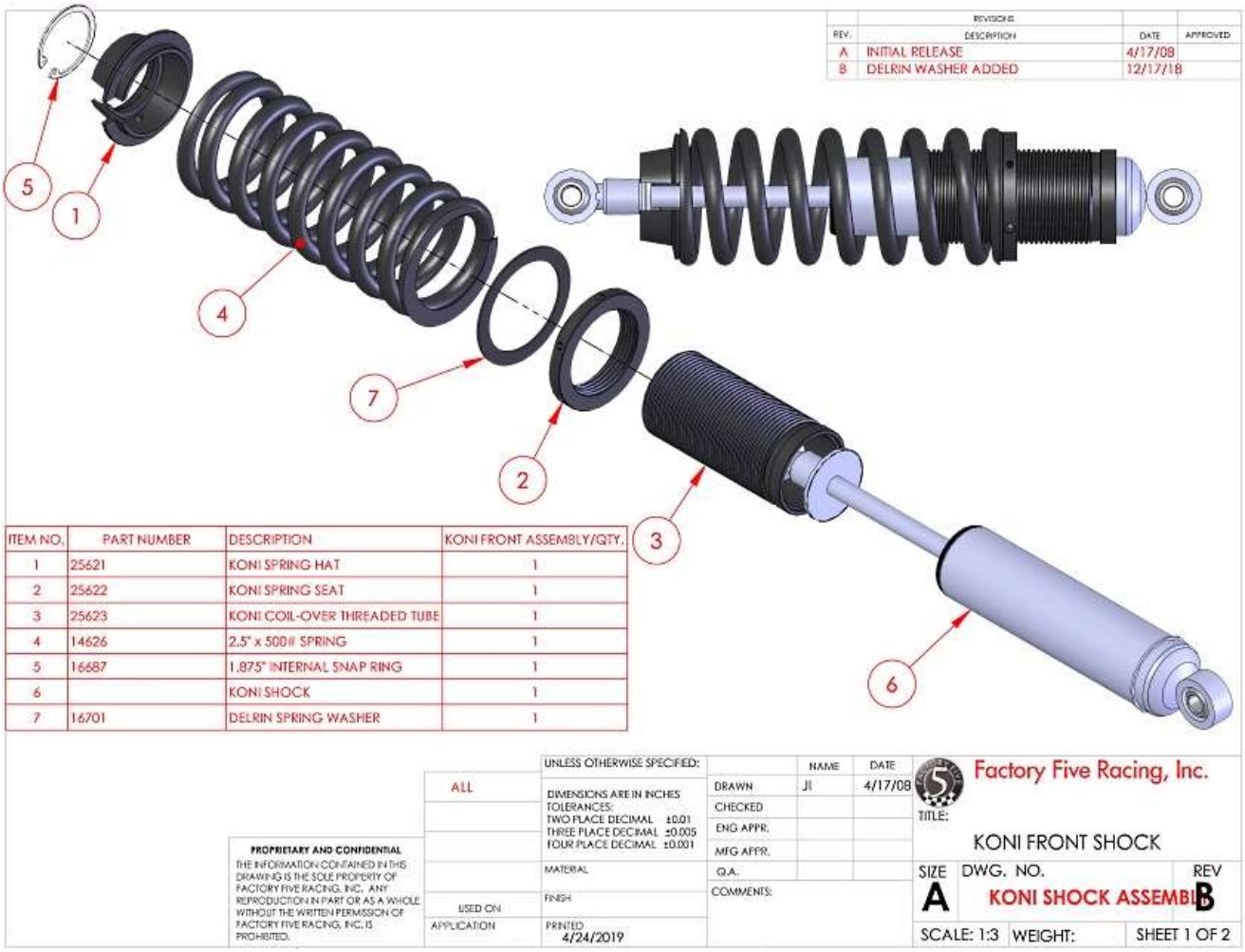
Insert the greased sleeve into the bushings in the upper control arm

Install the grease fittings into the pivot points on the upper control arm. Attach a grease gun onto the grease fitting and fill with grease until the grease starts to seep out.

Coil-Over Shock Assembly

- Snap ring pliers, ¾" wrench, ¾" socket, Ratchet, Torque wrench
- Front shock set, Front shock set, Insulated clip hardware.
- The front 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 400lb, the rear springs are 250#. Other springs are available for different ride characteristics.
- WARNING! Incorrect assembly and maintenance of this part can cause serious injury or death.

- The front/IRS shock extended measurement is 15.15” center to center. They are 2.50” **shorter** than the rear Solid Axle shocks
- If using the silver double adjustable shocks, these must be mounted with the body of the shock down.



Unpack the front shocks, coil-over's and hardware.

Double check the jam nut under the rod end and bump stop to make sure that it is tight.

Start the set screw in the spring seat.

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.

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

Put the 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.

Check to make sure that the spring is seated correctly on the shock.
Run zip ties through the holes in the spring hat and around the spring to prevent the spring from becoming unseated.

Front Suspension Build Up

- The suspension has two sets of holes. The top set is for the stock Hot Rod while the bottom set is for the Truck and full fender cars.

If running the lower suspension hole set-up, the front lower control arm left side rear tab will have to be cut to the upper bolt hole location as shown so that the steering rack will not hit it. **Do not run the upper steering rack holes and the lower suspension holes**.

Insert the front upper control between the frame mount plates followed by the M16 x 110mm bolt.

- Leave the upper control arm bolts loose until the grill is installed.

Install the shocks on the chassis with the body down. Use the 0.32” spacers on either side of lower the spherical joint and use the ½” x 2.00” bolts and locknuts.

- The suspension has two sets of holes. The top set is for the stock Hot Rod while the bottom set is for the Truck and full fender cars.
- Make sure to install the upper shock bolts from the back side (engine side) going forward so that they can be removed if necessary once the radiator is installed.

Install the other end of the shock to the upper control arm with the 0.21" shock spacers on either side of the spherical joint using the ½" x 2.00" bolts and locknuts. Make sure to install the upper shock bolts from the back side (engine side) going forward so that they can be removed if necessary once the radiator is installed.

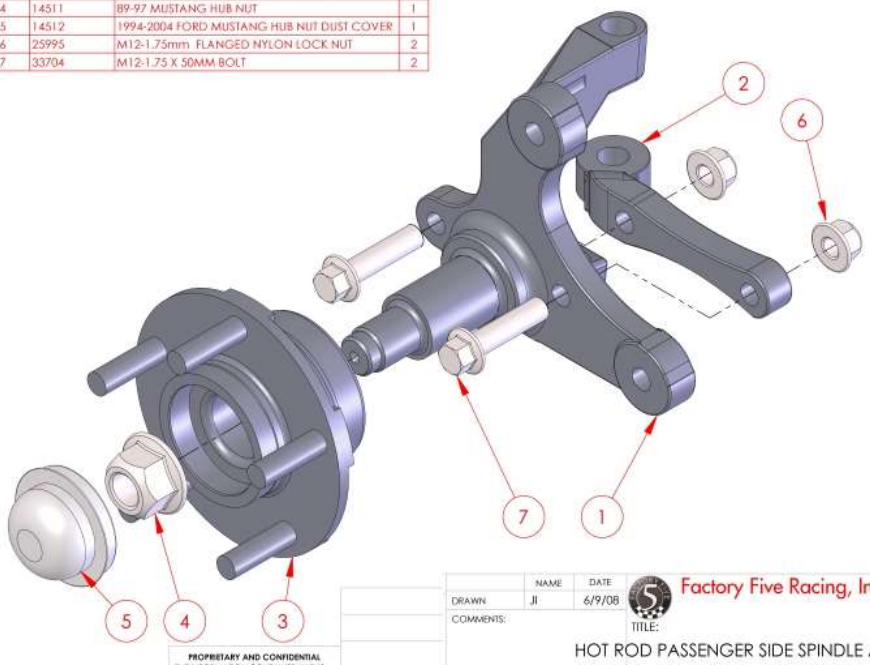
Install the lower control arm onto the frame. The fixed part with the ball joint is towards the rear of the arm.

Front spindles

🛠 $^{13}/_{16}$" socket, Torque wrench, Needle Nose Pliers, Rubber Mallet
🚘 Spindle Assembly

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33043	SPINDLE - Hot Rod Driver/Roadster Passenger	1
2	33045	33046 - HOT ROD STEERING ARM, PASSENGER SIDE	1
3	14510	1994-2004 FORD MUSTANG FRONT HUB	1
4	14511	89-97 MUSTANG HUB NUT	1
5	14512	1994-2004 FORD MUSTANG HUB NUT DUST COVER	1
6	25995	M12-1.75mm FLANGED NYLON LOCK NUT	2
7	33704	M12-1.75 X 50MM BOLT	2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	6/9/08	



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	NAME	DATE
DRAWN	JI	6/9/08
COMMENTS:		

Factory Five Racing, Inc.

TITLE: HOT ROD PASSENGER SIDE SPINDLE ASSEM

USED ON
APPLICATION
PRINTED 3/22/2019

SIZE	DWG. NO.	REV
A	HOT ROD PASSENGER SIDE S	A

SCALE: 1:2 WEIGHT: SHEET 2 OF 2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33043	SPINDLE - Hot Rod Driver/Roadster Passenger	1
2	33045	33045 - HOT ROD STEERING ARM, DRIVER SIDE	1
3	14511	89-97 MUSTANG HUB NUT	1
4	25995	M12-1.75mm FLANGED NYLON LOCK NUT	2
5	14510	1994-2004 FORD MUSTANG FRONT HUB	1
6	14512	1994-2004 FORD MUSTANG HUB NUT DUST COVER	1
7	33704	M12-1.75 X 50MM BOLT	2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
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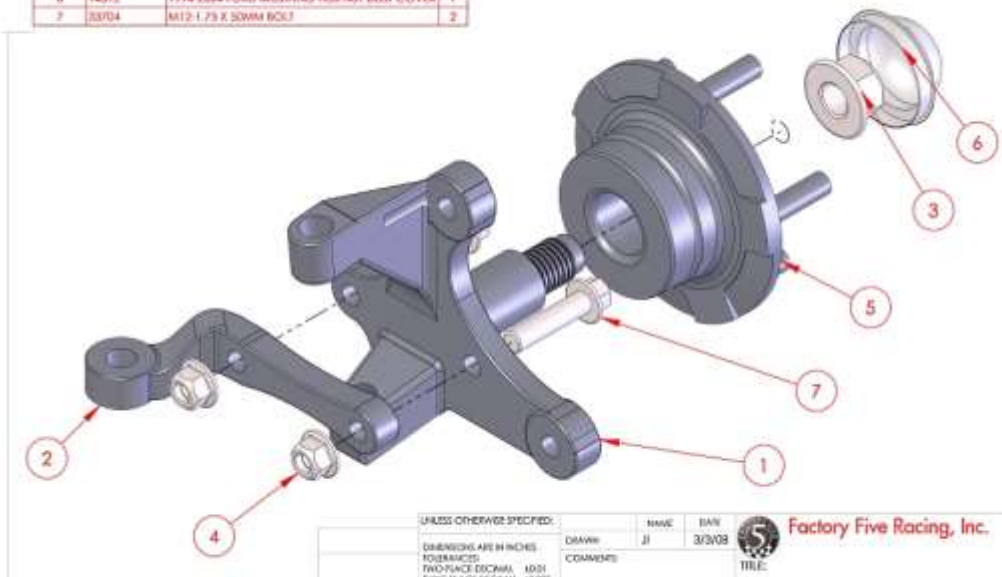

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.0001
MATERIAL
FINISH
USED ON
APPLICATION

	NAME	DATE
DRAWN	JI	3/3/08
COMMENTS:		

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Factory Five Racing, Inc.

TITLE: DRIVER SIDE SPINDLE ASSEMBLY

PRINTED 3/22/2019

SIZE	DWG. NO.	REV
A	Hot Rod Driver side Spindle	A

SCALE: 1:2 WEIGHT: SHEET 2 OF 2

Assemble the spindles (passenger side is on the left; driver side is on the right).

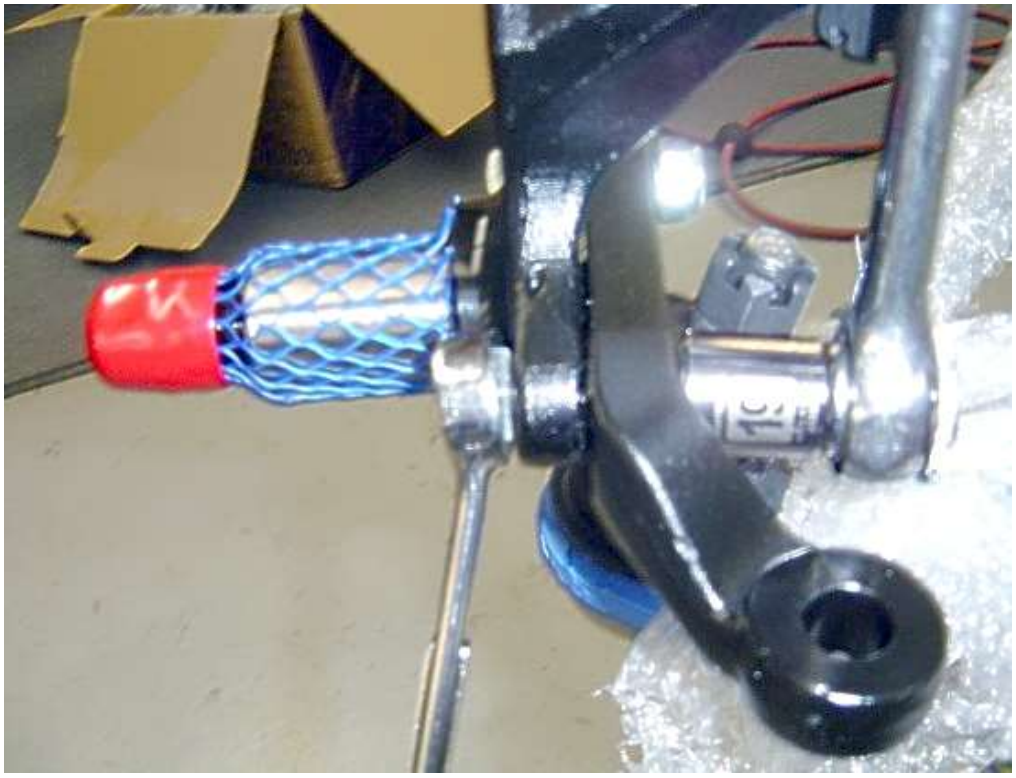
- If installing bike fenders attach the fender mount now.

The steering arms are attached to the spindles with the provided hardware. The steering arm pickups are oriented towards the rear of the car and drop down a bit. It may be easier to tighten these bolts once it is installed on the frame.

Attach the upper ball joint to the spindle and torque to **100Nm** (**75 lb-ft)** and install the cotter pin.

Install the spindle on the lower control arm ball joint stud. Then install the countersunk spacer on top of the spindle. There is a small taper on the inside edge of the spacer that should face down toward the spindle.

Torque to **106-149Nm (80-110 lb-ft)** and install the cotter pin.



Once the spindles are mounted firmly on the chassis, tighten the steering arm hardware then torque to **81Nm (60 lb-ft)**.

Hubs and Brakes

Install the front hub onto the spindle

Install the hub nut onto the spindle. Torque the hub nut to **305-338Nm (225-250 lb-ft)**.

Front Suspension Torque Specs Chart

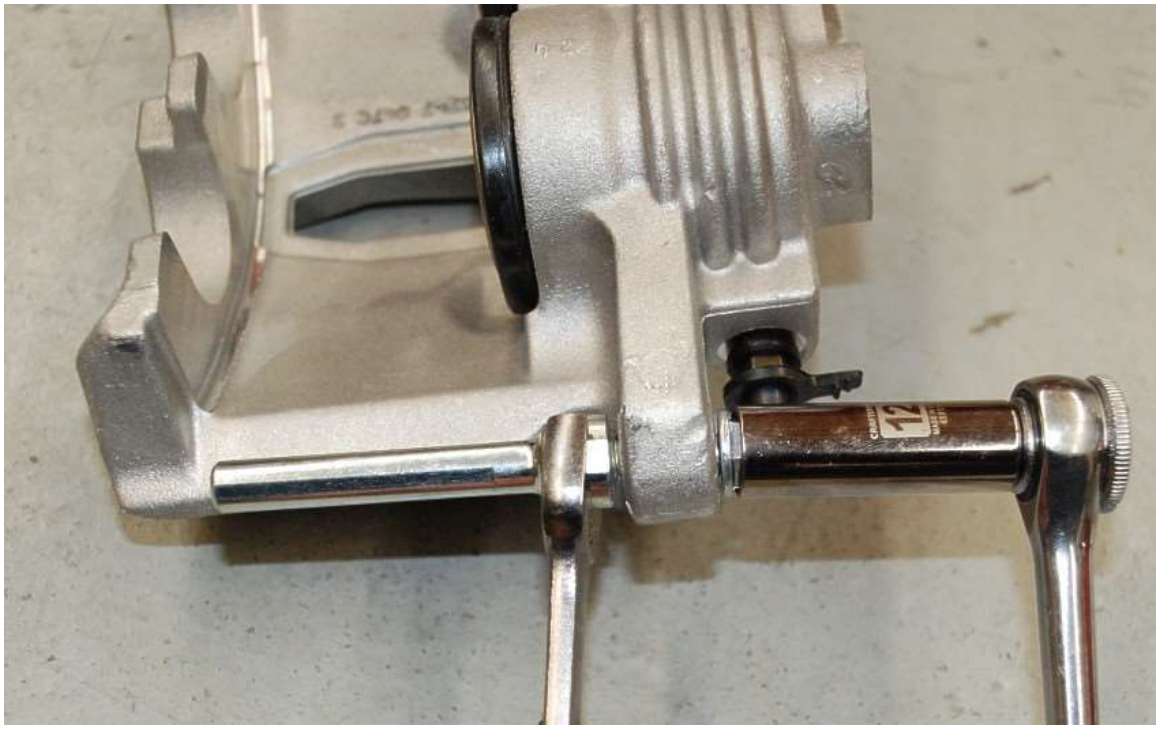
Item	Nm	lb-ft

Front lower control arm to frame	135-162	100-110
Front lower clevis to bushing sleeve	100	75
Front lower ball joint to spindle	106-149	80-110
Upper A-arm to frame	135-162	100-110
Upper ball joint to Spindle	95-122	70-90
Steering arm to Spindle	81	60
Spindle hub nut	305-338	225-250

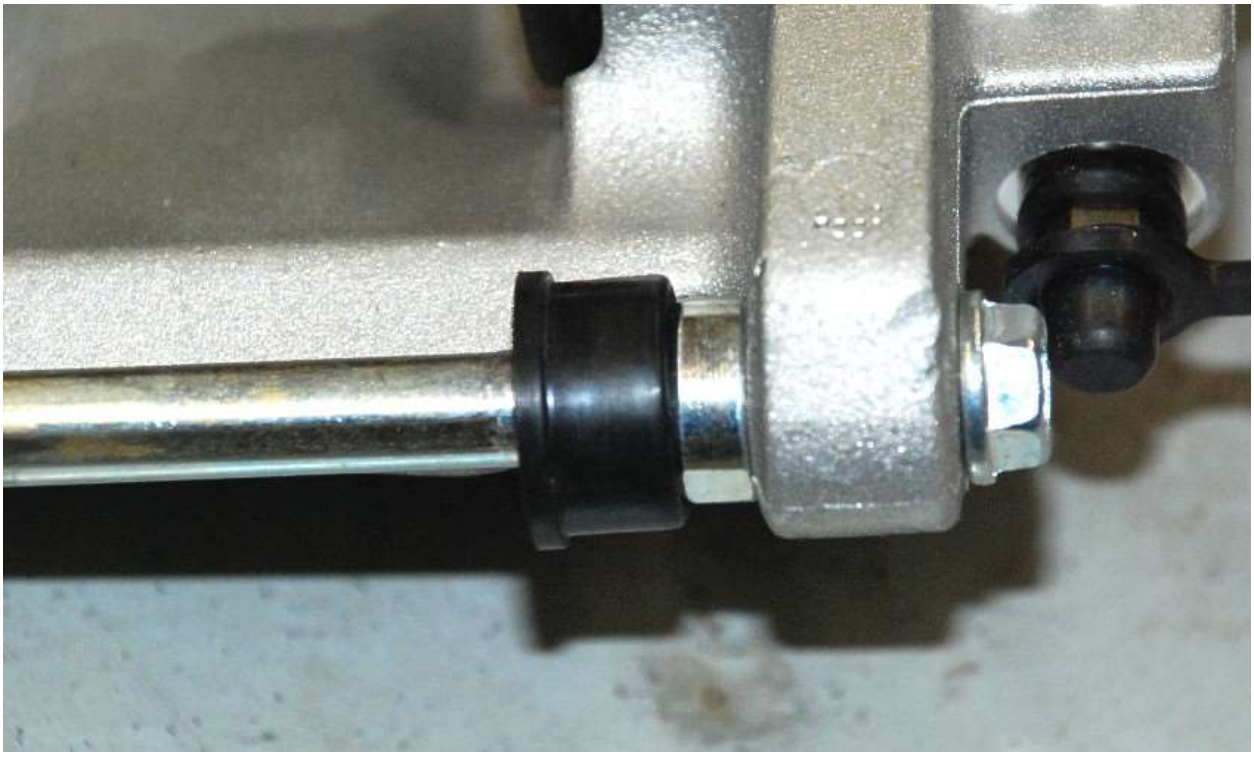
Front Brakes

🛠 12mm socket, Ratchet, 16mm wrench, Torque wrench, thread locker

🚘 Front 11” Caliper/Rotor Assembly

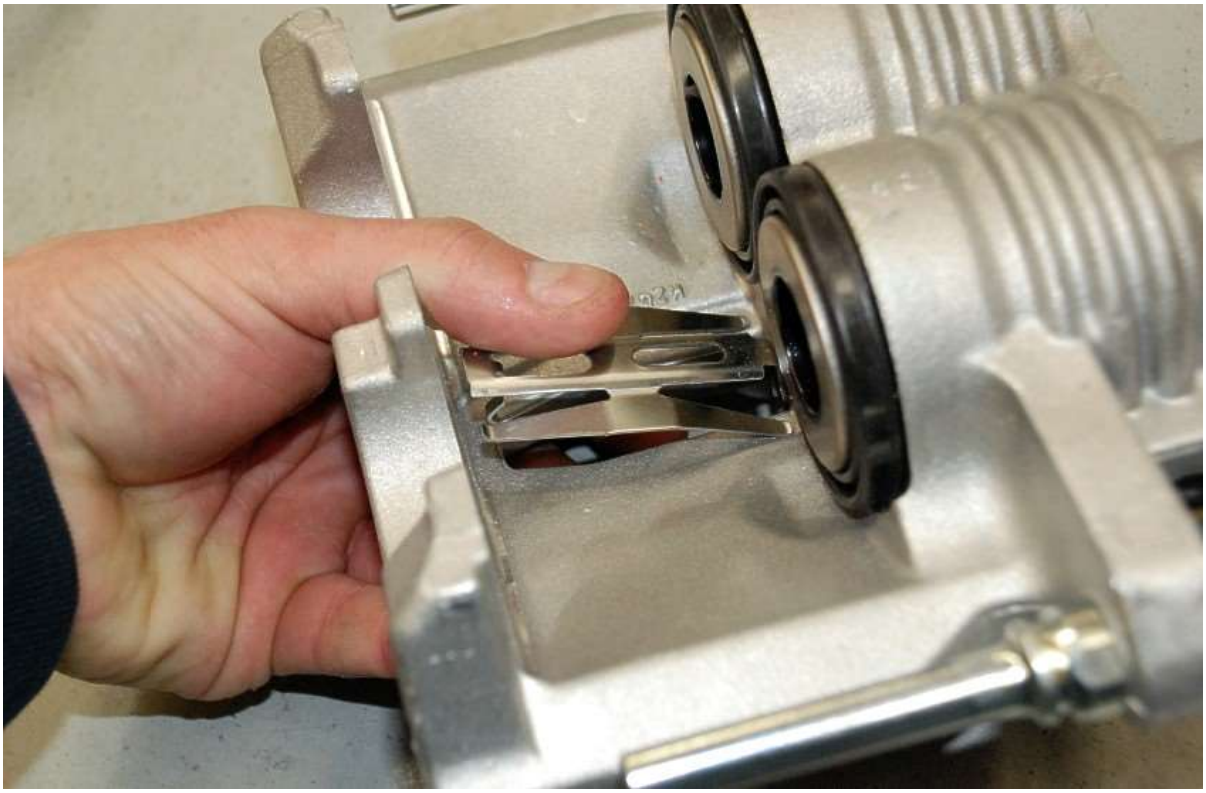


Install the caliper slider pins on the caliper using the supplied bolts and a 16mm wrench and 12mm socket. Torque to **23-26 lb-ft.**



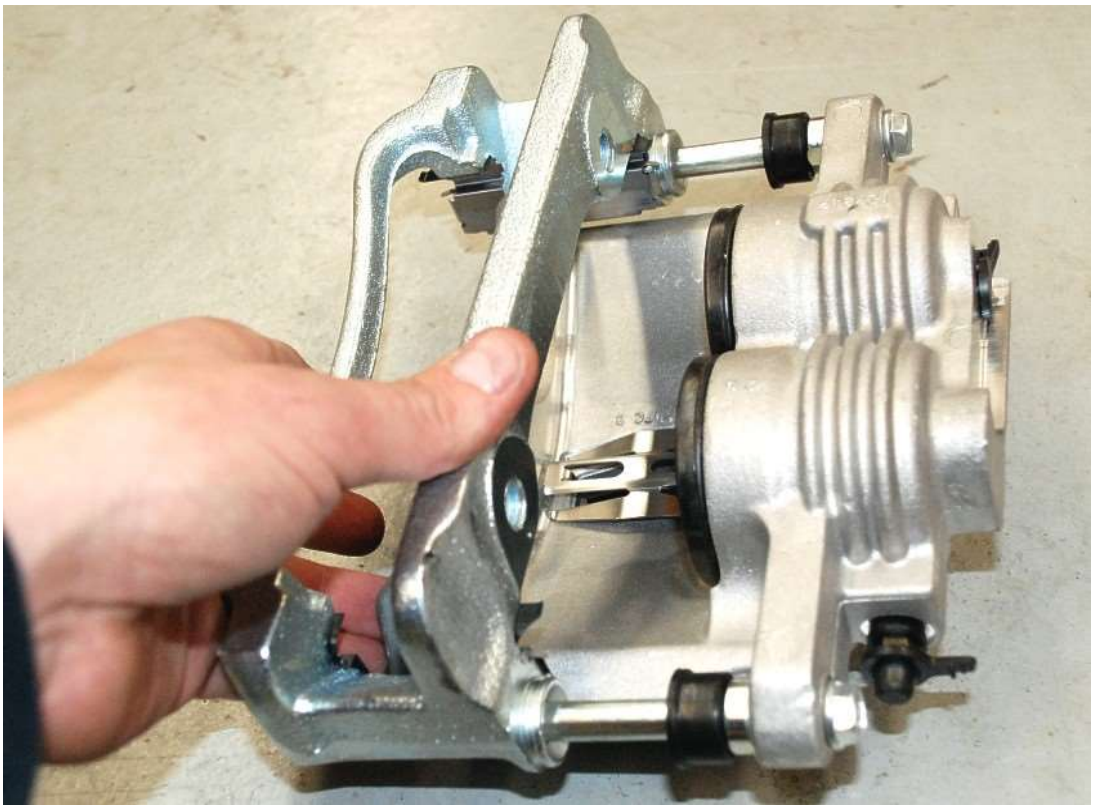
Install the slider grease boots on the slider pins.

In the supplied hardware bag there are six steel clips that are designed to separate the pads from the caliper. These clips allow the pads to slide on a smooth surface and not wear on the caliper. The four clips that go on the ends of the hanger are different end to end, and must be installed with the long tab facing out.

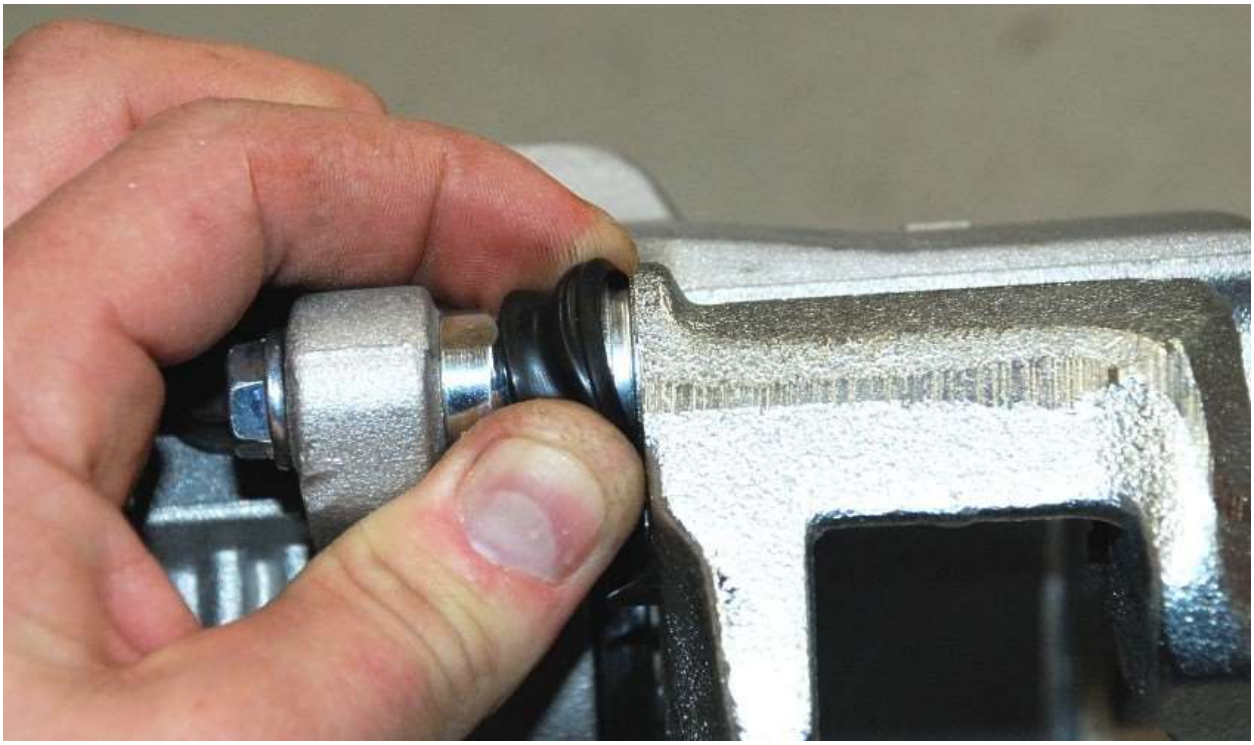


The two clips that are left go in the center of the caliper with the tab sticking up through the center hole. Insert the clip from the inside of the caliper through the large center hole with the larger tab on the side facing the pistons then press down on the outer part of the clip so the small clip goes through the large hole and clips on.

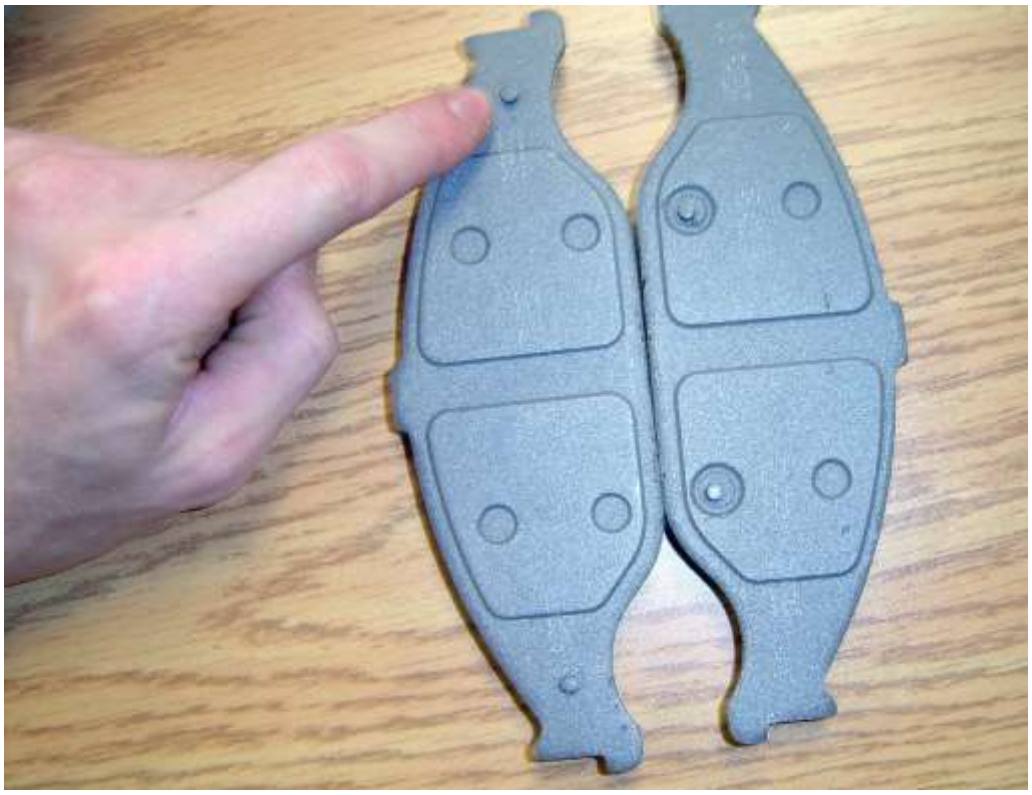
Grease the slide pins using the supplied grease.



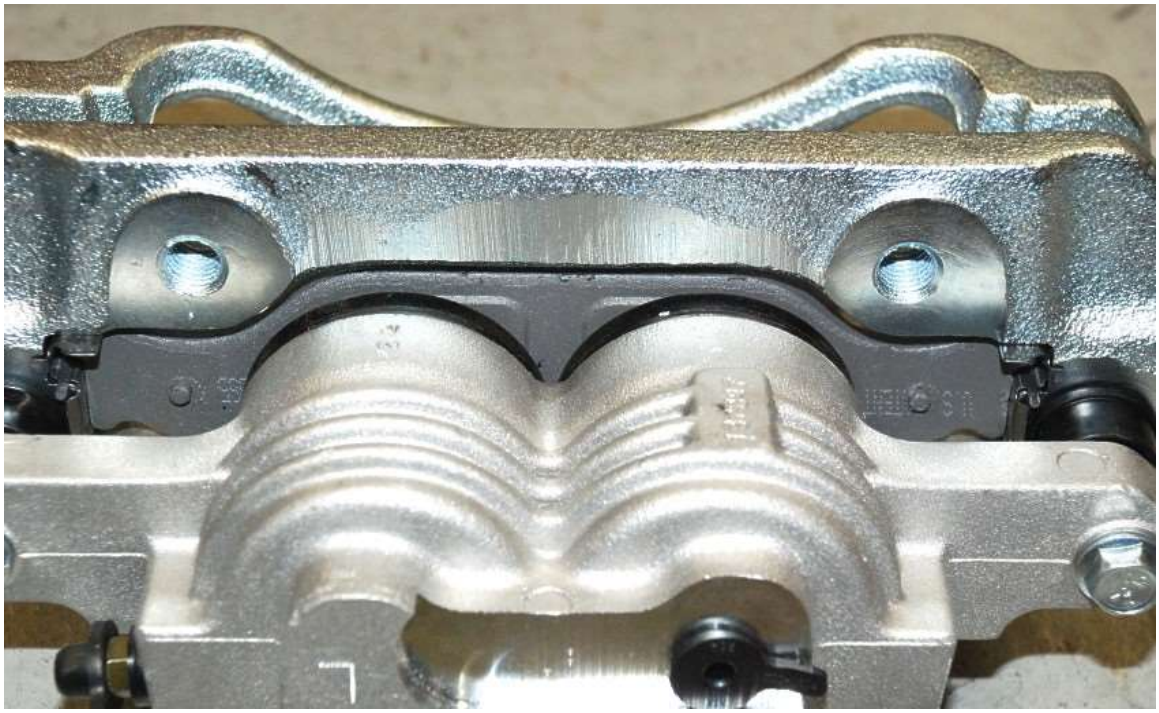
Slide the caliper hanger onto the caliper.



Push the rubber boots over the lip on the caliper bracket to seal the slider bolts correctly.



Look at the back side of each brake pad to find the inside pads and the outside pads. The difference is the location of the studs that are on the back of each pad. The studs on the inside pads are out near the ends of the pad, while the studs on the outside pads are near the middle.



Install the brake pads in the Caliper.

Clean the rotor with brake cleaner and push it onto the hub.

Install the caliper on the spindle; make sure that the fluid bleeder is at the top of the caliper. Note that the caliper marked LH will actually mount on the pass/right side so that the bleeder screw will be at the top of the caliper. Torque the caliper mounting bolts to **130Nm (95 lb-ft)**.

Install the calipers on the front spindles. Mount the calipers with the supplied bolts (FFR #14513). Make sure the pads are loaded into the caliper before installing it.

Solid Axle Rear Suspension

- If using an Independent Rear Suspension, skip to the Independent Rear Suspension section.

Solid Axle Preparation

🛠 ¾” sockets, ¾” wrench, ½” drill bit, drill, floor jack, jack stands, Torque Wrench
🚘 8.8” Rear axle assembly, Solid axle adapters/hardware Box.
✋ Use caution when working with the rear end assembly, it weighs 225 lbs.

If not already done, fill the axle with gear oil. See Appendix for specifications and capacities.

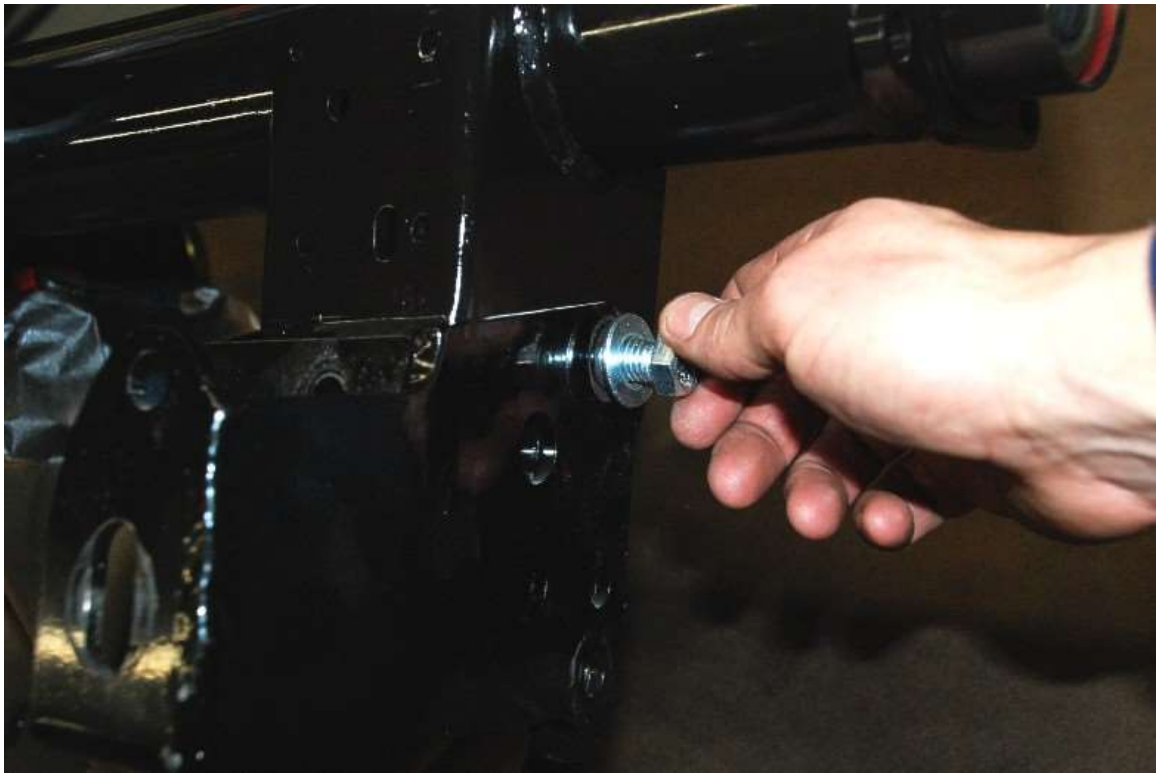
If using a used rear axle, remove the lower shock mounts and the anti-vibration weight under the pinion.

Drill the lower control arm mount holes with a ½” drill bit.

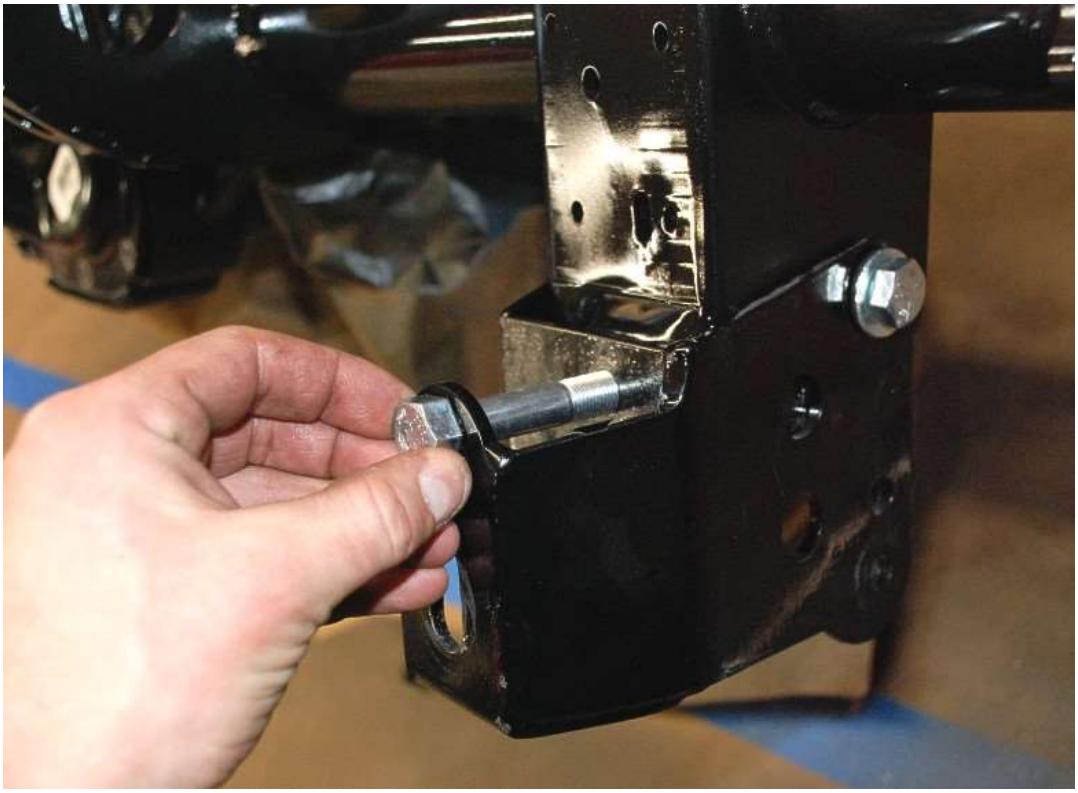
Traction Lok brackets

Axle Bracket left side

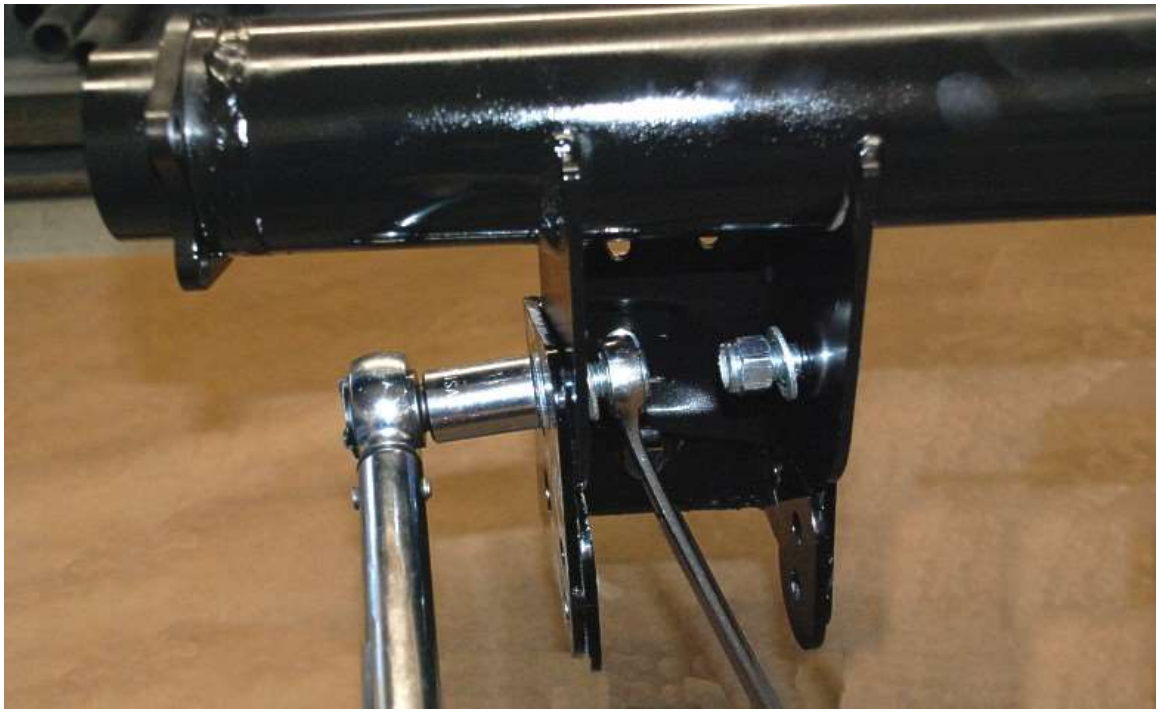
Axle Bracket right side



Position the Traction Lok brackets on the rear end with the bolts provided (the two short bolts go on the sides).



Insert the long bolt through the rear of the bracket and axle



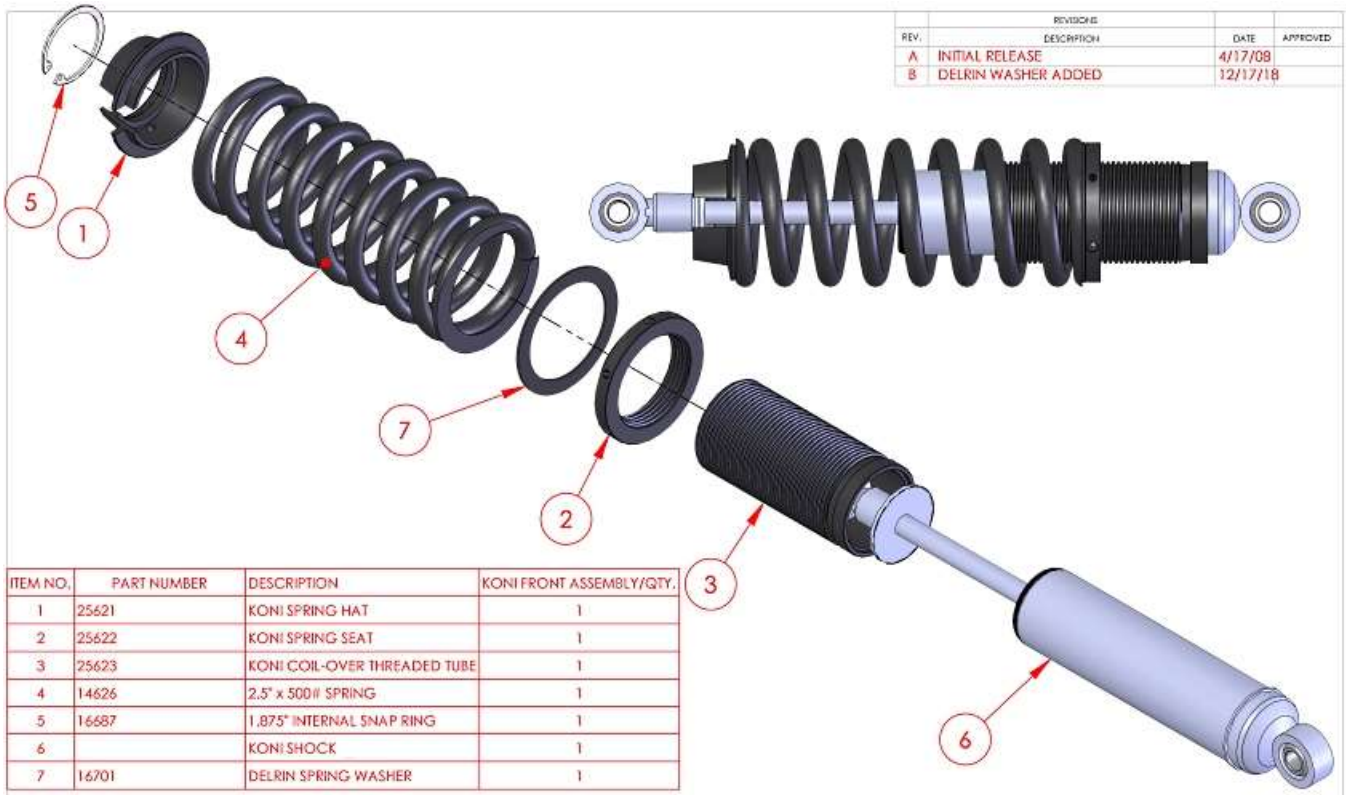
Tighten the two short bolts. Torque to Ford Specs **75-95 Nm (55-70 lb-ft)**.

Attach the lower control arms to the brackets on the axle using the bolt provided. The lower bolt holes provide more traction than the upper holes. Torque to **101-111Nm (75-82 lb-ft).**

Rear solid axle coil-over shock assembly

- Snap ring pliers, ¾" wrench, ¾" socket, ratchet, ruler, marker, hack saw.
- Rear solid axle shock kit
- The rear 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 rear springs are 250lb. Other springs are available for different ride characteristics.
- WARNING! Incorrect assembly and maintenance of this part can cause serious injury or death.
- If using the silver double adjustable shocks, these must be mounted with the body of the shock down.
- This section is for the Solid axle shocks only NOT the IRS shocks.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	4/17/08	
B	DELRIN WASHER ADDED	12/17/18	



ITEM NO.	PART NUMBER	DESCRIPTION	KONI FRONT ASSEMBLY/QTY.
1	25621	KONI SPRING HAT	1
2	25622	KONI SPRING SEAT	1
3	25623	KONI COIL-OVER THREADED TUBE	1
4	14626	2.5" x 500# SPRING	1
5	16687	1.875" INTERNAL SNAP RING	1
6		KONI SHOCK	1
7	16701	DELRIN SPRING WASHER	1

USED ON	ALL
APPLICATION	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
PRINTED 4/24/2019

	NAME	DATE
DRAWN	JI	4/17/08
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

Factory Five Racing, Inc.

TITLE: KONI FRONT SHOCK

SIZE A | DWG. NO. KONI SHOCK ASSEMBLY | REV B

SCALE: 1:3 | WEIGHT: | SHEET 1 OF 2

Unpack the rear shocks, coil-over's and hardware.

Double check the jam nut under the rod end and bump stop to make sure that it is tight.

Start the set screw in the spring seat.

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.

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

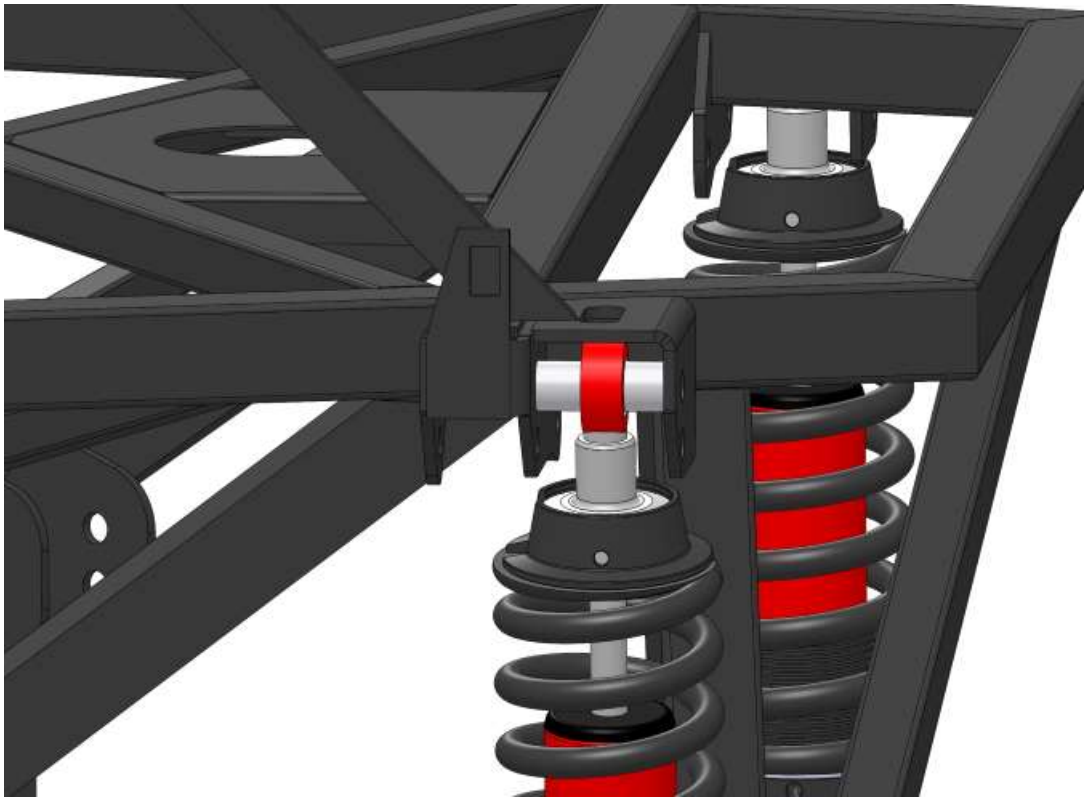
Put the spring and hat on the shock and rotate the spring seat back up the sleeve so that the spring pushes the hat tight against the end of the shock.

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.

Check to make sure that the spring is seated correctly on the shock.
Run zip ties through the holes in the spring hat and around the spring to prevent the spring from becoming unseated.

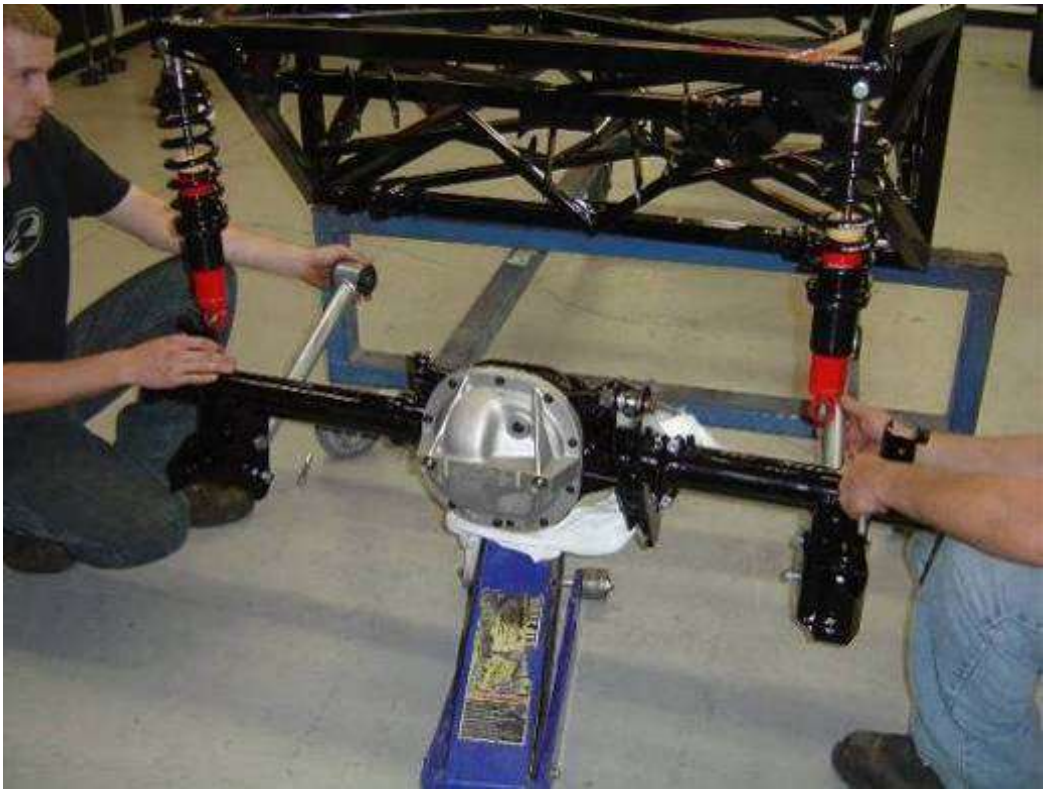
Rear solid axle shock install

- The suspension has two sets of holes. The top set is for the Hot Rod or low ride height while the bottom set is for the Truck.
- If using the double adjustable shocks, attach them to the frame using the upper holes.



Attach the rod end of the shock to the upper shock mount using the two equal length 0.675” kit spacers, ½”x 3” bolt, ¾” wrench and socket.

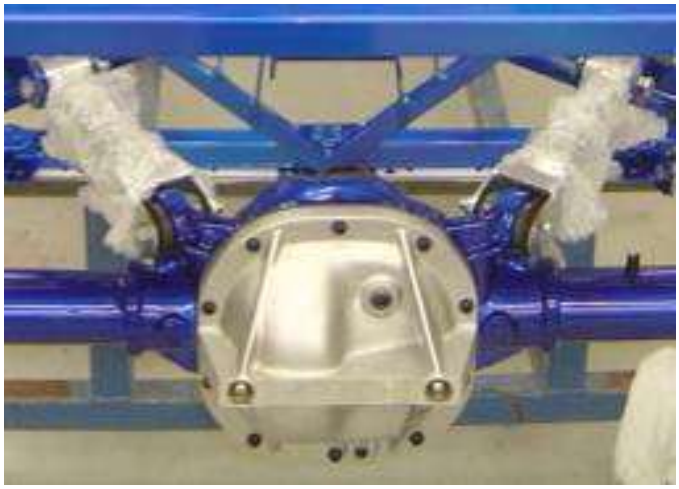
4 Link Suspension



Place the rear axle assembly on a jack and move it into position.

Install the lower control arms onto the frame with the provided hardware, making sure to install this bolt from the center of the car going outward to the side of the car (FFR# 13976 & 13706 & 13751)

Install the shocks (body down) to the rear axle assembly. Right side - The longer spacer (FFR# 33238) is placed at the front of the shock and the smaller 0.125" shim (FFR# 13210) is placed at the rear. Use the 3.25" long bolts for the axle mount.



Install the upper control arms onto the frame and the axle. These are attached to the frame with provided hardware.

4 LINK REAR SUSPENSION TORQUE SPECS CHART

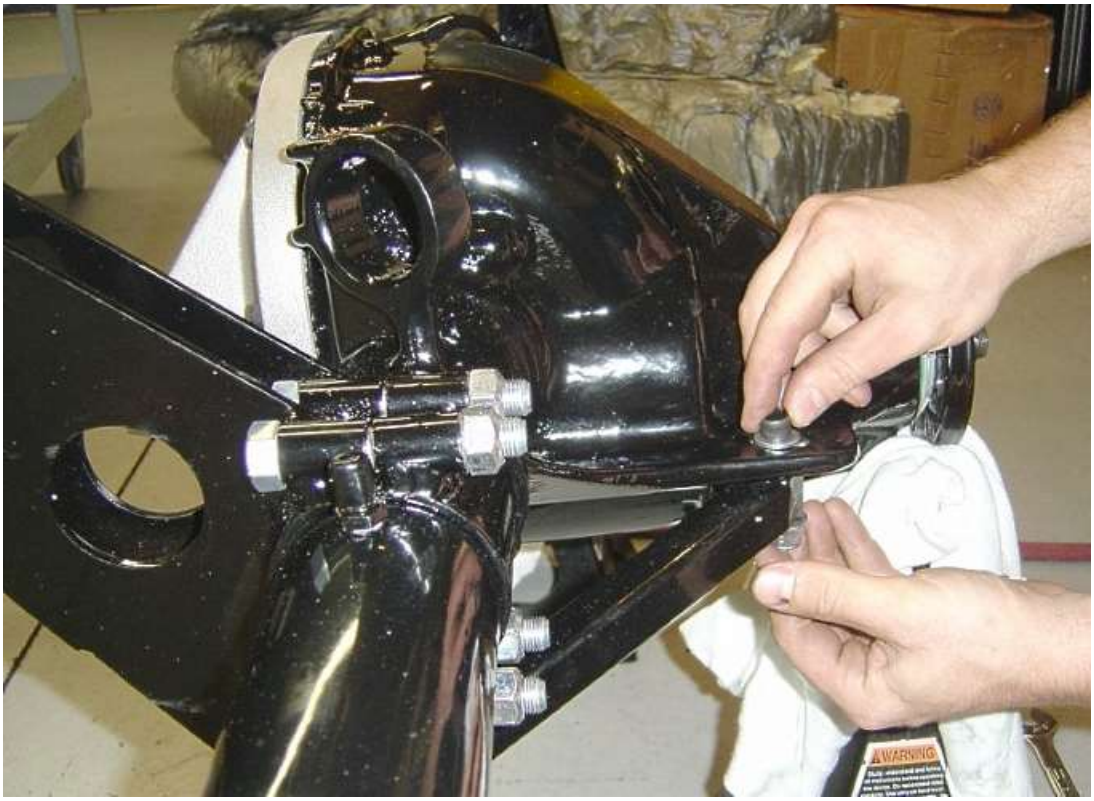
Item	Nm	lb-ft
Upper control arm to axle	101-111	75-82
Upper control arm to frame	101-111	75-82
Lower control arm to axle	101-111	75-82
Lower control arm to frame	101-111	75-82
Upper shock to frame	54-67	40-50
Lower shock to axle bracket	54-67	40-50

3-Link

3-link setup in chassis

Install the upper link bracket onto the axle using the fine hardware (FFR# 12217 & 12218)

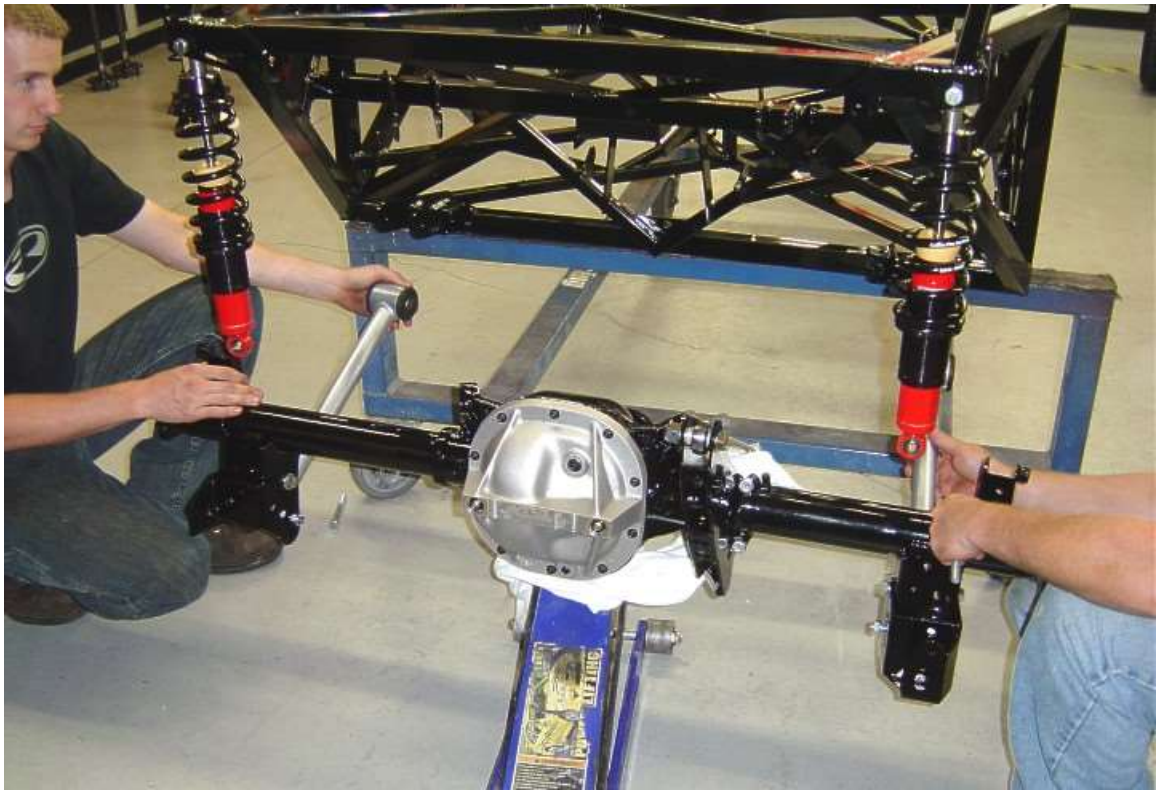
The bottom attachment of the axle clamp bracket attaches to the hole on the flange section of the pumpkin. This hole has some variance and may need to be drilled out from the bottom side.



Attach the leg of the axle clamp bracket to the rear end housing (FFR# 11020 & 13964 & 13977)

Insert the rod ends into the swaged tubes (one is right hand thread and one is left hand thread). The longer tube is the Panhard bar and the shorter one is the upper link.

Install the upper link onto the axle clamp bracket using the $^{5}/_{8}$" x 3.00" bolt and locknut



Place the rear axle assembly on a jack and move it into position.

Attach the lower control arm onto the frame with the provided hardware; make sure to install this bolt from the center of the car going outward to the side of the car (FFR# 13976 & 13706 & 13751)

Install the shocks (body down) to the rear axle assembly. Right side - The longer spacer (FFR# 33238) is placed at the front of the shock and the smaller 0.125" shim (FFR# 13210) is placed at the rear. Use the 3.25" long bolts for the axle mount.

- With the rear end correctly installed with the 3-link, the rear axle will rest on the 3-link Panhard bar mount with the suspension at full droop.

Install the upper link onto the frame, this bolt must be inserted form the inside of the frame going outward. Make sure to use one of the 0.25" spacers (FFR# 33240) on either side of the rod end.

Install the Panhard bar into the passenger side traction lock bracket. Three spacers are used in the front (2) 0.375” (FFR# 33239) and (1) 0.25” (FFR# 33240). The rear uses the thin 0.0625” shim (FFR# 13337)

The Panhard bar is then installed on the Panhard frame mount (driver’s side) and mounted with a 0.375” spacer (FFR# 33239) on either side.

3 link Rear Suspension Torque Specs Chart

Item	Nm	lb-ft
Upper link to axle	101-111	75-82
Upper link to frame	101-111	75-82
Lower control arm to axle	101-111	75-82
Lower control arm to frame	101-111	75-82
Upper shock to frame	54-67	40-50
Lower shock to axle bracket	54-67	40-50
Panhard bar	101-111	75-82

Rear brakes

Install the rear brakes according to their directions.

Optional Independent Rear Suspension

- L&R lower control arms, L&R upper control arms, Toe arms, L&R CV axles, Koni coil-over shocks, Springs, Fasteners, Driveshaft adapter
- Philips head screwdriver, 5/8" Drill bit, 13/16", 15/16" wrenches, 13/16", 15/16" 18mm Sockets, Large adjustable wrench – up to 1 5/8", 1/8" Hex Key, Marker, Ruler, Hacksaw, Drill, Plastic mallet, Hammer, Torque wrench

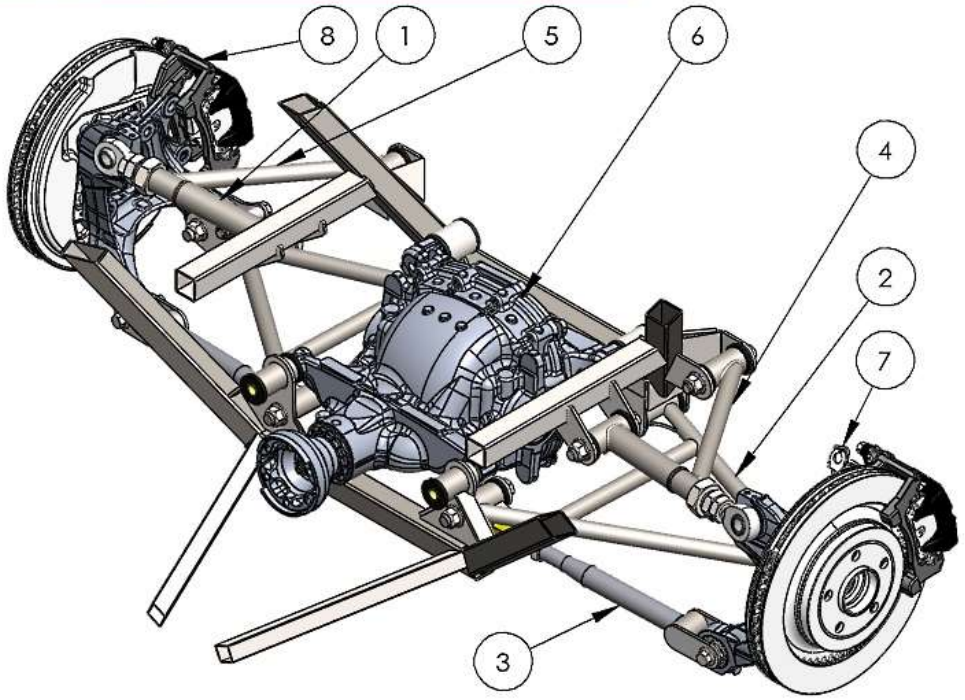
Parts needed

2015 or newer Ford Mustang IRS parts
Super 8.8" center section
L&R spindles
L&R brake parts

Mustang IRS Specifications

	2.3L Ecoboost	3.7L V6	5.0L Coyote
Housing	Steel	Aluminum	Steel
Weight	93lb	78lb	93lb
Gear Ratios	3.15:1, 3.31:1, 3.55:1	3.15:1, 3.55:1	3.15:1, 3.55:1
Brakes	12.6" (320mm) Solid rotor, 45mm single piston aluminum caliper	12.6" (320mm) Solid rotor, 45mm single piston aluminum caliper	13.0" (330mm) Vented rotor, 45mm single piston iron caliper

ITEM NO.	PART NUMBER	DESCRIPTION	Hot Rod/QTY.
1	15911	IRS RIGHT LOWER CONTROL ARM	1
2	15906	IRS LWR CNTRL ARM COMP.	1
3	15902	IRS TOE ADJUSTMENT ARM COMPONENTS	2
4	33998	UPPER CONTROL ARM	1
5	34025	34025 - IRS RIGHT UPPER CNTRL ARM	1
6	CENTER SECTION		1
7	LEFT SIDE SPINDLE		1
8	RIGHT SIDE SPINDLE		1



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DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
USED ON
APPLICATION HOT ROD
PRINTED 8/17/15

	NAME	DATE
DRAWN	JI	3/23/15
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

Factory Five Racing, Inc.

HOT ROD IRS COMPONENTS

SIZE A | DWG. NO. IRS Assembly | REV. A
SCALE:1/8 | WEIGHT: | SHEET 4 OF 4

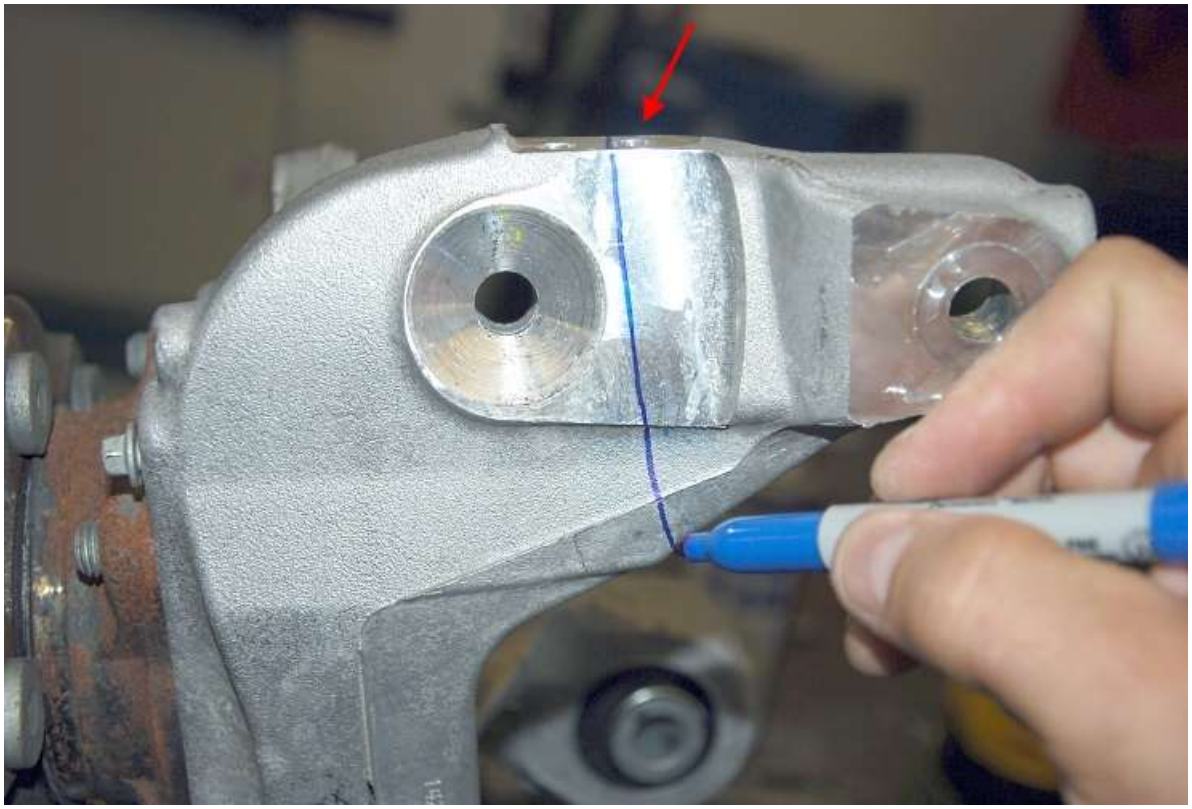
Parts preparation

Spindles

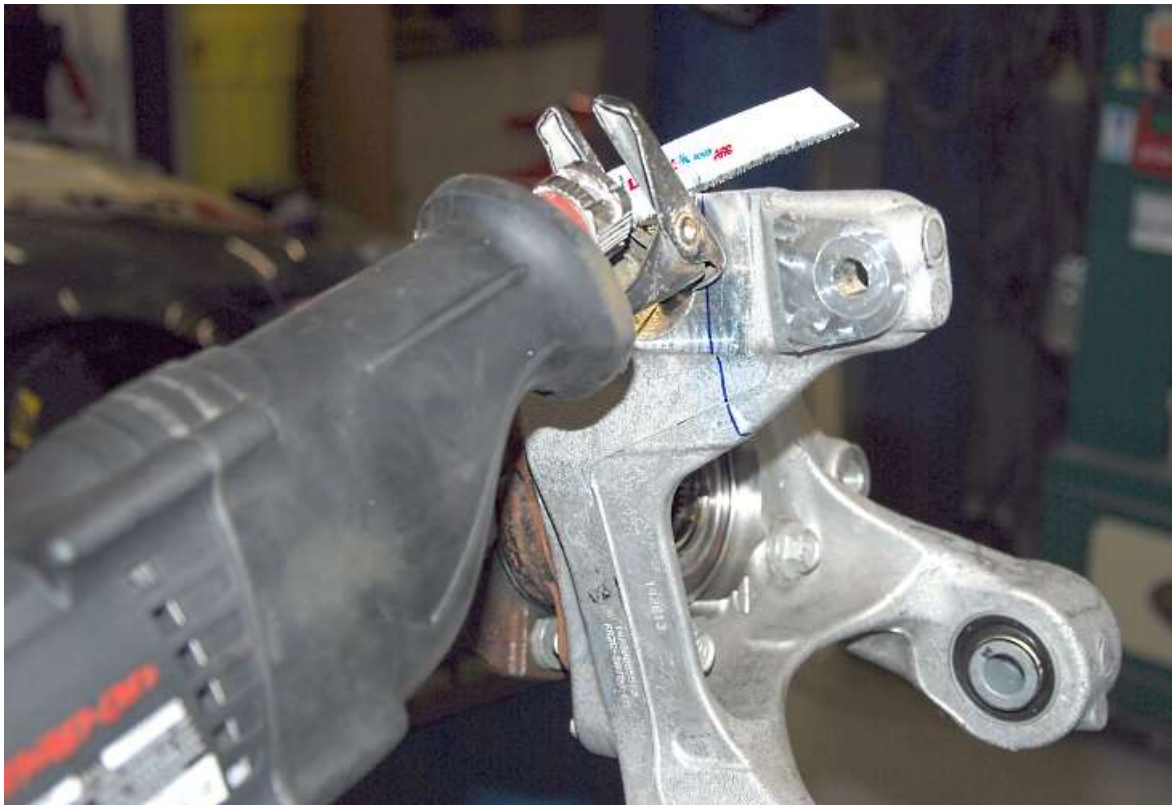
🛠 $^{5}/_{8}$" drill bit, drill, saw, marker

Remove the brake calipers from the spindle if they are mounted. They will be reinstalled after the spindle is put on the car.

Use a 5/8" drill bit to drill out the tapered hole at the top of the spindle.



Mark the spindle starting at the top just to the inside of the top inside hole down to the corner of the small boss at the bottom of the ear.

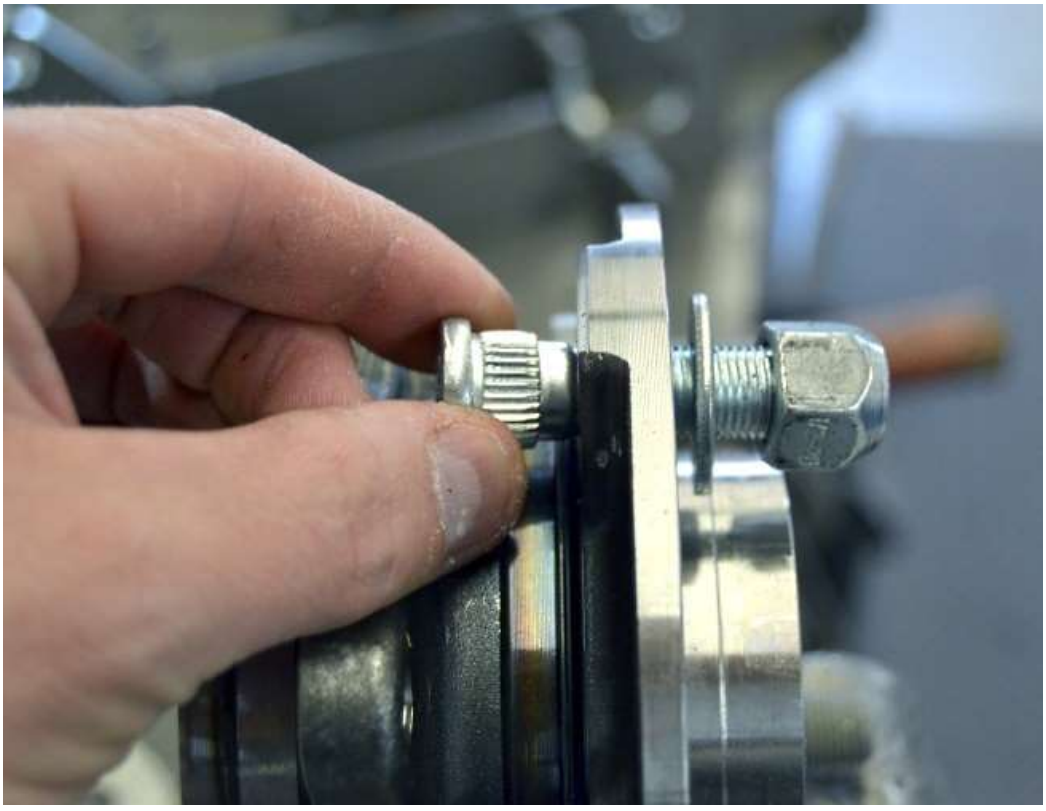


Use a saw to cut the ear off the spindle. If using a Sawzall or similar, use a wood blade; a 14tpi blade or finer will just get gummed up with the aluminum.

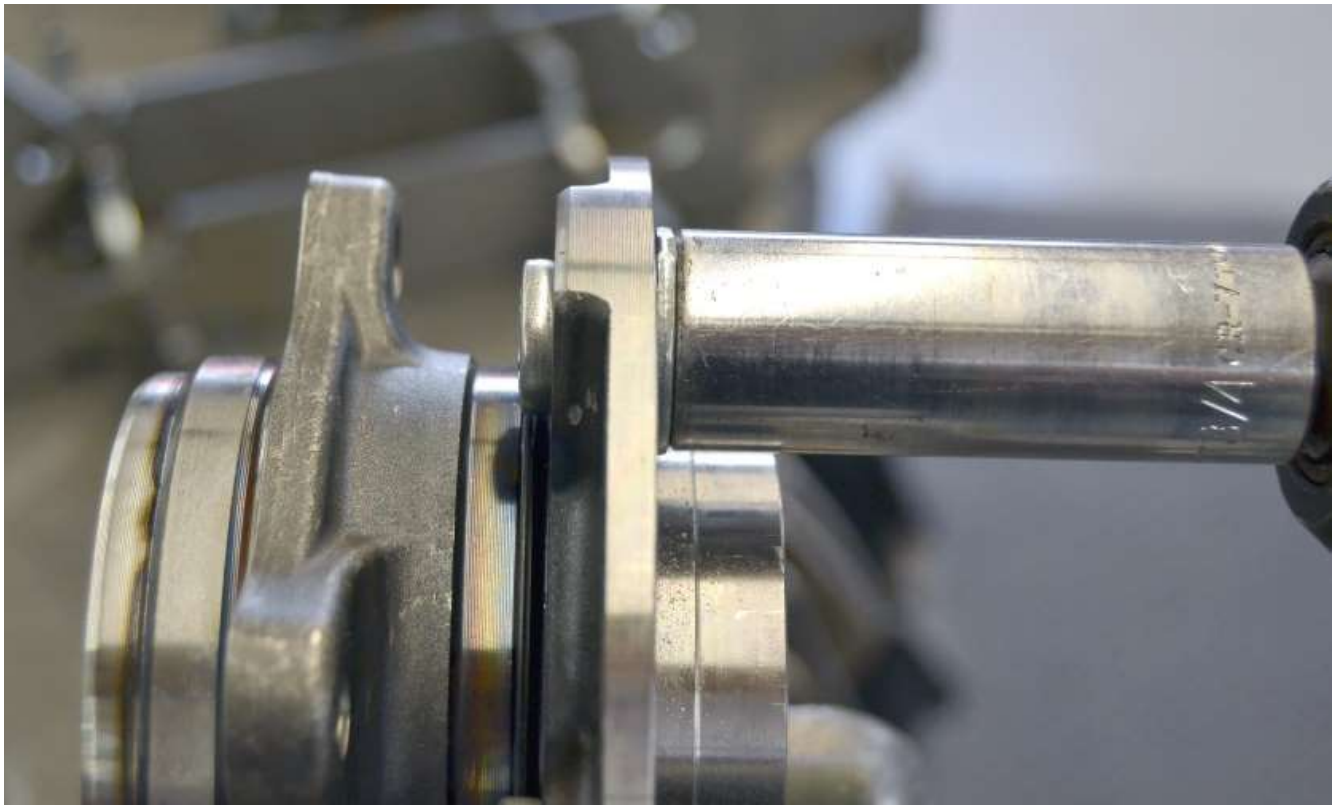
Hubs

🛠 Hammer, vise, ratchet, ½”-20 lugnut, torque wrench.
🚘 Rear wheel studs.
✋ Removal of the hub from the spindle is not necessary but can make things easier.

Use a vise to lightly hold the side of the wheel stud head then use a hammer to bang out the Mustang studs. Repeat for all of the studs.



Insert one of the included wheel studs into the hub from the back and use a washer and lug nut on the front side.



Use a ratchet to draw the wheel stud into the hub and torque the stud to **135Nm (100lb-ft)**.

Repeat for the other wheel studs.

If the Hub was removed, use Loctite on the threads and reattach to the spindle.

Torque the bolts to **133Nm (98 lb-ft)**.

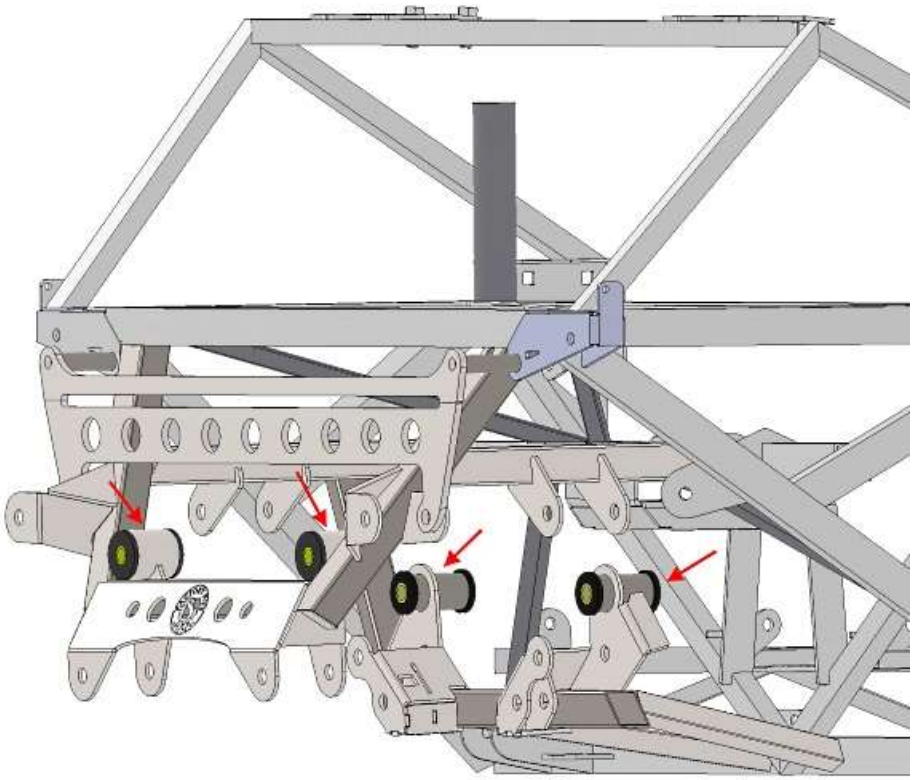
Center section

🛠 $^{5}/_{8}$" drill bit, drill.

Use a 5/8” drill bit to chase the front mount holes on the center section.

Frame

🛠 Rubber/plastic mallet
🚗 Differential mounting components



Bushing locations.

Use a plastic mallet to install the polyurethane bushings marked 2048 and the longer ($3^{1}/_{16}$") sleeves where the front of the center section will mount.

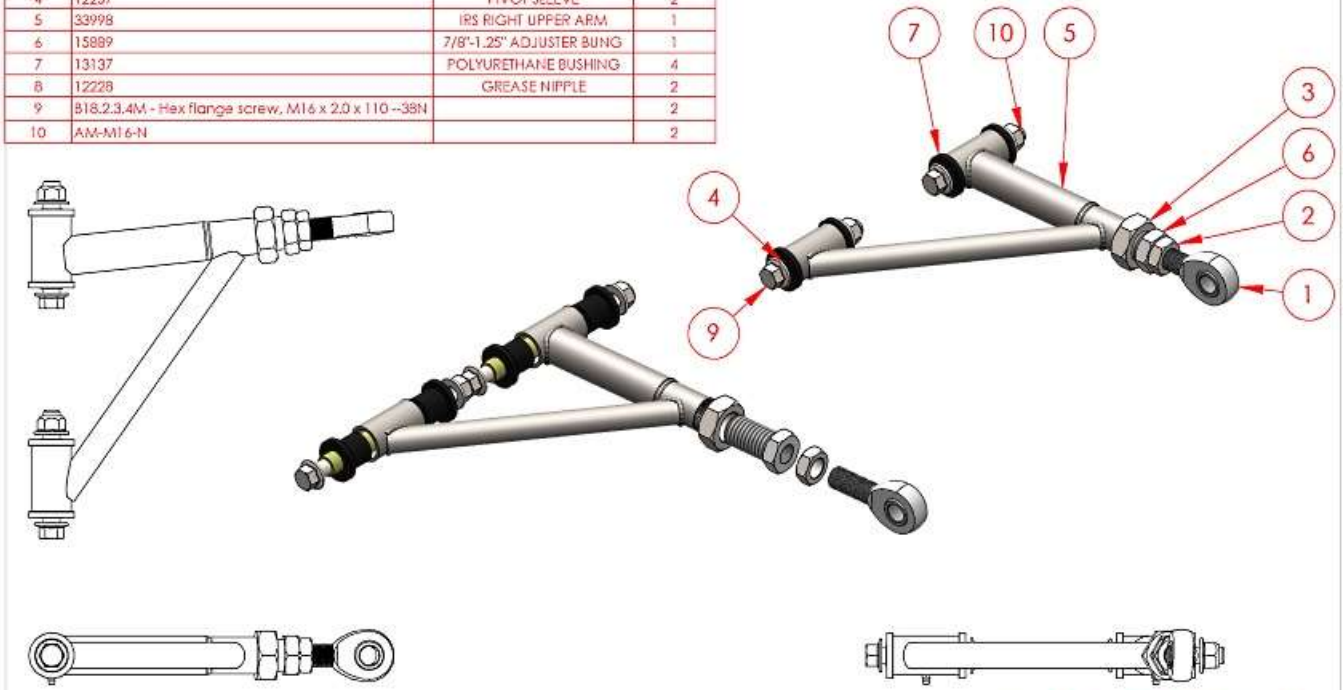
Use a plastic mallet to install the polyurethane bushings marked 2123 and the shorter (2.40”) sleeves where the rear of the center section will mount.

Upper control arms

Upper control arm components
Grease gun

ITEM NO.	PART NUMBER	DESCRIPTION	34025/QTY.
1	15890	7/8"-14 LH THREAD ROD END	1
2	HJNUT 0.8750-14-D-N		1
3	HJNUT 1.2500-12-D-N		1
4	12257	PIVOT SLEEVE	2
5	33998	IRS RIGHT UPPER ARM	1
6	15889	7/8"-1.25" ADJUSTER BUNG	1
7	13137	POLYURETHANE BUSHING	4
8	12228	GREASE NIPPLE	2
9	B18.2.3.4M - Hex flange screw, M16 x 2.0 x 110 --3SN		2
10	AM-M16-N		2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	3/15/15	



HOT ROD

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
USED ON
APPLICATION 2015 IRS

	NAME	DATE
DRAWN	JI	11/20/14
COMMENTS:		

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Factory Five Racing, Inc.

TITLE: 34025 - IRS RIGHT UPPER CNTRL ARM

SIZE	DWG. NO.	REV
A	33997	A

PRINTED 8/17/2015
SCALE: 1:5 WEIGHT: SHEET 1 OF 1

Assemble each of the upper control arms as shown.

Grease the control arms using chassis grease until the grease comes out of the flutes in the bushings next to the pivot sleeves.

Lower control arms

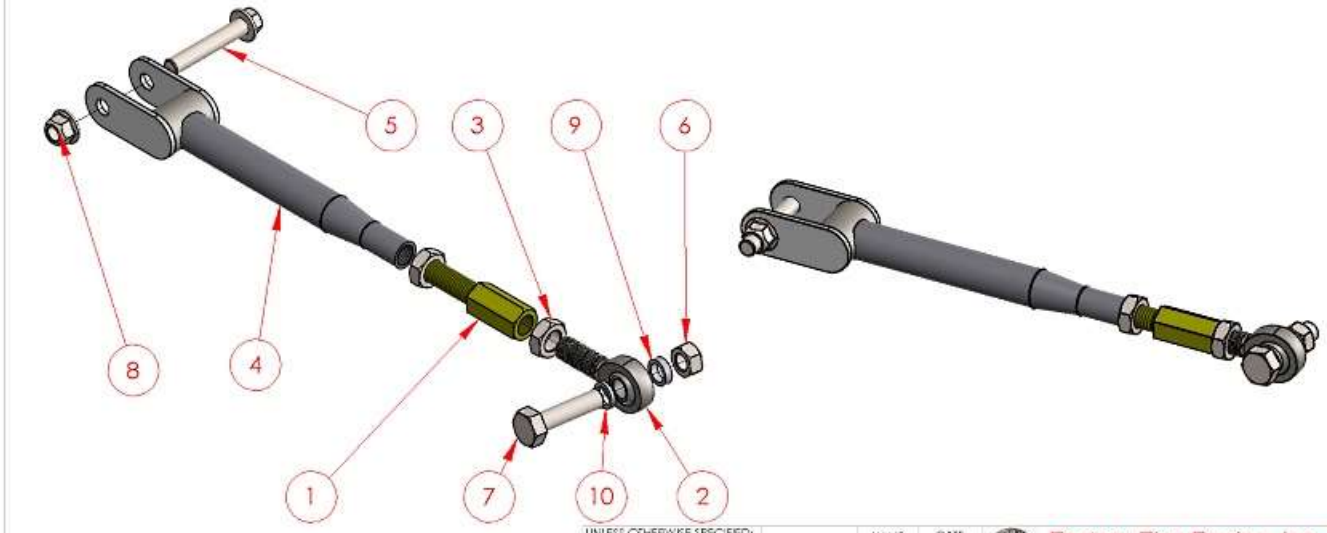
🛠 Grease gun

Grease the control arms using chassis grease until the grease comes out of the flutes in the bushings next to the pivot sleeves.

Toe adjustment arms

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33388 - LINKAGE ADJUSTER	LINKAGE ADJUSTER	1
2	12348 3-4 ROD END BODY	12348 - 3/4"-16 THREAD x 5/8" BORE ROD END	1
3	HJNUT 0.7500-16-D-N		2
4	15903	IRS TOE ARM	1
5	B18.2.3.4M - Hex flange screw, M14 x 2.0 x 80 --34N		1
6	HNUT 0.6250-11-D-N	15936	1
7	HHBOLT 0.6250-11x2.5x1.25-N	15216	1
8	AM-M14-N		1
9	33240	14739 0.25" SPACER	1
10	15908	0.25" SPACER	1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	1/23/15	



ROADSTER	UNLESS OTHERWISE SPECIFIED:		NAME DATE
COUPE	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN JI 1/6/15 COMMENTS:	Factory Five Racing, Inc. TITLE: IRS TOE ADJUSTMENT ARM COMPONENT
	MATERIAL		SIZE A · DWG. NO. 15902 · REV A
USED ON	FINISH		
APPLICATION 2015 IRS		PRINTED 5/2/2016	SCALE: 1:4 WEIGHT: · SHEET 1 OF 1

PROPRIETARY AND CONFIDENTIAL
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Assemble each of the toe adjustment arms as shown.

Installation

Center section

- Rubber/plastic mallet, torque wrench, 18mm, $^{13}/_{16}$" sockets, $^{15}/_{16}$" wrench.
- Differential mounting components.
- Roadster is shown but Hot Rod installation is similar.
- Use a friend to help with the heavy center section in the next steps.

Use rags to protect between the front center section mount on the frame.

With the help of a friend, lift the center section nose up into the frame and over the front mount.

Flatten the center section out so it is horizontal then back it up so it is above the mount locations and lower it down so the bolts can be installed. The smaller/shorter bolts are used for the rear mounts.

The larger/longer bolts and nuts are used for the front mounts.

Torque both the front and rear bolts to **135Nm (100 lb-ft)**.

Toe Adjustment arms

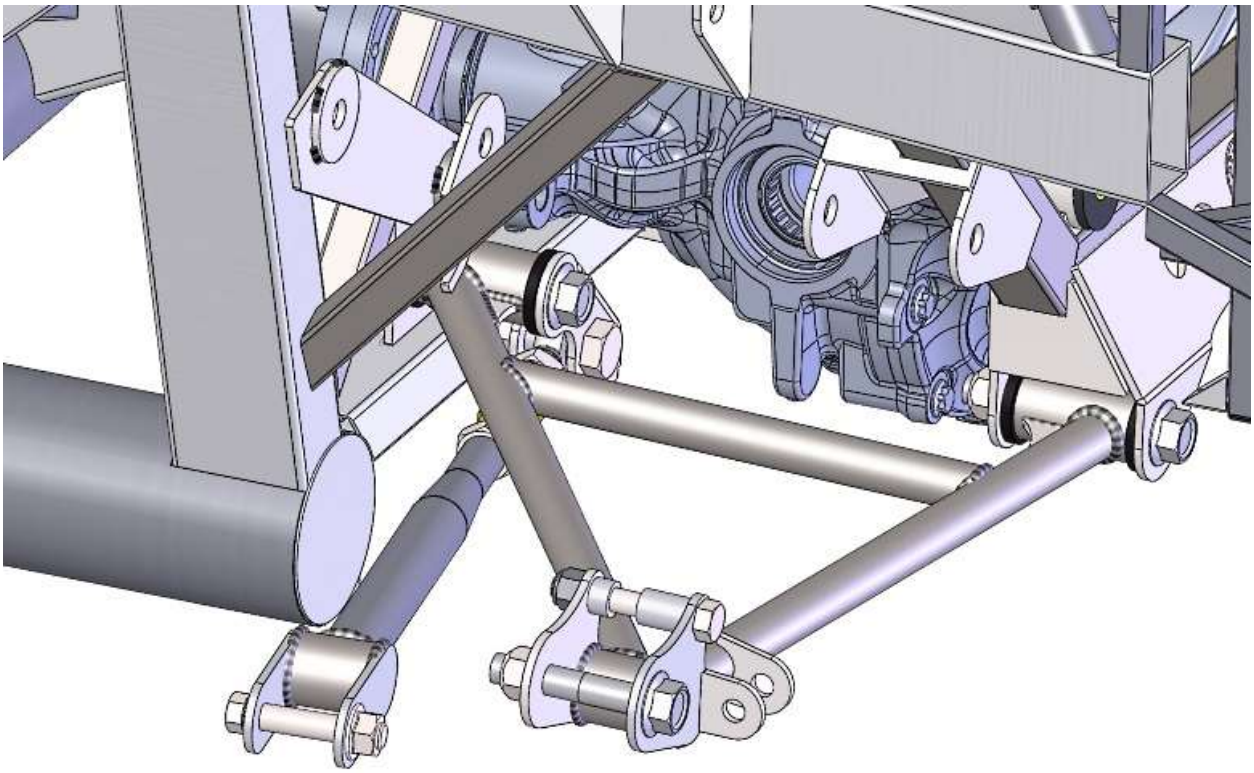
IRS Toe adjustment arm components
$^{13}/_{16}$" socket, $^{15}/_{16}$" wrench, torque wrench.

Attach the toe arms to the frame below the front lower arm mount using the $^{1}/_{8}$" thick spacer in the back and the ¼" spacer on the front side of the rod end. Use the $^{5}/_{8}$" x 2.25" bolts to attach them to the frame.

Torque bolts to **135Nm (100 lb-ft)**.

Lower control arms

IRS lower control arm components
$^{13}/_{16}$" socket, $^{15}/_{16}$" wrench, torque wrench.

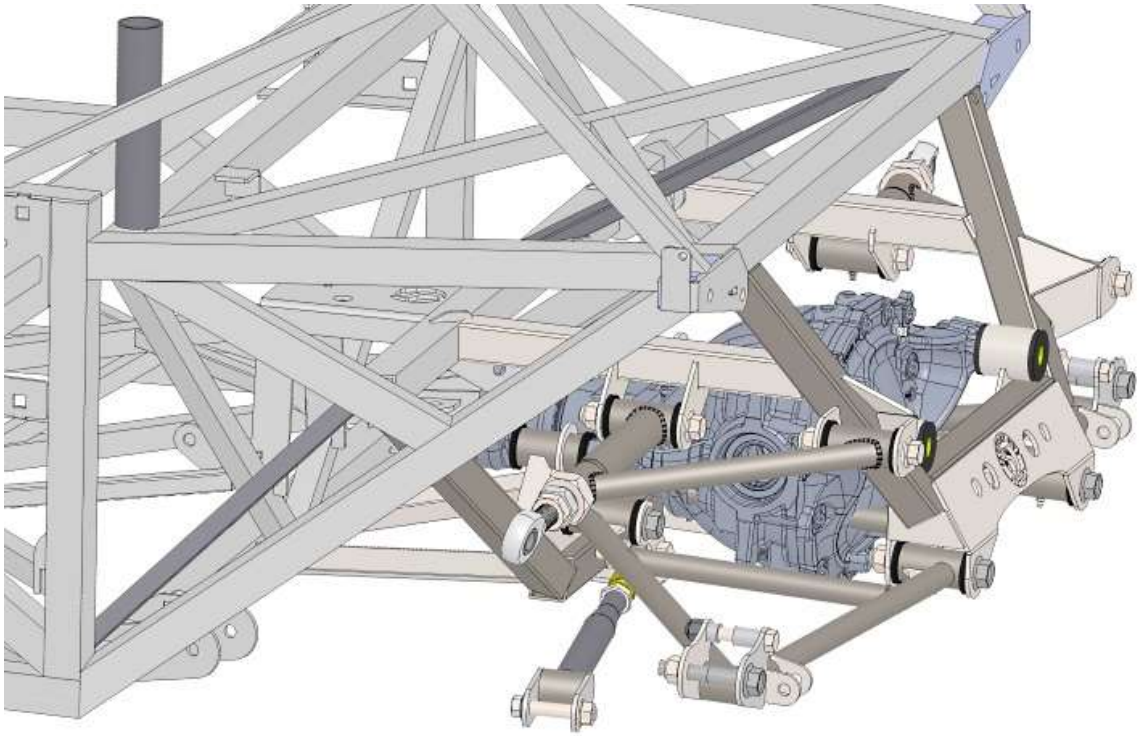


Attach the control arms to the frame with the shock mount towards the rear and spindle brackets up. Use the longer M16 x 110mm (~$4^{5}/_{16}$") bolts.

Hold the arm horizontal and torque the bolts to **135Nm (100 lb-ft)**.

Upper control arms

IRS upper control arm components
$^{13}/_{16}$" socket, $^{15}/_{16}$" wrench, torque wrench.

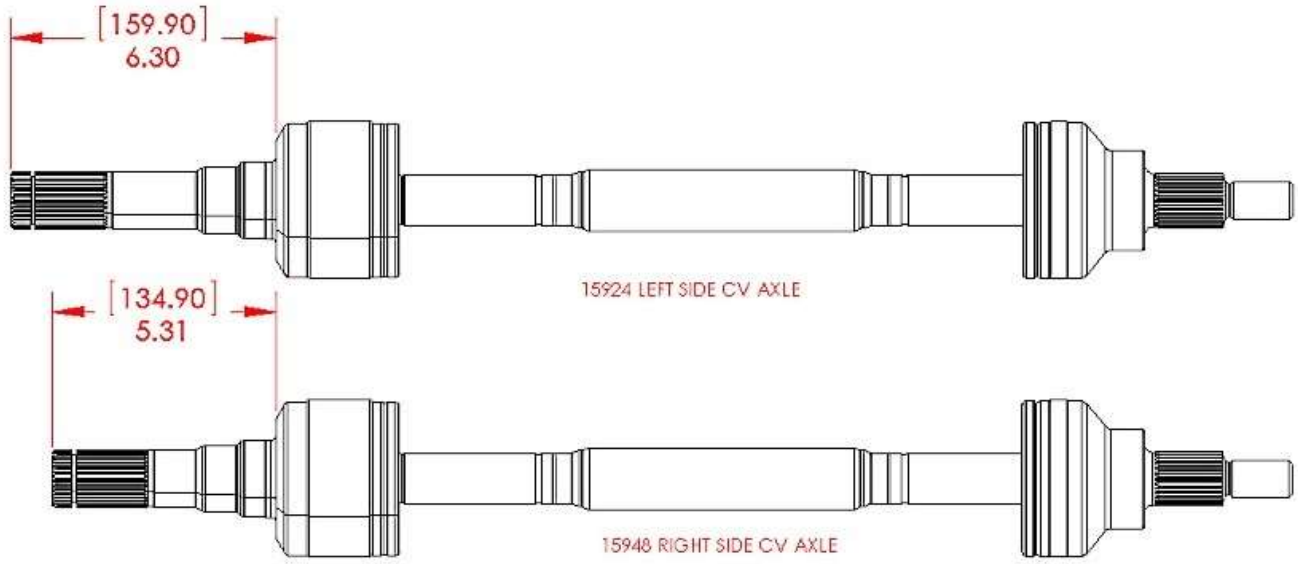


Attach the upper control arms to the frame with the thick tube at the front. Use the longer M16 x 110mm (~$4^{5}/_{16}$") bolts.

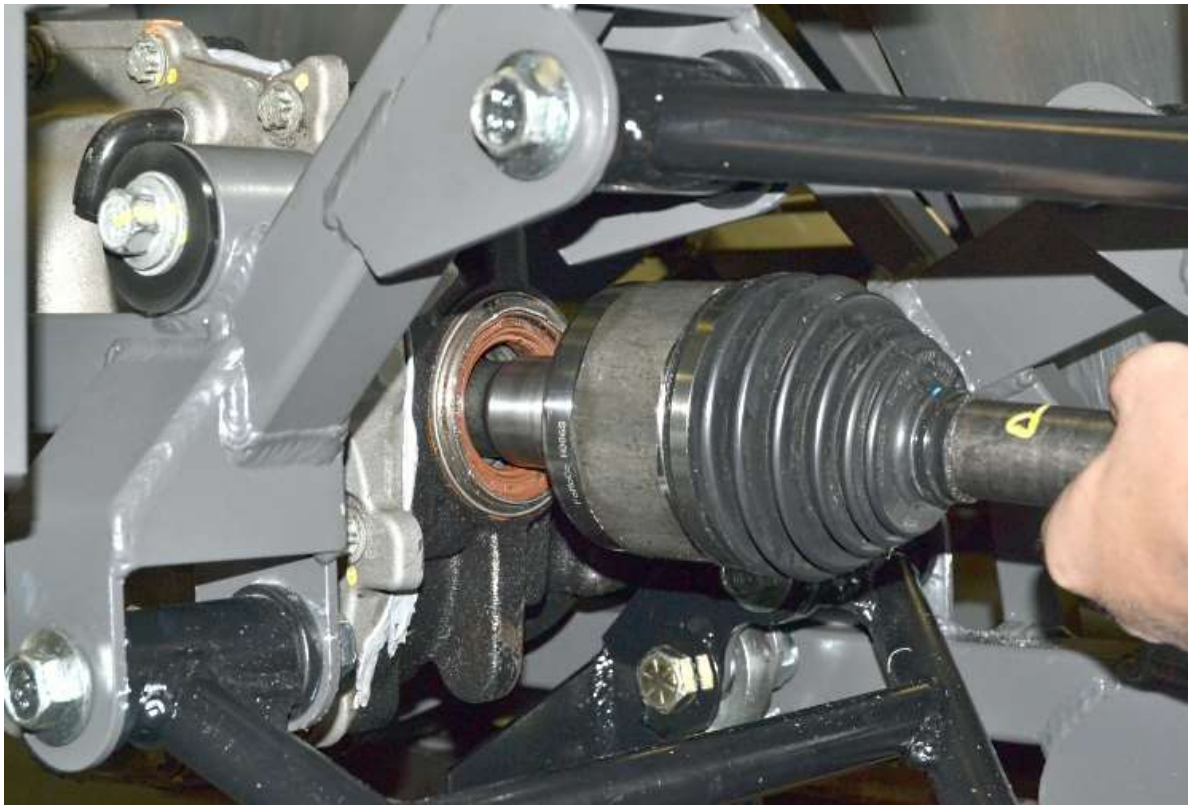
Hold the arm horizontal and torque the bolts to **135Nm (100 lb-ft)**.

CV Axle

- CV Axles, spindles

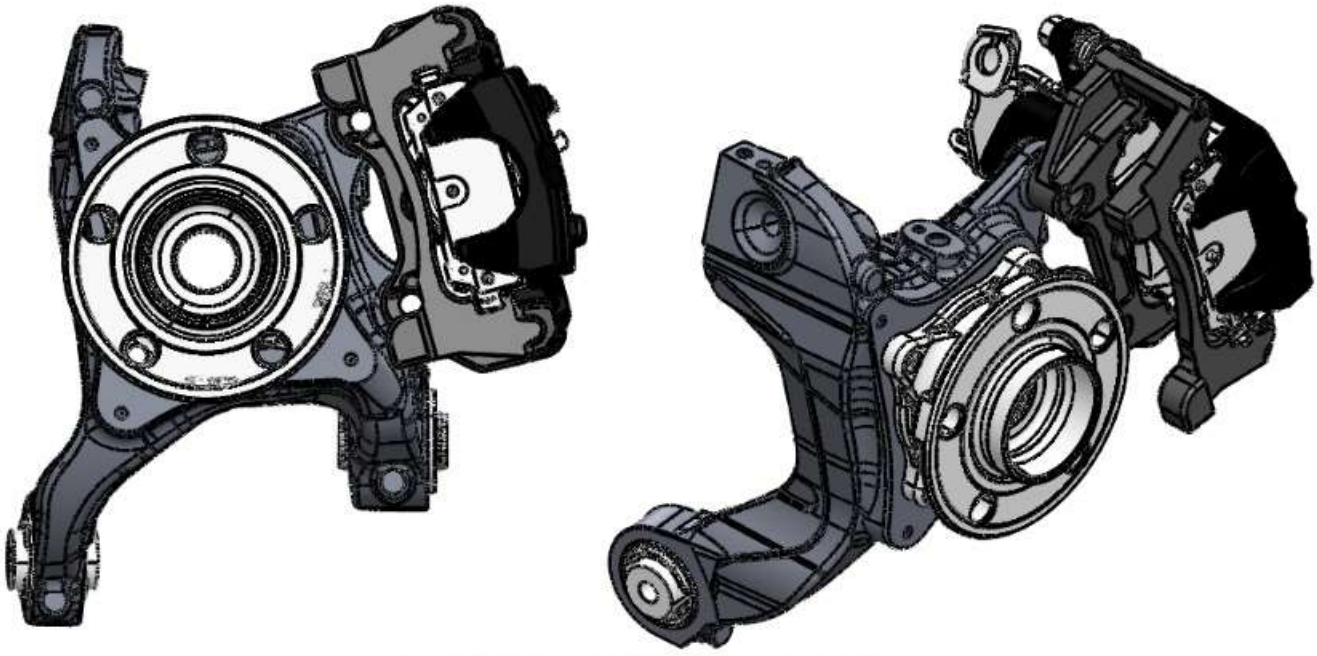


The inside CV joint is different for each side of the car, make sure to use the correct one when installing.



Starting with the left side using the correct axle, push the inner CV joint into the center section.

- When fully installed there should be an 1/8" (~3mm) gap between the inside of the CV joint and the center section. If necessary, compress the CV axle and with the CV axle nut on the end hit the CV axle in with a plastic mallet. Pull on the inner CV joint to make sure that it does not come out.



LEFT SIDE SPINDLE

Slide the left spindle onto the outer CV joint and start the nut on the end.

Spindle to Lower arm

Connect the bottom of the spindle to the lower control arm using the M16 x 90mm bolts and locknuts. Right side shown.

Wait to torque the axle nut until after the other arms, brakes and e-brake cables are installed.

Spindle to Upper arm

Insert the angled mount adapter into the upper arm rod end.

Reuse the 5/8" washer that was on the old bolt and place it on the new 5/8" x 4.25" bolt along with a misalignment spacer.

Attach the upper control arm to the spindle using the bolt with the misalignment spacer.

Use a $^{15}/_{16}$" wrench, $^{15}/_{16}$" socket and ratchet to tighten the locknut.

Wait to torque the bolts until after the other arms are installed.

Check the angle of the upper control arm rod end, make sure that the rod end is not touching the spindle and that it is aligned with the upper control arm.

Once the car has been aligned, use a $1^{5}/_{8}$" wrench to loosen the upper control arm large jam nut and put some Loctite on the threads where the jam nut will sit.

Retighten the jam nut.

Toe Link

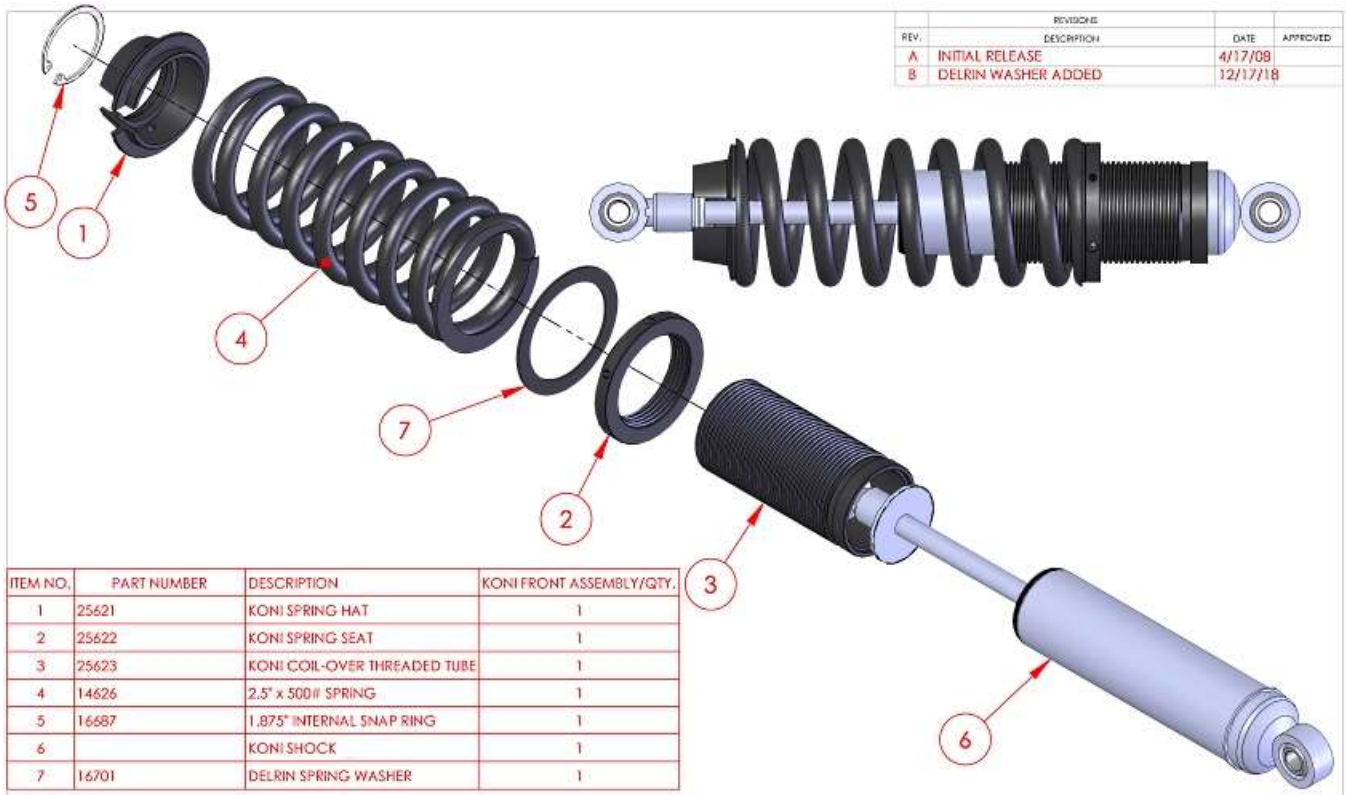
Attach the Toe link arm to the spindle using the M14 x 80mm bolt and locknut.

Repeat for the right-hand side.
Use the torque specifications page at the back of the instructions to torque the control arm to spindle bolts.

Coil-Over Shock Assembly

- Snap ring pliers, ¾" wrench, ¾" socket, Ratchet, floor jack
- Shock set, Insulated clip hardware.
- 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.
- Hot Rod IRS springs are 300#.
- WARNING! Incorrect assembly and maintenance of this part can cause serious injury or death.
- If using the silver double adjustable shocks, these must be mounted with the body of the shock down.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	4/17/08	
B	DELRIN WASHER ADDED	12/17/18	



ITEM NO.	PART NUMBER	DESCRIPTION	KONI FRONT ASSEMBLY/QTY.
1	25621	KONI SPRING HAT	1
2	25622	KONI SPRING SEAT	1
3	25623	KONI COIL-OVER THREADED TUBE	1
4	14626	2.5" x 500# SPRING	1
5	16687	1.875" INTERNAL SNAP RING	1
6		KONI SHOCK	1
7	16701	DELRIN SPRING WASHER	1

ALL	
USED ON	
APPLICATION	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
PRINTED 4/24/2019

	NAME	DATE
DRAWN	JI	4/17/08
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

Factory Five Racing, Inc.

TITLE: KONI FRONT SHOCK

SIZE	DWG. NO.	REV
A	KONI SHOCK ASSEMBLY	B

SCALE: 1:3 | WEIGHT: | SHEET 1 OF 2

Unpack the front shocks, coil-over's and hardware.

Double check the jam nut under the rod end and bump stop to make sure that it is tight.

Start the set screw in the spring seat.

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.

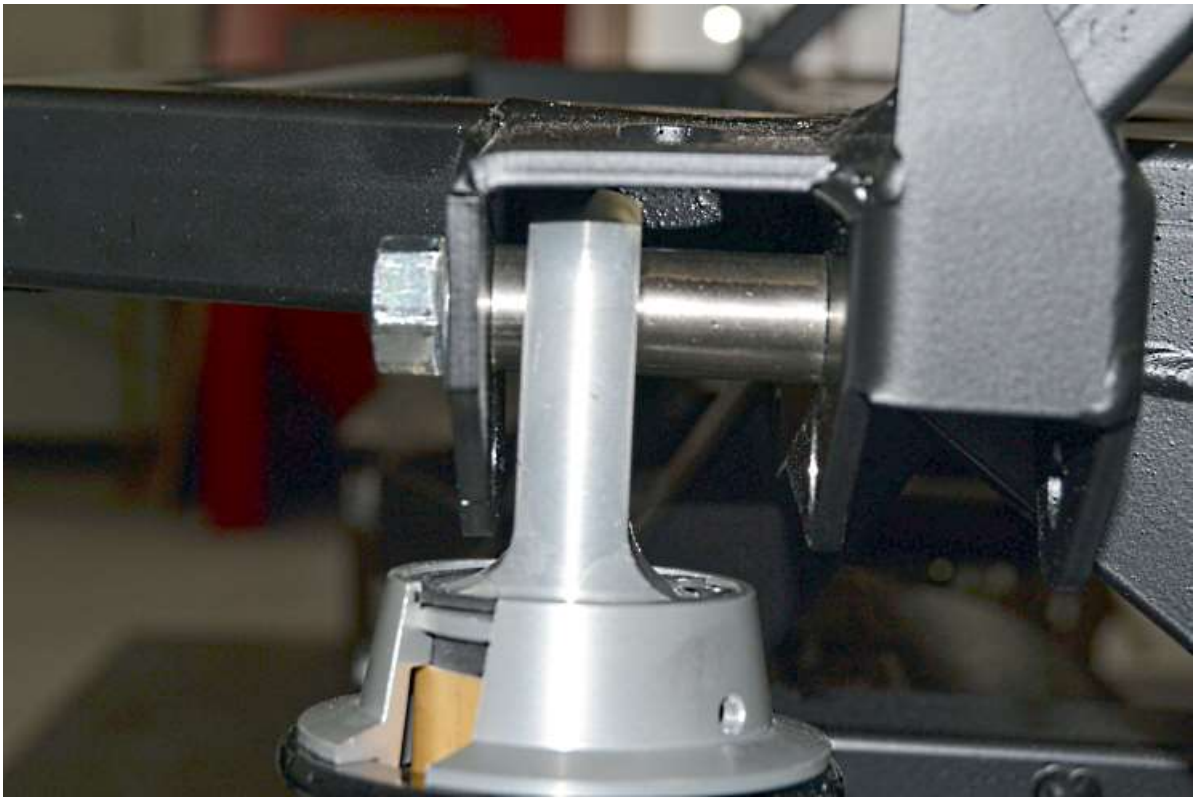
Put the Delrin spacer grease side down onto the spring seat on the threaded tube.

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

Put the 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.

Check to make sure that the spring is seated correctly on the shock.
Run zip ties through the holes in the spring hat and around the spring to prevent the spring from becoming unseated.



Attach the shaft end of the shocks to the rear upper frame mount. The body of the shock should be down. Use a ½" x 3.00" fine thread bolt with a ⅛" spacer on the rear side of the shock and 1.09" spacer on the front side.

Torque the upper shock bolt to **54Nm (40 lb-ft)**.

Jack the spindle up so the body end of the shocks can be mounted on the shock mount on the control arm using the longer 1.09” spacer on the back and $^{7}/_{16}$” spacer in front of the shock.

Torque the lower shock bolt to **54Nm (40 lb-ft)**.
Remove the floor jack.

Optional IRS Brakes

Download the 2015 IRS brake instructions from www.factoryfiveparts.com/instructions and install the brakes.

Connect the brake hose to the brake caliper.

Torque the banjo bolt to **39 Nm (29 lb-ft)**.
Run the brake hose over to the frame while the suspension is in droop and keep the brake line slack to locate the frame mount.
Run the hard brake lines in the kit to the brake line mount.

IRS CV axle Nut

🛠 Impact wrench, 36mm deep socket, Torque wrench.
✋ Wait to torque the axle nut until after the e-brake cables are installed.

Fluids

Name	Specification

Motorcraft® Additive Friction Modifier (U.S.) XL-3 (U.S.)	EST-M2C118-A
Motorcraft® SAE 75W-85 Synthetic Hypoid Gear Lubricant XY-75W85-QL	WSS-M2C942-A

Fill the rear axle with fluids.

Capacities

Fluid	Amount
SAE 75W-85 Synthetic Hypoid Gear Lubricant	3.15-3.30 pt. (1.49-1.56 L)
Friction Modifier	3.0-3.5 oz (0.089-0.104 L)

Alignment specs

Camber: -0.5°to -0.75°

Total Toe: 1/8" Toe in or 0.28° in

- For every full clockwise (screwed in) of the **Toe Link**, Camber increases by 0.7° (gains positive Camber) and Toe goes in by 0.156".
- For every full clockwise (screwed in) of the **Upper Control Arm**, Camber decreases by 0.9° (gains negative camber) and Toe goes in by 0.14".
- In order to increase negative Camber while maintaining Toe, for every 1 clockwise turn of the upper control arm, the Toe link should be turned counterclockwise 1 full turn. Each full turn of the upper control arm equals -1.6°.
- In order to change Toe while maintaining Camber, for every 1 full turn of the Toe Link, the Upper control arm should be turned in the same direction ¾ turn. Clockwise will Toe in and counterclockwise will Toe out.

Torque Specifications

	lb-ft	**Nm**
CENTER SECTION TO FRAME FRONT	129	175
CENTER SECTION TO FRAME REAR	129	175
BRAKE CALIPER TO CALIPER BRACKET	24	32
BRAKE CALIPER BRACKET TO SPINDLE	129	175
BRAKE HOSE BANJO BOLT TO CALIPER	29	39
LOWER CONTROL ARM TO FRAME	100	135
LOWER CONTROL ARM TO SPINDLE	100	135
TOE LINK TO FRAME	100	135
TOE LINK TO SPINDLE	100	135
UPPER CONTROL ARM TO FRAME	100	135

UPPER CONTROL ARM TO SPINDLE	100	135	
HUB TO SPINDLE	98	133	
CV AXLE NUT	98	133	THEN ROTATE 45°
DRIVESHAFT ADAPTER TO PINION FLANGE	41	55	
DRIVESHAFT TO DRIVESHAFT ADAPTER	70	95	

Firewall Aluminum

Footbox front aluminum

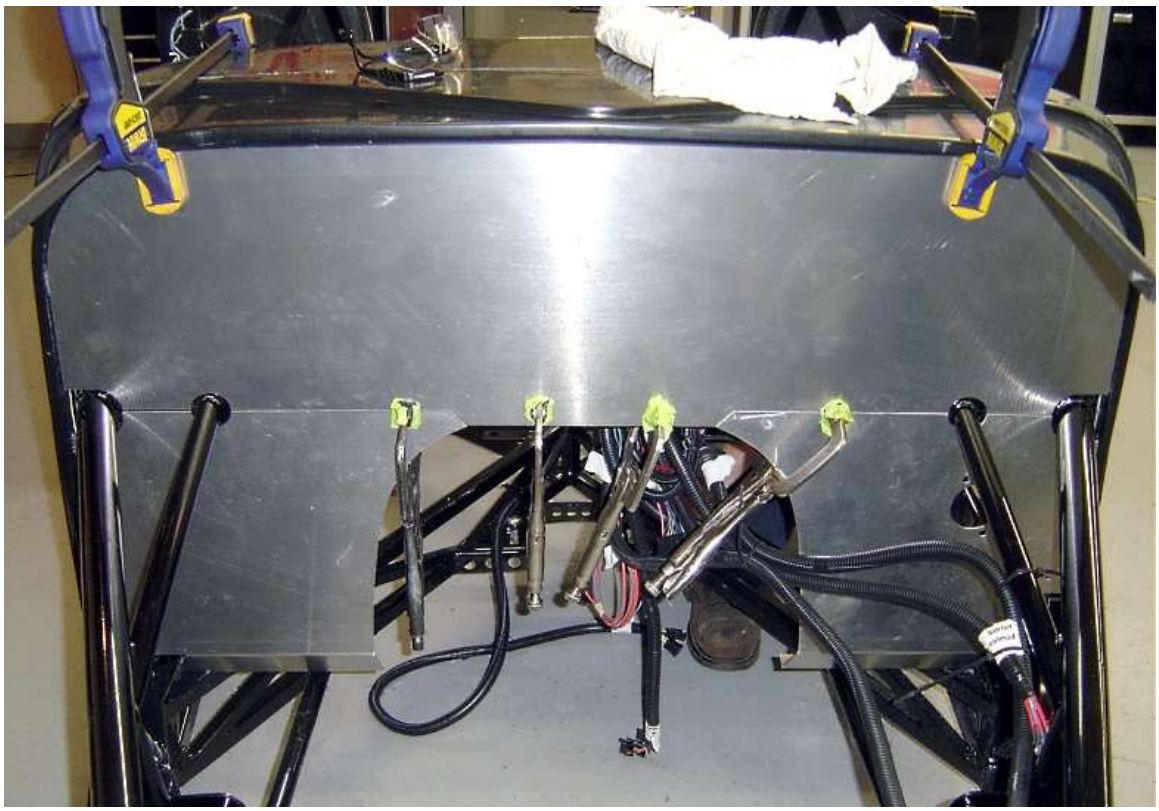
- 🛠 Clamps
- 🚗 Packaged aluminum

Clamp the front passenger footbox in place.

Clamp the driver side footbox front panels (has steering shaft hole in it) in place.

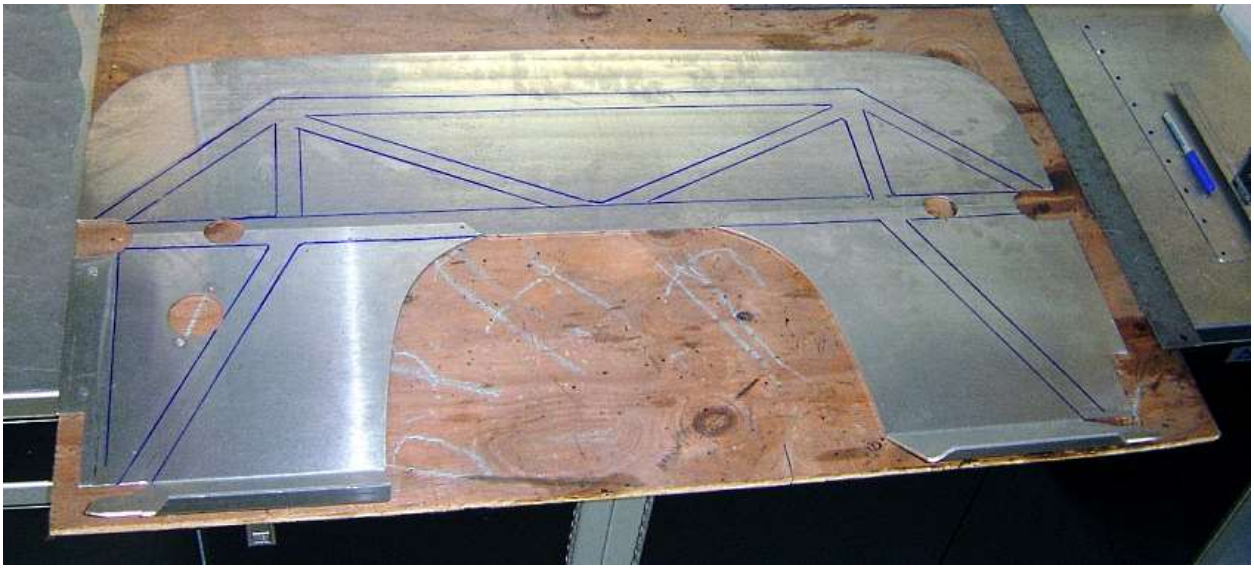
Firewall

🛠 Marker, drill, silicone, clamps
🚘 Secondary body fasteners, packaged aluminum, firewall



Clamp the firewall onto the frame. The bottom edge of the firewall meets the top edge of the footbox front walls.

Using a marker, mark the backside of these three pieces where they come in contact with the frame.



Remove the three marked panels.

Determine how you want to install your firewall (3/16" rivets, ¼-20" button heads or any other type of fastener). We recommend that you place a fastener every 3" or there about.

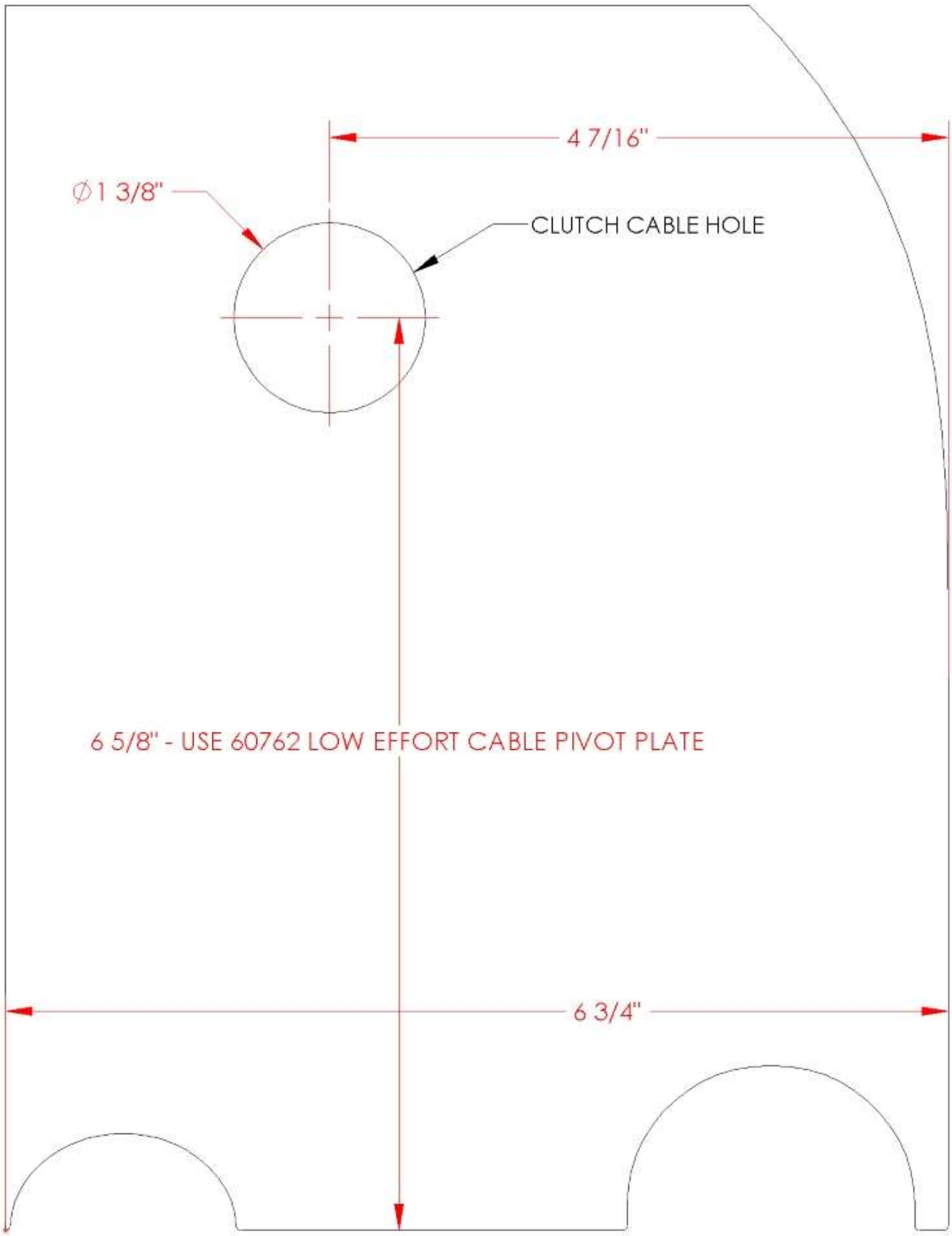
Mark the panel for your desired spacing and then drill the holes in all three pieces.

Skip the next section if not running a manual transmission.

Optional clutch cable hole

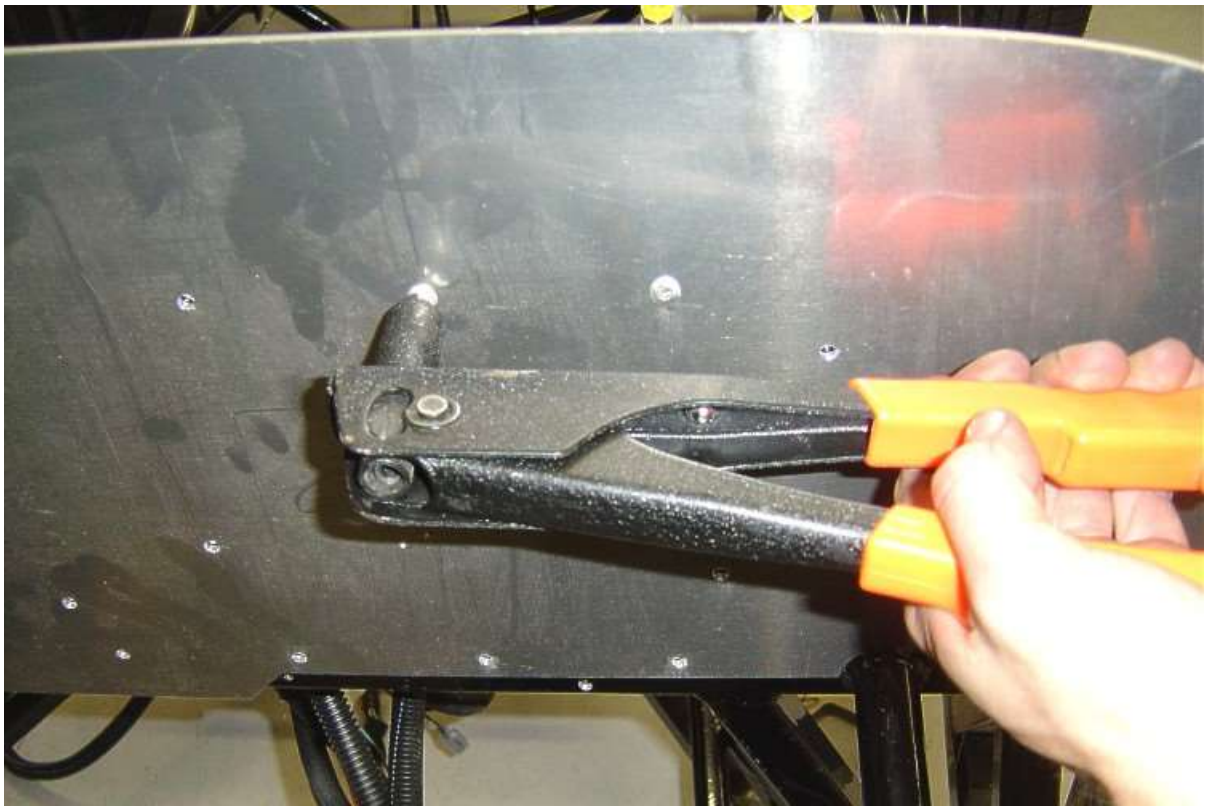
1.375" hole saw, drill, 3/16" drill bit, silicone
Manual Transmission components
For use with optional manual transmission components.

If you are building a manual transmission car, lay the following template down on the front surface of the firewall.
Drill the center mark with a 3/16" drill bit
Drill the firewall using a 1 3/8" for the clutch cable.



Final Firewall Install

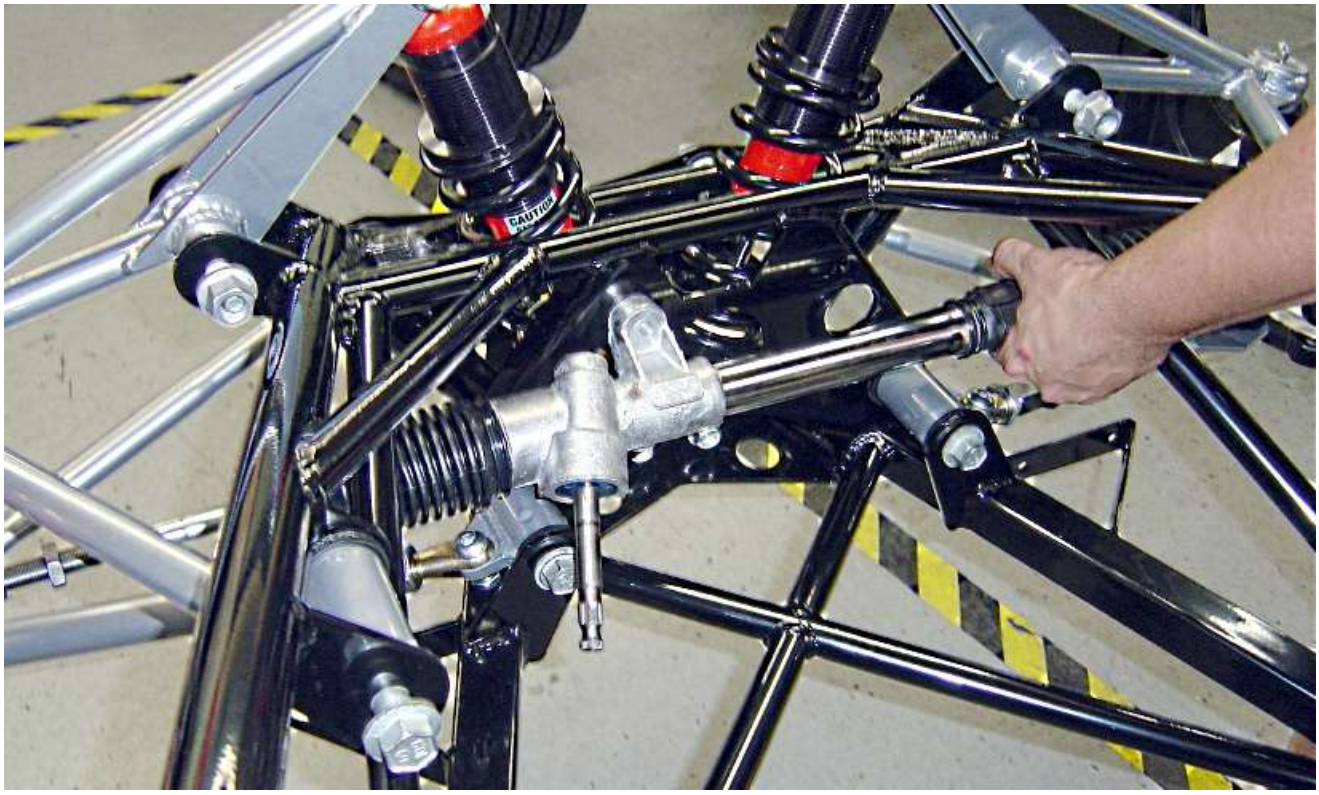
Clamp all of the ⅛" aluminum pieces back onto the frame and drill the frame for each attachment point.



Fasten/attach the firewall and the front footbox panels to the frame.

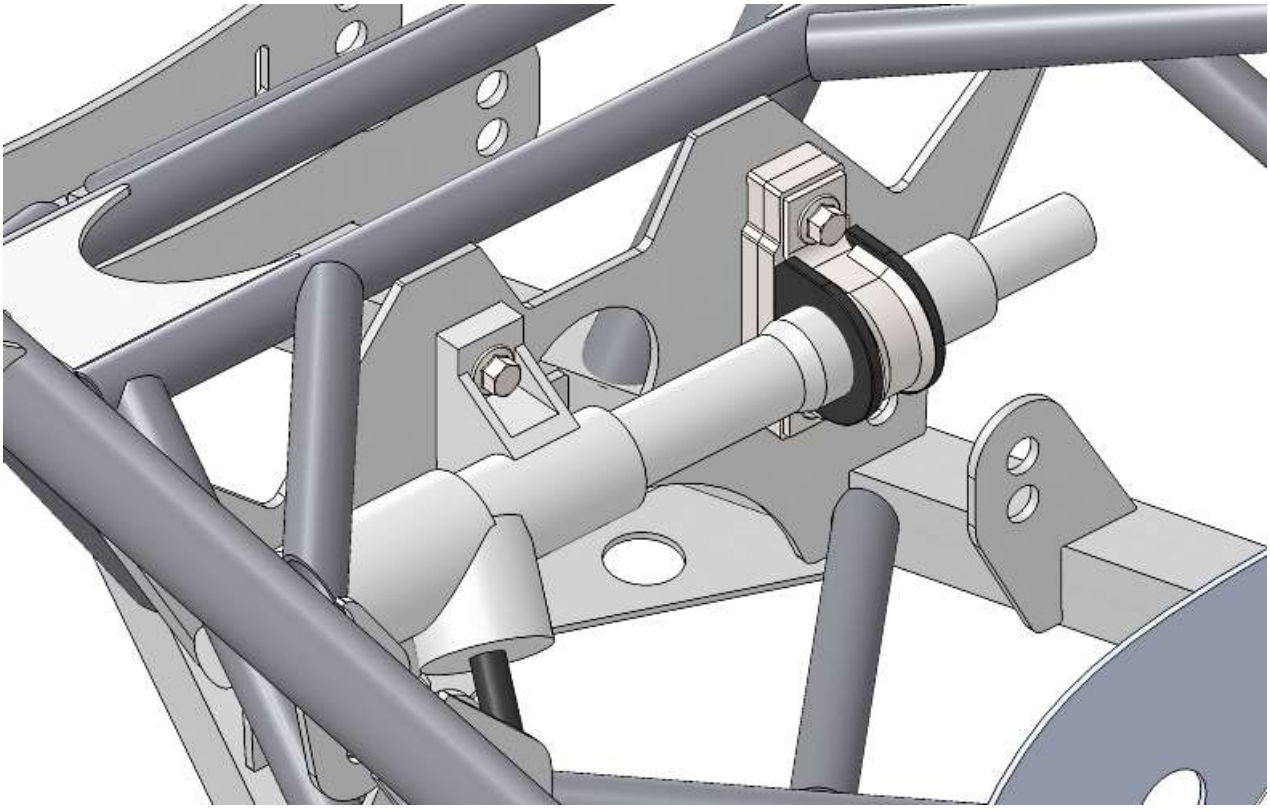
Steering Rack

🛠 15mm, 16mm, 5/8" socket, Ratchet, 16mm, 17mm, 5/8" wrench, Torque wrench.
🚘 Steering Rack Assembly



Position the rack in the frame with the input shaft facing down and to the left side.

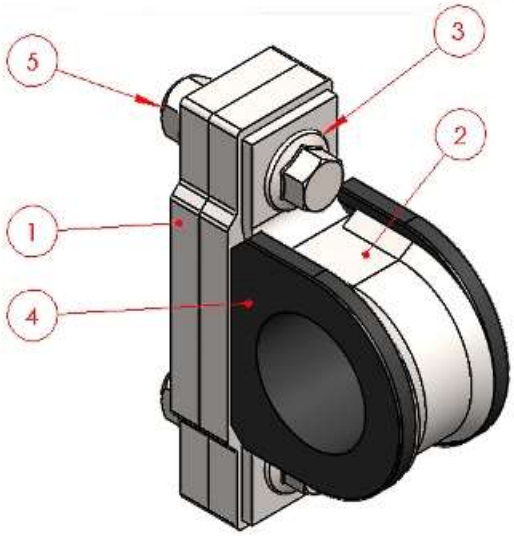
On the left side of the rack, use the M10 x 30mm fasteners. Push the bolts through and spin the nuts on but do not tighten yet.



- On the right side, the rack is mounted using a polyurethane bushing and bracket.

Push the bushing onto the right side of the rack followed by the bracket.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	34791	STEERING RACK MOUNT SPACER	2
2	34790	BUSHING MOUNT BRACKET	1
3	34876	M10 x 1.5mm x 40mm BOLT	2
4	34789	1-7/16" POLYURETHANE BUSHING	1
5	34877	10mm FLANGED NYLON LOCK NUT	2



Slide the rack mount spacers under the bushing and pass the M10 x 40mm bolts through the bracket, spacers and frame.

Check the fitment of the rack on the rack mount, make sure that the large nut on the rack is not hitting the plate. If it does, use a hole saw on the plate at this location for clearance.

Tighten all of the steering rack mounting lock nuts.

Make sure the jam nut is on the inner tie rod then spin the outer tie rod onto the inner tie rod.

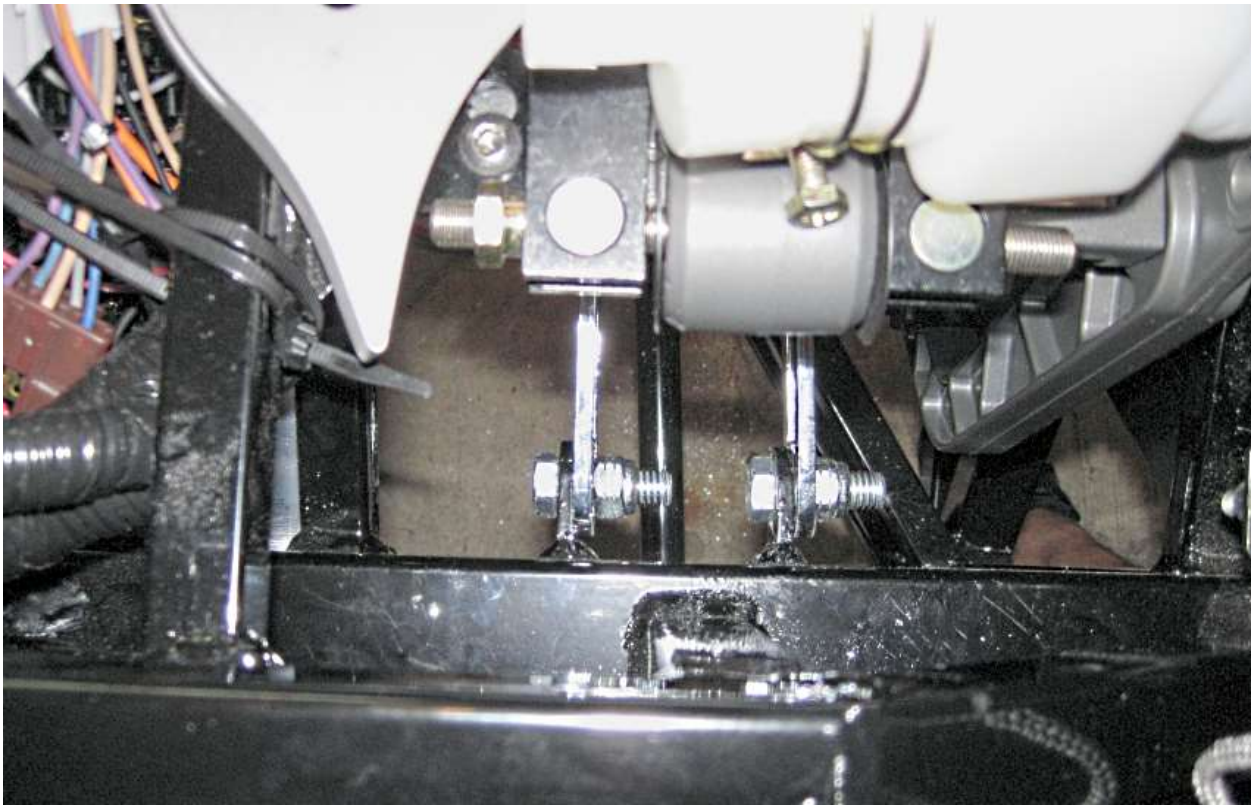
Attach the tie rod to the spindle with the stud pointing down. For now, align the front end by eye. Torque the nut to **25 lb-ft**. If a castle nut is used, torque the nut then install the cotter pin.

If the tie rod has a locknut instead of a castle nut, torque to **80Nm (59 lb-ft)**.

Steering Column

⅝" wrench, ⅝" socket, ratchet, flathead screwdriver.
Steering column, steering column components.
The standard column material is brushed steel so you may want to coat, paint or clear coat this part.

The front of the mount brackets on the column are slotted to allow some room to adjust it up or down.



Fasten each of these points onto the chassis with the provided hardware (FFR# 13965 & 11058). The front mount should go through the top hole in the frame bracket.

Install the turn signal stalk onto the steering column with the provided screw.

Screw on the hazard switch onto the steering column.

Firewall Flange Bearing

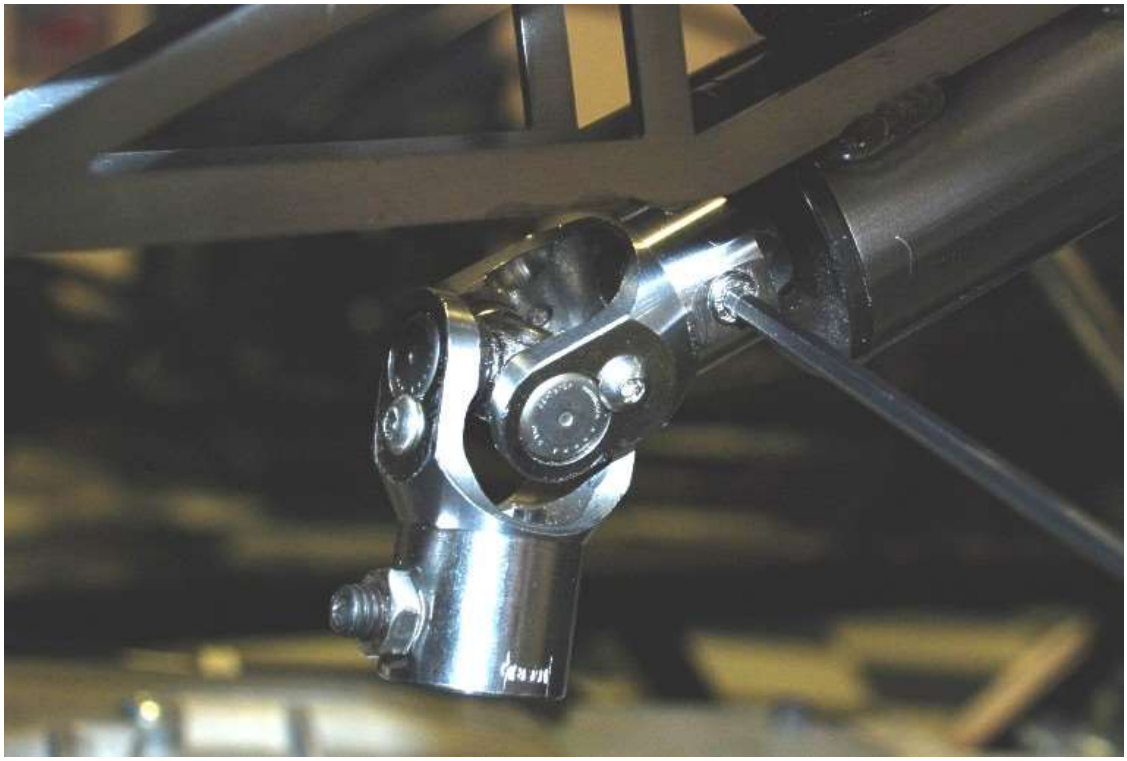
- 3/16" hex key, ½" socket, ratchet.
- Steering bearings/hardware
- Notice the direction of the bearing, the locking collar should point inside the cockpit. Do not tighten the locknuts until the steering shaft has been installed so that the bearing is in the correct orientation.
- Both parts of the stamped flange bearing holder must be mounted on the front side of the firewall.

Attach the steering shaft flange bearing to the front surface of the firewall using the $^{5}/_{16}$" Button head and locking nut.

Steering shaft

- 🛠 ⅛”, $^{5}/_{32}$”, $^{3}/_{16}$” hex keys, ½” wrench
- Steering shaft components
- When installing the steering linkages, loosely install the entire system then tighten the bolts and set screws once it is complete.
- With all of the joints, the end of the shaft should be flush with the inner part of the joint.

ITEM NO.	PART NUMBER	DESCRIPTION	33592/QTY.
1	15838	9/16"-26 SPLINE x 3/4" DD U-JOINT	1
2	33591	3/4" DD JOINT	3
3	33438	291mm (11.4375") STEERING SHAFT	2
4	35071	MIDDLE STEERING SHAFT	1

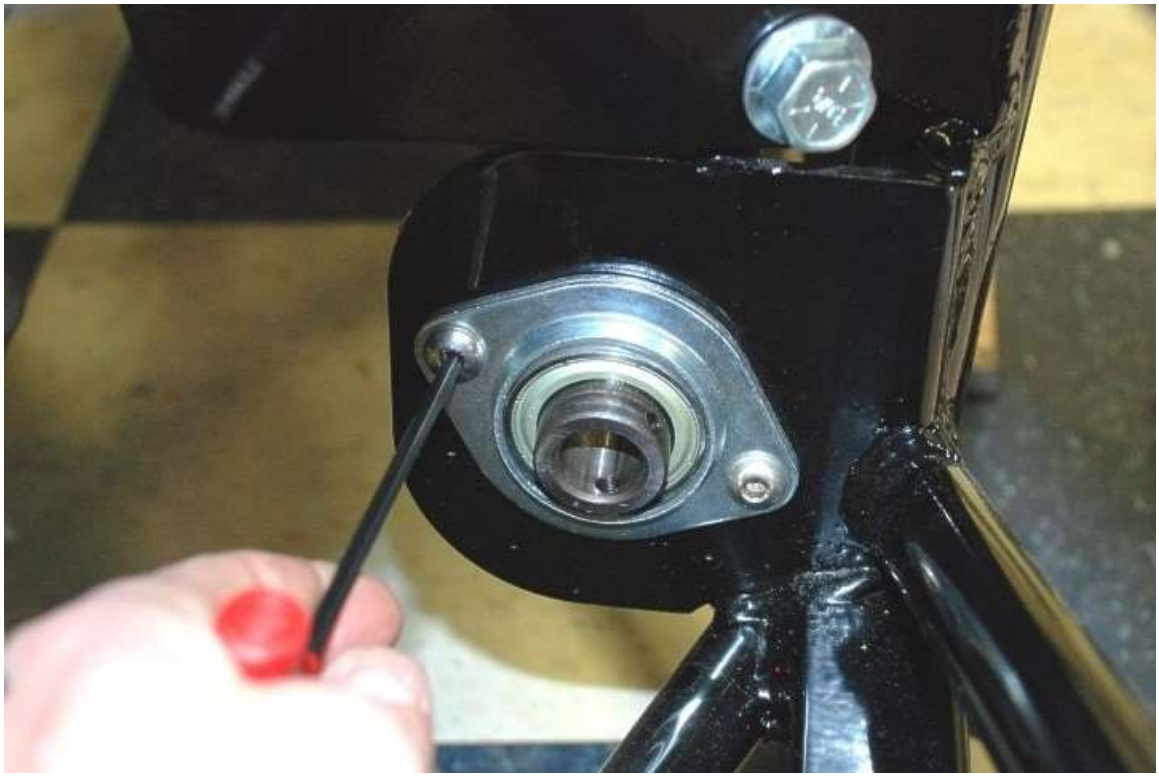


Attach the ¾" DD to ¾" DD joint on to the steering column output shaft using a 5/32" Hex key and ½" wrench. The smaller end goes on the steering column. Tighten the set screw just enough so the joint does not slide off, it will be adjusted later.

Insert a DD steering shaft from the engine bay side through the firewall bearing (note the direction of the bearing with the locking collar inside the cockpit.

Insert the upper shaft into the steering column u-joint.

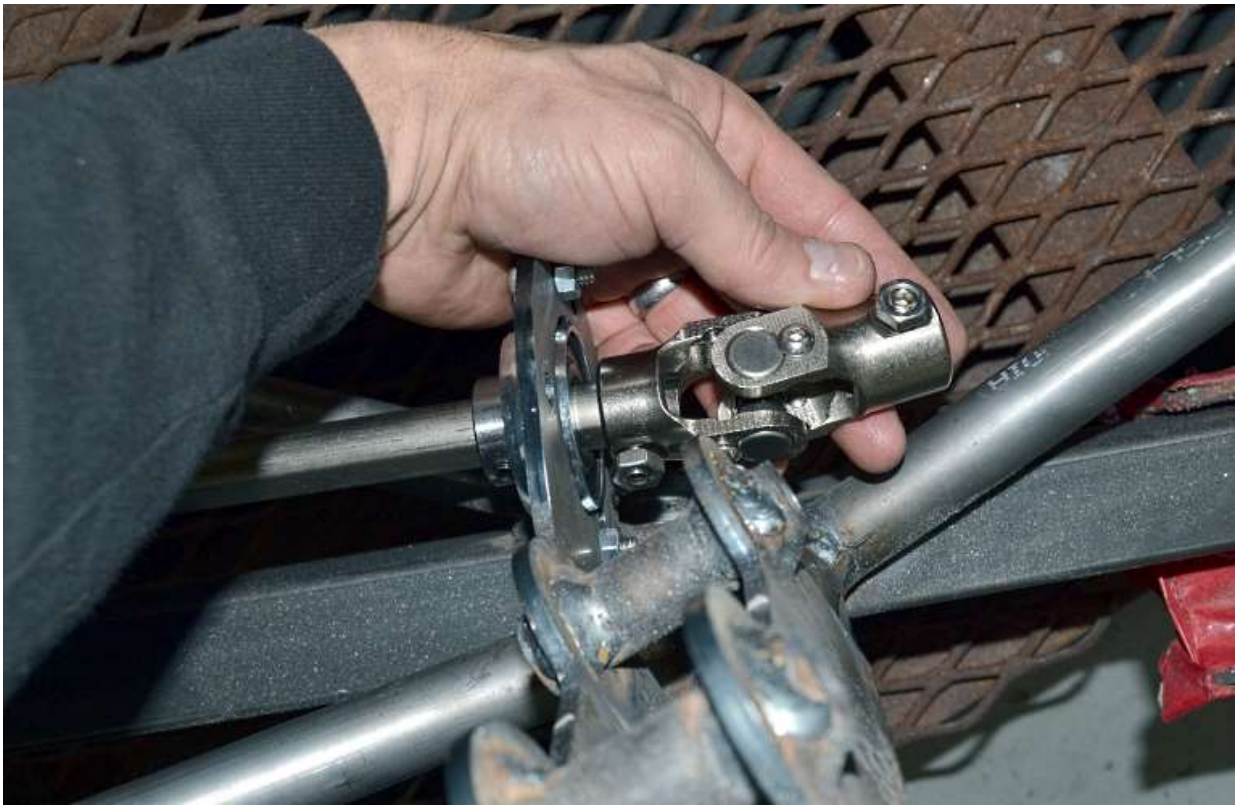
Push the steering joint ($^{9}/_{16}$"-26 spline to ¾" DD) all the way onto the input shaft of the rack making sure to align the set screw with the flat on the input shaft and the recessed area then tighten the set screw using a $^{5}/_{32}$" Hex key.



Attach the second flange bearing to the front side of the frame bracket with the locking collar forward using the 5/16" button head screws, 3/16" Hex key and ½" wrench. Do not fully tighten the locknuts until the steering shaft has been installed so that the bearing is in the correct orientation.

Insert a DD shafts through the front flange bearing and into the steering rack u-joint.

Push the shaft into the steering joint so that it is flush with the inside of the joint as shown above then tighten the set screw and jam nut using a $^{5}/_{32}$" Hex key and ½" wrench.



Put another ¾"DD x ¾"DD U-joint on the end of the front shaft next to the front flange bearing with the short end of the joint on the shaft.

Attach the twisted ¾”DD ended steering shaft to the longer end of the front flange bearing joint.

On the remaining 33591 ¾”DD U-joint remove the set screw and jam nut on the short end of the joint.

Place some blue Loctite on the included shorter set screw and insert it into the short end of the joint.

Push the long end of the u-joint onto the long steering shaft.

- The locking collar of the firewall flange bearing should point inside the cockpit.
- The location of the locking collars on the flange bearings, the short and longer u-joint ends, the short set screw on the firewall joint and the notches in u-joints all work together to make sure

there is no u-joint bind or set screw/jam nut bind. The steering shaft must be assembled as shown in these directions

Hold the short end up to the firewall flange bearing and slide the top shaft down into the joint so that it is flush on the inside of the joint.

Tighten the set screws on both joints with a 5/32" hex key.

Push the u-joint against the firewall and tighten the flange bearing set screw using a 1/8" hex key.

Angle the steering column as desired then tighten the steering column mount screws.

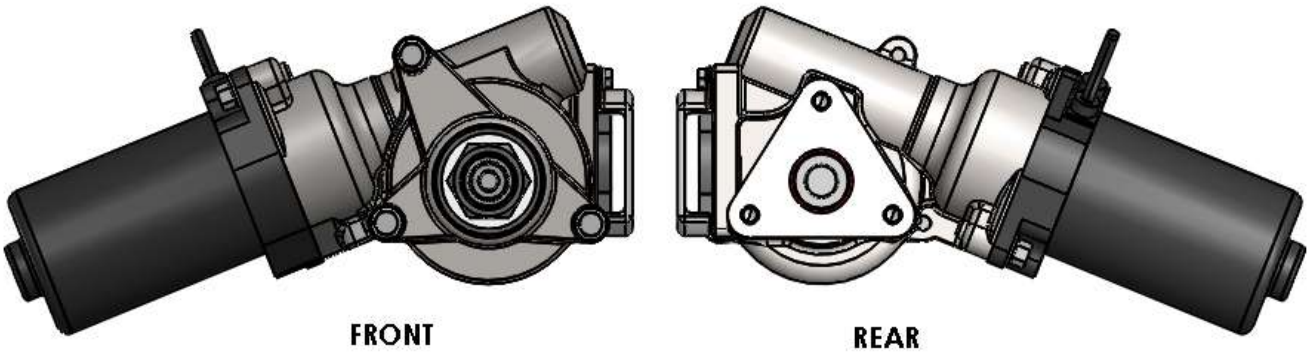
Check the upper u-joint on the steering column to see if the shaft going to the firewall is sticking through a lot. If it is, slide the u-joint up the steering column slightly and retighten the set screws.

Rotate the complete steering shaft so the steering rack goes from lock-to-lock. The steering should feel smooth throughout the travel. There should be no notchy or dragging feeling at any point. If there is, check the joints one by one to make sure there is no interference between the ends and no interference between the firewall joint and the flange bearing holder. The flange bearing holder can be filed slightly if necessary.

Start at the steering rack and go along the steering shaft and tighten all the set screws, jam nuts and flange bearing fasteners. Don't forget to Loctite the small set screw on the firewall joint.

Electric Power Steering (optional)

- 13mm, 15mm, 5/8" sockets, 6mm, 5/32" hex key, 1/2", 5/8", 17mm wrenches, marker, grinder, hack saw
- Electric steering components, Hot Rod steering shaft components.
- The power steering unit may need to be rotated in order to clear the engine or oil pan that is being used.
- The steering shafts included with the kit are the lengths required for manual steering. They will have to get cut for the electric steering.



Attach the motor to the front side of the chassis mount below the left engine mount using the screws included. Just snug the screws up so the motor is against the plate but can be rotated up and down in the slots.

Take the shorter of the two remaining ¾”DD shafts and cut a piece 2.50” long.

Push the short piece of ¾”DD shaft into the end of the 15838 steering rack joint and the end of one of the 33977 electric steering joints.

Push the steering rack joint (smaller splined hole) all the way onto the input shaft of the rack making sure to align the set screw with the flat on the input shaft.

Push the electric motor joint (larger splined hole) onto the motor.

Tighten the set screw of the joint in the recess of the motor shaft.

Tighten the set screw of the joint in the recess of the steering rack shaft.

Push the other electric motor joint (33977) onto the other side of the motor.

Cut the twisted ¾”DD ended steering shaft so that it is 14.375” long.

Attach the ¾”DD twisted steering shaft to the electric steering joint.

On the remaining 33591 ¾”DD U-joint remove the set screw and jam nut on the short end of the joint.

Place some blue Loctite on the included shorter set screw and insert it into the short end of the joint.

Push the long end of the u-joint onto the long steering shaft.

- The locking collar of the firewall flange bearing should point inside the cockpit.
- The location of the locking collars on the flange bearings, the short and longer u-joint ends, the short set screw on the firewall joint and the notches in u-joints all work together to make sure there is no u-joint bind or set screw/jam nut bind. The steering shaft must be assembled as shown in these directions

Hold the short end up to the firewall flange bearing and slide the top shaft down into the joint so that the distance on the inside of the joint to the shaft is equal on both the steering column joint and the firewall joint.

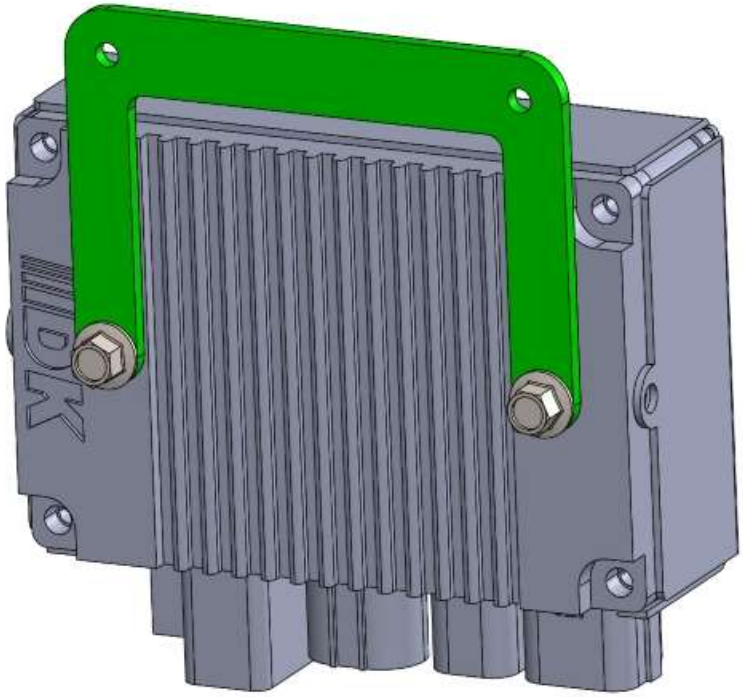
Tighten the set screws on both joints with a 5/32" hex key.

Push the u-joint against the firewall and tighten the flange bearing set screw using a 1/8" hex key

Rotate the complete steering shaft so the steering rack goes from lock-to-lock. The steering should feel smooth throughout the travel. There should be no notchy or dragging feeling at any point. If there is, check the joints one by one to make sure there is no interference between the ends and no interference between the firewall joint and the flange bearing holder. The flange bearing holder can be filed slightly if necessary.

Start at the steering rack and go along the steering shaft and tighten all the set screws, jam nuts and flange bearing fasteners. Don't forget to Loctite the small set screw on the firewall joint.

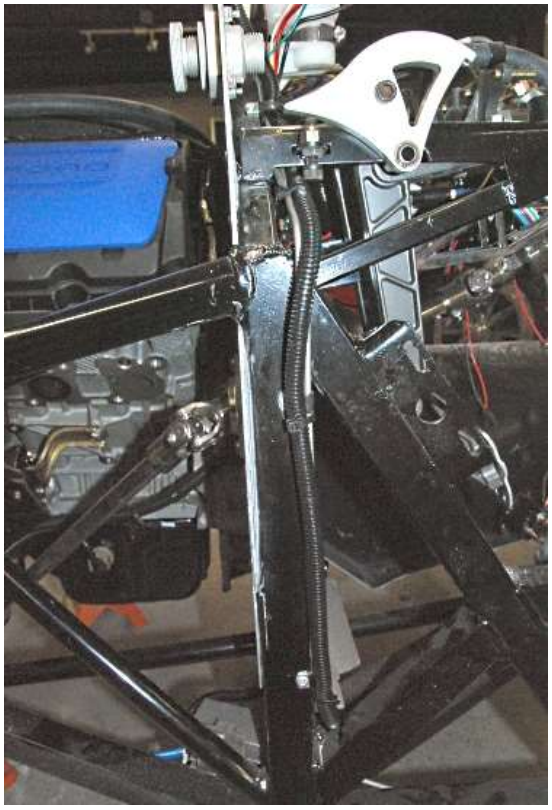
Control Module mounting



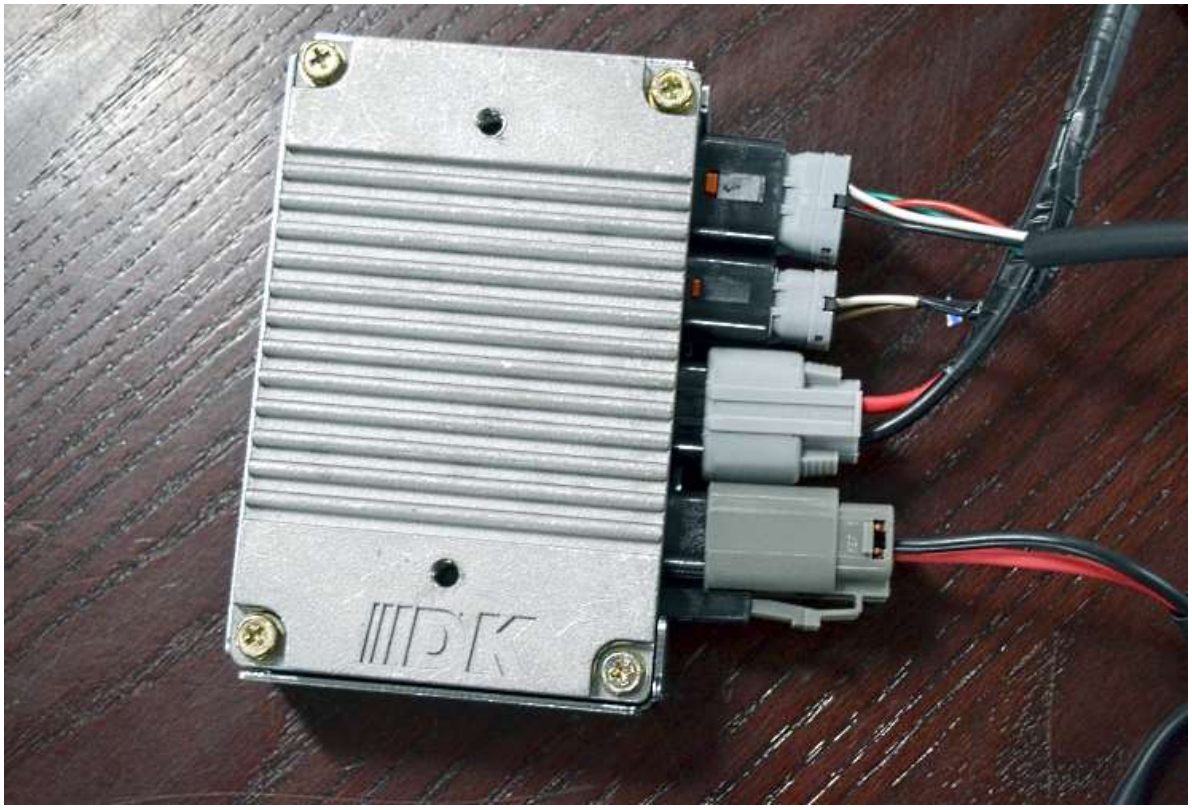
Attach the mounting bracket to the motor controller using the M6 screws.

Attach the controller harness to the motor.

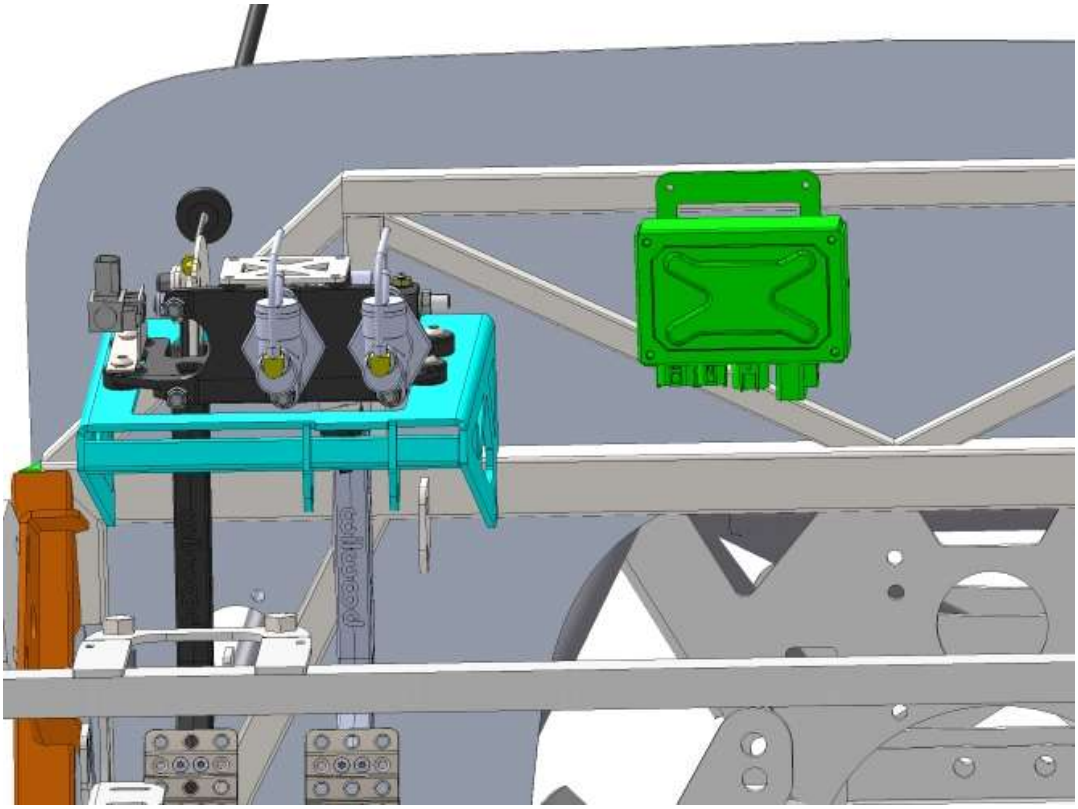
Attach the power wire harness to the motor.



Run the harnesses up behind the dash area.



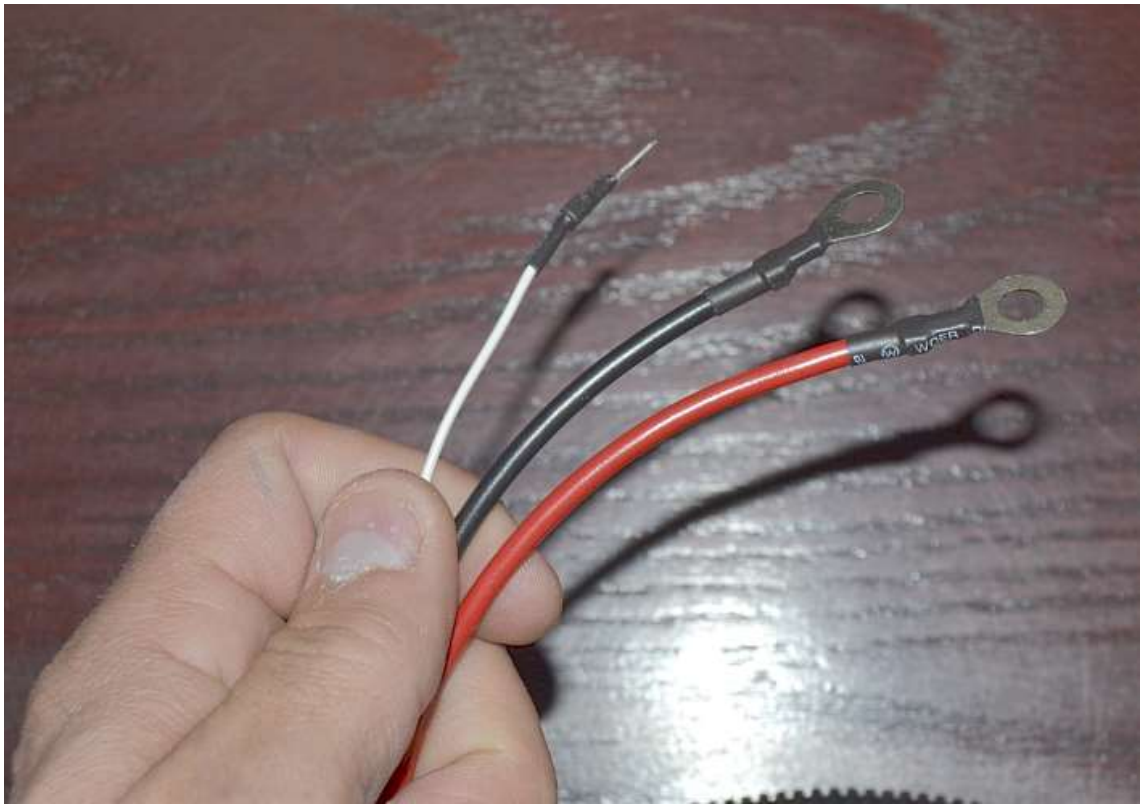
Attach the harnesses to the appropriate plug on the controller.



Attach the controller behind the dash area using the self-tapping #10 screws so that the harnesses will reach.

Wiring

- Return to this section and do the wiring after the chassis harness is installed.



Wire the large red wire to constant +12 volts.

The heavy black wire should get grounded.

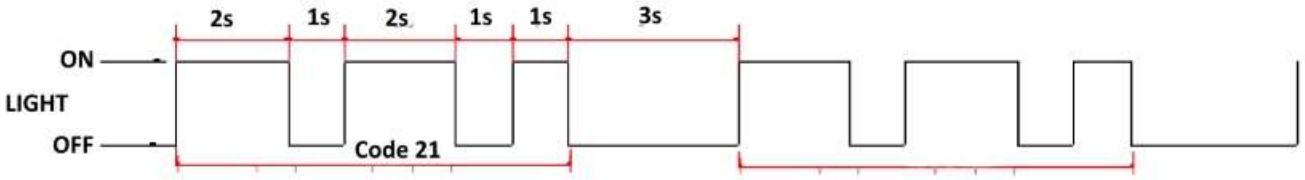
Connect the white wire to a switched +12 volts. This can be done by either running a wire directly to the key or, if running an EFI car or Carb without electric choke, the tan "electric choke" wire can be used. Remove it from the Sending unit plug and connect the wires together.

- If an existing circuit is used such as the "electric choke" for something other than the original purpose, make sure to note the new function on the fuse panel and also make sure the correct fuse size is used.

Troubleshooting

If there is a malfunction with the system, it will flash a code to identify the problem. Each fault code is shown by a series of flashes with the inline light.

Every fault code is a double digit shown by a series of long and short flashes of light. Each long flash represents a tens digit and is 2 seconds long and each short flash represents a single digit and is 1 second long. There will be a 3 seconds space between the long flashes and the short flashes.



For example: Long flash\long flash \space\short flash represents the code number 21.

Light Codes

21	Main torque sensor disconnection	1. Check sensor wiring harness 2. Replace ECU
22	Main torque sensor output error (voltage is too high or low)	
23	Vice torque sensor disconnected	
24	Vice torque sensor output error (voltage is too high or low)	
25	Main and vice torque difference is too large	
26	Main torque sensor inner fault	Replace ECU
35	Current sensor zero offset is too large	
32	Motor disconnected	Re-insert wire of the motor
33	Current of ECU is over the limit	Replace ECU
34	One side of motor has no assistance	
36	Motor voltage abnormal	Check motor wire, check motor plug

If you encounter a specific issue with the system check the chart below to see if you can find your issue and repair instructions.

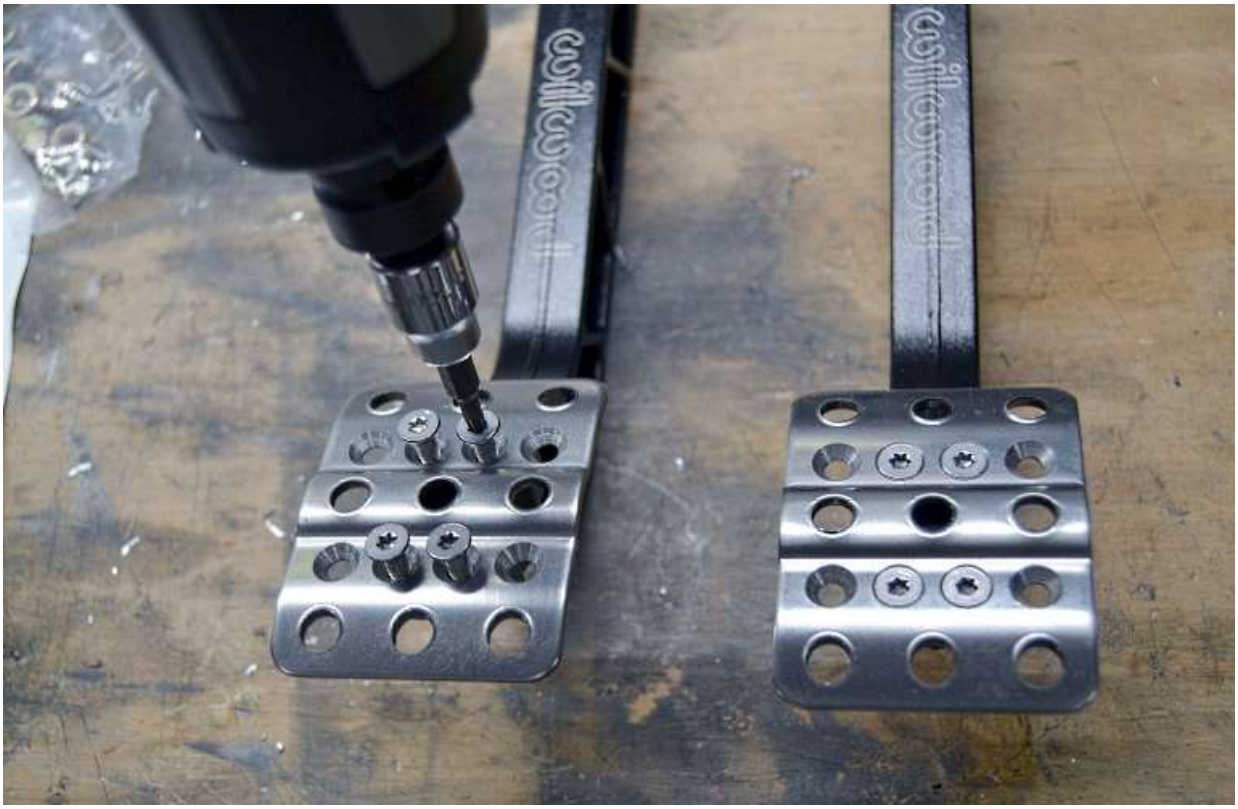
Failure	Reason	Troubleshooting
Steering without assistance	1. Wiring harness connectors have a bad contact 2. The fuse blew 3. Relay damage 4. Controller, motor or sensor is damaged	1. Check whether wiring harness connectors are fully inserted 2. Replace the fuse (40A) 3. Replace the relay 4. Replace damaged item
Power is not the same for left and right	1. The output voltage has deviation 2. Controller, motor or sensor is damaged	1. Disconnect motor connectors, adjust the sensor data to keep the voltage in 2.5V ± 0.1V 2. Replace damaged item
When system is on, steering wheel swings on both sides	1. Motor is mounted backwards 2. Controller or sensor is damaged	1. Swap the position of the red and black power wires at the motor 2. Replace damaged item
Steering becomes heavy	1. Battery power loss 2. Motor damage (power reduction) 3. Low air pressure in front tires	1. Charge battery 2. Replace damaged item 3. Inflate tires

System has noise	1. Motor damage 2. Steering u-joint to ¾"DD fitment is loose.	1. Replace damaged motor 2. Tighten the u-joint screws.

Pedal Box

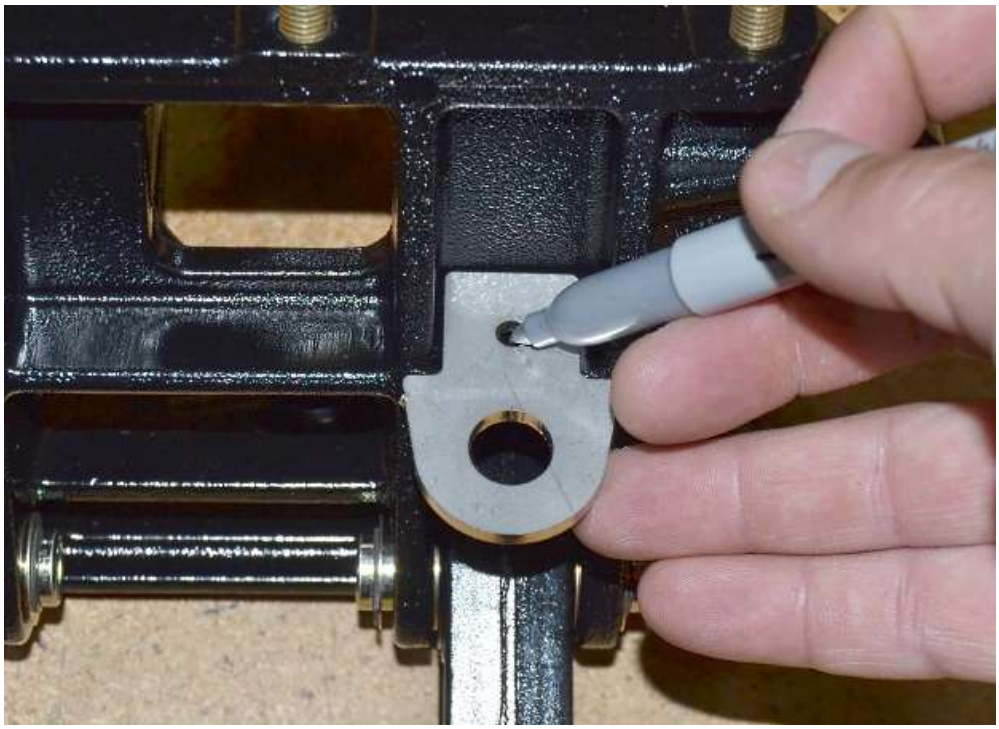
- ½", 9/16" sockets, ⅜", 11/32", ½", 9/16" wrenches, Drill, 3/16", ¼", ½" Drill bit, ⅛", 9/32", 5/16" Hex Keys, T-20 Torx bit, Hammer, Razor knife or file or grinder, snap ring pliers or two small screwdrivers.
- Pedal Components, pedal box hardware.
- If using an automatic transmission or a hydraulic clutch some of these steps will not apply.
- Unpack the pedal box assembly. Now is a good time to paint all of the bare steel brackets.
- The brake switch may look different than in the pictures.
- The pedal box comes with two pedal switches, one for the brake lights and the other can be used as a clutch safety switch (used to prevent starting the car while in gear) if desired.

Pedal pads



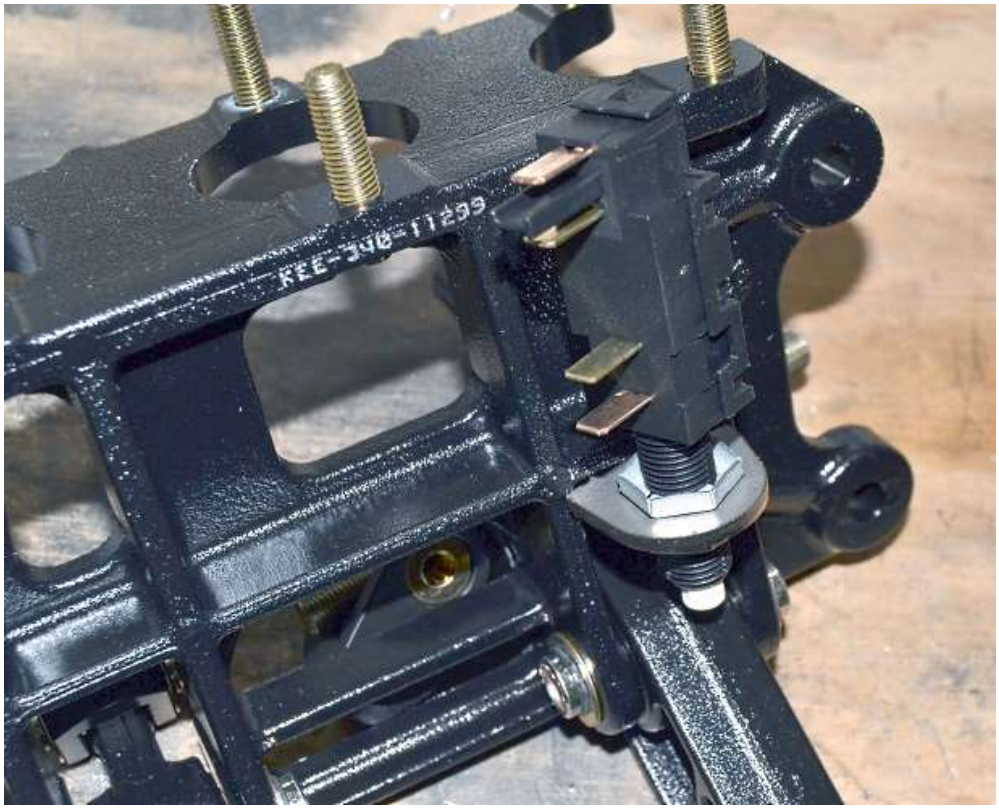
Attach the pedal pads to the pedals using a T-20 Torx bit. The pads mount holes allow the pads to be moved around if desired depending on foot room needed. Start with the pads in the middle holes. Once the seats are mounted in the car the pads can be moved or cut as needed.

Brake switch mount



Place the switch mount between the brake pedal mount tabs on the side closest to the brake pedal pivot holes and drill a $^{3}/_{16}$" hole through the brake switch mount hole and the pedal box.

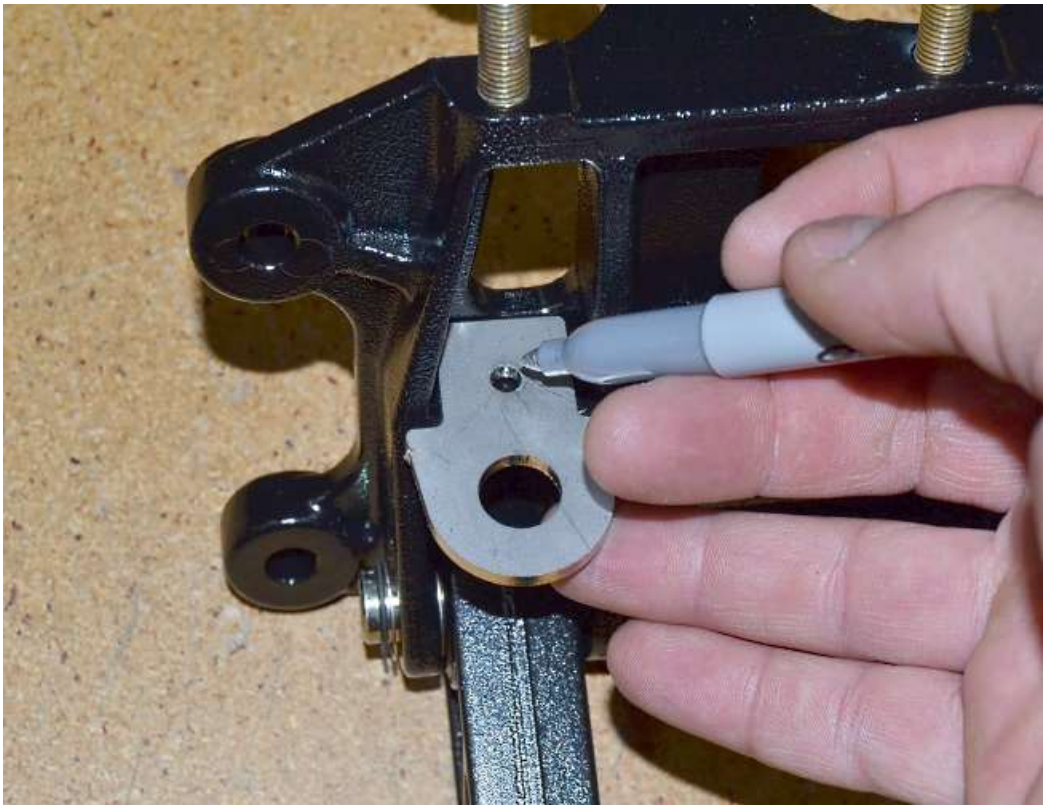
Attach the switch mount to the pedal box using the black #10 screw and locknut.



Connect the switch to the switch mount using a hex nut on each side of the mount bracket.

Clutch safety switch mount

The clutch switch mount attaches the same way as the Brake switch mount.



Place the switch mount between the clutch pedal mount tabs on the side closest to the clutch pedal pivot holes and drill a $^{3}/_{16}$" hole through the switch mount hole and the pedal box.

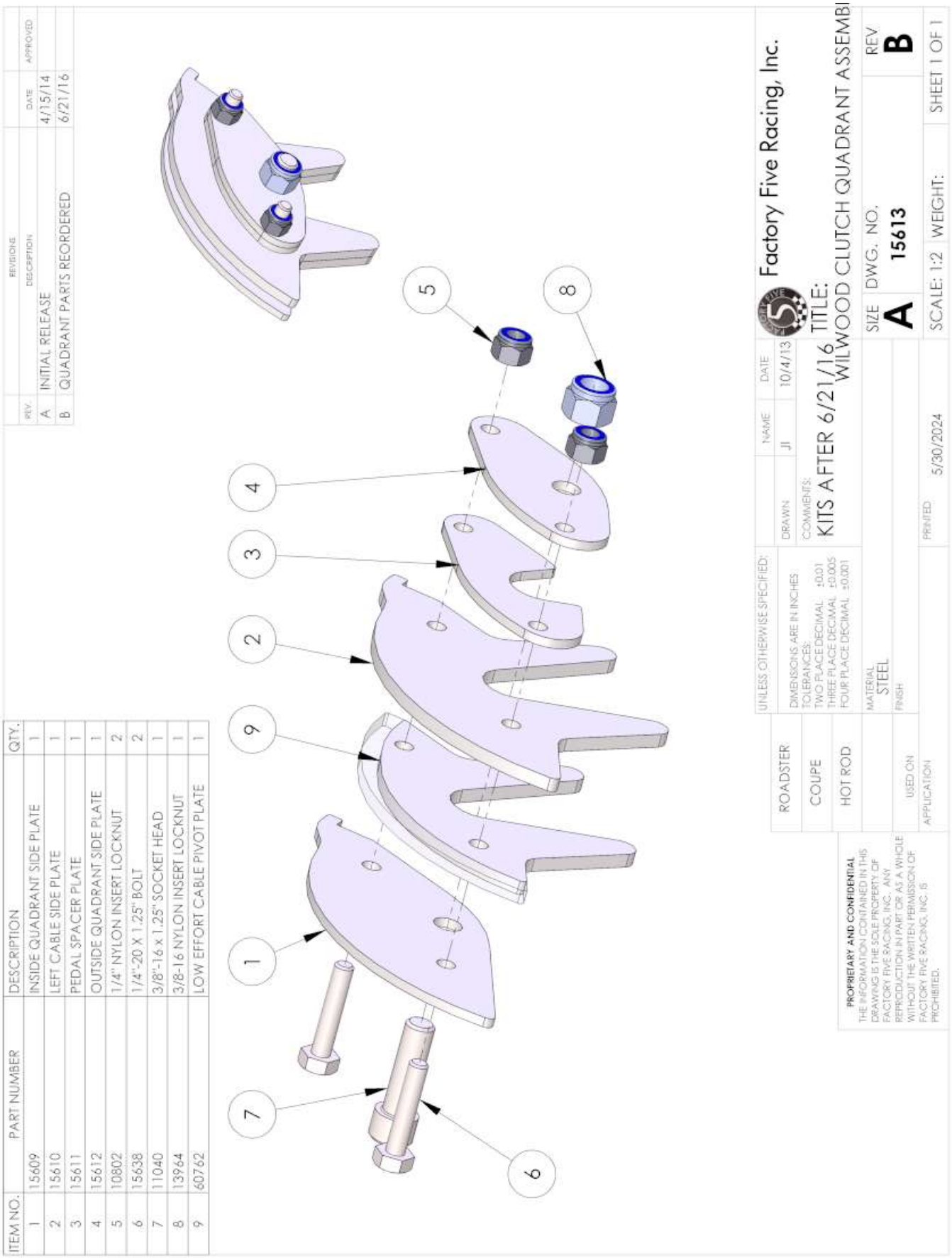
Attach the switch mount to the pedal box using the black #10 screw and locknut.

Connect the switch to the switch mount using a hex nut on each side of the mount bracket.

Optional Clutch Cable Quadrant

- For use with optional manual transmission components.
- If you are using an automatic remove the clutch pedal and disregard the next few steps.
- ½", 9/16" sockets, ¼", ⅜", ½" wrenches, ¼" drill bit, drill, Philips head screwdriver, 3/16", 5/16" Hex Key, snap ring pliers

Use snap ring pliers or two small screwdrivers to remove the clevis at the top of the clutch pedal.

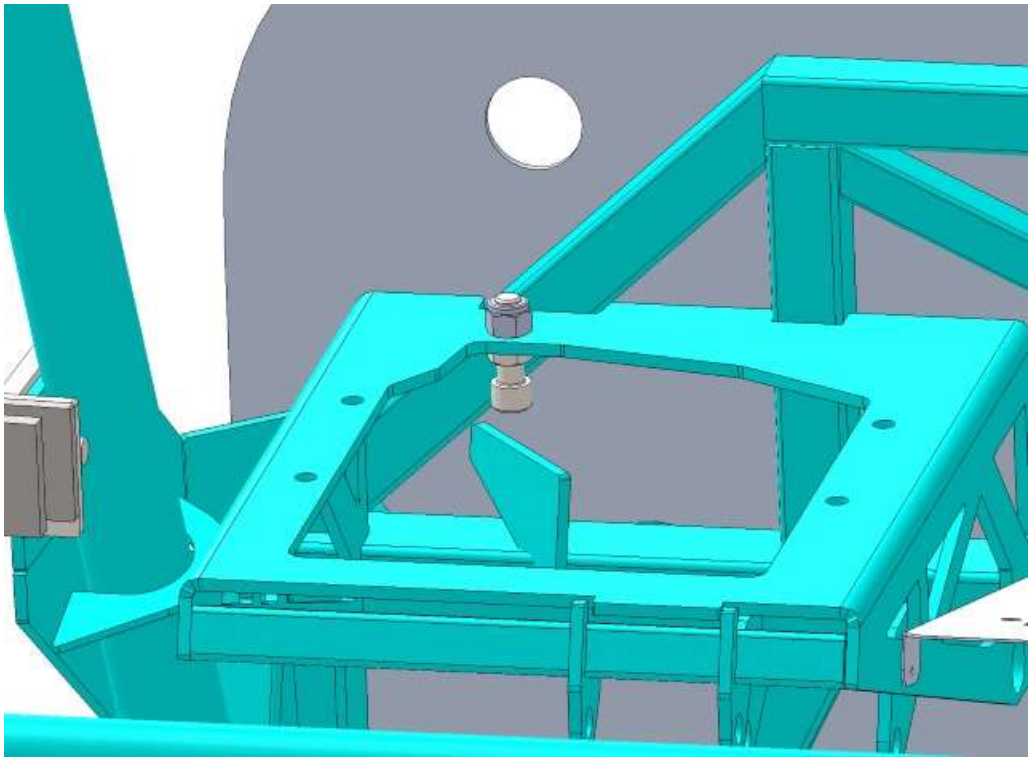


Assemble the clutch quadrant to the Wilwood clutch pedal as shown above.

If necessary, use a file to remove the forging flash so the 3/8" bolt can go through the clutch pedal hole.

Clutch quadrant stop

🛠 5/16" Hex key and 9/16" wrench

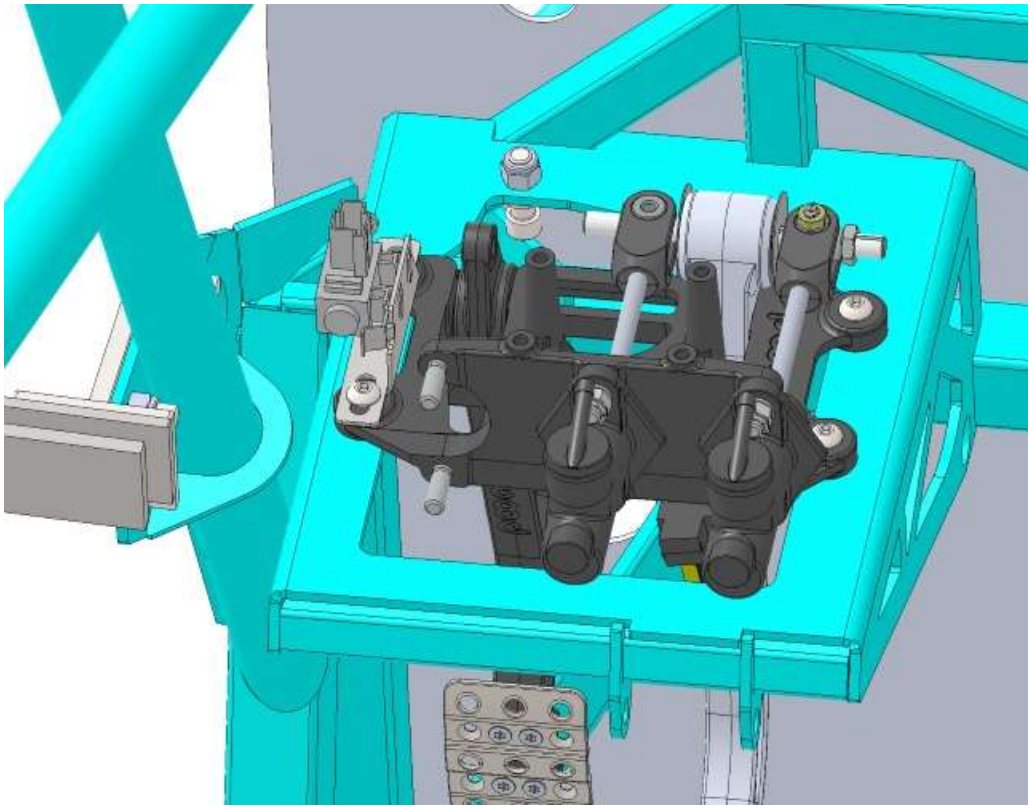


If you building a manual transmission car you need install the clutch quadrant stop 3/8"-16 x 2" screw with the jam nut on the bottom and locknut on top of the pedalbox mount.

Pedalbox Installation

🛠 $^{3}/_{16}$" hex key, ½" socket.

✋ If installing a Coyote engine, locate the clutch switch in the Ford control pack and the bracket in the Coyote install kit now.



Attach the Pedalbox to the top of the frame mount using the $^{5}/_{16}$"x 1" button head screws, locknuts, $^{3}/_{16}$" hex key and ½" socket.

Master Cylinders

✋ These instructions show the installation for a cable clutch car. If doing a hydraulic clutch, one more master will be needed.

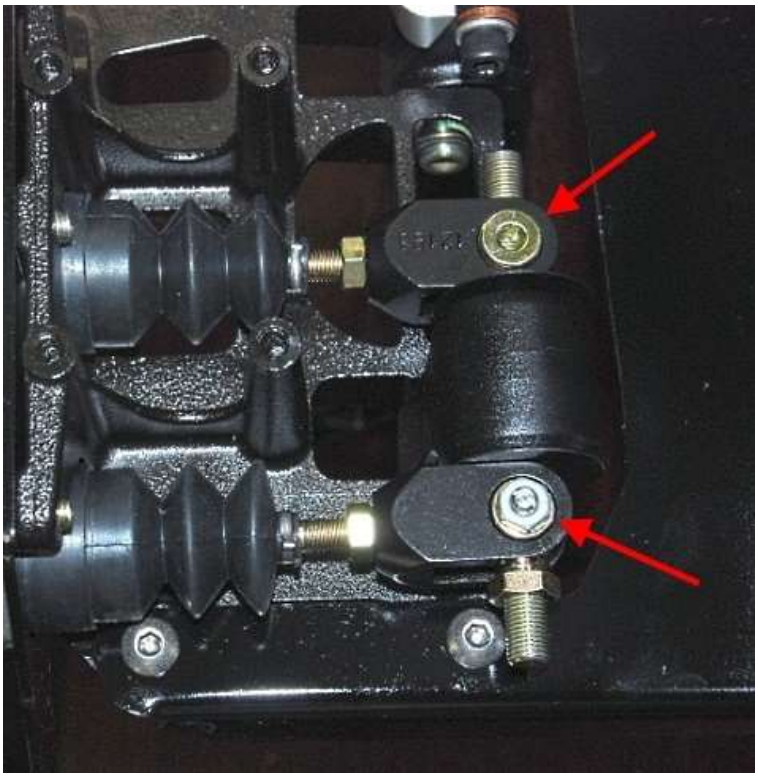
🛠 6mm socket, ½" deep socket, ratchet, ½" wrench

🚗 Master cylinders

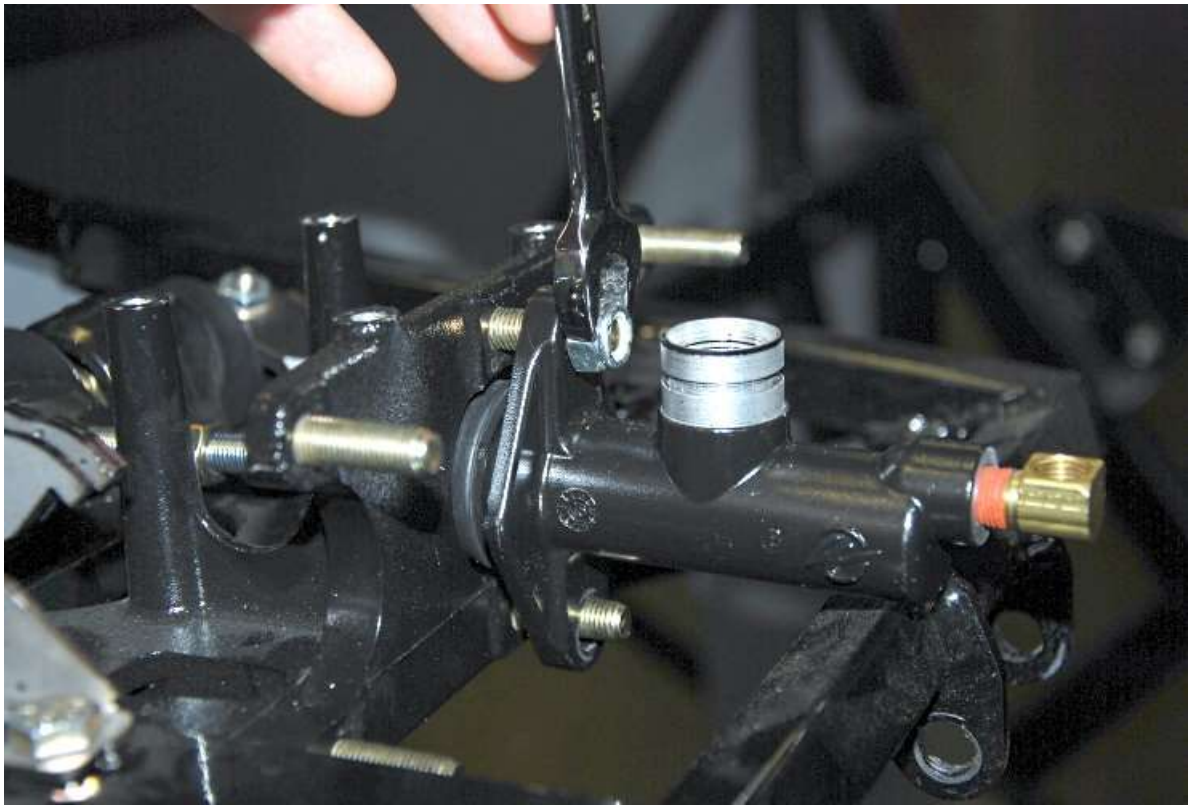
With the jam nut on the threaded shaft, cut $^{5}/_{8}$" off each of the master cylinders.

Screw the 90° brake line adapter into the end of the master cylinder making sure that the opening points up when tight.

Put one of the master cylinders onto one of the brake master cylinder mounts and turn the threaded shaft into the threaded mount on the brake pedal. As a starting point, thread the shaft in until you can see it is flush on the other side of the mount.



The brake pedal master cylinder pushrod mounts are different from each other. Only one has a screw and nut. This is normal.



Attach and tighten the locknuts using a ½" wrench holding the master cylinder to the pedal box then repeat for the other master cylinder.

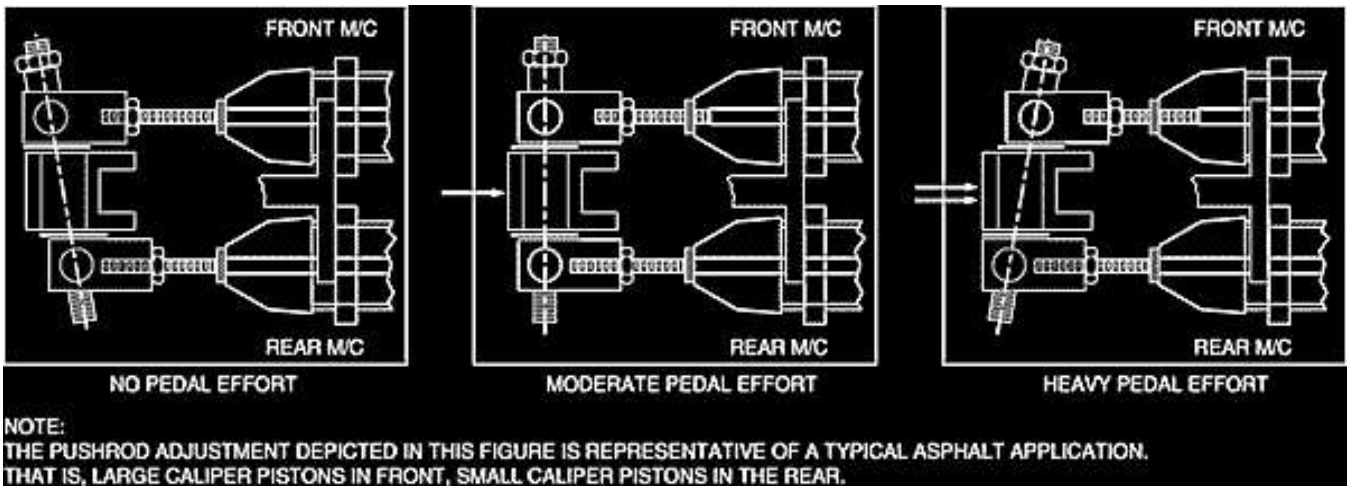
Put the plastic angled inlet adapter with hose clamp on the master cylinders. Use a 6mm socket and ratchet to tighten the hose clamp.

Tighten all the remaining hardware mounting the pedal box to the chassis.

Balance Bar adjustment

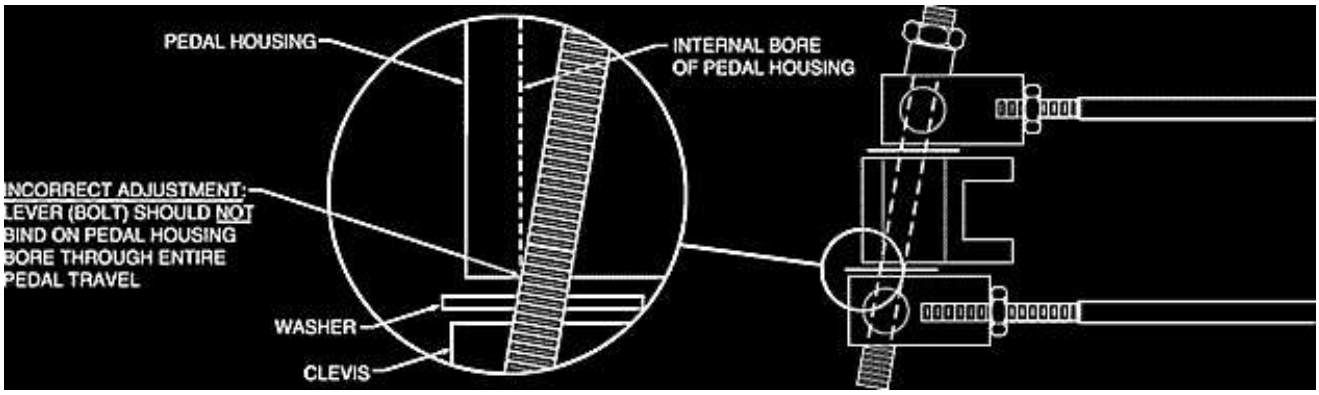
The balance bar is an adjustable lever (usually a threaded rod), that pivots on a spherical bearing and uses two separate master cylinders for the front and rear brakes. Most balance bars are part of a pedal assembly that also provides a mounting for the master cylinders. When the balance bar is centered, it pushes equally on both master cylinders creating equal pressure, if the master cylinders are the same size bore. When adjusted as far as possible toward one master cylinder it will push approximately twice as hard on that cylinder as the other.

To set up the balance bar, thread the master cylinder pushrods through their respective clevises to obtain the desired position. Threading one pushrod into its respective clevis means threading the other one out the same amount.



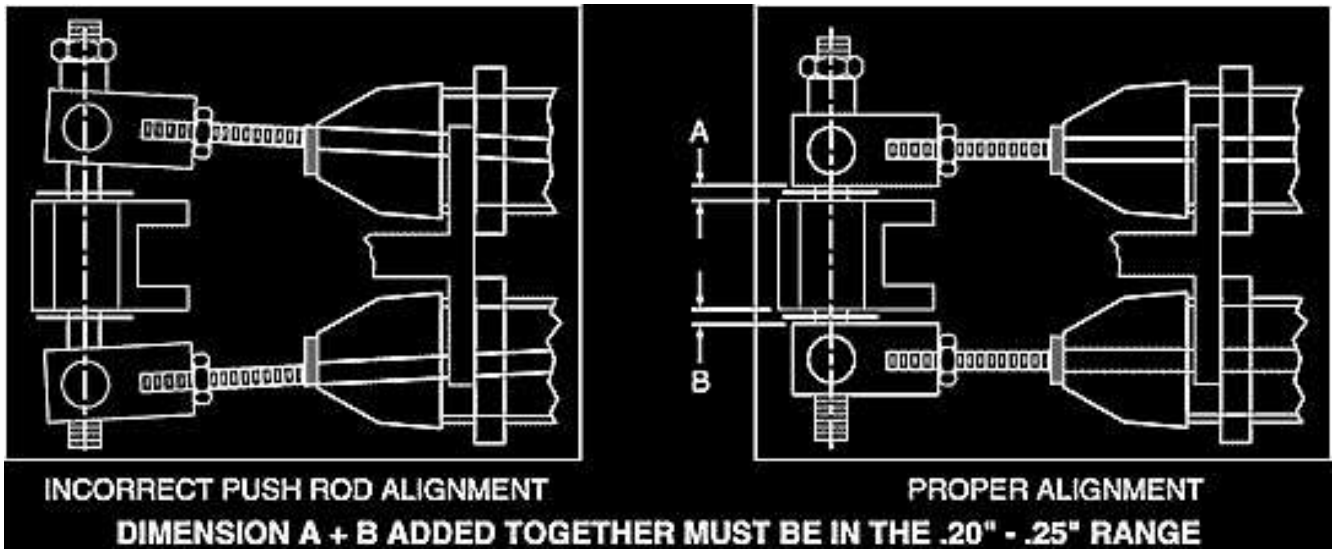
Sometimes this will lead to a “cocked” balance bar when the pedal is in the relaxed position, “no pedal effort”. This is acceptable as long as each master cylinder pushrod is completely free of pressure when the pedal is relaxed.

- The pushrod adjustment depicted in the figure is representative of a typical asphalt application. That is, large caliper pistons in front, small caliper pistons in the rear.



It is important that the operation of the balance bar functions without interference by over adjustment. This can occur when a clevis jams against the side of the pedal or the lever (bolt) hits the pedal bore during any point of pedal travel.

Lever movement should be unimpeded throughout pedal travel. In the neutral position, clevises should have between .20” - .25” total clearance between the side of the pedal. The large washers between the pedal and clevis should remain loose.



Make sure that the master cylinder pushrods remain true in relationship to the cylinder during entire pedal travel; pushrods should not be pushing master cylinder pistons at an angle.

- In its non-depressed position, the pedal and balance bar should allow the pushrod of the master cylinders to fully return. This can be checked by feeling pushrods for very slight movement, not loose movement. Master cylinder pistons should be against the retaining snap ring (under boot).

Brake Reservoir

- 5mm Hex key, $^{7}/_{16}$" wrench, ¼" drill bit, drill.
- There are two ways to plumb the brake fluid reservoirs. One way is to use two reservoirs, one for each master cylinder. The other way is only use one reservoir and put a "Y" in the line to go to the two reservoirs.

Unpack the master cylinder reservoir fittings and the reservoir kit from the pedal-box assembly.

Screw in the hose barb.

Remove the cap and put the reservoir gasket in the cap.

Use a small screwdriver to get the edge down under the threads.

The reservoir should be mounted in the engine bay on the firewall.

Use some tape on the frame or firewall then locate the brake fluid reservoir and mark the hole locations.

- Make sure that the top of the reservoir cap is below the top of the firewall or the cap will hit the body.

Using the bracket as a template drill ¼” mounting holes.

Mount the reservoir using the ¼” screws, 5mm hex key and $^{7}/_{16}$” wrench.

Attach the reservoir to the mounting bracket ¼” screw, 5mm hex key and $^{7}/_{16}$” wrench.

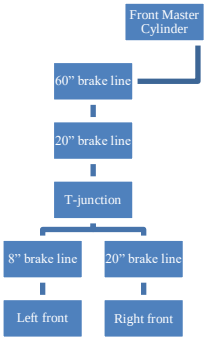
If drilling a hole for the reservoir hose, drill a ⅝” hole. Take extra time with a file and round all the edges making sure there are no burrs left or sharp spots.

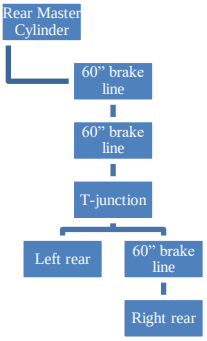
Attach the hoses to the reservoir and the master cylinders.

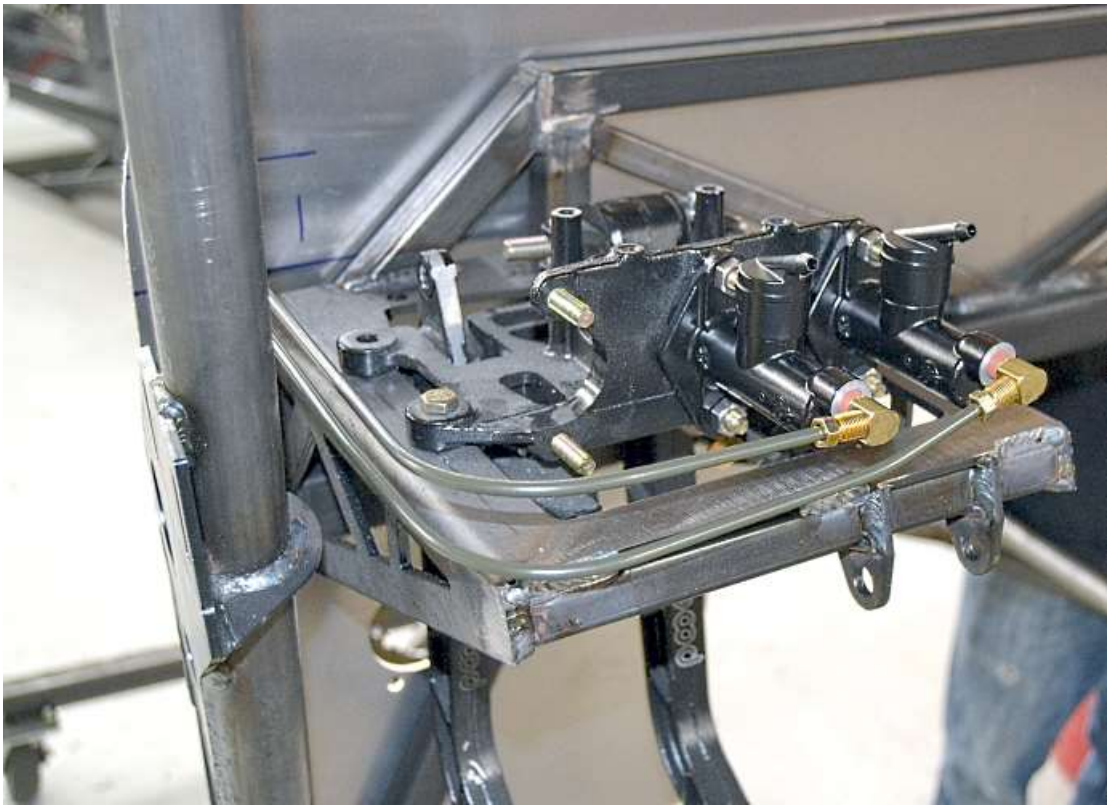
Use the ⅝” line clips and the ¼”-20 x ½” socket head screws to attach the hoses to the top of the pedal box.

Brake Lines

- 🛠 Tubing bender, ⅜”, $^{7}/_{16}$”, ½”, $^{11}/_{16}$” wrenches, pliers, $^{3}/_{16}$” drill bit, drill, rivet tool, masking tape, marker.
- Brake lines, insulated clip hardware, Hot rod brake line components
- Some pictures show the old frame but routing is similar.







Connect a 60” section of brake line hand tight to each of the master cylinders and route the line to the left of the pedal mount and then forward to the firewall.

Insert the cockpit front outside corner aluminum panel then route the brake lines down along the 1.5” tube below the floor level.

At the bottom of the frame, split the lines and angle the one from the ¾" master towards the front of the car and the one from the ¾" master towards the rear.

Front Brake line

Around the location of the electric steer motor or the flange bearing for the steering linkage, install a female-female brake line union.

Coming off one side of the brake line union, attach a 20” section of brake line. Route this brake line to the front of the car running along the inside of the 1.5" frame rail.

At the end of the 20" brake line section, install the 3-female T-junction.

Install an 8" section of brake line and route it towards the driver side wheel.

Clamp the brake line mount on the round tube under the upper control arm.

- Attach the flexible brake line to the caliper and make sure that when the steering is turned all the way in both directions that the brake line is not tight. If necessary, move the location of the frame bracket.

Attach the brake line mount to the frame using (2) $^{3}/_{16}$" rivets.
Fasten the braided brake line to the frame with the brake line clip mount.

Move the spindle all the way left and right to make sure the flexible lines do not bind or rub on any parts.

Attach another 20” section of brake line onto the T-junction and run this line to the passenger side of the car.

Install the brake line mount on the round tube under the upper control arm. This mount is installed with (2) $^{3}/_{16}$” rivets.

Fasten the braided brake line onto the frame with the brake line clip mount.

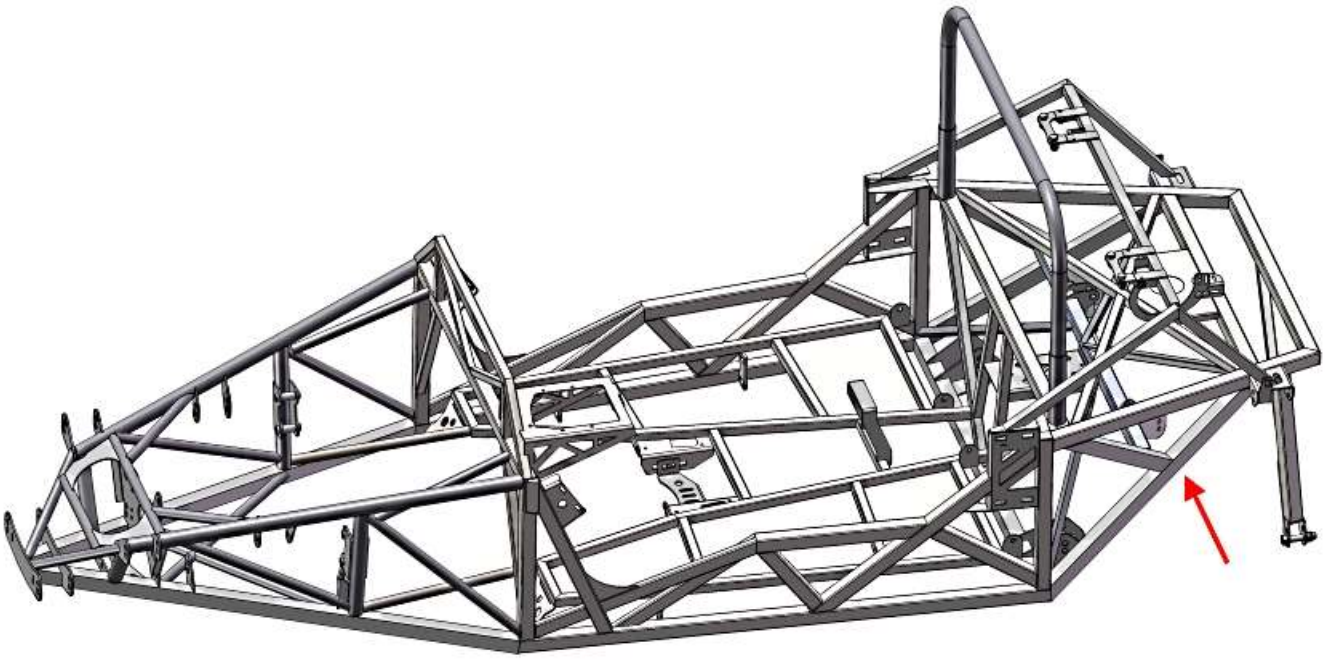
Torque the front flexible brake line to caliper banjo bolts to **29 lb-ft**.

Rear Brake line

Route the initial 60" section of brake line along the inside of the outer 1.5" frame rail attaching it as you go with the ¼" insulated line clips.

At the end of the 60" brake line piece, install a female-female union and attach a second 60” section of brake line.

At the end of the passenger compartment, route the brake line up the back side of the vertical 1.5" tube. Stay to the inside of the tube as the body will be very close to the outside of this tube.

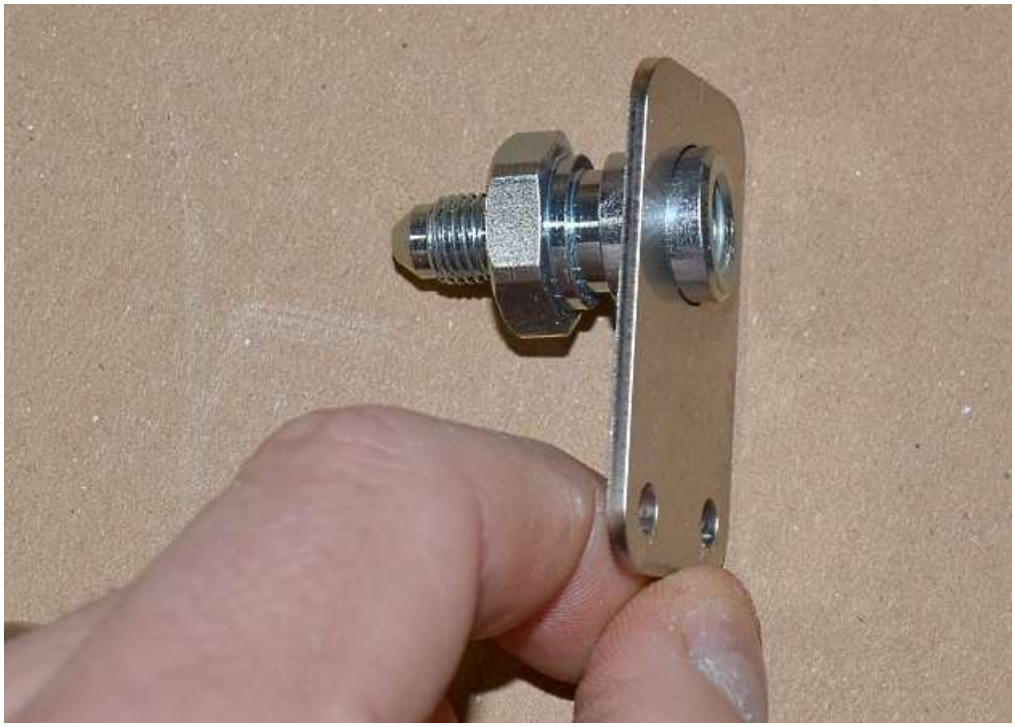


Route the brake line on the inside of the 1.5” tubes to the arrow location shown above. The body will be very close to the outside of the 1.5” tube so do not go to the outside.

If you are using your own rear brake assembly, attach the rear brake line mounts now.

Optional 11.65” Rear Brakes Brake line mounting

Remove the flexible brake line adapter from the flexible brake line.

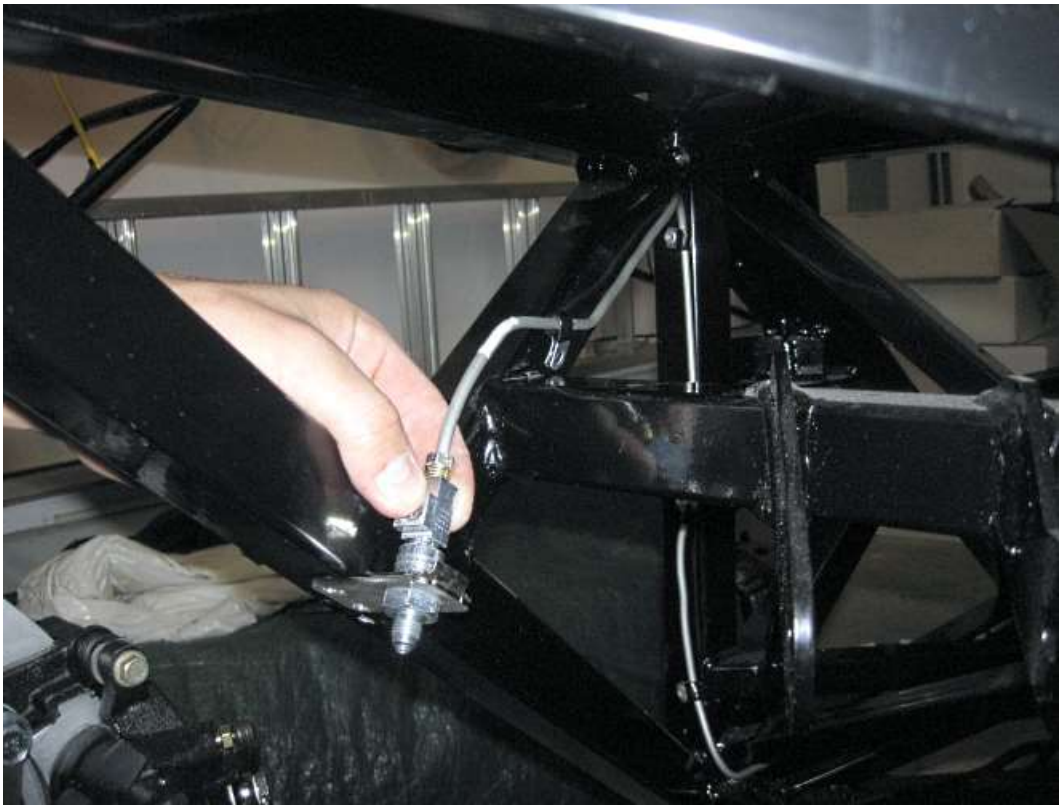


Insert the adapter into the brake line mount.

Attach the 2 female/1 male brake line adapter to the flexible brake line adapter.

Rotate to clock the brake line adapter as shown in the picture and push on the brake line clip.

Use a set of pliers to make sure the clip is fully seated around the groove in the flexible brake line adapter.

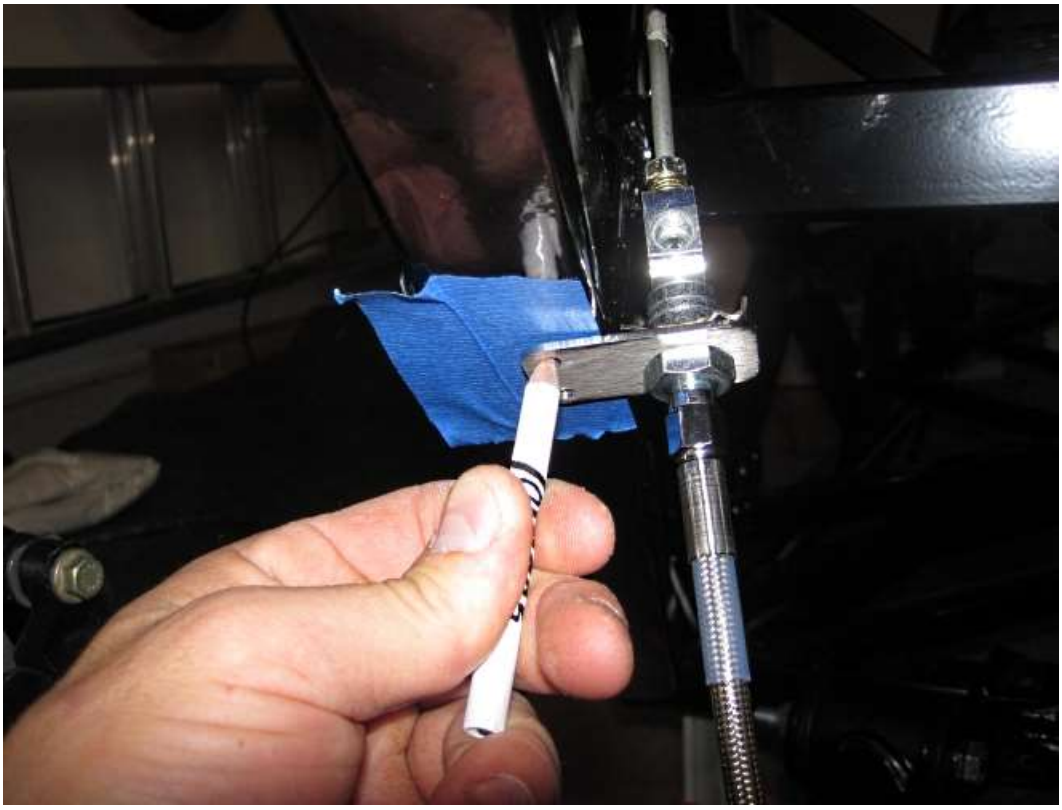


Hand tighten the rear brake line to the end of the brake line mount assembly and position the mount on the frame.

Place a crush washer on either side of the banjo fitting on the flexible brake line.

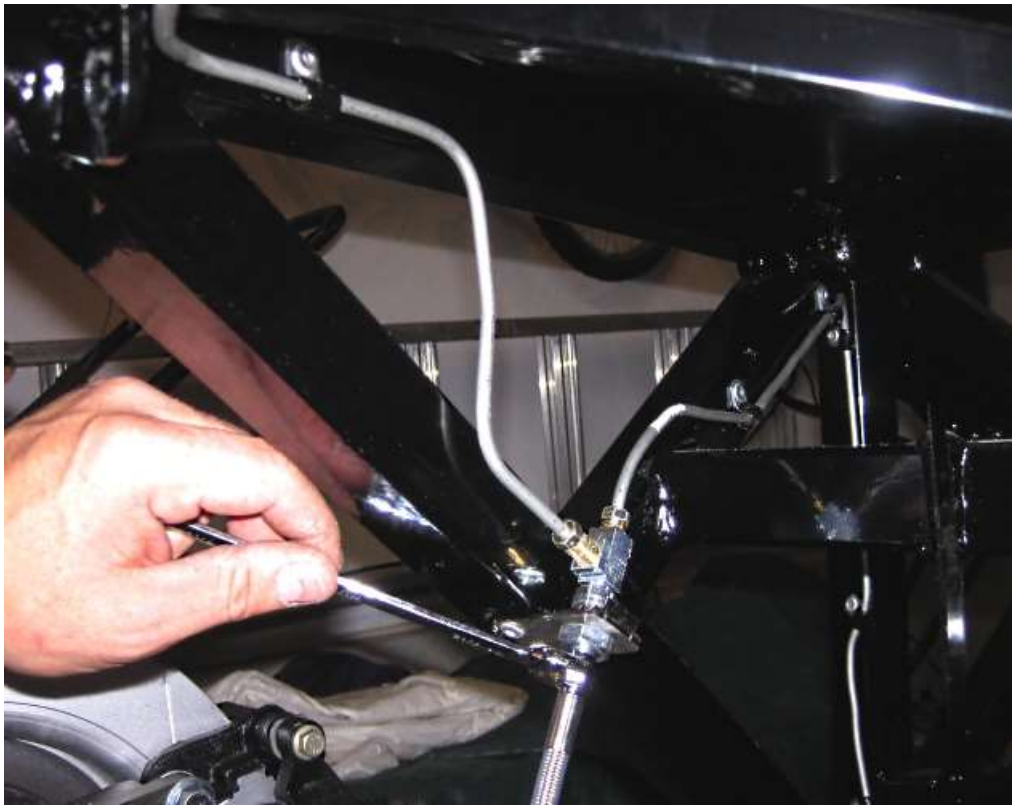
Loosely attach the flexible brake line to the brake caliper.

Attach the flexible brake line to the brake line frame mount by hand so that you can make sure that the brake line is not tight. If necessary, move the brake line mount to a new location so that the flexible line will reach without being tight. Keep in mind that the axle is hanging down so this is the maximum it would ever need to reach. It is also important that the flexible line will not rub on the control arm or frame when the axle is at ride height. Move the mount if necessary.



Place some masking tape on the frame tube and mark the hole locations for the mount.

Move the mount out of the way and drill one of the 3/16" mounting holes.
Remove the masking tape.
Reposition the brake line mount and attach it to the frame with a 3/16" rivet.
Drill and rivet the other mounting hole.



Run a 60” rear brake line from the side of the brake line mount up to the 1.5” tube at the back of the frame making sure to leave room around the bolts for the 3-link frame mount if you are running it.

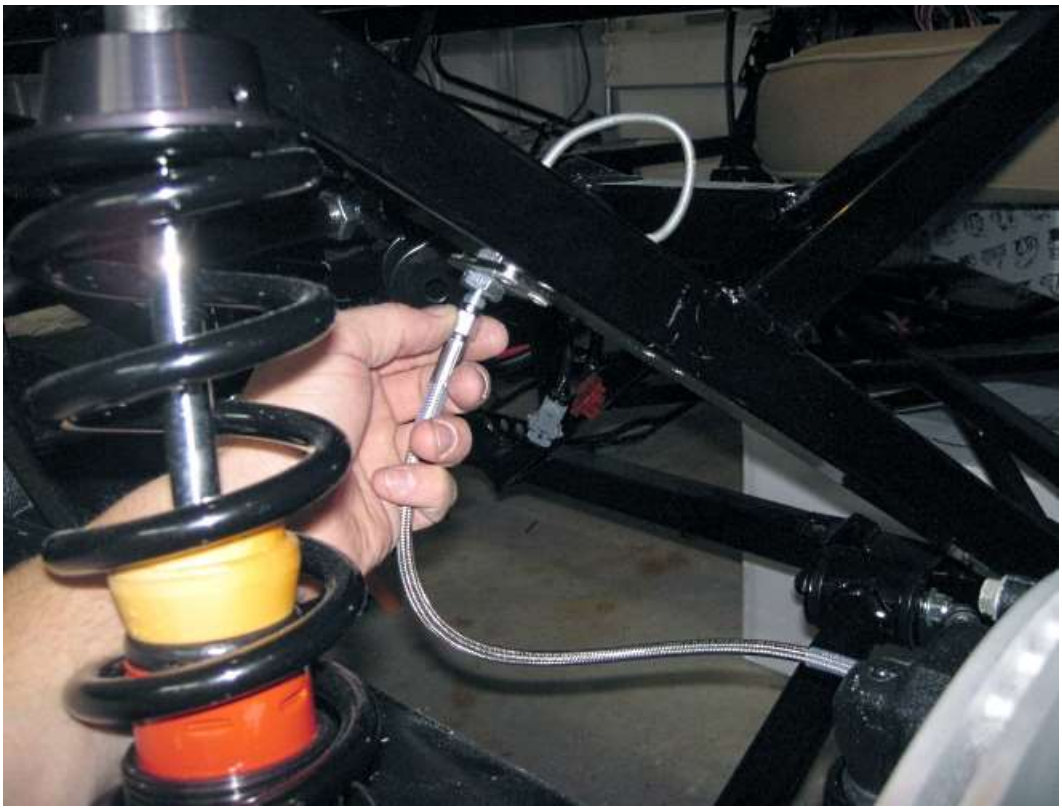
Route the line towards the passenger side of the car along the 1.5” tube.

Run the brake line down the frame on the passenger side to a location similar to the driver side again leaving room around the 3-link mount bolts if running it.

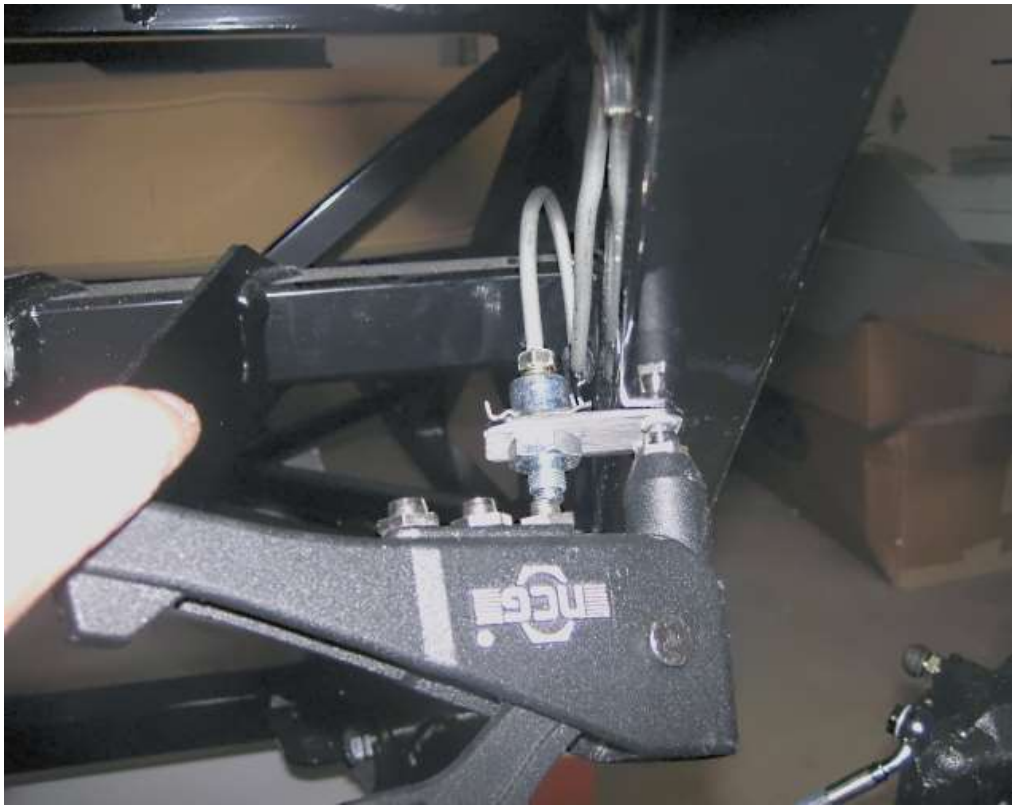
If necessary, put a loop or two on the brake line to take up extra line.

Attach the flexible brake line adapter to the frame mount using a brake line clip.

Attach the flexible brake line by hand to the brake caliper.



Attach the flexible brake line to the hard brake line and check the reach of the flexible brake line.



Drill and rivet the brake line mount to the frame.

Brake fluid filling/bleeding

- Brake fluid - DOT 3

Adjust the pedal height temporarily high to ensure maximize travel in the master cylinders. The pedal should be topping out and bottoming out only when the master cylinder is at the extreme ends of its travel. Ensure that the pedal is not contacting any frame section or other installed part and limiting it's travel in either direction.

Fill the brake fluid reservoir with brake fluid.

Unscrew the brake lines from the master cylinders.

Bench bleed the master cylinders in the frame. This can be done in the car with a short piece of brake line run from the master cylinder back into the reservoir.

Reattach the brake lines to the master cylinders.

Gravity bleed the system to get a head start on filling up the lines with fluid - Crack the four bleeder screws and leave the reservoir lid loosely screwed in to allow for easier fluid movement. Depending on reservoir height and line routing you may not get fluid all the way to the calipers.

Work your way around the car getting fluid to each caliper before trying for a final bleed, always making sure the reservoir never runs dry.

Once you have some pedal feel the master cylinders will not travel the same distance as one another. This can lead to difficulty bleeding the side which isn't compressing as much. In order to solve this bleed one caliper from the front and one from the rear simultaneously through several pedal cycles. The bleeders do not need to be cracked open at the same exact moment but they both need to remain open until the pedal is fully at the bottom of its stroke.

- Air can get trapped inside the caliper even if none is coming out of the cracked bleeder. In order to get this air out it helps to give the caliper a few light taps with a soft mallet to dislodge the bubble and

get it up to the bleeder nipple.

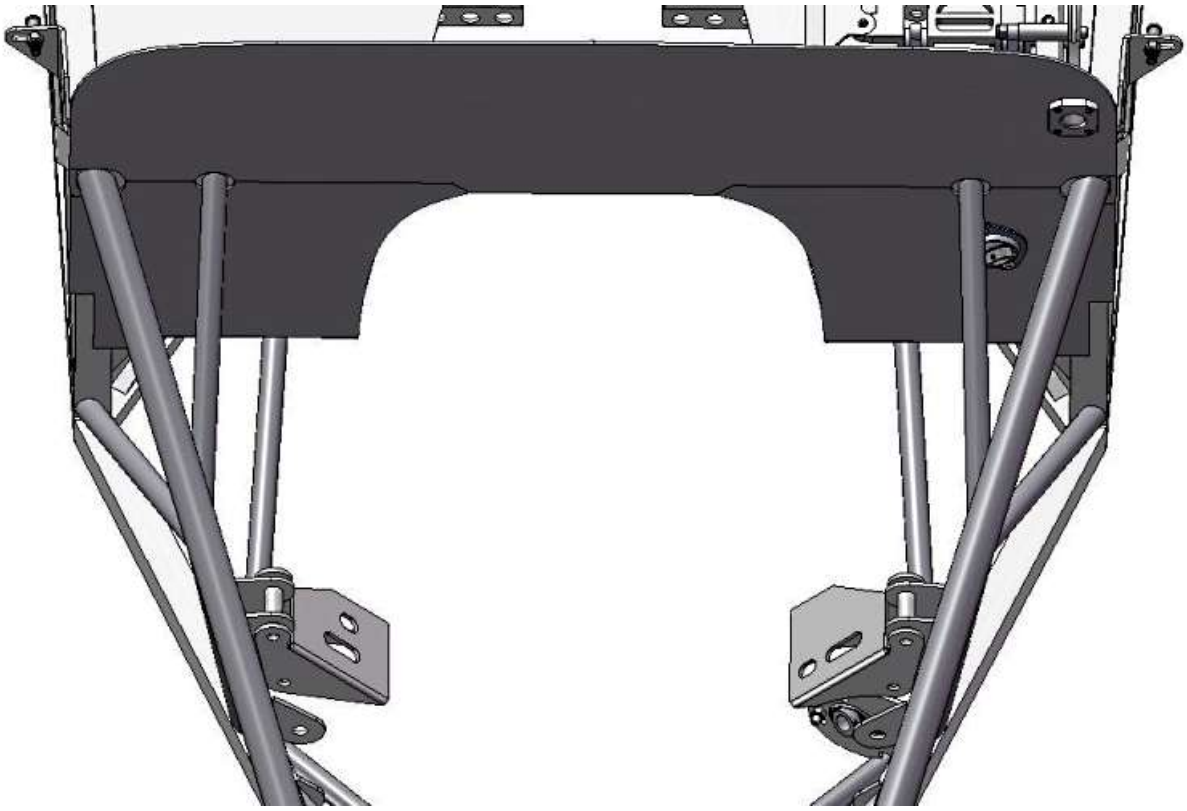
For the final bleeding, work from the farthest caliper away from the master cylinders until getting to the closest one last.

With the brakes bled you can set the bias and adjust the pedal heights, use the Wilwood adjustment procedure to set the pushrod lengths. Both the bias and pushrod adjustment can affect pedal feel so your pedal may not feel correct until this adjustment is made.

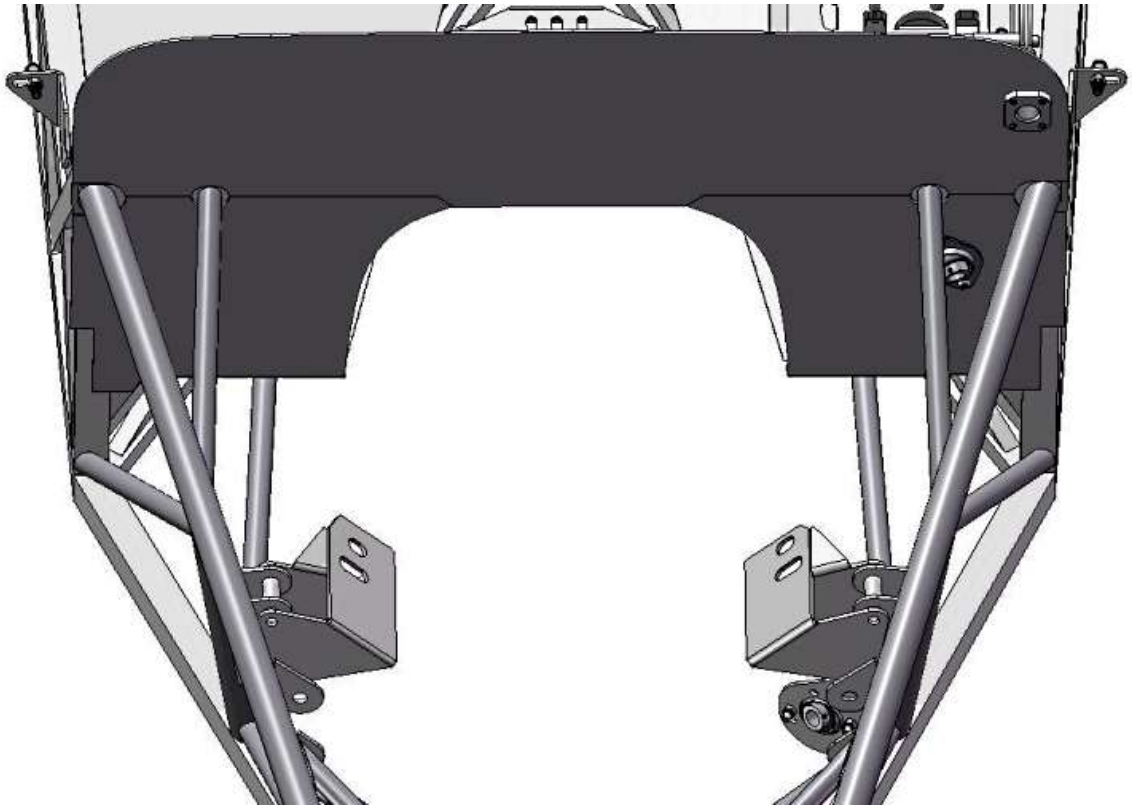
Engine, Transmission

- If installing a small block Chevy, LS or Ford Coyote Engine, go to www.factoryfiveparts.com/instructions for installation instructions.
- The appendix has the various driveshaft lengths that we stock if you are using a unique engine or transmission.
- If using an automatic transmission, we recommend a torque converter stall speed of 3500 RPM due to the weight of the finished car.

Frame Prep



289/302/351 engine mounts

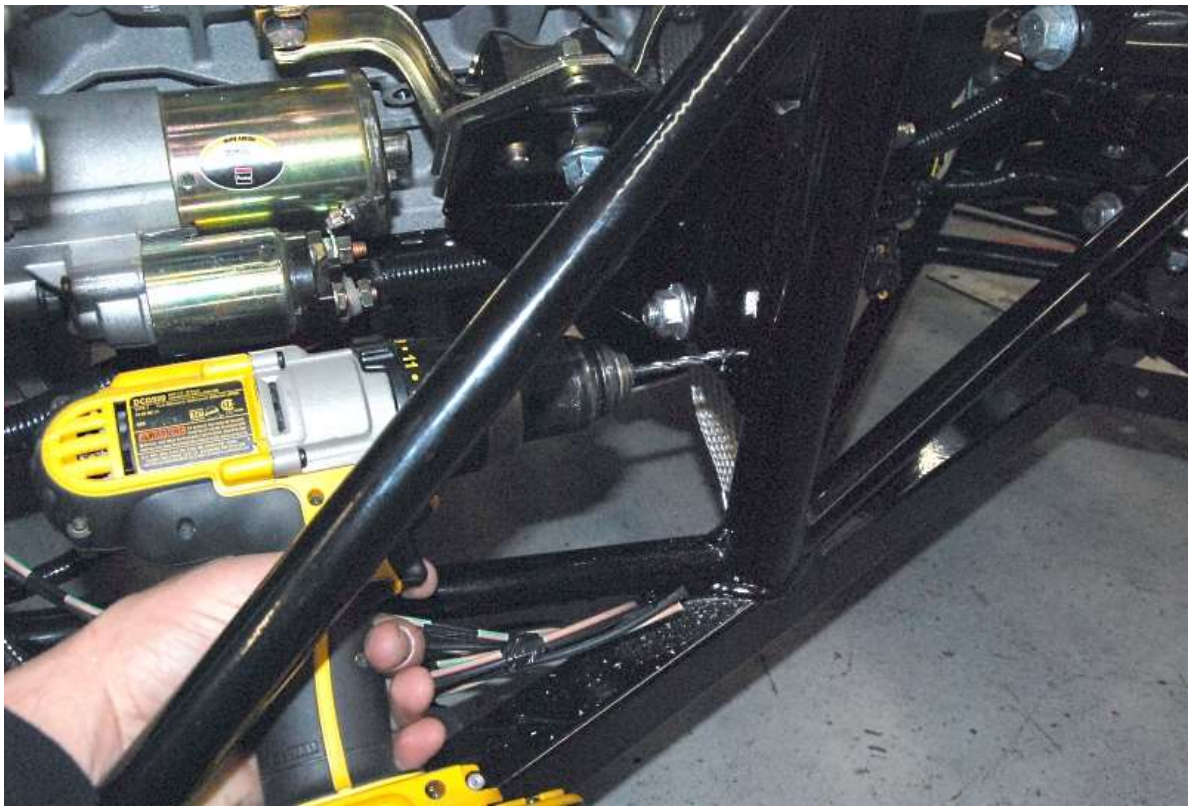


4.6L/Coyote engine mounts

Install the engine mount mounts onto the frame with the ½"-20 hardware (FFR# 33454 & 25619). It is helpful to only bolt the top of the mount in for now and pivot it down and away while installing the engine to provide more clearance.

Engine Ground

Find a location on the back side of the right engine mount to attach the engine ground strap.

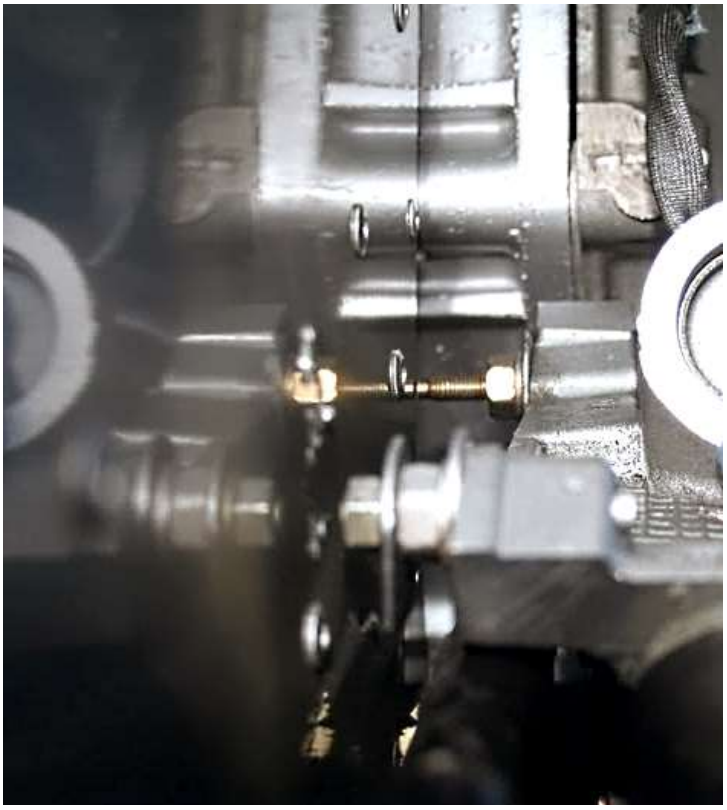


Drill a $^{5}/_{16}$" hole at the mount area.

Remove any powder coat or paint around the hole for a good ground.

Engine Prep

- Engine hoist, chain, ¾", $^{15}/_{16}$" sockets, ratchet, extension
- Engine, Engine mounts, engine ground strap.
- The easiest method to install the drivetrain is with the engine and transmission already bolted together and lowered in as a unit. Also remove anything that will make your job easier (shifter assembly, headers, power steering pump, etc.…).
- Some engine choices also need a short style oil filter. We recommend the Purolator L17019.
- If running a carbureted engine install the Fan thermostat switch to control the fan.



- The 4.6L/Coyote engine ends up extremely close to the firewall. Cut any extra length off the bolts to prevent damaging the firewall.

Engine Mounts

Unpack the engine and transmission mounts and loosely attach to the engine.

Attach the engine ground strap (electrical completion parts for complete kit) to one of the right-side engine mount bolts.

Engine/Transmission install

Bolt the Energy Suspension engine mounts to the engine before installing the engine. If the chassis is powder coated you may want to protect the engine bay down tubes.

Once the engine is hanging in place, on the right side of the engine bay put both bolts through the bolt-on engine bracket and move the engine so the mount stud goes into the mount.

On the left side of the engine attach the upper engine bracket bolt then pivot the engine mount bracket up into place so the engine mount stud is in the correct place.

Bolt the lower engine bracket bolt onto the chassis.

Install the nut on the Energy Suspension mounts attaching the engine mounts to the modular mounts.

The transmission mount plate is fully adjustable and can be positioned on the chassis to provide more adjustment to the front or the rear depending on the transmission choice. Lift on the rear of the transmission and slide this bracket into place. It is fastened to the chassis with the ½" carriage bolt, washer and nut.

- Depending on the transmission choice, you may have to use the provided spacer to space the transmission up in between the transmission and the transmission mount.

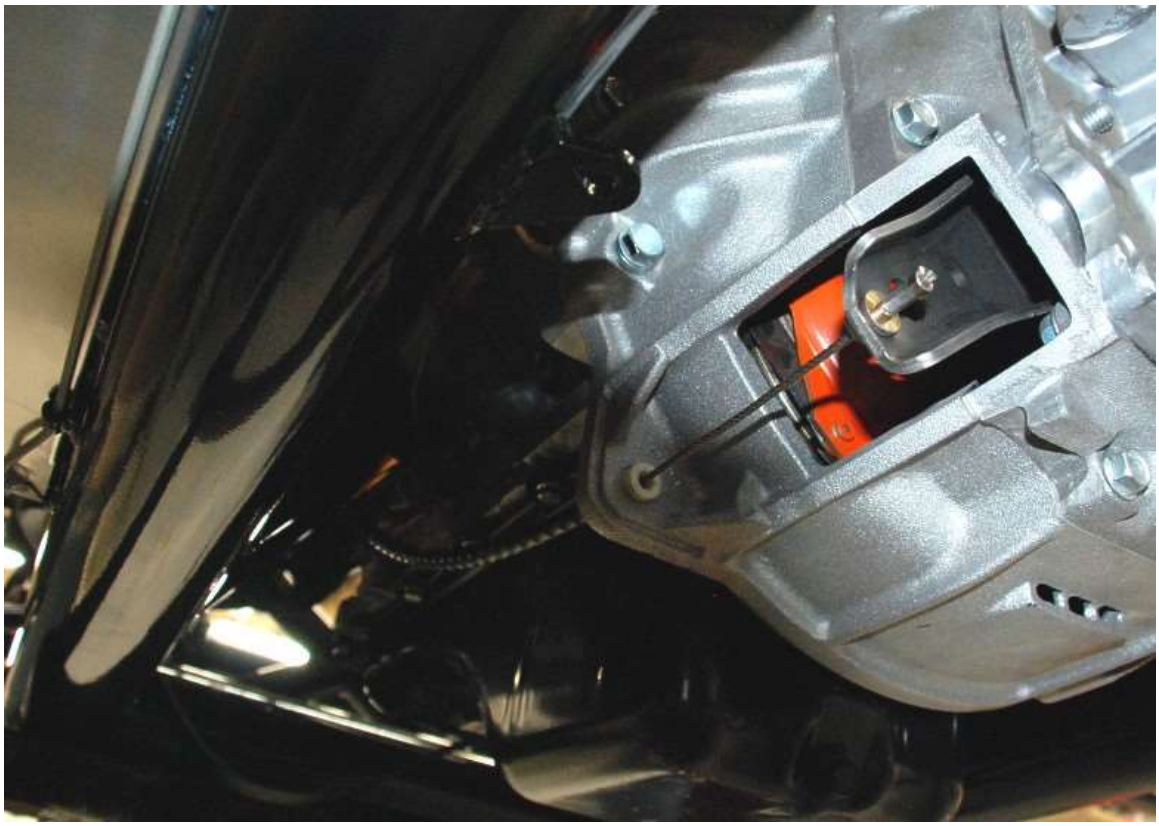
Optional Clutch Cable

- Clutch cable, insulated clip hardware
- For use with optional manual transmission components.

Slide the clutch cable end through the clutch cable spacer and loop the cable over the quadrant.

Route the clutch cable down to the bellhousing. Using zip ties or insulated clips tie the cable safely away from the headers and the moving steering components. It can be fastened to the engine using the bracket on the cable to the front lower bolt that holds the starter cable just before it leaves the block or, to the lower engine bay ¾" tubing.

- Make sure that the cable is clear of the hot exhaust header and the steering shaft or the cable may fail prematurely.



Connect the clutch cable to the bellhousing and the clutch fork.

Thread the cable end adjuster nut on so that the cable has no play in it.

Adjust the pedal closer or further away as desired by screwing the pedal stop screw up or down.

Check the full range of travel for the clutch pedal.

- There may be a small amount of movement in the firewall if you try pressing the clutch. Keep in mind that the firewall will get attached to the body which will help support/reinforce the firewall.

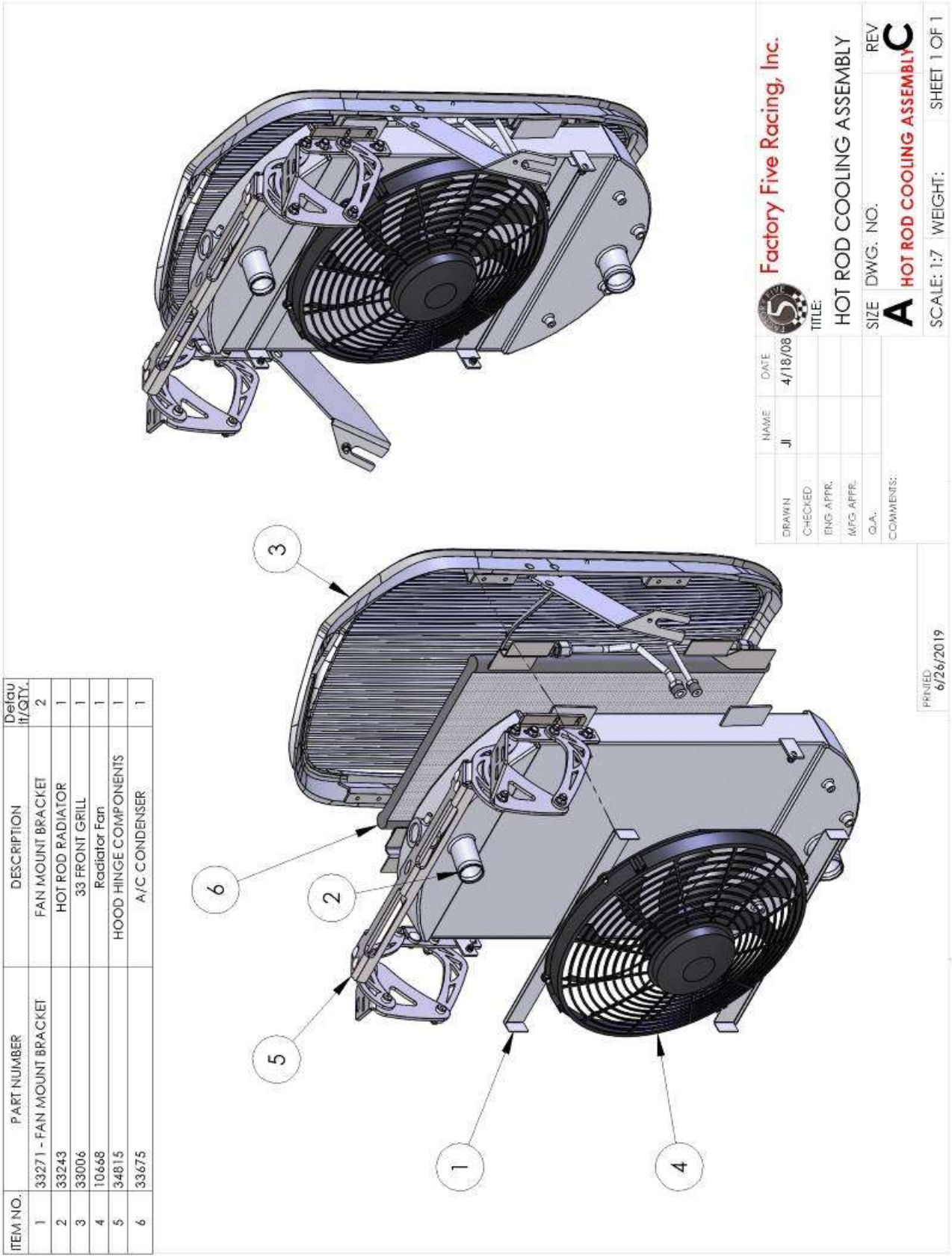
Engine Ground

Sand paper or grinder bit, ½" socket, ratchet, 3/16" hex key, drill, 5/16" drill bit

- Electrical system completion components

Attach the ground strap using the $^{5}/_{16}$" button head screw and locknut provided.

Front Grill, Radiator and Fan



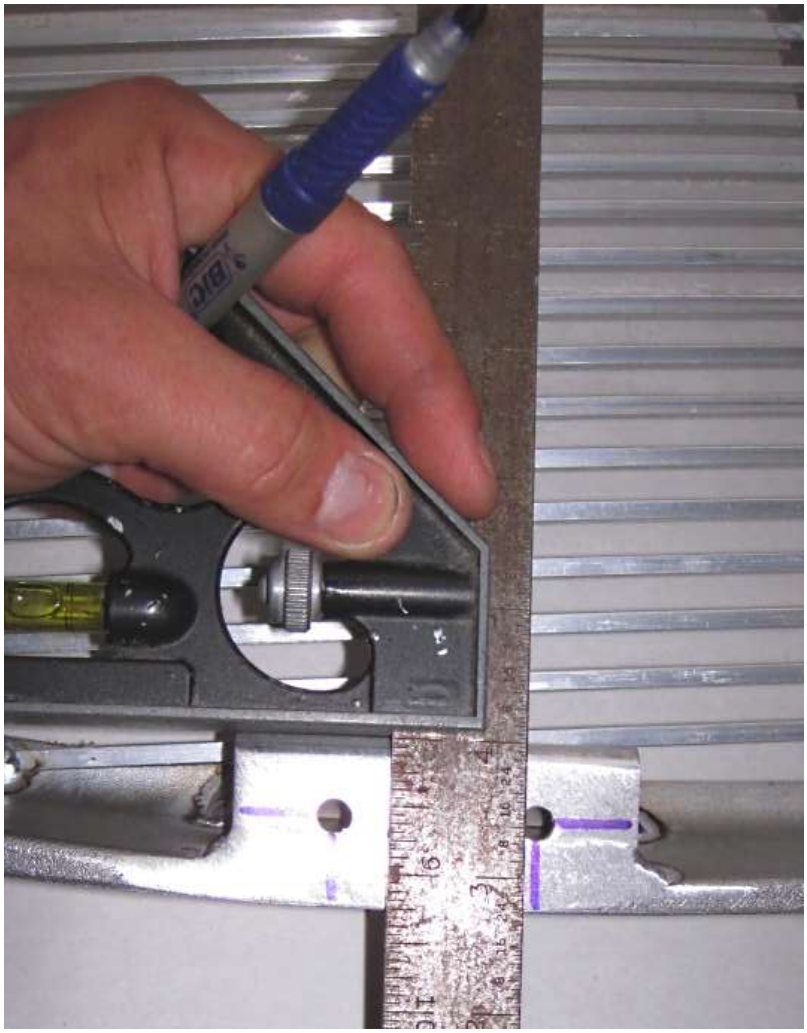
ITEM NO.	PART NUMBER	DESCRIPTION	Default QTY.
1	33271 - FAN MOUNT BRACKET	FAN MOUNT BRACKET	2
2	33243	HOT ROD RADIATOR	1
3	33006	33 FRONT GRILL	1
4	10668	Radiator Fan	1
5	34815	HOOD HINGE COMPONENTS	1
6	33675	A/C CONDENSER	1

🛠 Ruler, marker, ¼", $^{25}/_{64}$" drill bits, $^{5}/_{32}$" hex key, riv-nut tool, grinder

🚘 Cooling components, secondary body fasteners, radiator assembly, front grill.

Radiator

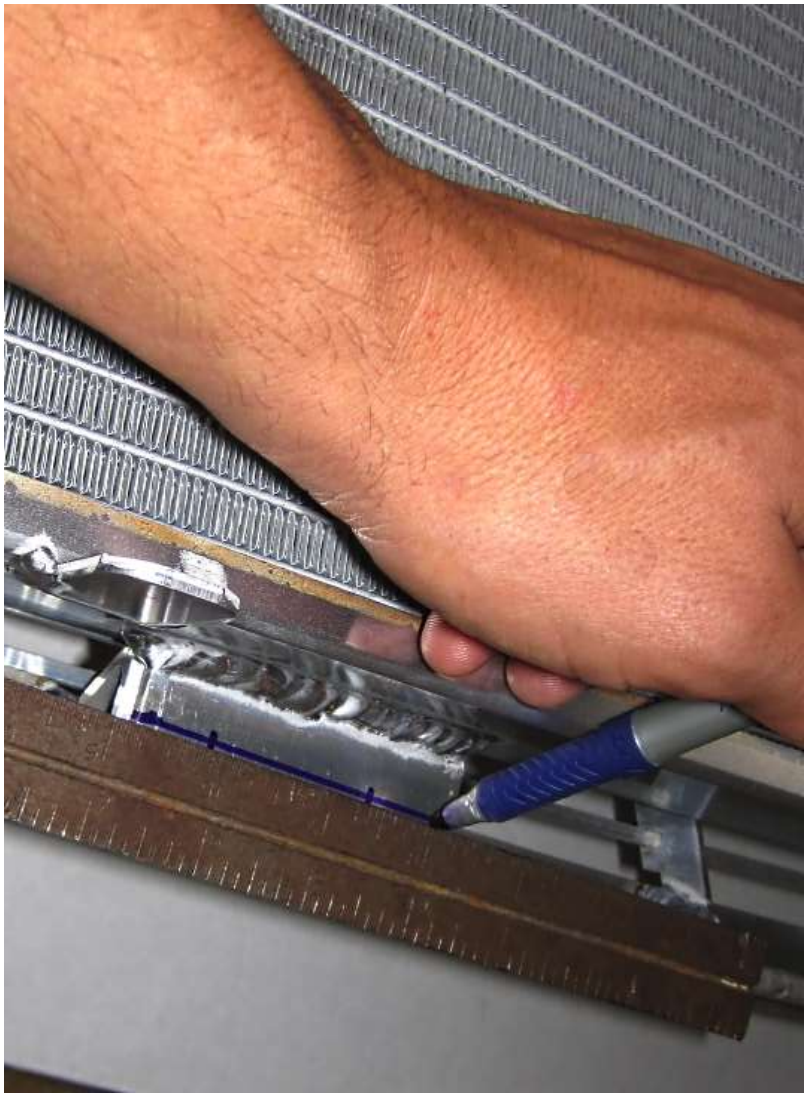
- The radiator has a built in Transmission cooler that can be used if so desired.



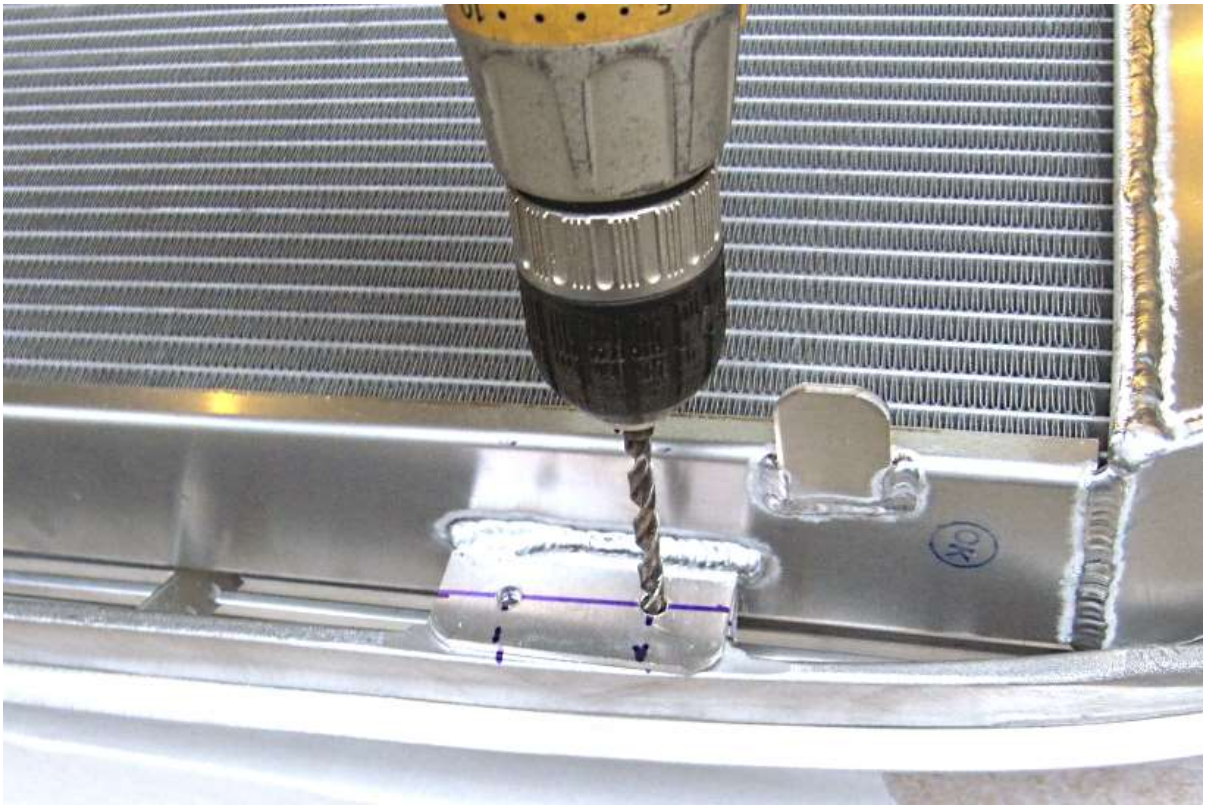
Lay the grill on its front and use a marker to mark the location of the holes on the radiator mount tabs on the edge of the grill. Mark the vertical location of the holes on the top and bottom of the radiator mount tab.

Place the radiator on the grill so that the radiator tabs are centered on the grill mounts.

Transfer the marks from the grill to the radiator.



Use a ruler to mark the locations of the holes on the radiator mount tabs.



Remove the radiator from the grill and drill ¼” mounting holes in the radiator mount tabs.

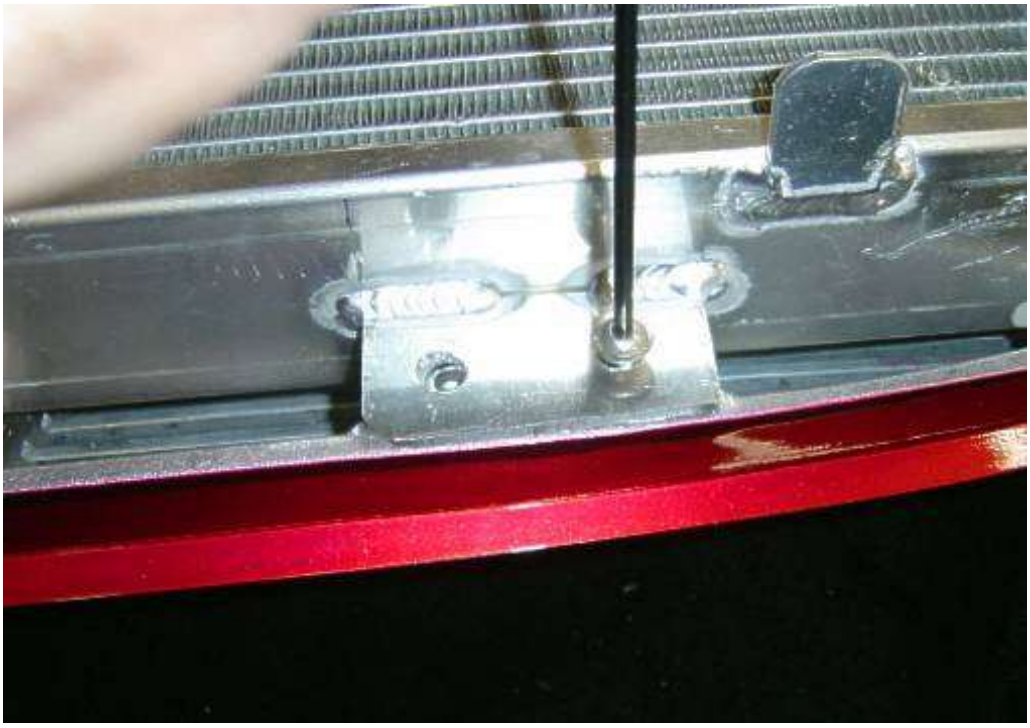
Lay the radiator back on the grill and check the hole alignment by putting the ¼” button head screws in as many holes as possible.

If necessary, with the radiator and screws in the grill, use the ¼" drill bit and drill to "align" the holes.

Remove the radiator from the grill.
Open up the holes in the grill using a $^{25}/_{64}$" drill bit.

Install Riv-nuts in the grill holes.

- If you are installing an A/C unit in the car, mount the Condenser to the radiator now using the A/C instructions.



If not mounting an A/C Condenser, attach the radiator to the grill using the ¼-20 x ¾" screws provided.

Fan Thermostat switch

- Teflon tape, $^{11}/_{16}$" wrench
- Cooling components, front grill
- If you are not running the thermostat switch, this hole can be plugged with a $^{3}/_{8}$" NPT pipe thread plug.

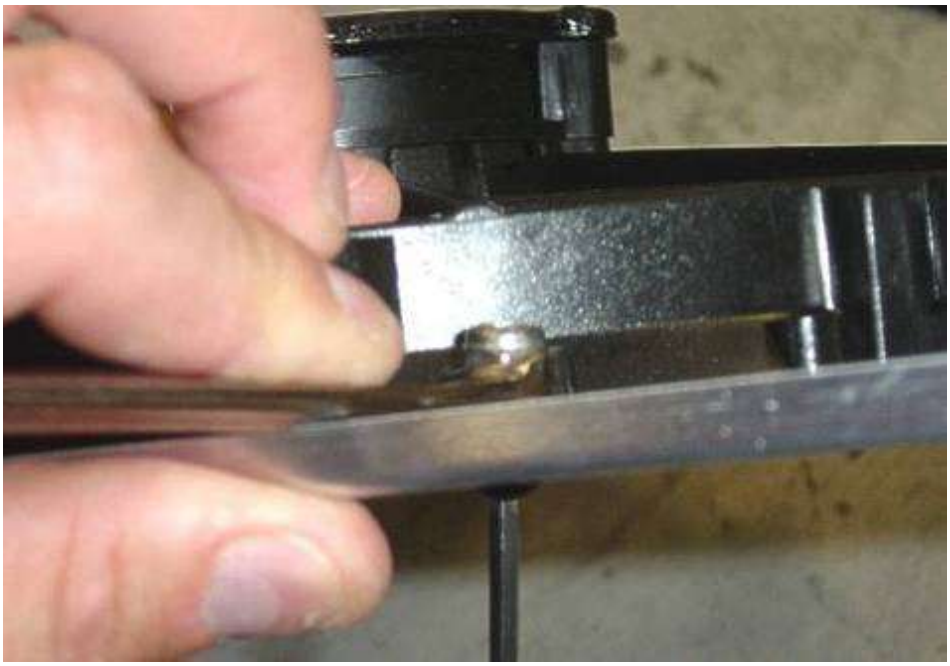
Wrap the thermostat threads with Teflon tape.

Insert the electric fan thermostat switch in the bottom center threaded bung on the radiator.

Carefully tighten the thermostat switch.

Electric Fan

🛠 ⅛" Hex key, ⅜" wrench
🚘 Cooling components, front grill



Attach the fan mounts to the electric fan using the 10-32 fasteners provided. Insert the screws from the bottom side so that the nut is on top of the fan. This will allow the fan to sit tight against the radiator.

Rotate the fan assembly so that the fan wires are on the bottom and the mount bars go across the radiator then, push the fan assembly onto the back of the Radiator by putting one side in then the other. It should be a tight fit.

Push on the fan mount sides against the Radiator tabs or hold the fan mount side against the tab with a pair of pliers.

Drill though the radiator tab and fan mount with a $^{13}/_{64}$" drill bit.

Attach the fan assembly to the radiator tabs using the screws and lock nuts provided. Pass the screw from the outside in for a clean look.

Grill Assembly

🛠 $^{5}/_{32}$" Hex key, $^{7}/_{16}$" wrench, floor jack
🚗 Front Grill, cooling components, secondary body fasteners
✋ If running A/C, it may be necessary to trim the grill mounts to clear the radiator mounts.

Use a floor jack to hold the bottom of the grill while getting the assembly into position.

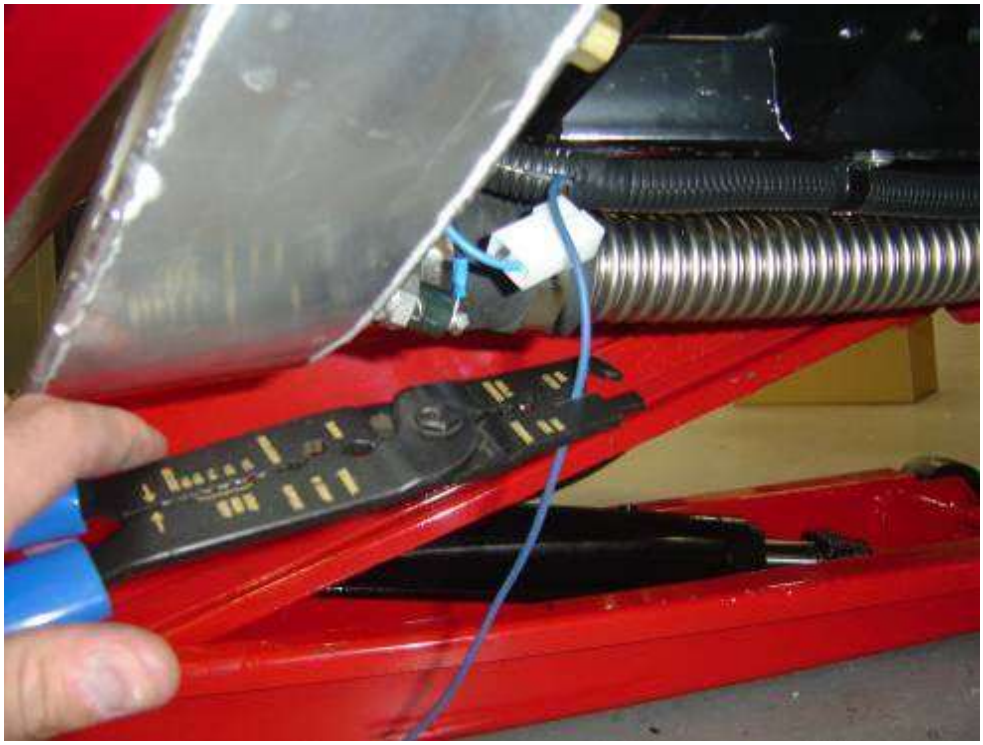
Hold the grill up to the grill frame mounts so that the mounts are on the inside of the grill.

Attach the grill to the grill mounts using the ¼" flat head socket screws and locknuts in the secondary body fasteners. Leave the locknuts loose to allow adjustment when the hood, and engine side covers are put on later.

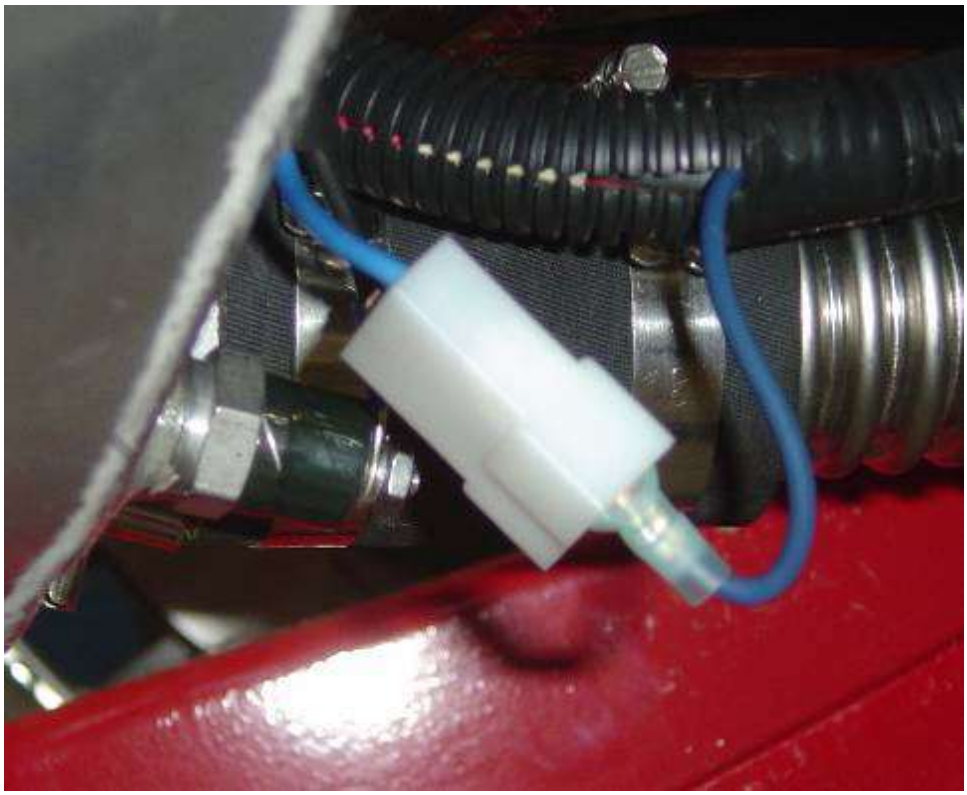
Wiring

🛠 Wire cutters, wire crimpers
🚗 Cooling components

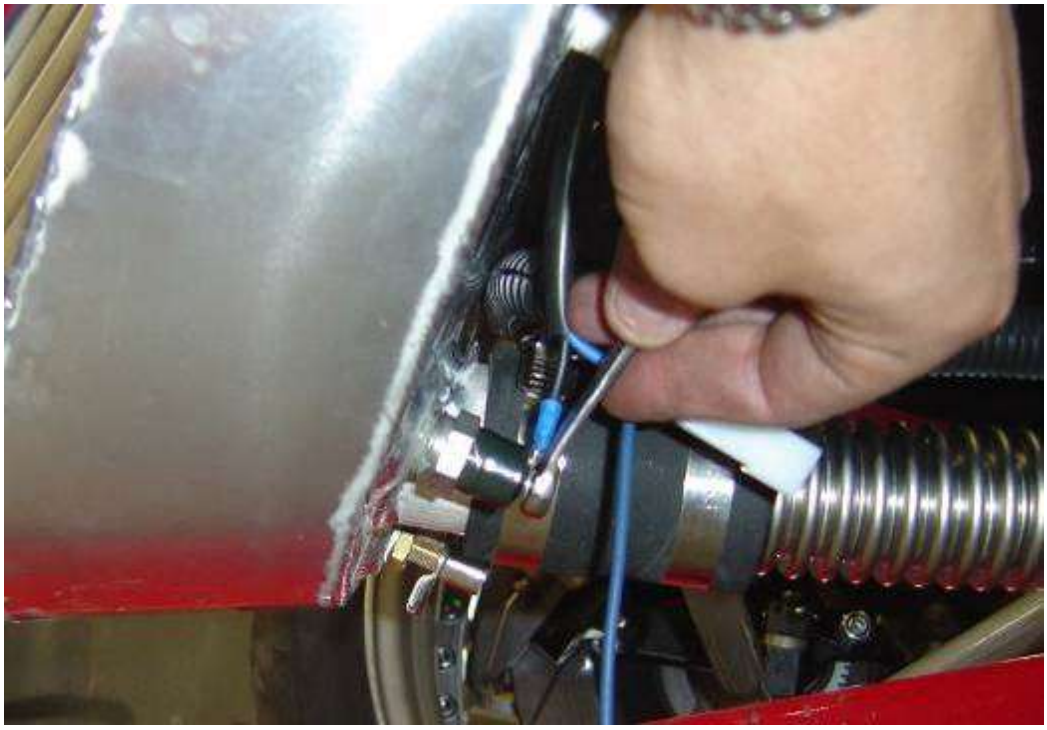
Locate the fan positive wire in the harness.



Cut the fan wire so that it can connect to the plug.



Install a spade connector onto this wire and connect it to the fan wires. Make sure to connect it to the blue wire of the fan.

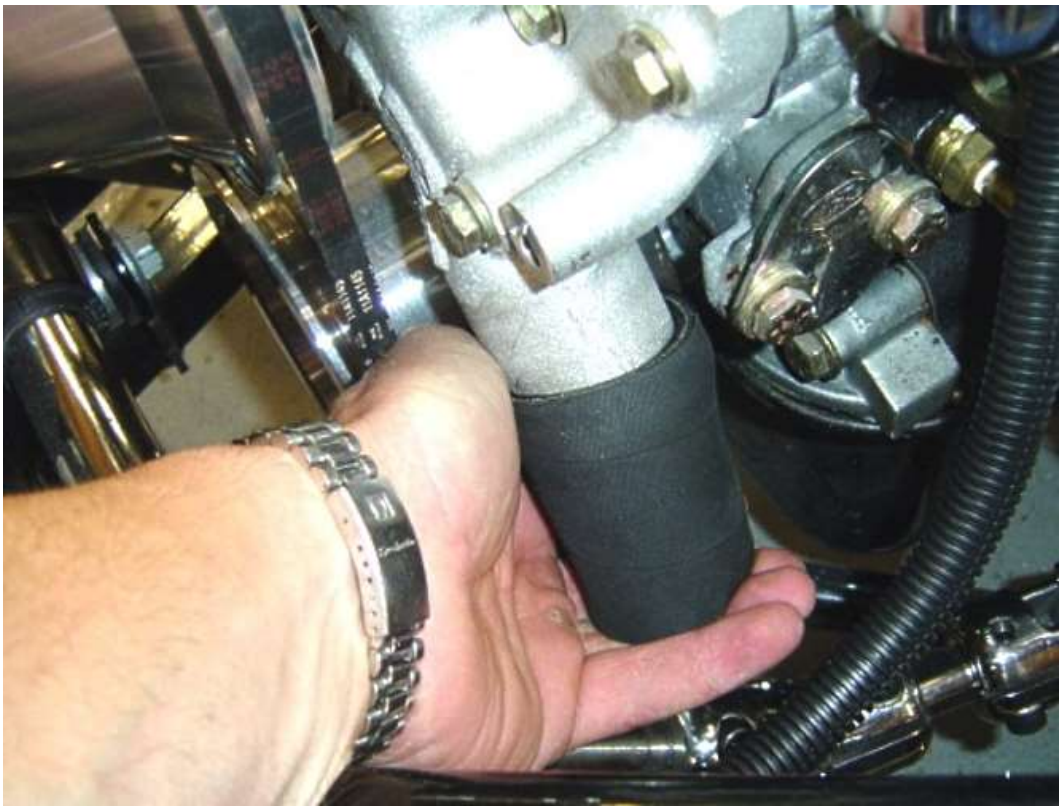


Install a ring terminal on the black wire coming from the fan itself. Then connect this wire to the thermostat sender which you just installed in the radiator. With this setup the fan will operate by interrupting the ground to operate the fan. Make sure your grill/radiator is grounded. If you are having a problem, run a ground wire to the radiator directly.

Radiator Hose

🛠 Hack saw, razor knife, 7mm socket, ratchet, masking tape
🚘 Cooling components

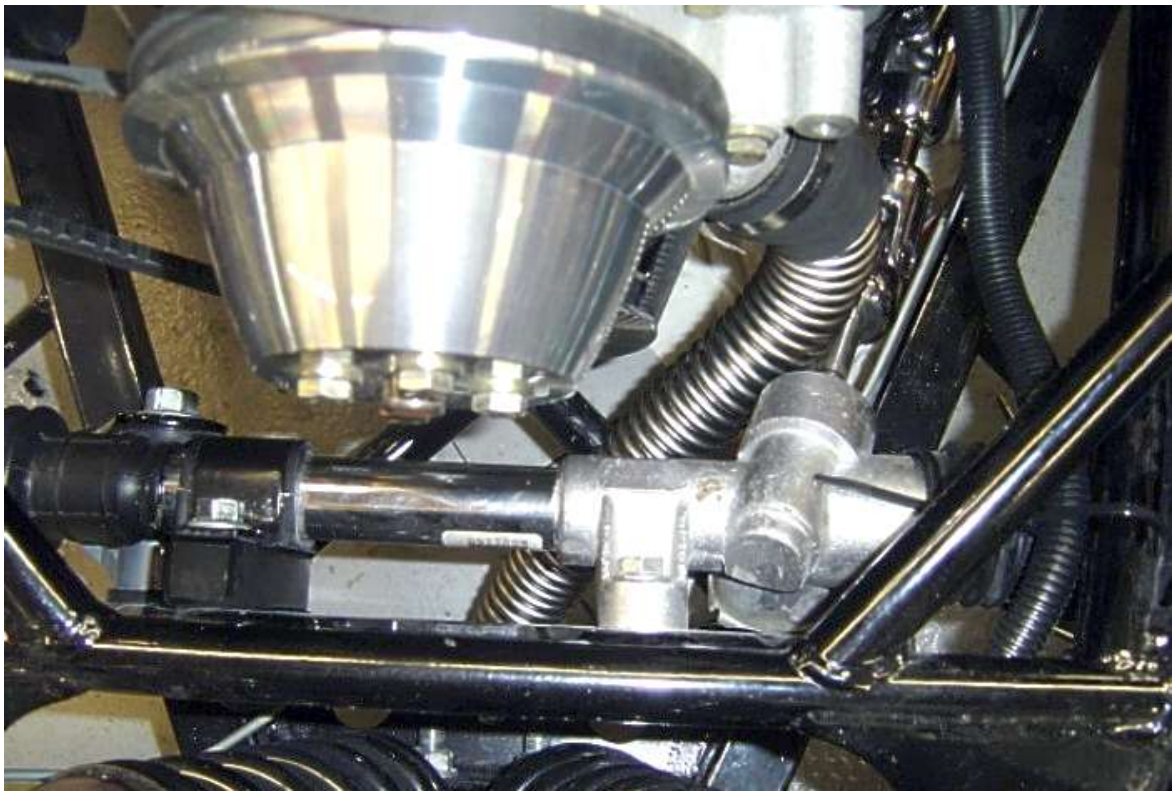
Lower Radiator Hose



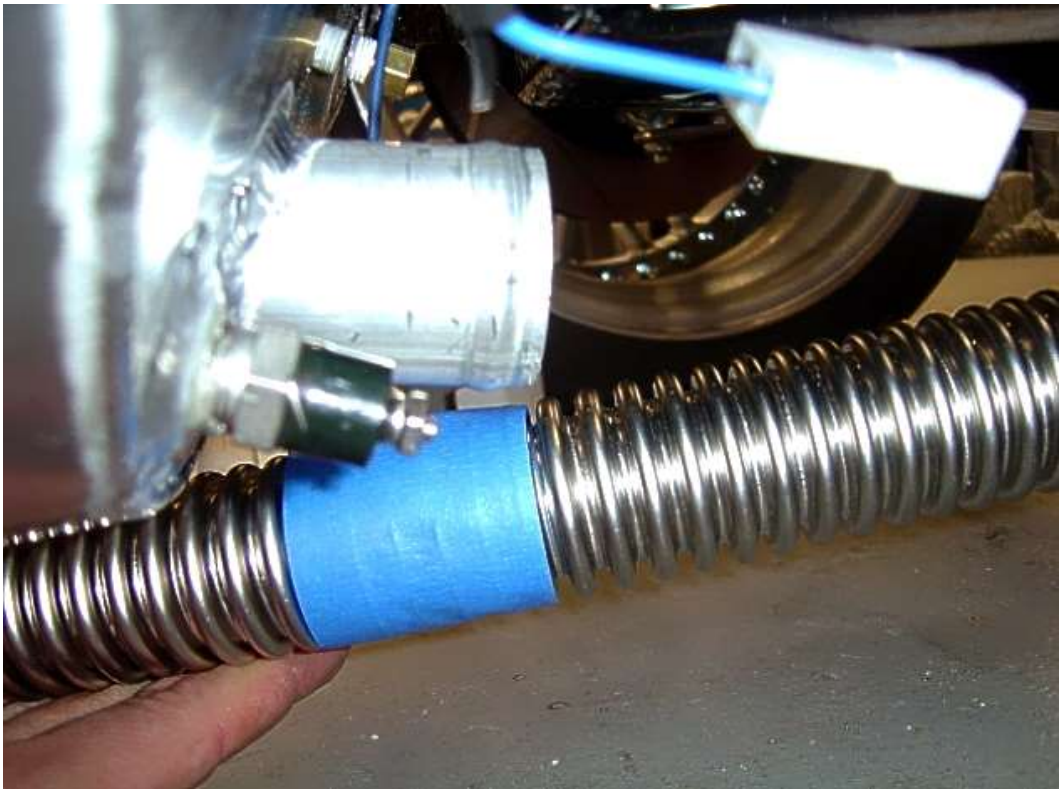
Open one of the radiator hose adapter kits and remove the adapters inside the larger hose and the hose clamps from the outside of the hose. Cut ¼" off the end of the larger hose. Push the large hose onto the water pump inlet.

Attach the large hose to the water pump using one of the hose clamps and a 7mm socket and ratchet. It gives a clean look if you position the hose clamp so that the screw is accessible but is not seen.

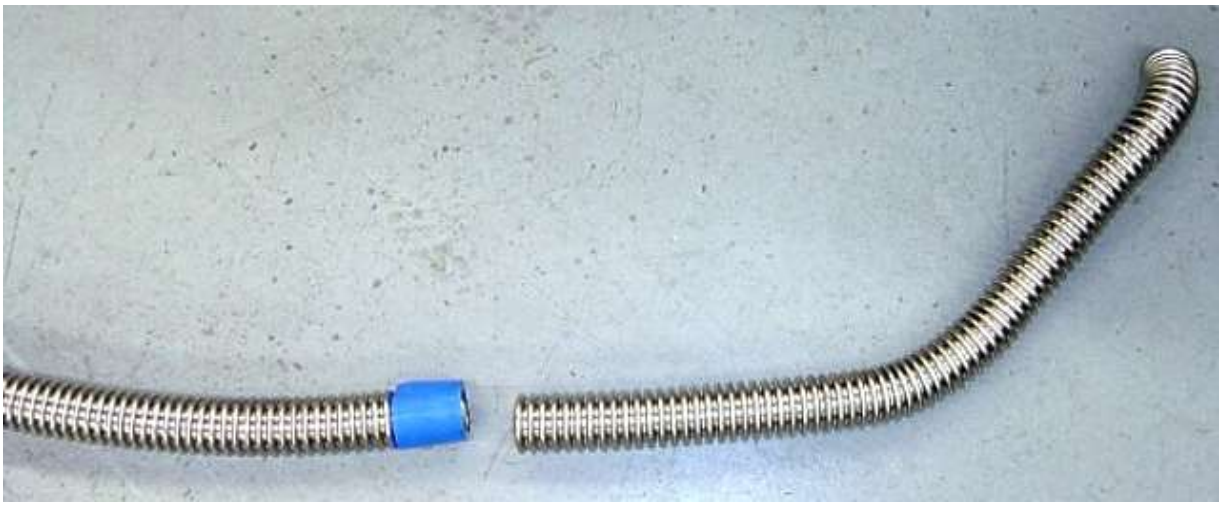
From the underside of the frame, pass the corrugated radiator hose up behind the shock mount plate but in front of the 1” tubes.



Route the corrugated tube over towards the steering shaft and into the rubber hose adapter on the water pump inlet. You will have to put a sharp bend in the end of the tube. Do not hose clamp it.

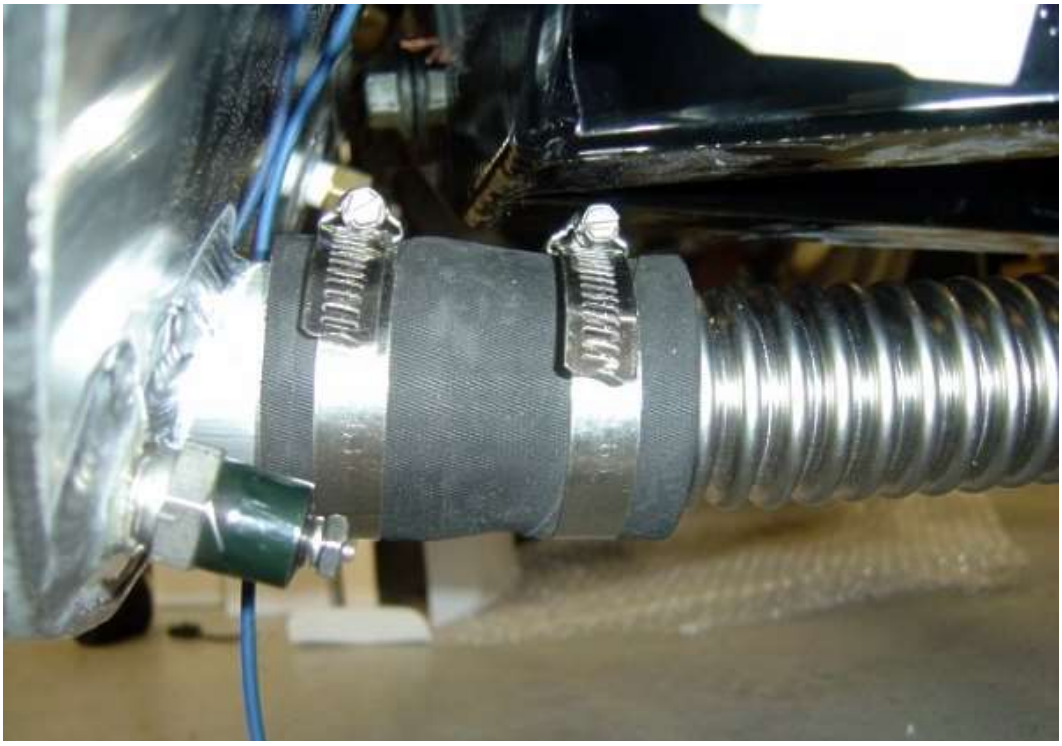


On the underside of the frame, route the corrugated hose straight to the lower radiator outlet and use some masking tape or a marker to mark the cut location of the corrugated tube.



Remove and cut the corrugated tube with a hack saw or band saw.

Re-install the corrugated tube and hose clamp it to the water pump using a 7mm socket and ratchet.



Open one of the radiator hose adapter kits and remove the adapters inside the larger hose and the hose clamps from the outside of the hose. Push the hose onto the lower radiator outlet and hose clamp it using a 7mm socket and ratchet.

Upper Radiator Hose

Open one of the radiator hose adapter kits and remove the adapters inside the larger hose and the hose clamps from the outside of the hose. Push the hose onto the engine outlet.

Attach the large hose to the engine outlet using one of the hose clamps and a 7mm socket and ratchet. It gives a clean look if you position the hose clamp so that the screw is accessible but is not seen.

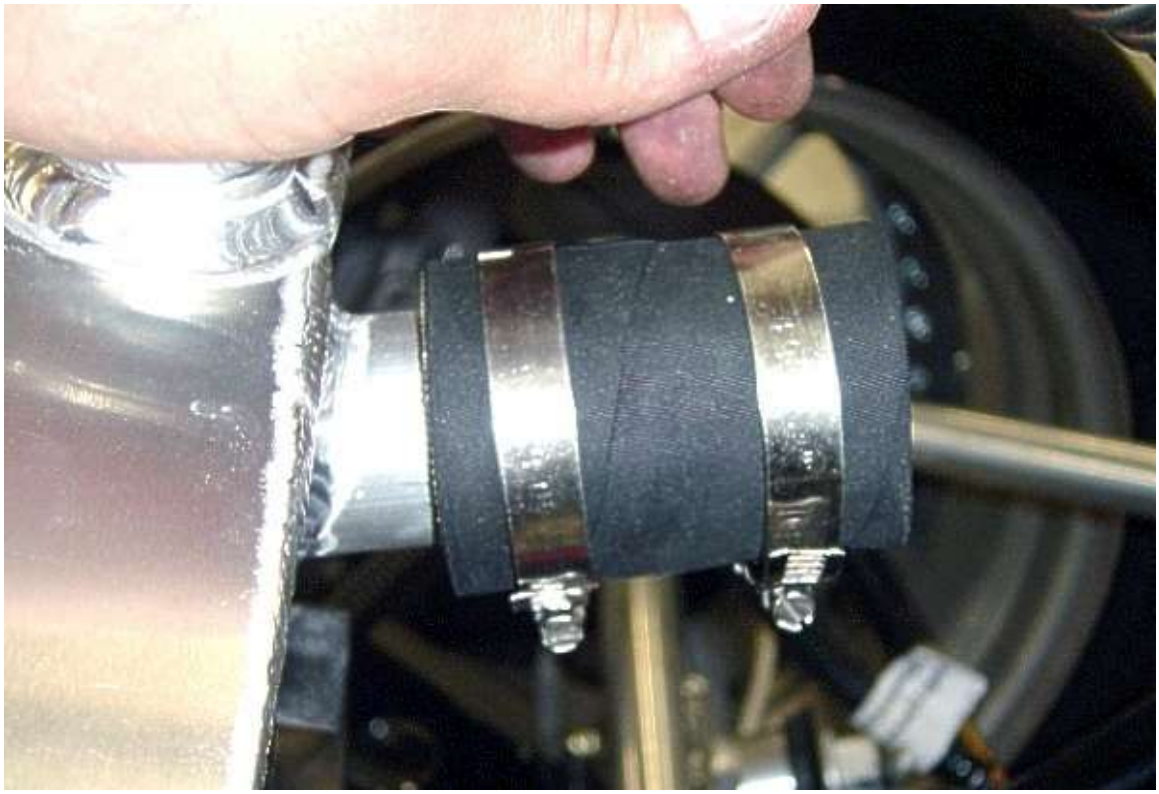
Bend and route the hose over to the radiator inlet and use a marker or masking tape to mark the cut location of the corrugated hose.

Remove and cut the corrugated tube with a hack saw or band saw.

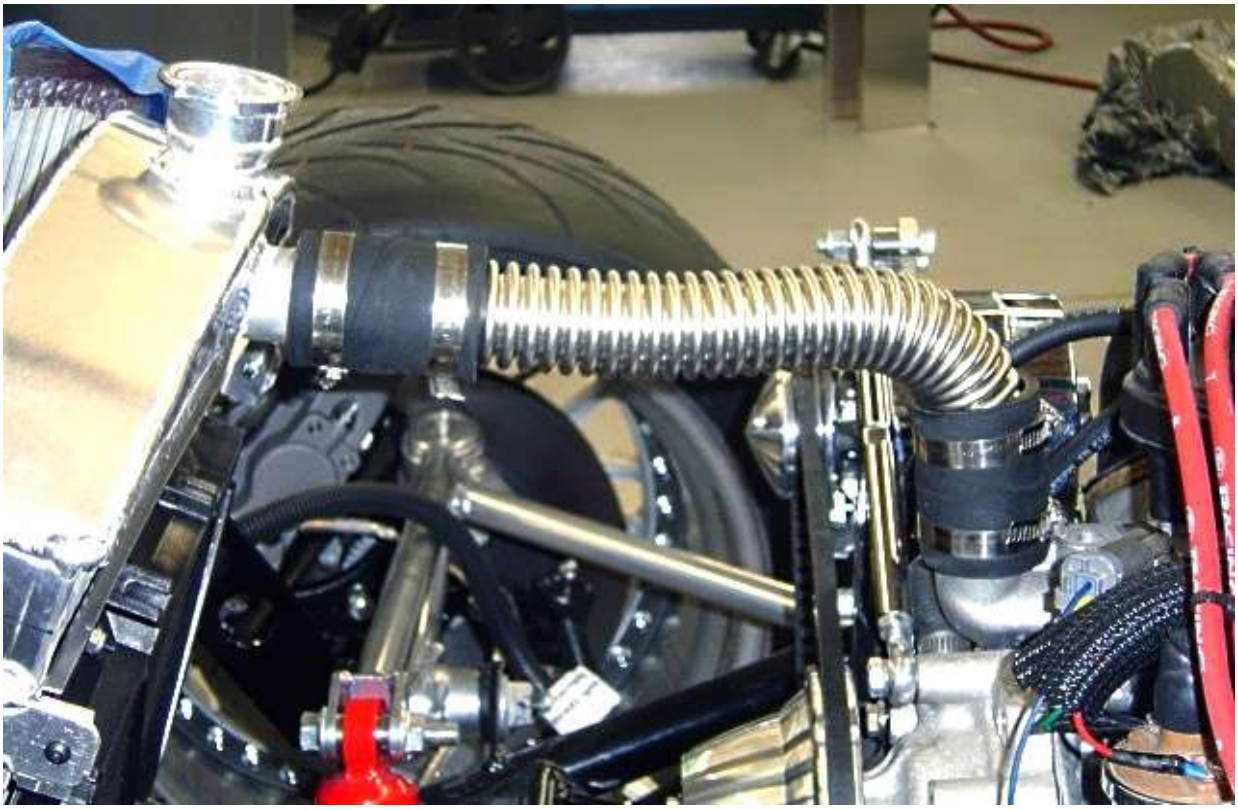
Open one of the radiator hose adapter kits, remove the adapters and the hose clamps from the large hose.

Push the thinner hose adapter onto the radiator inlet.

Push the large hose over the adapter on the radiator inlet.



Attach the hose to the radiator using a hose clamp, 7mm socket and ratchet. It gives a clean look if you position the hose clamp so that the screw is accessible but is not seen.



Re-install the corrugated tube and hose clamp it to the water pump and radiator using a 7mm socket and ratchet.

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

Overflow Tank

- Cooling components

- The overflow tank can either get mounted to the radiator as shown in the diagram before the radiator installation or directly to the firewall.

Attach the overflow tank to the overflow tank mount.
Attach and route the overflow tank tubing to the radiator overflow nipple.

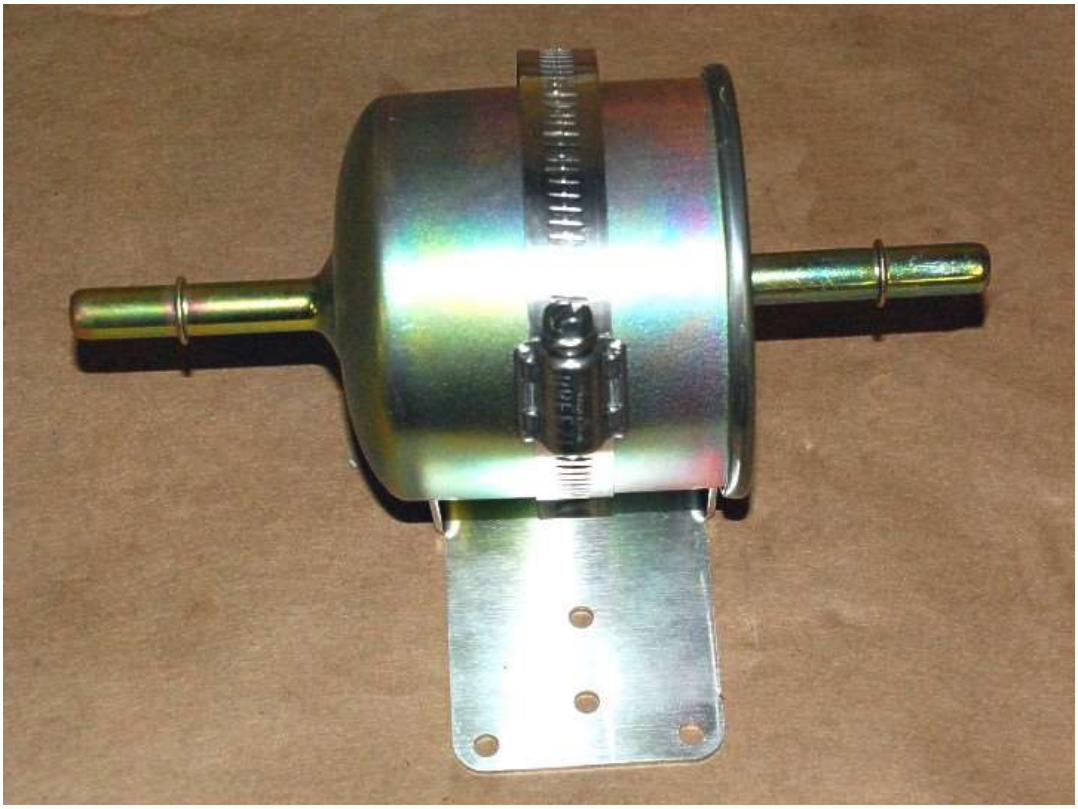
Fuel System

- Razor knife, 3/16" drill bit, drill, rivet tool
- Fuel tank components

Fuel Filter

Unpack the fuel filter and mounting hardware.

Open the hose clamp and slide it through the slots in the mount and start to tighten it back up into a hoop just bigger than the filter.



Clamp the filter in place on the mount with the filter flange oriented as shown.

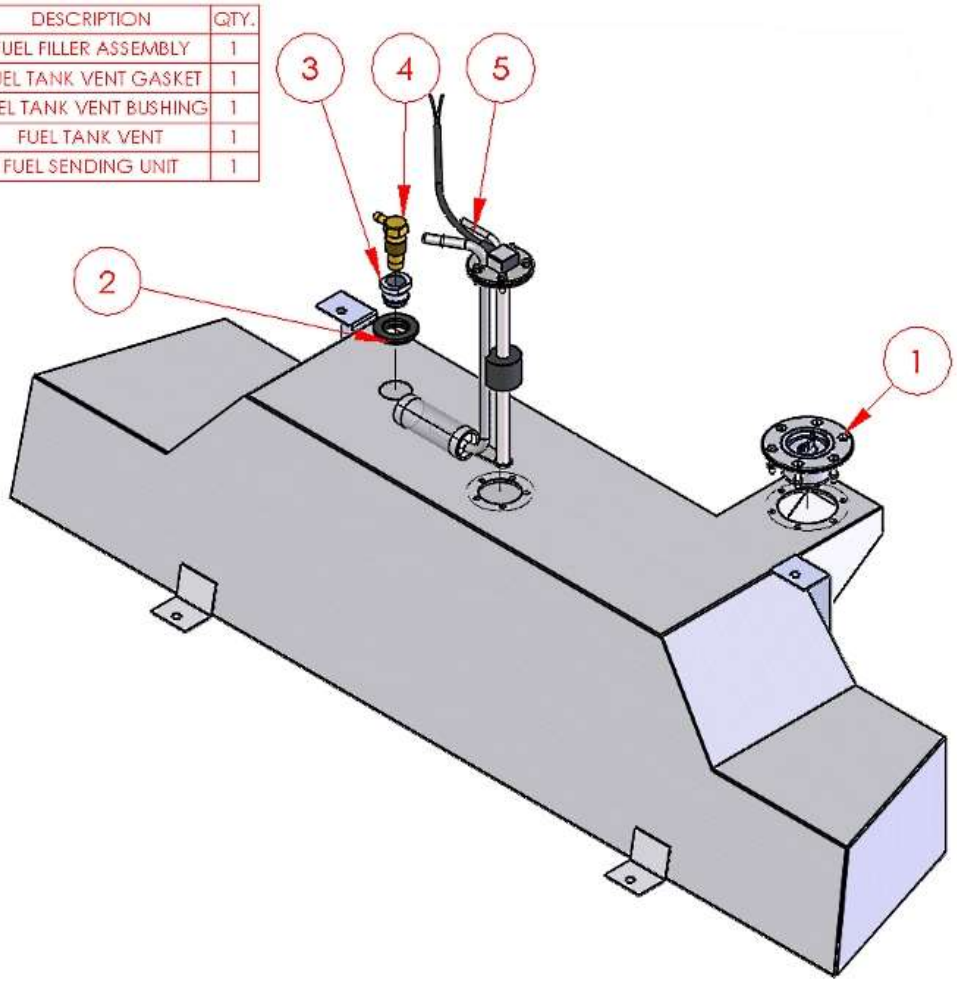
The fuel filter is installed near the battery behind the passenger seat. If necessary, slide the tank back a bit then drill and attach the filter to the frame with $^{3}/_{16}$" rivets.

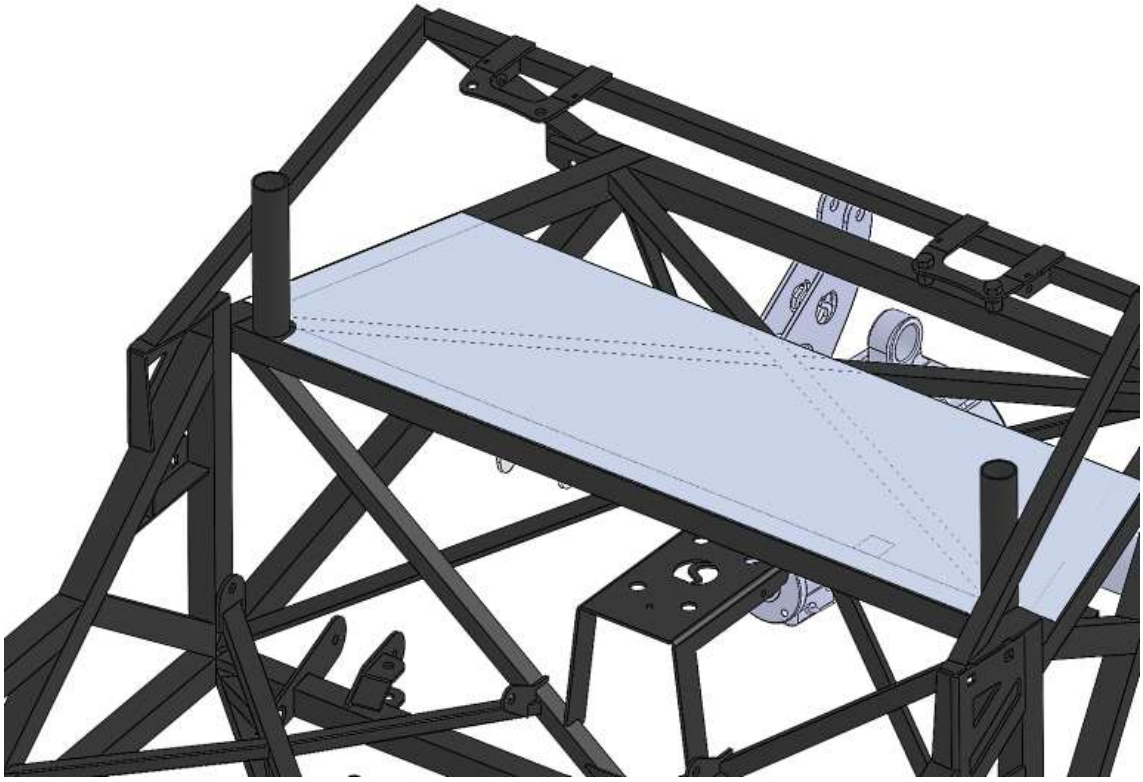
Fuel Tank

Fuel line components, Fuel tank components, Insulated clip hardware

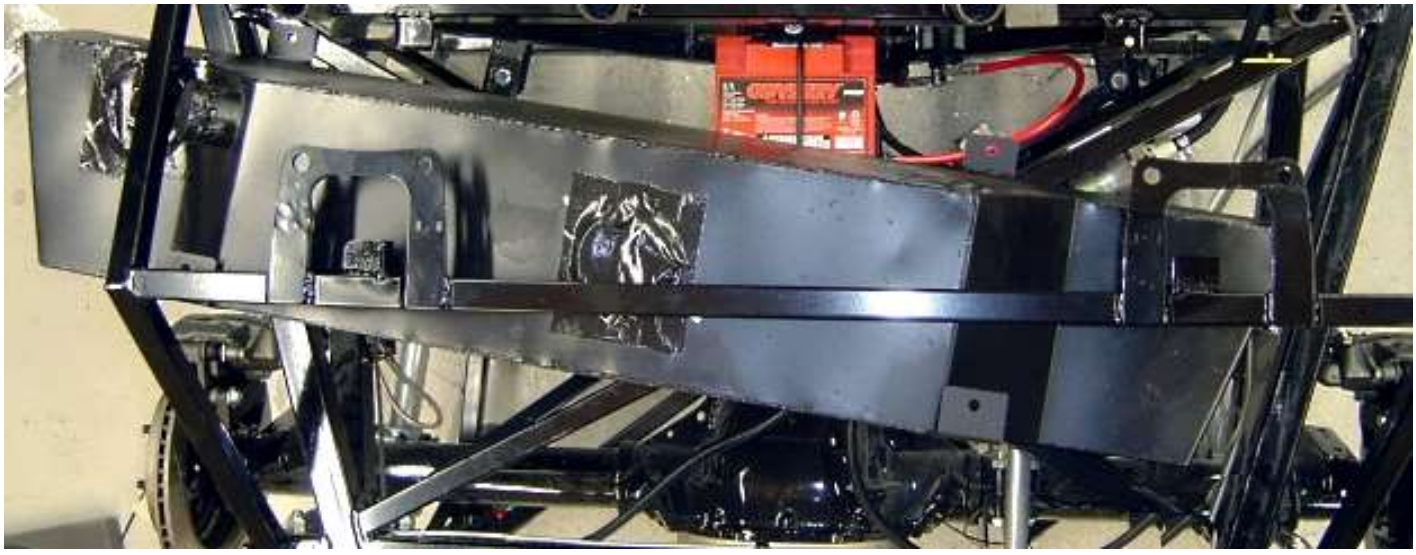
$^{9}/_{16}$" wrench, $^{5}/_{16}$" Hex key, $^{3}/_{8}$" drill bit, drill, rivet tool, silicone gun

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33913	FUEL FILLER ASSEMBLY	1
2	33973	FUEL TANK VENT GASKET	1
3	15205	FUEL TANK VENT BUSHING	1
4	15719	FUEL TANK VENT	1
5	34111	FUEL SENDING UNIT	1





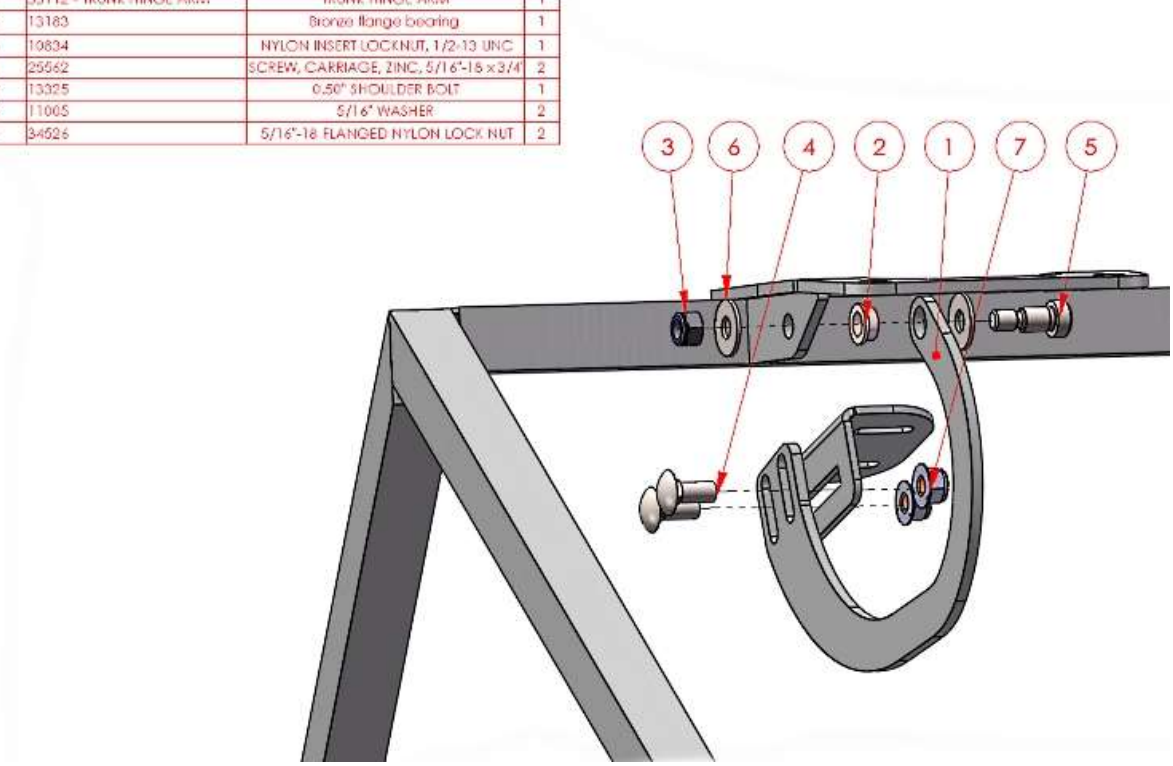
Install the front aluminum floor that goes under the front of the fuel tank.



Place the fuel tank onto the frame. The angled face of the tanks sits right behind the roll bars. When installing the tank move it past the side of the frame rails to load it into place as seen in the above picture.

Trunk hinge

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33112 - TRUNK HINGE ARM	TRUNK HINGE ARM	1
2	13183	Bronze flange bearing	1
3	10834	NYLON INSERT LOCKNUT, 1/2-13 UNC	1
4	25562	SCREW, CARRIAGE, ZINC, 5/16"-18 x 3/4"	2
5	13325	0.50" SHOULDER BOLT	1
6	11005	5/16" WASHER	2
7	34526	5/16"-18 FLANGED NYLON LOCK NUT	2



Right side trunk hinge.

Push the bronze bushings into the hinge arms on opposite sides.

Attach the hinge arm to the inside of the frame hinge mount using the $^{3}/_{8}$" x 0.50" shoulder bolts as shown above.

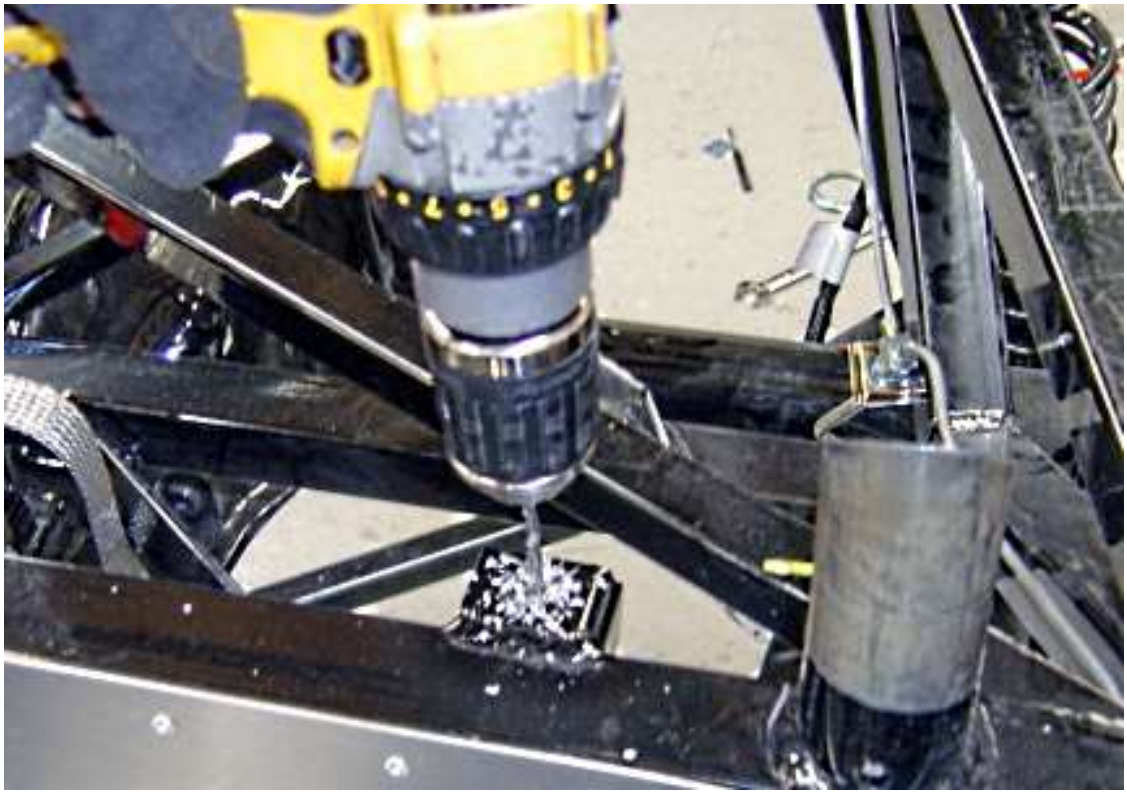
Use the carriage bolts and $^{5}/_{16}$" locknuts to bolt the mounting pads to the arms leaving them just snug so they can be moved without loosening the bolts.

Tank location

Position the tank in the frame so that is about even on both sides with the side 1.5" square frame rails. The tank should be slid all the way forward just before the front face of the tank comes into contact with the 1" down-tubes. Make sure the rear face of the tank is in front of the horizontal tube located above the tank (the trunk aluminum has to attach to this tube during a later step.

Move the hinge arms and make sure that they do not hit the angled sides of the tank. Shift the tank left to right if needed. If necessary, move the hinge arms to the outside of the brackets.

Using a marker mark the location on the frame where the (4) mounting locations.



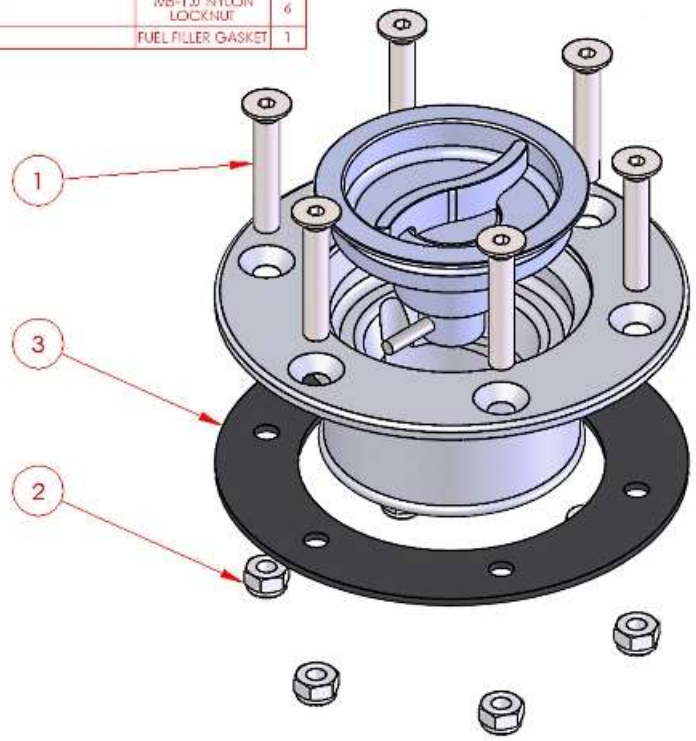
Drill the mount locations on the frame with a ⅜” drill bit.

Attach the tank to the lower locations using the ⅜” fasteners. Place the washers on the tank side of each of these mounting locations.

Fuel filler

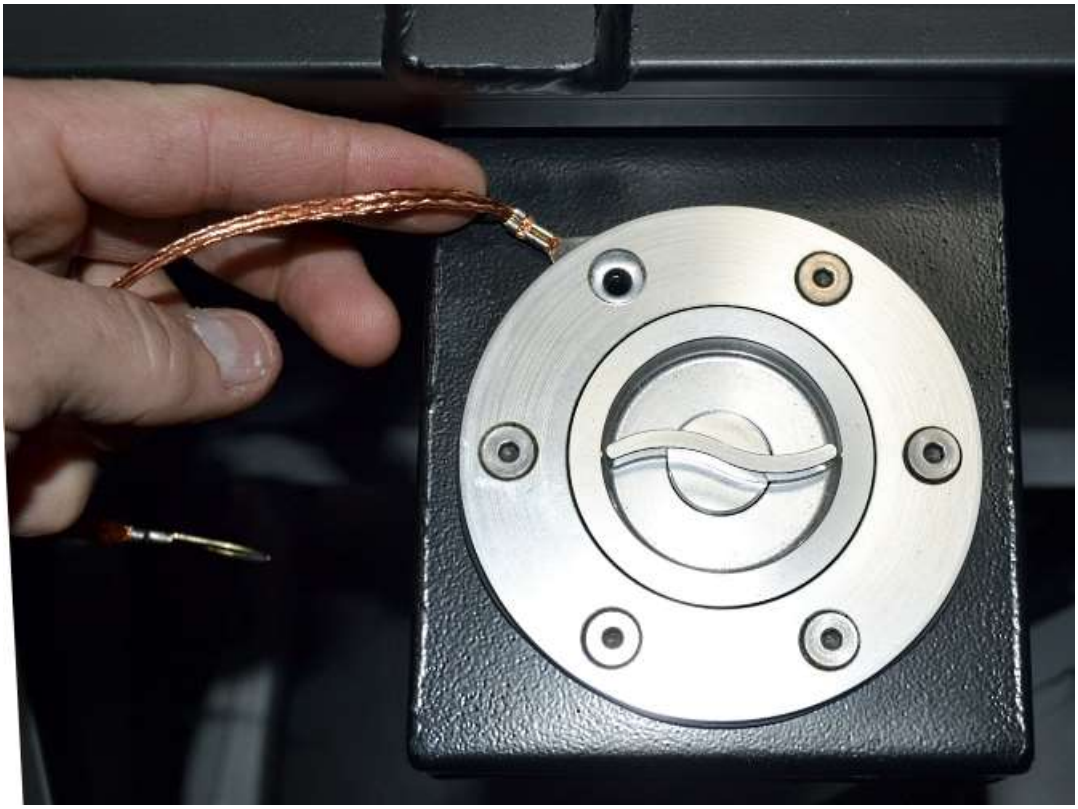
🛠 8mm deep socket, ratchet, 2.5mm hex key
🚘 Fuel filler assembly
✋ The locknuts are not used in this application

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B18.3.5M - 5 x 0.8 x 30 Socket FCHS - 30N		6
2	M5 NYLON LOCKNUT	M5-1.0 NYLON LOCKNUT	6
3	34143	FUEL FILLER GASKET	1

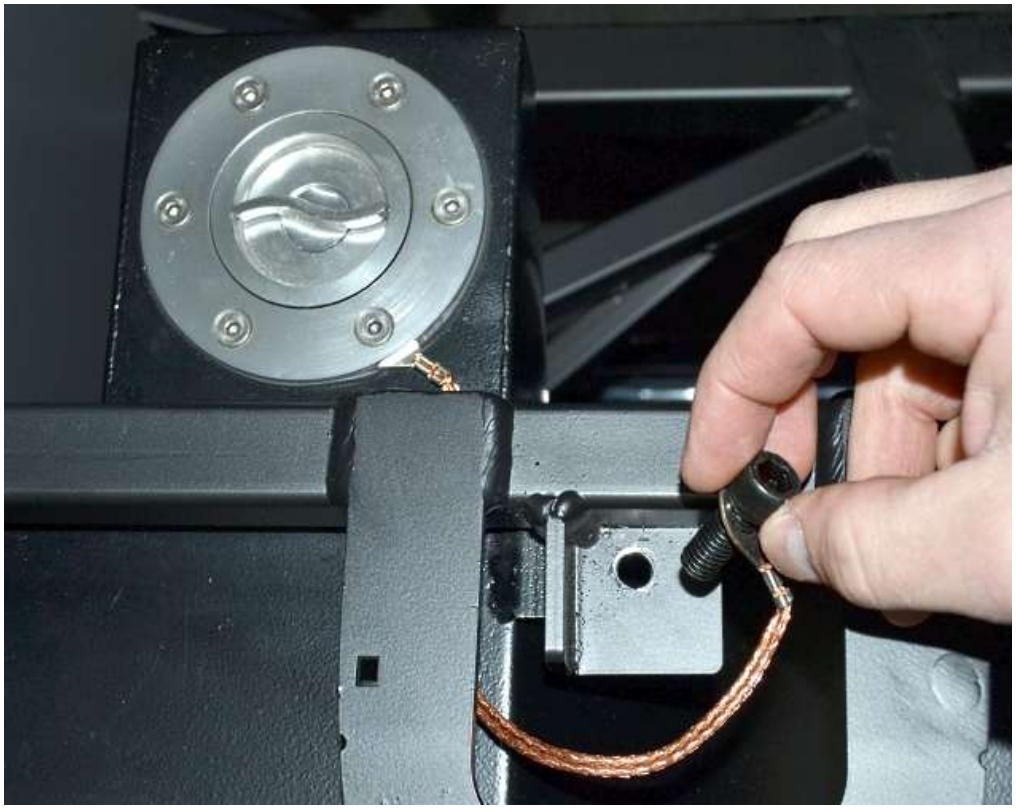


Put the gasket followed by the fuel filler cap onto the fuel tank.

✋ The ground strap is to prevent any static electric build-up in the filler which is important when filling the tank.



Put the ground strap on top of the gasket next to the aluminum filler cap so one of the screws closest to the tank will go through it.



Run the ground strap forward under the 1” tube to the left upper tank mount location.

Sand the area for the grounding strap.

Attach the tank to the frame using the ⅜” fasteners. Place the washers on the tank side of each of these mounting locations.

Fuel Tank Vent

🛠 ¼”, 5/16” sockets, ratchet, (2) 1” wrenches, Teflon tape, razor knife

Wrap the vent with Teflon tape

Screw the vent into the plastic bushing and tighten.

Insert the rubber grommet into the small hole in the top of the tank.

Push the vent into the grommet.

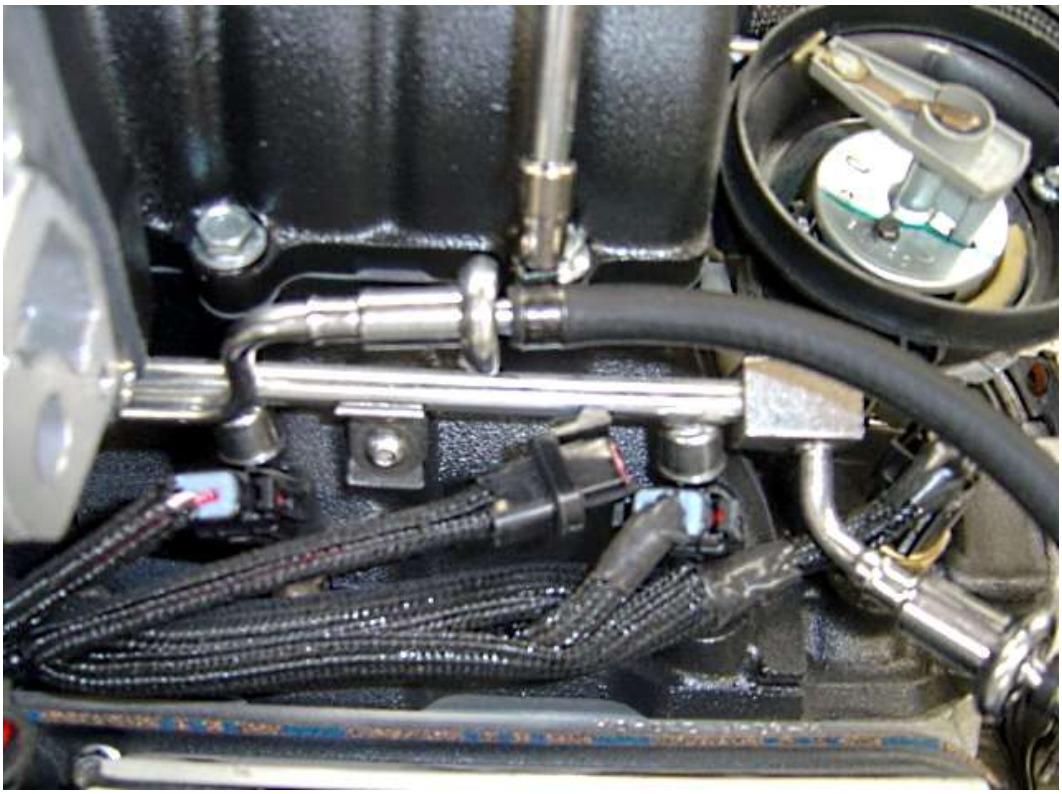
Attach a 25” section of $^{5}/_{16}$” fuel line and fuel line clamp to the vent and rotate the vent so that it points forward.

Run the vent hose down to the ¾” tube near the battery and attach it to the tube using a zip tie.

Fuel pressure regulator

Decide where you would like the fuel lines to end up in the engine bay along with where you are going to install your fuel pressure regulator if using a separate regulator. Usually this is on the right side of the firewall.

Mount fuel pressure regulator if you are using one.



Install the rubber fuel hose from the regulator to the engine. Make sure to clamp the line onto the barbs with the correct size hose clamps.

Fuel Lines

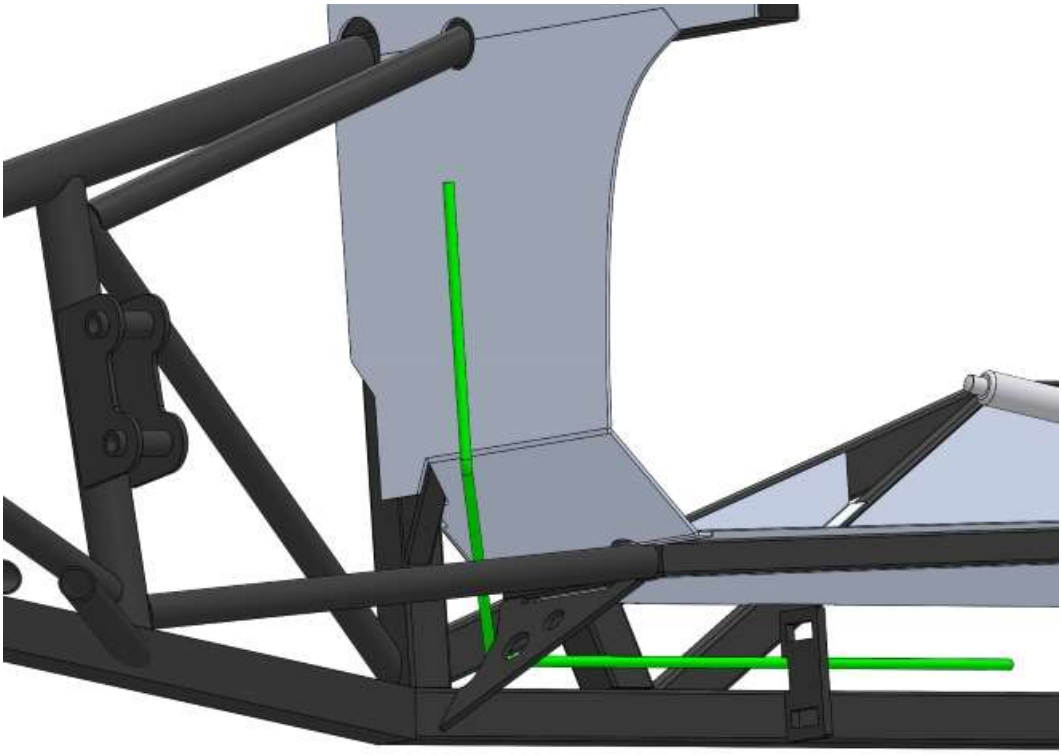
🛠 Tube bender, $^{3}/_{16}$" drill bit, drill, rivet tool, marker, tape measure, flat head screwdriver, razor knife.
🚘 Insulated clip hardware, Fuel line components, ¼", $^{5}/_{16}$" fuel lines.

- The 5/16” line is used for the feed and the ¼” is used for the return if needed.
- The fuel lines will run from the tank down the 1.50” square tube then along the right side of the frame on the inside of the 1.50” tube to the firewall and up.
- Run the first 5/16” line then the first ¼” line then go back and do the second 5/16” line.

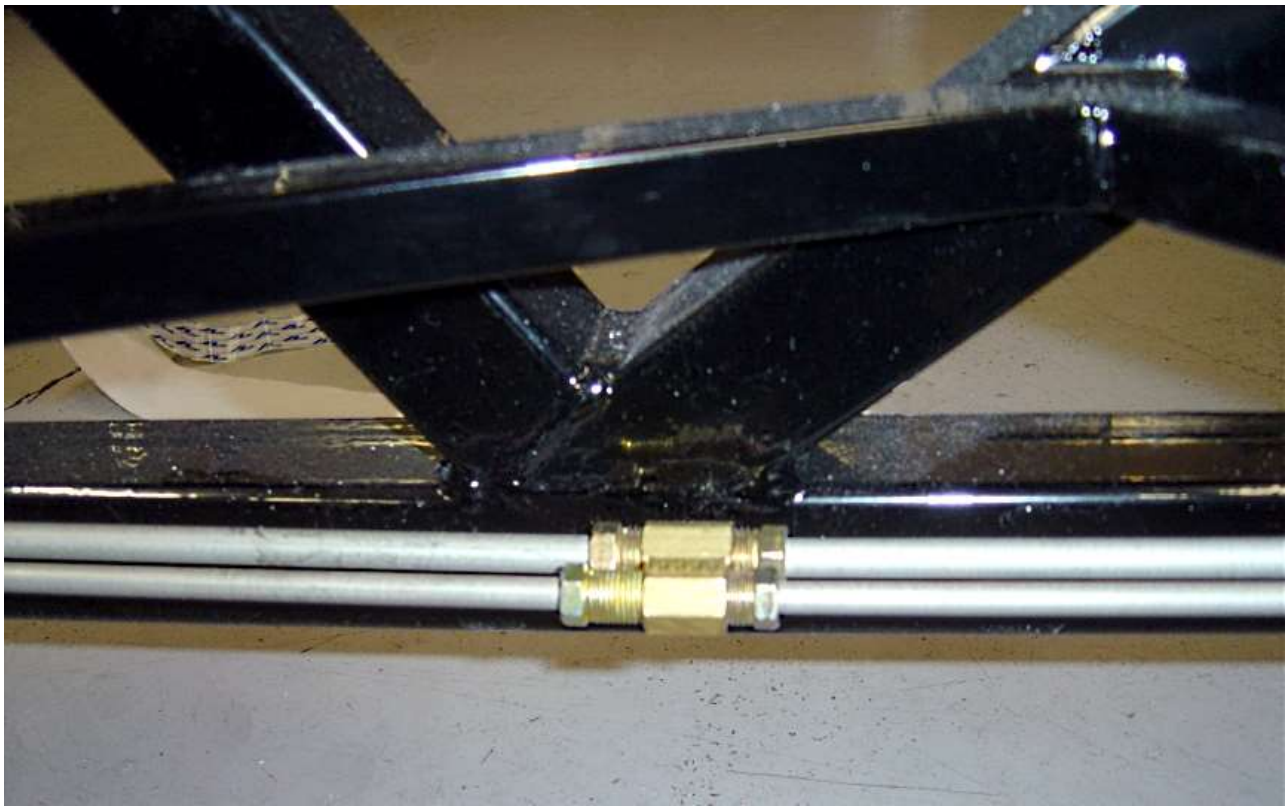
5/16" Fuel line

The larger fuel line is the feed for the engine. Install the 5/16" fuel line barb at the end of one of the 60" 5/16" lines.

Start the fuel lines at the front of the footbox 5"- 6" from the fuel pressure regulator and run the lines down the front of the footbox to the lower outside 1.50" square tube.



Run the line back along the top of the 1.50”



Use the ¼” and $^{5}/_{16}$” unions to connect another piece of 60" fuel line.

Push one of the quick connect fittings onto the “out” side of the fuel filter.

Position the end of the $^{5}/_{16}$" fuel line 2" from the fuel filter, far enough away that you can disconnect the fitting from the filter. Note the location of the vertical 1.50" square tube and bend the line so it will go down the back of the tube.

- Do not fasten the line to the frame yet.

Run the fuel line down the back of the 1.50” tube and then bend and snake it over the ¾” tube and under the top 1.50” tube.

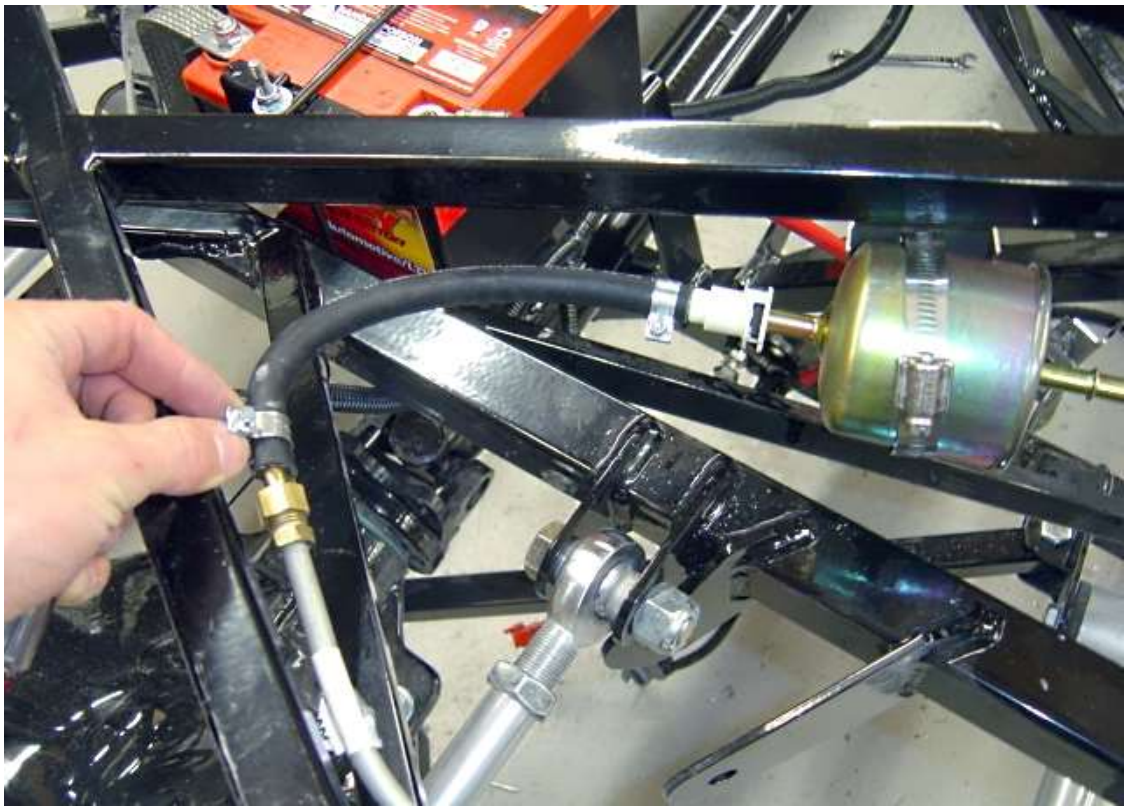
Run the fuel line down sharply to the lower inside of the side 1.50” tube. The lower the better (but above the bottom of the tube) to keep it away from the exhaust if you are going to run the side exit pipes. Position insulated line clamps to hold the fuel line every 12” or on each side of a bend.

- Use either the small insulated clamps for each of the lines (hard on the 5/16" size) or put both lines in a single 5/8" clamp.

Use the clamp hole as a guide and drill 3/16" rivet holes then place the rivet in the hole to hold it in place but do not pull the rivets with the rivet tool yet.

Measure and cut a 3" section of the rubber 5/16" fuel hose to connect the fuel filter to the 5/16" hard line.

Connect the rubber fuel line to the quick connect fitting using one of the fuel injection hose clamps.



Connect the other end of this rubber line to the barb on the 5/16" hard line.

- If you are not running a return line, skip the next part and continue with the 5/16" line.

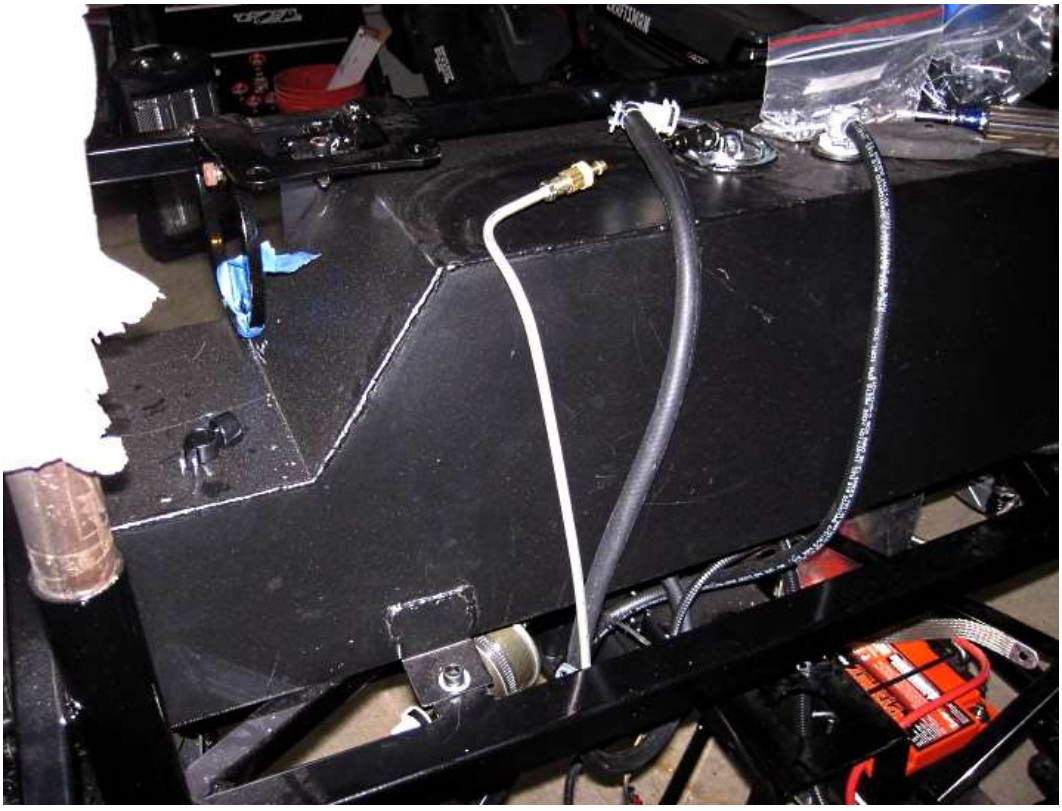
Attach the lines to the correct ports of the fuel pressure regulator or to the lines on the engine depending on your fuel system.

¼” Fuel line

Attach a barb on one end of one of the ¼” fuel lines.

Remove the plastic locking clip from one of the ¼” quick connect fittings and push it onto the return of the fuel pick-up.

With the tank positioned correctly, position the end of the ¼” line 2” away from the barb in line with the pick-up and bend it so it will go down the front side of the tank.



Run the ¼” line down to the backside of the 1.50” horizontal tube and across to the right side of the frame.

Run the ¼” line next to the $^{5}/_{16}$” line down the 1.50” tube to the side 1.50” tube.

Use small insulated line clips on the ¼” line or put the line in the larger line clip then pull the rivets holding the line clips to the frame using the rivet tool.

It is helpful to slightly flatten them with a pair of pliers to conform to the shape of the lines being next to each other.

Remove the plastic barb from the tank return and the ¼” barb off the fuel line.

Attach a 3” piece of the ¼” rubber fuel line to the two barbs using the fuel injection hose clamps.

Attach the fuel line to the tank and the ¼” hard fuel line.

Exhaust

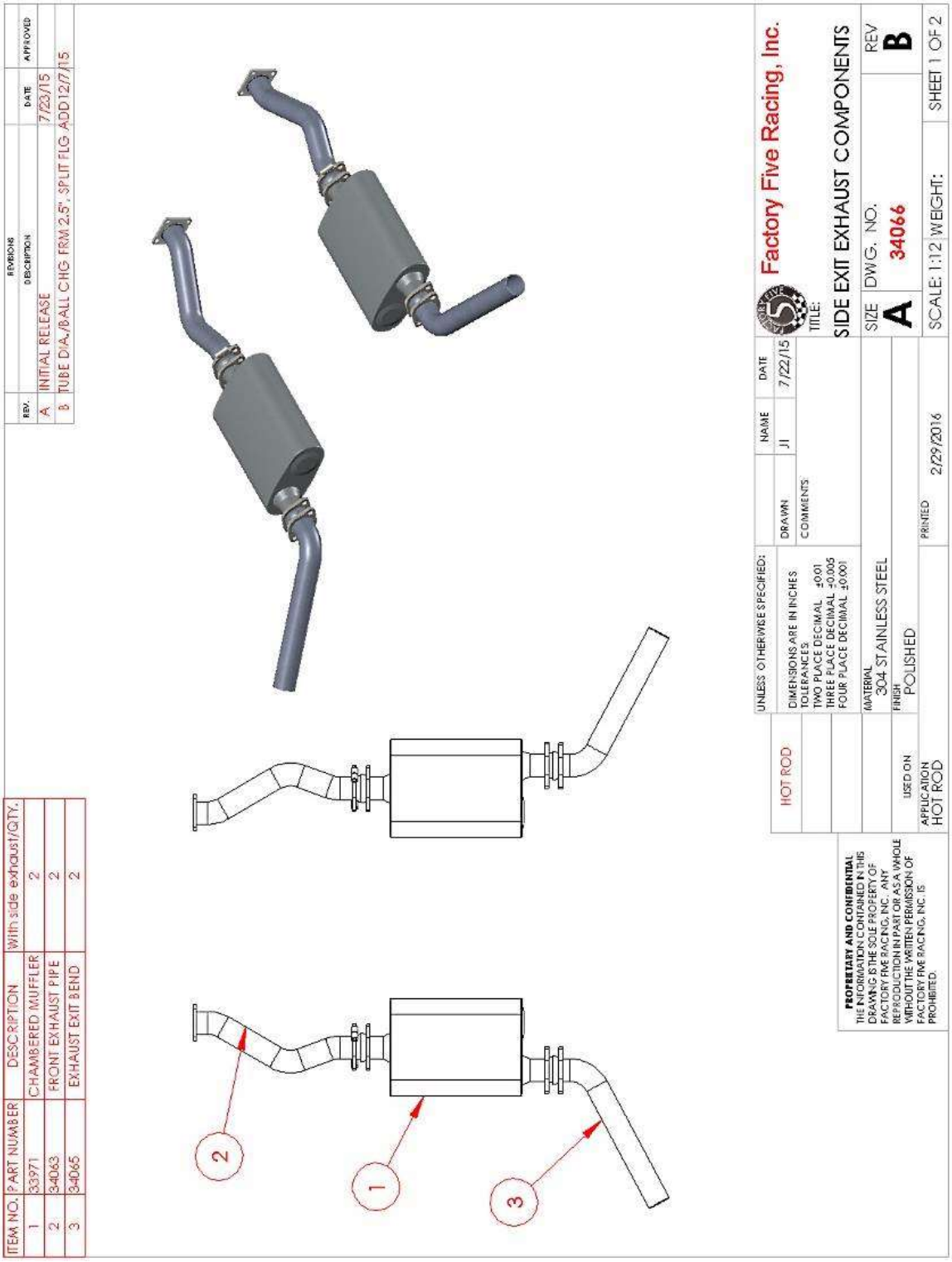
- The exhaust has been designed and built with ball flanges to allow for the most adjustment. Some of the pictures show the older non-ball flange pieces.

- The stock exhaust is designed to exit through the body in front of the rear wheels using the aluminum with the cutout. The end of the pipe can be cut to the angle desired.

- The optional rear exit exhaust runs the exhaust back under the tail lights.

Shorty pipes and mufflers

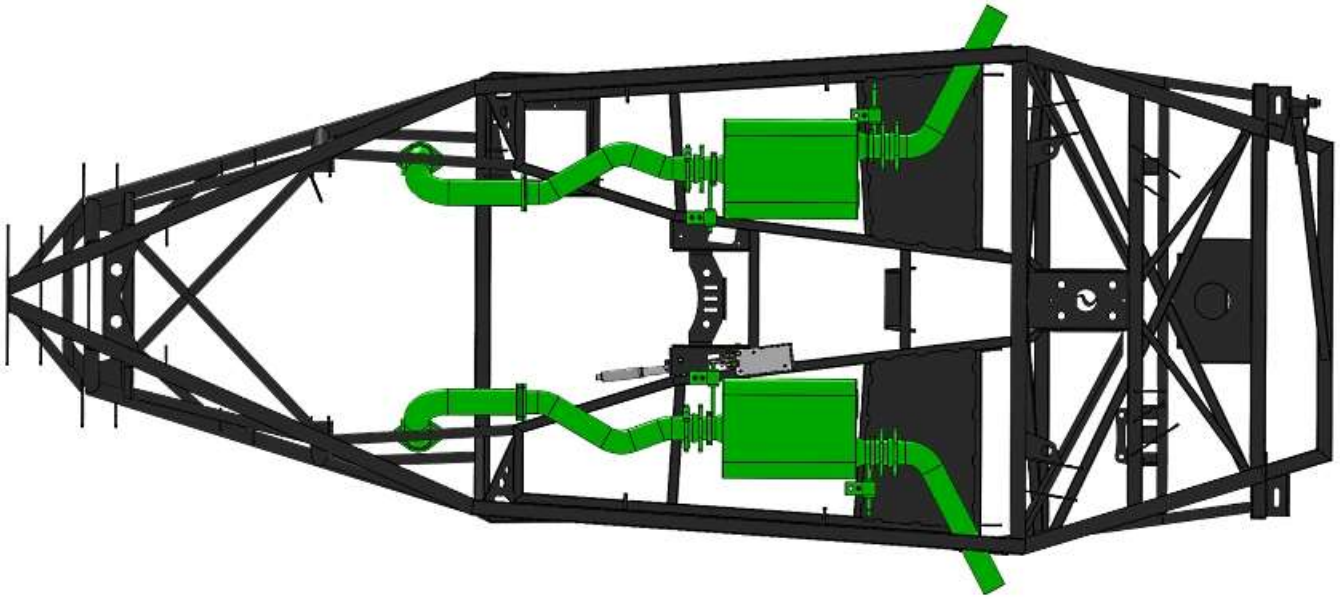
- If doing the rear exit exhaust use this section for the muffler and forward exhaust pipes only.



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	7/23/15	
B	TUBE DIA./BALL CHG FRM 2.5", SPLIT FLG ADD	12/7/15	

Attach the shorty pipe to the shorty header coming off of the engine. Do not fully tighten this ball and socket joint yet.

Attach the front exhaust pipe assembly to the shorty pipe with the supplied $^{3}/_{8}$" hardware. Make sure to install the supplied gasket (FFR# 33369) between the two square flanges.



Loosely install the exhaust clamp and mount onto the muffler. The inlet to the muffler is in the center and outlet is offset to the outside of the car. The nuts on the exhaust clamps are oriented downwards with the u-bolt at the top. Place the front exhaust mount towards the center of the car and the rear one towards the outside of the car so that the mounts can attach to the small tubes.

Clamp the exhaust mounts to the frame to hold the assembly in place.

Attach the tip section of the tail pipe to the muffler.

Once you are happy with the placement of all the exhaust components, tighten all of the fasteners holding the exhaust in place.

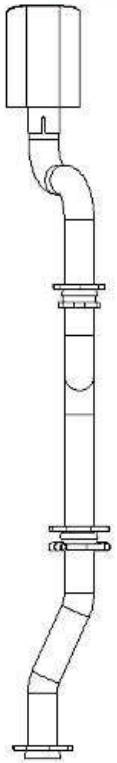
Check all of the connections including the ball and socket joint for sealing and clearance. If the shorty pipe is angled so that the socket joint hits the header flange, remove material from the edge of the pressed socket.

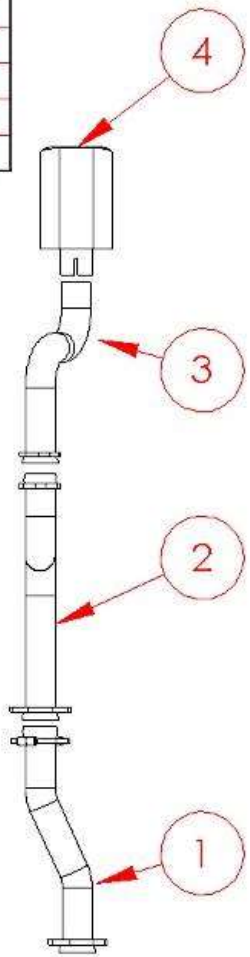
Rear exit exhaust

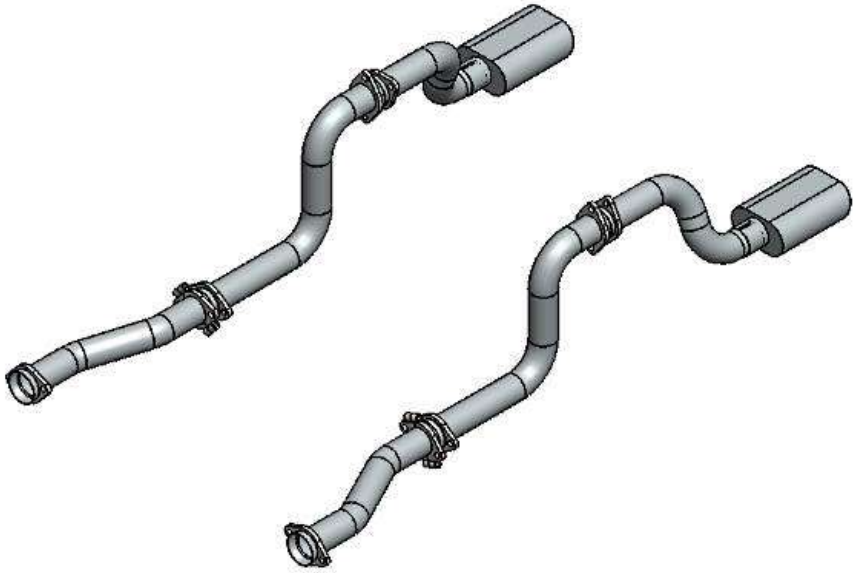
- ½", 9/16" socket, Ratchet, Drill, 5/16" drill bit, 3/16" hex key, (2) clamps, Marker, hack saw or razor knife
- This exhaust is designed to mount the exhaust tips below the tail lights so the top of the tips are 1.50" below the aluminum trunk floor.

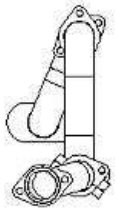
ITEM NO.	PART NUMBER	DESCRIPTION	Default /QTY.
1	34068	FRONT REAR EXIT EXHAUST TUBE	2
2	34069	MIDDLE REAR EXIT EXHAUST TUBE	2
3	34070	BACK REAR EXIT EXHAUST TUBE	2
4	34071	EXHAUST TIP	2

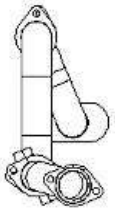
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	7/23/15	
B	TUBE DIA./BALL CHG FRM 2.5", SPLIT FLG ADD	12/7/15	

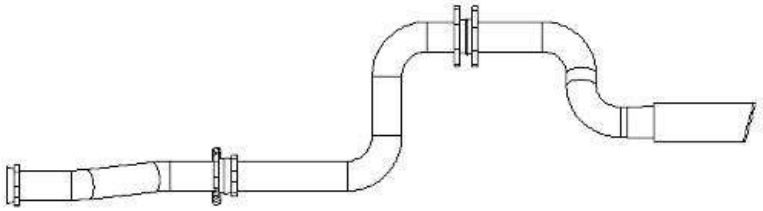












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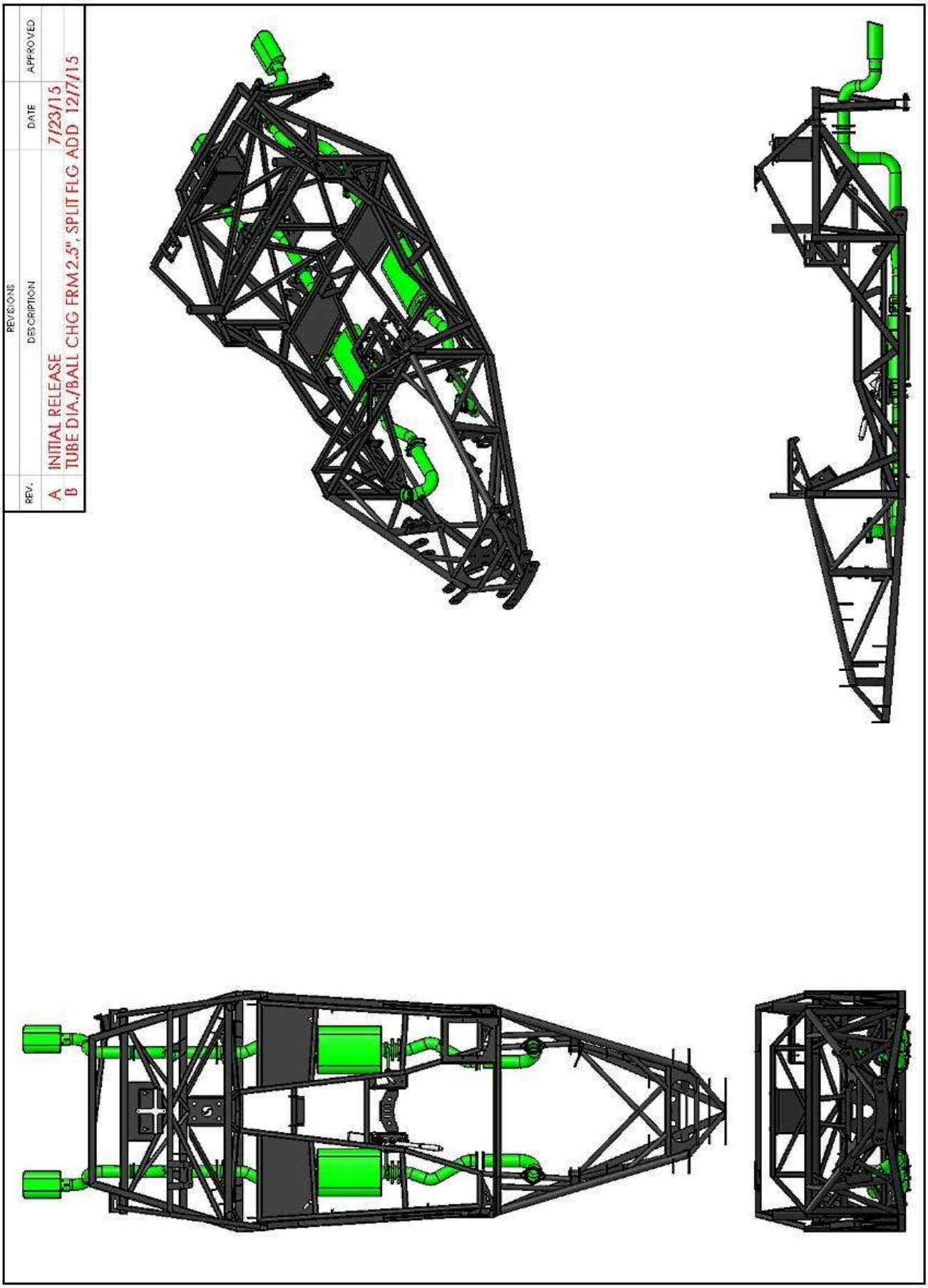
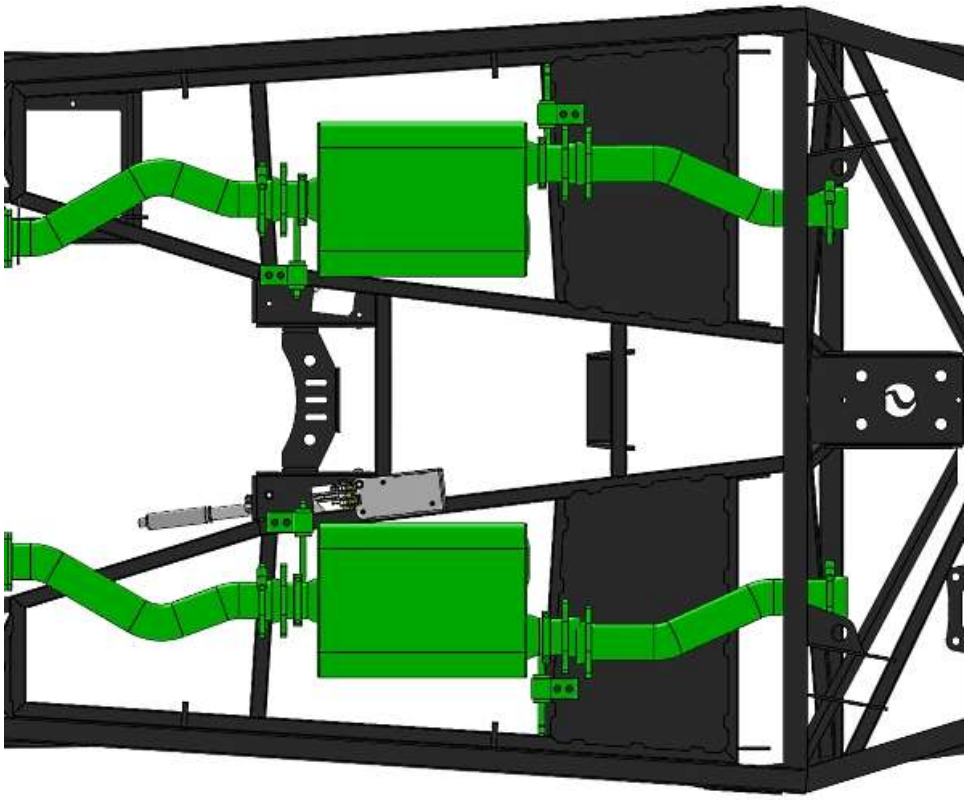


Attach the engine shorty pipes and mufflers.



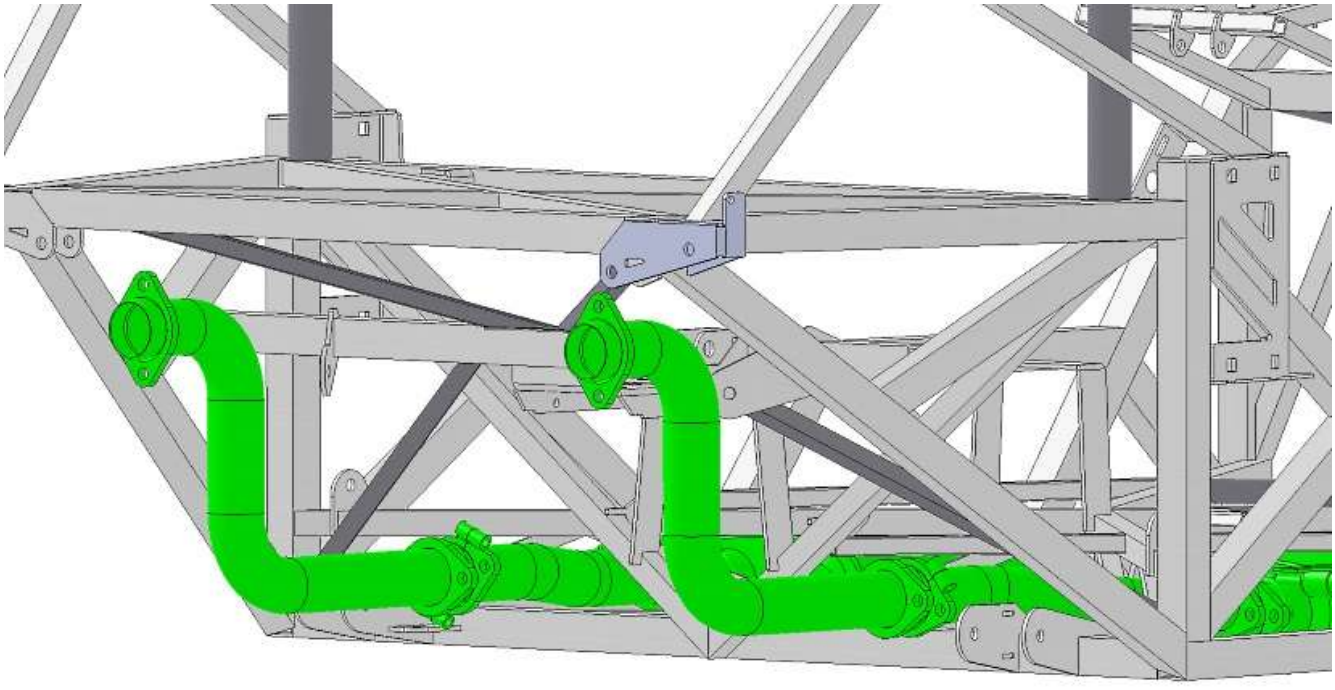
Insert the front rear exit tube from the muffler side.

Bolt one of the ball flanges together around the front pipe ball.
Attach the front tubes of the rear exit exhaust to the mufflers but do not tighten the clamp on the tube.

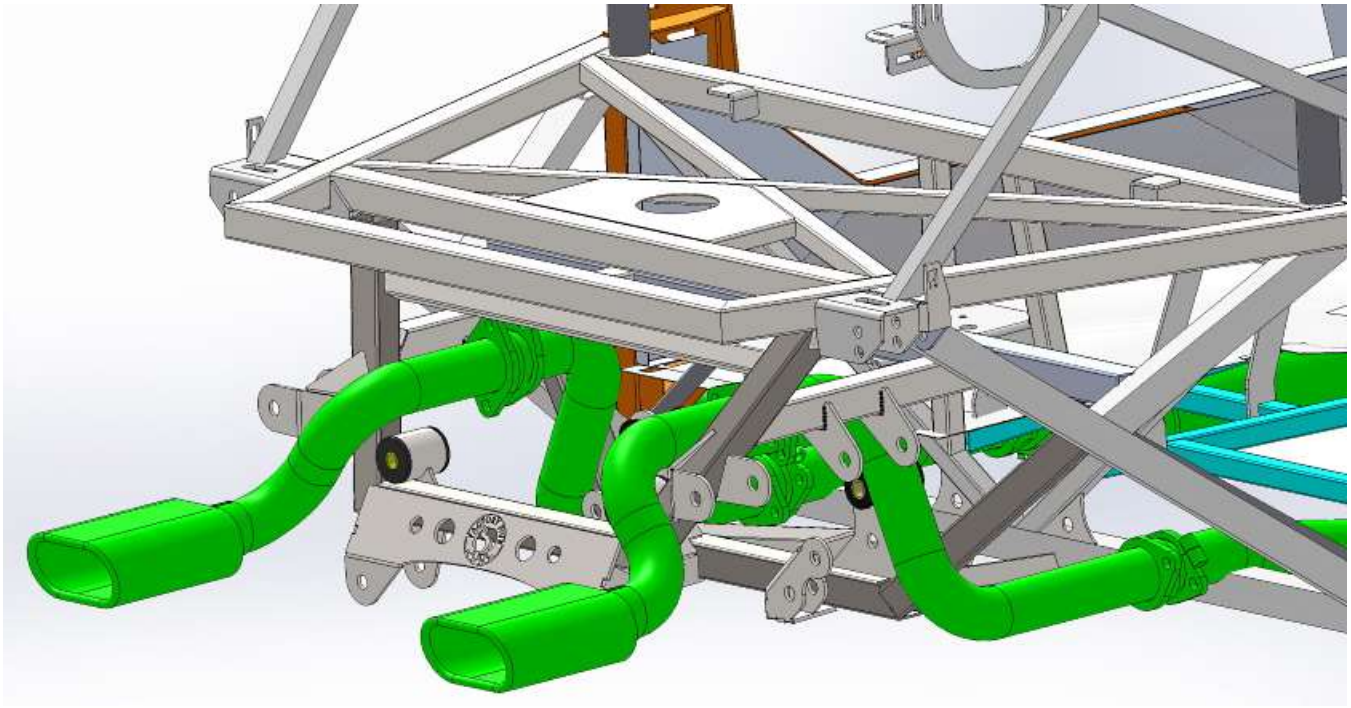
Slide one of the clamps onto the rear tube up near the top of the bend.

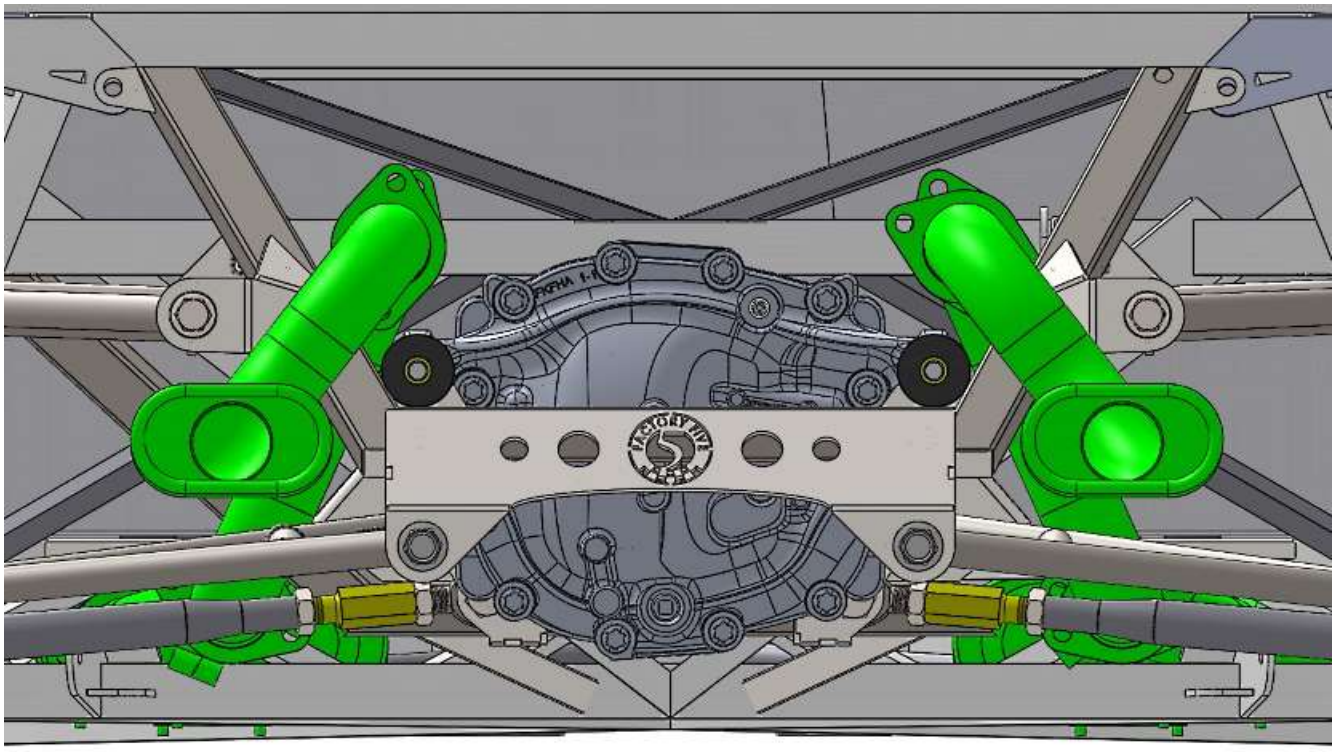
Cut the rubber hanger just below the second hole otherwise it will hit the trunk floor using either a razor or hack saw.

Slip one of the hangers under the clamp and hand tighten the clamp so that it can be easily adjusted later



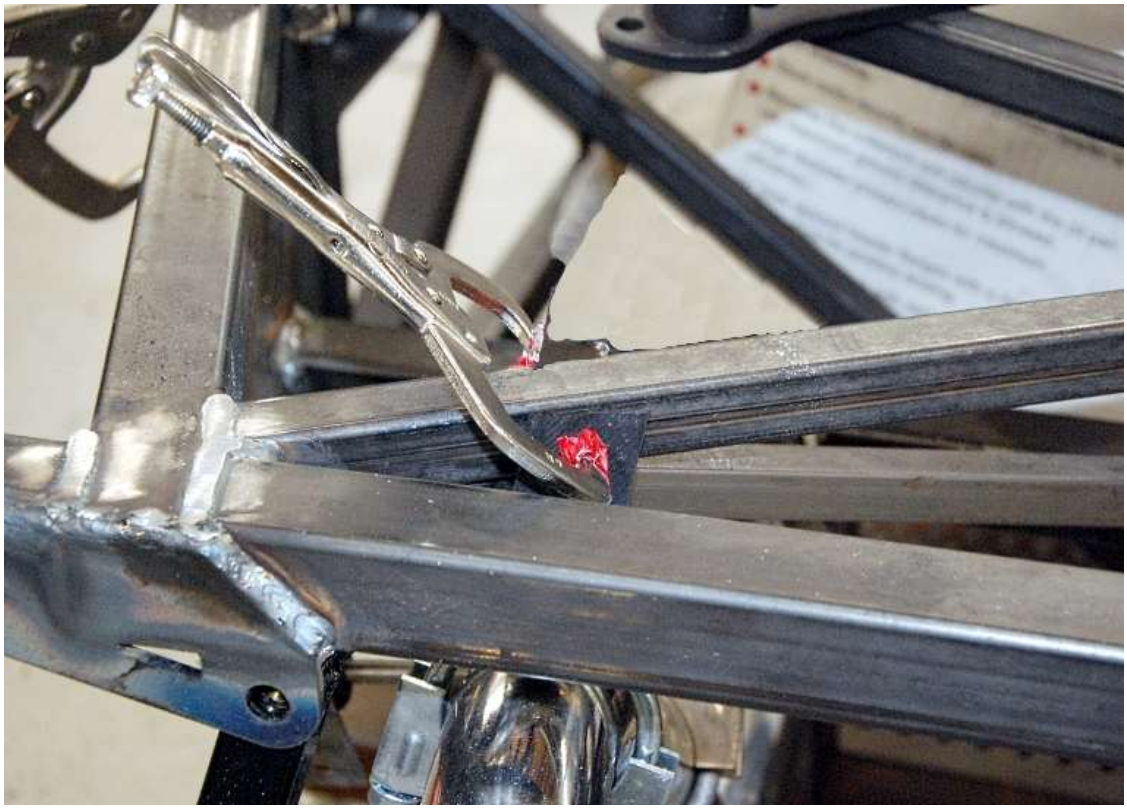
Attach the rear tubes to the front tubes.





If running an IRS, locate the rear top part of tube on the inside of the upper control arm mount next to the center section.

- The remainder of the installation must be done after the body is mounted if not already on.
- The following pictures are shown on a chassis for better pictures and understanding of location.



Clamp the hangers so that the lowest hole is on the back side of the tube shown in the pictures above.

- The tips are sent with a rolled lip on the end. If you want, you can cut this lip off for a different look.

Stock

Cut tip

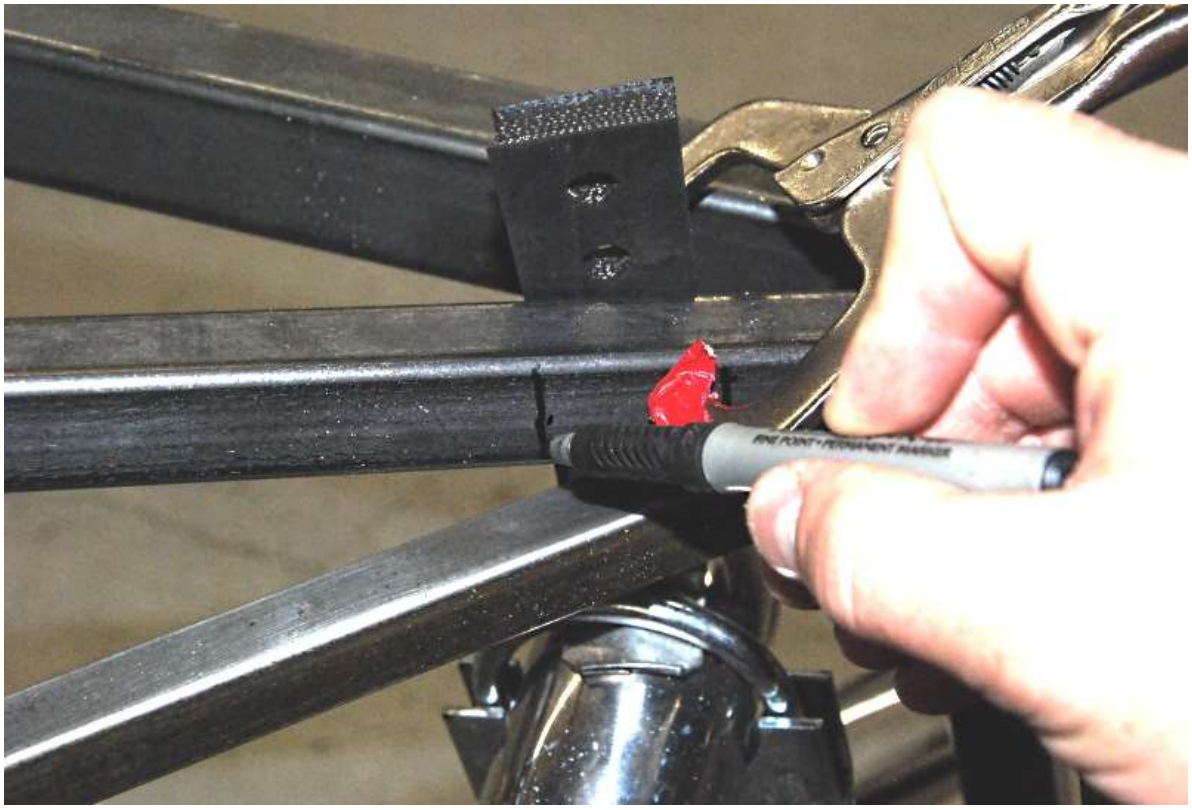
Attach the exhaust tips and locate them so that they are below the tail lights. Move the rubber hanger if necessary.

Adjust the exhaust so that it does not hit/sit any frame member or the back of the body.

- Use the tube bend over the axle as a lever to rotate the front tube to level the tips out.
- Raise or lower the rubber hanger as needed or push the rear tube onto the front tube more or less to get the correct height.

- Rotate the rear tube to change the angle of the tip slightly or straighten the tip when looked down on from above.

Tighten the front tube to muffler clamp nuts using a $^{9}/_{16}$" wrench.



On the front side of the tube, mark the side locations of the rubber.

Remove the clamp and rubber hanger.

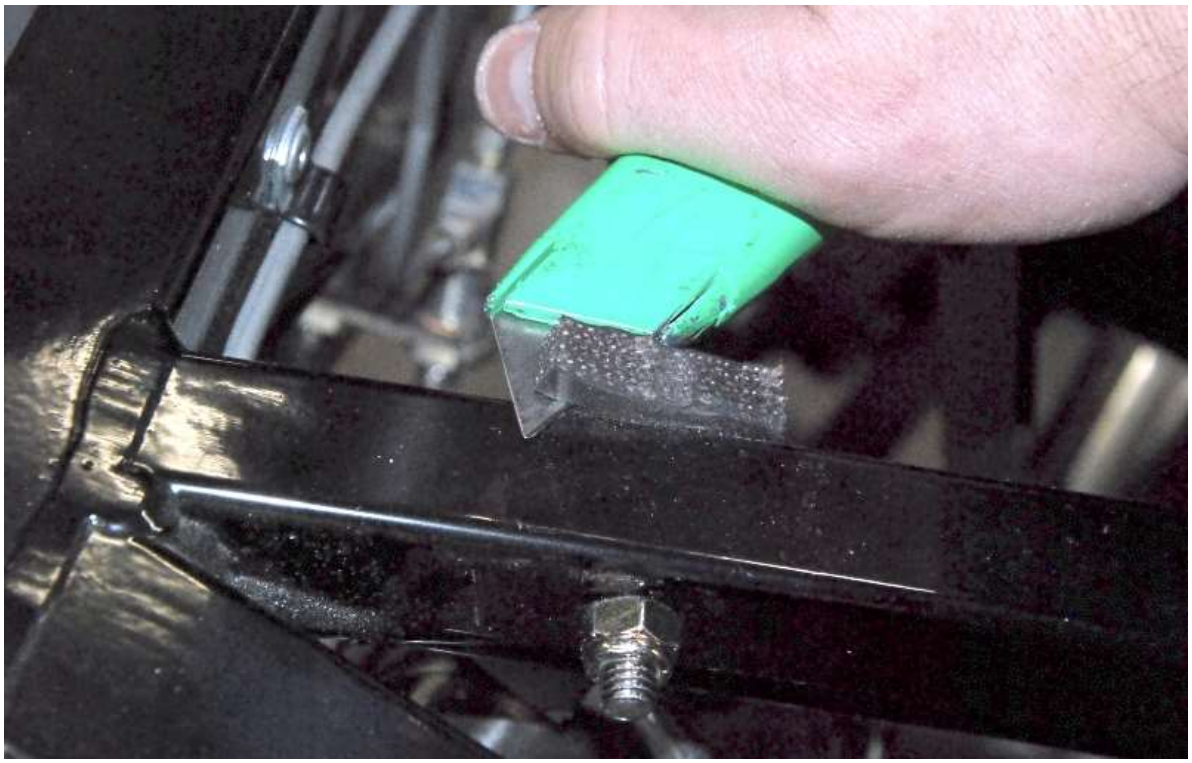
Drill the 1” tube in the middle of the tube in the middle between the rubber side marks made with a $^{3}/_{16}$” drill bit.

Open the $^{3}/_{16}$” hole up with a $^{5}/_{16}$” bit.

Rotate the rubber hanger and attach it to the tube using the included $^{5}/_{16}$” bolt and washers.

Double check the tips.

Tighten the rubber hanger clamp nuts using a $^{9}/_{16}$" wrench.



Cut any rubber that sticks up past the top of the frame tubes.

Floors

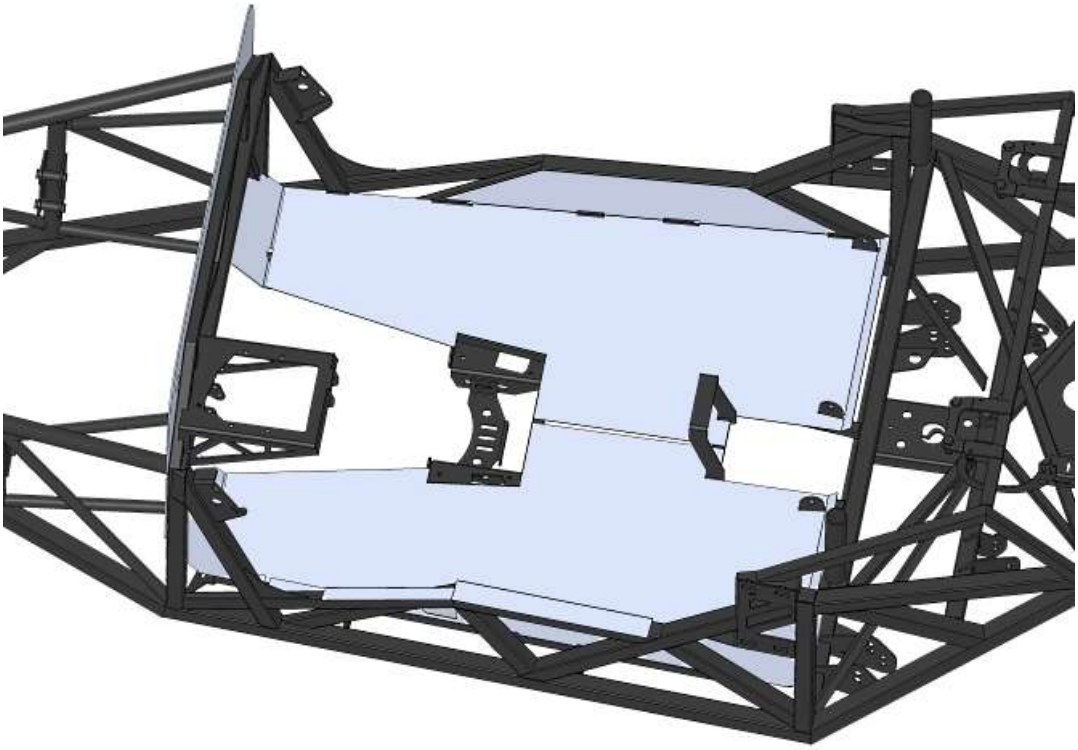
🛠 Drill, ⅛" drill bit, rivet tool, silicone gun, (4) 10oz. tubes 3M Marine 5200 Adhesive/Sealant

🚗 Packaged aluminum, Mounted aluminum, Secondary chassis components, foam core inserts

✋ The Foam core with aluminum bonded to it is extremely strong when used with the correct adhesive. The Factory Five chassis is designed to use 3M Marine 5200 Adhesive/Sealant. Do not use silicone, it is too flexible.

Test fit all of the foam panels in the cockpit floor and use a marker to mark the location of the foam part.

Remove the foam from the floor areas.



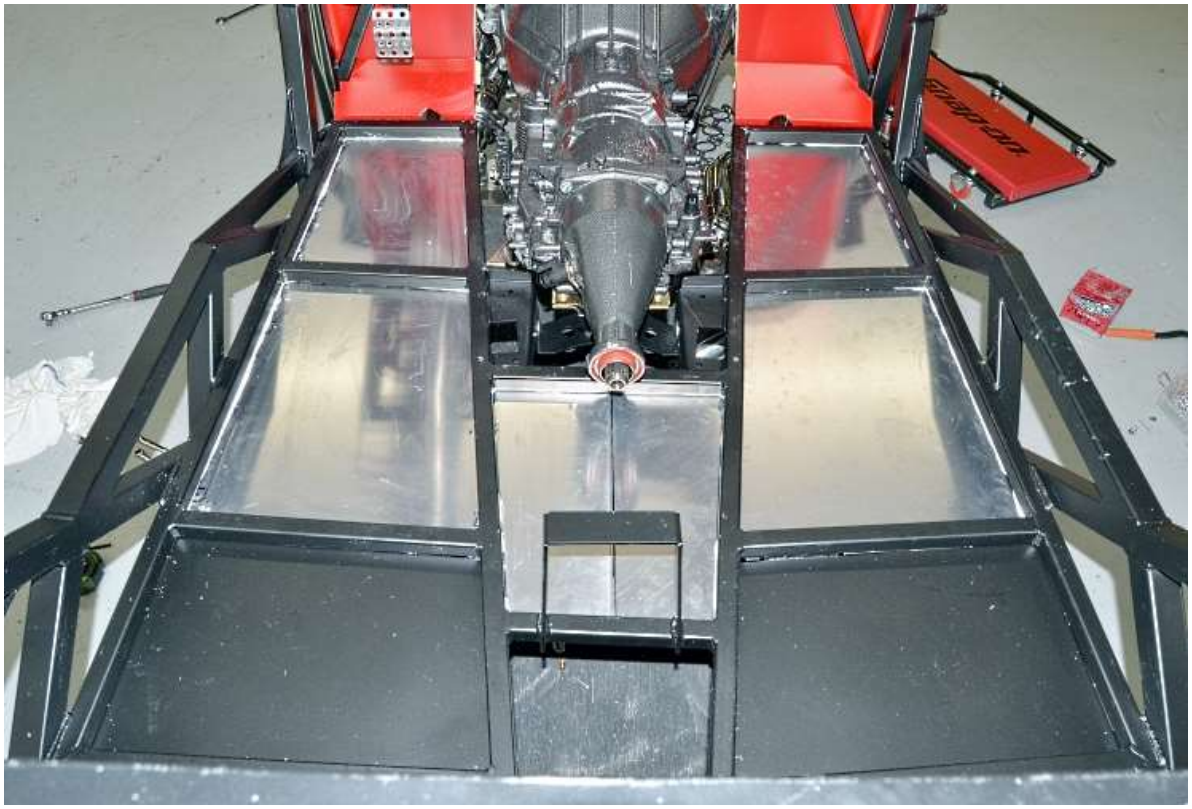
If not already marked, place the floor top panels onto the frame and trace the frame tubes from the underside then remove.

Clamp the flat under-floor aluminum panels to the bottom of the frame and trace around the tubes from the top.

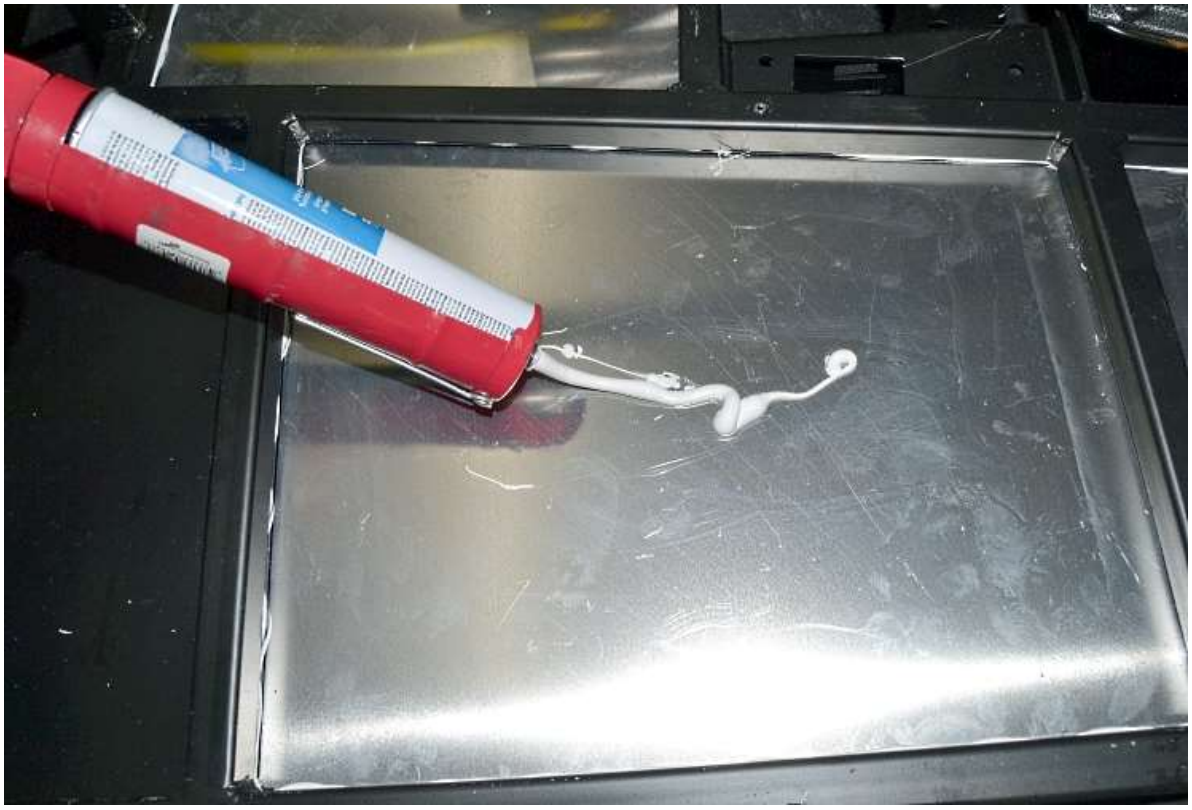
Remove the under-floor panels.

Mark and drill the top and bottom aluminum panels for 1/8" rivets using a 3" hole spacing.

Using the 3M 5200 sealant, cut the tip at an angle and run the sealant on the bottom of the frame where the aluminum will touch.

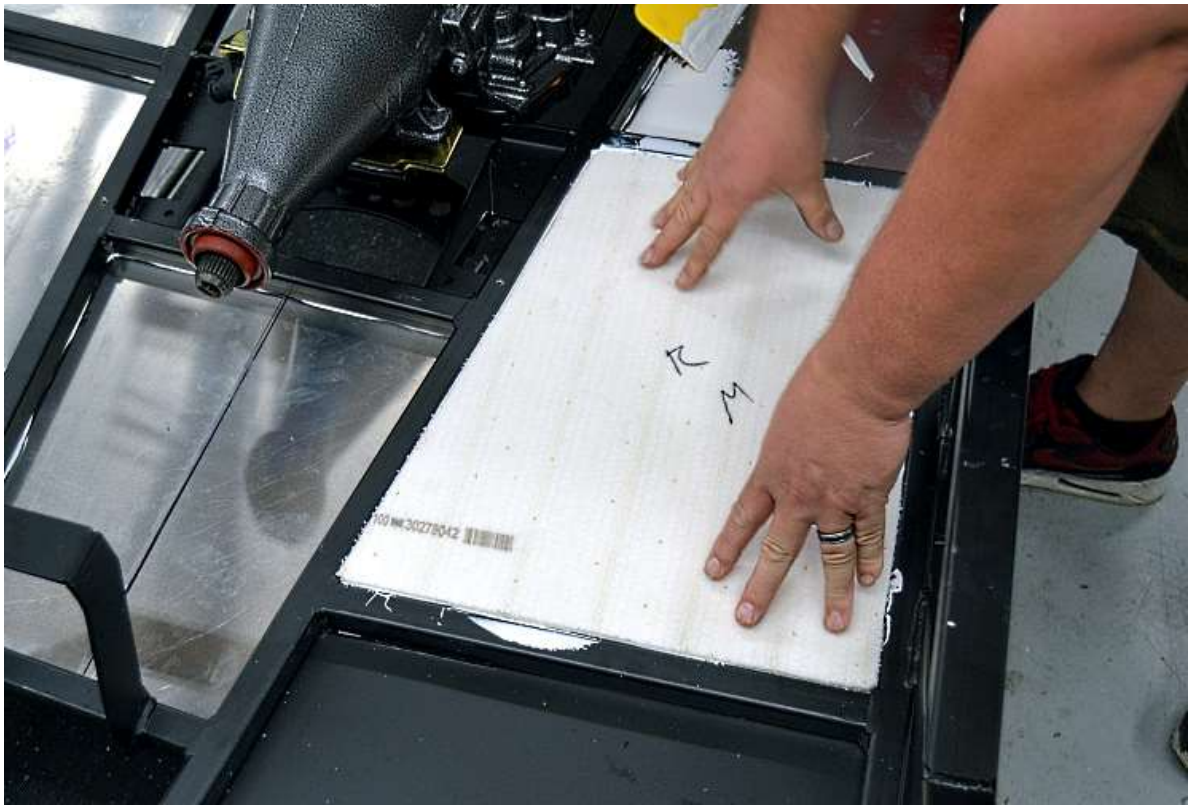


Clamp the under-floor aluminum panels to the bottom of the frame then drill and rivet the panels to the frame using 1/8" long rivets.



Remove the plastic tip of the sealant and apply to all of the aluminum and inside steel surfaces one area at a time.

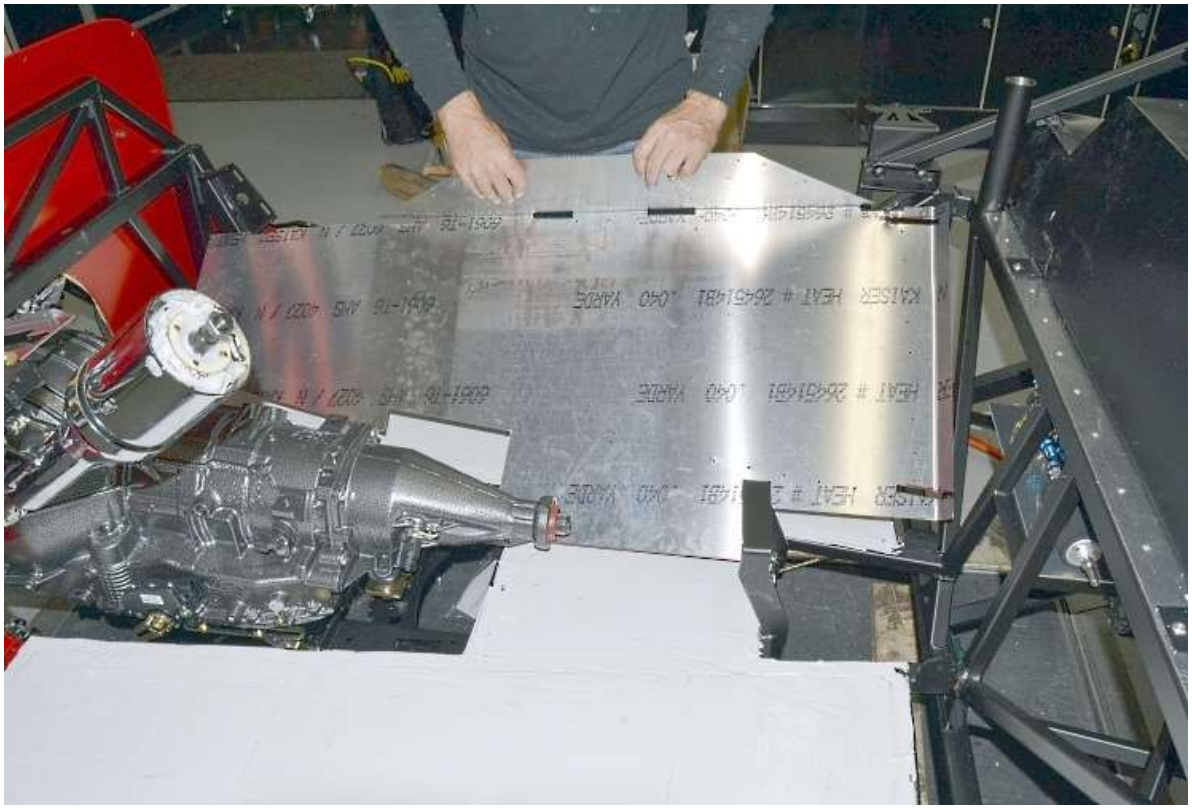
Spread the sealant so that there is a consistent coating everywhere.



Push the correct foam piece into the frame opening until the top is flush with the top of the 1” tubes.

Repeat this procedure for all of the openings.

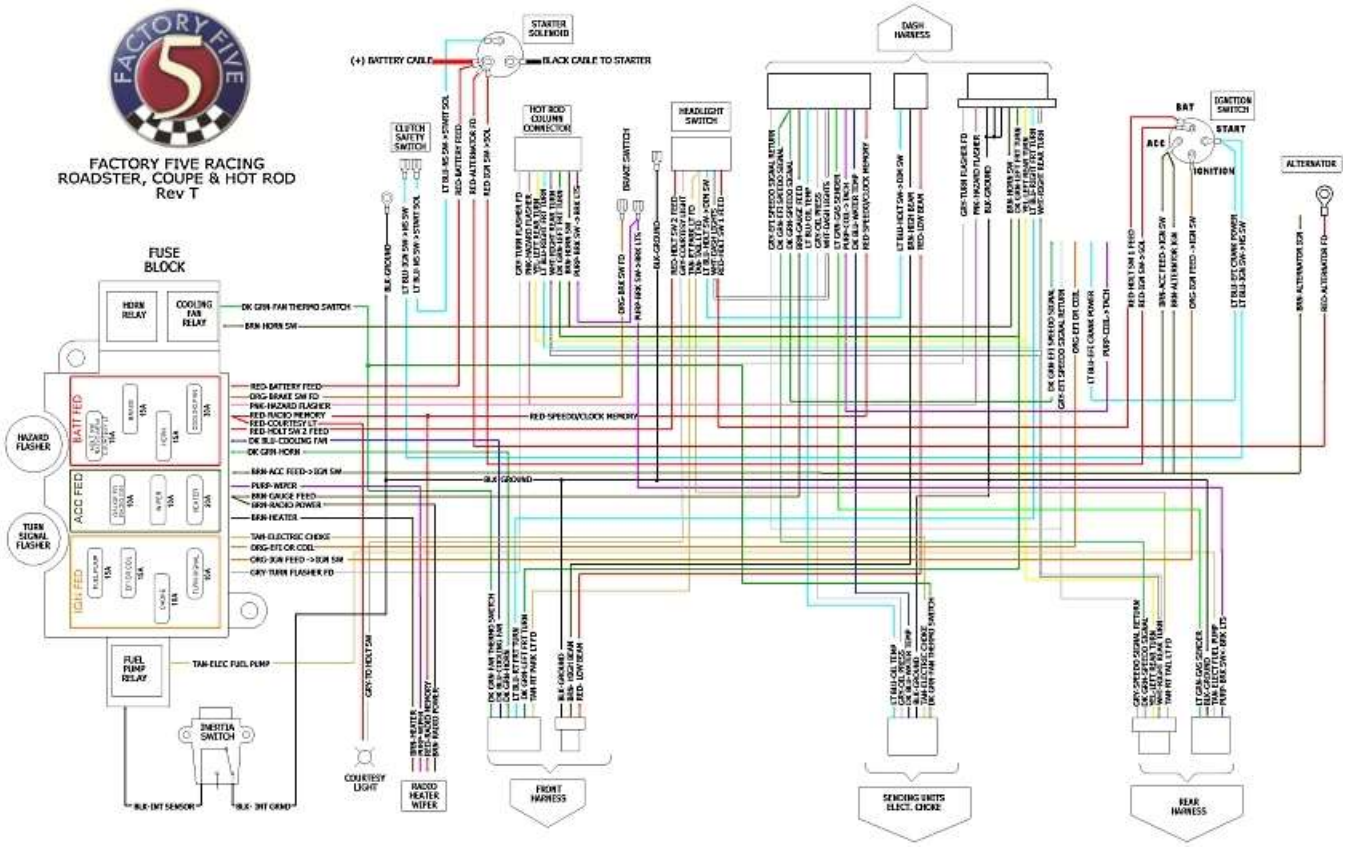
Spread the sealant over the top of the foam and 1” frame tubes where the aluminum will touch.



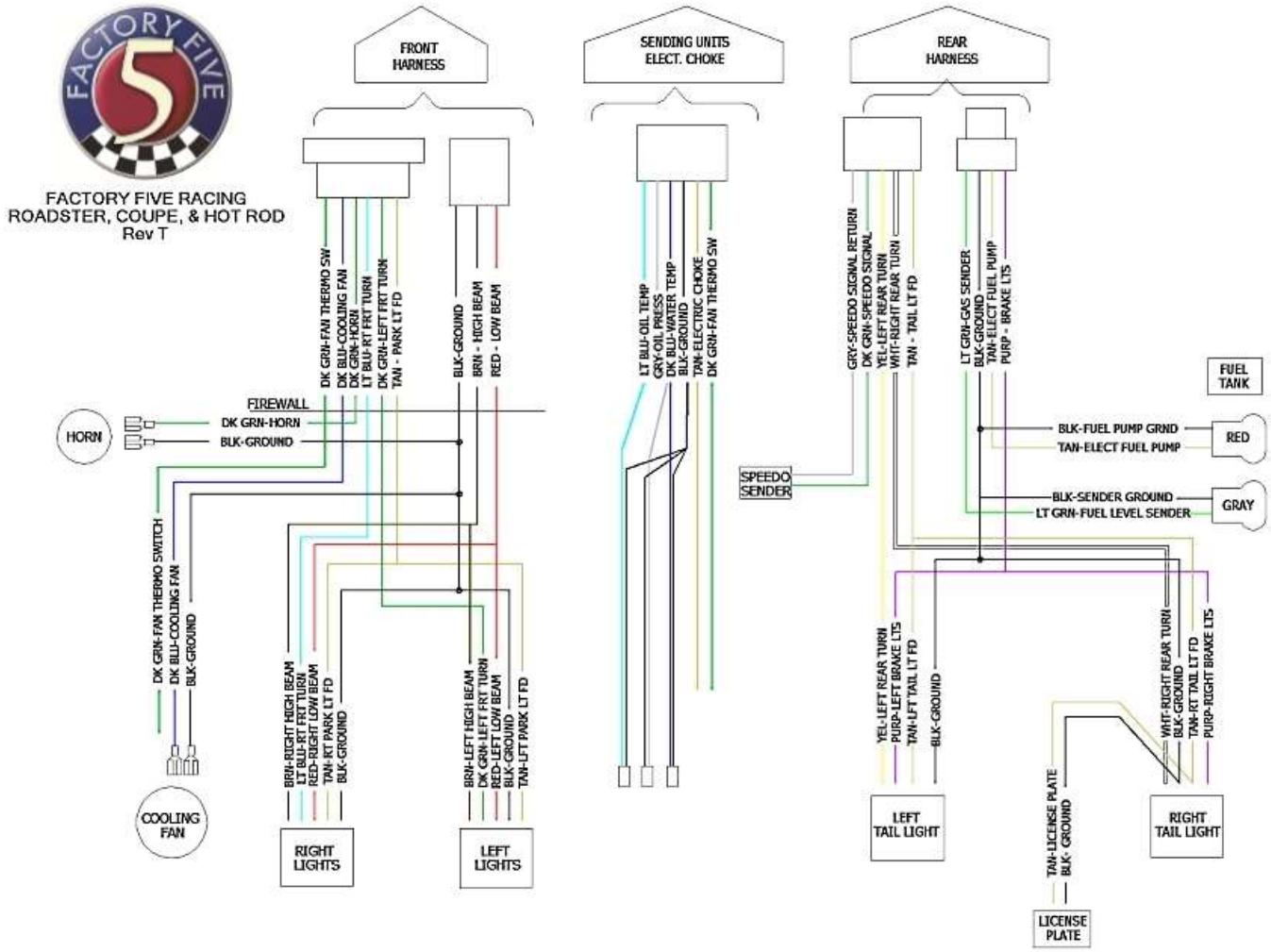
Put the floor tops on the frame.

Drill and rivet the top floor panels to the frame using 1/8" long rivets.

Wiring Harness



Main wiring harness. A larger latest revision is packed with the harness.

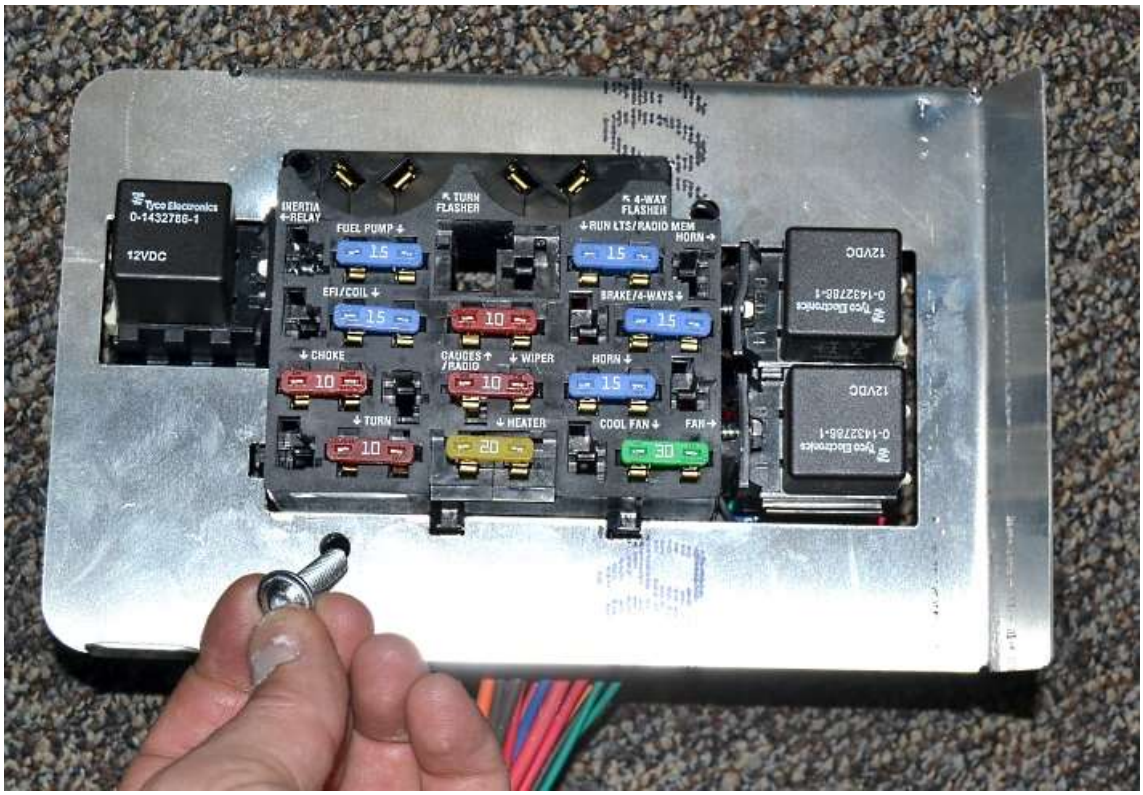


Front, engine sensor and rear wiring harness.

Fuse Panel Installation

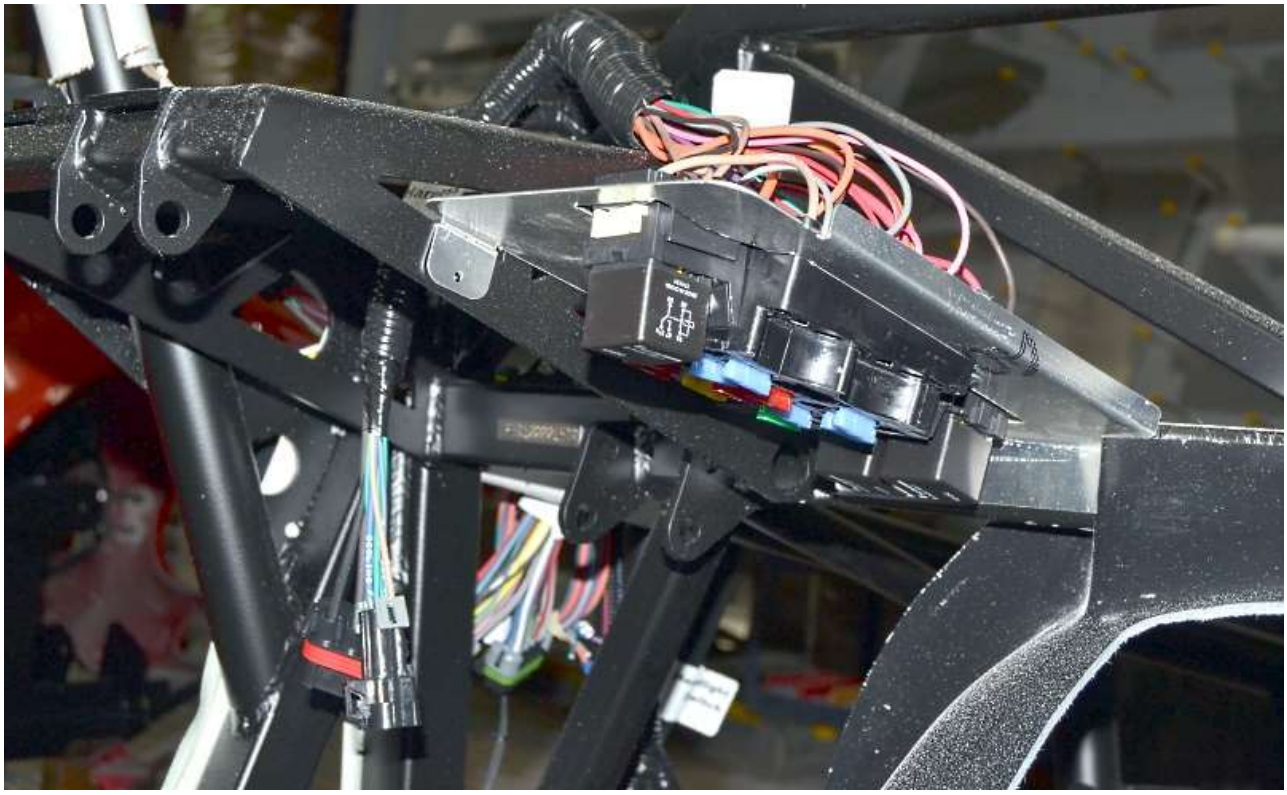
- 🛠 $5/32$" Hex key, $7/16$" socket, ratchet, $3/16$" drill bit, $3/8$" wrench
- Read all of the instructions thoroughly before starting the actual installation. If you have any technical questions concerning this installation please call and ask for our tech department.
- Route the harness away from sharp edges, exhaust pipes and moving parts.
- Have all needed tools and connectors handy.
- When crimping wires, select the correct size crimper for the wire.
- Do not use the routing instructions provided with the harness as it is geared towards the Roadster. Use the instructions provided in this manual.

Remove the two flashers from the fuse panel.

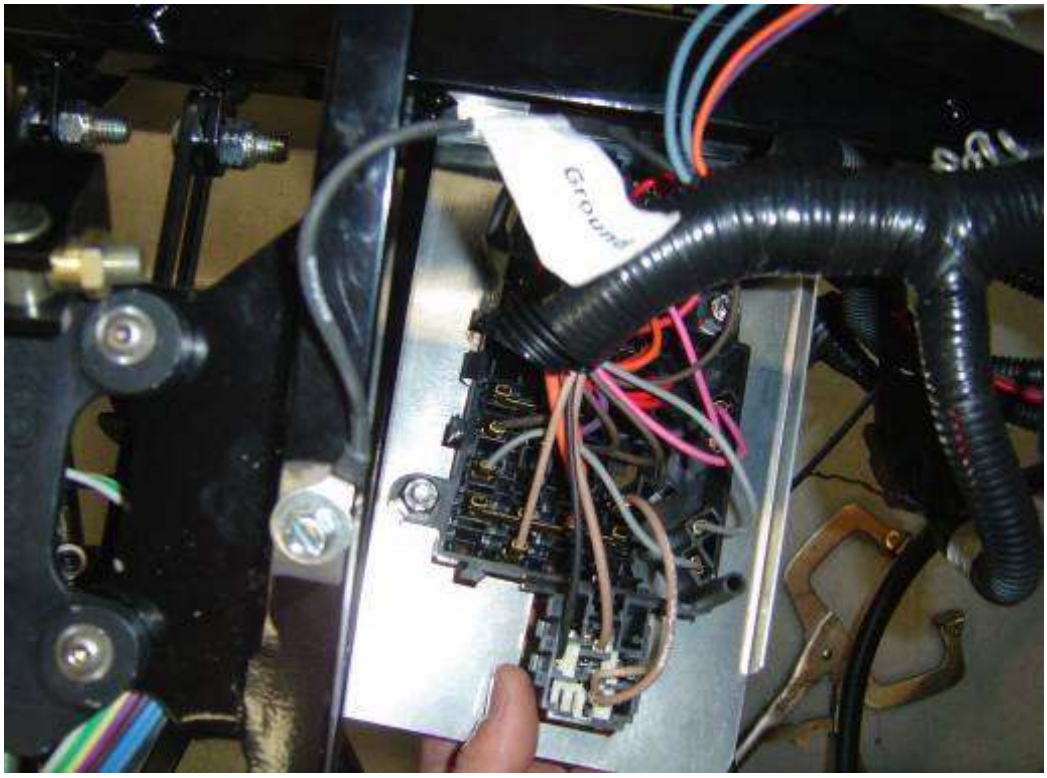


Attach the fuse block to the aluminum mount plate from the packaged aluminum box not the one included with the chassis harness using the ¼” screws and locknuts.

Position the fuse block and the mounting plate to the right of the pedal box area with the fuses facing towards the ground

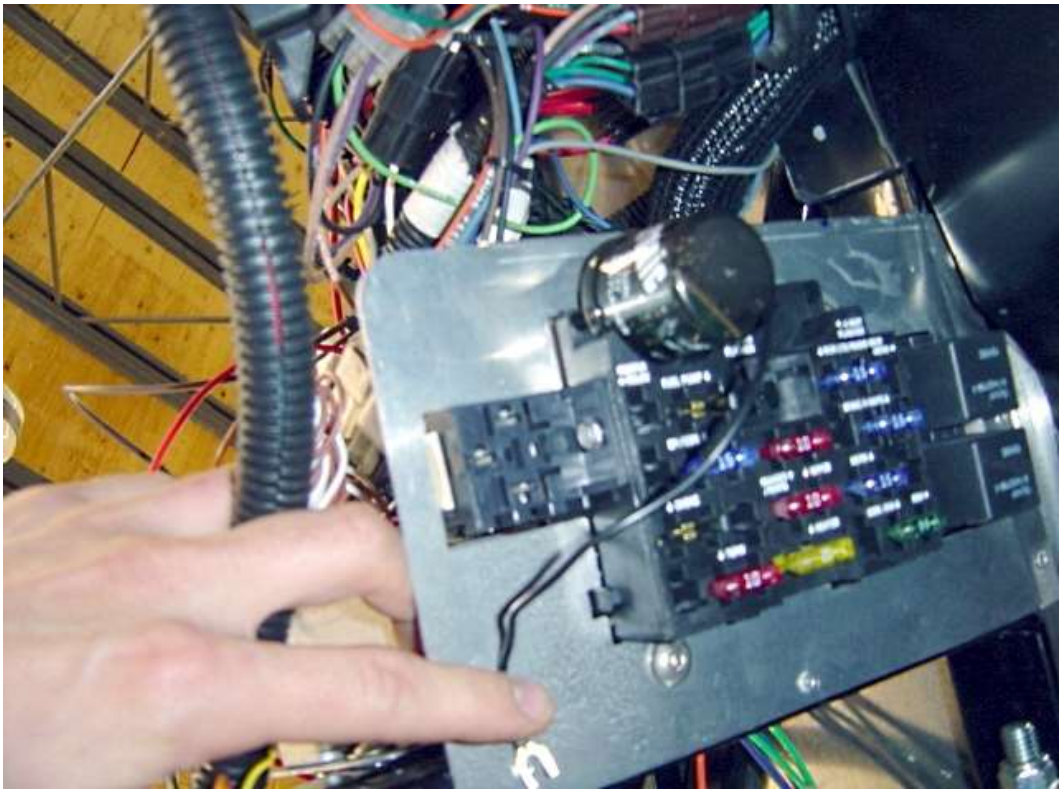


Drill into the 1.5" square tube (firewall mounting surface tube) and the ¾" tube (lower one) which triangulates the pedal box mounting location. Install the panel with rivets.

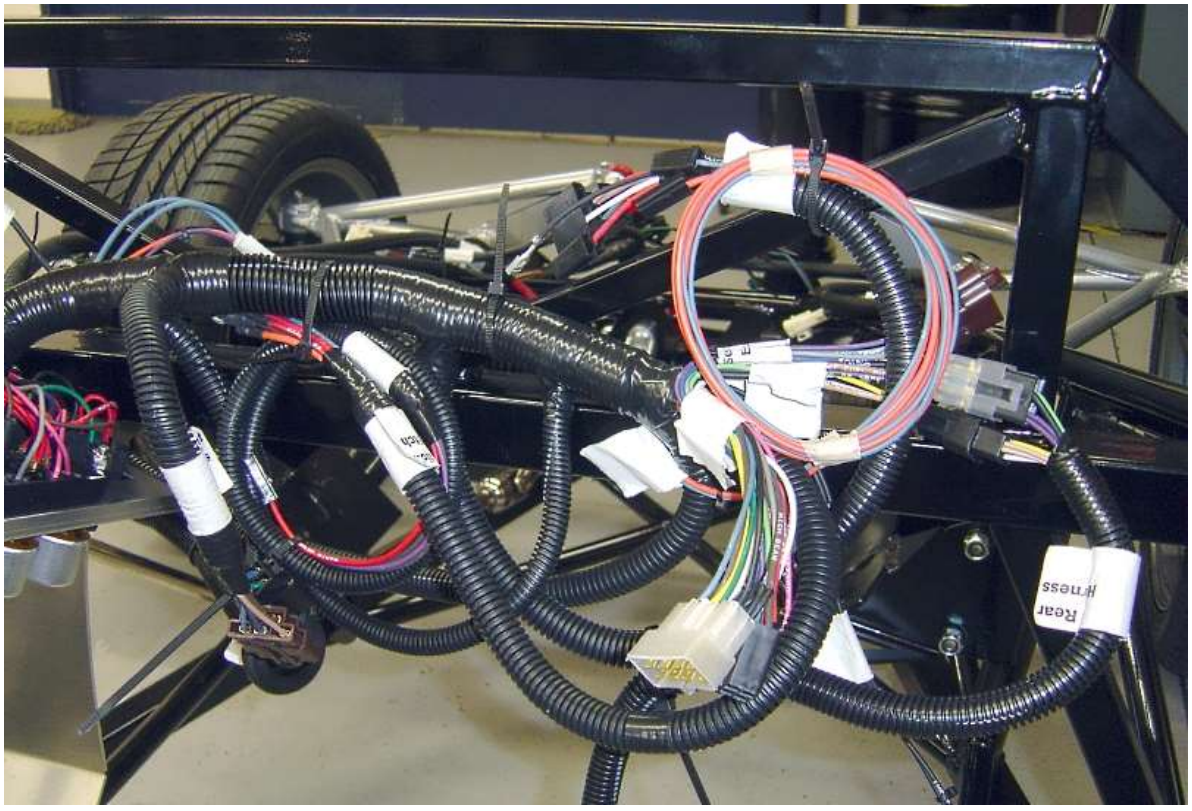


Attach the ground for the fuse block to the frame. If the frame is coated or painted be sure to remove this before grounding it.

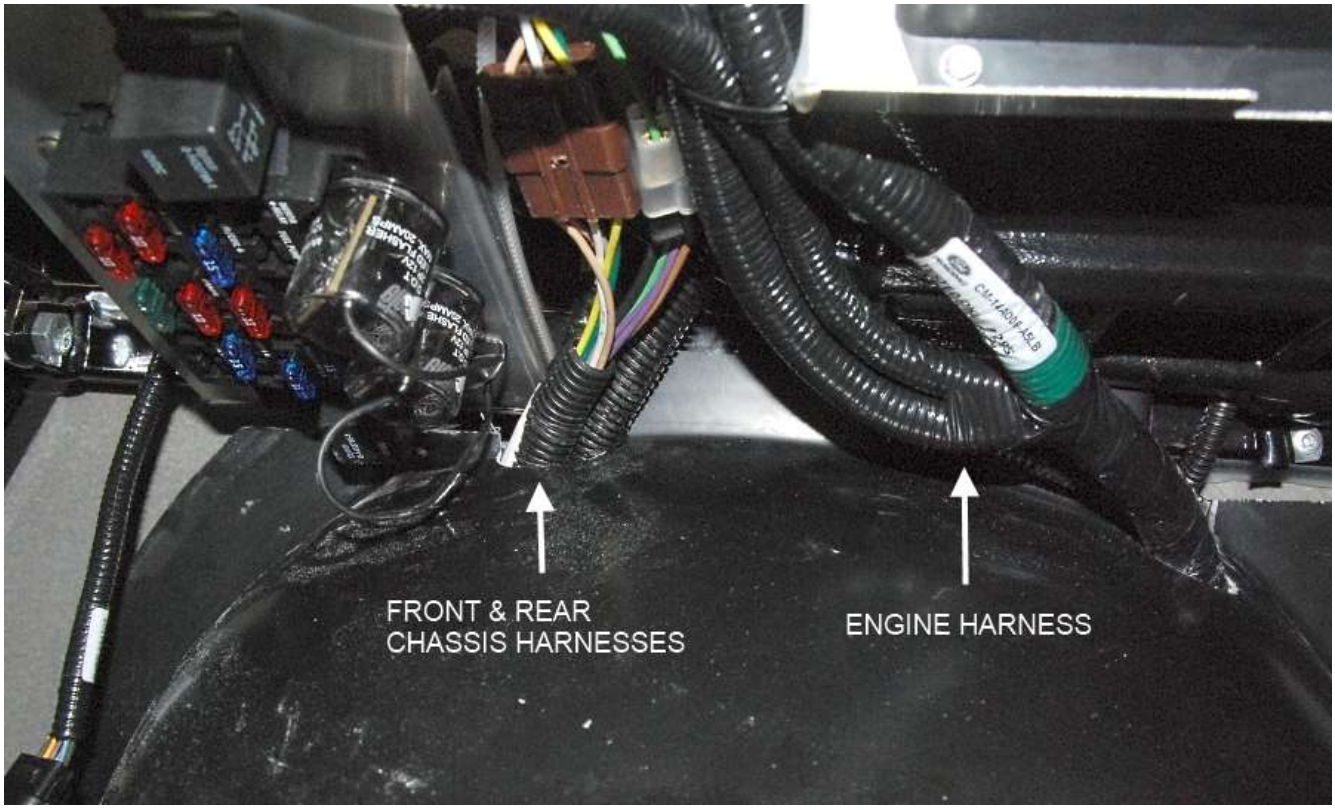
Locate the electronic flashers in the kit pack. These must be used instead of the standard flashers because of the LED rear lights. The flashers are located on the fuse block for the flasher and turn signal.



Make sure to ground the flashers.



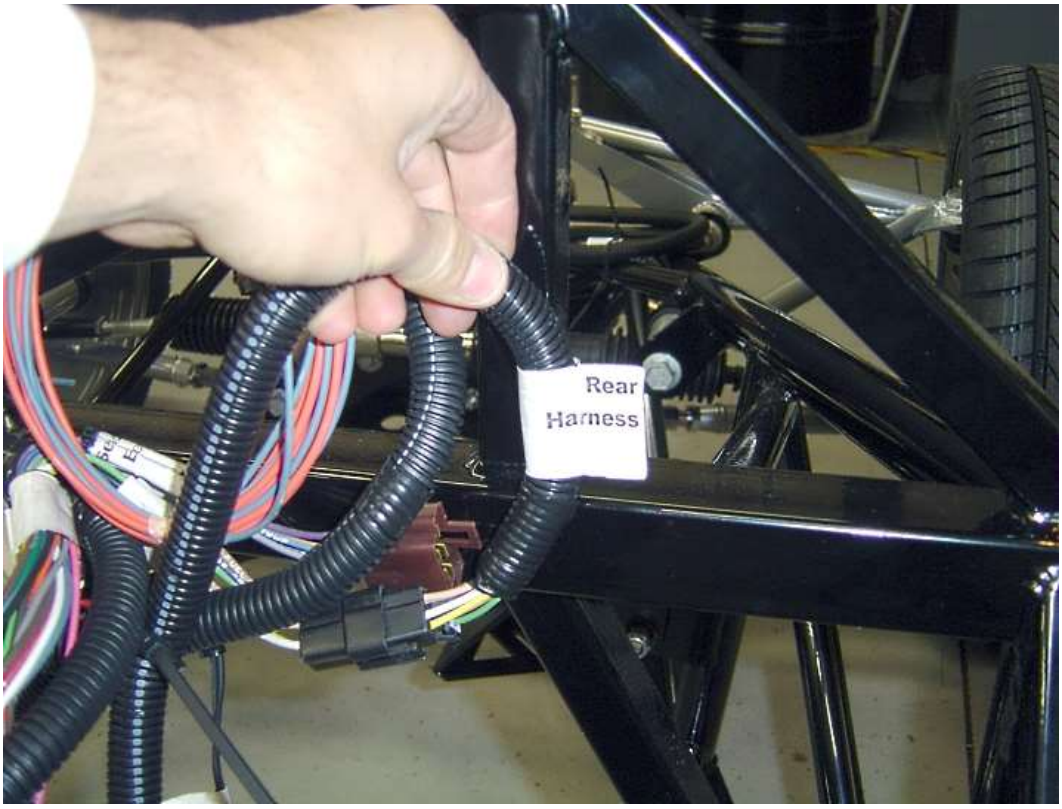
Use zip ties to begin draping the harness onto the frame.



The main wiring harness will exit the cockpit towards the left side of the transmission tunnel.

Rear Harness

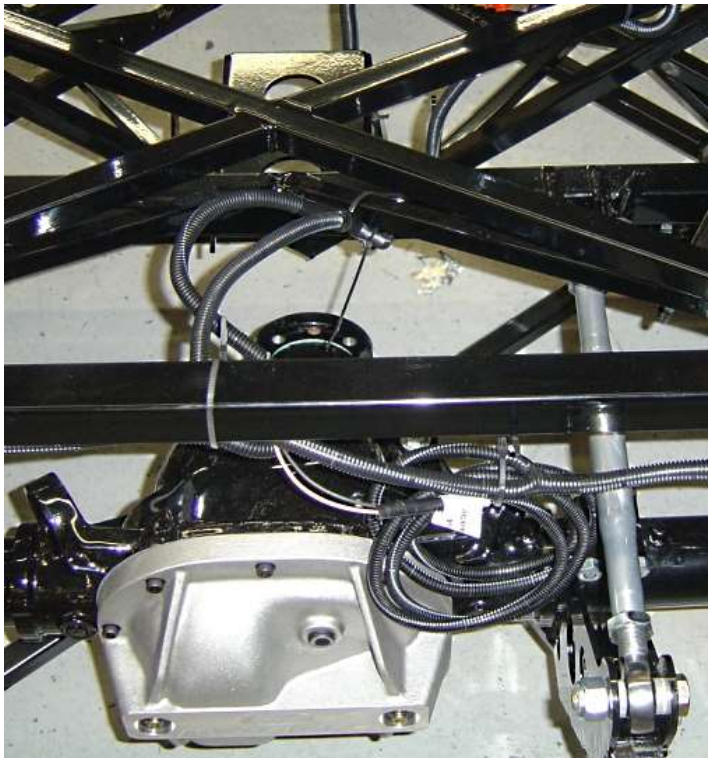
- Some pictures show the old-style frame.



Locate the rear wire harness.

Starting at the firewall, route the cable and harness to the rear of the car by running it over the transmission mount and on top of the floor holding it in place loosely with zip ties temporarily. At the back of the cockpit area, go under the angled 1” tube and over the 1.50” tube.

Here, the rear harness continues up and over the 1.50” tube.



Drape the harness over the rear axle straight back to the rear of the frame so the harness can “T” at the back of the frame.

Locate the fuel tank wires in the rear harness and run them forward just behind the rear 1.5" square tube to which the roll bar is attached.

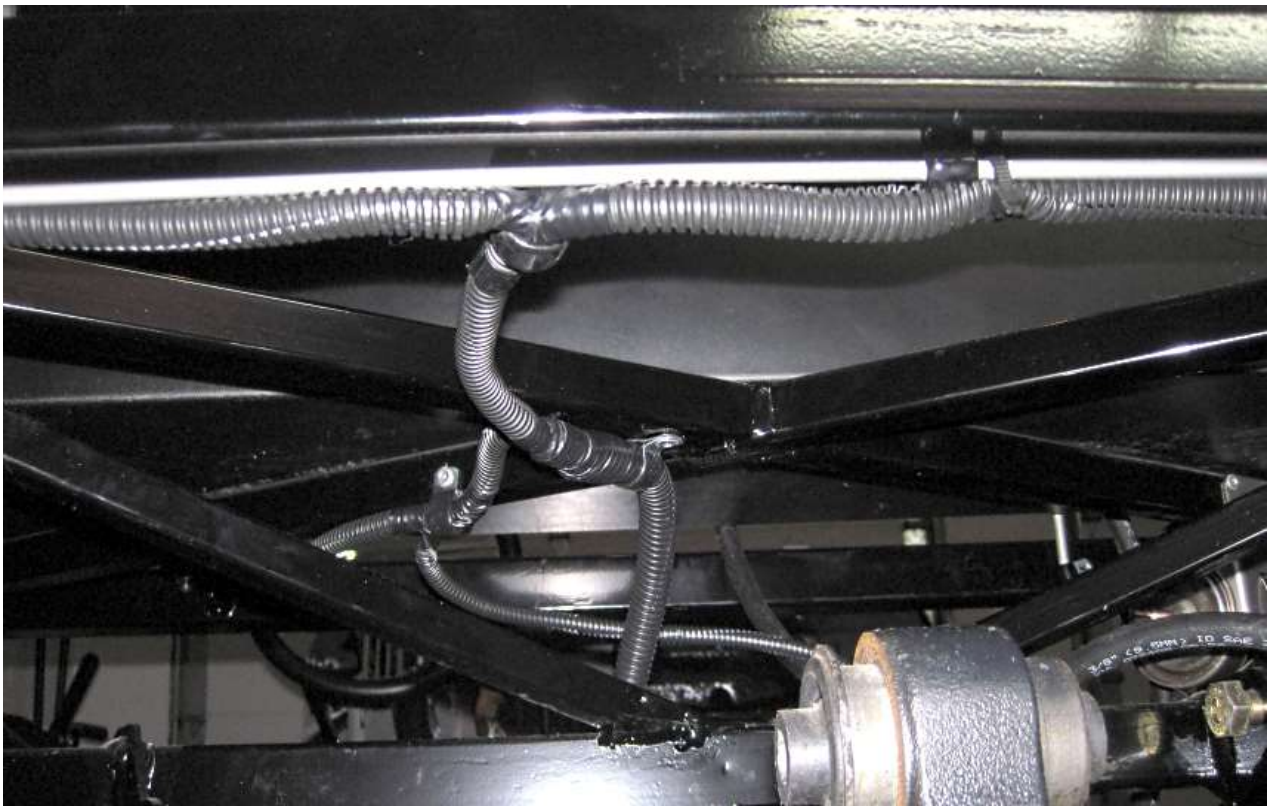
- If you need more length on the fuel system wires, pull the loom back and cut the electrical tape so the wires can move forward a few inches.

If you are running an inline fuel pump, separate the fuel pump wires from the fuel level sender wires by undoing the electrical tape and loom.

- The fuel pump will get located on the right/middle side of the frame while the fuel level is on the left side of the frame.
- An in-tank pump is close to the fuel level sender so it is not necessary to separate the wires.

Temporarily attach the rear light wires to the rear of the frame. Later these will get routed around the trunk aluminum to the tail lights.

- If you are going to install a stereo in the car and plan to have rear speakers, now is a good time to run the rear speaker wires to the back of the cockpit inside the rear harness loom.



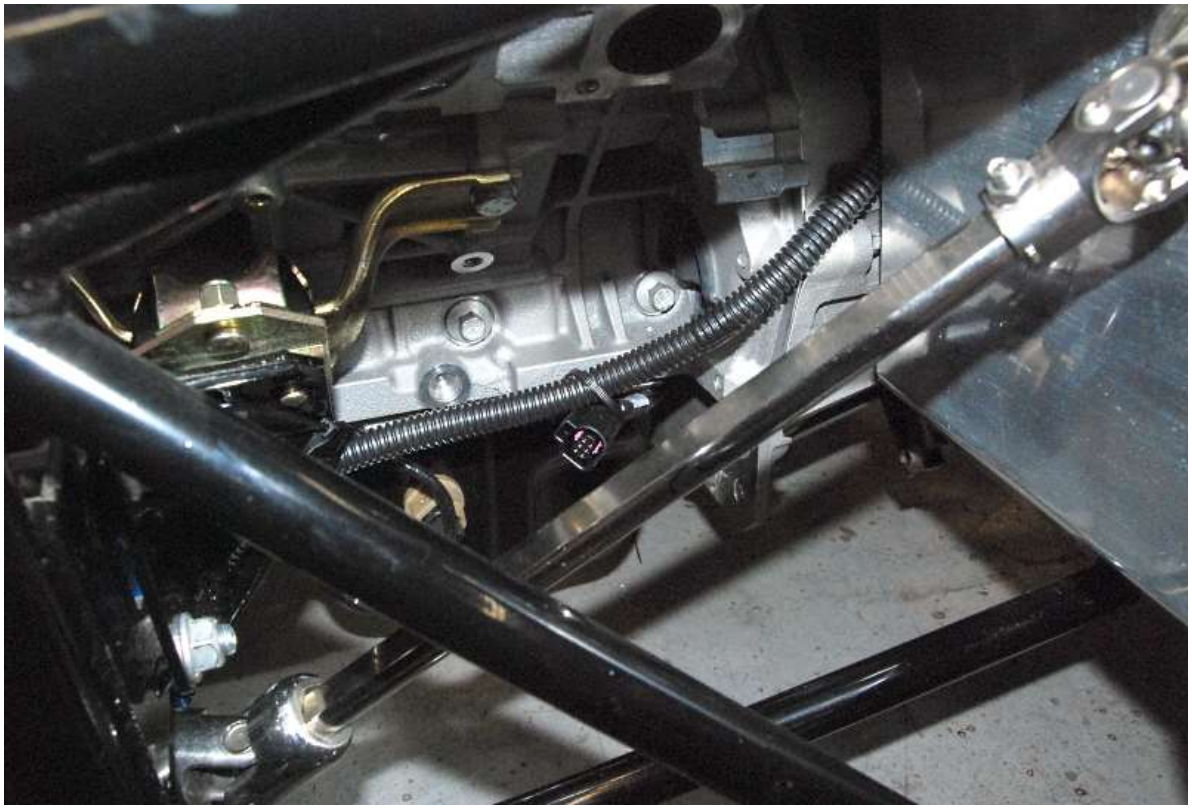
Starting at the back of the frame at the harness "T", use the ⅝" line clips and $^{3}/_{16}$" rivets to attach the harness to the frame.

Zip tie the rear light wires to the rear brake line running across the car.

Moving forward towards the firewall, pull the harness and battery cable tight and attach them to the frame every 12” or as needed using the ⅝” insulated clips.

Front Harness

🛠 Razor knife, electrical tape, drill, 3/16” drill bit, rivet tool
🚘 Insulated clip hardware

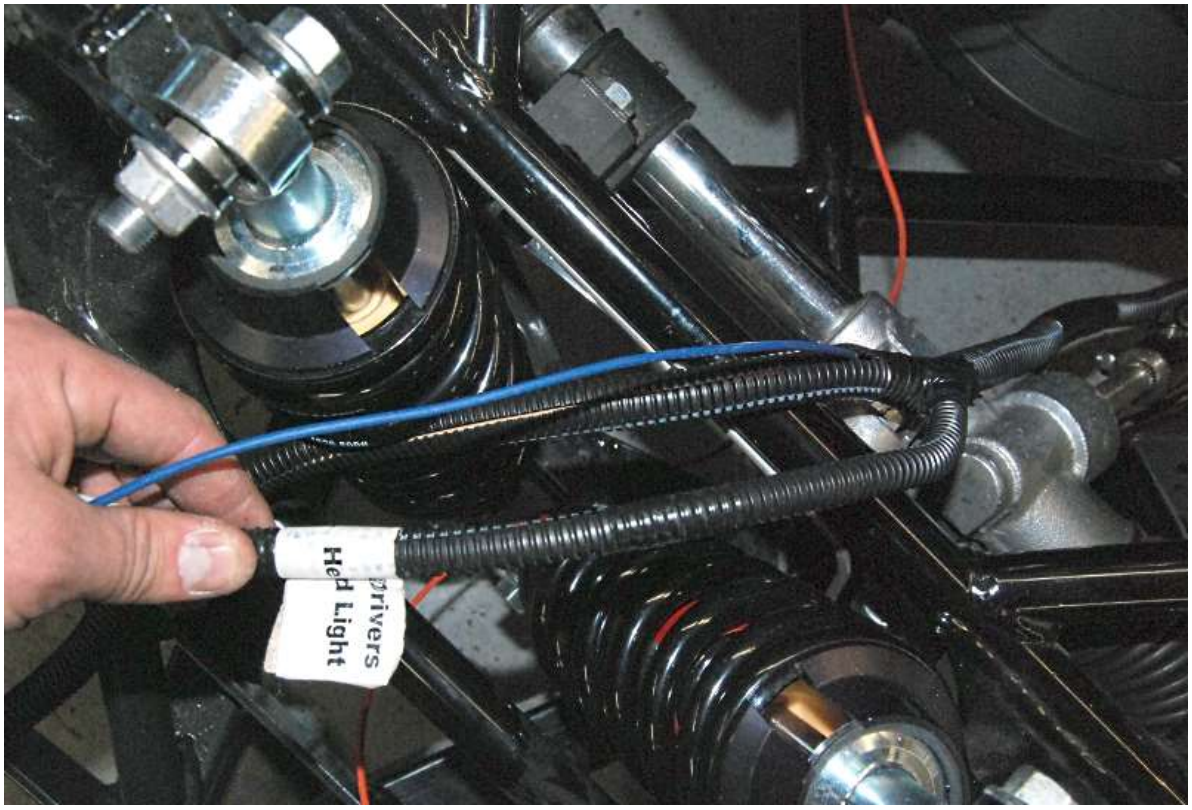


Loosely run the front harness to the front of the car. The best place to bring this harness into the engine bay is to the left of center directly under the firewall piece of aluminum passing through the front of the transmission tunnel.

Run the harness forward to the engine mount then run it along the inside of the 1.50” square tube next to the brake line.

Forward of the “X” bring the harness up above the $^{3}/_{16}$” plate.

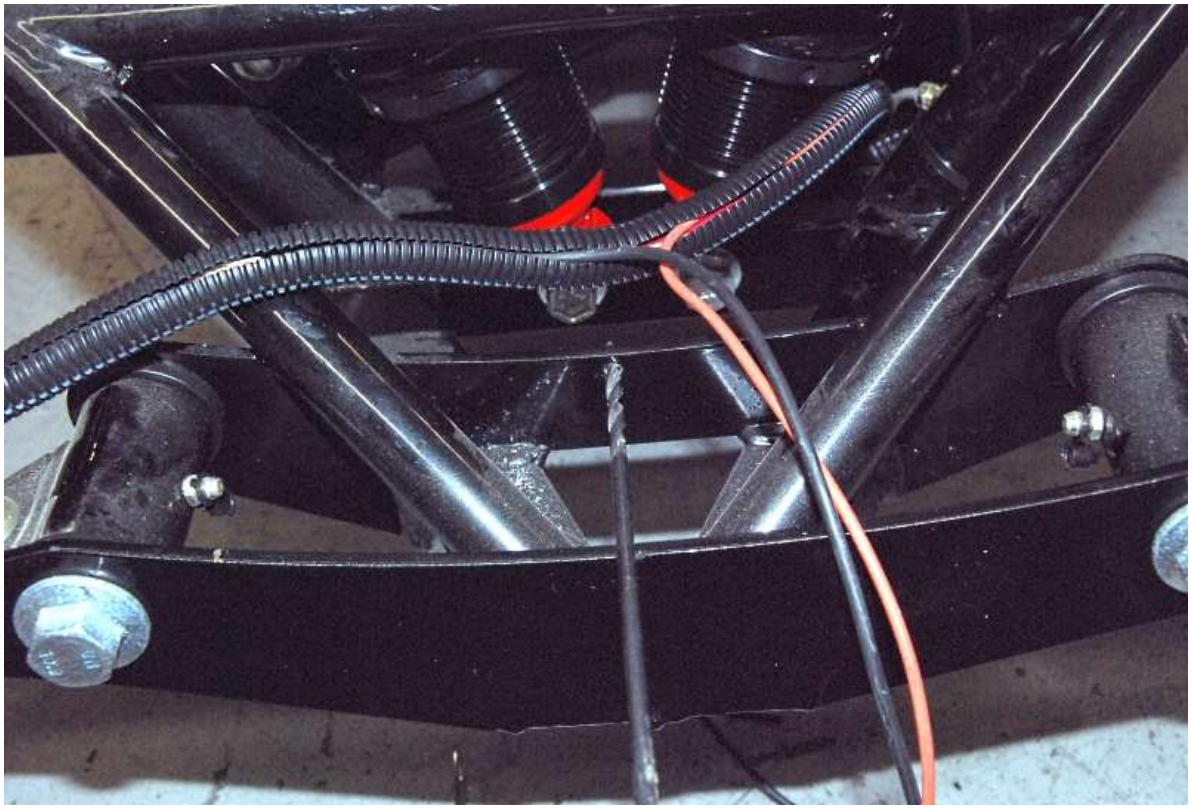
Zip tie the left headlight harness to the 1.50” round tube going to the upper control arm.



Pull the blue fan wire and the ground back out of the harness so that it can get located front and center.

Run the right-side headlight forward to the front of the frame.

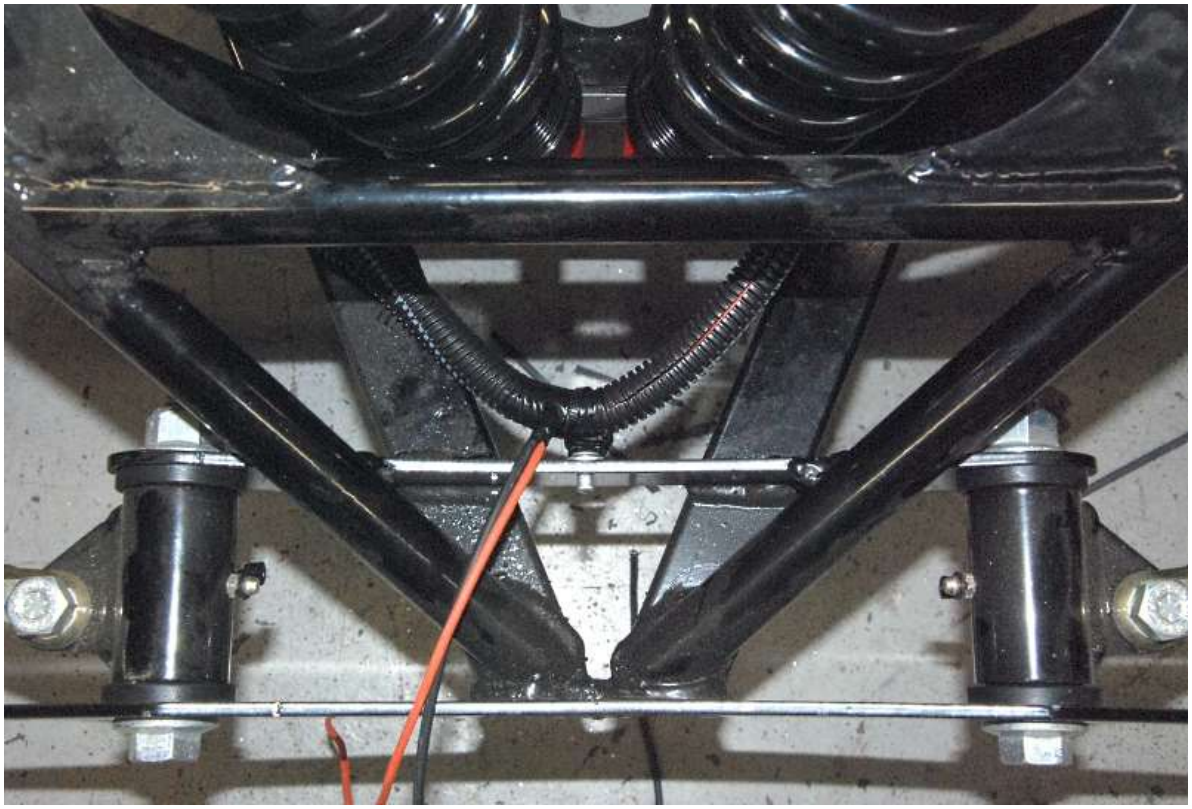
Locate/center the fan wires. If necessary, use scrap wire of the correct gauge to extend the ground wire. Re-tape where the fan wires come out of the harness.



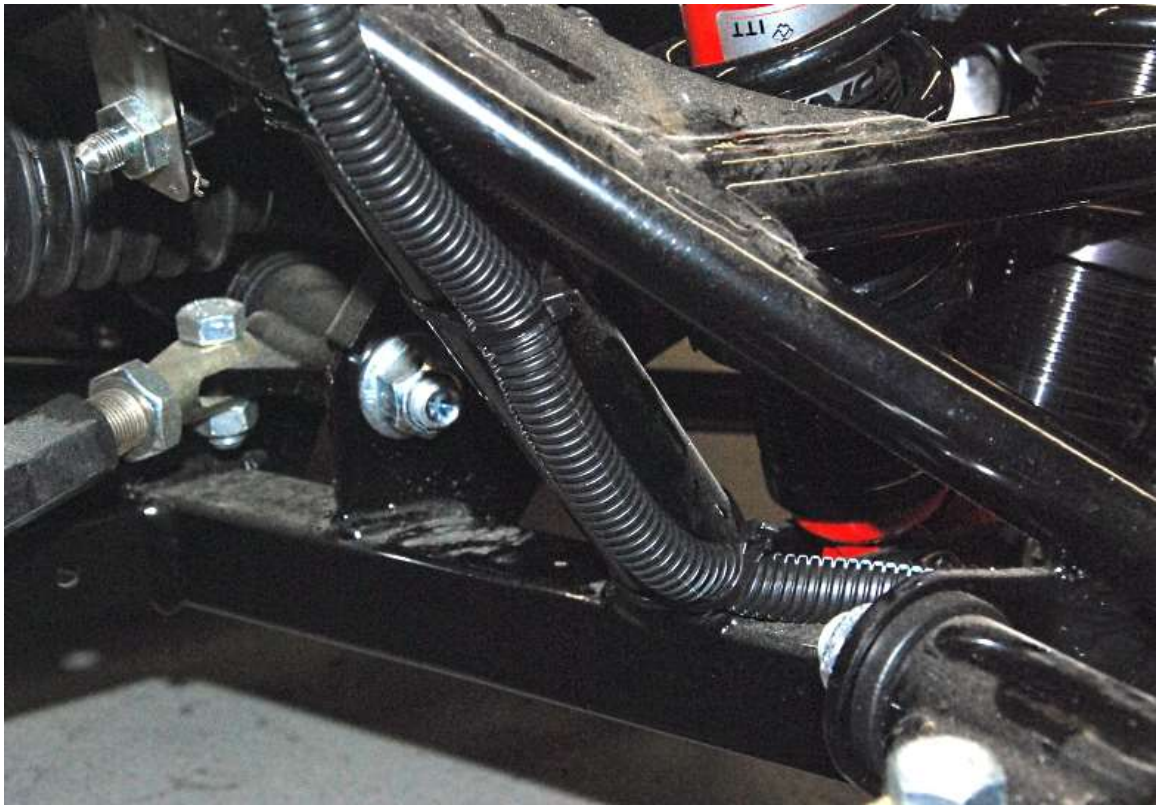
Drill a 3/16" hole in the center of the rear lower control arm mount.

Insert a long 3/16" rivet into a small insulated line clip.

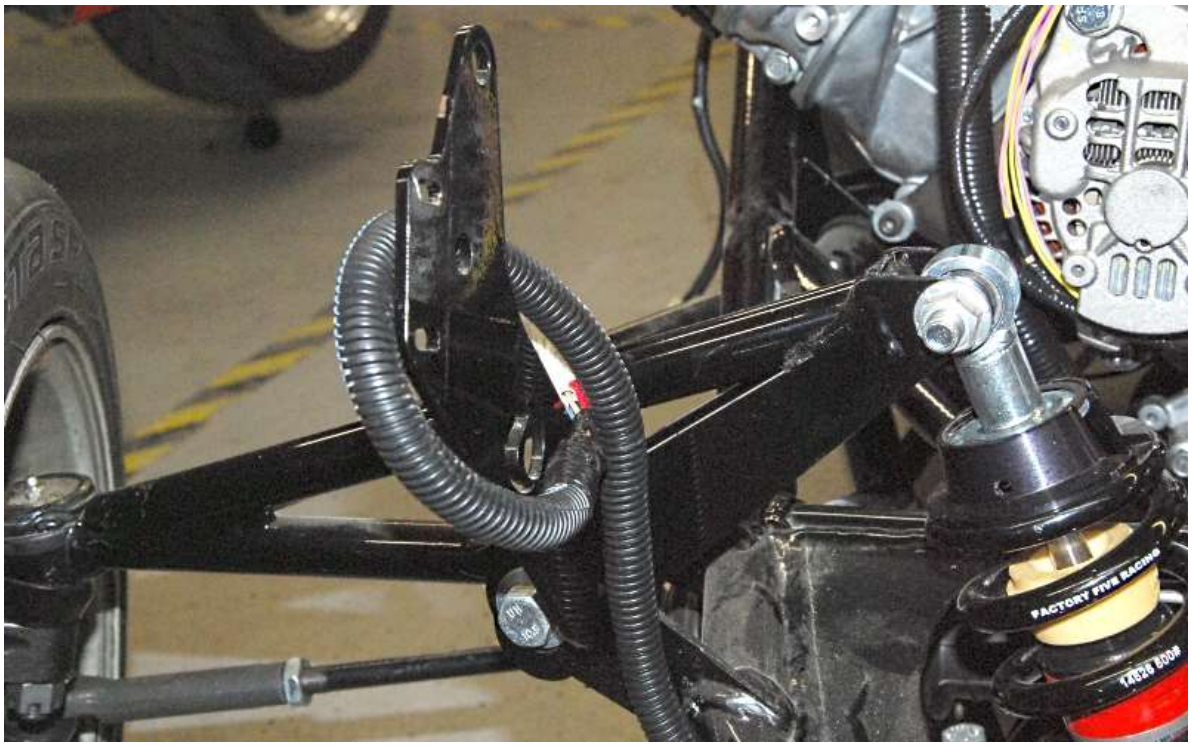
Rivet the line clip to the back of the lower control arm mount plate.



Use a zip tie to hold the front harness to the line clip.

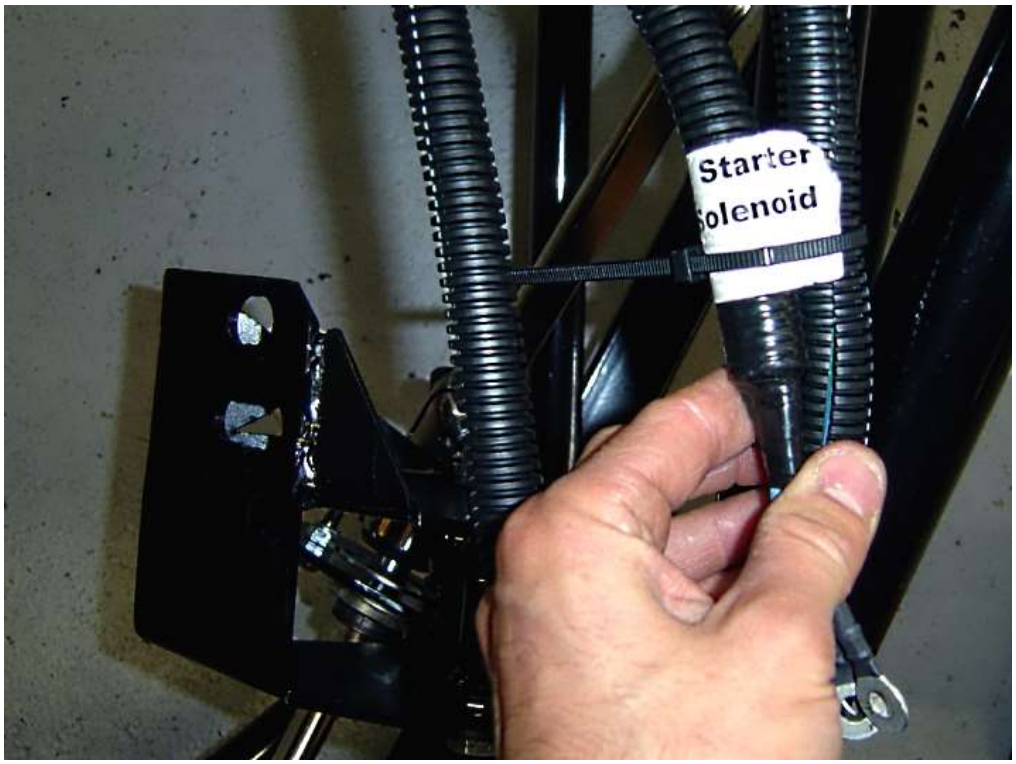


Run the right headlight harness up the right 1.50” round tube.



Leave the right headlight harness around the grill mount until the headlight is wired later.

Starter Solenoid Wiring

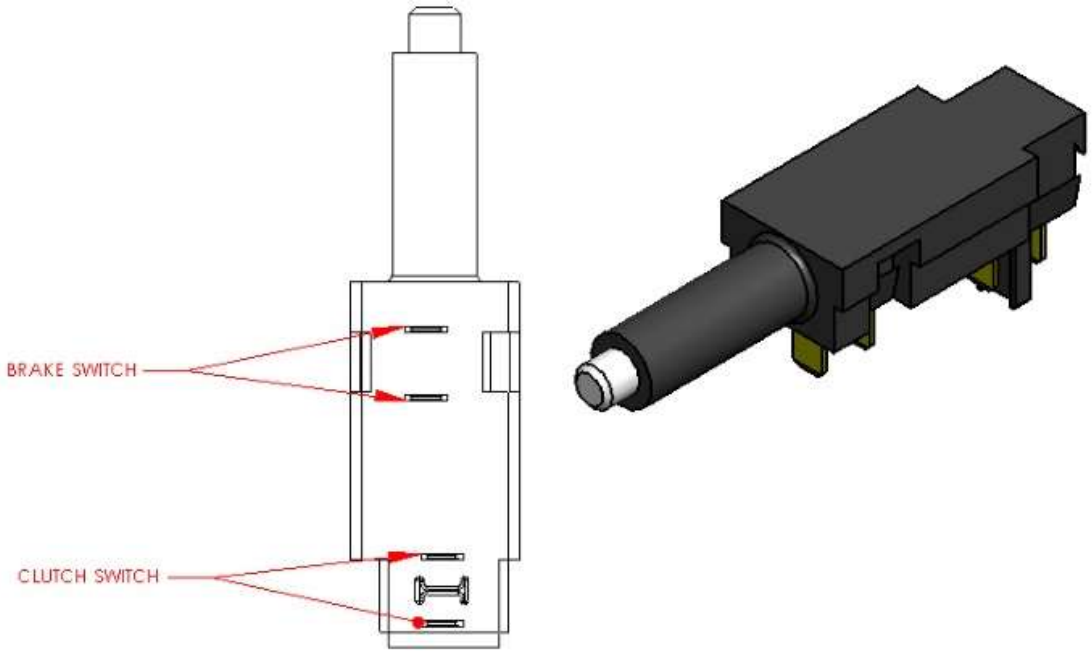


Locate the starter solenoid wires.

Wire the solenoid on the back side of the starter. The battery cable goes to one of the large posts on the solenoid. On the smaller S-terminal connect the LT BLU-NS SW > START (if you are running an EFI car you will have additional wires connected to this terminal as seen in the picture.

Brake Switch

Locate the brake switch plugs on the chassis harness

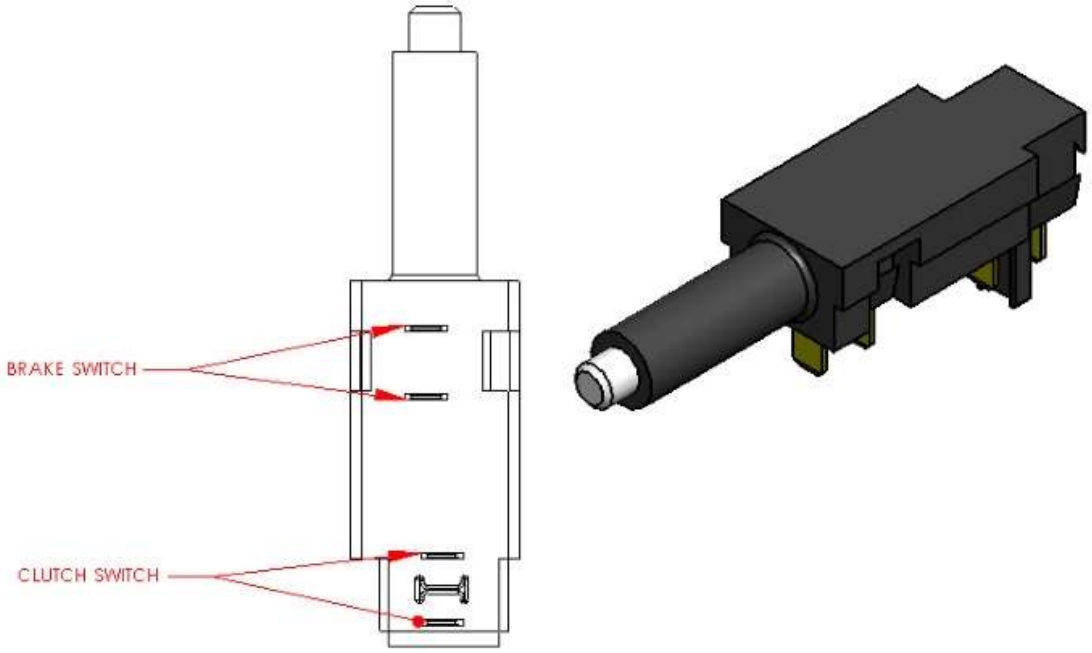


Connect the orange wire which was removed from the brake pedal plug and install it on one of the spades on the brake pedal switch.

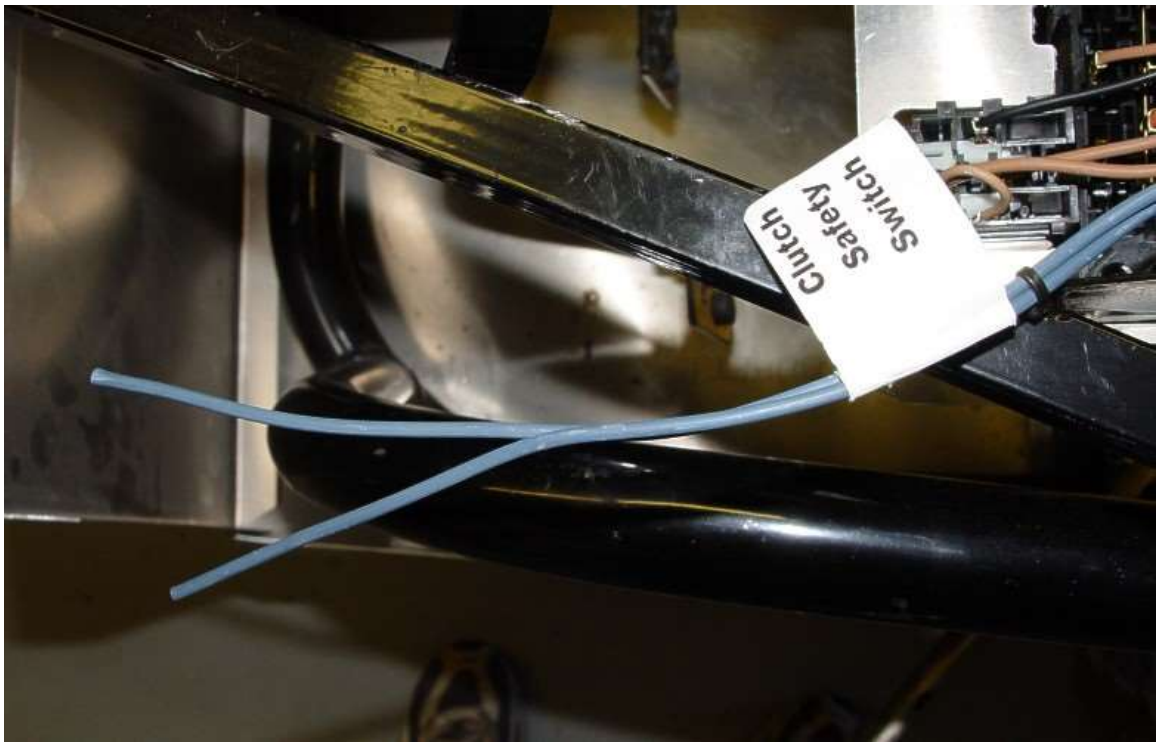
Connect the purple wire which was removed from the brake pedal plug and install it on one of the spades on the brake pedal switch.

Clutch Safety switch

- A clutch safety switch is used to prevent starting the car while in gear. It requires pushing the clutch pedal in while starting the car.
- Another option is to use a momentary dash switch that must be used at the same time as the key.



Attach the two wires to the switch.



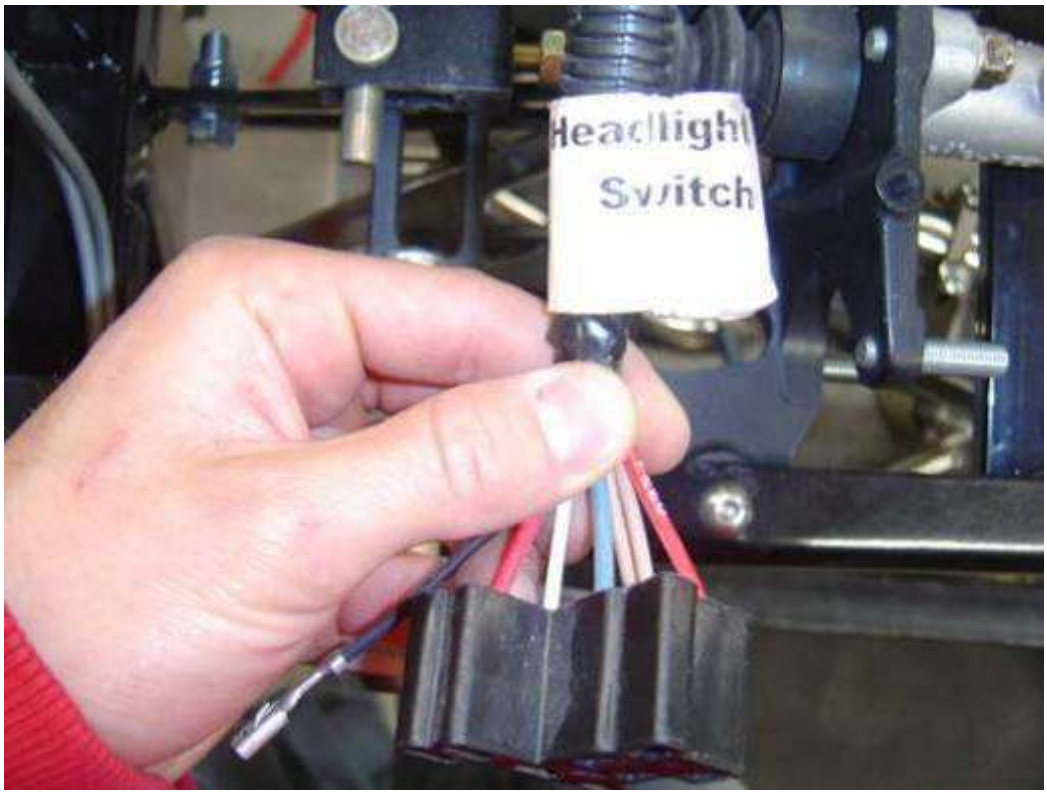
If a switch is not going to be used, connect the two wires together by either soldering the wires or using a butt connector from the “misc. electrical components” assembly in the Factory Five Racing main kit pack.

Fuel Inertia Switch

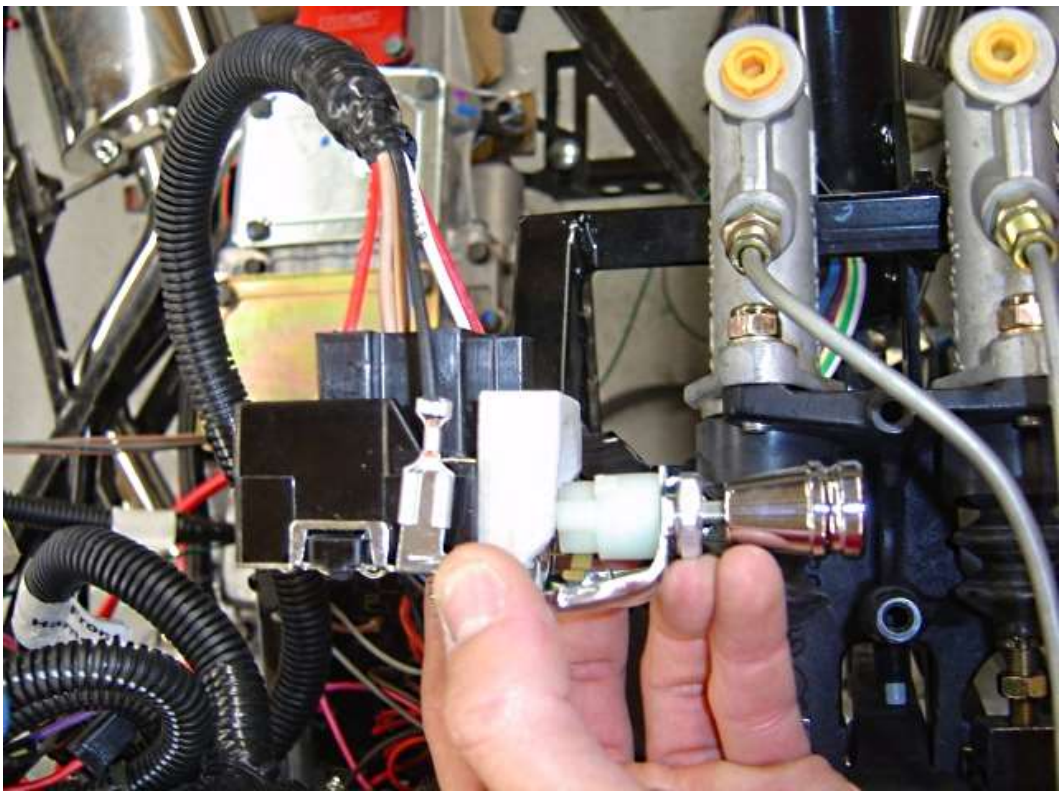
🛠 Drill, ¼” nut driver

Use the fuel inertia cut-off switch (attached to the main harness near the fuse panel) as a guide and mount the inertia fuel cut-off switch to the 1x1” frame rails on the backside of the firewall on the frame rails near the column mount using the #8 self tapping screws provided. Use a cordless drill with a ¼” nut driver. Do not mount the switch over the stamped chassis numbers.

Headlight switch



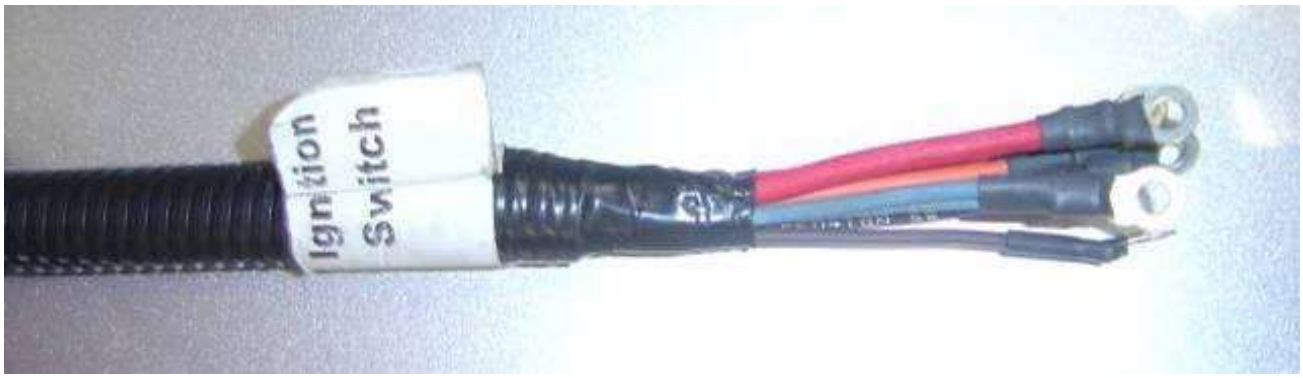
Locate the headlight switch plug and install it onto the headlight switch.



Install the female spade connector which is connected to the black wire (ground) onto the male spade connector on the side of the headlight switch.

Ignition switch wiring

- If you are using a one wire alternator with the chassis harness, the brown Alternator ignition power wire is not necessary.



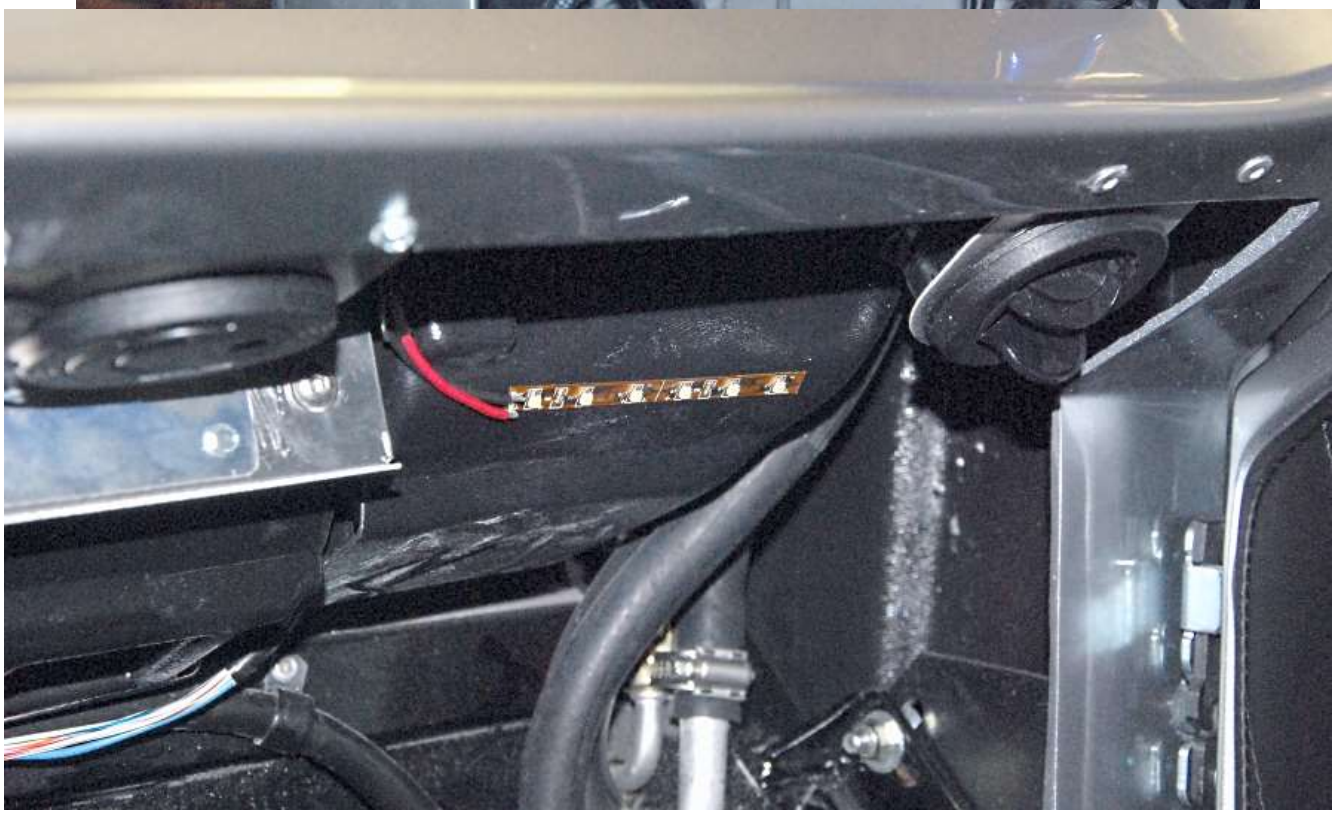
Locate the ignition switch wires and make the following connections to the ignition switch itself.

Ignition wiring

BAT	RED-HDLT SW 1 FEED RED-IGN SW>SOL
ACC	BRN-ACC FEED >IGN SW BRN-ALTERNATOR IGN
START	LT BLU-EFI CRANK LT BLU-IGN SW>NS SW
IGNITION	ORD-IGN FEED>IGN SW

After you connect the wires to the correct terminals tape over the backside of the casing with electrical tape to prevent electrical shorts.

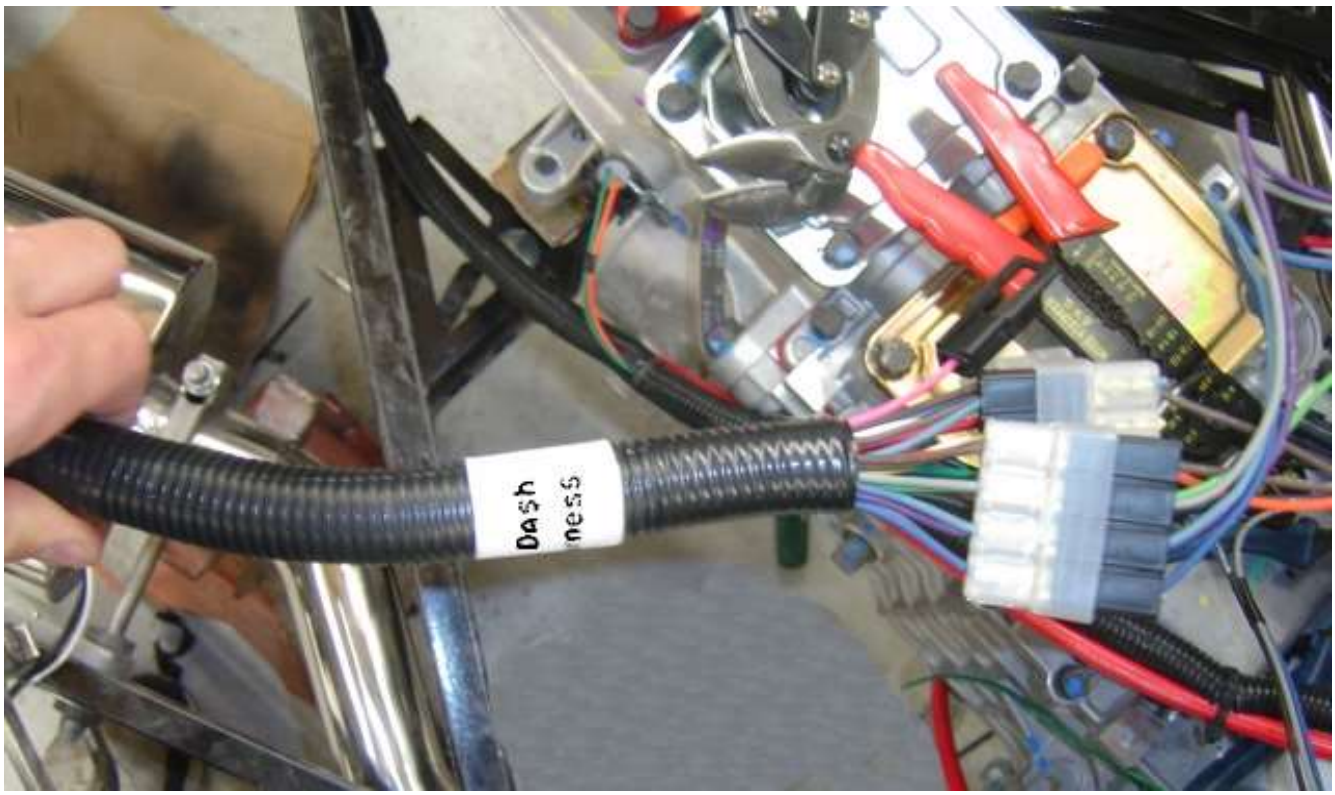
Under dash lighting



Install the under-dash lights on the frame as desired according to the wiring harness instructions.

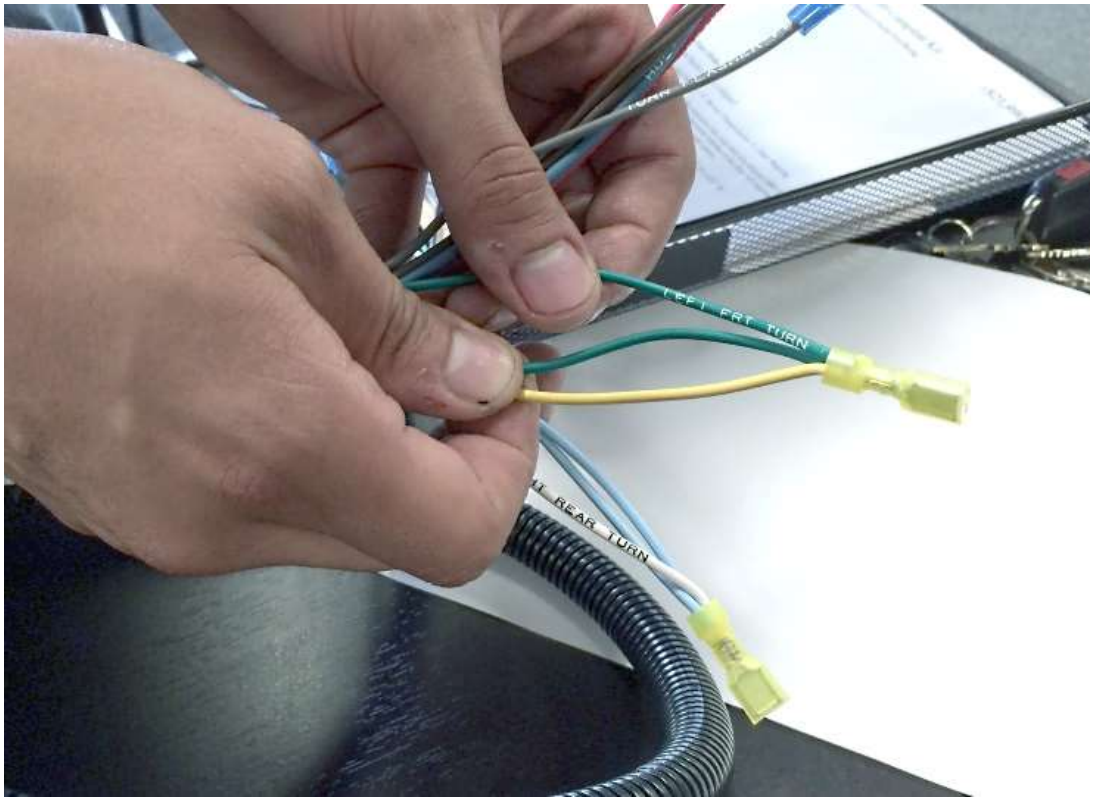
Steering column Wiring

Plug the steering column into the chassis harness plug.



Locate the dash harness section of the chassis harness.

Cut the horn wire back and tape the end so that it will not ground out and make the horn go off once they are connected.
Cut the (pink) hazard wire back and tape the end so that it will not ground out and pop the brake fuse.



Cut the yellow and white rear turn signal light wires off the turn signal connectors that are for the dash turn signal switch so that the turn signal lights do not back feed and light the front turn signals when the brakes are pressed.

Fan Wiring

Follow the directions in the chassis harness instructions

Carbureted Engine

Run the coil wires with the alternator wires and gauge sender wires for use with the coil.

Fuel Injected Engine

Leave the coil and crank wires in the footbox and connect them to the power wires for the EFI harness according to the EFI harness instructions.
If the EFI harness uses its own wires for the fuel pump, remove the fuse for the fuel pump from the fuse panel and cut and solder the fuel pump wire from the EFI harness onto the chassis harness wire.

- If using a Coyote engine, refer to the available “Coyote Install” instructions.

Alternator

Run the alternator wires along the top of the engine to the alternator.

Troubleshooting

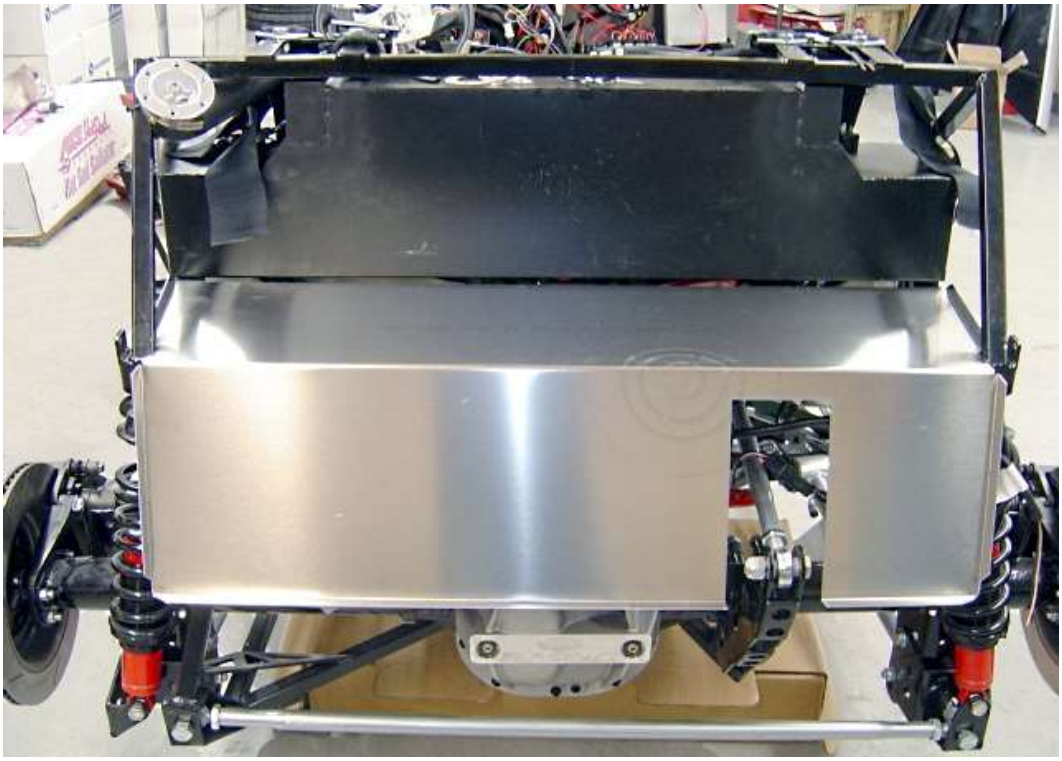
Some of the areas that can cause problems are:

- Inertia Switch – This switch can cause a “no start” problem. Make sure that the button is pushed down.
- 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.

If a radio is being used connect the power wires to the radio.
If a heater or wiper system is being used, connect the wires using the instructions from that option.

Trunk upper aluminum

🛠 Drill, ¼” hex driver, clamps, ruler, tin snips
🚘 Mounted aluminum, secondary body fasteners

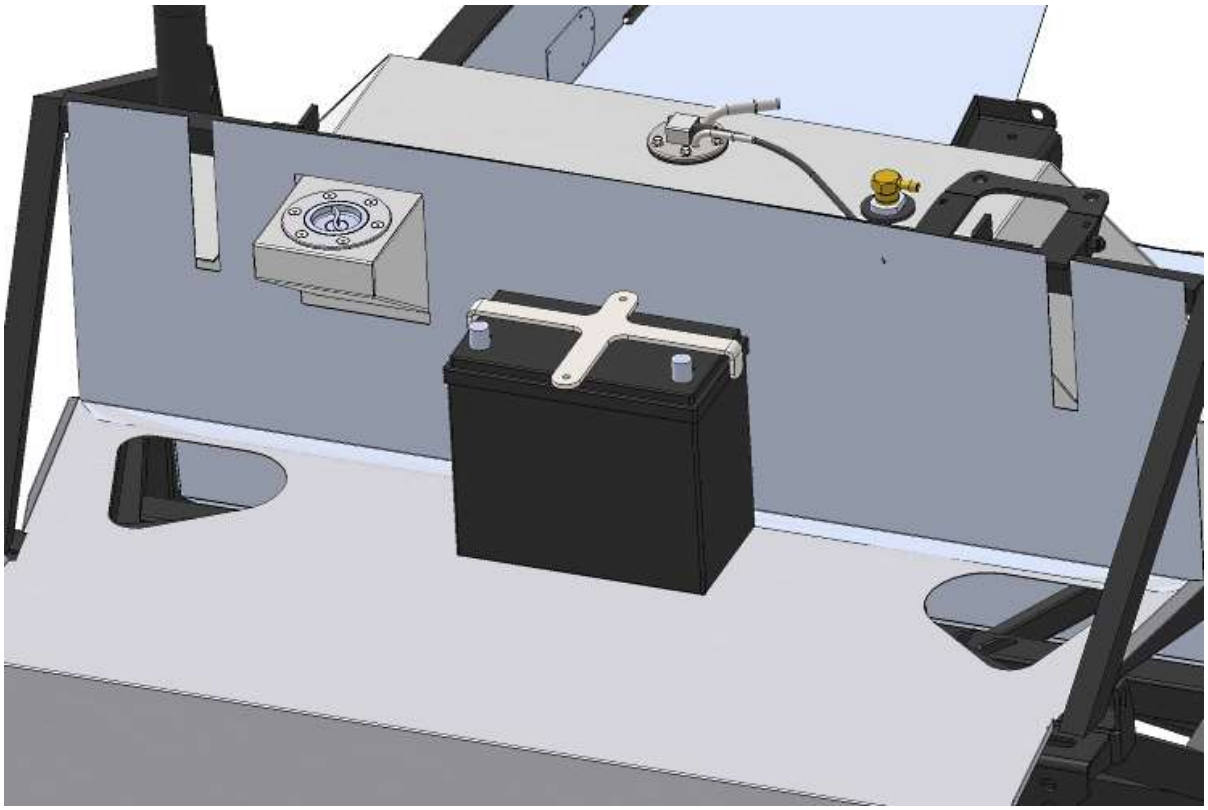


Set the upper floor of the trunk in place.

If necessary, trim the aluminum around frame welds so that the aluminum sits flat against frame tubes.

Battery and Battery Cable

🛠 Drill, ¼" drill bit, 1" hole saw, $^{7}/_{16}$" deep socket, ratchet, hack saw, hammer, vise, marker, ruler.
🚘 Battery installation components, battery.



Position the battery on the trunk upper floor centered behind the rear bulkhead of the cockpit. We recommend a Group 51R size battery.

The battery is held in place with the battery hold down and the J-bolts.

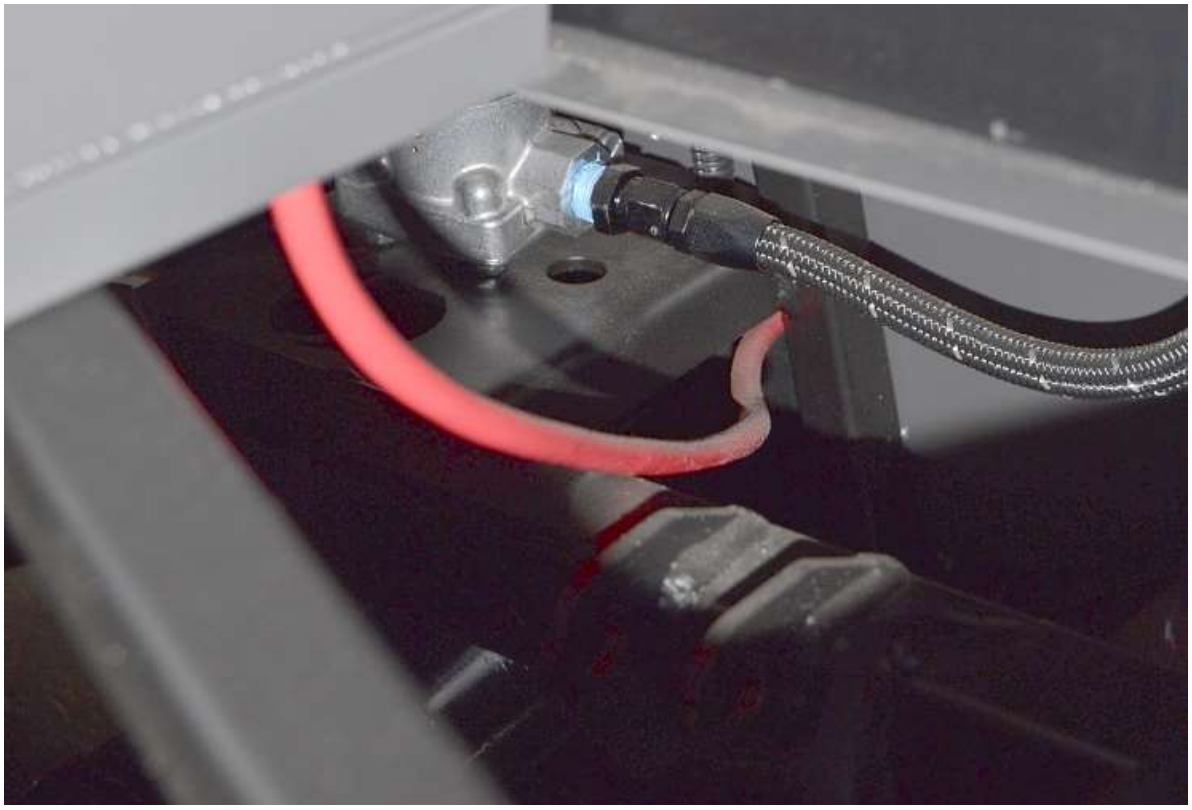
Put the J-bolts in the mounting holes thread down on the aluminum and mark the needed hole locations.
Remove the battery and drill ¼" holes for the J-bolts to pass through.
Install the battery and mount it in place with the J-bolts. Pass the "J" section through the frame and then use the supplied nuts and washers on the top to fasten the mount bracket to the battery.

Positive cable

Near the positive side of the battery, use a 1" hole saw to drill the positive battery cable hole.

Install the grommet in the hole.

Push the small end of the battery cable through the floor from the top and hook the terminal end to the positive side of the battery.



From under the floor, the battery cable will go forward and to the transmission tunnel.

Run the cable down the right side of the transmission to the starter.

Attach the battery cable forward and to the battery post on the starter.

Beginning at the starter, leave a little slack then use zip ties or the 5/8" insulated line clips to hold the cable in place.

Leave some cable next to the battery so it can be disconnected.

If there is extra cable loop it over the rear driveshaft loop and attach it to the frame.

Negative cable

Near the negative side of the battery, drill a 5/16" hole in floor through the 16ga steel plate for the ground cable to attach. On the underside where the nut will go, grind the paint or powder coat so that the ground cable has a good connection to the chassis.

Attach the ground strap to the chassis with the supplied $^{5}/_{16}$" button head screw, locknut, $^{3}/_{16}$" hex key and ½" socket.

✋ Do not connect the negative lead to the battery until all of the wiring on the vehicle is finished.

Horns

🛠 14mm wrench, wire cutters, wire crimpers, $^{5}/_{32}$" hex key
🚘 Hot Rod Electrical system components

There are a couple of possible locations to mount the Horns. If you plan on running the car without the engine side covers, a hidden location is between the front shocks.

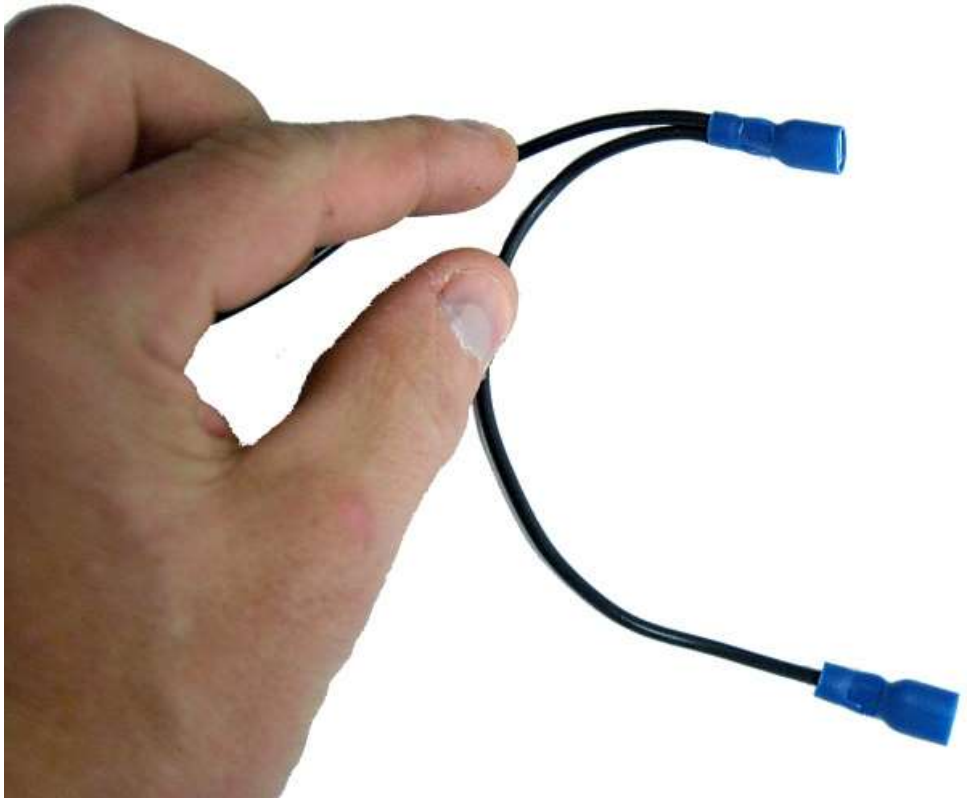
The other location is the side body mount which is described in the following instructions. The wires are long enough to reach either location.

Attach one horn to the included bracket using one of the 14mm lock washers and nuts included. Note the orientation of the wire connectors when tightening the bracket so that it will be correct when installed. The flat horn outlet is pointed right.

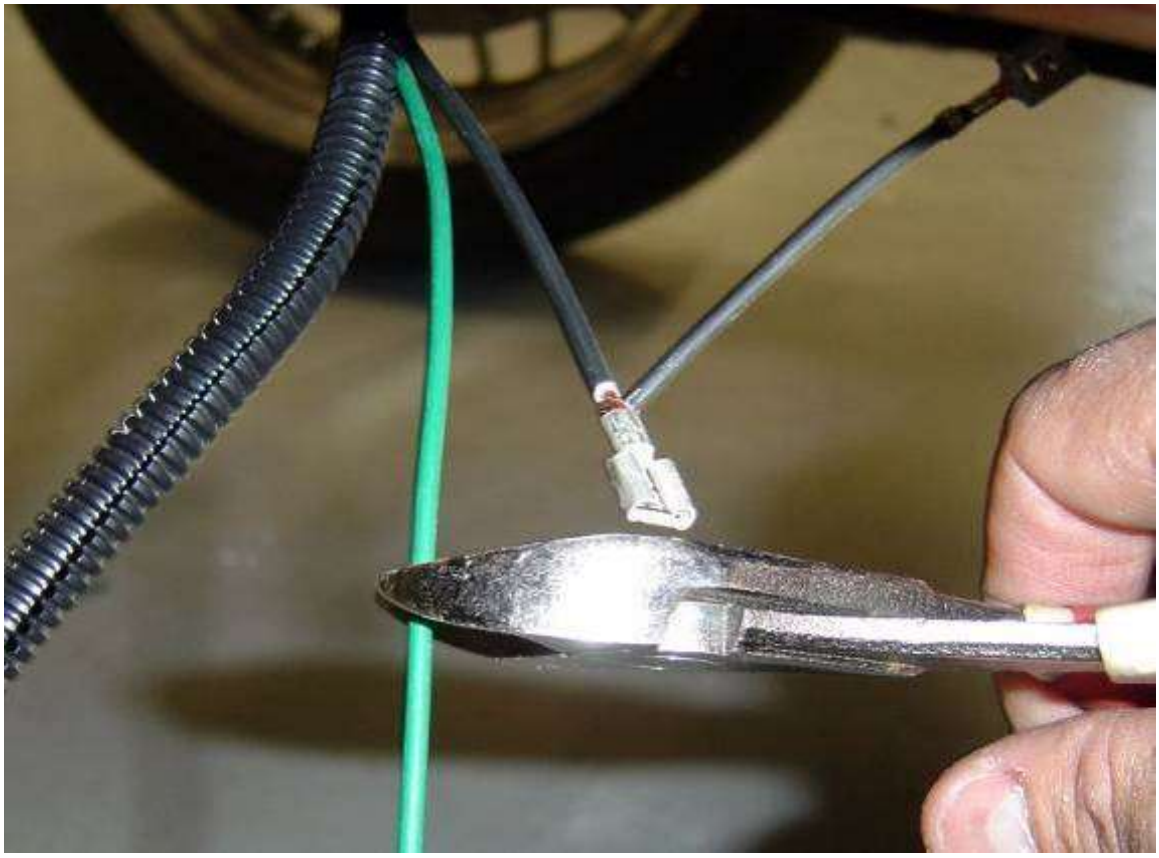
Mounting brackets on the horns

Holding the horns the connectors should be spaced so that the wires will not hit each other.

Cut 2” off the end of the chassis harness horn ground wire and strip the end of the chassis harness ground wire.



Twist the chassis harness ground wire and small wire ground together and insert them into one of the ¼” female connectors included then crimp the connector on.



Cut the same 2” off the green horn power wire and strip the ends of both wires.

Twist the chassis harness green wire and small wire ground together and insert them into one of the ¼" female connectors included with the horns then crimp the connector on.

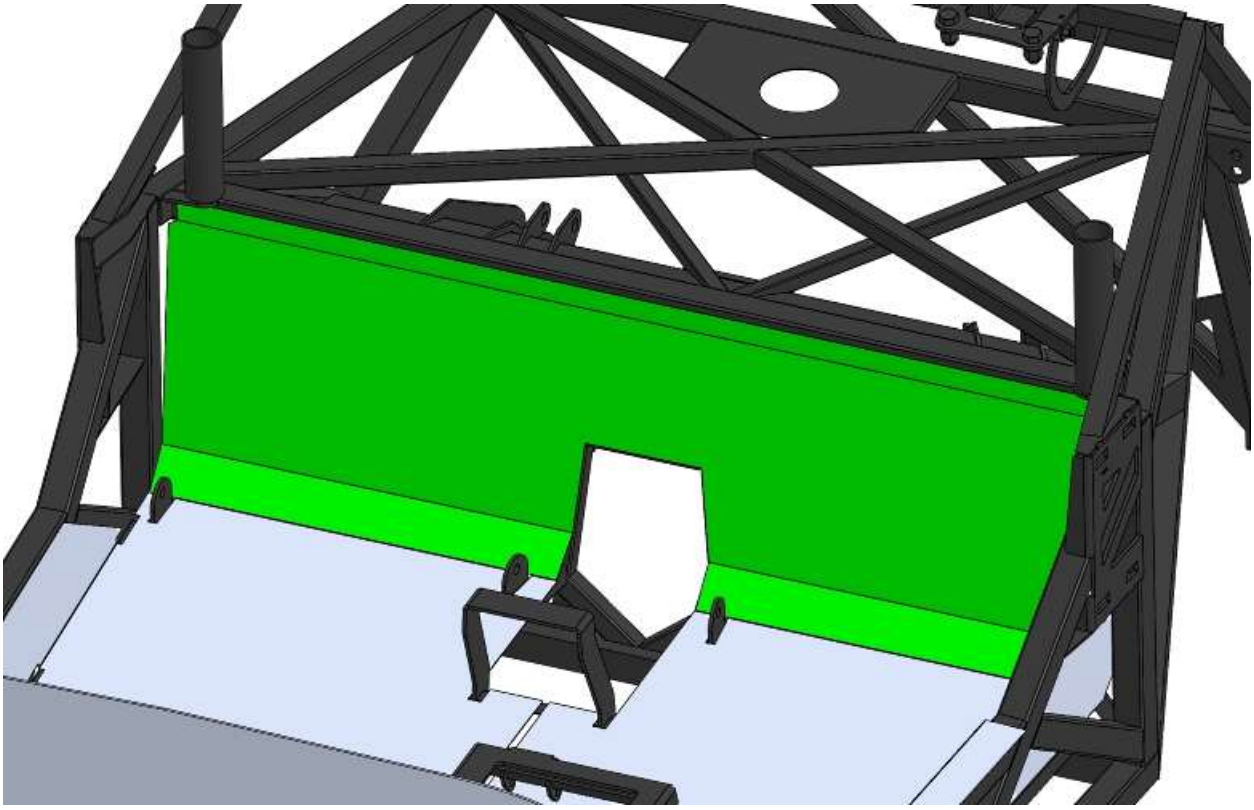
Attach the chassis harness horn wires to one horn and push the jumper wires on to the other horn. Either connector on the horn will work.

Attach the two horns to the backside of the side body mount behind the driver side front wheel using the supplied ¼" bolt.

Chapter 3 - Interior Assembly

Interior Aluminum

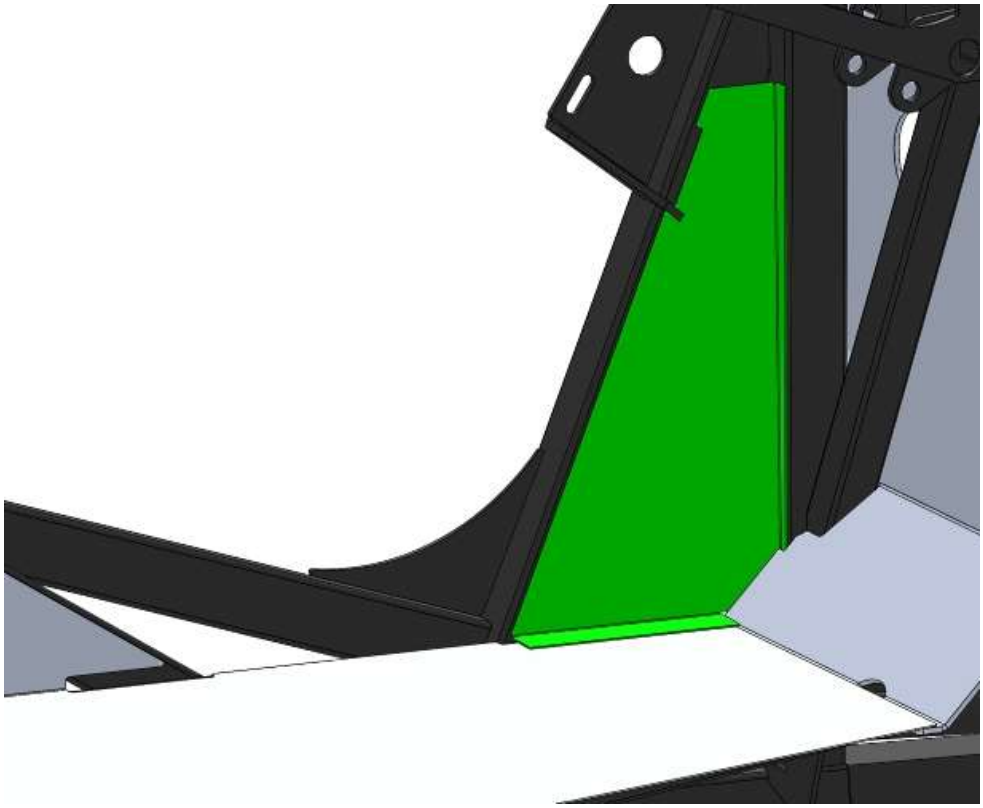
🛠 Drill, ⅛" drill bit, rivet tool, silicone, silicone gun
🚘 Packaged aluminum, Mounted aluminum, Secondary body fasteners



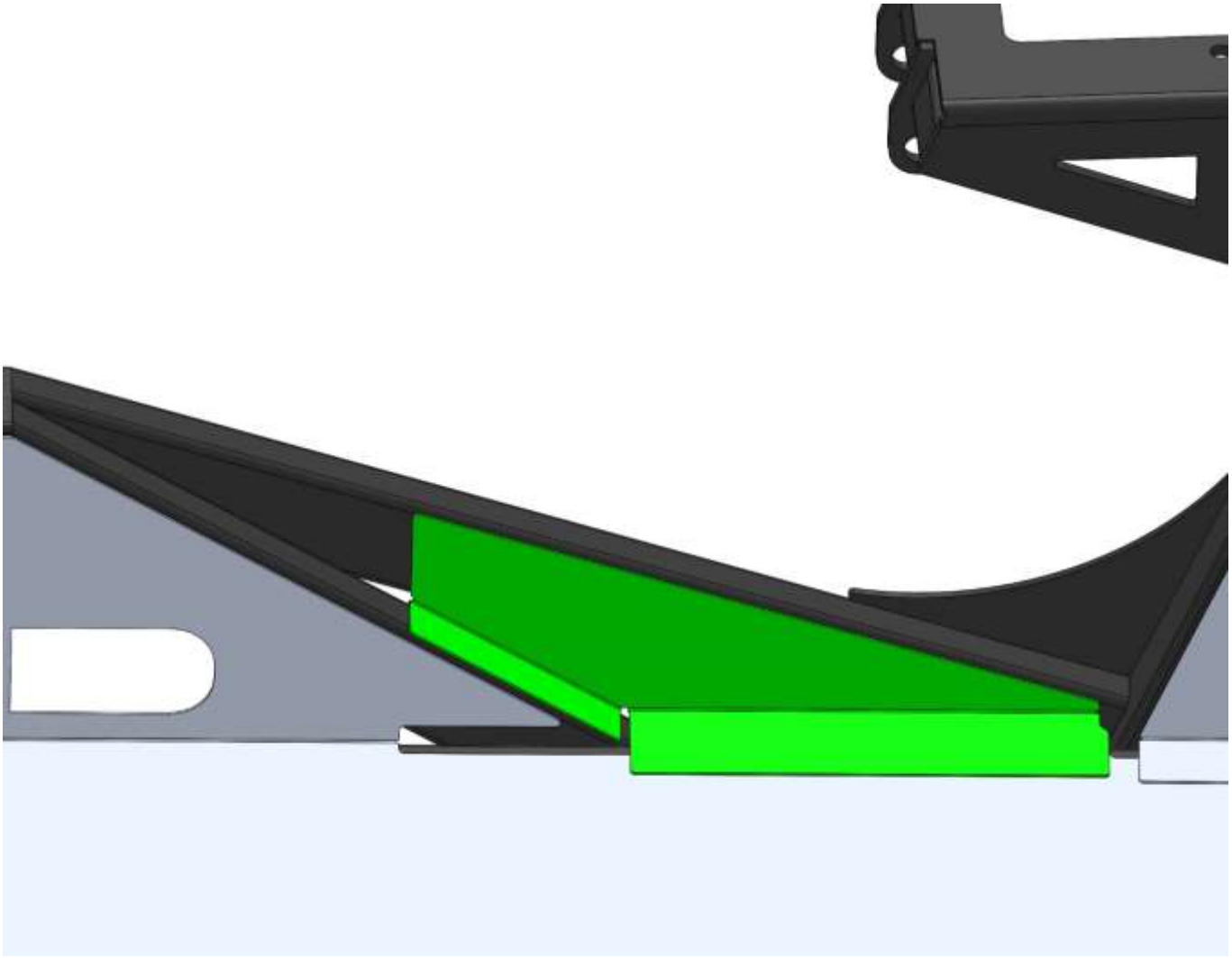
Drill and rivet the rear cockpit wall piece of aluminum on top of the floor rear lip.

Install the patch panel on the left side floor if not using a trunk release cable.

Install the drive shaft cover piece of aluminum.



Silicone, drill and rivet the front outside corner panel to the frame and floor.



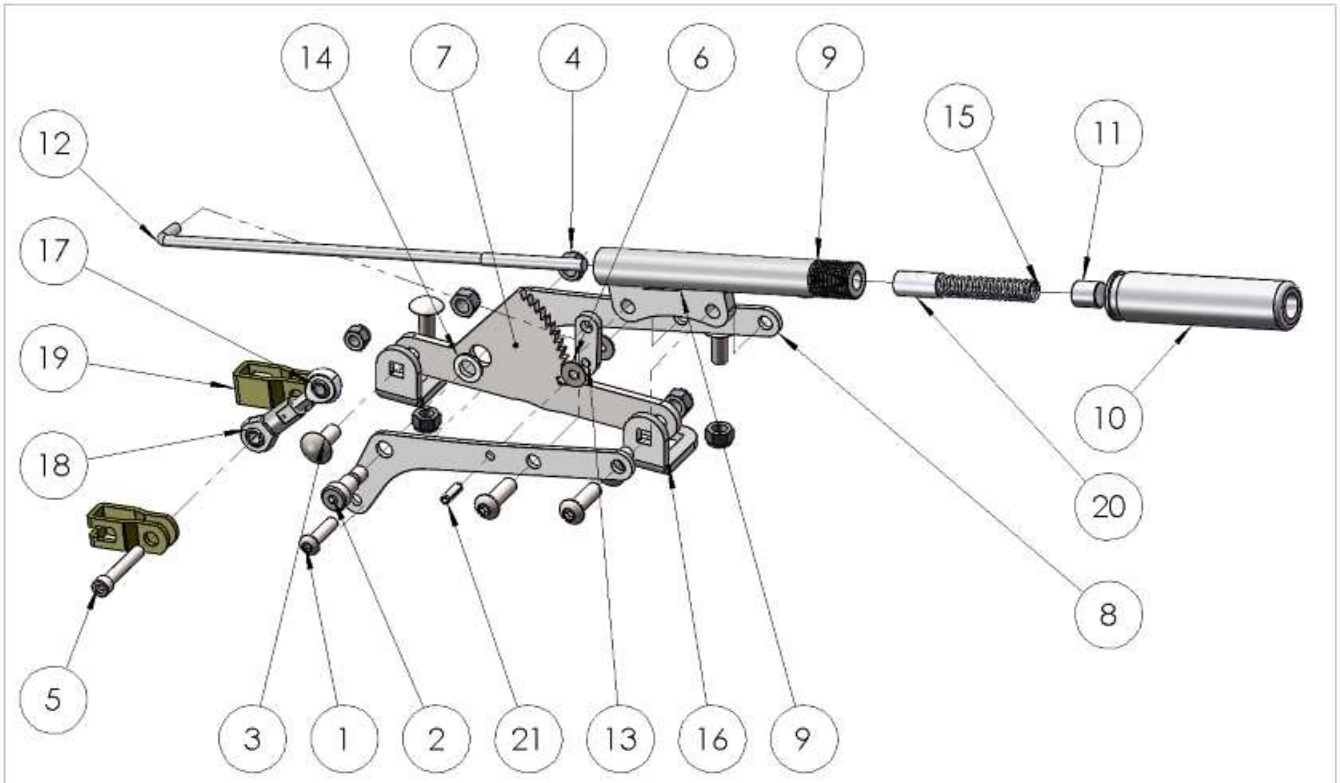
Silicone, drill and rivet the under-door aluminum wedge panel to the frame and floor.

E-brake Handle

Assembly

🛠 $^{5}/_{32}$”, $^{3}/_{16}$” hex keys, $^{7}/_{16}$”, ½” wrenches, channel lock pliers, WD-40

🚗 E-brake handle components.



ITEM NO.	PART NUMBER	DESCRIPTION	HOT ROD GEN 2/QTY.
1	34365	1/4"-20 x 1" BLACK BUTTON HEAD BOLT	3
2	13325	0.50" SHOULDER BOLT	1
3	25562	5/16"x 3/4" CARRIAGE BOLT	4
4	13963	NYLON INSERT LOCKNUT, 5/16-18 UNC	9
5	12336	1/4"-20 x 1.5" SCREW	1
6	10635	#10 WASHER	2
7	15167	FIXED GEAR	1
8	15168	HANDLE TO RATCHET MOUNT	2
9	15176	LOWER HANDLE ASSEMBLY	1
10	15173	HANDLE GRIP	1
11	15174	E-BRAKE BUTTON	1
12	10801	ANCHOR BOLT, 1/4-20 x 10", 4.25" THREAD LENGTH	1
13	15169	RATCHET TOOTH	1
14	15165	NYLON BUSHING	2
15	COMPRESSION SPRING	2.625" 6.0#/in COMPRESSION SPRING	1
16	15170	MOUNT BRACKET	2
17	15177 - 1-4 MALE ROD END	1/4" MALE ROD END	1
18	15180 - 1-4 FEMALE ROD END	1/4" FEMALE ROD END	1
19	15181	E-BRAKE CABLE CLEVIS	2
20	Nylon Spacer	0.50" OD x 0.25"ID x 1" NYLON SPACER	1
21	15178	3/16" x 0.625" SPRING PIN	1

HOT ROD
35 TRUCK

USED ON
APPLICATION

DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001

MATERIAL
FINISH
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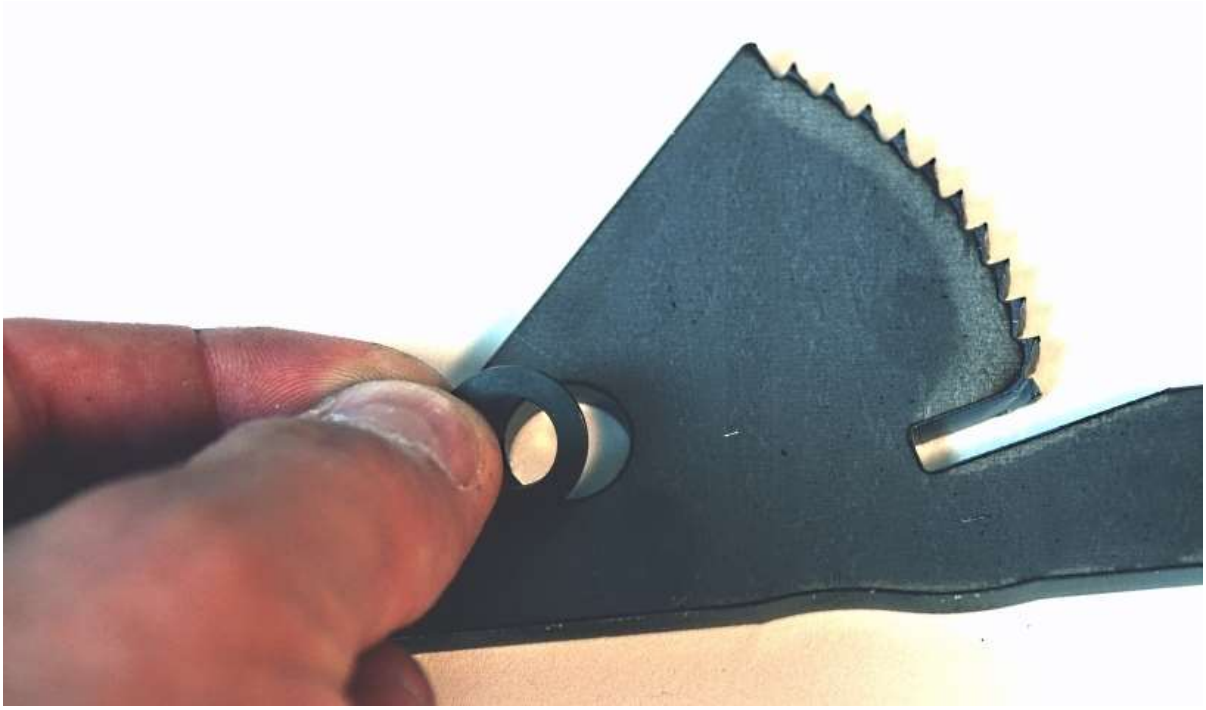
Factory Five Racing, Inc.

34648 - E-BRAKE HANDLE

	NAME	DATE
DRAWN	JI	4/26/10
COMMENTS:		

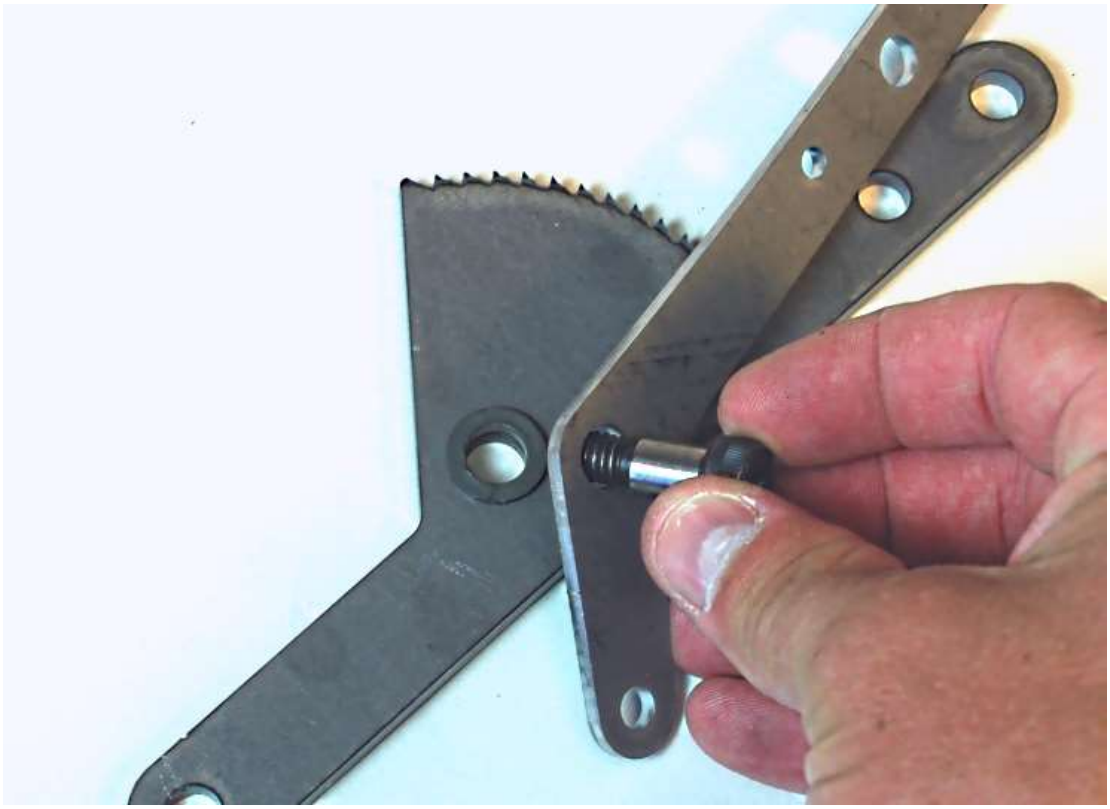
SIZE A | DWG. NO. 34648 | REV. A
SCALE:1:3.5 | WEIGHT: | SHEET 1 OF 1

Unpack the emergency brake handle components.



Push a nylon bushing into one side of the fixed gear.

Push the other bushing into the other side of the fixed gear.

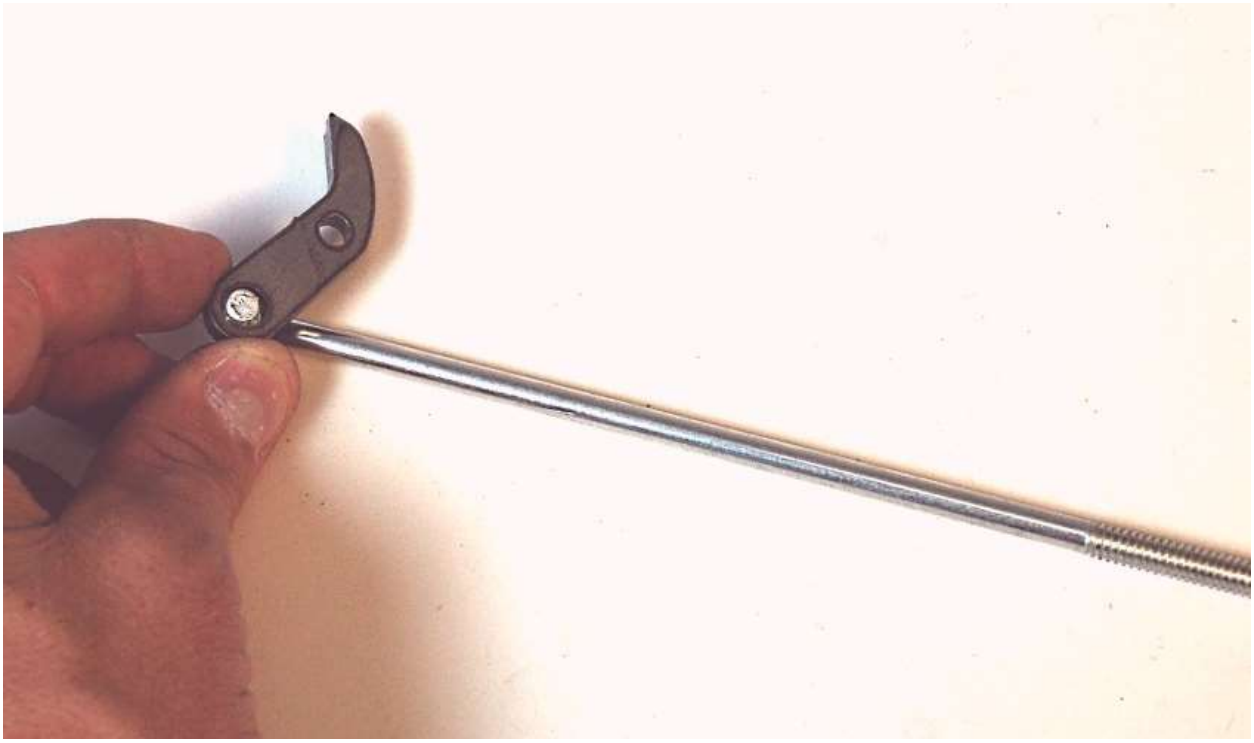


From the right side of one of the Handle to ratchet mounts, insert the shoulder bolt through the ratchet mount and then the fixed gear.

Put the other ratchet to handle mount on shoulder bolt from the other side of the fixed gear.

Using a 3/16" hex key and ½" wrench, tighten the shoulder bolt lock nut so that the ratchet to handle mount plates are against the bushings but they can still move up and down. Make sure the ratchet to handle mount plate next to the locknut does not get caught on the edge of the shoulder bolt.

Slide the lower handle between the ratchet to handle mount plates and bolt the three pieces together using the two $^{5}/_{16}$"x 1" button head screws as shown above. The bolt heads should be on the right so there is more clearance against the transmission tunnel.



Put the ratchet tooth on the long anchor bolt as shown in the picture.

Rotate the fixed gear out of the way and pass the anchor bolt up through the lower handle.

Rotate the ratchet tooth between the handle to ratchet mount plates and align the mount holes.

Push the included spring pin through the ratchet mount plates and the ratchet tooth using a pair of channel lock pliers.

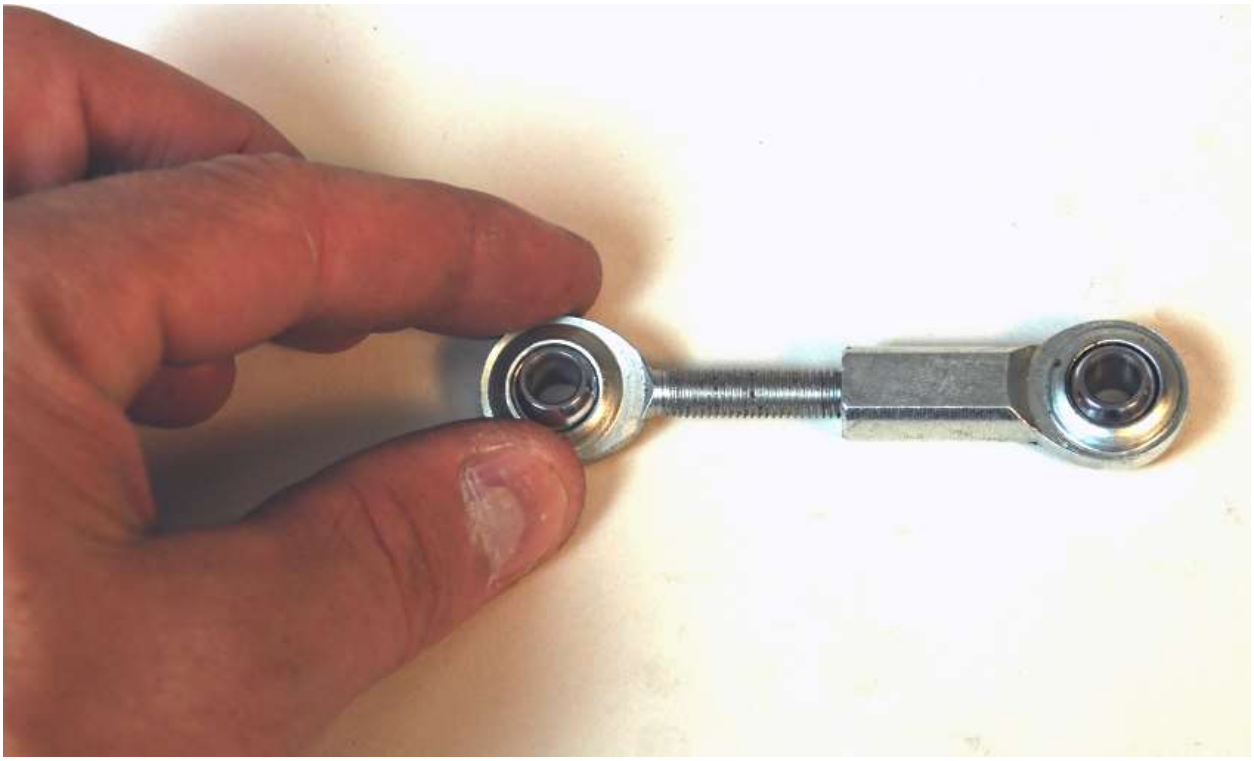
Slide the 1” nylon spacer onto the end of the anchor bolt.

There are two nylon spacers included. They provide preload on the spring so there is more force holding the ratchet tooth to the fixed gear and making the release button harder to push. Try using the 1” long spacer first. After the handle is assembled, try the handle and if desired the other ½” spacer can be added.

Spray a little WD-40 on the lower handle threads and screw the upper handle onto the lower handle.

Insert the spring into the upper handle over the anchor bolt.

Screw the button onto the end of the anchor bolt.



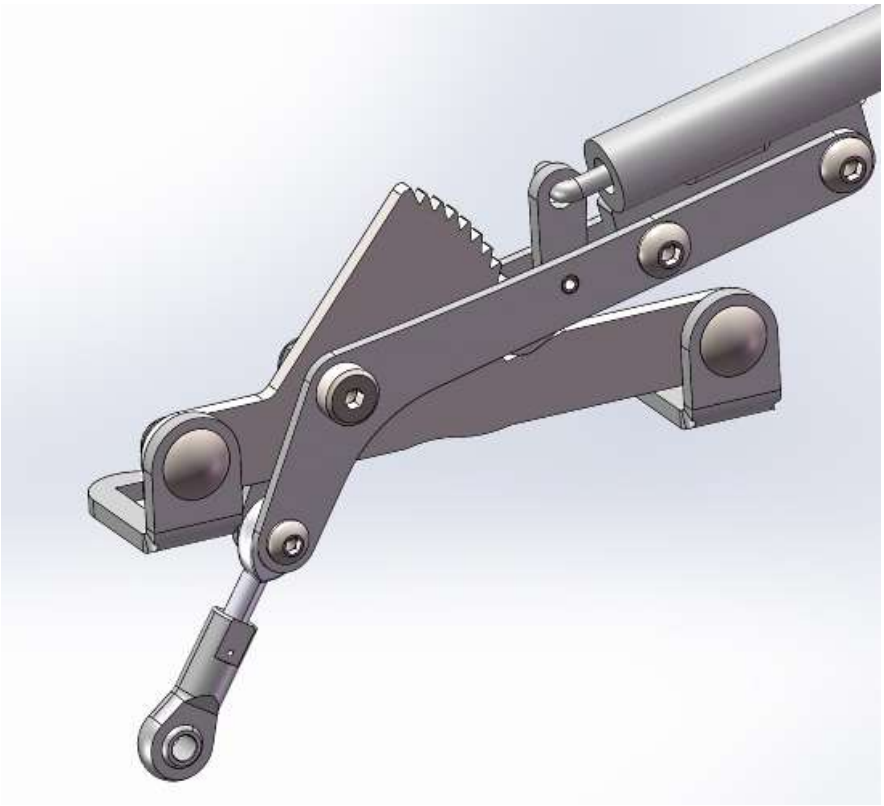
Screw the male and female rod ends together.

Use a wrench to spread the ears of the ratchet to handle mounts so that the rod end can just slide between them.

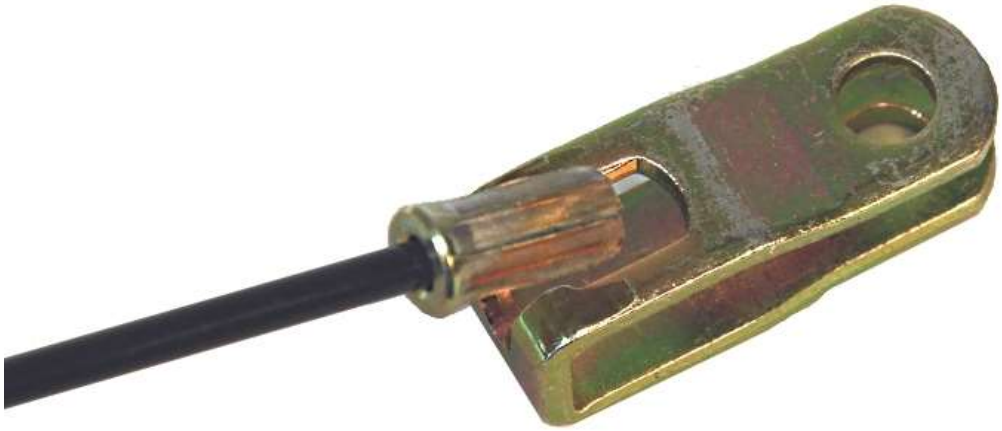
Slide the male rod end between the ratchet to handle mount plates and attach it using the ¼” flange head bolt and locknut.

Insert a $^{5}/_{16}$" carriage bolt into one of the bent mount brackets so the square shoulder is in the square hole.

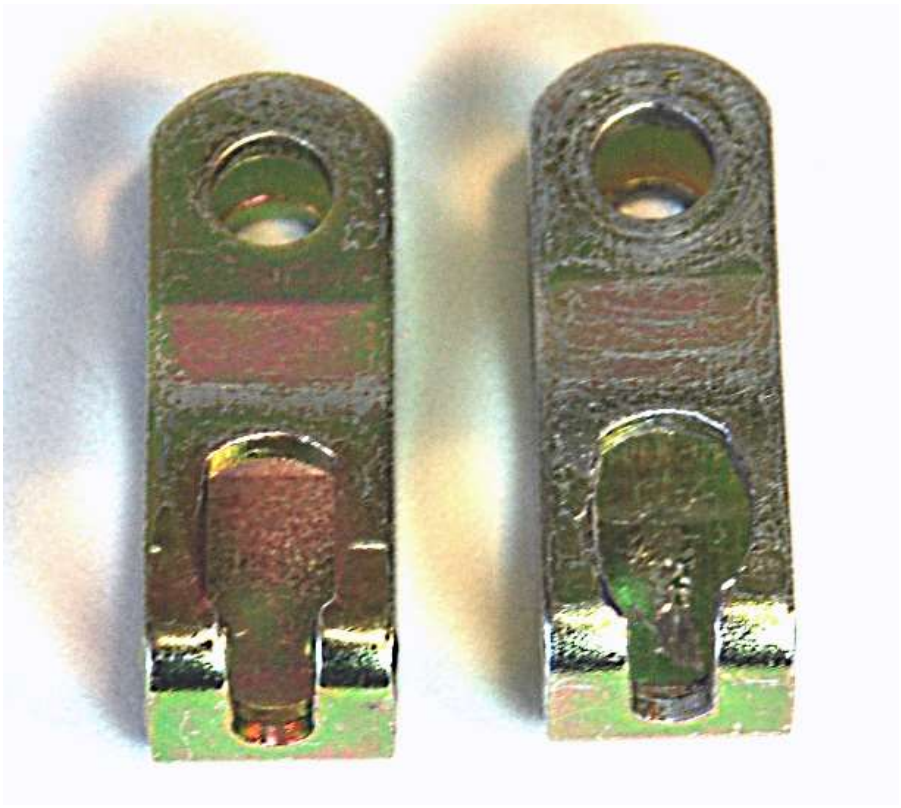
Attach the mount bracket to the front fixed gear using a ½" wrench. Leave the locknut slightly loose so positioning can be done on the frame later.



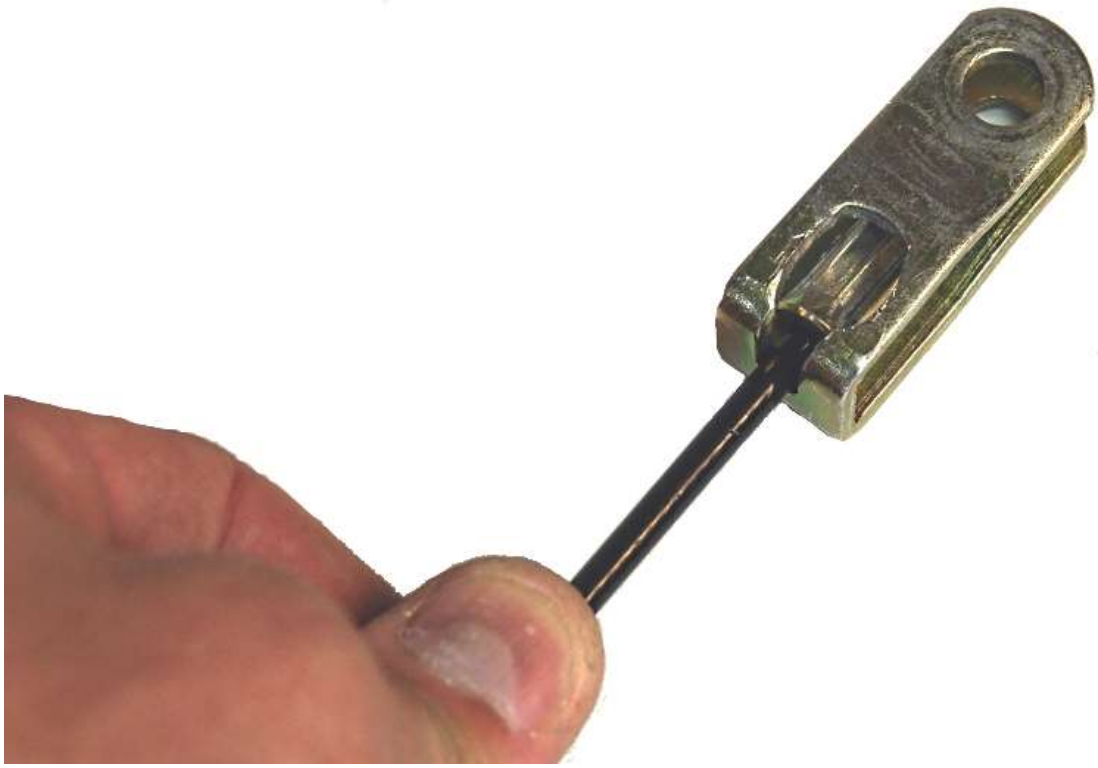
Attach the rear mount bracket to the handle using a ½" wrench. Leave the locknut slightly loose.



Check the fit of the emergency brake cable end in the brake cable clevis.

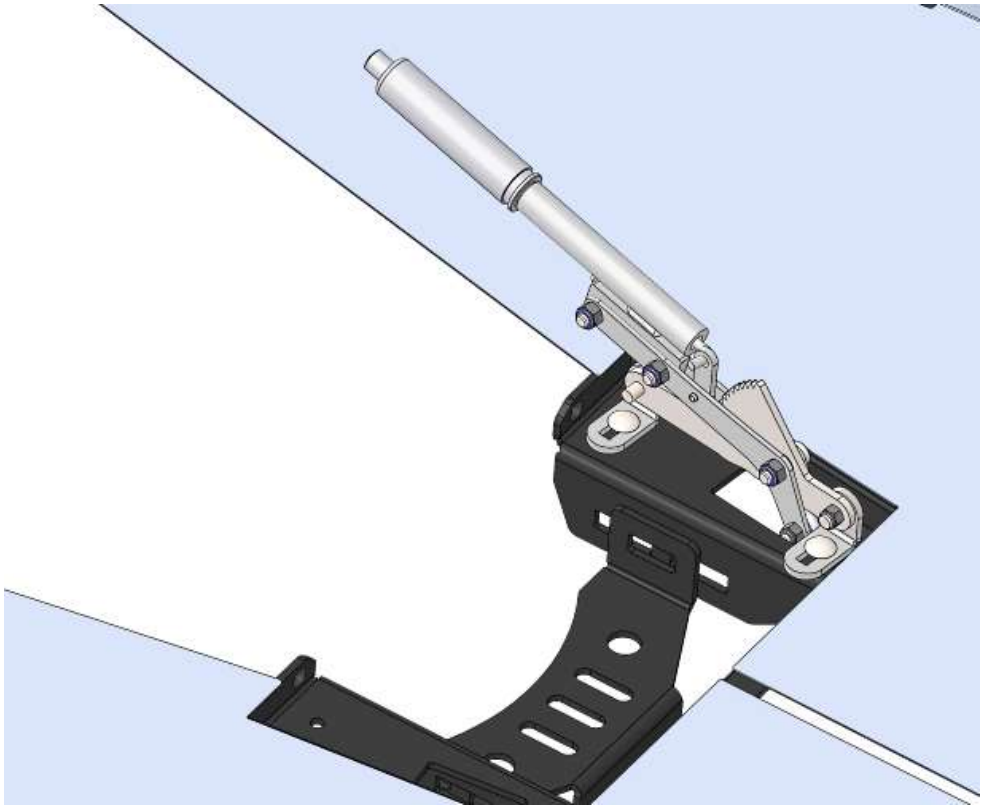


If necessary, use a drill bit and drill or a Dremel tool to open up the slot slightly.

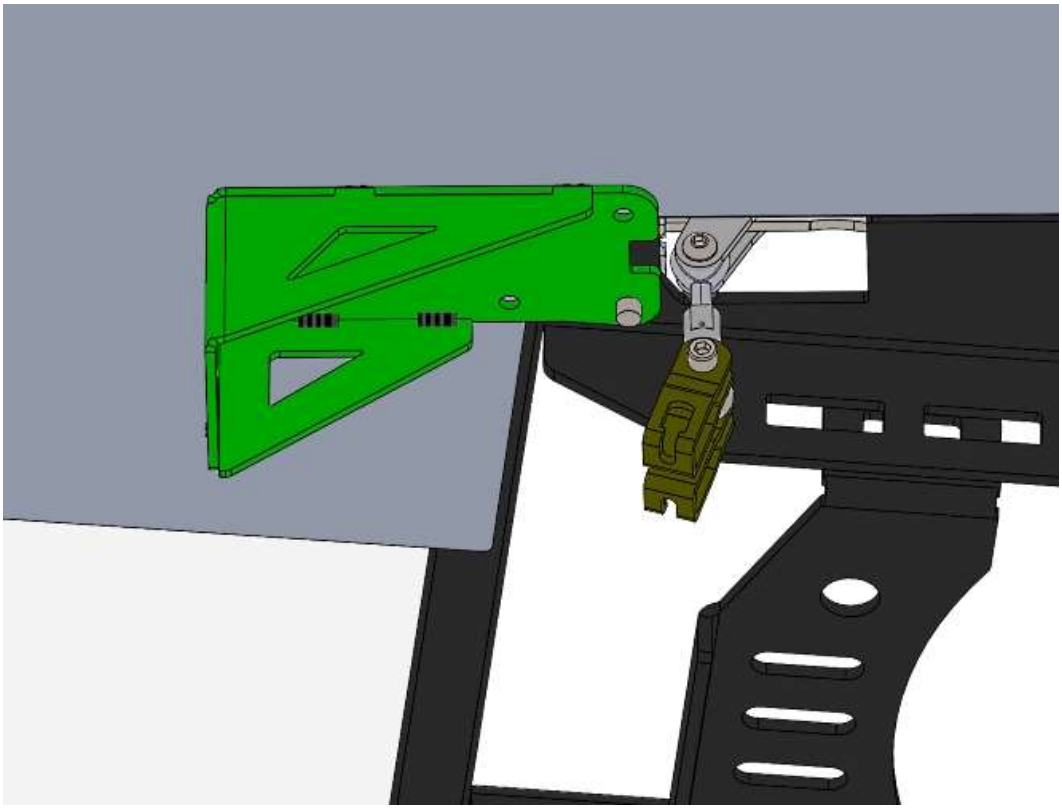


Facing the cable slots towards each other, attach one of the cable clevises to each side of the female rod end using the ¼”x 1.50” socket head bolt and locknut. Just start the nut for now, do not tighten it.

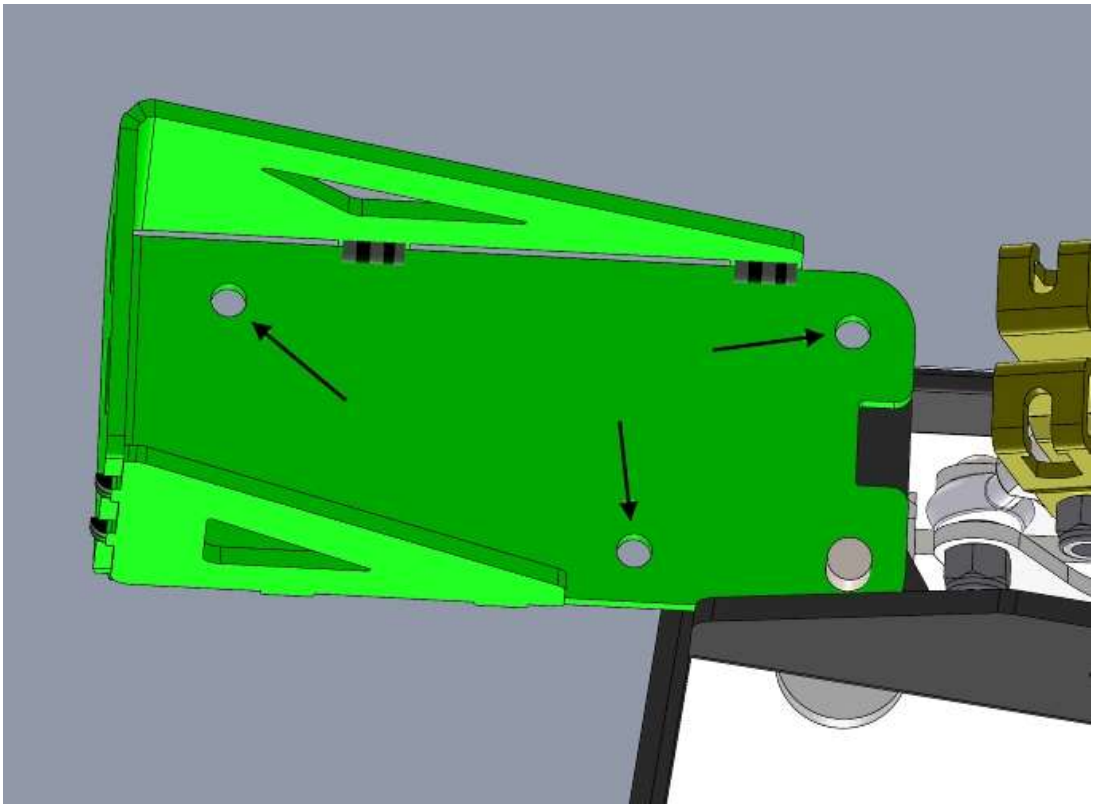
Handle Mounting and cable mount



Place the handle on the right-side transmission mount using the $^{5}/_{16}$” x ¾” carriage bolts. Only put the front locknut on.



On the underside of the frame put the cable mount on the rear handle bolt, align the front edge of the mount with the frame bracket so they are parallel then tighten the locknuts on the carriage bolts with a ½" socket.



Use a $^{5}/_{16}$" nut driver to screw the #10 x 1" screws through the floor aluminum into the frame steel.

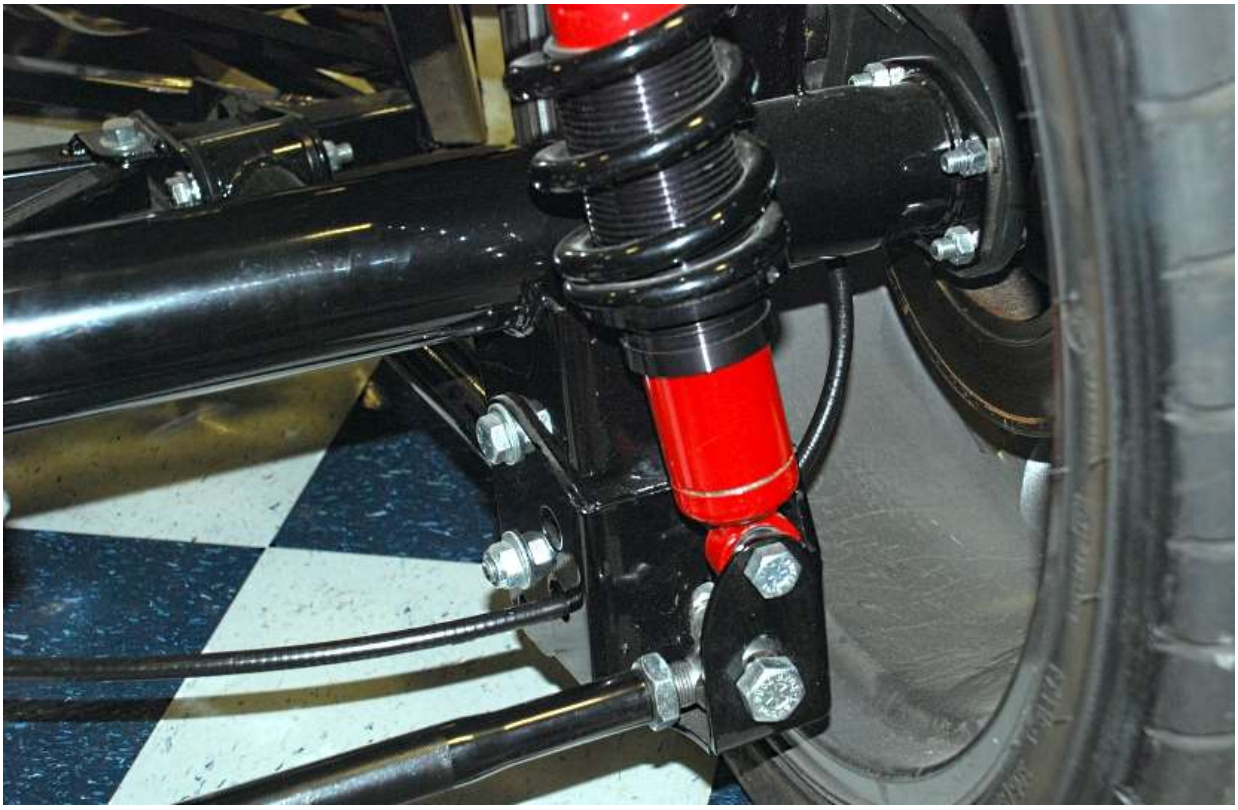
With the handle down, position the handle so that your hand can go around the grip and not hit the transmission tunnel while keeping it close to the tunnel so that it will not hit the seat.

Cables

- Your E-brake cables should be from the same car as your rear brakes.

For FFR cables, route them through the cable mount bracket holes until the sheath end clicks in place.

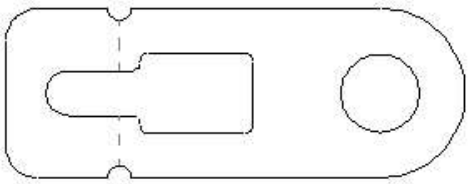
Route the brake cables over the Panhard mount if using a 3-link

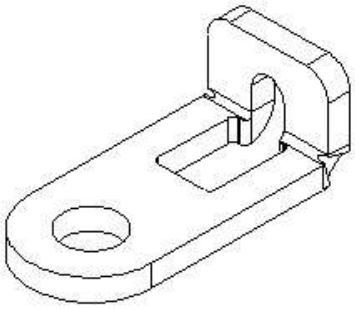


Make sure your routing is out of the way of any moving parts and the cable has slack to move with the axle. Two possible ways are shown below, either in front of the rear shock or through the lower hole in the traction lock bracket.

Attach the brake cable to the brake caliper.

Wilwood e-brake adapter





WILWOOD CALIPER E-BRAKE ADAPTER

Insert the cable end into the bent bracket then bolt the bracket to the e-brake lever.

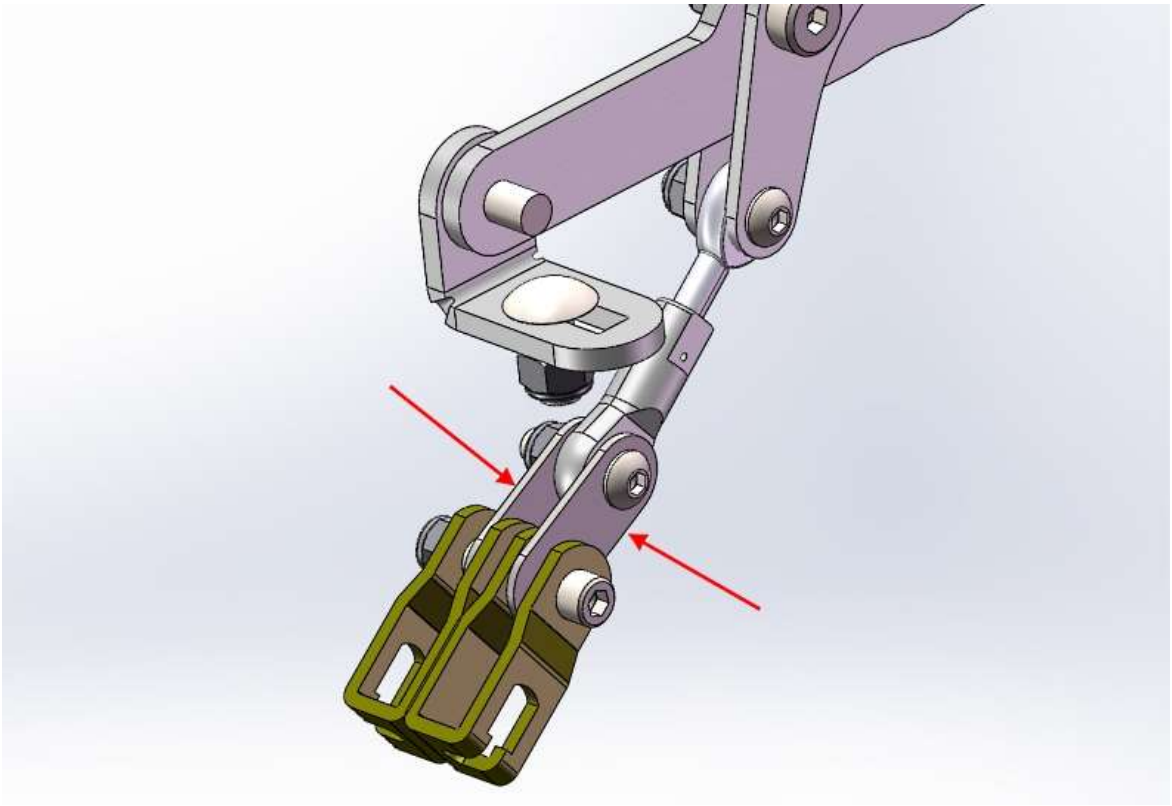
Wilwood brake routing

Run the e-brake cables from the handle cable mount back under the center differential.

Behind the center section, run the cable along the control arm then up and over to the brake caliper.

Run the right cable over the center section and right rear mount then down and over to the brake caliper.

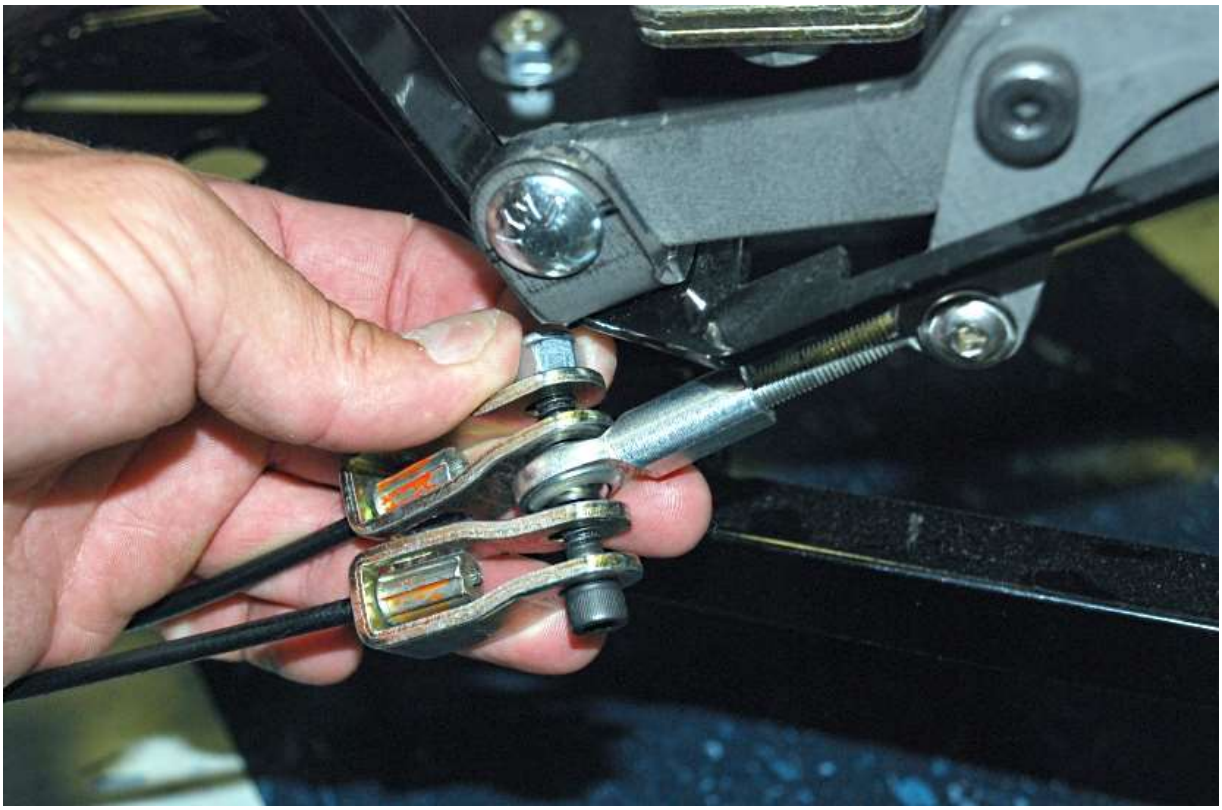
Adjustment



If using Wilwood brakes attach the two spacer brackets included with the brakes between the clevises and rod end.

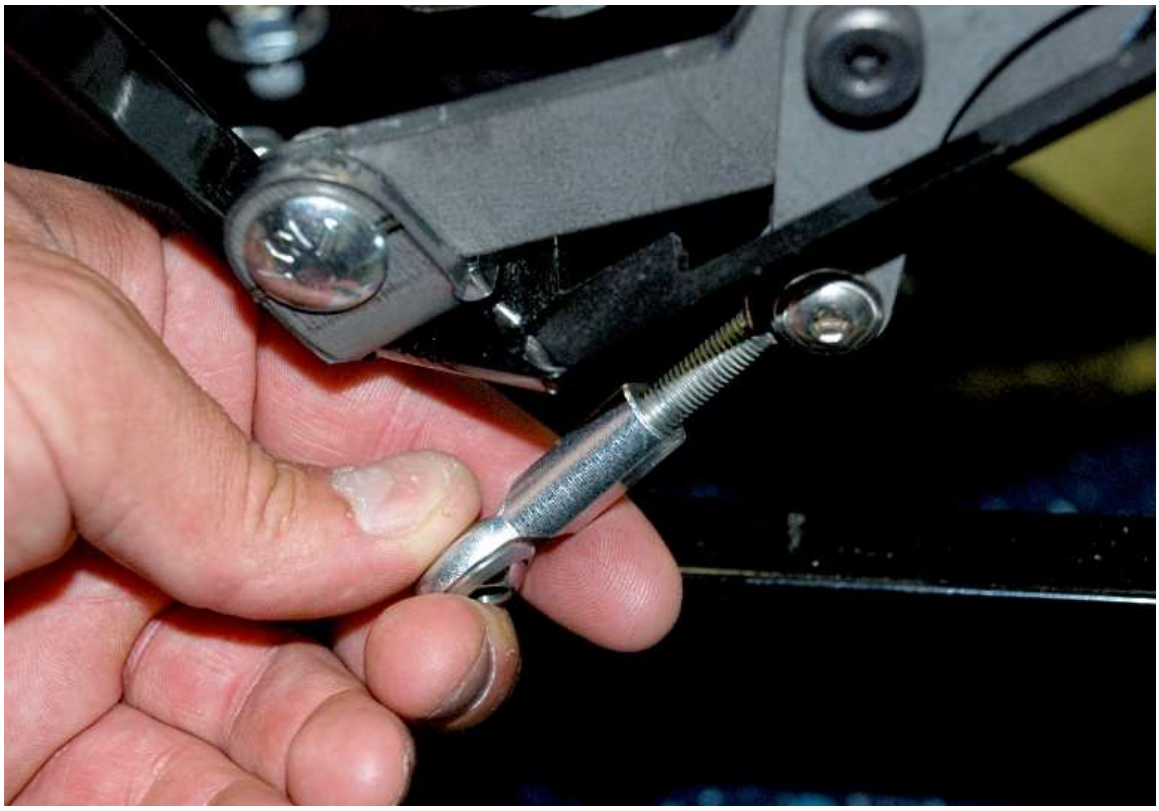
Remove the cable clevises from the rod end and attach them to the cable ends.

Adjust the rod end so that the ¼” bolt goes through the rod end and both clevises and the cable is tight.

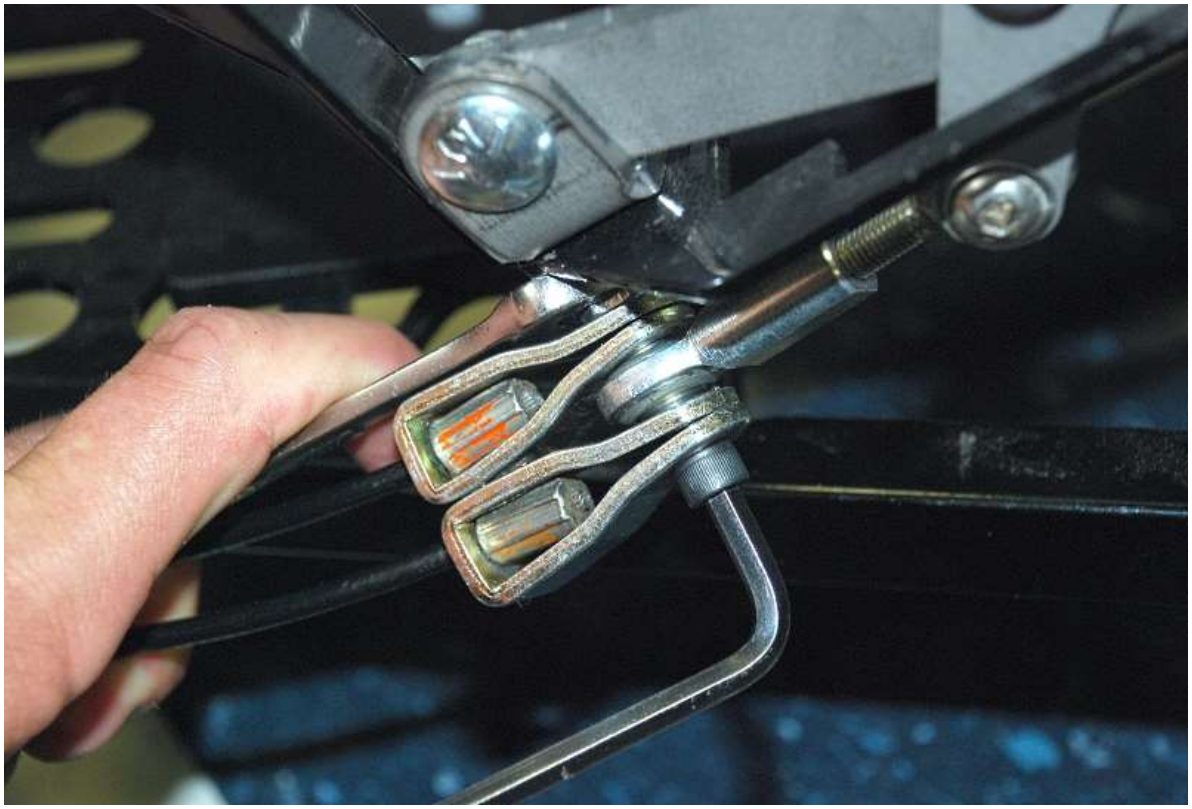


Put the locknut back on the ¼” bolt hand tight.

Slowly pull up on the handle to set the brake pads and remove any slack from the brake cables.



Release the brake and if necessary, remove the ¼” clevis bolt and readjust the rod end so that the cable is tight.



Reinstall the clevises and ¼” bolt then tighten the bolt so that the clevis ends are closed, this will prevent the cable ends from coming out.

Pull the handle up. If the bolt for the rod end hits frame, trim the frame slightly to clear.

Transmission Tunnel Cover

- Jig saw or air saw, ¼" drill bit, drill, marker, masking tape, ¼" hex drive bit, silicone, sanding tool, measuring tape, clamps.
- Mounted aluminum/components, body finish components, shifter boot components
- The pictures shown are of the older tunnel but the process is similar.
- The transmission tunnel is designed to be adjustable to allow maximum foot room for every engine/transmission combination.
- The tunnel sits on the aluminum floors and forward against the front of the footboxes and the 1.5" square bulkhead cross member.
- Depending on the thickness of the fiberglass, you may have to sand the rear inside of the tunnel to allow it to sit flat on top of the drive shaft loop/aluminum.

Insert the fiberglass transmission tunnel into the cockpit.

Look at the bellhousing to tunnel clearance. It is advisable to have at least ½" clearance between the bellhousing and the tunnel to allow the engine to torque under acceleration without hitting.

Check both sides of the engine to ensure clearance.

If there is a lot more clearance, remove the transmission tunnel.

Cut the middle area fiberglass holding the two sides of the transmission tunnel together at the front the same amount measured before.

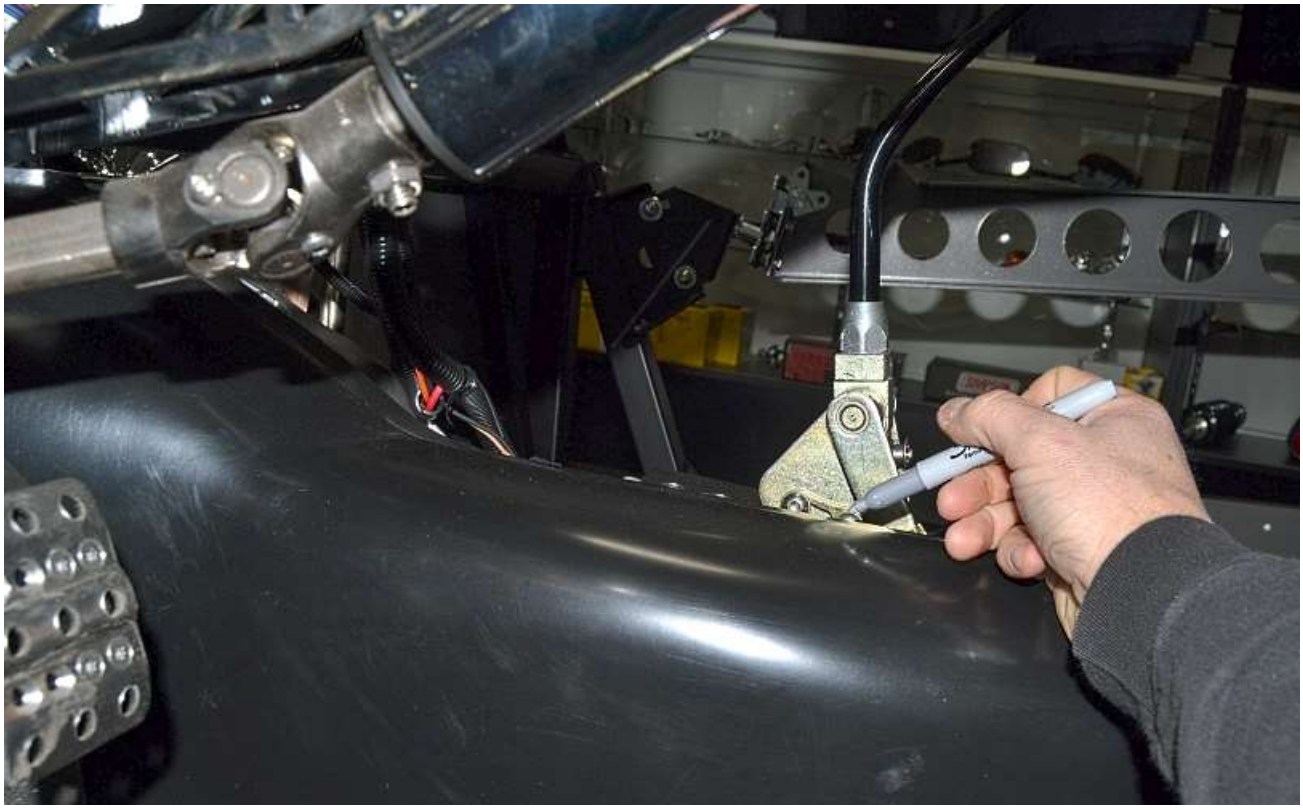
Place the tunnel in the cockpit and push the sides in until there is ½" clearance to the bellhousing and mark the floor so it can get put back in the same place.

Mark the front cut area so that the sides butt against each other when the sides are in the correct place, tape the piece together.

Check the clearance for the emergency brake handle.

If necessary, remove and trim the transmission tunnel cover for the emergency brake handle.

Reposition the tunnel in the frame and mark the front cut area so that the parts but against each other when the sides are in the correct place.



With the tunnel side positioned in the frame mark the center of the shifter handle location front to back.

Remove the transmission tunnel.

Cut the center of the transmission tunnel so that it sits down on the transmission tunnel flange.

Shifter hole

Mark the center cover where the center of the shifter is located.

Center the shifter boot ring over the point marked so that the mounting holes are front/back and on the sides.

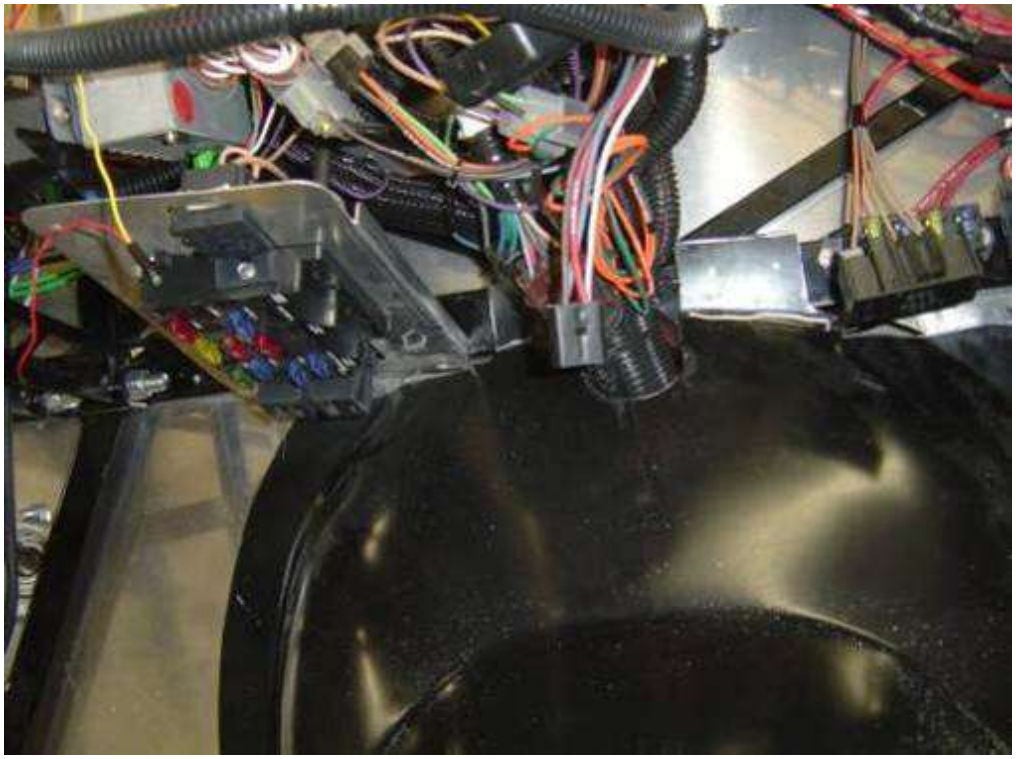
Look at the amount of bend needed on the piece.

Move the ring to the back of the tunnel and push down on the sides of the ring so that the ring forms to the shape of the cover then move the ring forward to marked location and check the shape of the ring. Bend more if necessary.

Position the ring so it is centered on the shifter point and mark the inside of the ring on the tunnel cover.

Cut the area marked with a jigsaw.

Position the transmission tunnel cover on the frame.



Position the top center piece and mark where a slot needs to get cut in the front to pass the wires into the engine bay to run to the rear of the car.

Remove and cut the center piece for the wires.

Reinstall the center cover.

- The transmission cover will get fastened after the accelerator pedal is installed.
- The shifter ring will get installed after the carpet later.

Drill silicone and rivet or screw the tunnel to the floor.

Accelerator Pedal Positioning

- 5/16", 3/8", ½" wrenches, 5/32" hex key
- Accelerator pedal components, secondary body fasteners
- There are a few things to keep in mind when locating the accelerator pedal, foot clearance to the brake pedal, clearance to the transmission tunnel height to the ball of your foot and the location for drilling the accelerator cable hole in the firewall.

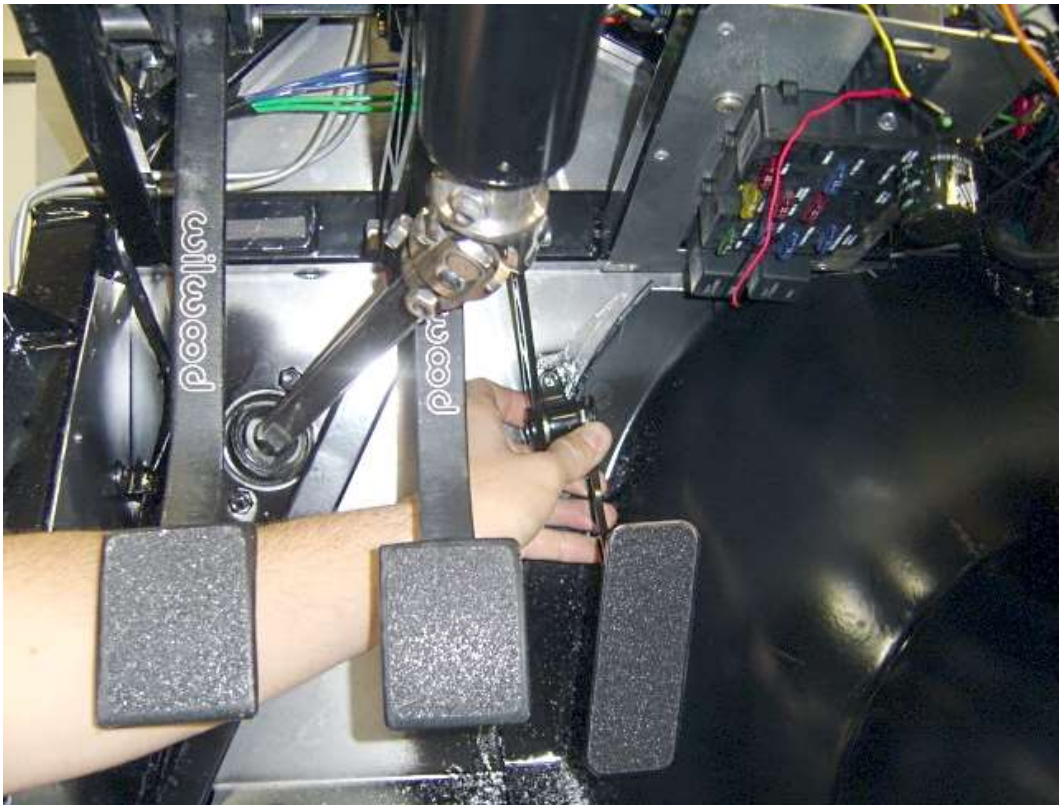
- If running a Coyote engine or other drive-by-wire use the accelerator included with that control harness.

Set the seat on the floor.

Unpack the throttle pedal and separate the lower arm from the center mount using the included hex key.

Roughly adjust the pedal as shown and reinstall the washer and screw. The pedal will get adjusted later after install.

Attach the ball stud to the top hole in the pedal using a $^{5}/_{16}$" wrench and $^{3}/_{8}$" socket.



Position the throttle pedal where it feels comfortable for you and mark the mounting holes on the aluminum.

Hold the Accelerator pedal in position and push the top up so that the top of the pedal is just below the 1.50” square tube.

Mark the firewall where the ball stud retainer is horizontal.

Check the front of the firewall that the location marked is not in the way of the engine head.

Drill ¼” throttle pedal holes in the front of the footbox.

Mount the accelerator pedal to the aluminum footbox using two ¼”-20 x ¾” flange head screws in the secondary body fasteners. We like to install these fasteners from the engine side of the firewall for a cleaner look.

- The throttle pedal should get final installed after the carpet is installed. Install it now though to cut the tunnel and do the accelerator cable.

Mark the flange on the side of the tunnel if it hits the accelerator pedal mount.

Attach the throttle pedal mount to the firewall.

Check the full range of the accelerator pedal travel to ensure that there are no interferences with the pedal or travel.

IRS CV axle Nut

🛠 Impact wrench, 36mm deep socket, Torque wrench.
✋ Wait to torque the axle nut until after the e-brake cables are installed.

Apply the emergency brake.

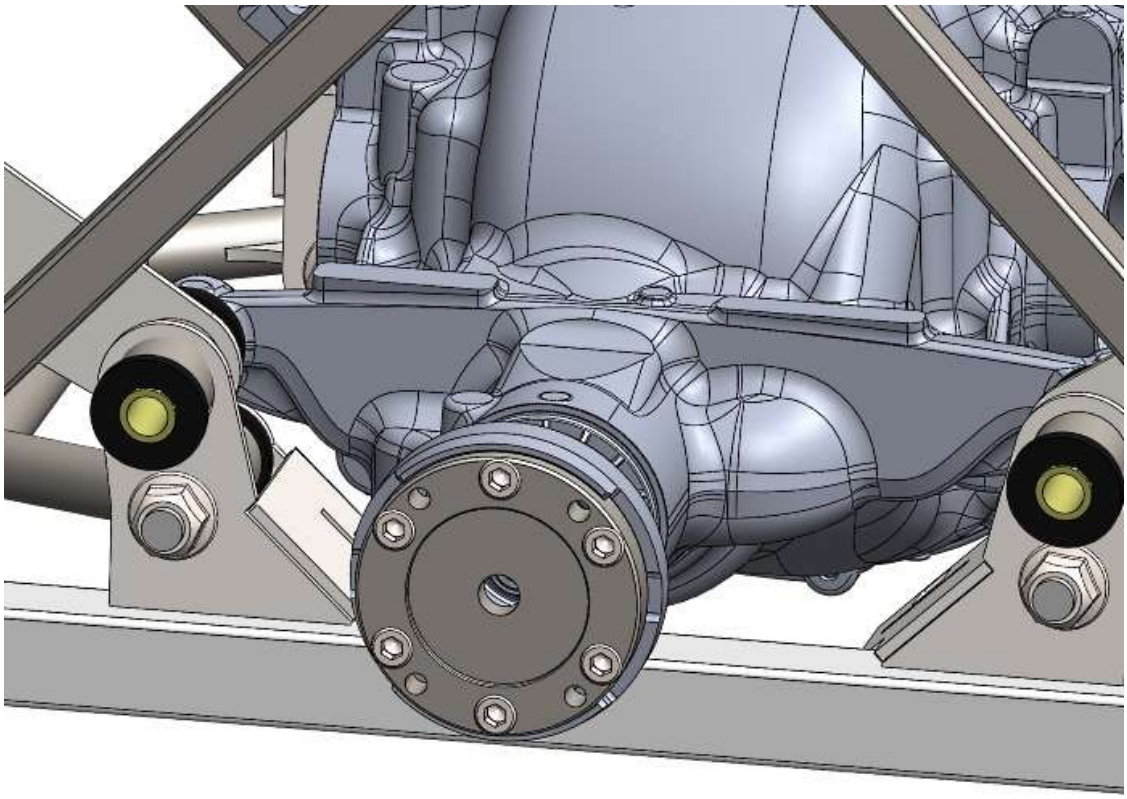
Use a 36mm deep socket and impact wrench to tighten the CV axle nut until it touches the bearing.

Use a torque wrench to torque to **133Nm (98 lb-ft) then rotate the nut an additional 45°**.

IRS Driveshaft adapter

🚘 There are two different Driveshaft adapters; one for 2015-17 Automatic transmission cars an all 2018+ center sections which is coated clear zinc. The Driveshaft adapter for 2015-17 manual transmission center sections is coated yellow zinc. The standard one included is the clear zinc adapter.
🚘 Driveshaft adapter, fasteners
🛠 8mm hex socket, torque wrench, Loctite.

Apply Loctite to the (6) M10 x 25mm socket head screws.



Attach the driveshaft adapter to the center section pinion flange and torque the bolts in a star pattern to **55Nm (41 lb-ft)**.

Driveshaft

- Appendix I has the various driveshaft lengths that we stock if you are using a unique engine or

transmission.

Install the drive shaft next. Begin by inserting the front of the driveshaft onto the output shaft of the transmission.

Fit the driveshaft snug against the yoke and install the bolts and tighten. You can put the transmission in gear to stop the driveshaft from turning while you tighten. Torque the bolts to **95Nm (70 lb-ft)**.

Insert the driveshaft into the transmission, bolt the rear flange to the driveshaft adapter and torque the bolts to **95Nm (70 lb-ft)**.

Fill the engine and Transmission with fluids. See Appendix K for specifications and capacities.

Seat Install

🛠 Drill, ⅛” drill bit, marker
🚘 Seats

With the body still on, set the rear cockpit fiberglass piece in place to determine the seat location. Position the seats in the chassis and adjust them to where you would like.

Without moving the seat, pull up on the rear of the base of the seat (it has Velcro at the rear) to expose the seat frame.

Mark the location of the seat frame on the aluminum floor.

Remove the seat and verify that the location of the mounting points intersects with the frame rails by looking at the floor rivets.

Drill (4) holes through the metal framework of the seat and through the frame.

- Do not mount the seats yet as you still need to install the aluminum carpet.

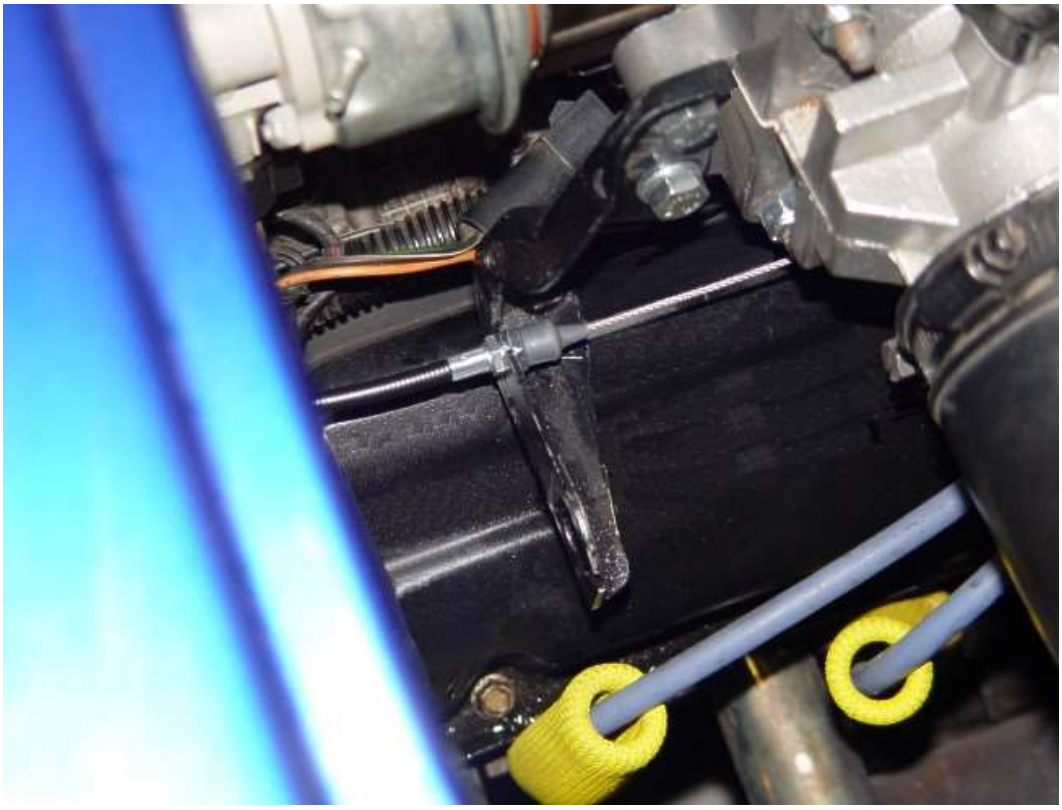
Accelerator Cable

- $^{5}/_{64}$" hex key, ⅜", $^{7}/_{16}$", ½" wrenches, wire cutters.
- Accelerator cable components, insulated clip hardware
- The cable design is set up for a 96-04 4.6L Mustang engine with an OEM pedal but using the supplied ball studs and retainers it can be adapted for all applications.

87-93 5.0L Fuel Injected Applications

Run the accelerator cable to its proper position on the engine.

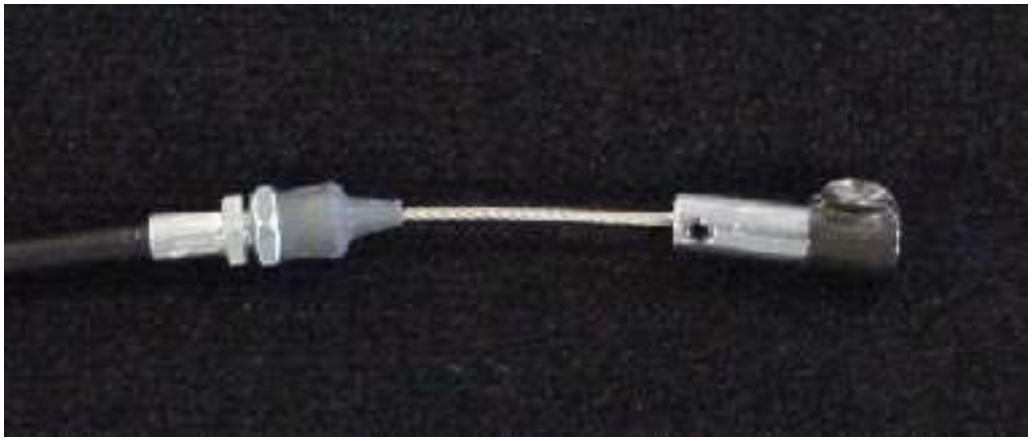
Attach the engine end of the cable sheath to the cable mount on the intake using ⅜" and $^{7}/_{16}$" wrenches and push the cable wiper onto the remaining threads.



Put a dab of silicone on the rear edge of the rubber wipe then push the rubber wipe back onto the threads.

There is a ball stud and retainer in the accelerator cable components to attach to the throttle body on 87-93 applications.

Cut the barrel fitting off the end of the cable.



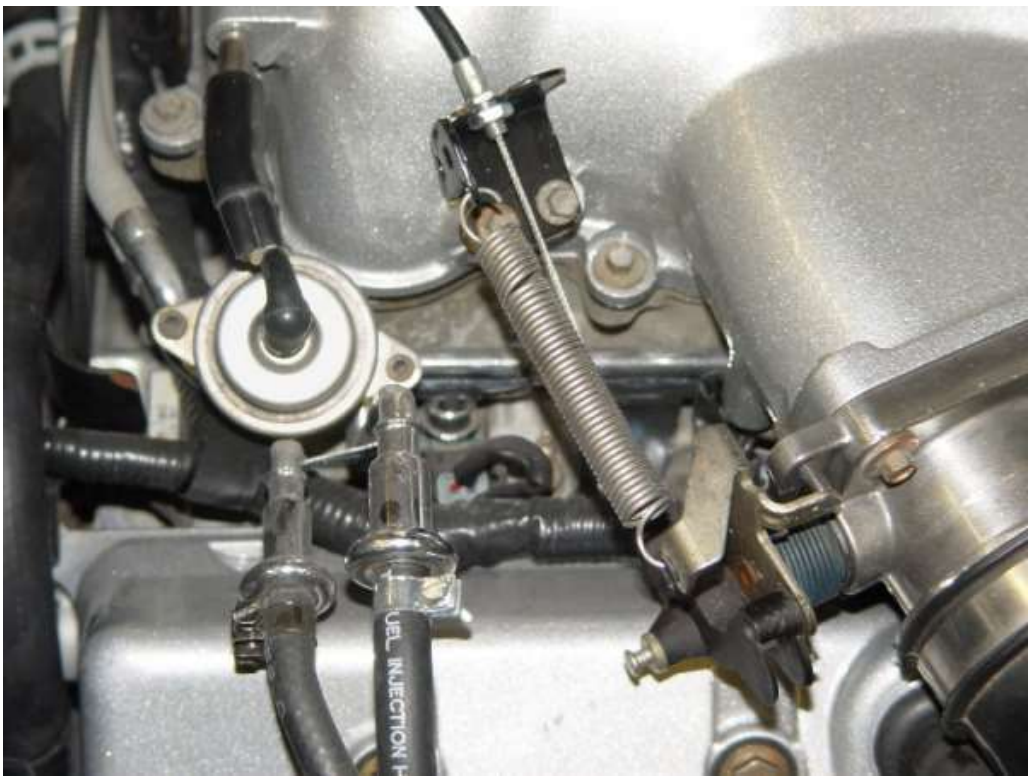
Push and twist the ball stud retainer onto the end of the cable and attach the ball stud retainer using a 5/64" hex key.

Push the ball stud retainer onto the ball on the bottom of the throttle body.

Make sure the accelerator cable is tied up and out of the way of moving or hot parts as well.

Check the idle screw underneath the throttle body to see if the throttle arm is hitting it. If it is not, either loosen the ball stud retainer set screw and readjust the cable or, readjust the accelerator pedal until the idle screw hits the throttle arm. You will notice a fairly high idle later when the car starts if the throttle is held open.

94-04 4.6L Fuel Injected Applications



Accelerator cable mounted on 1998 4 valve Intake.

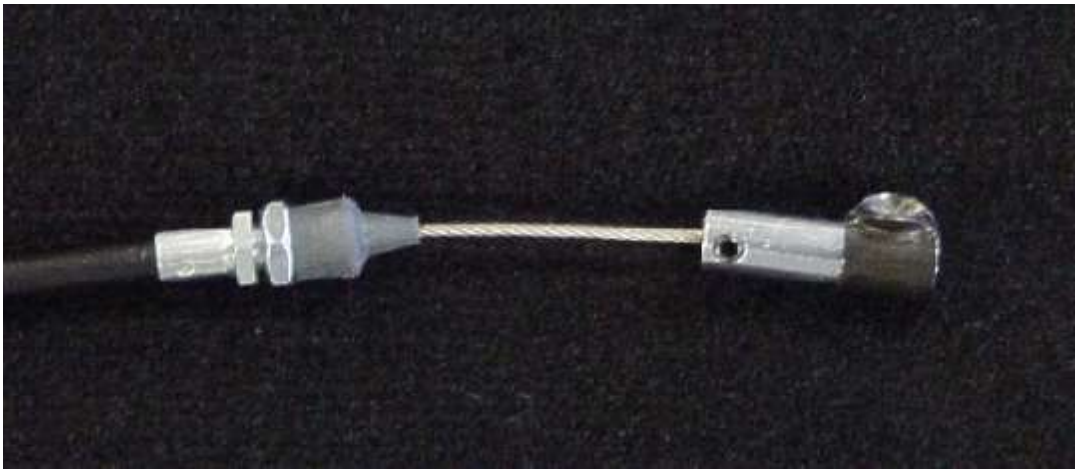
Accelerator cable mounted on 1996 2 valve Intake.

Carbureted applications

If necessary, attach the supplied ball stud to the carburetor in the appropriate location. Refer to the carburetor instructions for placement.

Attach the ball stud retainer to the ball stud.

Using a pair of wire cutters, cut the barrel fitting off the cable.



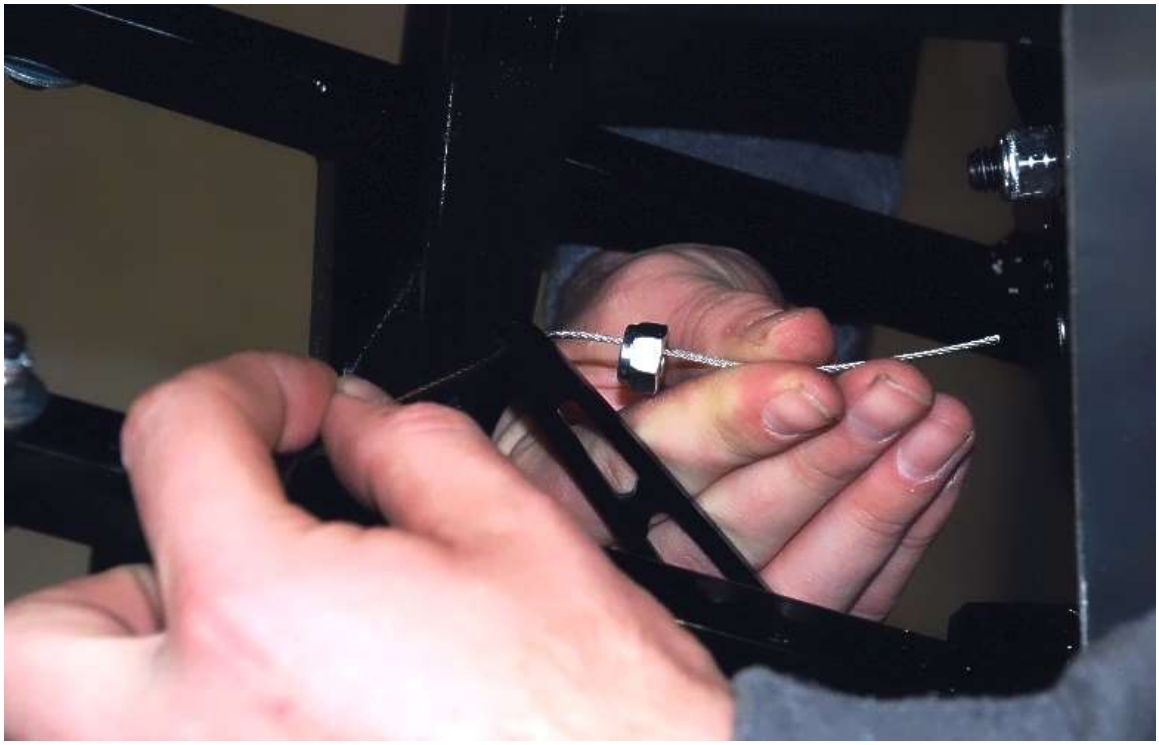
Push and twist the ball stud retainer onto the end of the cable and attach the ball stud retainer using a 5/64" hex key.

Attach the engine end of the cable sheath to the cable mount on the engine using 3/8" and 7/16" wrenches.
Put a dab of silicone on the rear edge of the rubber wipe then push the rubber wipe back onto the threads.

Interior Fitment

Hold the pedal ball stud retainer up to the firewall and mark the center location to drill the cable hole.

Drill a 5/16" hole for the accelerator cable.
Pass the cable sheath through to the cockpit.



Thread the inner cable through the cable retaining lock nut from the accelerator cable components assembly.

Tighten the accelerator cable locknut to the cable sheath.

Push the ball stud retainer onto the throttle pedal.

While pulling the cable tight, push the accelerator pedal up until the ball stud retainer hits the end of the throttle cable and clip off the cable ball fitting end so that the cable is long enough to go into the ball stud retainer $^{3}/_{8}$" and get tightened with the set screw.

Push and twist the ball stud retainer onto the end of the cable and attach the ball stud retainer using a 5/64" hex key.

Check the full range of the accelerator pedal travel to ensure that there are no interferences with the pedal or travel.

- After driving the car for the first time you may want to adjust the lower pedal location for optimum heal/toe and shoe size differences.

Remove the accelerator pedal until the carpet is installed.

Seat Harnesses

- ¾" wrench, ¾" socket, ratchet
- Seat harnesses/fasteners
- These have to be installed before the body because the bolt may be difficult to install with the body in place.
- Even if you are not going to install the upper seat harnesses, place the bolt and nut on the chassis as shown in case you or the next owner decided to install them. This makes is much easier in the future.

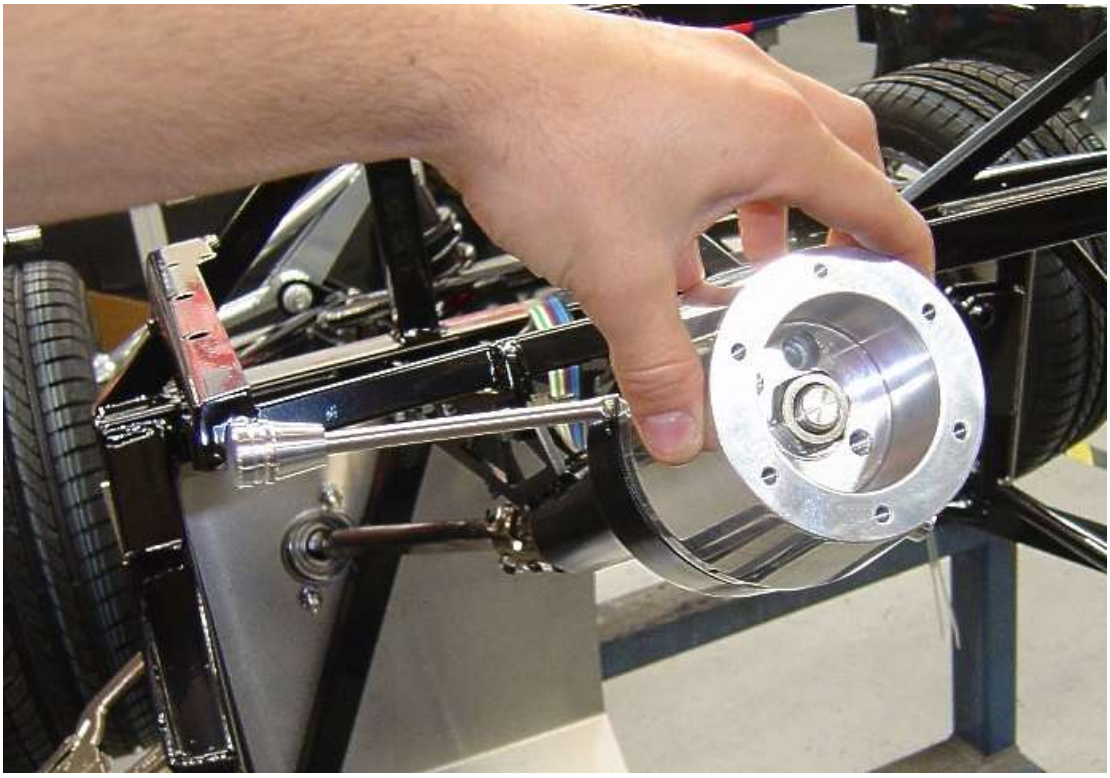
The shoulder part of the harness is mounted to the U-shaped bracket above the gas tank.

Adjust the length of the shoulder straps to fit.
Fasten the belts with the ½" fasteners to the bottom of the plate.

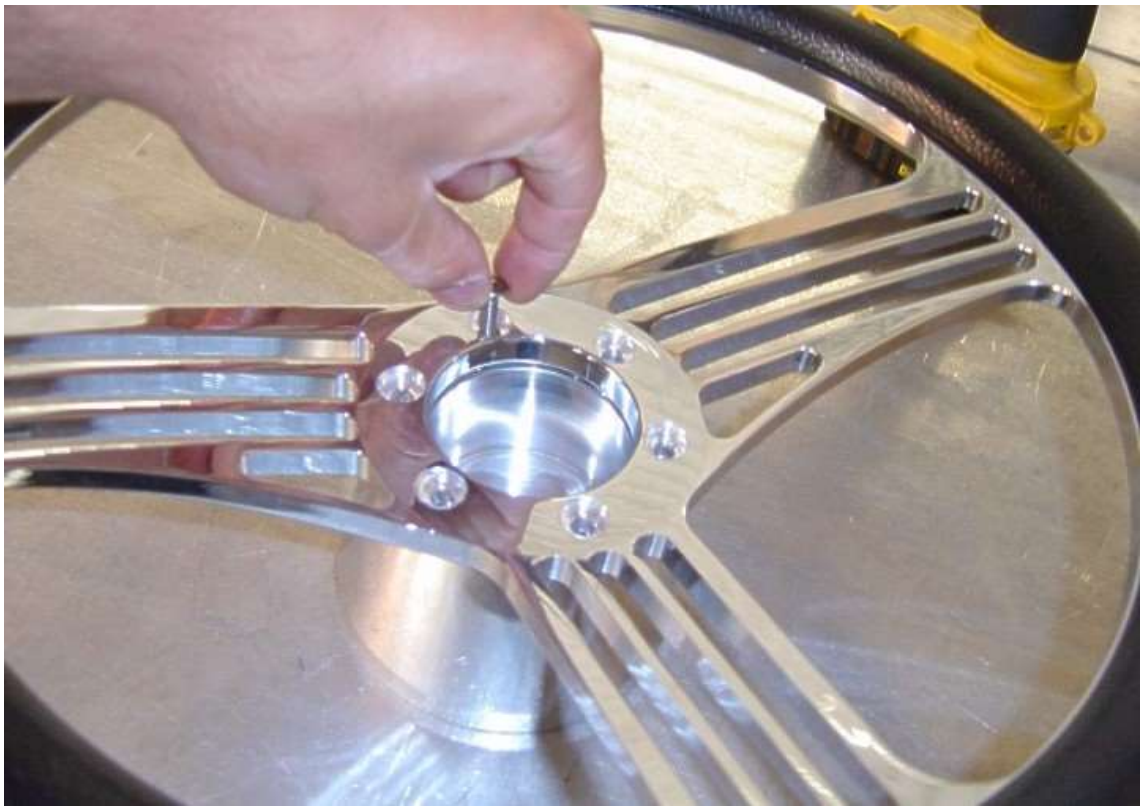
Install lap portion of the harnesses to the mounts on the chassis with the supplied hardware. It is a good idea to mount the belt on the outside of the tabs to provide the most amount of space for the seat.

Steering Wheel

- Steering wheel/hardware.



Attach the steering wheel hub to the steering column with the nut which came on the steering column.



Mount the steering wheel to the hub using the fasteners which came with the steering hub.

- The steering wheel center section is installed after aligning the car

Wheels

- See the Appendix for wheel/tire specs.

Install and torque your wheels. Make sure they rotate freely and do not interfere with the brake calipers, lines, or any suspension components.
Lower the car off the jack stands and onto the ground.

Go-cart the Chassis

- check the car using the suggested "Final check" sheet in the appendix

Before you install the body is the best time to double check all of your hoses and wires to look for leaks, loose connections or interference with moving parts. Running the engine, and moving the car (even just back and forth in your driveway if you don't have a safe area to test) and using the brakes and putting the car in gear helps double check that all of your systems are working properly. Steer the wheels from side to side and check to make sure your flexible brake lines have plenty of length, and your steering moves freely, also check for wires or anything that can melt close to your exhaust components.

Front Suspension

- See the Appendix for alignment and ride height

Set the ride height of the frame.
Align the front suspension if driving the chassis.

Once the car has been aligned, use a 1⅝" wrench to loosen the upper control arm large jam nut and put some Loctite on the threads where the jam nut will sit.

Retighten the jam nut.

Fluid Levels and Grease

🛠 Grease gun, chassis grease, ratchet, rags
🚘 Transmission fluid, rear axle gear oil, engine oil, coolant, water

Transmission

Fill the transmission with fluid and install the shifter assembly. Leave the shift handle and knob off for now.

Engine

Fill the engine with Oil and coolant. Both these fluids should be rechecked after you have started the engine for the first time. Make sure there is some coolant in the overflow to start out, about ⅓ full is good.

Suspension

All of the suspension and steering components that have grease fitting need to be greased. With a grease gun squeeze grease into each fitting on all the control arms, including rear lowers on a slid axle, and tie rods.

General

Double check all your hardware, make sure your wiring and hoses are away from extreme heat and moving parts.

Make sure the steering turns freely lock to lock, and make sure your brake flex lines have enough slack for the full range of wheel movement.

Get the engine up to temperature and check for leaks and make sure the fan is working.

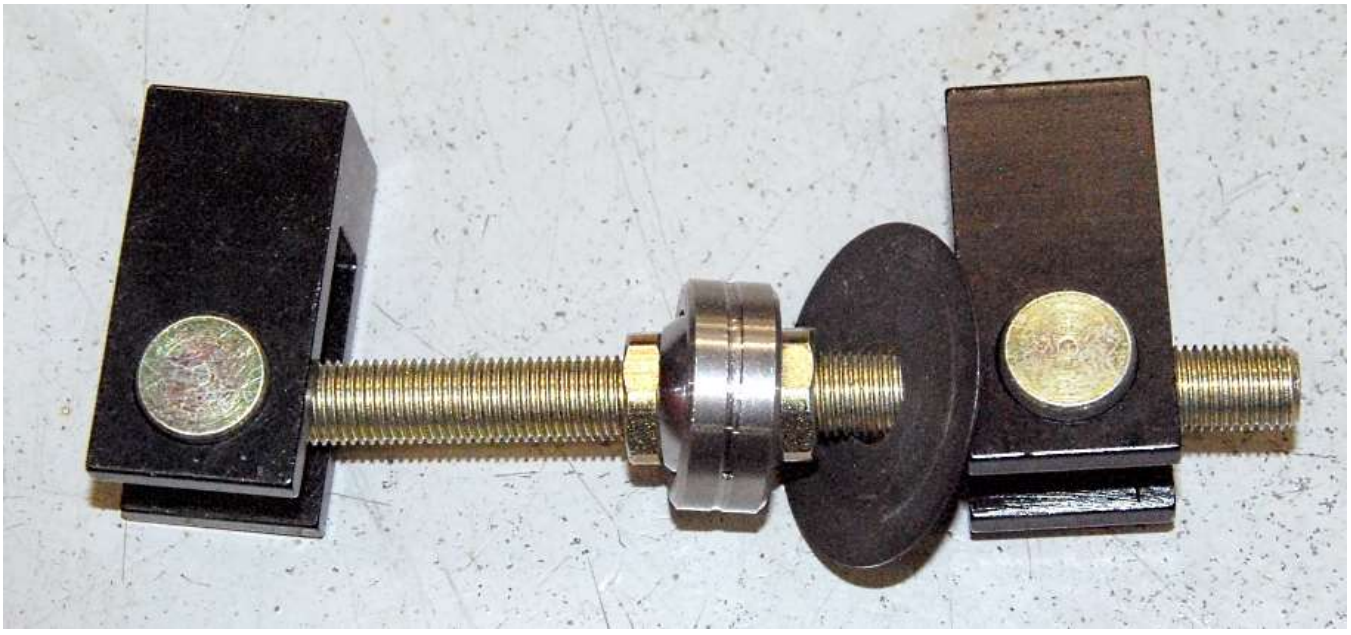
After running the car for the first time once coolant is added and while the system is still warm, retighten the hose clamps used on the cooling system.

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.

 If you do this, bolt the seat harnesses in and use them 

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 balance bar (the set up and adjustment procedure is detailed in the paperwork that came with the pedal-box) Set up your brakes so that the fronts lock up just before the rears.



The brake pedal balance bar and brake pedal bearing looks like this.

Chapter 4 – Body Work

Door Hinge

🛠 $^{9}/_{16}$”, ¾” socket, ratchet, $^{5}/_{16}$” Hex key
🚘 Door hinge components

Mount the door hinge standoff to the frame with the small ears at the top using the 1.25” ½” carriage bolts and flanged locknuts leaving the bolts just loose enough so the standoff can slide.

Tighten the locknuts with a ¾” socket so that the assembly can just slide around.

Install 3/8" socket head bolts on the front hole on the hinge standoff as hinge stops using a 5/16" hex key and 9/16" socket.

Body (Temporary)

🛠 Tape measure, 5/16" drill bit, (2) Jack stands, extra person, clamps, 3/16" hex key, floor jack
🚘 Body, Secondary body fasteners assembly.

Check the location of the jack stands on the frame. The body will come down so that it is flush with the bottom of the frame. If necessary move the jack stands so they will not hit.

Use two people to mount the body, one person on either side is the easiest way to lift the body.

Pull the sides of the body outward ever so slightly to get the front of the body around the frame and front control arms. Make sure to tuck the front sections of the body around the upper control arms.

Clamp the top of the dash area to the firewall.

Rear wheel well mount

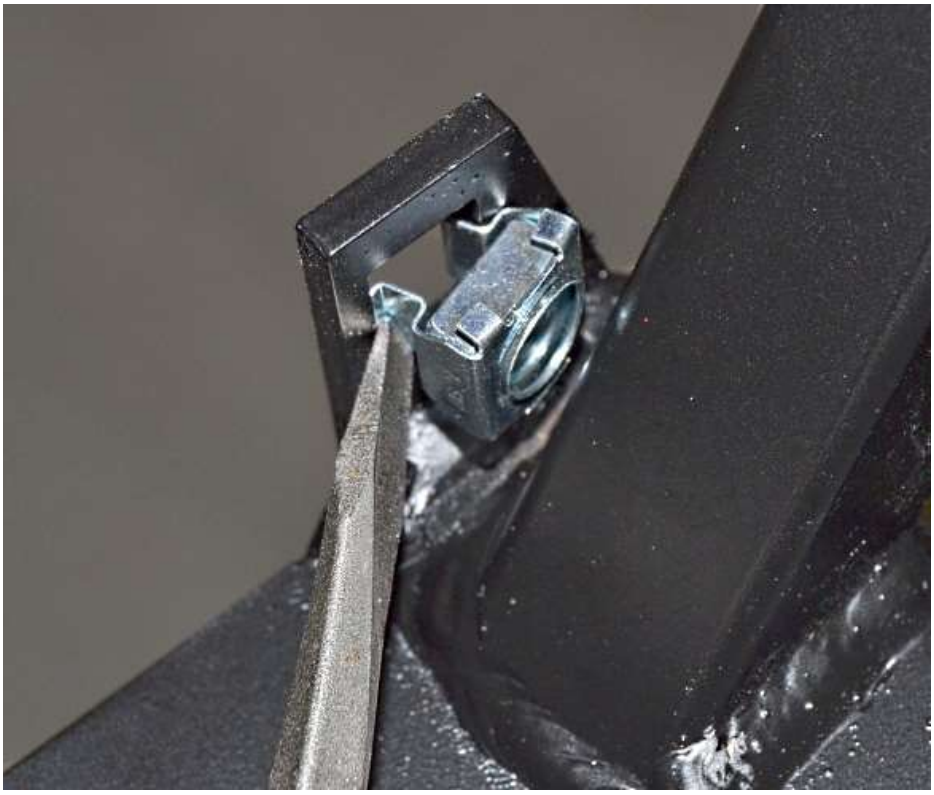
- Secondary body fasteners
- Flat head screw driver, $^{5}/_{16}$" drill bit, drill, $^{3}/_{16}$" hex key

Place a jack stand under the back of the body.

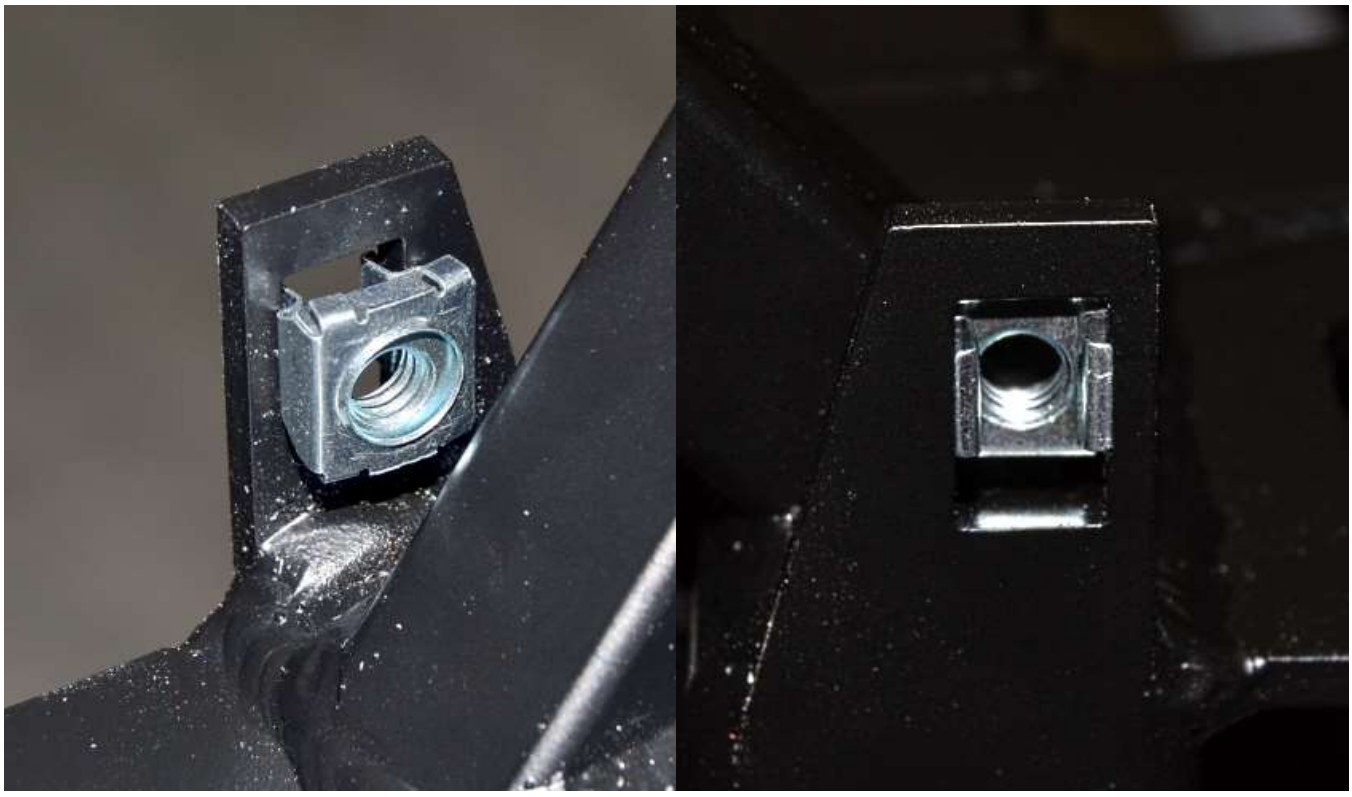
Use a tape measure between the front and rear of the cockpit and set the distance to 45.50" by raising or lowering the body.

Drill through the rear wheel well body frame mounts and through the body with a $^{5}/_{16}$" drill bit.

From the inside push one side of the cage nut into the rear body frame mount.



Use a flathead screwdriver to push the other side of the cage nut into the slot.



Installed cage nut.

Slide one of the $^{5}/_{16}$" washers onto the button head bolts and run the $^{5}/_{16}$" bolt through the body.

Place the spacer on the bolt and screw the button head bolt into the cage nut using a $^{3}/_{16}$" hex key.
Check the cockpit measurement again; Raise or lower the body if necessary then tighten the button head screw.
Remove the Jack stands from under the trunk.

Body Cut-outs

Door Hinge cut-outs

🛠 Marker, masking tape
🚘 Packaged aluminum

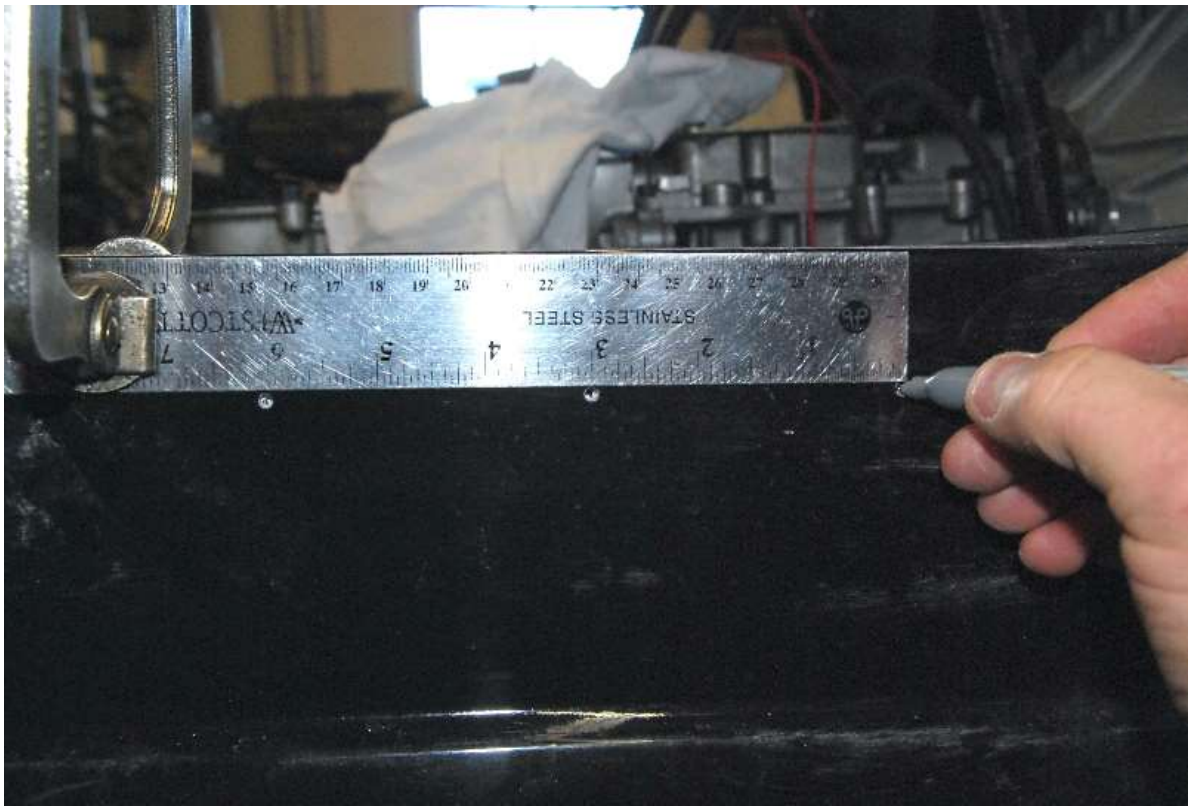
Tape the Body door hinge arm template (square bottom) to the body lining up the outer edge with the recessed weatherstrip mounting area and the top radiused corner.

Mark the slots on the body.
Remove the template and drill ¼” holes in the corners of the slots.

Use an air saw or jig saw to cut the slots in the body out making sure to square the corners off.

Door sill body mounts

🛠 ⅛” drill bit, drill, ¼” nut driver, ruler, marker
🚘 Kit aluminum screws



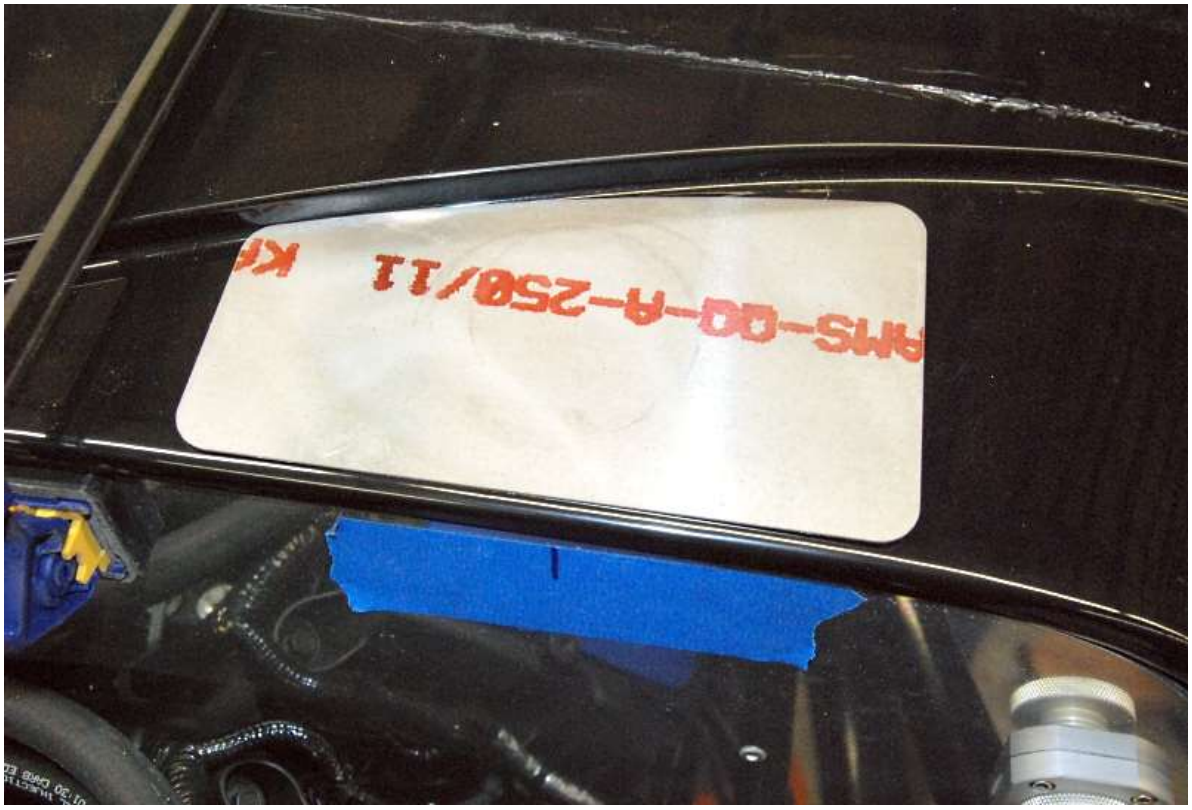
Use a marker and ruler to mark the under-door body mounts 1” down from the door sill spaced every 3”.

Use three kit aluminum screws to mount the ends and center of the door sill area to the frame.

Drill through the remaining marks in the **body** only using an ⅛" drill bit.

Pedal box/Master Cylinder Access panels.

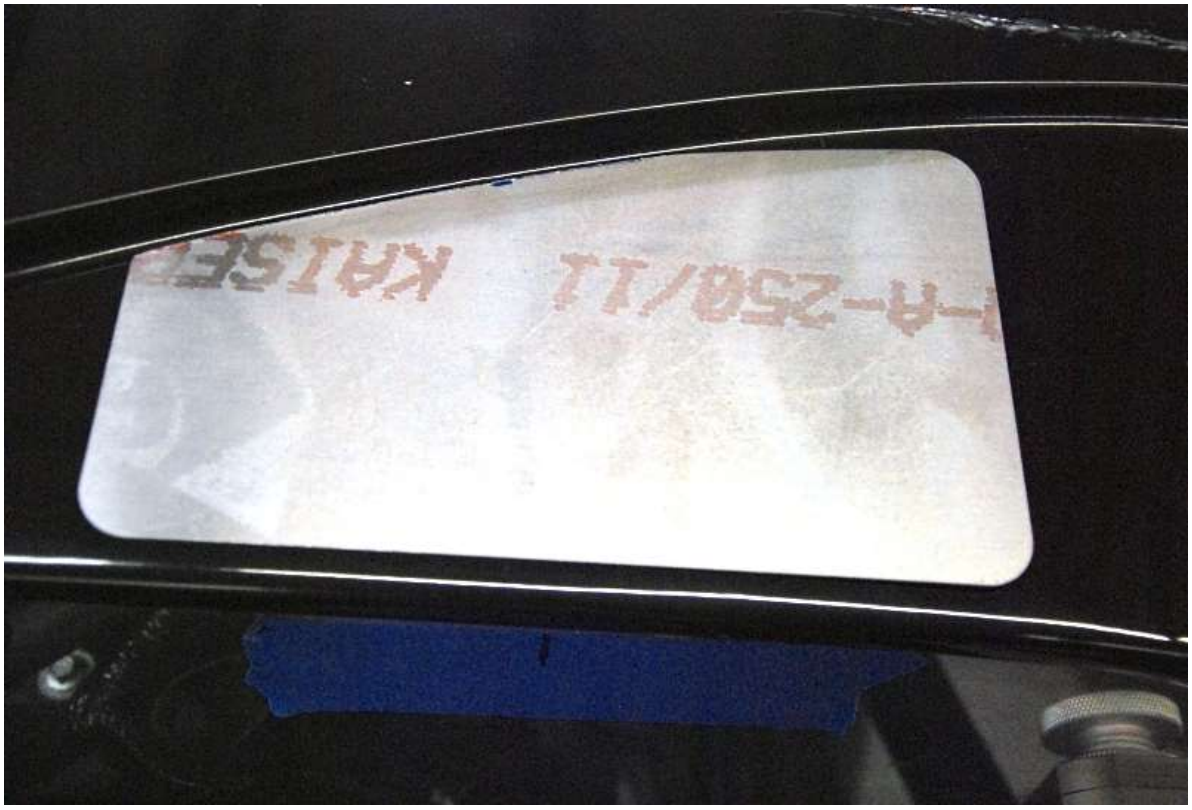
- 🛠 Tin snips, marker, ruler
- 🚘 Packaged aluminum
- ✋ The passenger side access panel is helpful when installing the windshield and checking on wiring and such located behind the dash.



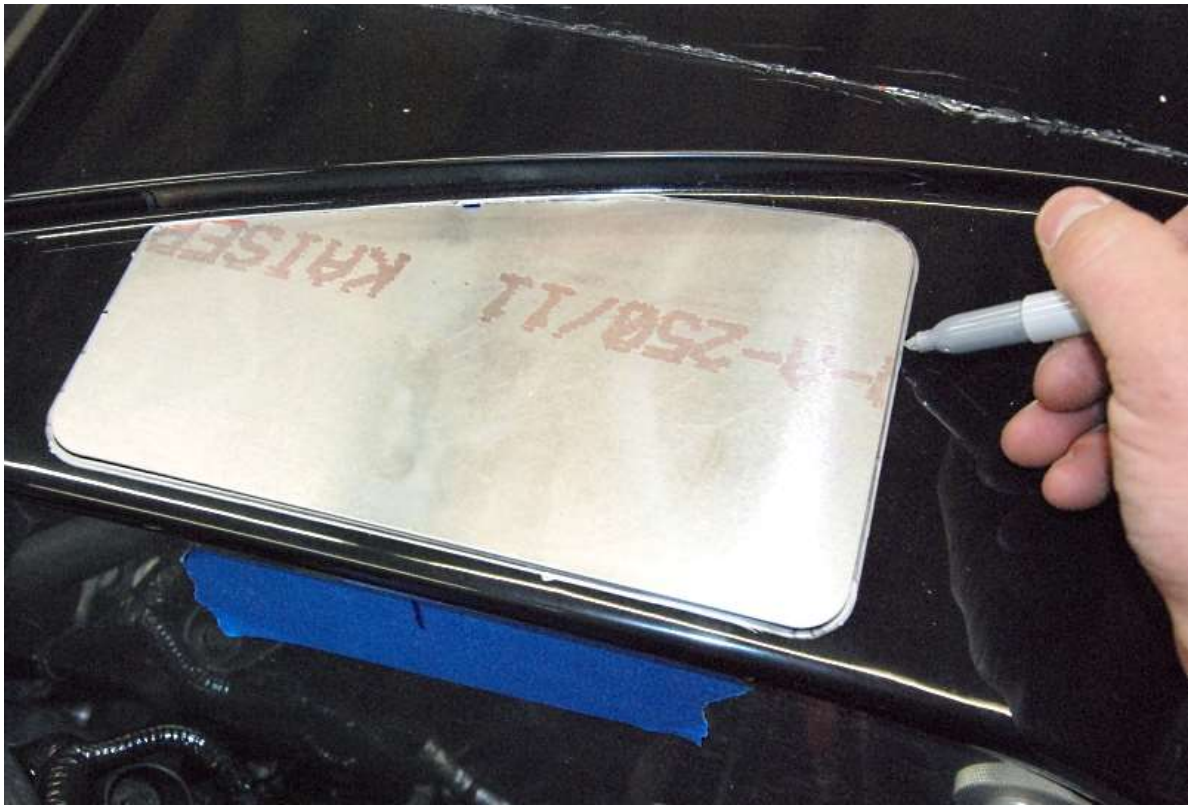
Place the aluminum access hole cover on the driver side of the hood recess of the body.

Use the masking tape with the Master cylinder location as a guide to locate the panel.

If necessary, mark the edge of the aluminum to trim so that the aluminum does not hit the back of the hood area and has a nice even gap.

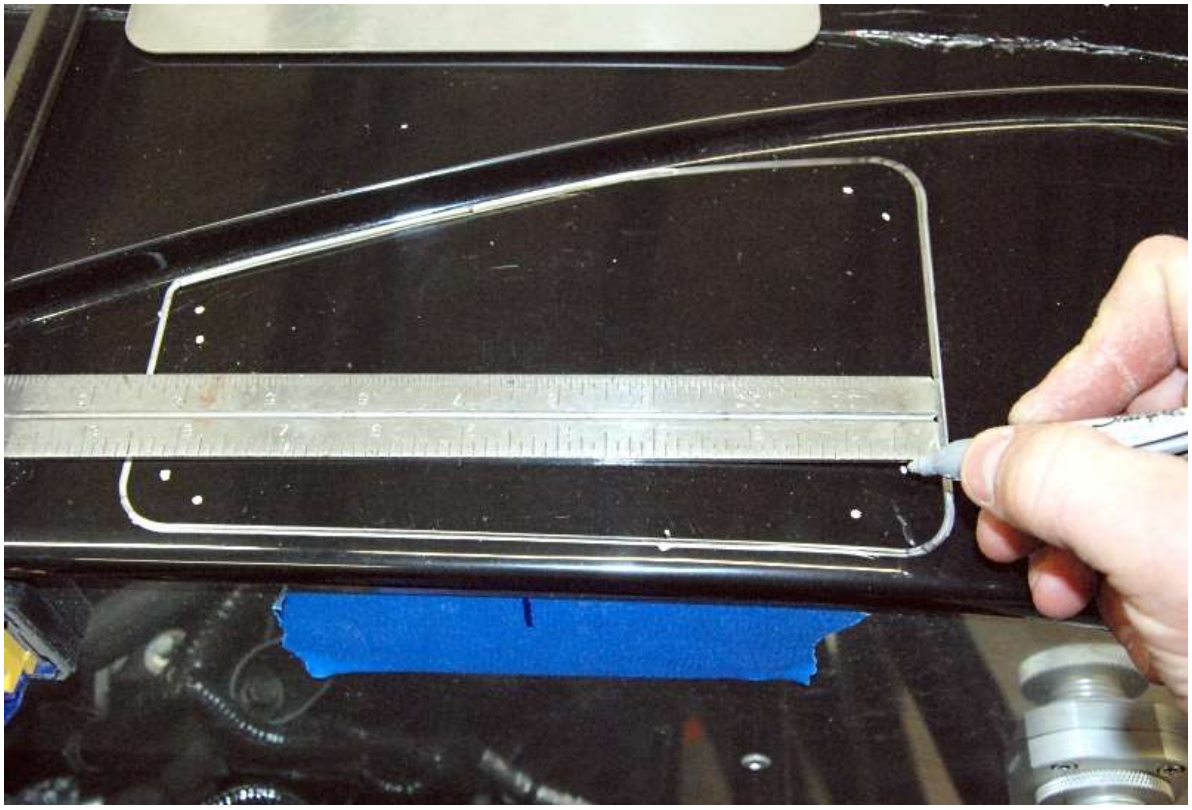


Trim the aluminum panel as needed and test fit.



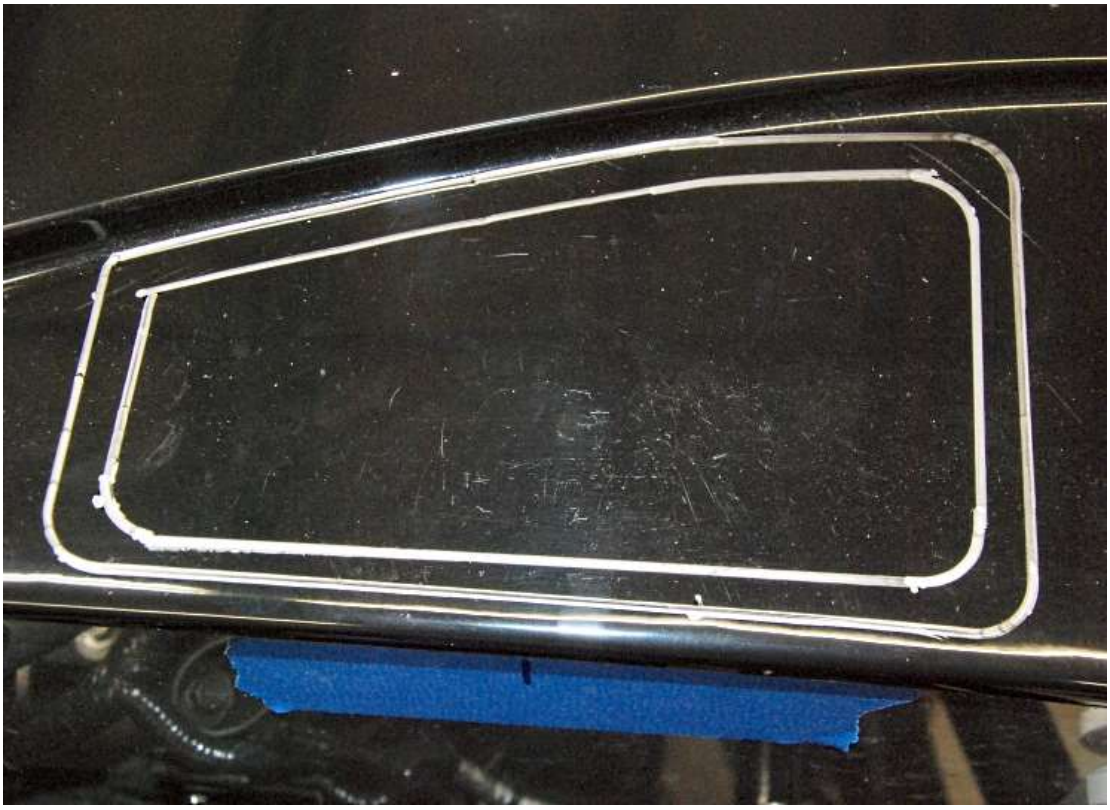
Mark around the outside of the panel.

Remove the panel.

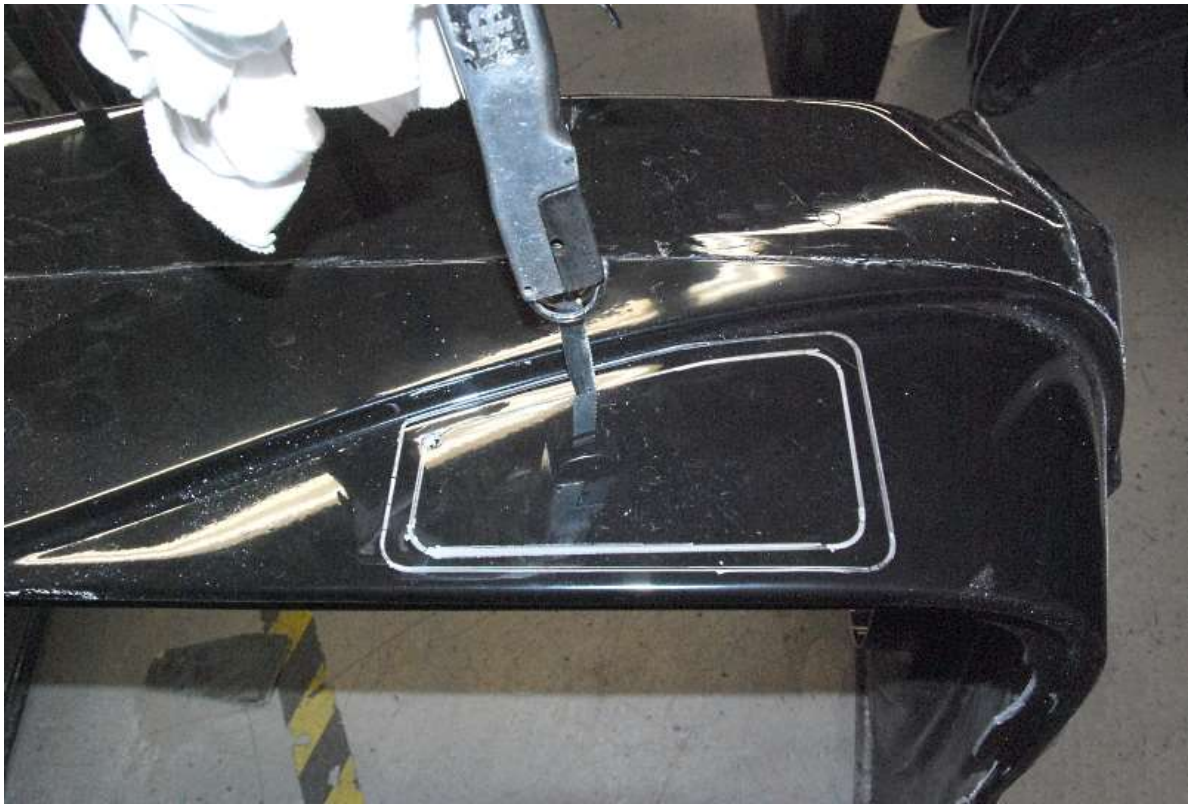


Use a ruler to make marks ⅜” in from the inside edge of the lines made.

Use the panel to make offset lines that are inside the panel outline.



Remove the body from the frame.



Cut the inner line for the access panels.

Trunk Opening

🛠 Ruler, marker, air saw.

Use a ruler and marker to mark a 5/8" line around the trunk flange.

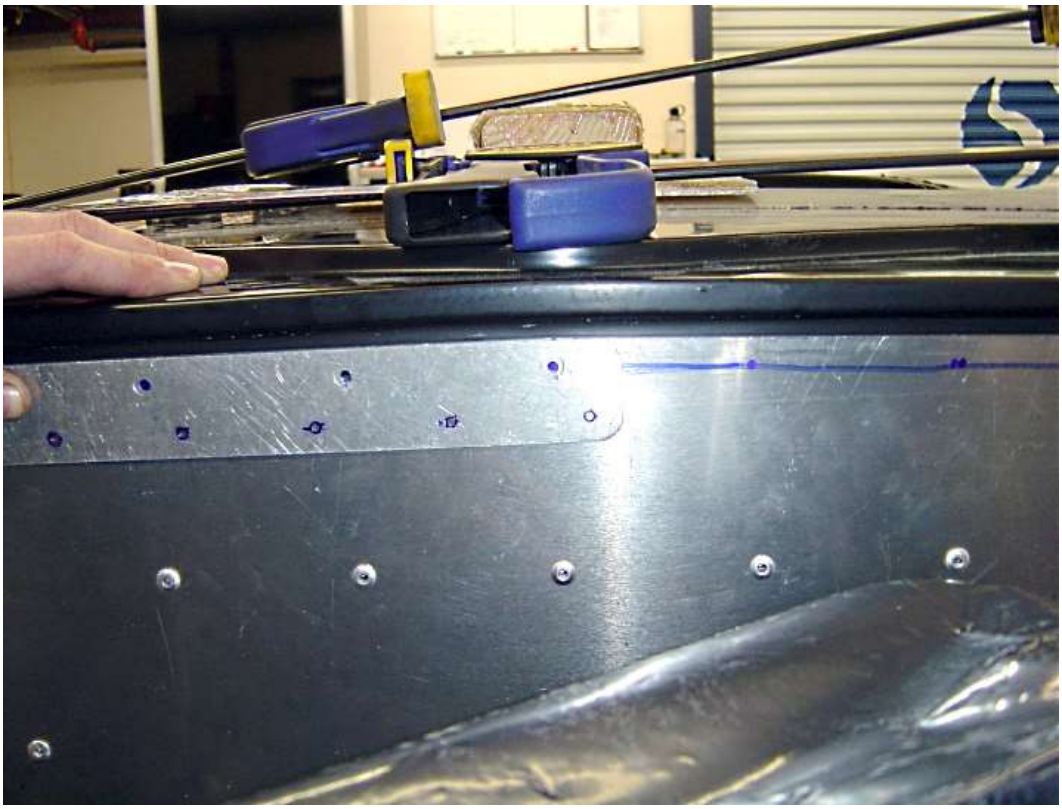
Use an air saw to trim the flange to the line.

Firewall

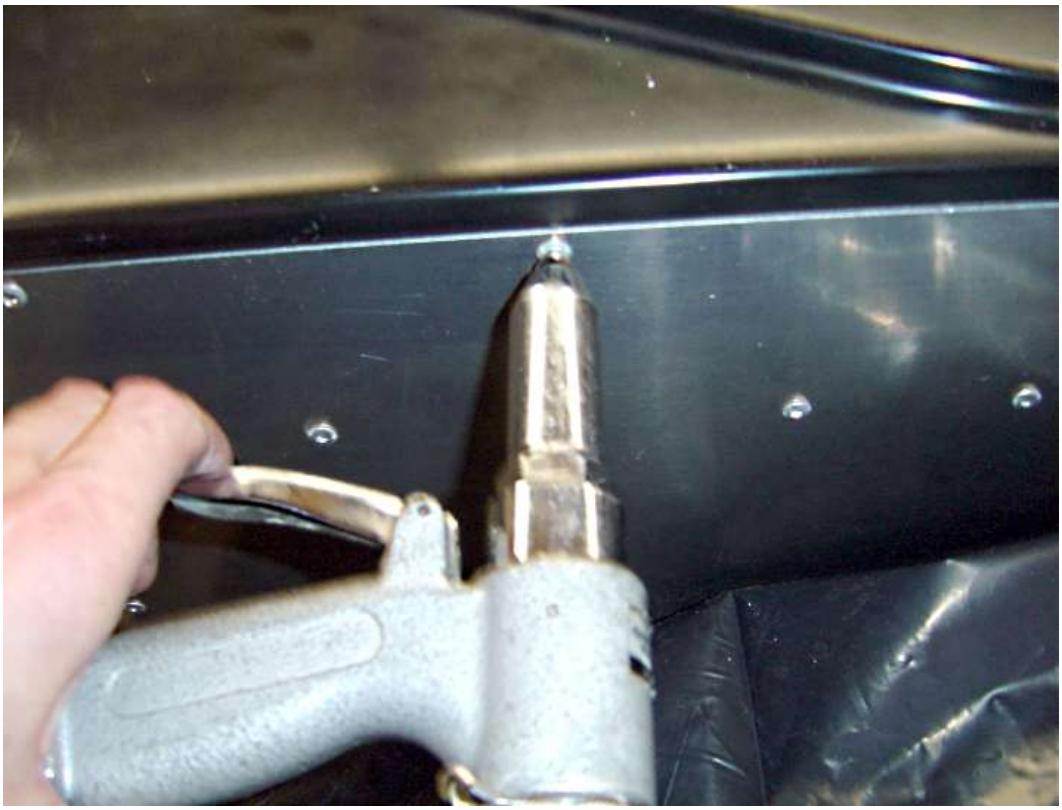
🛠 Marker, square, masking tape, drill, 3/16" or ¼" drill bit, Rivet tool or 5/32" hex key and 7/16" wrench.
🚘 Secondary body fasteners

Decide how the firewall will attach to the body, whether 3/16" rivets or bolts will be used.

Riveting



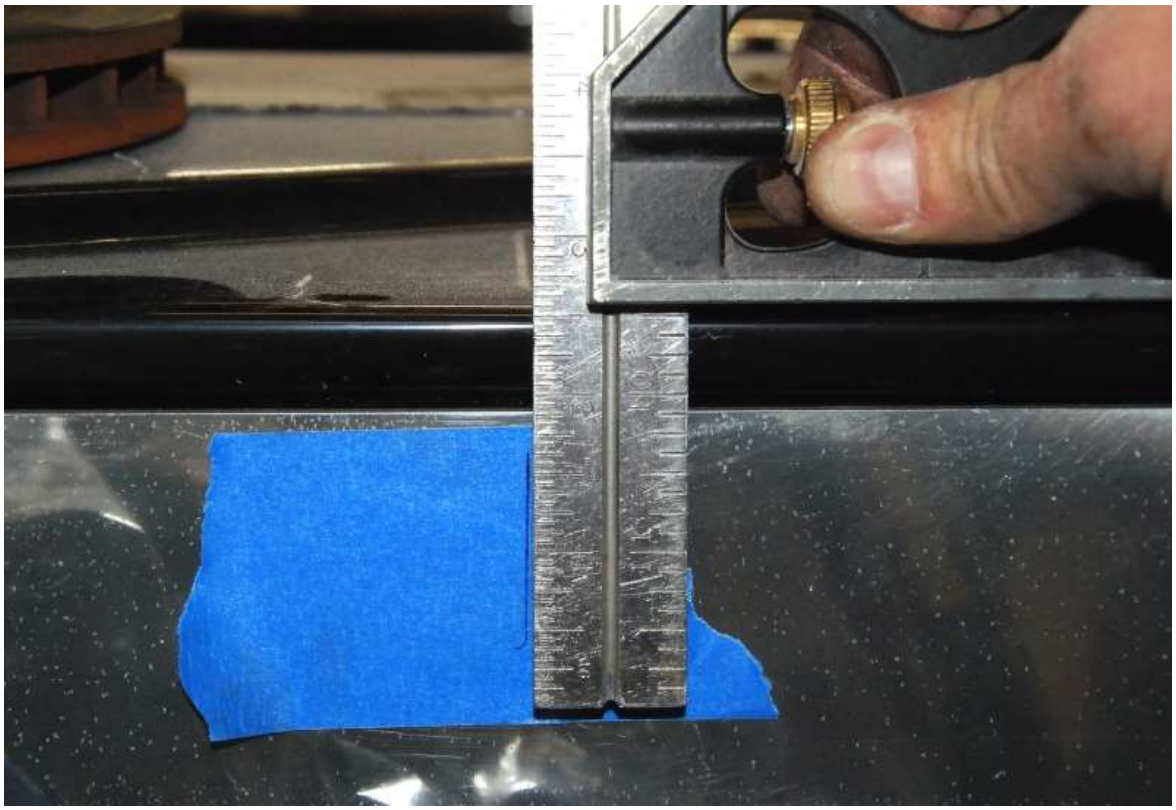
Space and mark the rivet locations around the edge of the firewall using the rivet spacing too.



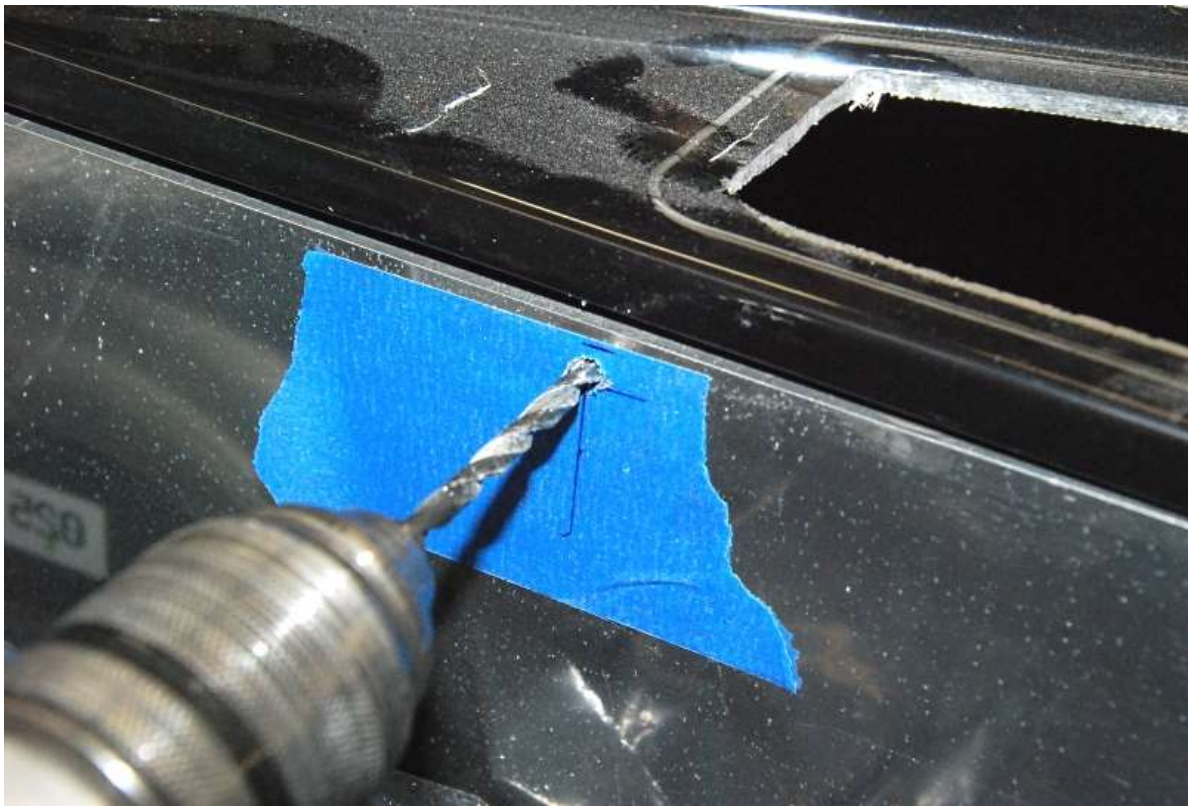
Drill and install a couple of rivets through the so that the body can get mounted again in the same position.

Bolting

A good place to put a couple of bolts is within reach of the access cover locations.



Put masking tape on the firewall and use a marker and square to mark the locations desired. The pictures show aligning the hole with the edge of the access cover aluminum.

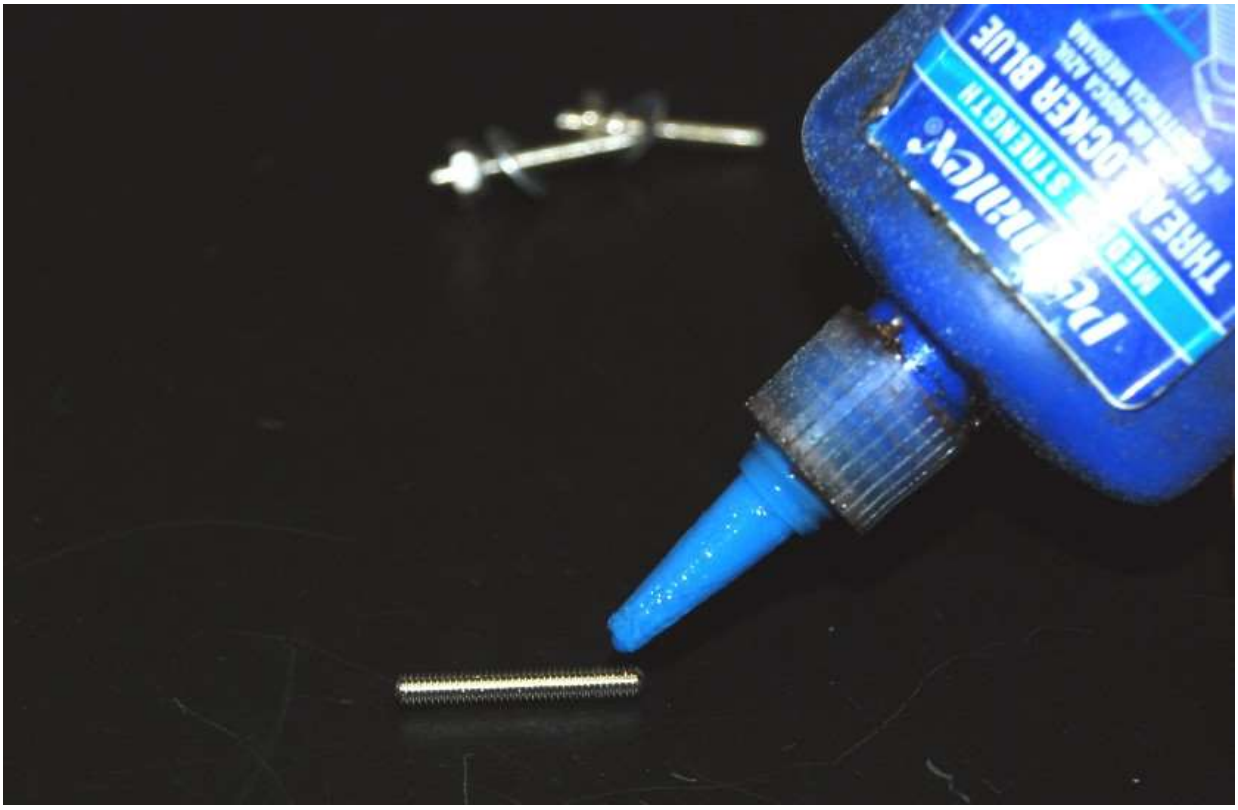


Drill mounting holes for the bolts.

Attach the bolts to the firewall and body.

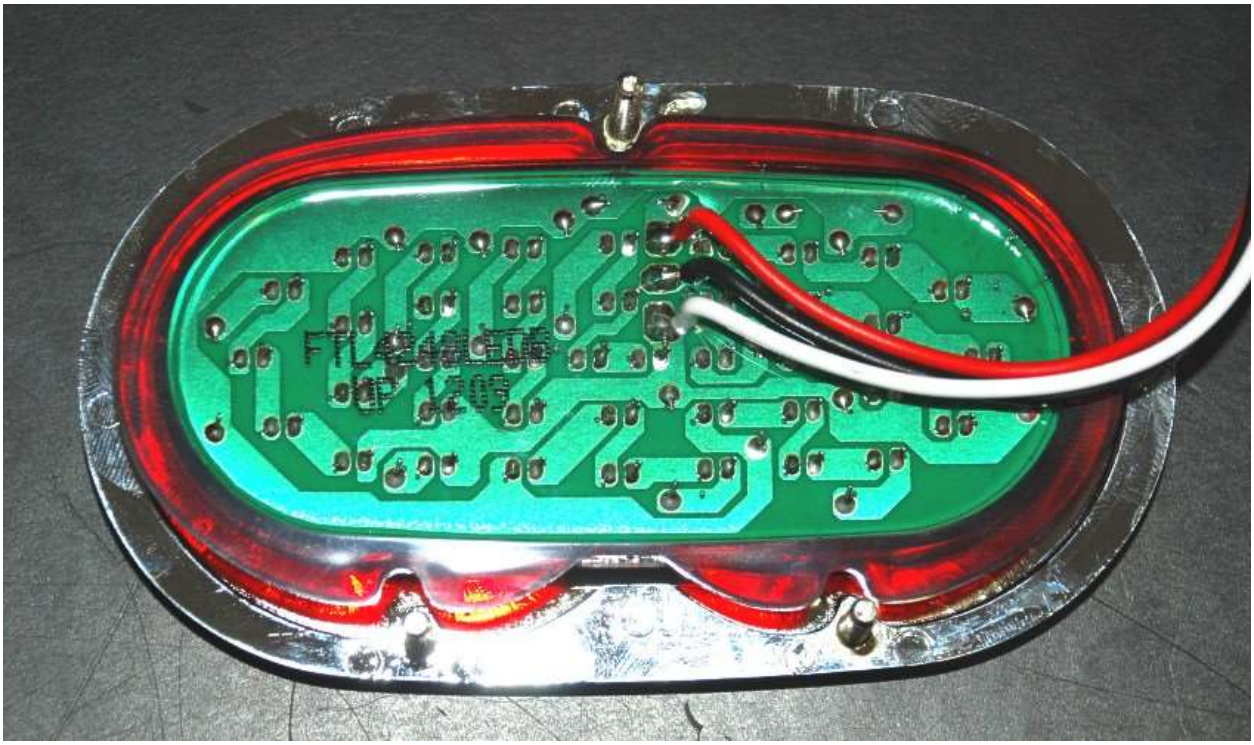
Taillights

🛠 Loctite, 3/16" drill bit, ¾" hole saw, marker, drill, masking tape, pencil
🚘 Tail light components.

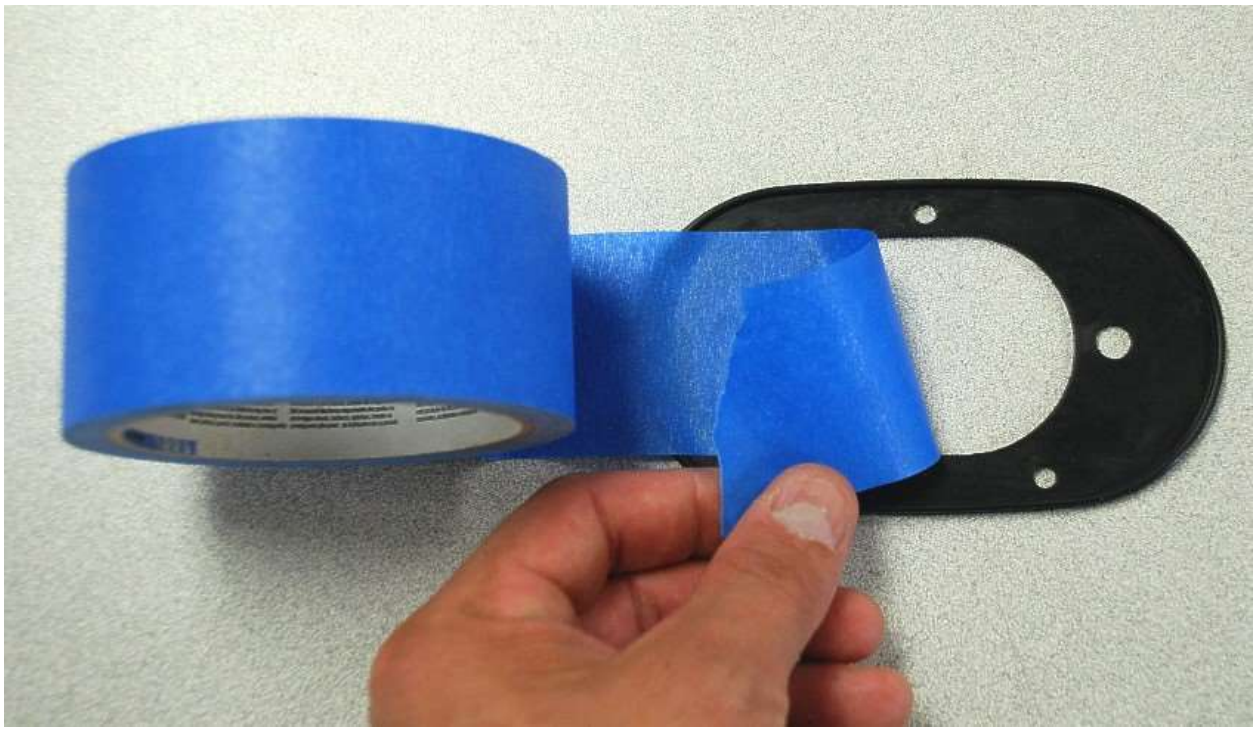


Put a drop of Loctite on one end of the threads for the bezel studs.

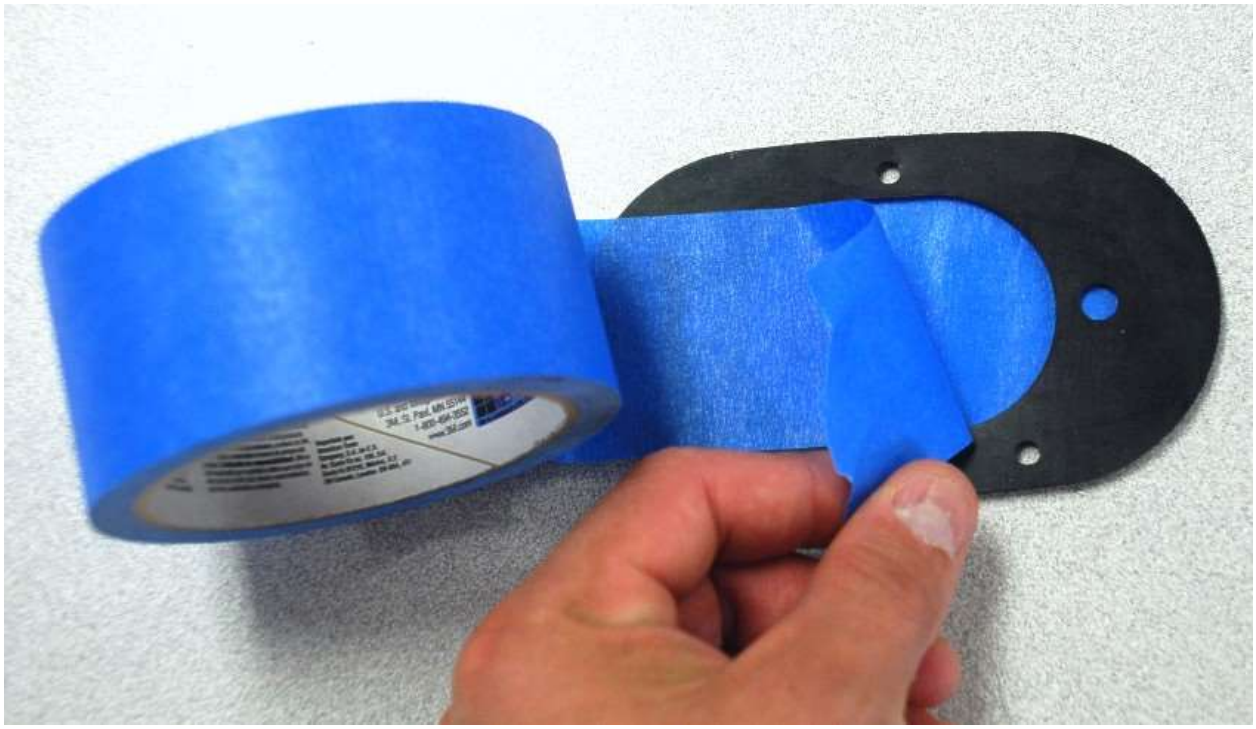
Thread the studs into the bezels.



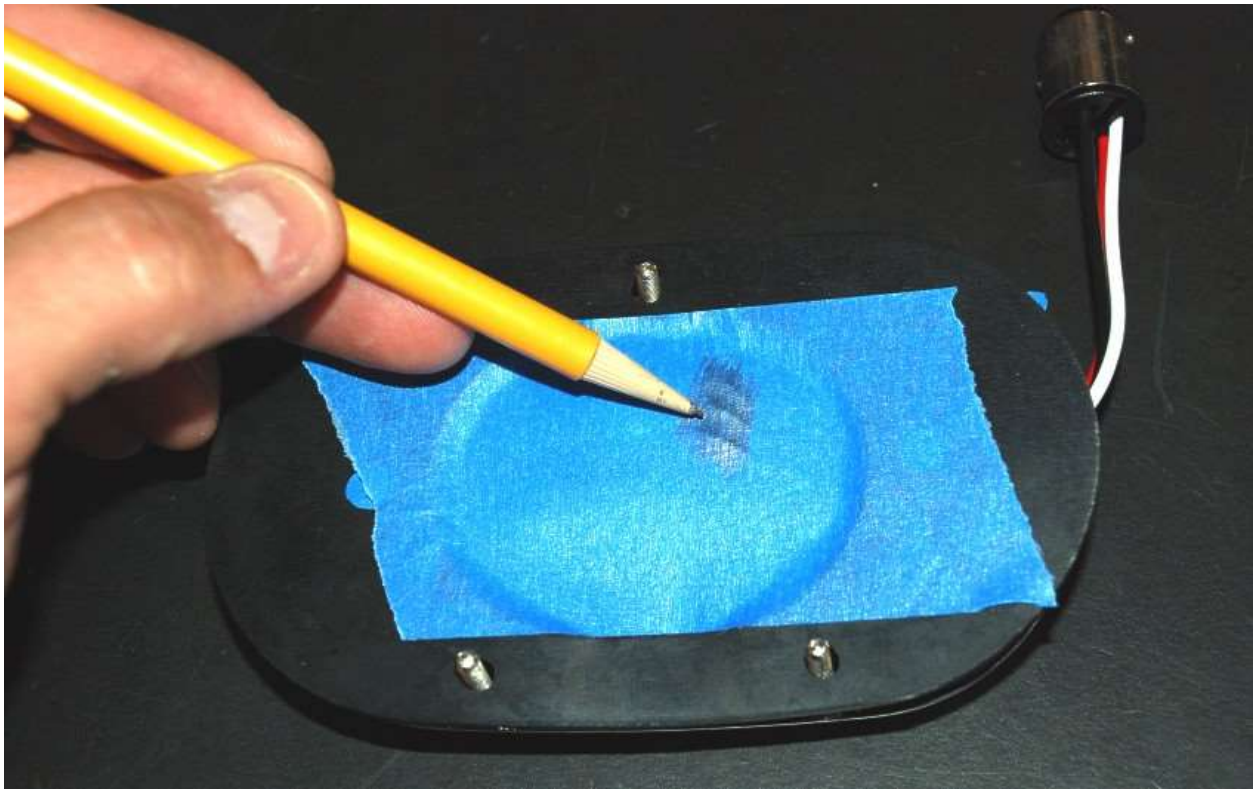
Place the LED light in the bezel from the backside.



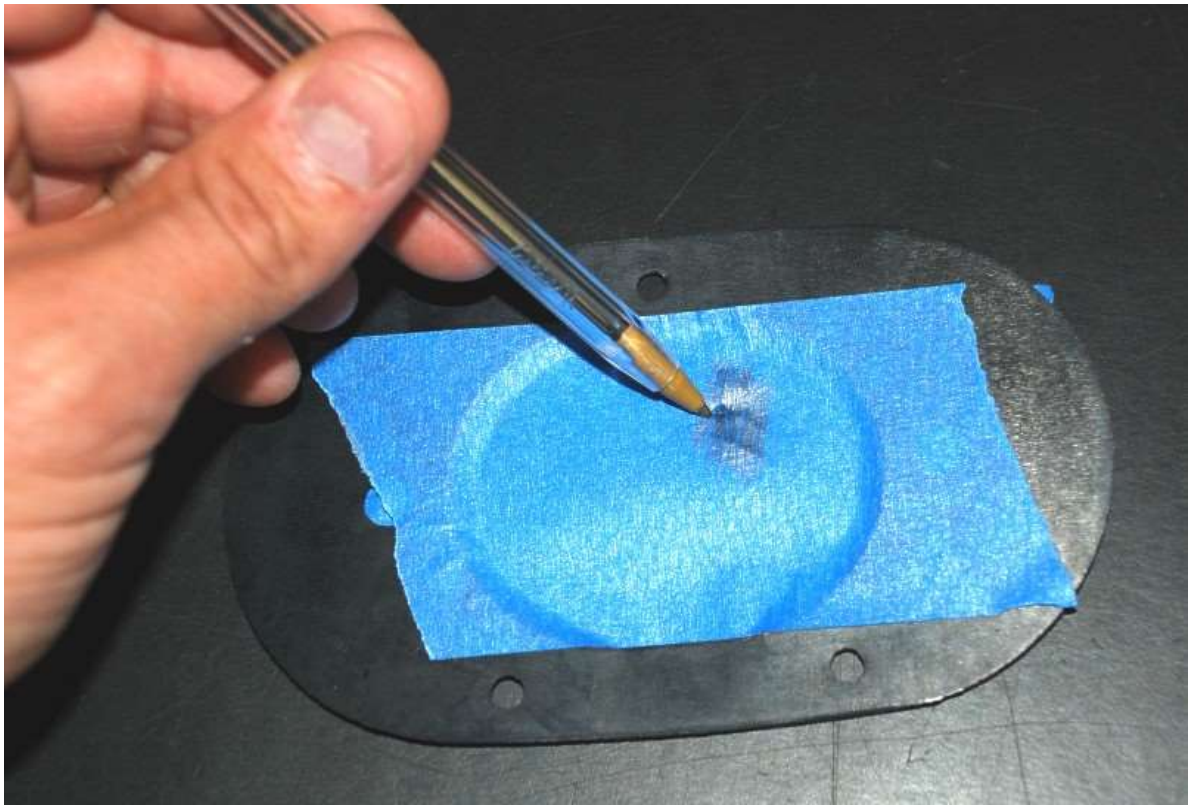
Put a piece of masking tape over the large hole in the center of the mounting gasket.



Turn the gasket over and put another piece of masking tape over the hole again.

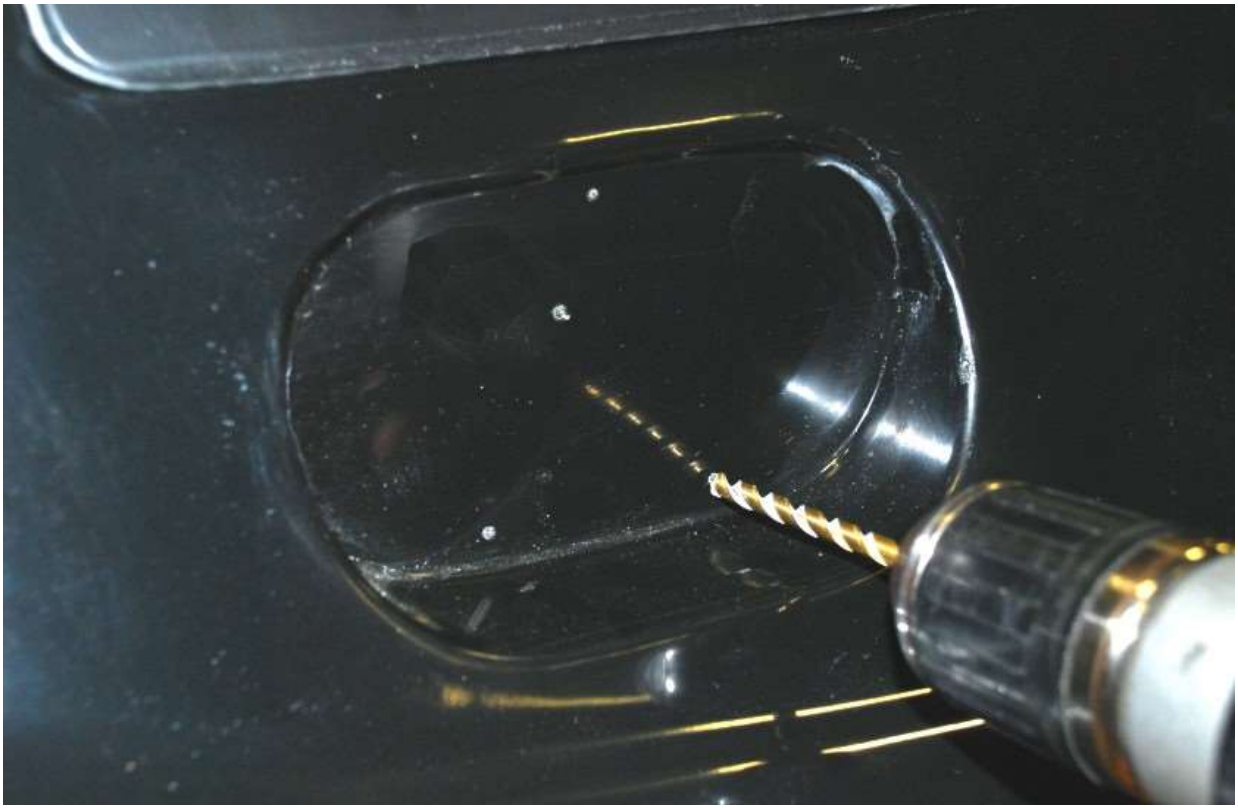


Put the gasket on the light/bezel assembly then use a pencil to highlight where the three wires come out of the LED circuit board.



Remove the gasket from the light assembly and poke a small hole through the tape where the center wire comes out of the circuit board. This is the drill location for the light wire hole.

Hold the gasket on the tail light location on the body (the single bezel mount hole goes at the top) and mark the three mount hole locations and the wire hole location.



Drill the three mounting holes for the bezel studs using a 3/16" drill bit.

Drill the light wire hole using a ¾" hole saw.

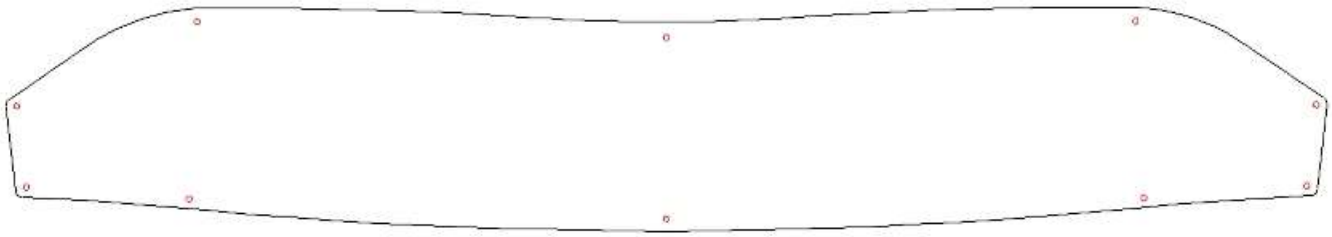
Dash

Secondary body fasteners, dash
Drill, 3/16", 19/64" drill bits, marker, clamps, rivnuts tool.
These directions use screws and rivnuts to fasten the dash to the body.

Decide how the dash will be attached; with the screws provided or Velcro or another method.

Dash with optional FFR gauge cluster and custom covering.

Clamp the dash into the body dash opening.



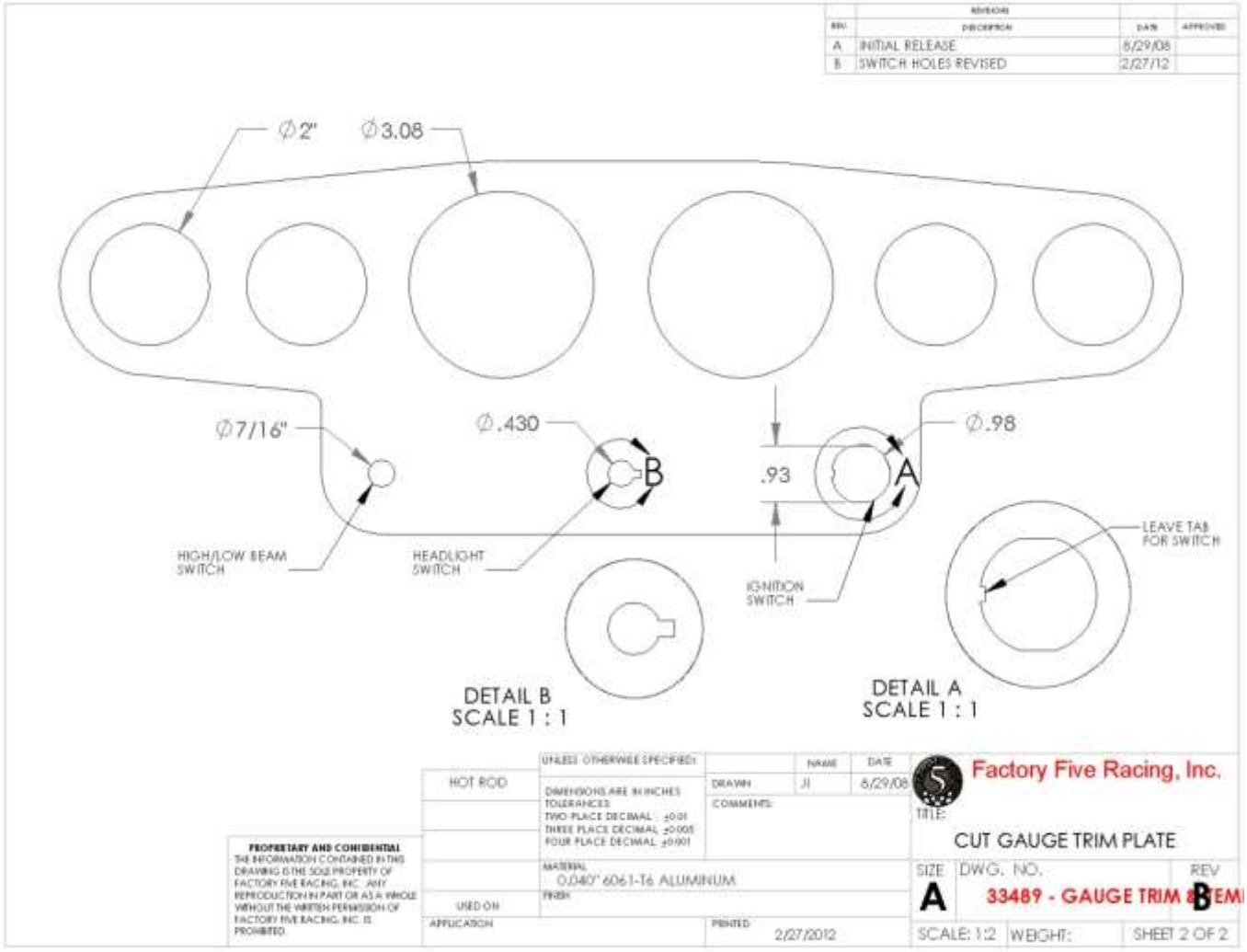
Mark 8 mounting screw locations around the edge 0.50" from the edges.

Drill the marks through both the dash and mounting flange with a 3/16" drill bit.
Remove the dash and drill the body flange holes with a 19/64" drill bit for the small rivnuts.
Use the rivnuts tool to attach the 10-32 rivnuts to the body dash opening.
Test fit the dash using the 10-32 x 5/8" black button head screws in the secondary body fasteners.

Gauges

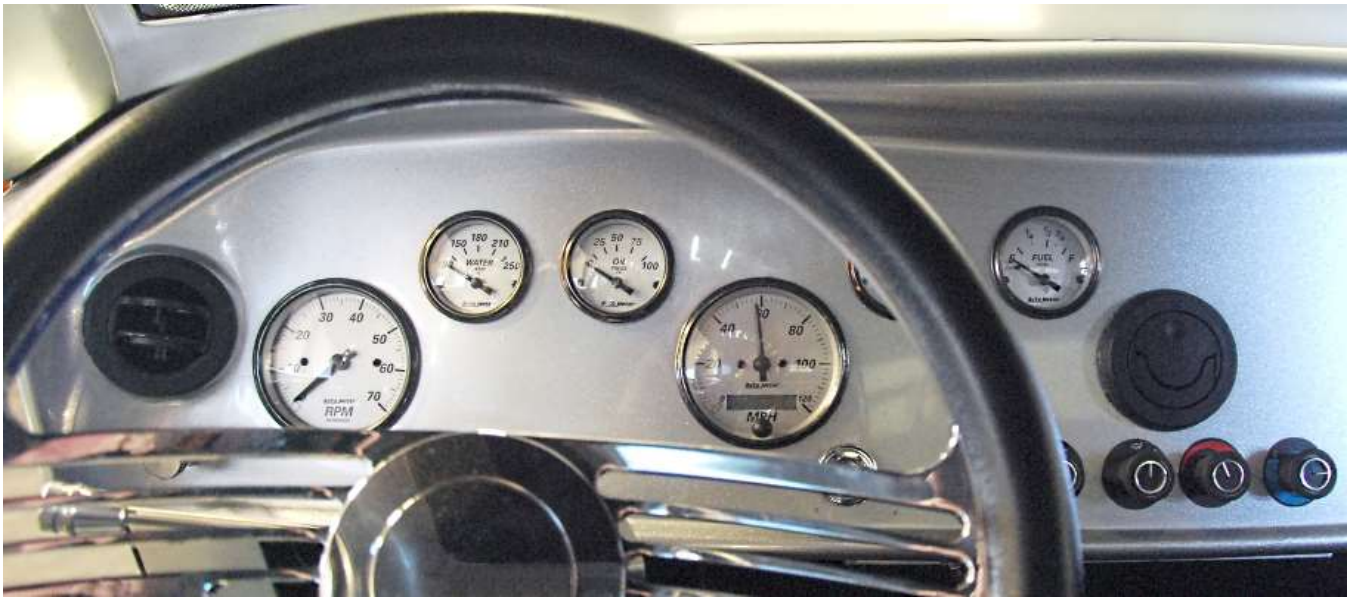
1/8", 7/16" drill bits, drill, marker, 7/8", 2", 3" hole saws, file

- Gauge set, packaged aluminum.
- The gauge template is the FFR proposed center dash gauge and switch layout but other layouts can be used.



- The template can also get used as a gauge trim plate if desired.

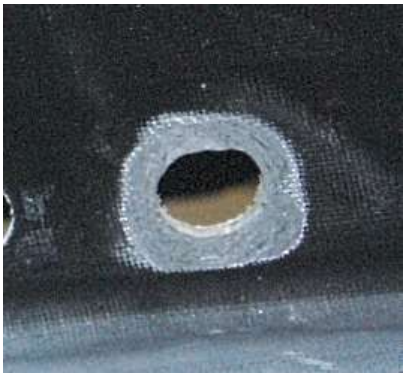
- The large holes will need filing, the gauges are an odd size.



- Other gauge layouts have been used by customers. Keep in mind though that the master cylinders and pedal box tubes are very close to the dash.

Lay the template on the dash and either mark the centers of the holes or clamp the aluminum to the dash and drill through the holes for the ignition, horn, headlight and gauges.

Test fit the gauges in the holes. File if necessary.



Test fit the ignition switch. If necessary, remove material on the back side of the dash area to allow more than two threads to engage.

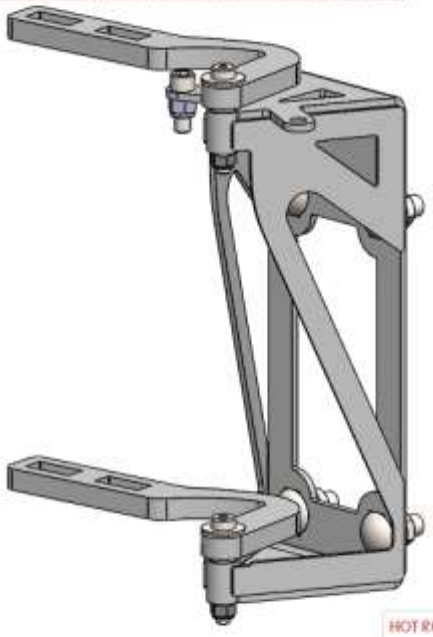
Test fit the headlight switch.

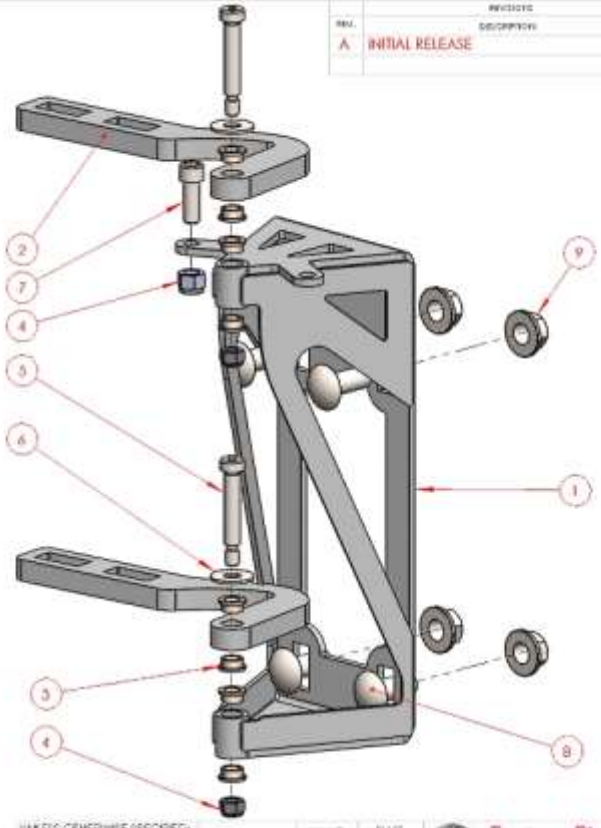
Door hinge arms

- Door hinge assembly

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	34798	DOOR HINGE STAND OFF ASSEMBLY	1
2	34796	DOOR HINGE ARM	2
3	13183	Bronze flange bearing	8
4	13964	NYLON INSERT LOCKNUT, 3/8-16 UNC	3
5	33431	1.75" SHOULDER BOLT	2
6	13977	3/8" WASHER	2
7	10520	3/8"-16 x 1" SOCKET HEAD CAP SCREW	1
8	25590	1/2"x 1.25" CARRIAGE BOLT	4
9	25677	1/2"-13 FLANGED NYLON LOCK NUT	4

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	3/2/19	





HOT ROD GEN 2

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.0005

MATERIAL

FINISH

USED ON

APPLICATION

	NAME	DATE
DRAWN	JE	3/2/19

COMMENTS:
LEFT SIDE SHOWN

NEXT ASSY

PROPRIETARY AND CONFIDENTIAL
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Factory Five Racing, Inc.

TITLE:
DOOR HINGE COMPONENTS

SIZE	DWG. NO.	REV
A	34971	A

SCALE: 1:3 WEIGHT: SHEET 1 OF 1

Press the bronze bushings into the top and bottom of the hinge arms.

Press the bronze bushings into the top and bottom of the pin sleeves on the hinge standoffs.

Insert the hinge arms through the body holes so that they sit on the top sides of the hinge stand-off.

Put a washer on the shoulder bolt then insert it through the hinge arm, hinge stand-off and into a $^{5}/_{16}$" locknut.

If necessary, raise or lower the hinge stand-off so the arms sit flat on them.

Tighten the hinge shoulder bolts using a $^{3}/_{16}$" hex key and ½" wrench so that they can move but there is no slop or play in the arm.

Raise or lower the hinge stand-off so the arms are centered in the body slots.

Move the arm through its range of motion making sure that the top arm can contact the bolt stop and not the body.

If necessary, remove the arm and cut more of the slot out.

Door

Door Latch Prep

- Door handle components, Exterior door handle components (optional), interior door handle components (optional).
- Philips head screwdriver, $^{7}/_{16}$" socket, ratchet, pliers.
- If doing exterior or interior door handles do this section otherwise skip it.

Exterior handle only

If only doing exterior door handles, place a clevis over the release lever so the legs are on both sides of the lever and insert the ¼" x ¾" Philips head screw, locknut and $^{7}/_{16}$" socket.

Tighten the locknut so that the clevis can rotate but is not loose.

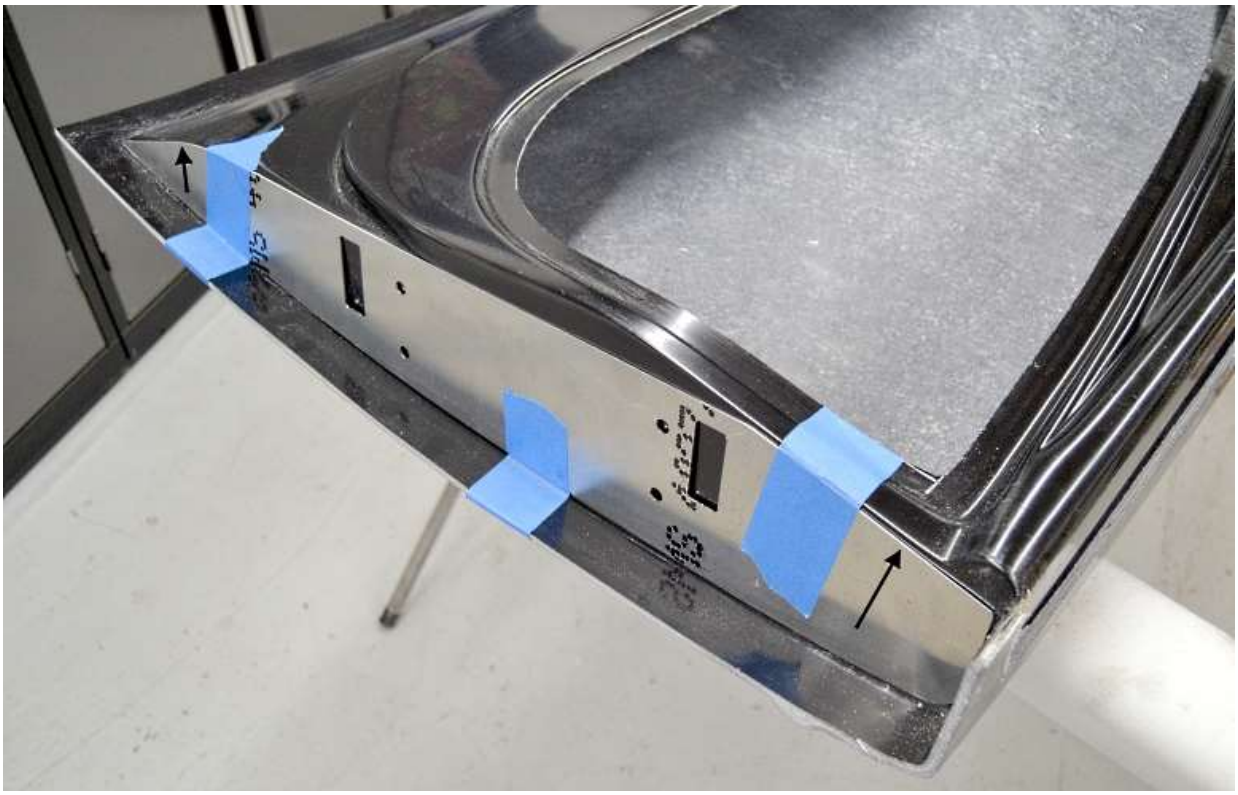
Interior and exterior door handles

Squeeze the open end of each clevis with a pair of Pliers so that the legs touch.

Place a clevis on each side of the release lever top insert the ¼" x ¾" Philips head screw then fasten using a locknut and $^{7}/_{16}$" socket. Tighten the locknut so that the clevises can rotate but are not loose.

Hinge arm slots

🚘 Packaged aluminum
🛠 Marker, masking tape, drill, 1/8", 1/4", 3/8" drill bits, half round file.



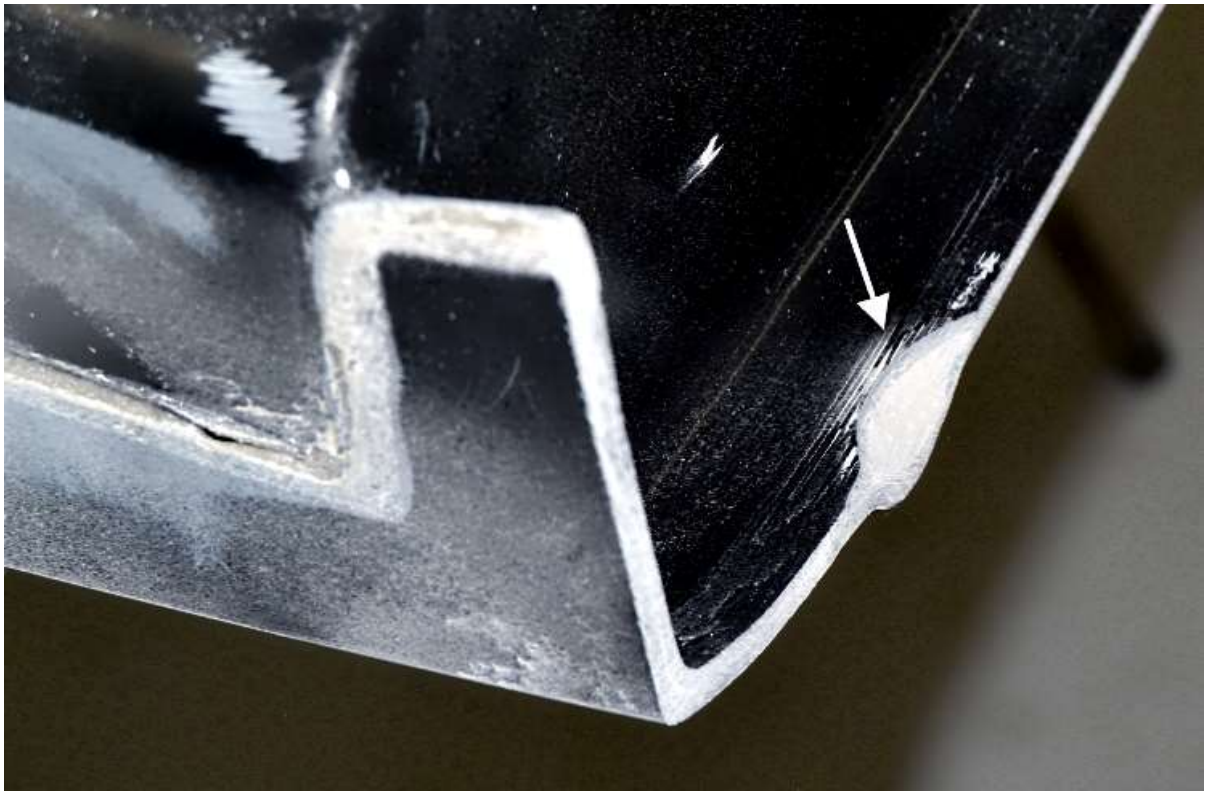
Tape the Door - door hinge template (pointed bottom) to the door lining up the inside edge shown.

Mark the slots and holes in the template.

Use an 1/8" drill bit to drill the center of the four small holes.

Remove the template and open the four holes up using a 3/8" drill bit.

Drill ¼” holes in the corners of the slots then use an air saw or jig saw to cut the slots.

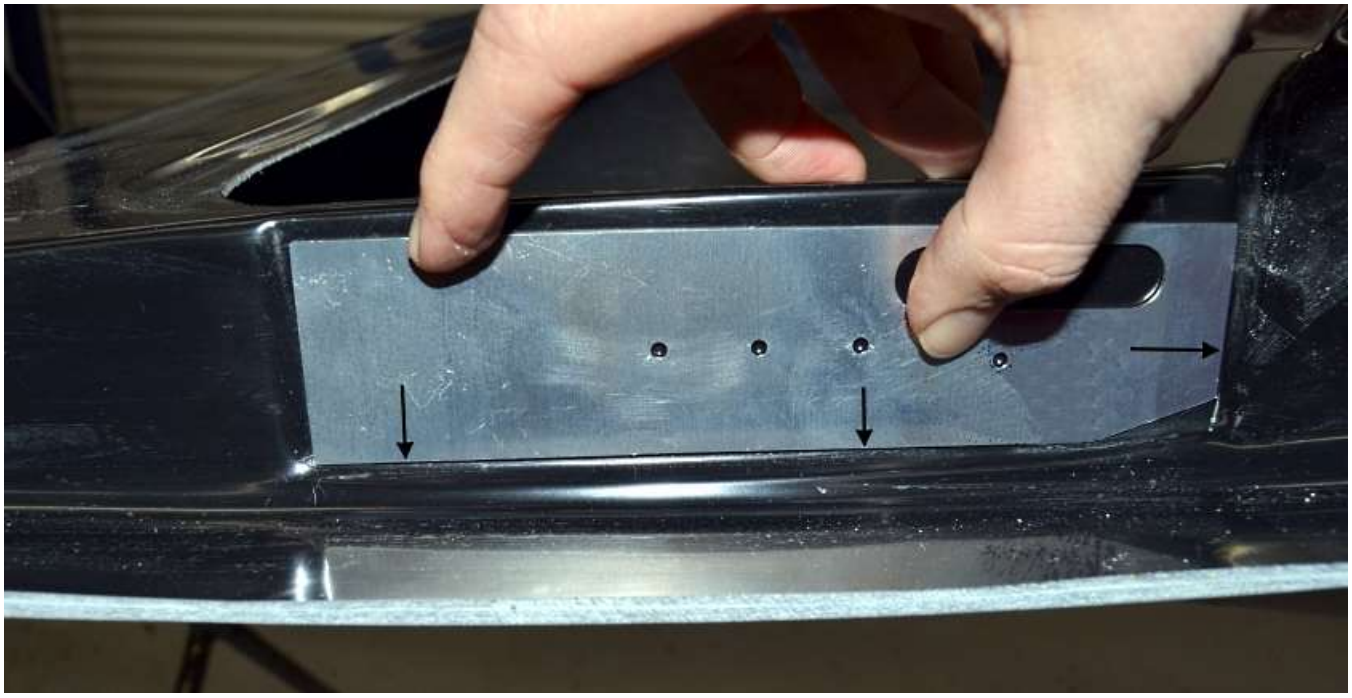


Near the hinge arm slots is the raised trim line that runs down the length of the door; File the back side of the trim so that there is clearance to where it will get close to the body.

Door latch holes

- Packaged aluminum

Marker, masking tape, drill, 1/8”, ¼”, ½” drill bits

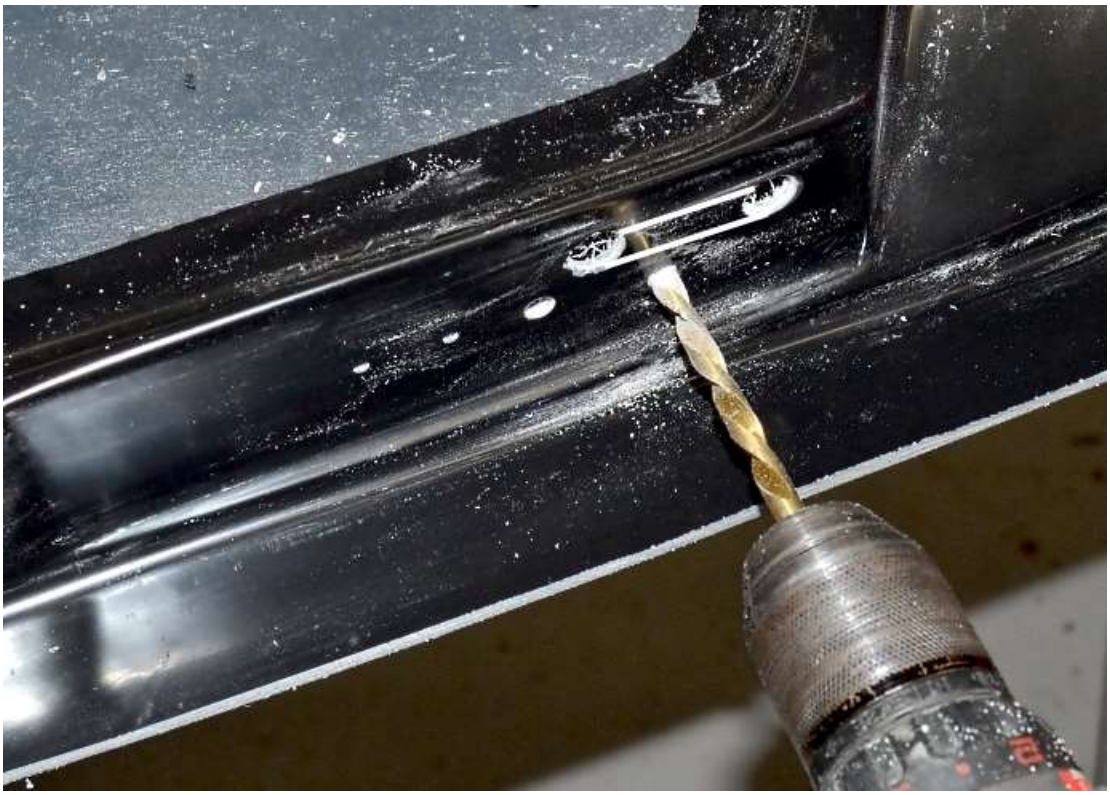


On the front of the door, align the door latch template with the start of the radius going to the outside of the door and the top of the inside door liner.

Tape the template in place and drill the ends of the slot with a 1/8" drill bit then work up to a ½" drill bit.

Mark the sides of the slot.

Drill the smaller template holes with an 1/8" drill bit.

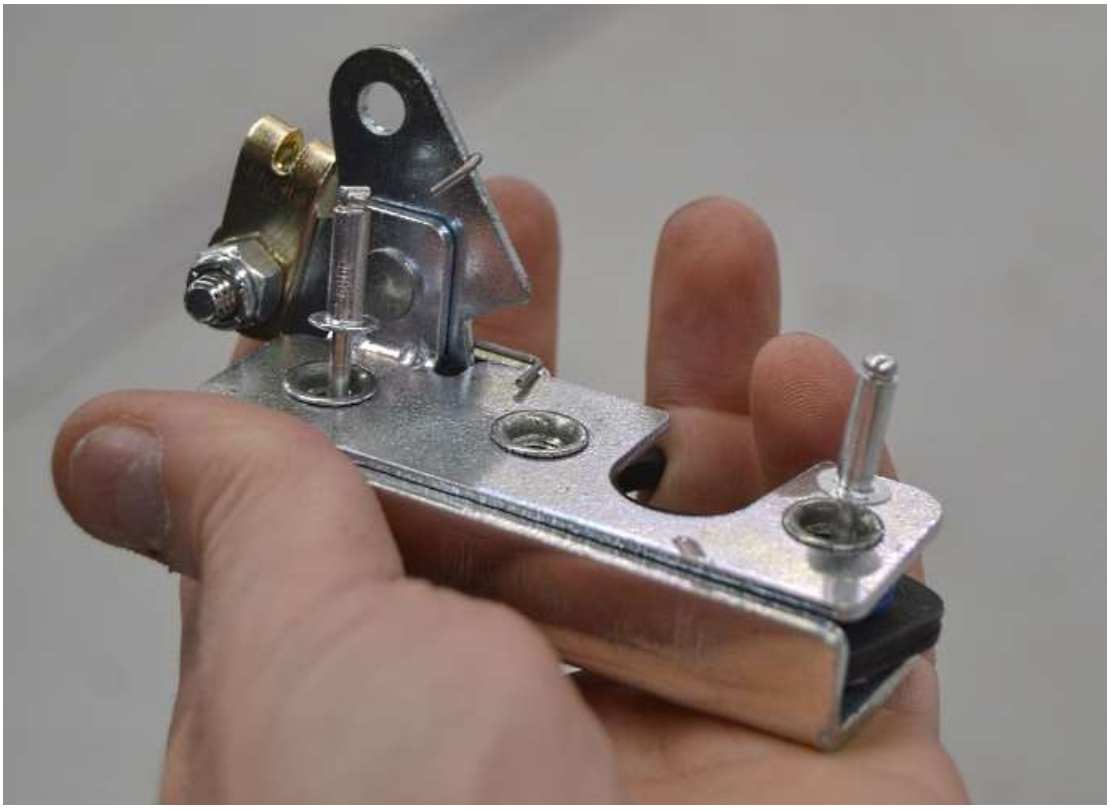


Remove the template and drill the small holes out with a ¼" drill bit.

Cut the sides of the slot with an air saw or jig saw.

Exterior and interior door handles

- If only using inside release levers (standard) skip this section.



Take a couple of the kit $^{3}/_{16}$" long rivets and put them in two of the door latch threaded holes.

Hold the latch up to the correct door so the rivets go into the latch holes.

Check for clearance around the clevises and screw on the latch release lever.

If trimming is necessary, mark around the screw and locknut.

Use an air saw or jig saw to trim the area marked out.

Check the fit of the latch again. Single clevis shown for exterior door handle used with interior release lever.

Double clevis shown for exterior door handle used with interior door handle.

Door fitment

- Orbital sander, 80 grit sand paper, 5/16" drill bit, drill, masking tape, jig saw or air saw.
- Doors
- The doors are cut oversized at the factory to allow for maximum adjustment and to allow the customer to set their own desired panel gaps.

Insert the hinge arms into the door and hold the door in position and note the areas that need to be trimmed to allow the door to fit in the opening and allow the half-moon trim accent of the door to align with the trim on the body.

Mark the areas with a marker.

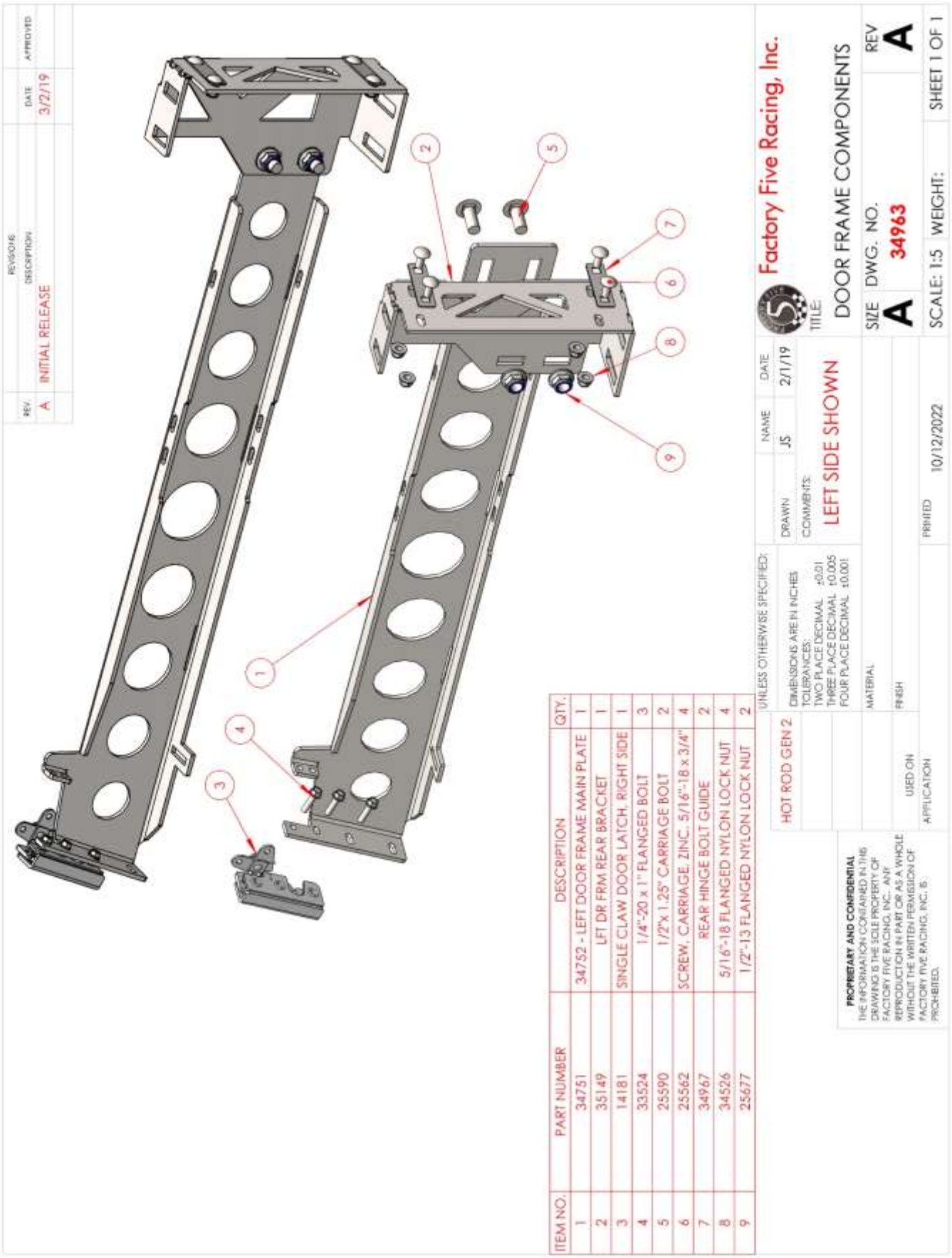
Remove the door and sand the marked areas in long smooth movements to prevent notches from occurring using an orbital sander and 80 grit sand paper. Make two or three passes over the areas only.

Recheck the door fitment and sand more if necessary.

Remove the door.

Door frame/Door assembly

- 3/16" hex key, ½", ⅝" wrenches, ½", ¾" sockets, ratchet, extension, drill, 7/16" drill bit.
- Door Hinge assembly, 33 door handle components, door frame components



Starting with the left door, place the door frame main and rear plates in the door.

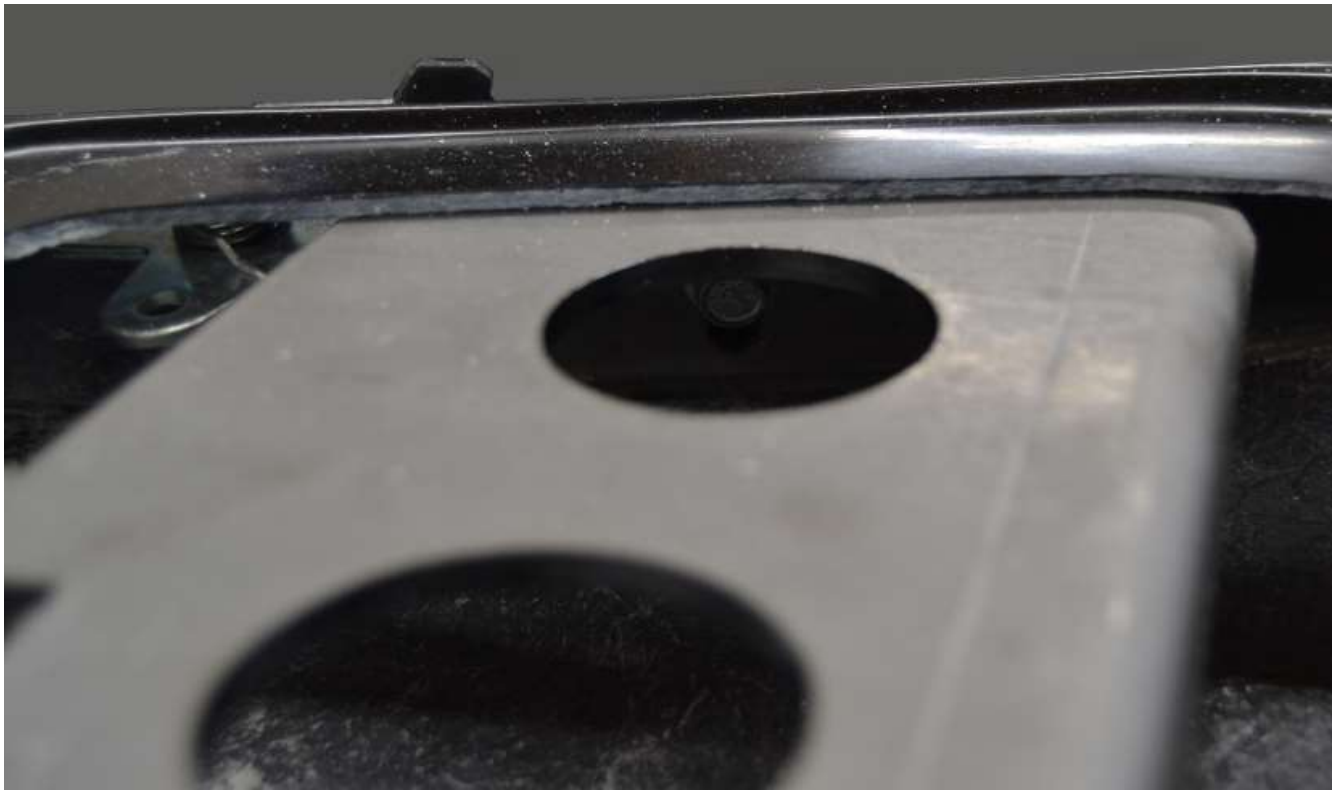
At the back of the door pass the 5/16" x ¾" carriage bolts through the rear hinge bolt guide and check the fit in the holes drilled. If necessary open the holes up with a 7/16" drill bit.

Pass the 5/16" x ¾" carriage bolts through the rear hinge bolt guide, door and rear plate fastening with a 5/16" flanged locknut and a ½" socket. Do not fully tighten the locknut.

Attach the front and rear door frame parts together using the ½” x 1.25” carriage bolts, flanged lock nuts and a ¾” socket. Do not fully tighten the locknuts, allow the plates to slide against each other.

At the front of the door insert the ¼” x 1” flanged bolts through the top hole and next two slots in the main door frame plate and door.

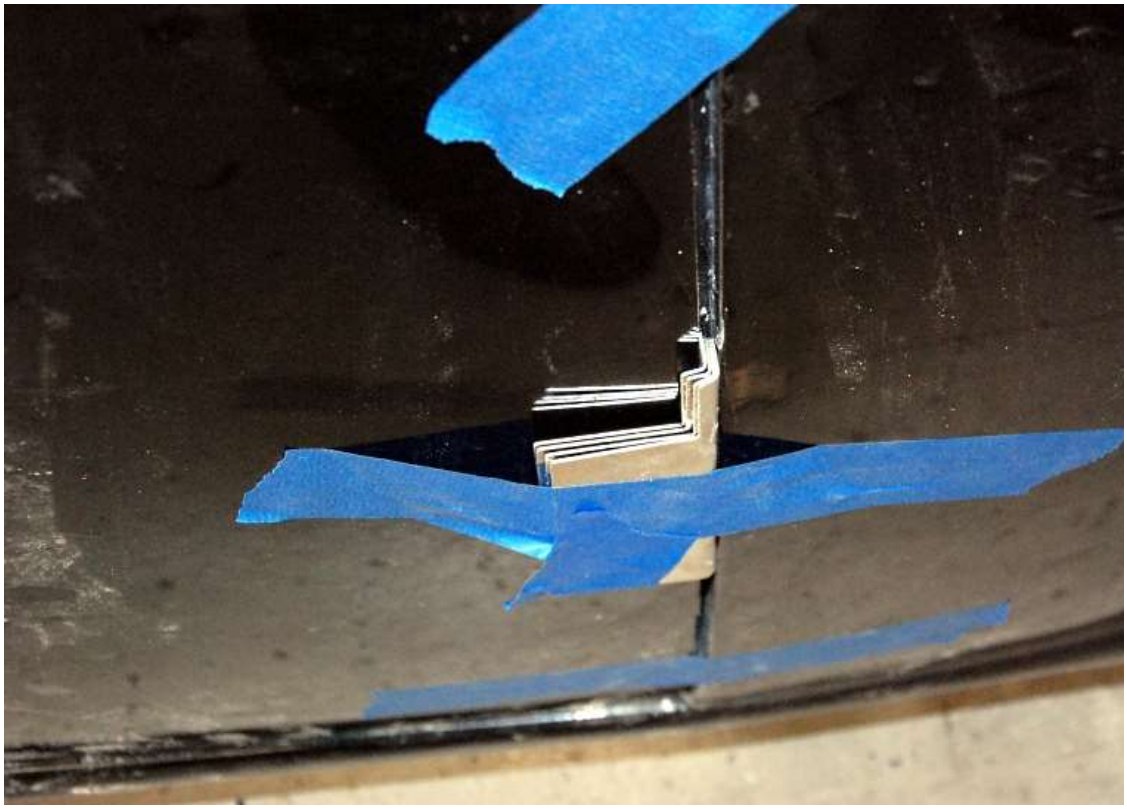
Screw the ¼” bolts into the door latch using a $^{7}/_{16}$” socket. Do not fully tighten the locknuts



At the front of door, bring the main plate in so that it touches the inside door liner then tighten the ¼” door latch bolts.

Tighten the door frame carriage bolts with a ¾” socket.

Insert the hinge arms into the door and tape the door in place.



- Use washers or paint sticks or something similar to hold the door gap at the back of the door.

- If the door is high, it may be sitting on the hinge arms. Trim the door hinge arm opening with a saw if necessary.

Move the hinge arms so that they are straight or as far towards the center of the car as possible. The top arm is especially important since this is the arm that hits the stop. The further in the arm is the more the door can open before it hits the stop.

Tighten the hinge carriage bolts with a ¾" socket.

Latch striker mount

- ⅛", ⅜", ½" drill bits, drill, ½", ⅝" sockets, ¾" wrench.
- Door handle components.

Close the door latch.

Drill a 1/8" hole in the middle of the door striker hole in the latch through the door and door frame steel.

Put a drill with an 1/8" bit inside the door so the drill bit goes through the hole just made.

Close the door making sure that it is straight and at the correct height in the front then drill through the body.

Open the door, remove the drill then open the hole in the body door opening up to ½”.

Insert the striker into the hole made.

Install the striker mounting bracket so that the striker goes through the slot on the bent tab.

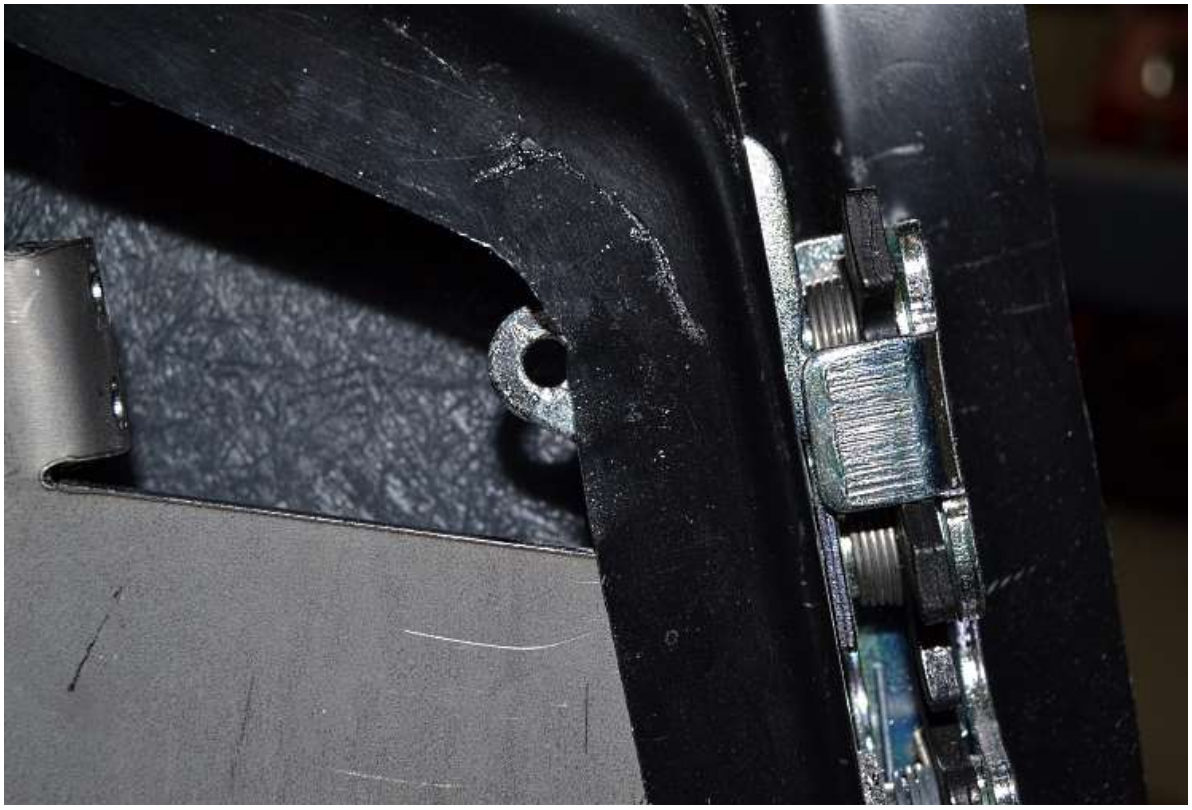
Screw the locknut onto the striker by hand only.

From the outside of the frame, run the 5/16”x ¾” carriage bolts through the striker bracket and frame followed by a washer and locknut. Tighten the carriage bolt locknuts so the plates touch but can still slide.

Tighten the striker on the mount using a ¾” wrench and ⅝” socket.
Tighten the striker to frame mount using a ½” socket.

Interior Door latch release

- ½” drill bit, drill, 7/16” socket.
- 33 door handle components
- If using an inside handle this section is not needed, skip to the Hardtop Optional interior door handle section.



Look at the door latch release lever, if it looks like this some material will have to be removed around the lever hole for clearance.

Use a ½” drill bit to grind a slot in the door flange.

Insert the release lever into the latch hole to check clearance.

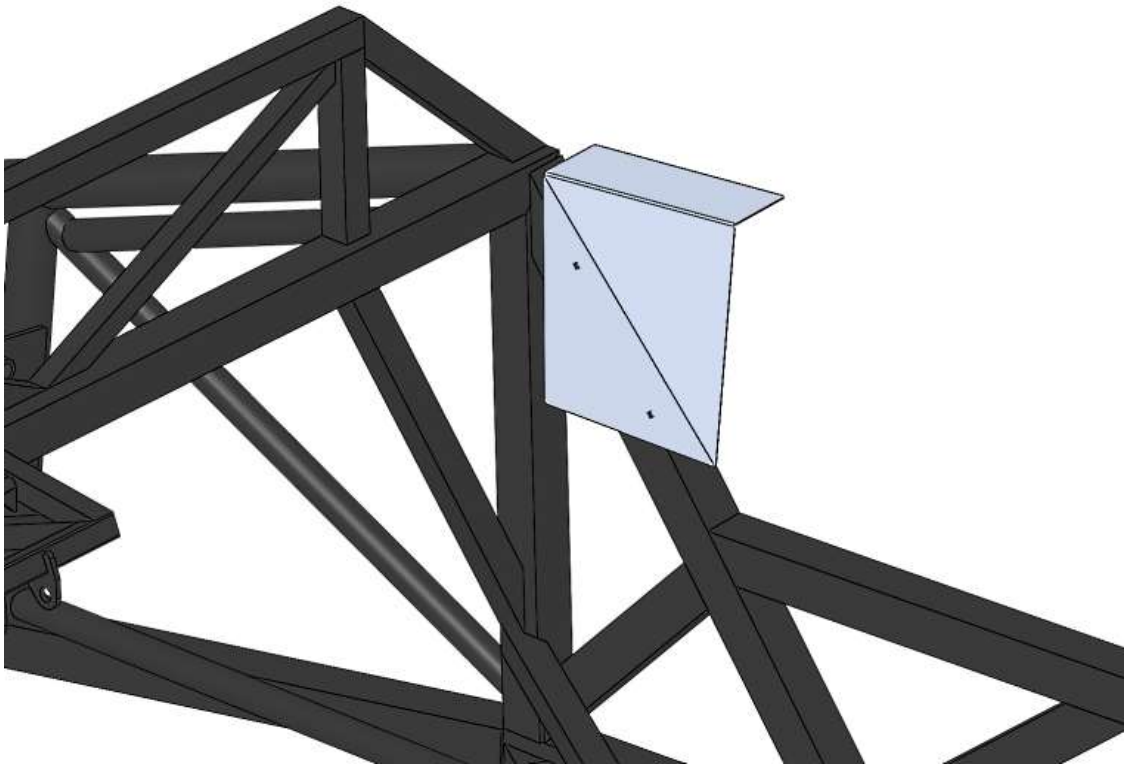
If there is 1/8" clearance around the release lever attach the locknut to the lever with a 7/16" socket.

Interior aluminum panels

Striker cover

🛠 Drill, ⅛" drill bit, rivet tool, silicone, silicone gun
🚘 Packaged aluminum, Secondary body fasteners

Push weatherstrip onto the aluminum striker covers on the outside where is will seal against the body.



With the door hinge and latch adjusted, position the striker cover. Some trimming for the door striker mount may be needed.

Silicone and rivet the panel in place.

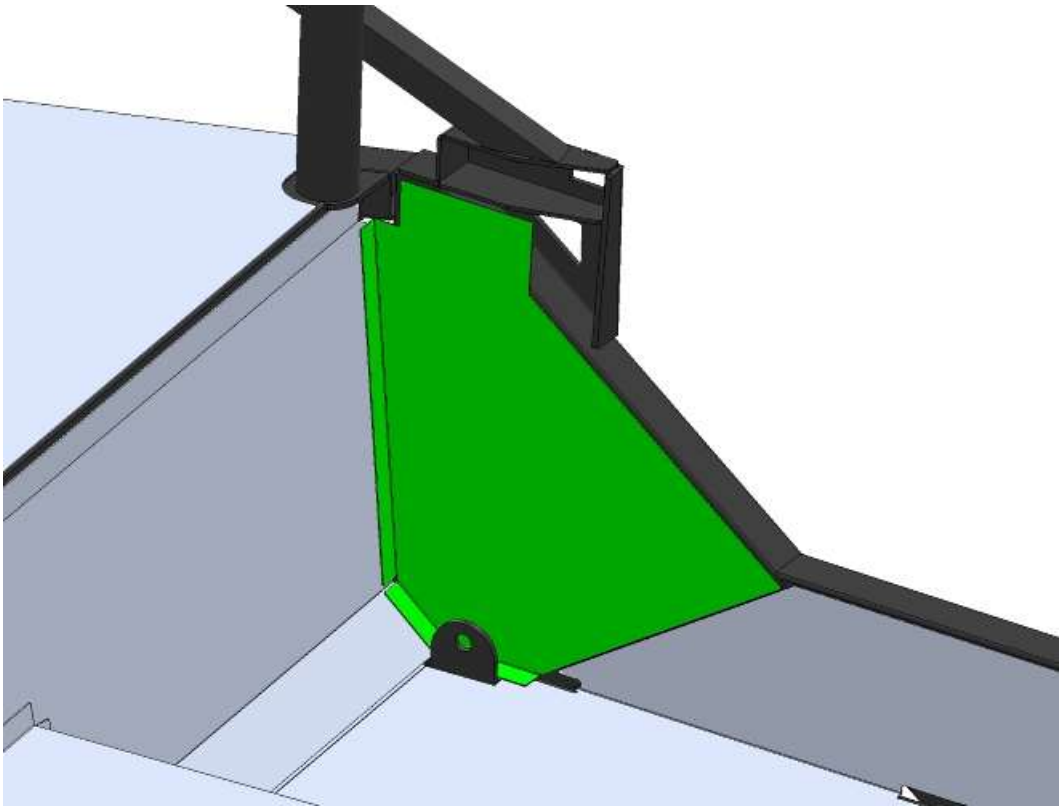
Fuel tank side cover

🛠 Drill, ⅛" drill bit, rivet tool, silicone, silicone gun
🚘 Packaged aluminum, Secondary body fasteners

Push weatherstrip onto the top, outside and front edges of the cover panel. Insert and locate the panel so that the weatherstrip seals against the outside body and behind the door.

Silicone and rivet the panel in place.

Cockpit rear corner



At the rear lower corner of the cockpit attach the cockpit rear lower corner aluminum pieces to the frame.

Cockpit rear waterfall

🛠 1¾” hole saw, drill, marker, tin snips, hack or air saw
🚘 body assembly – rear cockpit cover, secondary body fasteners, upholstered interior parts
✋ The cockpit rear cover can be covered a couple ways, black vinyl is included with the kit or it can be painted to match the color of the car.

Set the upholstered top cover on the rear cover.

The top cover should sit down nicely along the bend in the rear cover. If it does not, note the height that needs to be trimmed, remove the top cover, mark the rear cover, remove and trim the excess flange.

Mark the recessed area where the seat harnesses will come through.

Remove the upholstered top cover and mark 0.50” up from the bend.

Cut off the top area marked.
Set the rear cockpit cover in place on the frame.

Without Rollbar

The rear cover can either be installed with riv-nuts, $^{3}/_{16}$" rivets or black trim screws.

- The rear cockpit cover can be sent out for paint with the body or sent to get covered or see the installation section later for vinyl covering.

With Rollbar

Install the rear cockpit cover temporarily with clamps, black trim screws or masking tape.

From inside the trunk, hold a marker inside the rollbar mount tube and bring it up to the rear cockpit panel and mark the underside of the panel for the rollbar hole.

Remove the rear cockpit trim panel.

Turn the panel upside down and drill the hole positions marked using a 1¾" hole saw. Make sure that the hole saw is angled like the rollbar would be and **not** perpendicular to the panel surface.

Look at the bottom edge mark drawn on the rear cockpit aluminum. The mounting screws for the rear cover need to go into the 1.50" tube.

Measure up to the center of the 1.50" tube.

Mark the rear cockpit cover this same distance up from the bottom edge.

Temporarily remount the panel and check the fit of the rollbar by sliding it down into the mounts. If necessary, use a file to open the holes where necessary.

Drill the lower mounting holes through the cover and into the 1.50" tube on the line marked on the cover.

Remove the rear cockpit cover.

- The rear cockpit cover can be sent out for paint with the body or sent to get covered or see the installation section later for vinyl covering

Trunk

- Orbital sander, 80 grit sand paper, masking tape, jig saw or air saw, marker.
- Trunk, secondary body fasteners
- The trunk is cut oversized at the factory to allow for maximum adjustment and to allow the customer to set their own desired panel gaps.

Fit the trunk to the trunk opening of the body.

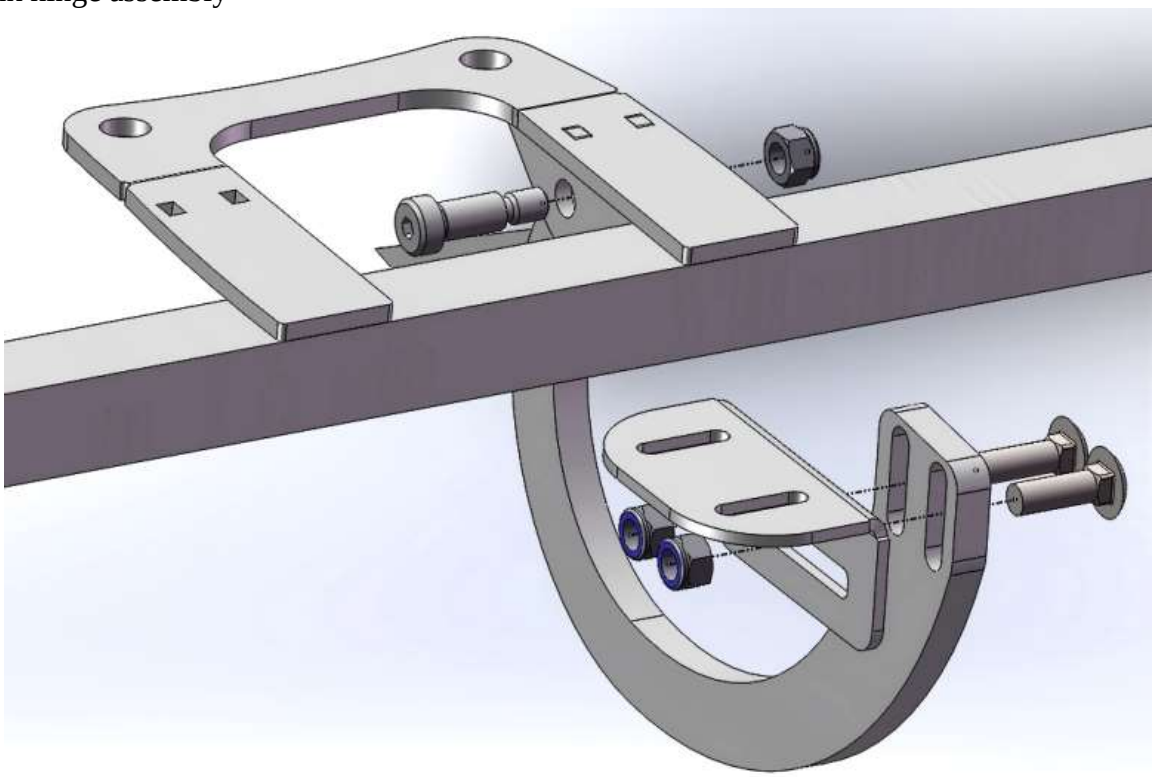
Starting at the bottom middle push the trunk weatherstrip onto the flange around the trunk opening.

- Use shims or washers to set the gap so that it is even around the sides and top of the trunk.

Tape the trunk in place with the shims so that it cannot move.

Trunk hinges

- 🛠 $^{5}/_{32}$”, $^{3}/_{16}$” hex keys, $^{7}/_{16}$” wrench, marker, ½” socket, ratchet, shop light, $^{3}/_{16}$”, $^{25}/_{64}$” drill bits, drill, masking tape, riv-nut tool
- 🚘 Trunk hinge assembly

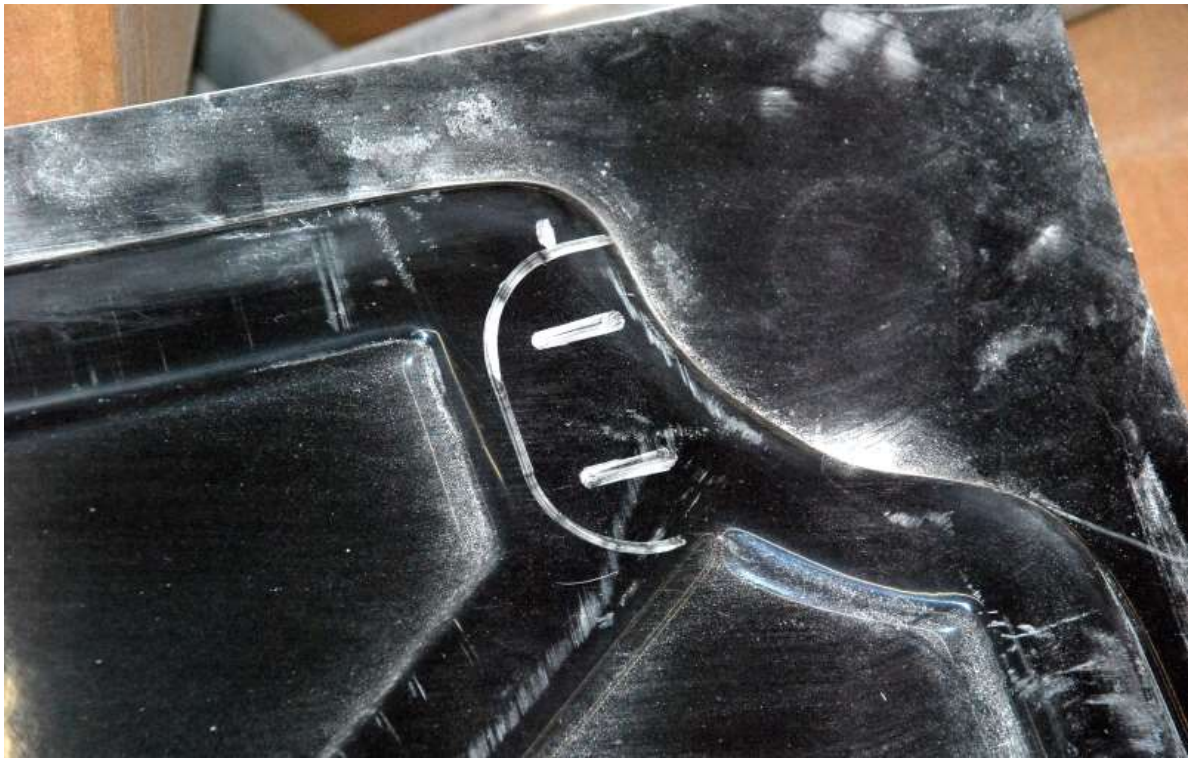


If not already in place, attach the hinge arms to the frame using the bushings and shoulder bolts.

Loosely attach the trunk hinge mounts to the inside of the hinge arms so that they can just move.

With a shop light and marker, go up into the trunk from under the car.

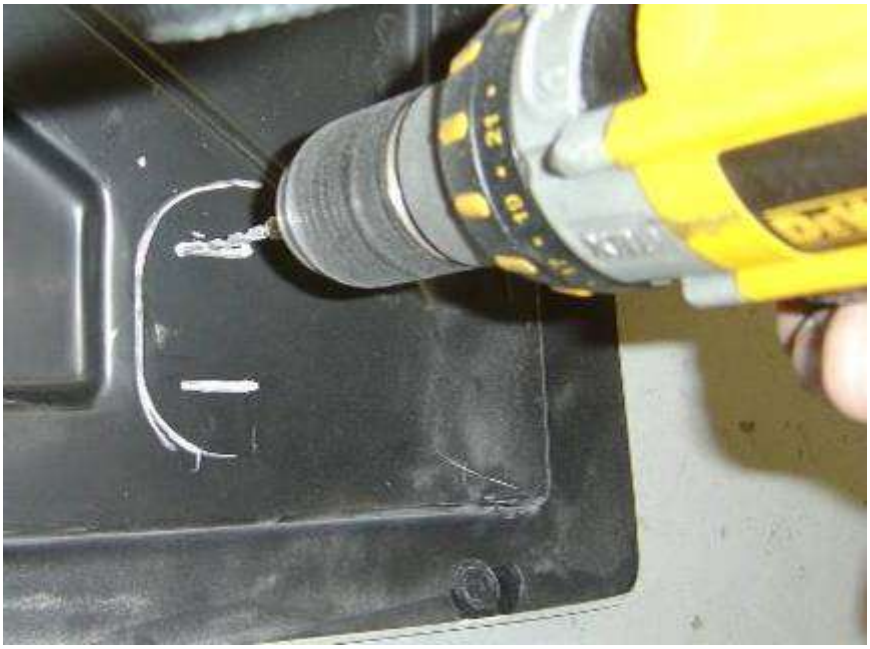
Hold the hinge mounts on the trunk so that the carriage bolts are centered in the slots and the mount is on the trunk mounting area.



Mark around the hinge mount and in the mounting slots.

Remove the trunk.

Mark the center of the slots.



Drill the center of the slot marks with a $^{3}/_{16}$" drill bit then open them up with a $^{25}/_{64}$" bit for rivnuts.

Install a ¼”-20 riv-nut in each of the holes drilled.

Re-shim the trunk in the body opening and tape in place.

From inside the trunk, fasten the trunk hinge mount bracket to the trunk using ¾” flanged button head screws keeping these loose enough for now to allow them to slide.

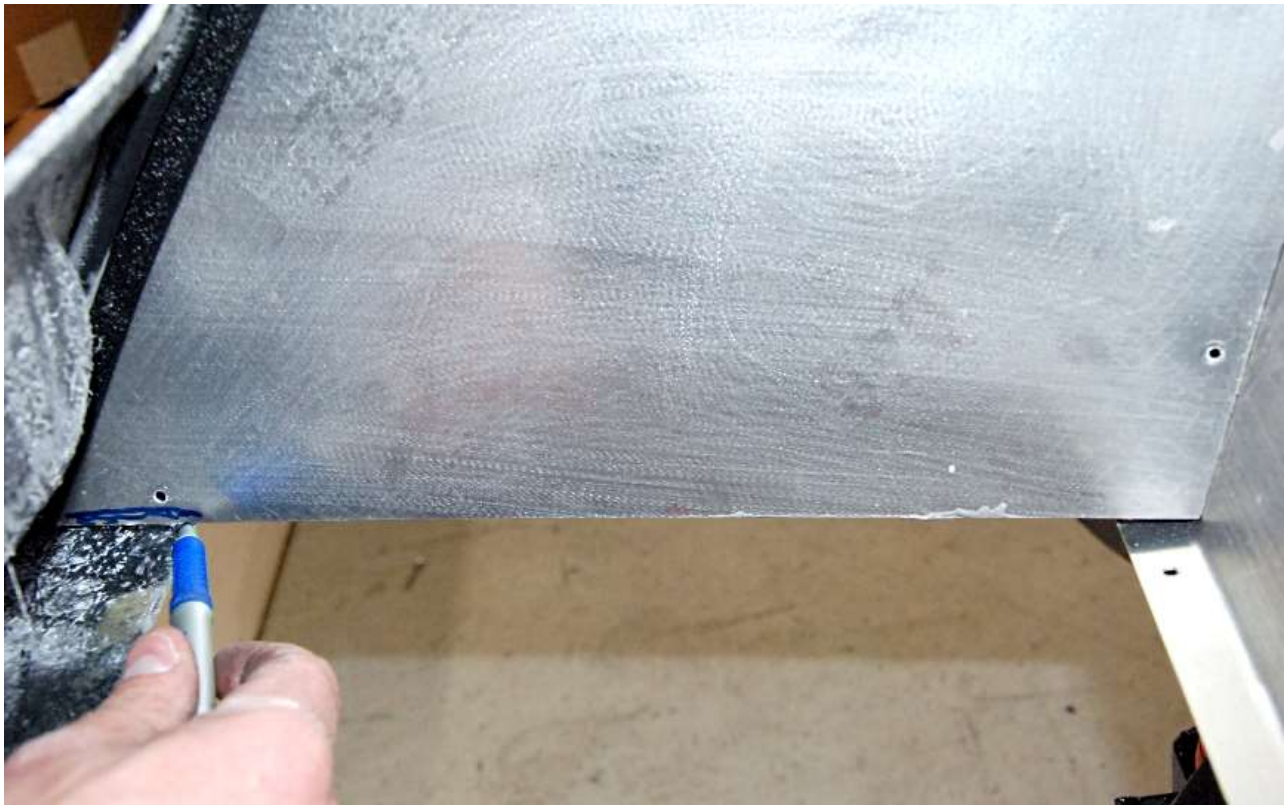
Push the hinge arm up to the trunk and tighten the hinge arm carriage bolts

Tighten up the mount bracket to trunk screws.

From outside the trunk, try opening the trunk. If it catches on the front edge of the trunk, more material will have to be removed.

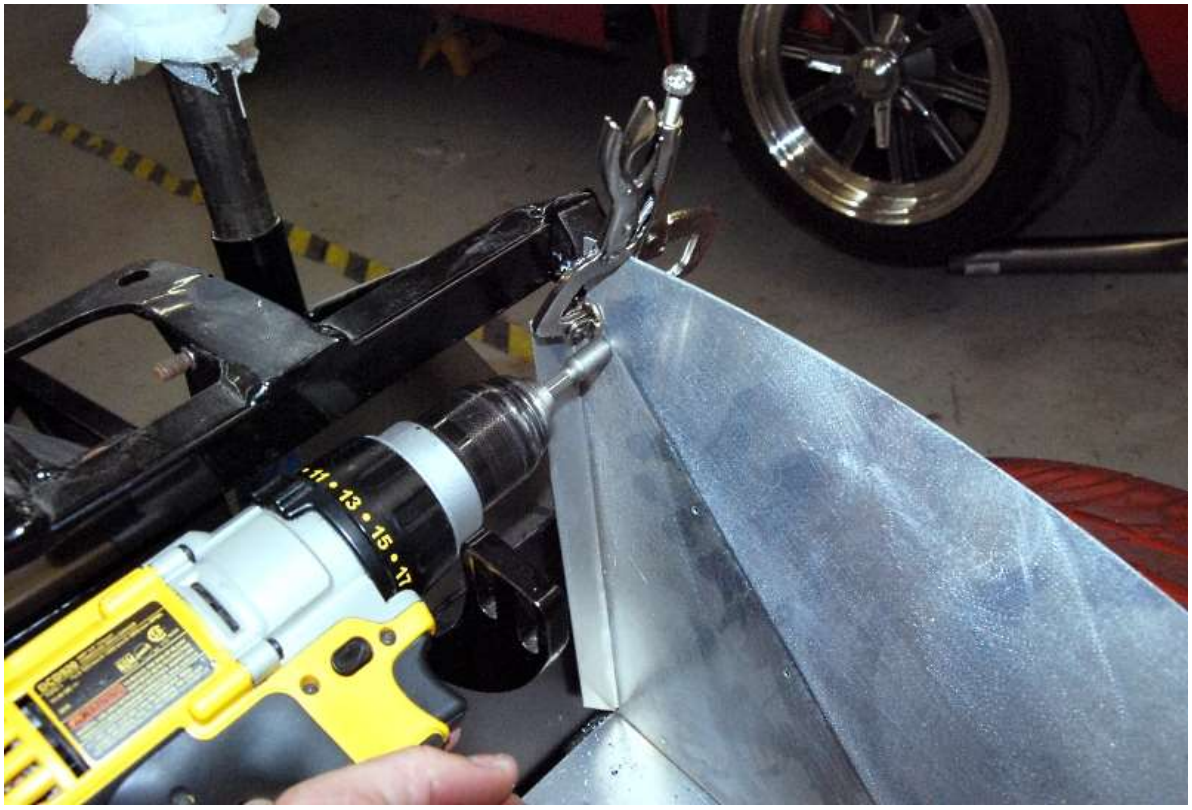
Trunk Aluminum

- 🛠 Ruler, marker, tin snips, ¼" nut driver.
- 🚘 Kit aluminum screws.
- ✋ The body is easier to remove and install with some of the trunk aluminum off the frame so do not rivet the lower floor on now.



Install the trunk side aluminum. It may hit the bottom of the body in the trunk. If so, mark the location, remove and trim in a straight line to the opposite corner.

Use a ruler or straight edge to align the front bent flange on the side wall aluminum with the tube frame tube that goes across the trunk.



Clamp the trunk wall aluminum to the frame then screw it to the frame using one of the holes for rivets.

If necessary, trim the aluminum around frame welds so that the aluminum sits flat against frame tubes.

Repeat for the other side.

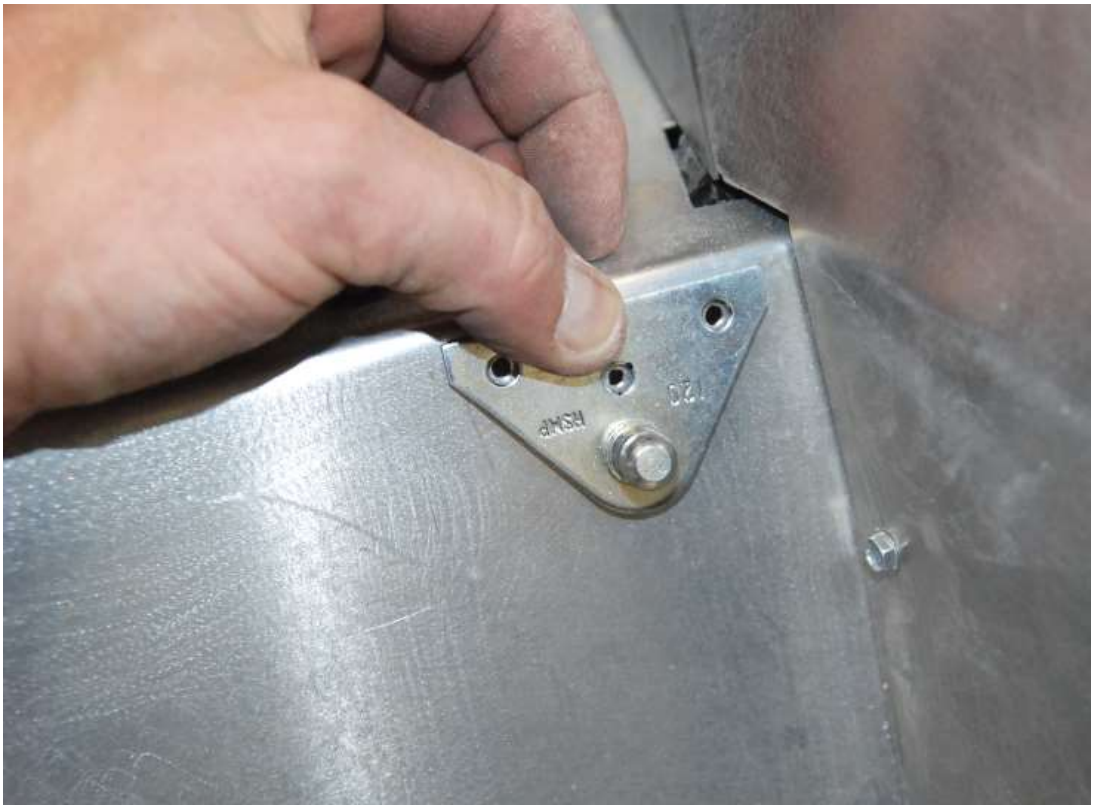
Screw the upper floor to the frame.

Remove the side panels.
Install the lower trunk floor.

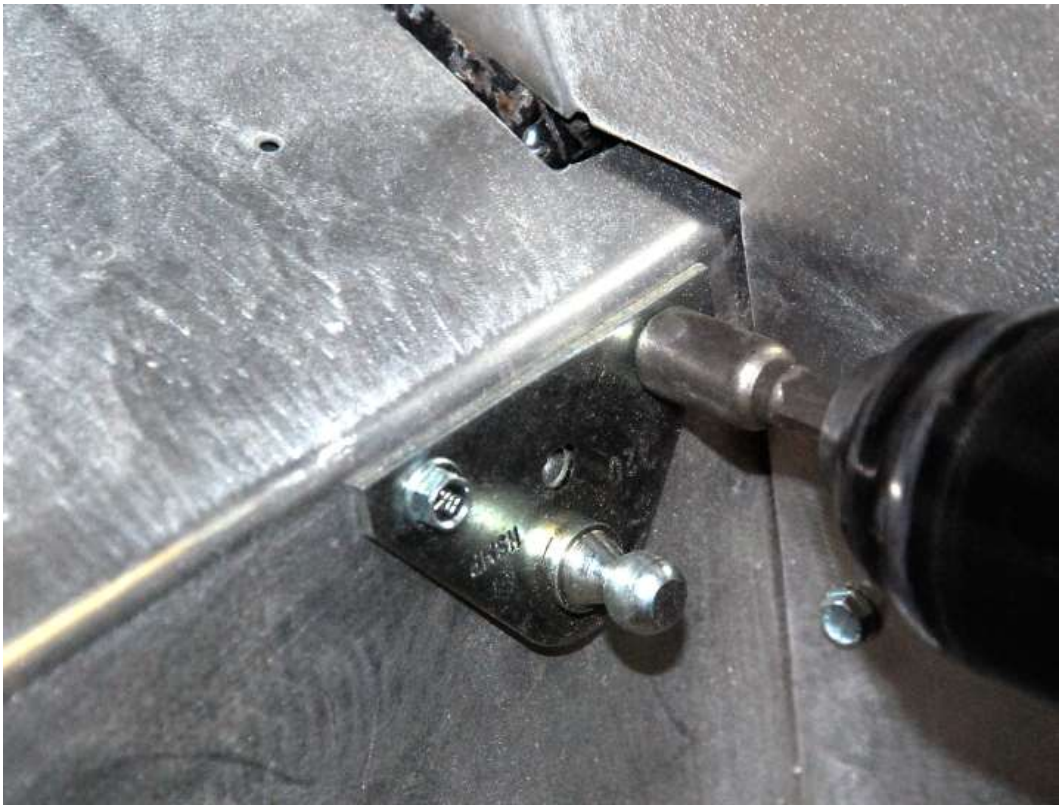
Install the trunk sides. If they are tight on the rear lower body flange, use a marker as a guide and trim off the area needed with tin snips.

Trunk Prop Rod

The trunk prop rod is mounted on the right side of the car on the vertical wall of the trunk.



Mark the 3 mount holes for the prop rod mount.



Attach the mount to the frame with a couple of the #6 self tapping screws for now.

Attach the prop rod assembly to the prop rod mount.

The rubber stop on the prop rod can be positioned anywhere you would like, but it seems to work the best in the triangular section on the trunk liner.

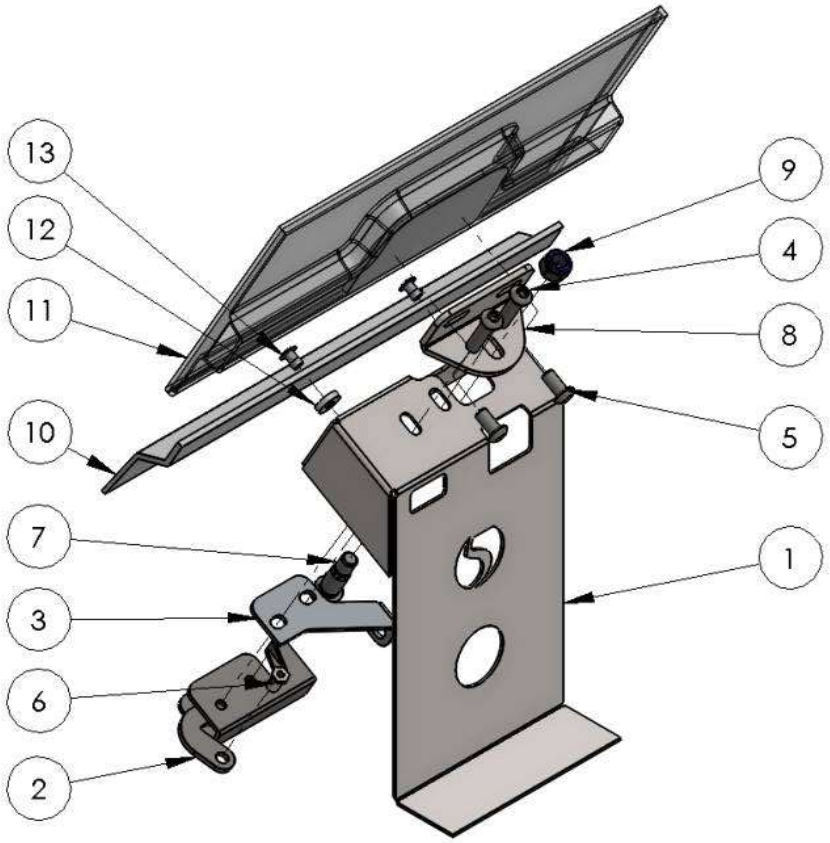
Trunk Latch

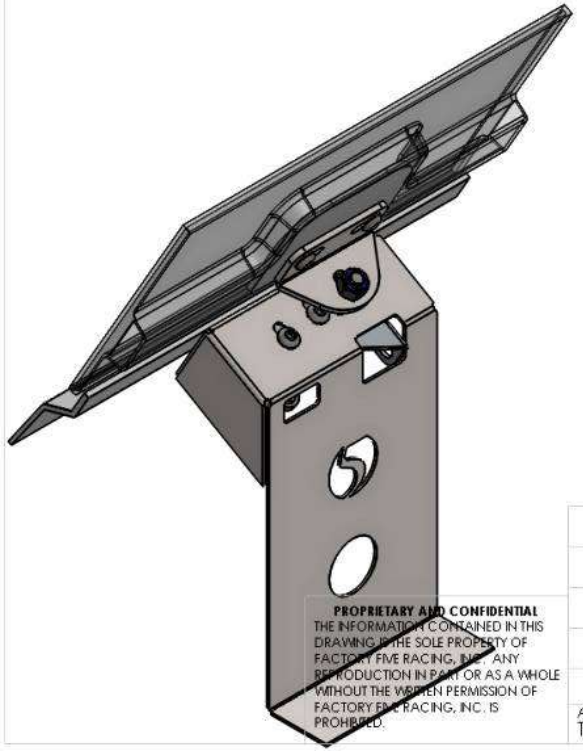
🛠 $^{5}/_{32}$" hex key, flat head screwdriver, $^{5}/_{16}$" wrench, ruler, ¼" hex driver, marker, needle nose pliers
🚘 Trunk latch assembly

- There are a few ways the trunk can be latched and opened. The parts provided in the kit include a release handle that can get mounted inside the car for the latch in the trunk. Another option would be a release cable under the trunk. The other option is a push button (shown) that Factory Five uses for the 818 and Coupe.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33743 - TRUNK LATCH BRACKET	TRUNK LATCH MOUNT	1
2	33734 - ROTARY LATCH		1
3	26165 - LATCH SPACER UNBENT	33737 - HOOD LATCH SPACER	1
4	SBHCSCREW 0.25-20x1-HX-N		2
5	SBHCSCREW 0.25-20x0.5-HX-N		2
6	33736 - SWIVEL WIRE STOP		1
7	SHSSCREW 0.375x0.625-N		1
8	33515 - TRUNK STRIKER MOUNT	TRUNK STRIKER MOUNT	1
9	NLN-3125C	NYLON INSERT LOCKNUT, 5/16-18 UNC	1
10	Body Section		1
11	Trunk Section		1
12	12759	0.50" OD x .192" ID x 0.125" SPACER	2
13	Rivet 3-16 long	3/16" LONG RIVET	2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	4/20/11	





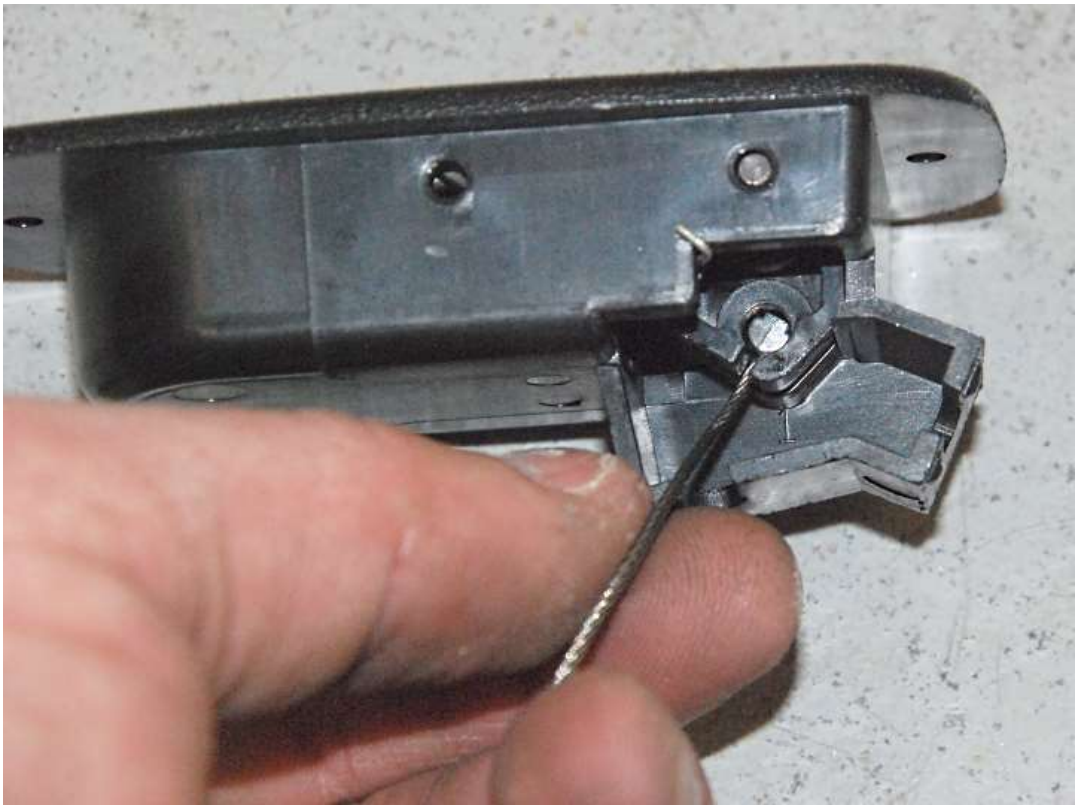
HOT ROD	UNLESS OTHERWISE SPECIFIED:		NAME / DATE
	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	JI 4/20/11
		COMMENTS:	
	MATERIAL		
USED ON	FINISH		
APPLICATION TRUNK LATCH		PRINTED 6/13/2011	

Factory Five Racing, Inc.

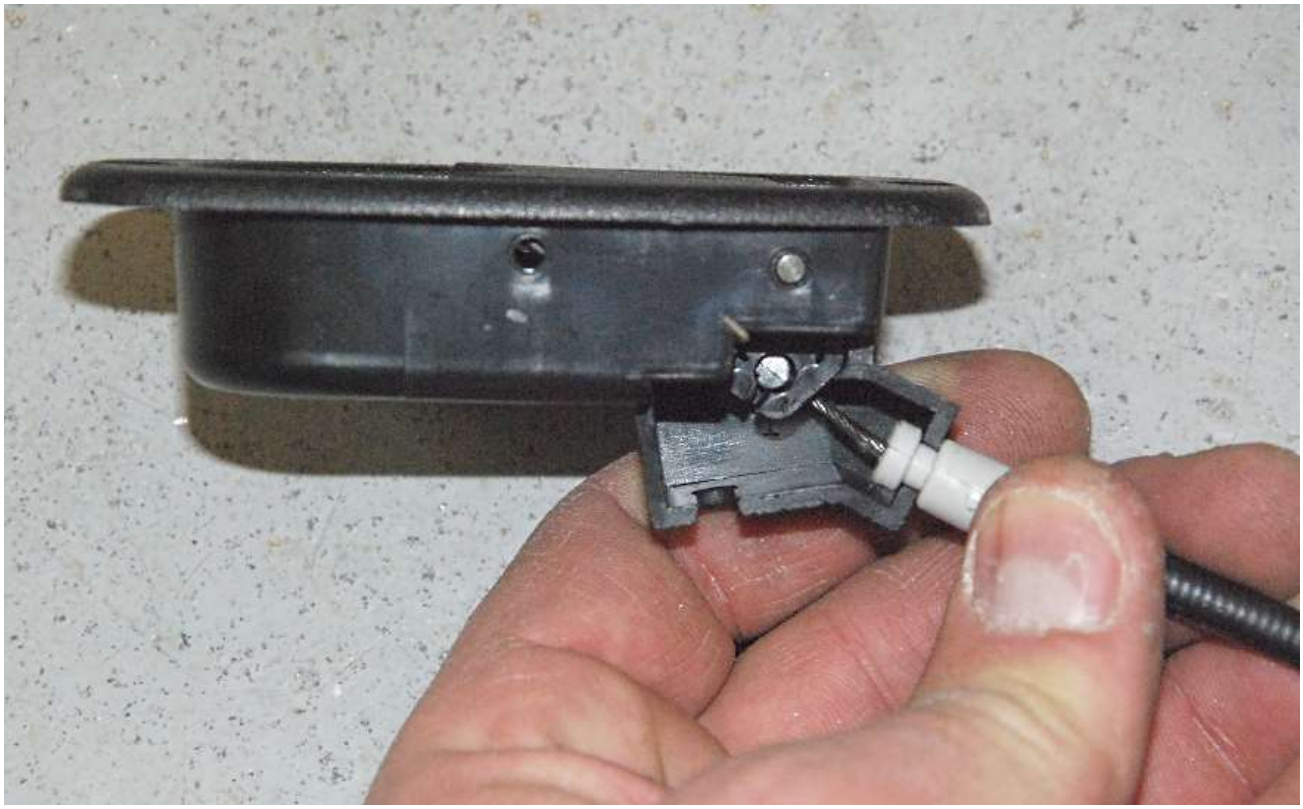
TITLE:
TRUNK LATCH ASSEMBLY

SIZE	DWG. NO.	REV
A	33761	A

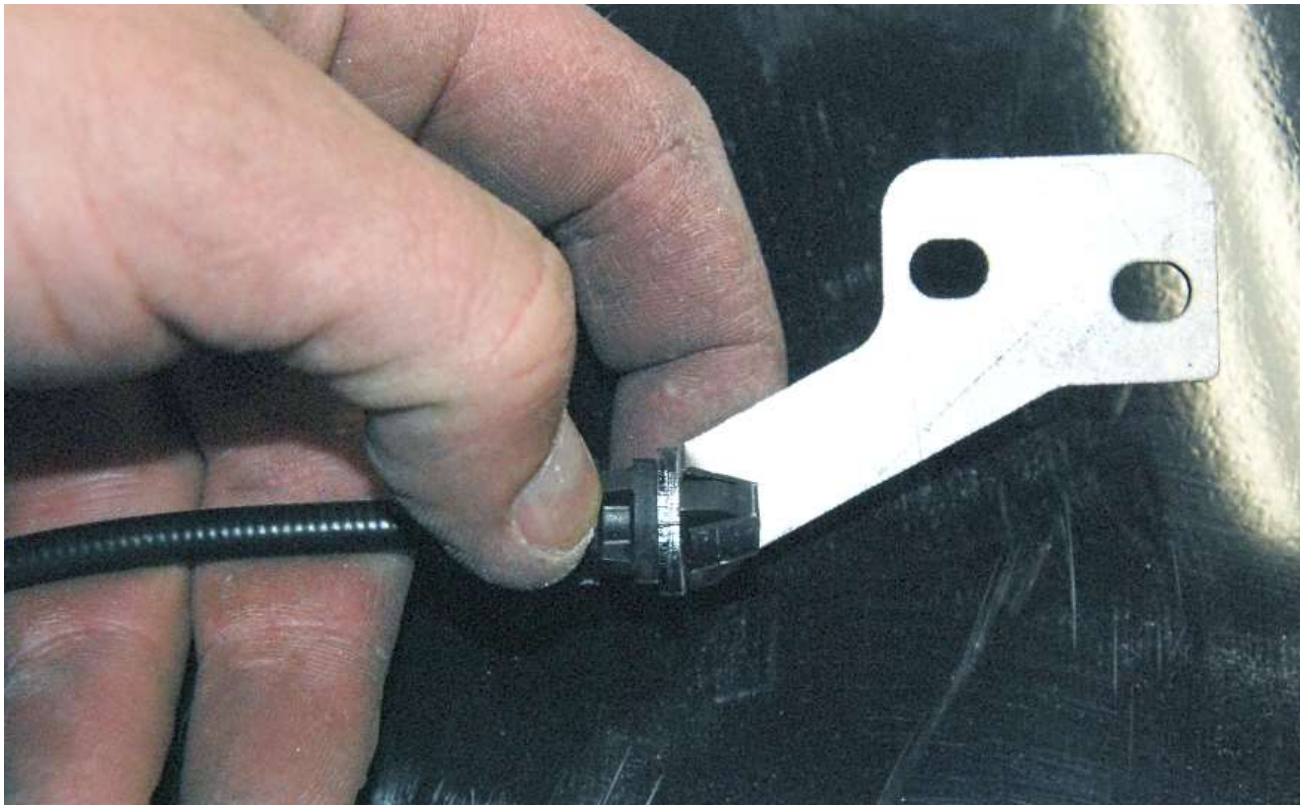
SCALE: 1:3 | WEIGHT: | SHEET 1 OF 1



At the handle end of the cable push the barrel end of the cable into the handle so that the wire can go into the slot and swing forward.

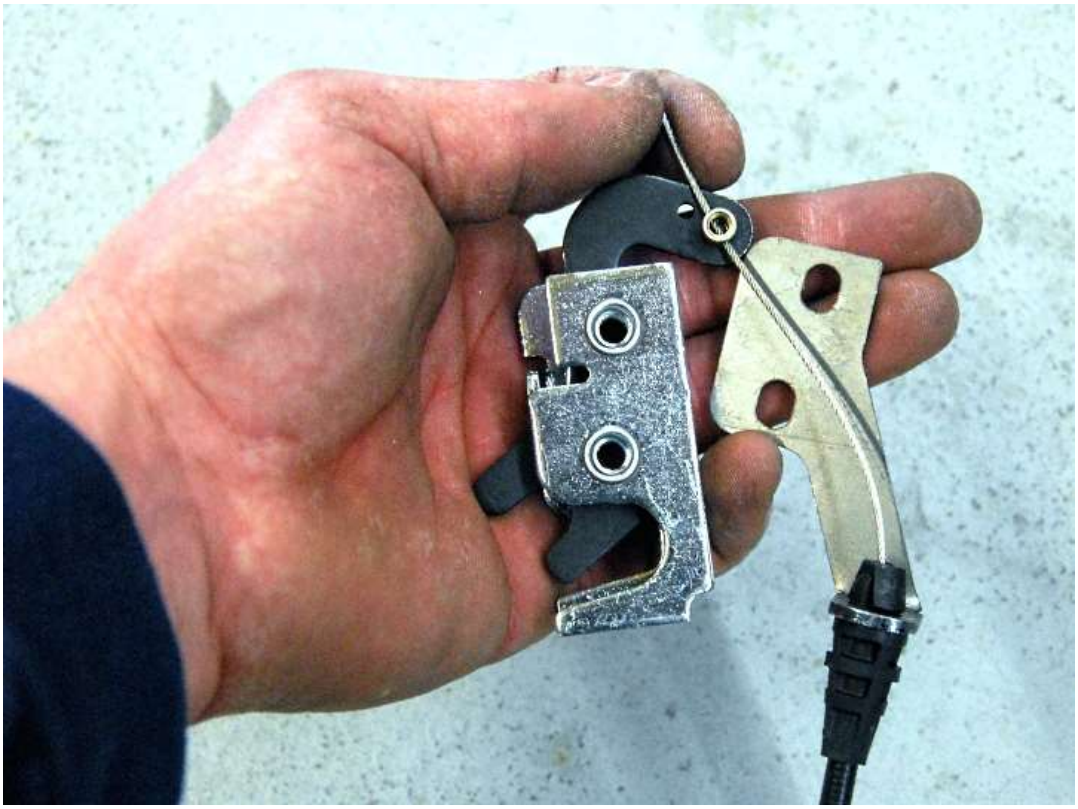


Push the cable sheath into the handle.

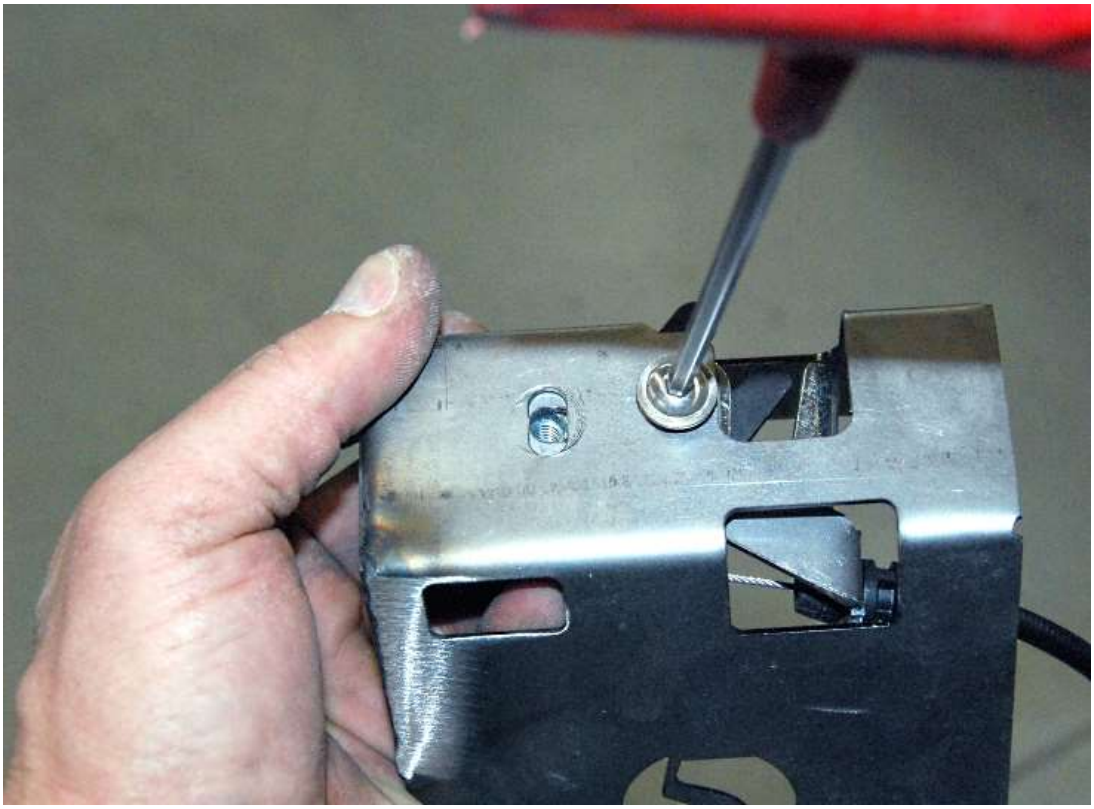


Insert the trunk latch cable into the latch spacer bracket.

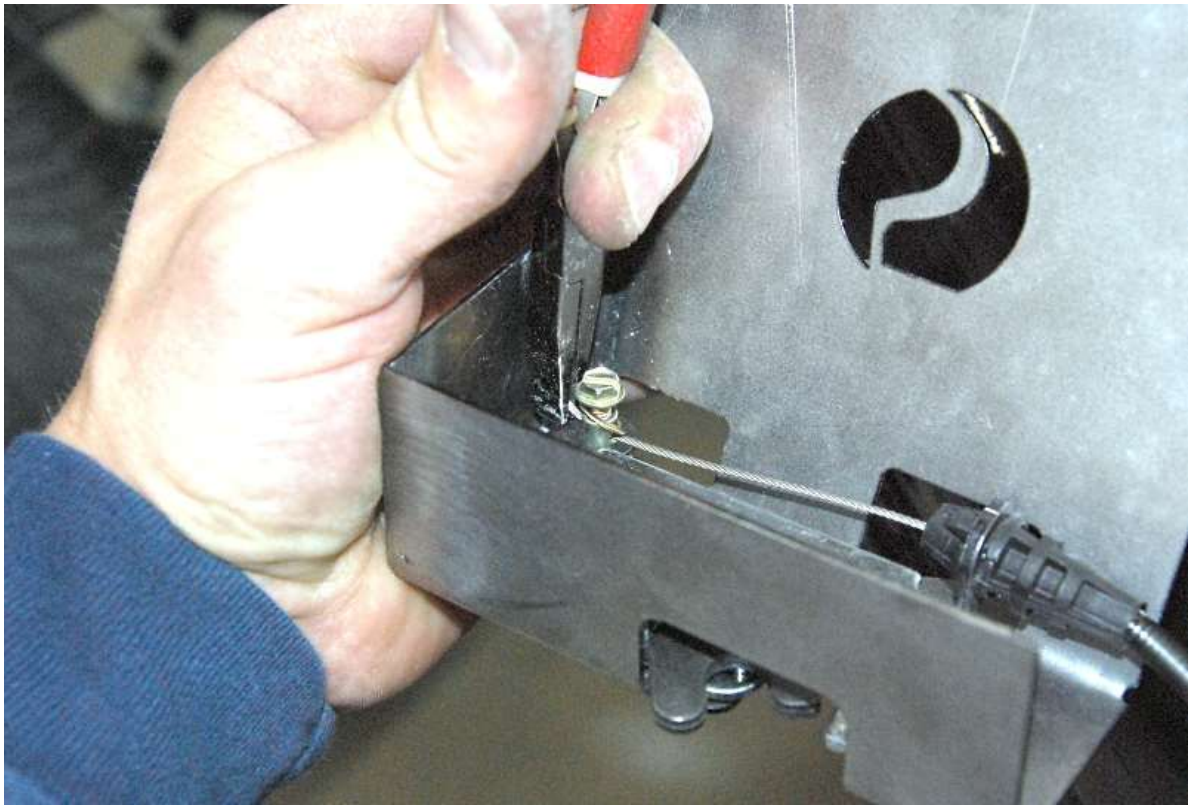
Insert the wire stop into the latch.



Insert the wire end through the wire stop.

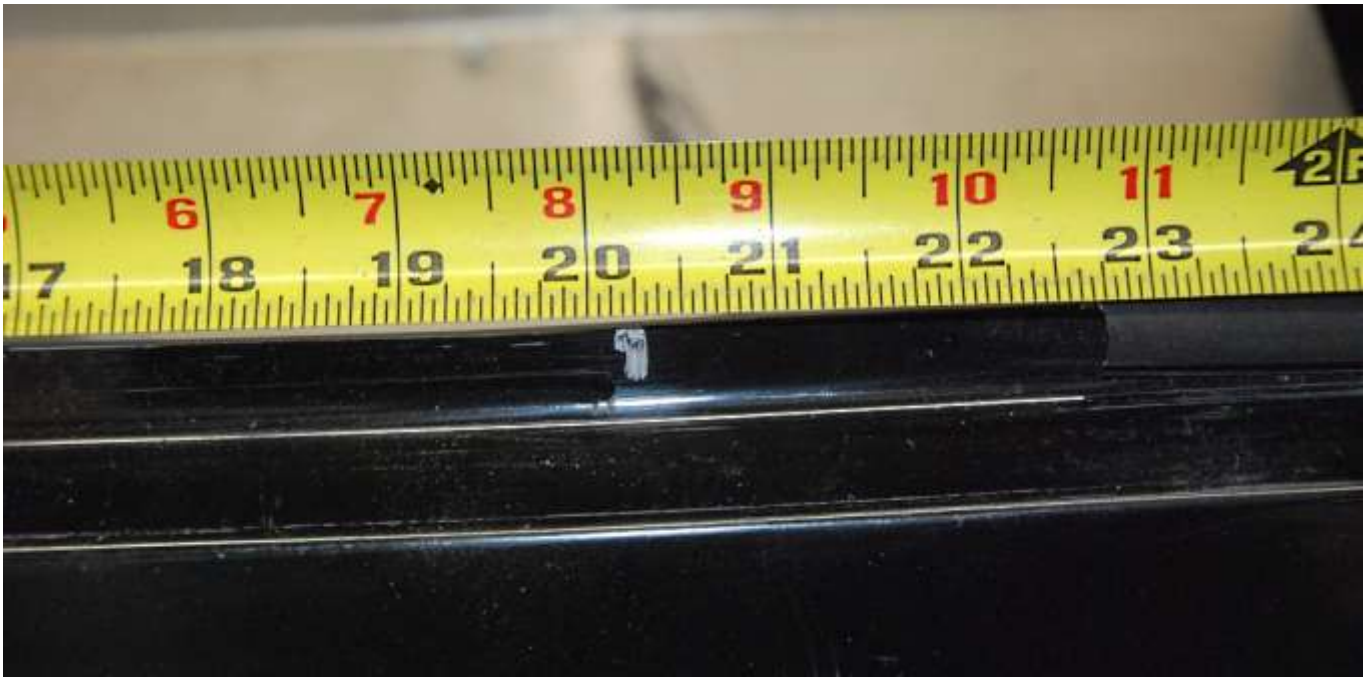


Attach the trunk latch and latch spacer to the trunk latch bracket as shown in the drawing at the beginning of this assembly. Leave it loose for now so it can be adjusted.

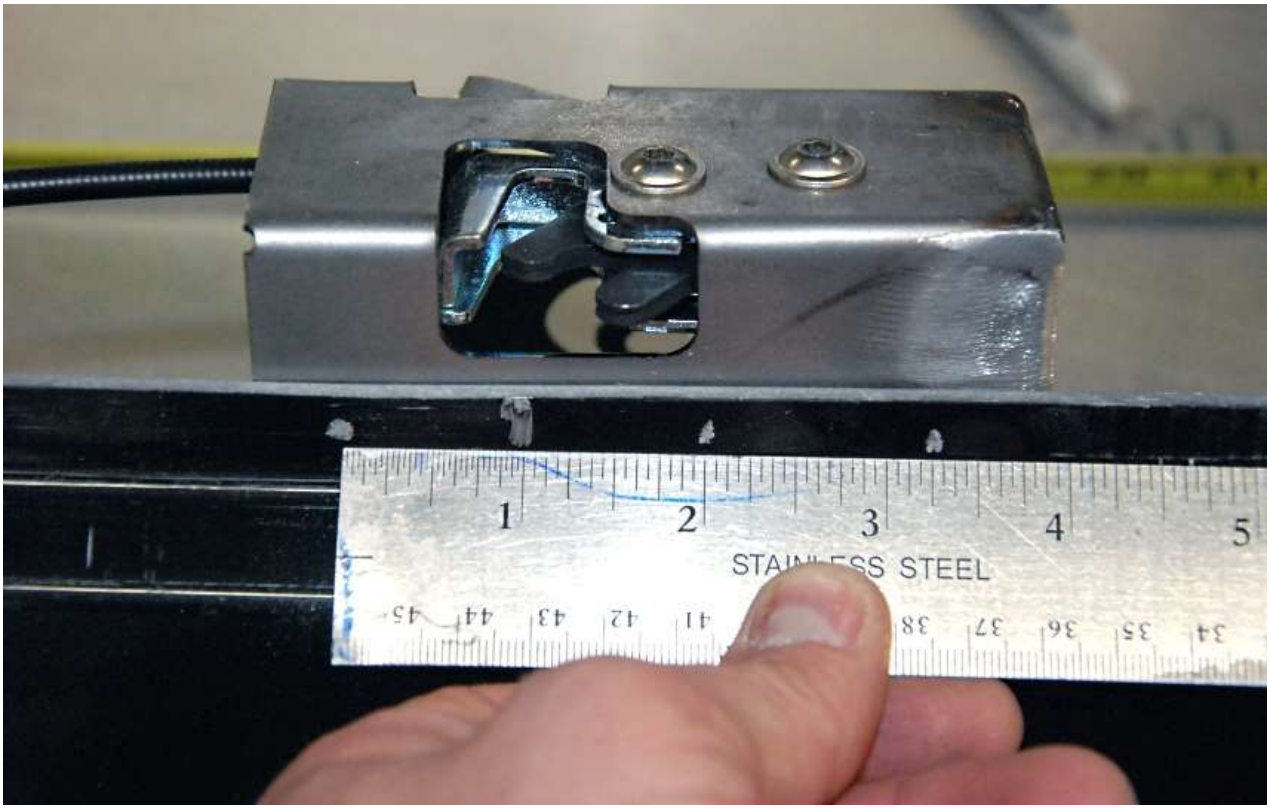


Use needle nose pliers to pull the cable tight then screw the wire stop screw down.

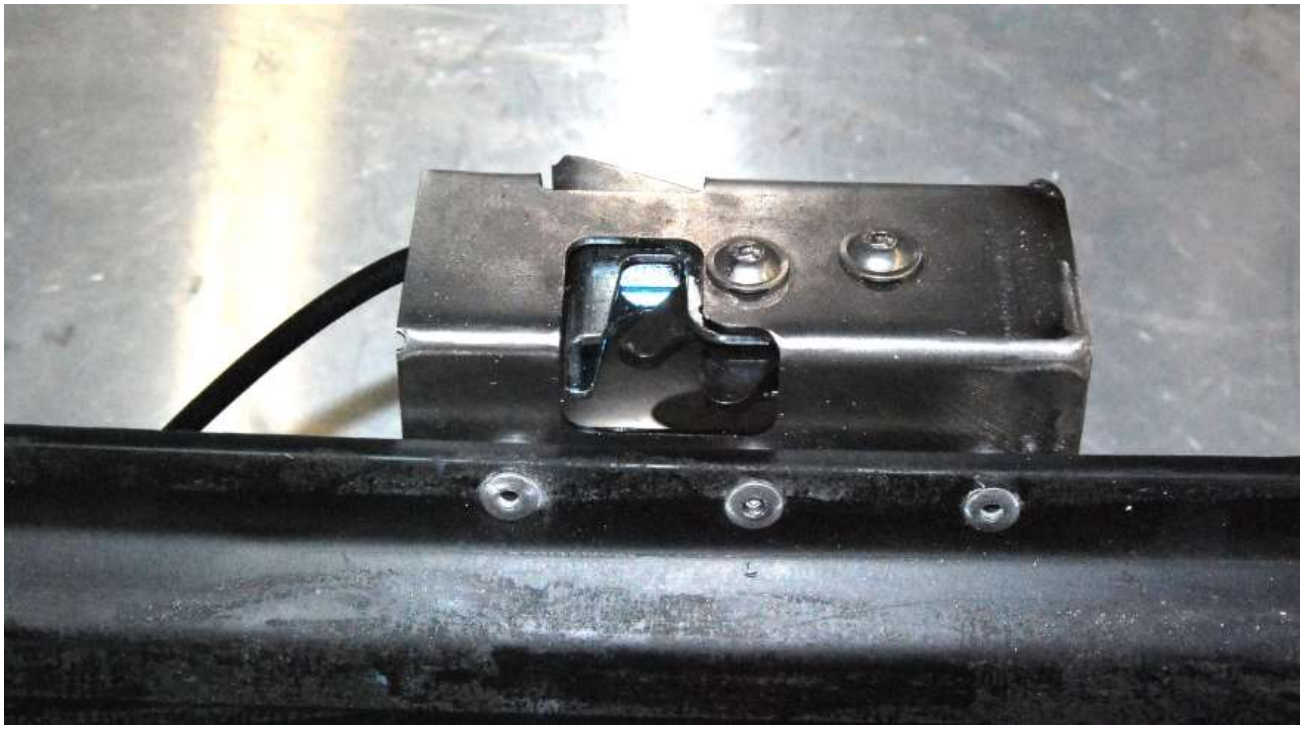
Use a $^{5}/_{16}$" wrench and screw driver to tighten the screw more.



Mark the center line on the trunk opening.



Line up the center of the latch up with the centerline you just drew.



Drill and mount the latch mount bracket to the body with $^{3}/_{16}$" rivets and the nylon spacers if necessary. The rivets go through the body lip then the spacers and into the bracket.

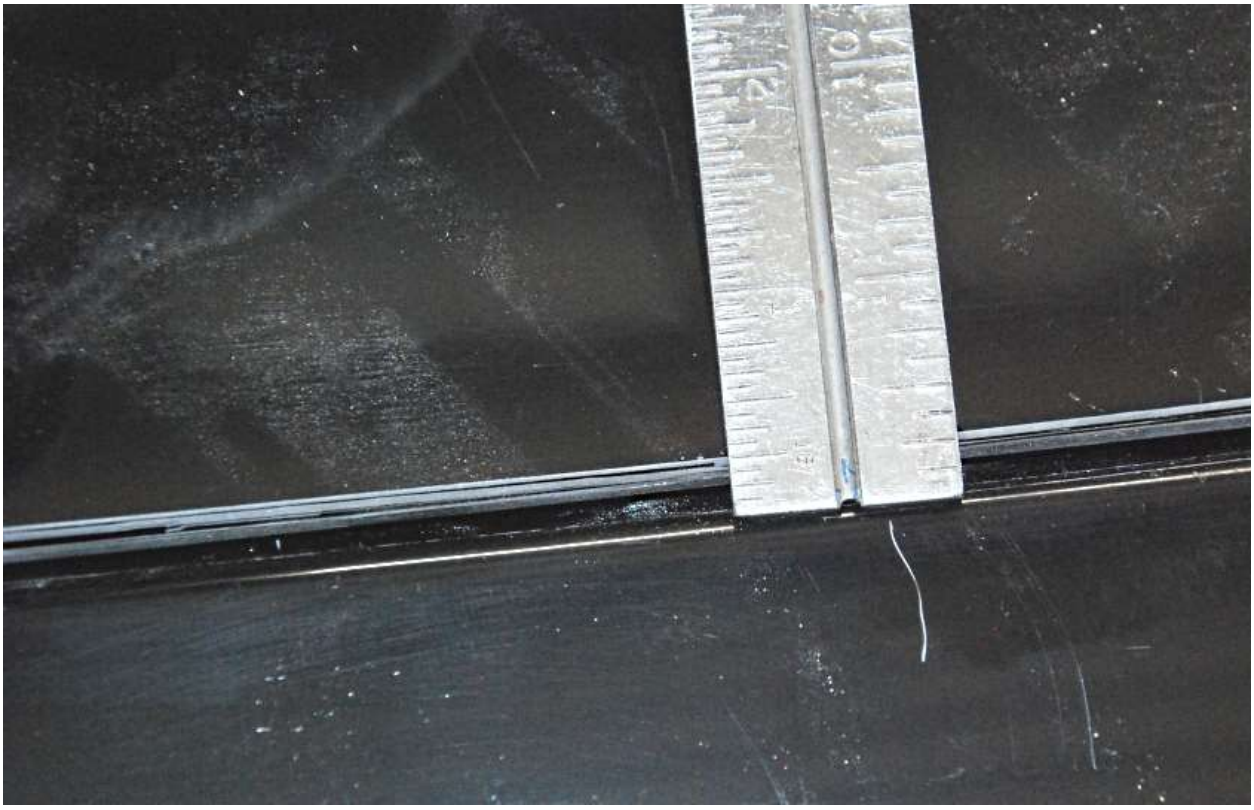
The bottom of the bracket is mounted to the trunk floor and attached with rivets from the bottom of the body.

Pass the release handle and cable through the hole in the trunk floor.

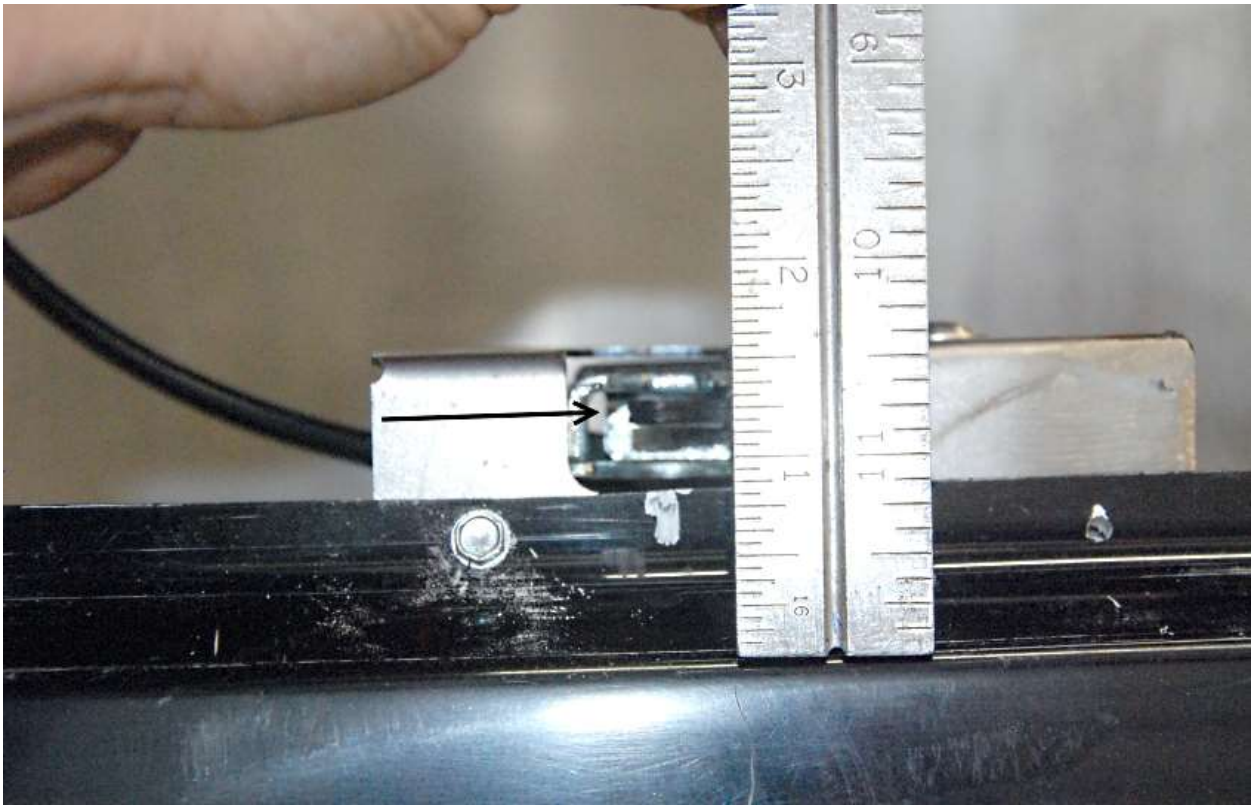
Striker

🛠 Clamp, marker, ruler, drill, $^{25}/_{64}$" drill bit, riv-nut tool, square, $^{5}/_{32}$", $^{3}/_{16}$" hex keys, ½" wrench
🚘 Trunk latch assembly, secondary body fasteners

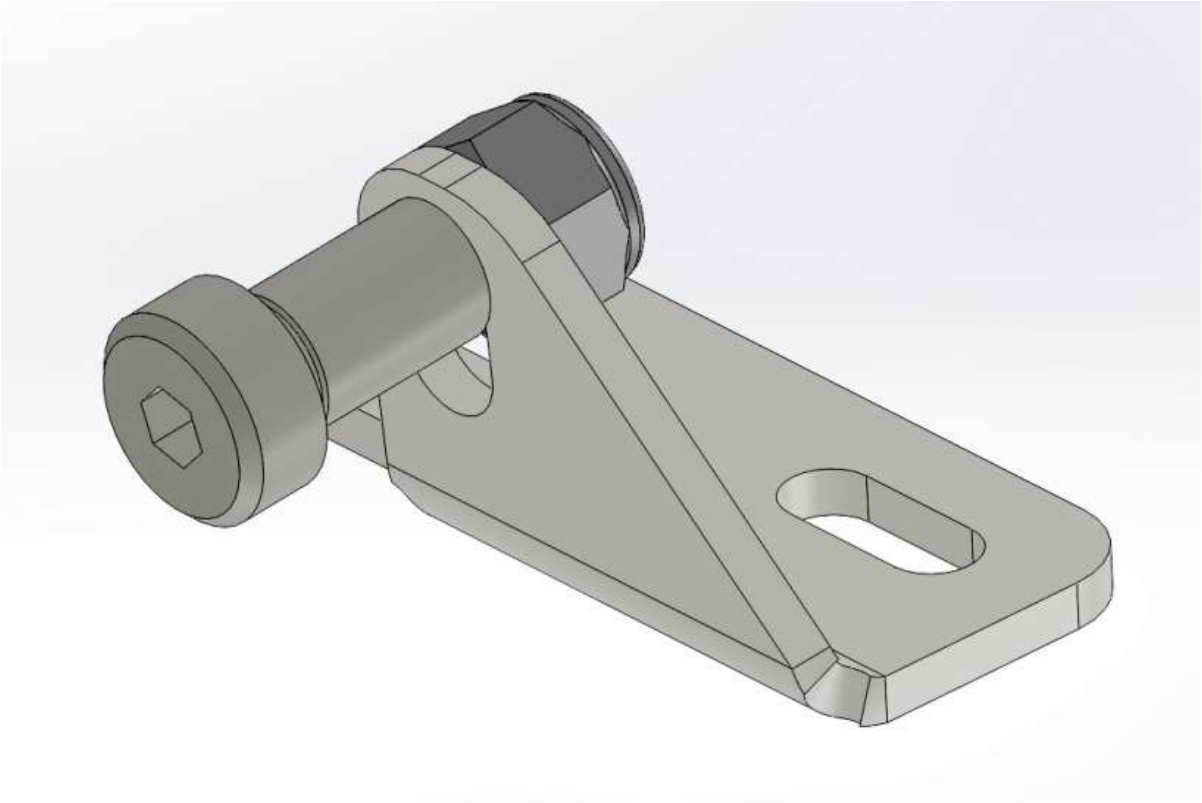
Close the trunk and mark the center of the latch location on the trunk.



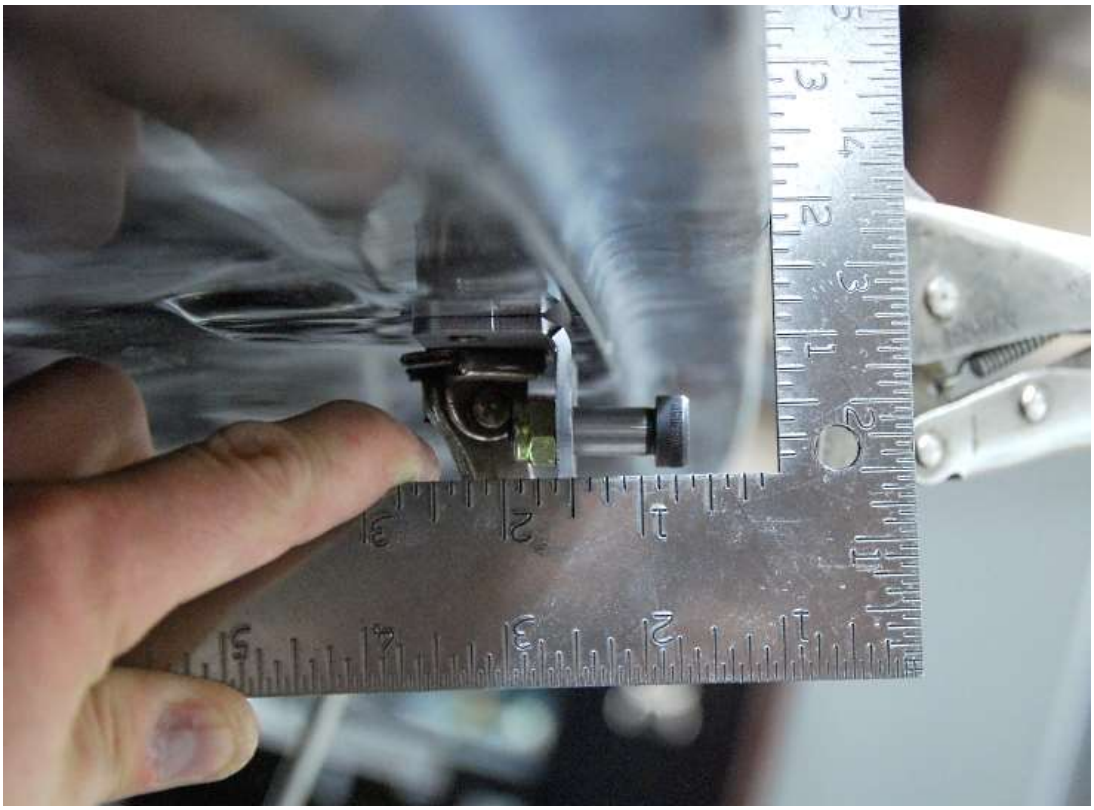
Close the trunk and measure the distance from the body lip to the trunk edge.



Open the trunk and measure the distance from the body lip to the bottom of the actual latch finger.



Attach the striker shoulder bolt to the striker mount.

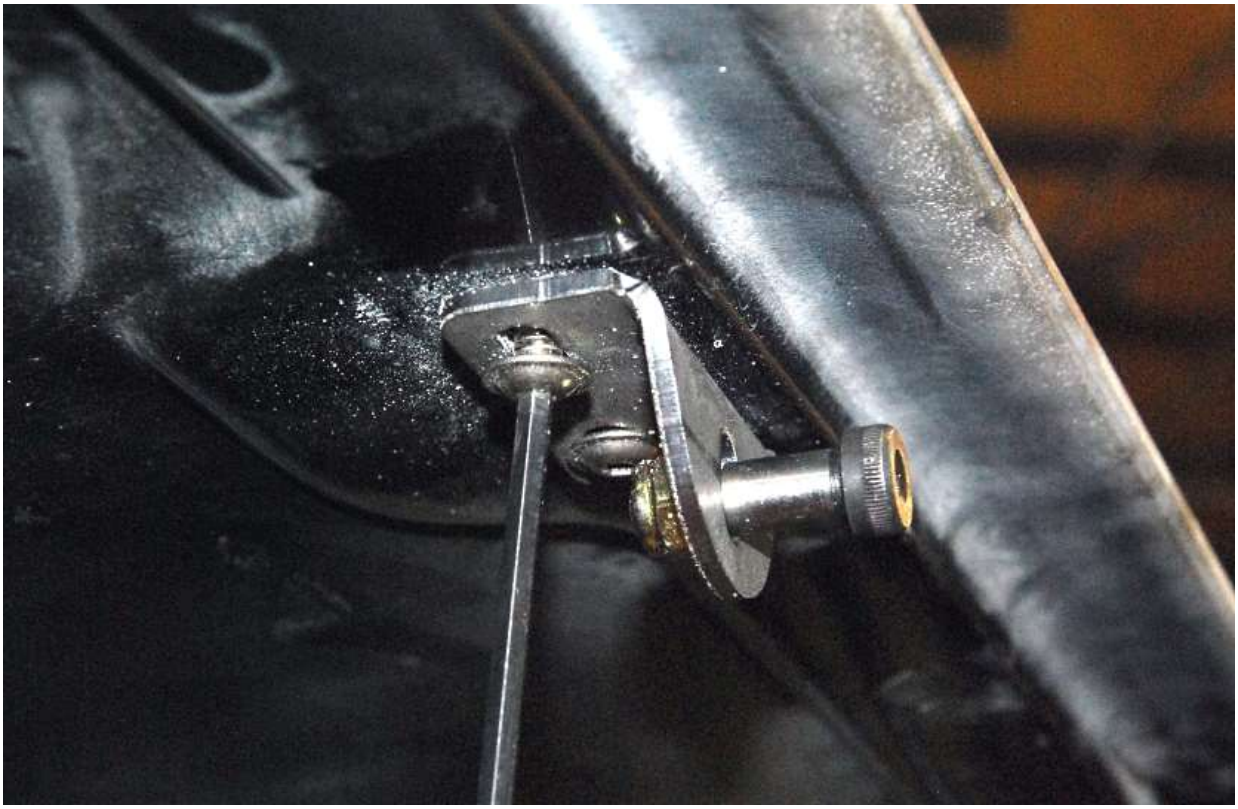


Hold the striker up to the trunk and use a square to measure and locate the striker so that the head of the shoulder bolt just clears the bottom of the latch finger and the striker is aligned with the mark made earlier on the trunk showing the latch center location.

Clamp the striker to the trunk.

Mark the center of the mount slots on the trunk.
Remove the striker assembly.

Drill ⅛” holes through the trunk liner and the 1/8" aluminum inside of the trunk then open the holes up with a 25/64” bit and install rivnuts at the points marked.



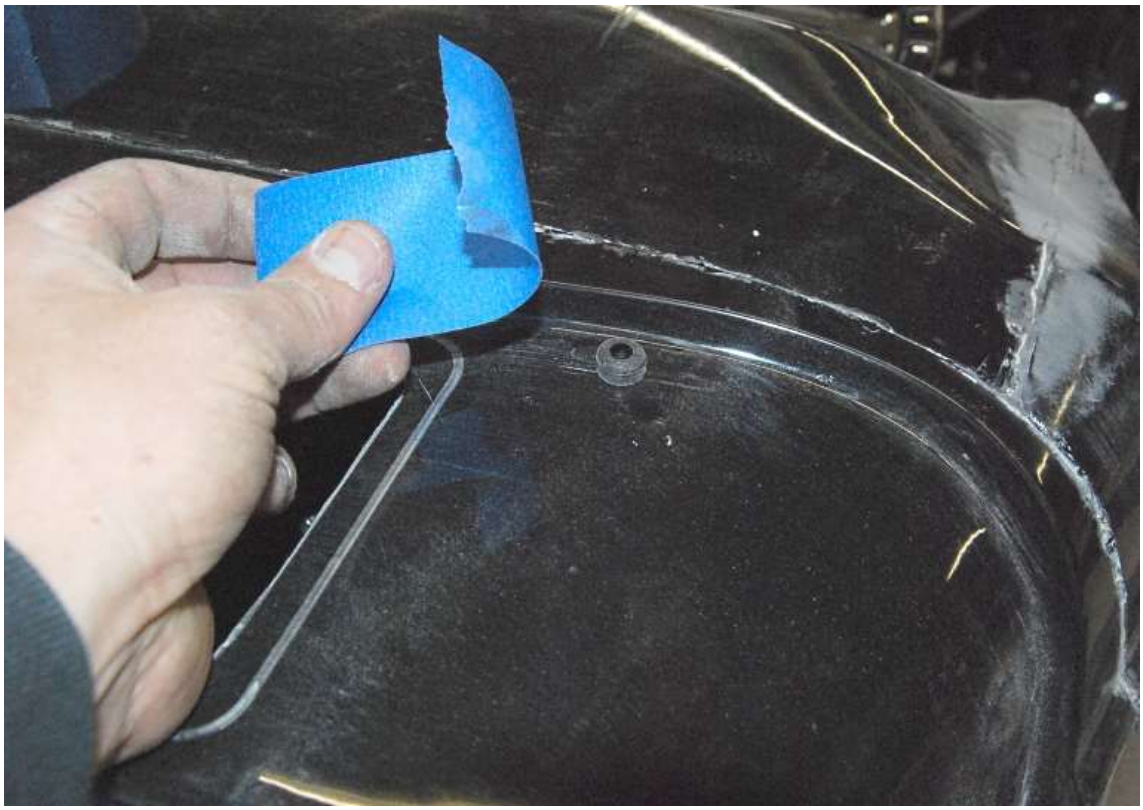
Install the trunk latch striker mount with ¾” flange head screws onto the trunk centered on the bolts.

Try closing the trunk. If necessary, adjust the various components to allow it to close.
If necessary, grind the head of the shoulder bolt.
Remove the rear latch
Remove the trunk lower floor aluminum.

Optional Hood/Engine side covers/nose cone

Hood

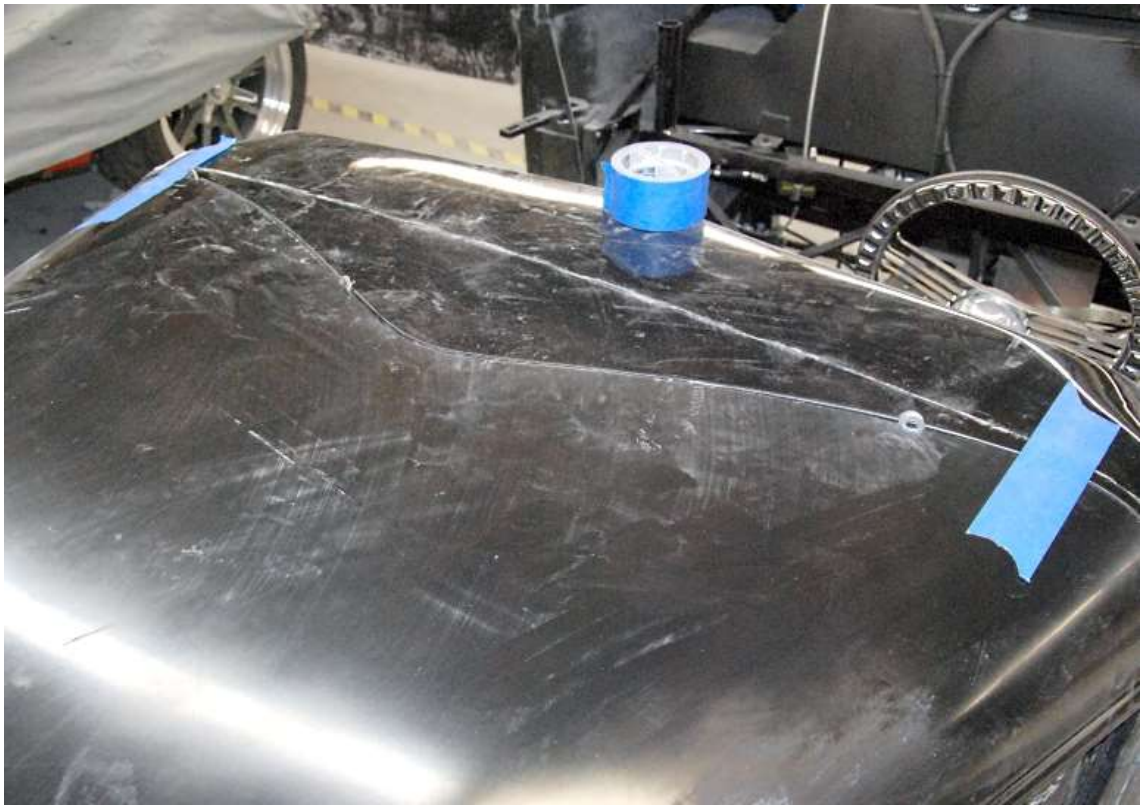
- Orbital sander, 80 grit sand paper, masking tape, jig saw or air saw, marker
- Hood, engine side covers, nose cone, secondary body fasteners
- The panels are cut oversized at the factory to allow for maximum adjustment and to allow the customer to set their own desired panel gaps.
- Read all instructions and try readjusting the grill before trimming too much.



Put a few of the small bumpers across the cowl on the car and tape to the body.

Put a few of the large bumpers across the top of the grill.

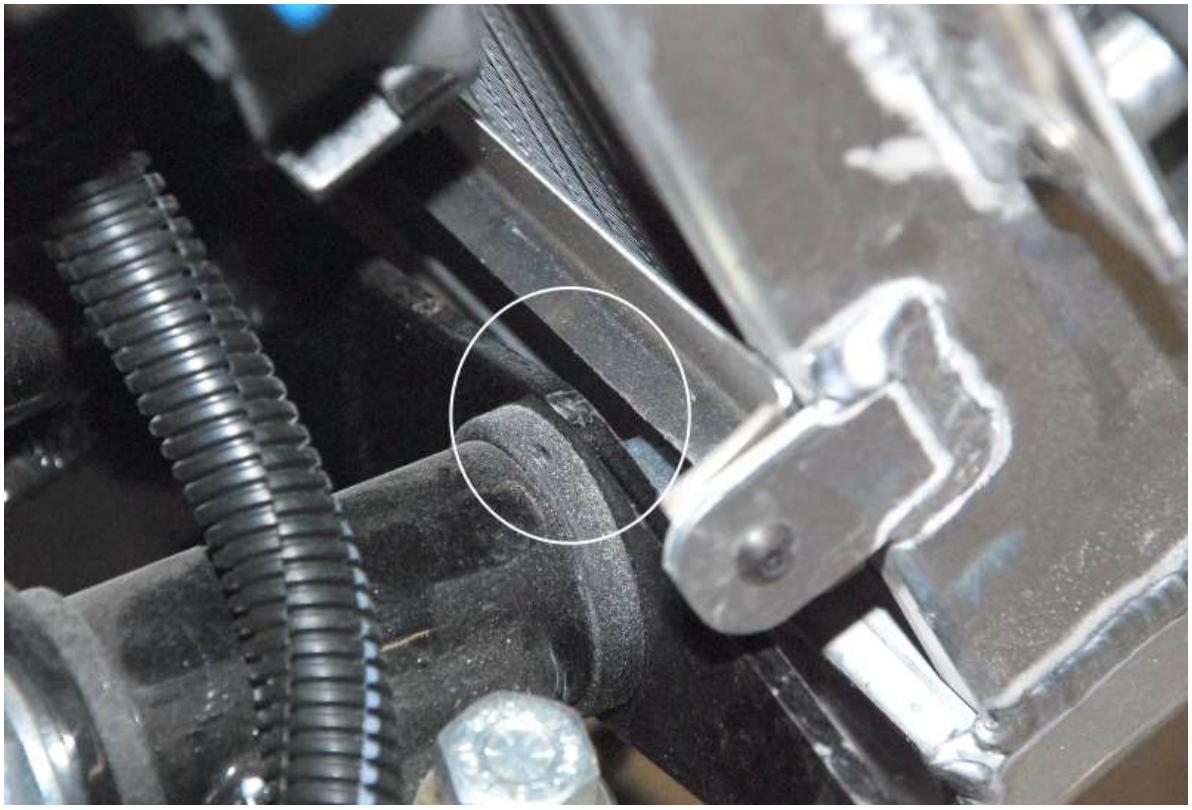
Set the hood in place for initial fitment so that the front is down in the grill recess. Trim the hood around the grill a little at a time if necessary so it just fits.



Trim the rear edge of the hood so that the hood just sits down in the opening.

Put a yard stick across the hood and cowl and look at any gap below the straight edge in the middle. Adjust the angle of the grill and height of the grill so that there is no gap between the straight edge and the hood. The half-moon trim accent on the hood should be aligned with the trim on the body and is either level or is slightly lower at the front of the hood.

Make sure the upper control arm bolts holding the grill mounts are tight.



Make sure that there is clearance between the front lower control arm mount/bolt and the radiator.

Nose Cone

Orbital sander, 80 grit sand paper, masking tape, jig saw or air saw, marker, ruler, clamps, ¼" drill bit, drill, 5/32" hex key, 7/16" wrench

Nose cone, secondary body fasteners

If not cut, mark the top of the nose cone 1.75” back so that the grill will fit in the nose cone.

Cut the nose cone.

Trim the front vertical flange off the nose cone so that the nose cone has no vertical lip along the front.

Clamp the nose cone to the front of the body section so that the bottoms are flush and the outside trim pieces align.

Clamp the front of the nose cone to the front of the grill.

If necessary, sand some material off the bottom of the grill so the nose cone can lie flush on the bottom edge.

Look at the side of the nose cone and top of the body section that the nose cone attaches to. This area should be flat. If necessary, raise, lower or angle the grill so that the area is flat. This may also affect the hood height so be careful.

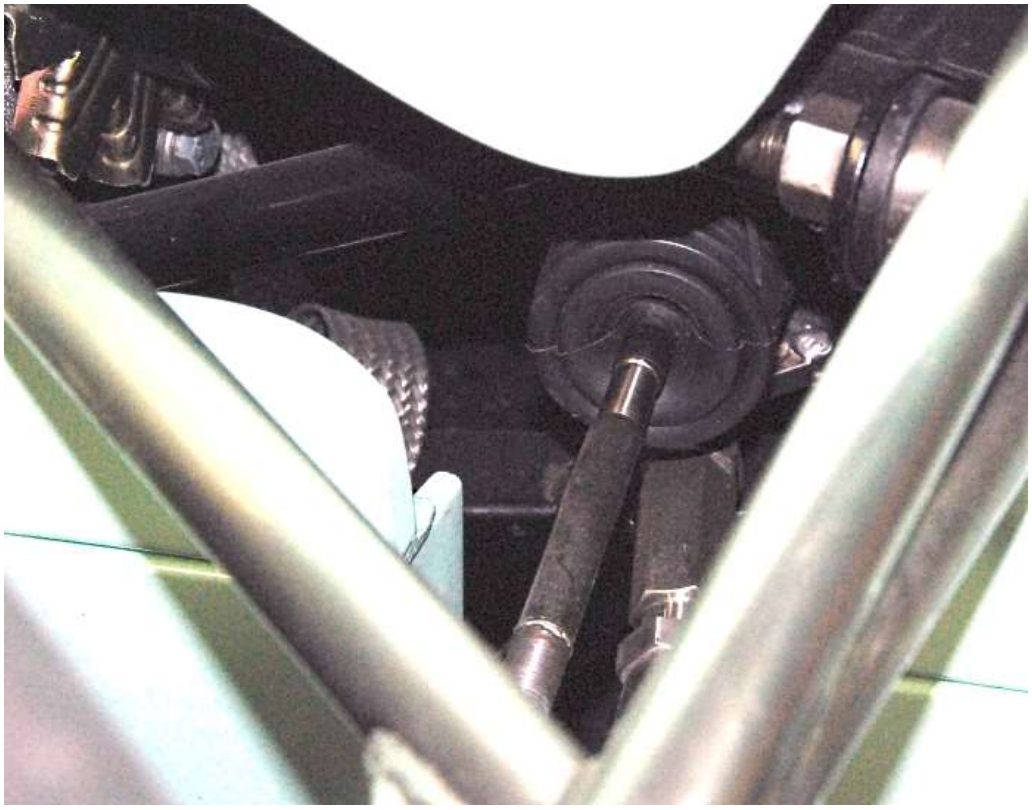
Once the grill angle is set, tighten the grill to grill mount bolts with a 5/32" hex key and 7/16" wrench.

Drill through the frame mount for the nose cone. This is the same piece of steel on the frame which the lower control arm is attached to.

At the front of the nose cone, fasten it to the bottom of the grill with a 3/16" rivet or ¼" screw and at the 4 and 8 o'clock positions if necessary or desired.

Turn the steering rack lock to lock and check the clearance of the boots with the nose cone.

If necessary, push the boot back slightly to prevent rubbing.



Turn the rack again to check to see if the boots move when all the way in.

More Hood

Mark around the grill on the hood so that there is an even ⅛”-$^{3}/_{16}$” gap.

Trim and sand the front of the hood.

Remove the hood.

Side covers

- Ruler, marker, saw, Orbital sander, 80 grit sand paper, masking tape, jig saw or air saw, marker, razor knife, large kit box, ruler, $^{5}/_{32}$" hex key, $^{7}/_{16}$" wrench drill, ¼" drill bit.
- Engine side covers
- The side covers are only fit at the back from the factory, they must be trimmed at the front for the style of grill being used: 33 or Deluxe.

Approximate cut lines for the different grills.

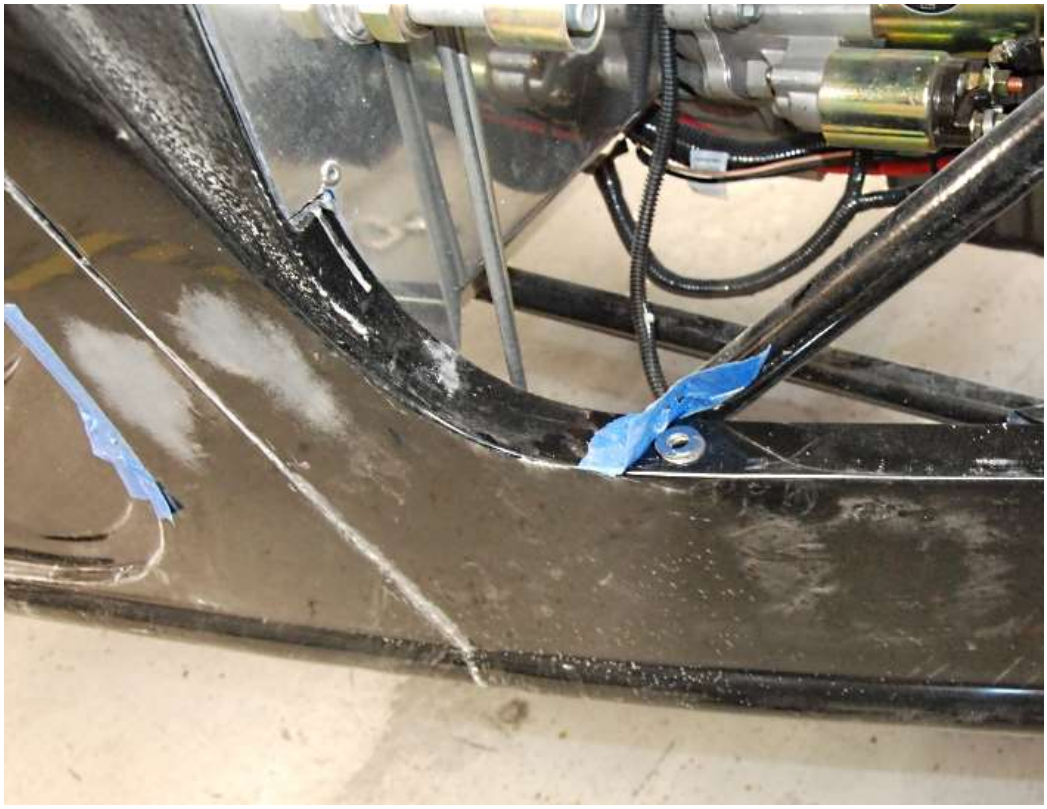
Approximate trim for Deluxe nose. Do not trim until locating the side panel on the car.

Approximate trim for the 33 nose. Do not trim until locating the side panel on the car.

Trim the top of the side cover so that the flange is ¾” wide.

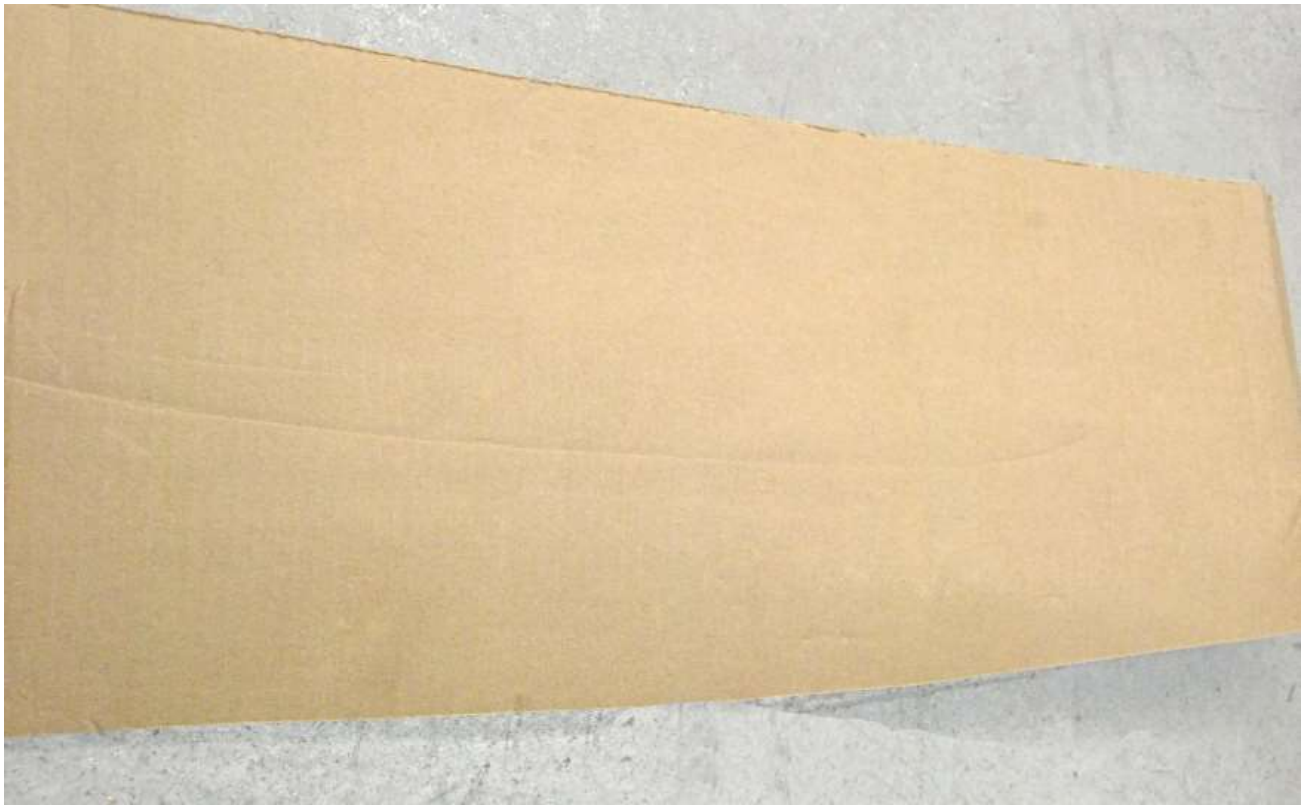
Trim the bottom front of the side cover so that the cover goes around the grill.

Trim the bottom of the side cover so that it is the same width as the top body lip that the cover sits on.



Use a couple of washers or cut some small rubber bumpers so that they are about ⅛” high and place them at the front and back of the body lip that the side cover will sit on.

Cut one of the flaps off one of the larger boxes and hold it up to the side of the grill. And put a small mark on both the grill and cardboard where it starts.



Push the cardboard against the grill edge so that the grill leaves a line in the cardboard.

Use a razor knife to cut along the line.

Tape the engine side covers to the body and the outside of the grill.

Mark the side cover where the grill starts at the top and bottom.

Align the rear cardboard template on the side cover.

Mark the grill along the line.

- This cardboard process should be done separately for each side of the grill, the fitment on each side is different.

Trim the side cover a little at a time so that there is a ⅛" gap at the back of the cover against the body and at the front next to the grill.

Tape the engine side covers to the body.

Put the hood on the body.

Mark and trim the bottom edge of the hood so that there is a ⅛"-3/16" gap between the hood and top of the side cover.

Drill a 3/16" hole through the engine side panel mount flange and the grill.

Drill a 3/16" hole through the engine side panel mount flange and the body.

Remove the side cover and enlarge the holes in the side cover to ¼".
For the rear body mount holes, drill the body hole out to 25/64" and install a ¼" riv-nut.

For the front hole either tap the grill hole for the ¼”-20 fastener or drill the grill out to ¼” and use a locknut on the other side of the bolt.

Temporarily attach the panel to the grill with ¼”-20 flange head fasteners.

Drill through the flange on the bottom of the panel and through the body in two or three locations with a ¼" drill bit.

Remove the side panel and enlarge the body flange holes and install ¼" rivnuts in the body.

- Headlights are bolted through the side covers. If you plan to take your side covers on and off and not have to thread each wire through the nut and have to realign the headlight each time a good idea is to make a spacer to go on the radiator mount and cut the side covers to go around the spacer so headlight

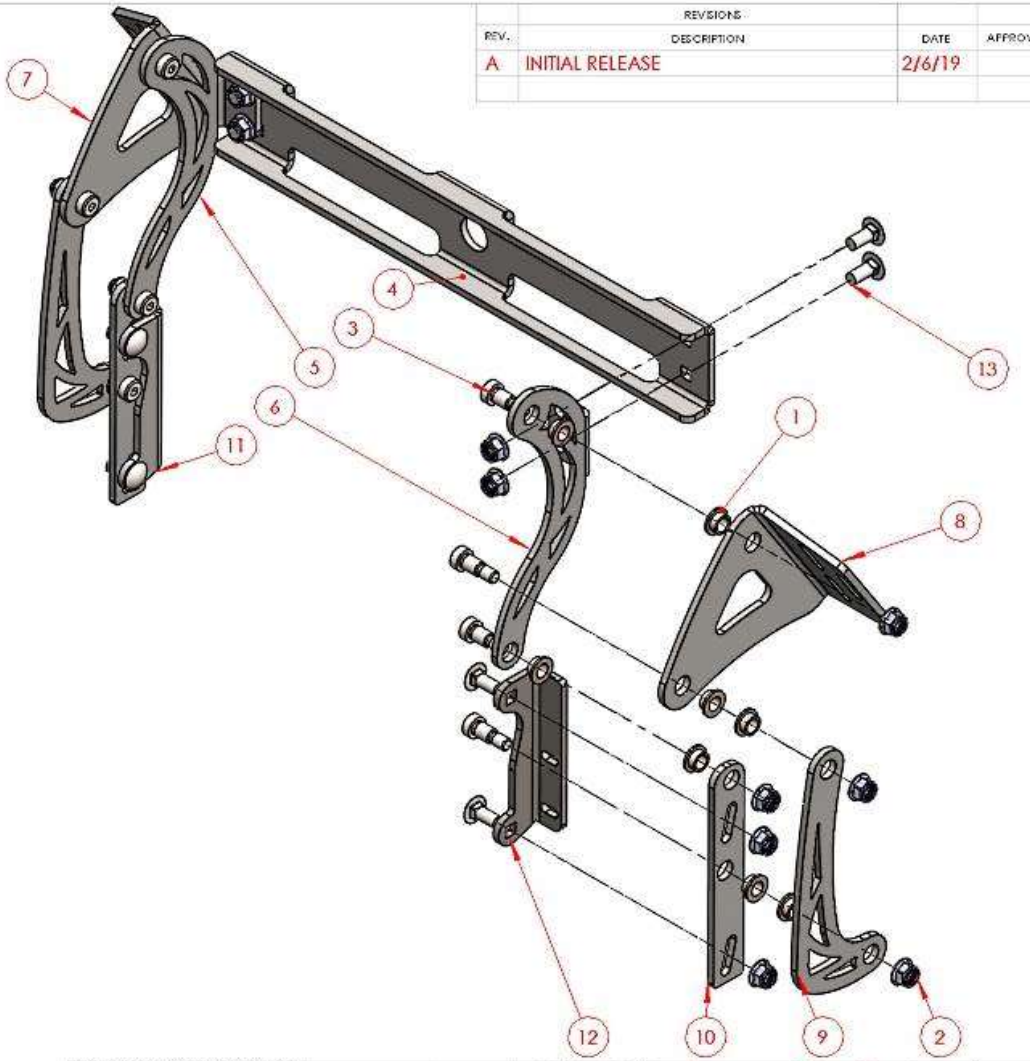
removal is not necessary.

Hood Hinge (Optional)

- Hood hinge components
- 5/32", 3/16" hex keys, ½" wrench, ½" socket, ratchet, vice or channel lock pliers, ¼", 25/64" drill bits, rivnut tool.
- Sometimes the bronze bushings go in easily other times they need help, a vice works best but channel lock pliers can also get used.
- 3/16" hex key, ½" wrench

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	13183	FLANGE BUSHING	16
2	34526	5/16"-18 FLANGED NYLON LOCK NUT	16
3	13325	0.50" SHOULDER BOLT	8
4	34855	CROSSBAR	1
5	34844	34845 - LEFT UPPER ARM	1
6	34844	34846 - RIGHT UPPER ARM	1
7	34848	34849 - LEFT HOOD MOUNT	1
8	34848	34850 - RIGHT HOOD MOUNT	1
9	34847	LOWER ARM	2
10	34854	GRILL HINGE UPPER MOUNT	2
11	34851	34852 - LEFT GRILL HINGE LOWER MOUNT	1
12	34851	34853 - RIGHT GRILL HINGE LOWER MOUNT	1
13	25562	SCREW, CARRIAGE, ZINC, 5/16"-18 x 3/4"	8

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	2/6/19	



		NAME	DATE
HOT ROD GEN 2	UNLESS OTHERWISE SPECIFIED:		
	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	JS 7/6/18
		COMMENTS:	
	MATERIAL		
USED ON	FINISH		
APPLICATION		PRINTED	2/6/2019

Factory Five Racing, Inc.

TITLE:
HOOD HINGE COMPONENTS

SIZE	DWG. NO.	REV
A	34815	A

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

Collect all of the parts for the right-side hinge.

Insert the $^{5}/_{16}$” x ¾” carriage bolts into the two side holes the grill hinge lower mount.

Place the grill hinge upper mount on the carriage bolts followed by the flange locknuts.

Use a ½" wrench to sung the grill hinge mount carriage bolts up so that they can slide smoothly but are not loose.

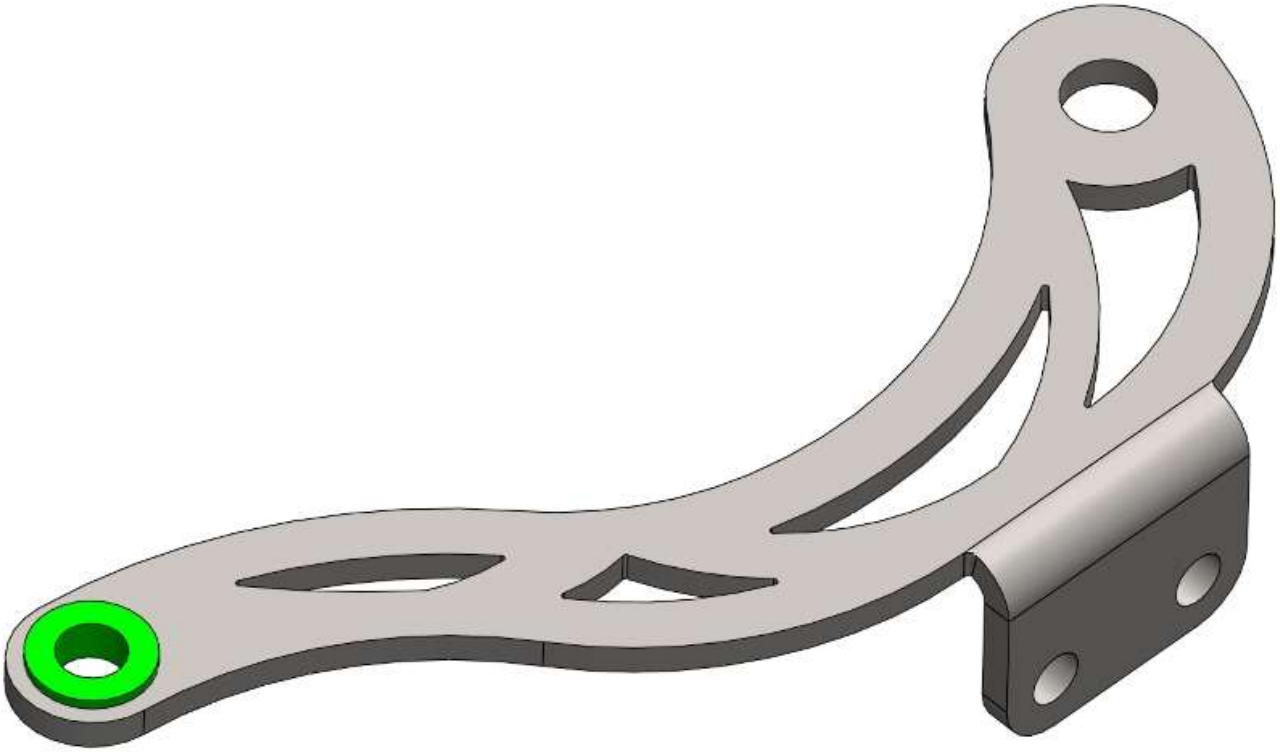
Put a bronze bushing on in the center round hole as shown.

Put a shoulder bolt through the bushing just installed as shown.

Push a bronze bushing into the lower hinge arm as shown.

Put the hinge arm on the hinge mount followed by the flange locknuts hand tight.

Turn the assembly over and insert another bronze bushing into the upper hinge mount.



Insert a bushing into the upper hinge arm hole furthest from the bent tab from the side without the bend.

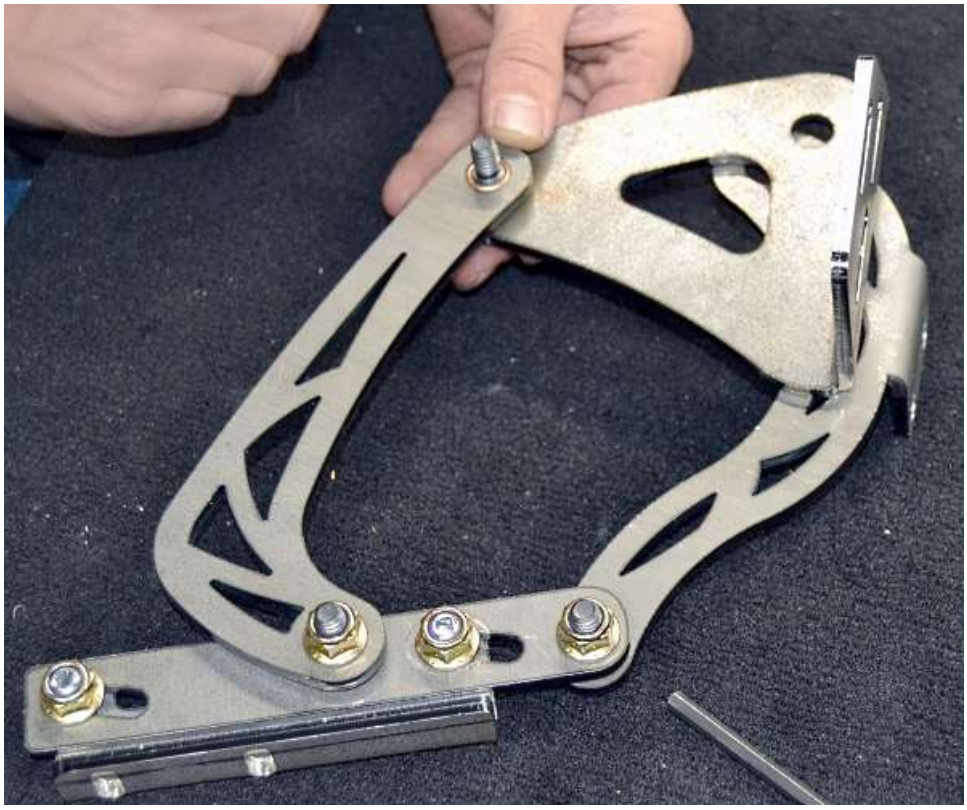
Put the upper arm on the hinge assembly followed by another shoulder bolt.

Turn the assembly over and attach another flange locknut to the upper hinge shoulder bolt.

Use a $^{3}/_{16}$" hex key and ½" wrench to sung the hinge arm shoulder bolts up so that the arms can move smoothly but are not loose.

Push a bronze bushing into the free end of the lower hinge arm.

Push a bronze bushing into the bottom hole of the hood mount as shown.



Place the hood mount on top of the upper hinge arm; swing the lower arm on top of the hood mount and insert a shoulder bolt from the bottom side.

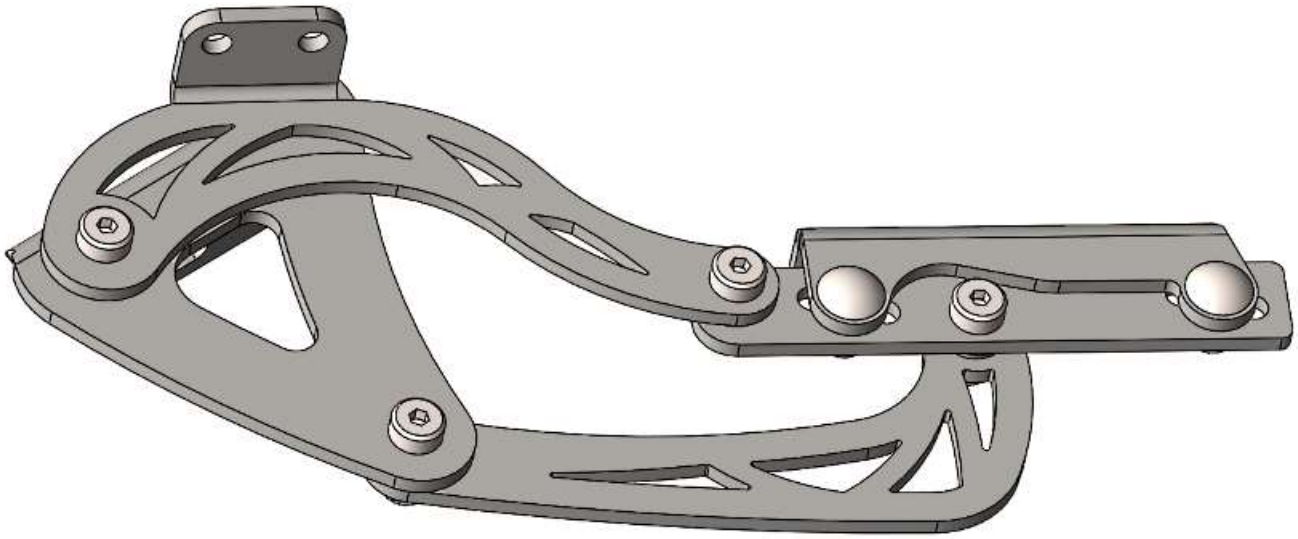
Screw on a flanged locknut then use a $^{3}/_{16}$" hex key and ½" wrench to sung the hood mount shoulder bolt up so it can move smoothly but is not loose.

Turn the assembly over and insert a bronze bushing in the upper hood mount hole.

Swing the upper hinge arm over the hood mount and insert a shoulder bolt.

Turn the assembly over and Screw on a flanged locknut then use a $^{3}/_{16}$" hex key and ½" wrench to sung the hood mount shoulder bolt up so it can move smoothly but is not loose.

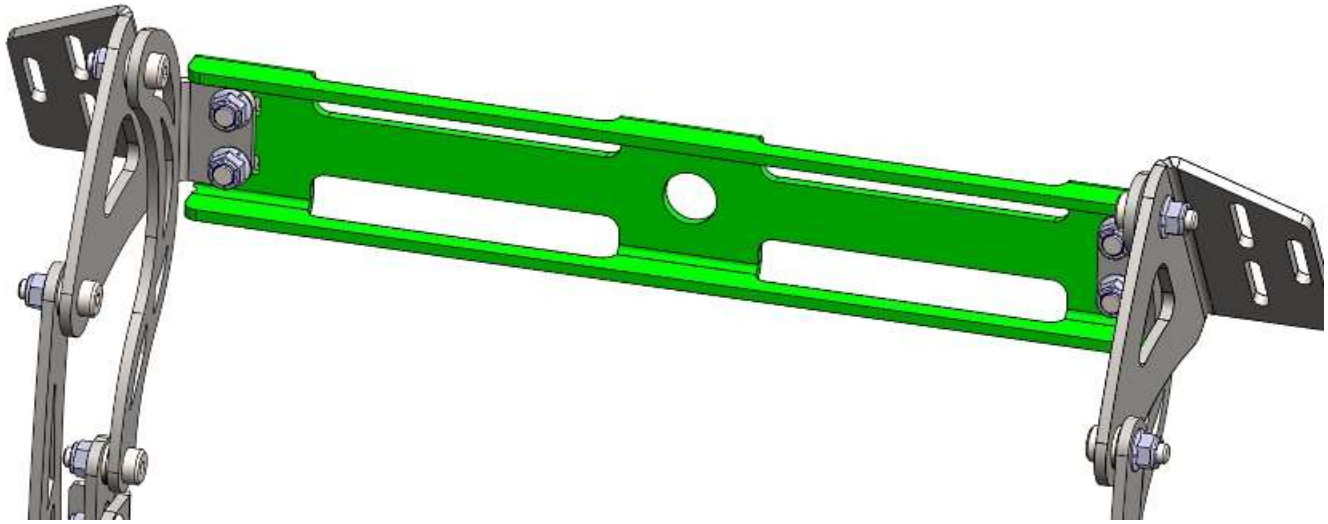
- All of the locknuts should be on the same side.
- The right side is now done.



Use the right side as a guide and assemble the left side. Left side shown.

Hold the right side up to the radiator grill mount and attach it to the grill leaving the bolts just loose enough so that the hinge lower mount can just slide sideways under the bolt heads for adjustment.

Repeat this for the left side.



Attach the crossbar between the two upper hinge arms using $^{5}/_{16}$" carriage bolts, flanged locknuts and a ½" socket. Leave the locknuts slightly loose for adjustment.

Put the hood template across the flat areas at the front of the hood.

Line the edge of the template up with the front of the raised flat areas.

Mark the through the template holes on the hood for riv-nut holes.

Drill only the center template mark with a ¼” drill bit.

Put a ¼” bolt through the template into the hood to hold the template in position.

Drill the center hole on the opposite side with a ¼” bit and place another ¼” screw in it.
Drill the 4 remaining holes with a ¼” drill bit.
Remove the template and open the holes up using a $^{25}/_{64}$” drill bit for the rivnuts.

Install ¼”-20 rivnuts in the hood.

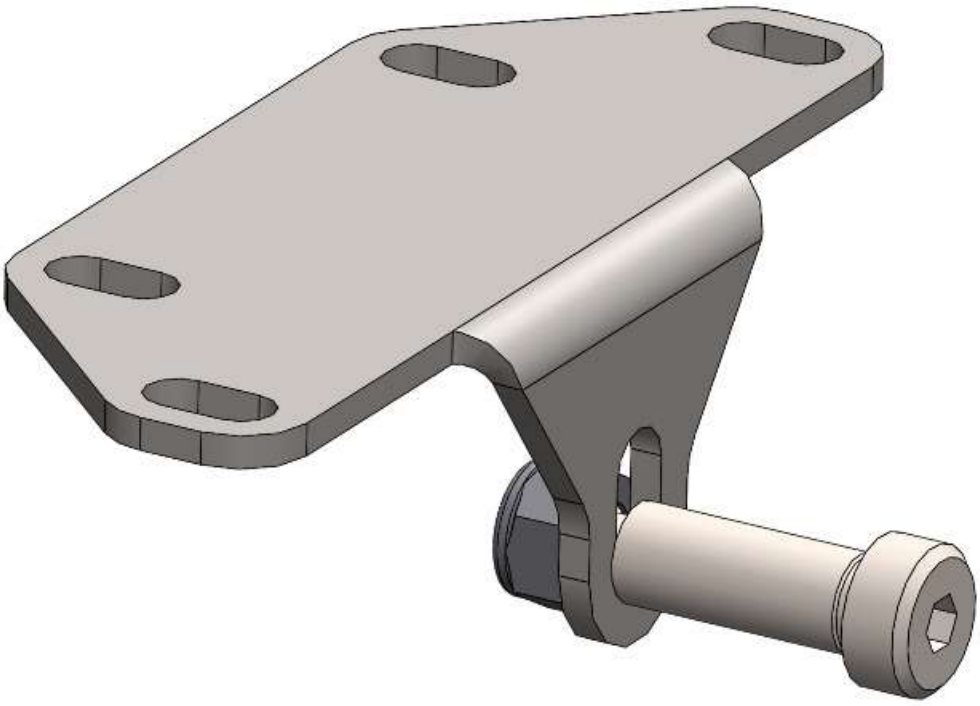
If not already on, put a few of the large bumpers from the kit across the top of the grill.

Set the hood in place so that the front is lined up with the grill.

Attach the hinge mount plate to the hood with the ¼” x ¾” flanged button head screws.

Tighten all of the crossbar locknuts;

Striker



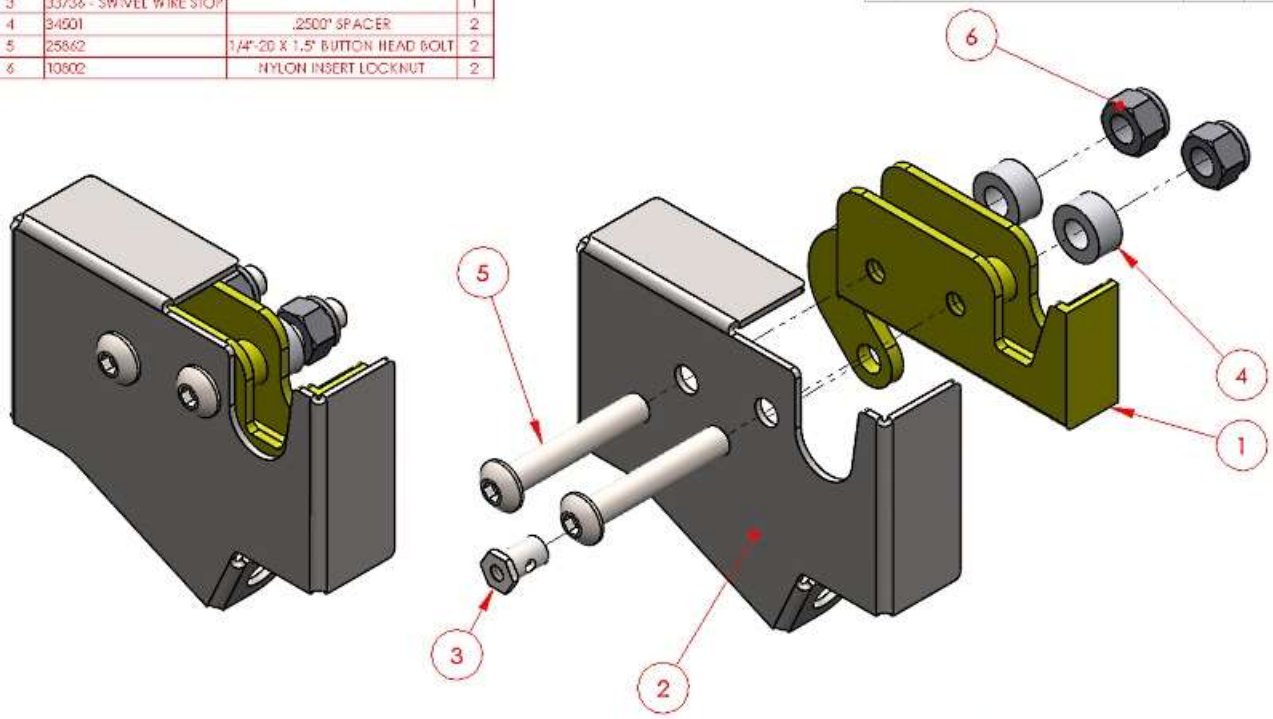
Mount the striker to the bracket.

Hood Latch

🛠 $^{5}/_{32}$" hex key, $^{7}/_{16}$" wrench, grinder, measuring tape, marker, square
🚗 Hood hinge components

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33734 - ROTARY LATCH	TWO STAGE LATCH	1
2	34500	HOOD LATCH COVER	1
3	33736 - SWIVEL WIRE STOP		1
4	34501	.2500" SPACER	2
5	25862	1/4"-20 X 1.5" BUTTON HEAD BOLT	2
6	10802	NYLON INSERT LOCKNUT	2

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	7/20/18	



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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
USED ON
APPLICATION

	NAME	DATE
DRAWN		
COMMENTS		
PRINTED	7/20/2018	

Factory Five Racing, Inc.

TITLE: HOOD LATCH

SIZE	DWG. NO.	REV
A	HOOD LATCH	A

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

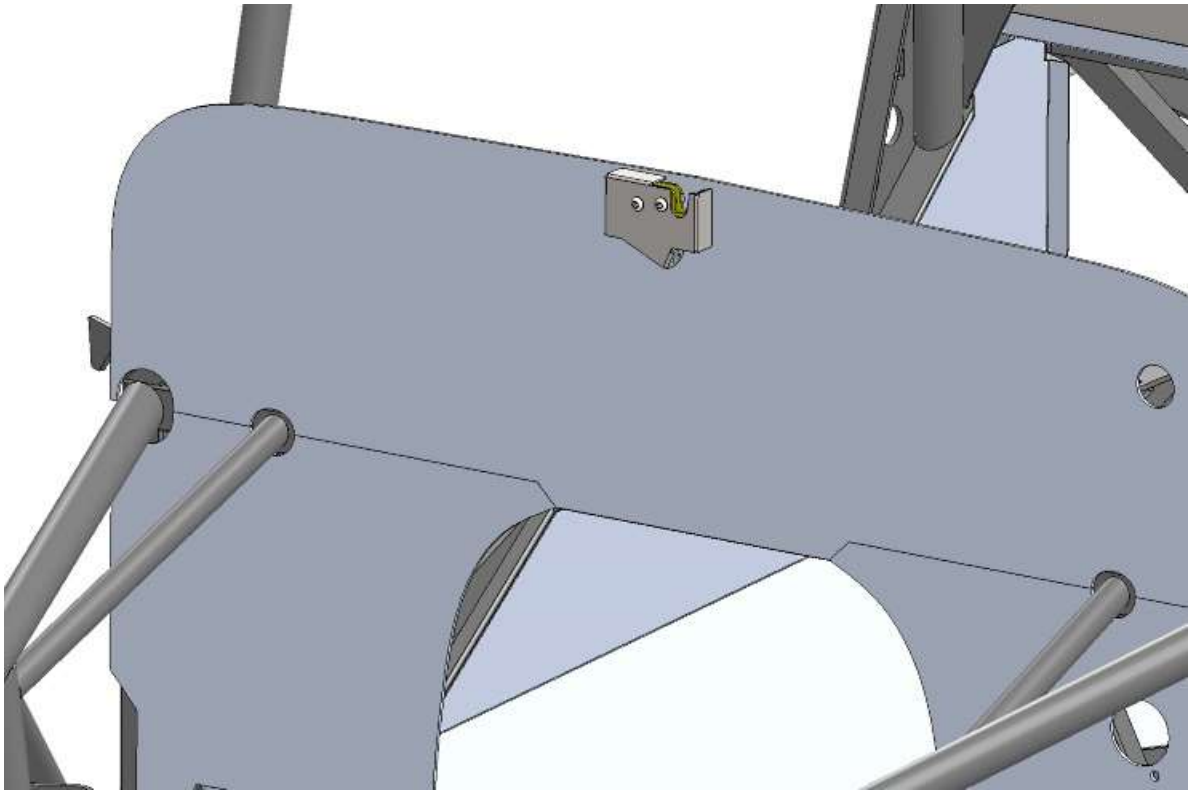
Insert the hood latch cable into the latch spacer bracket hole.

Insert the wire stop into the latch.

Attach the hood latch to the cover.
Insert the wire end through the wire stop.
Use needle nose pliers to pull the cable tight then screw the wire stop screw down.
Use a $^{5}/_{16}$" wrench and screw driver to tighten the screw more.

- Check that the pull handle releases the latch by adjusting the cable stop before mounting the latch assembly.

Connect the latch to the striker on the hood and close the hood.
Mark the hole location of the latch bolts on the firewall.
Open the hood and drill ¼" mounting holes through the firewall at the points marked.



Mount the bracket/latch assembly using ¼” locknuts on the backside of the firewall.

Place hood back on car and reattach the hinge pins. Check that the latch properly engages and disengages.

Hood Support rod

Mock up the Prop Rod to find the desired mount placement, either on the hood or the engine side cover.

Hood mounted support

Mark the holes on the underside of the hood for the ball stud bracket on the raised surface at rear of hood.

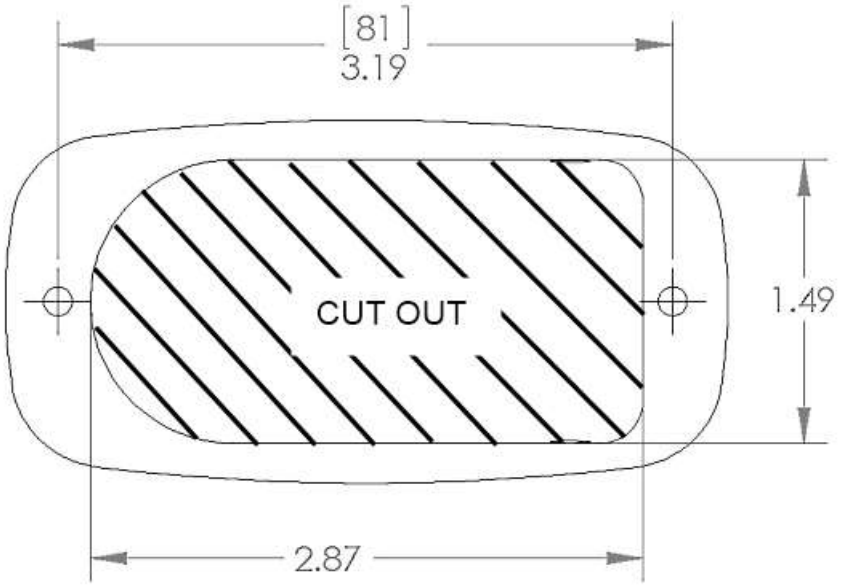
Drill and install $^{3}/_{16}$" rivets. Snap the Prop Rod onto the ball stud.

Snap the Prop Rod clip to the rod and mark the hood for desired placement.

Drill a $^{3}/_{32}$" pilot hole and use a self-tap mounting screw into fiberglass.

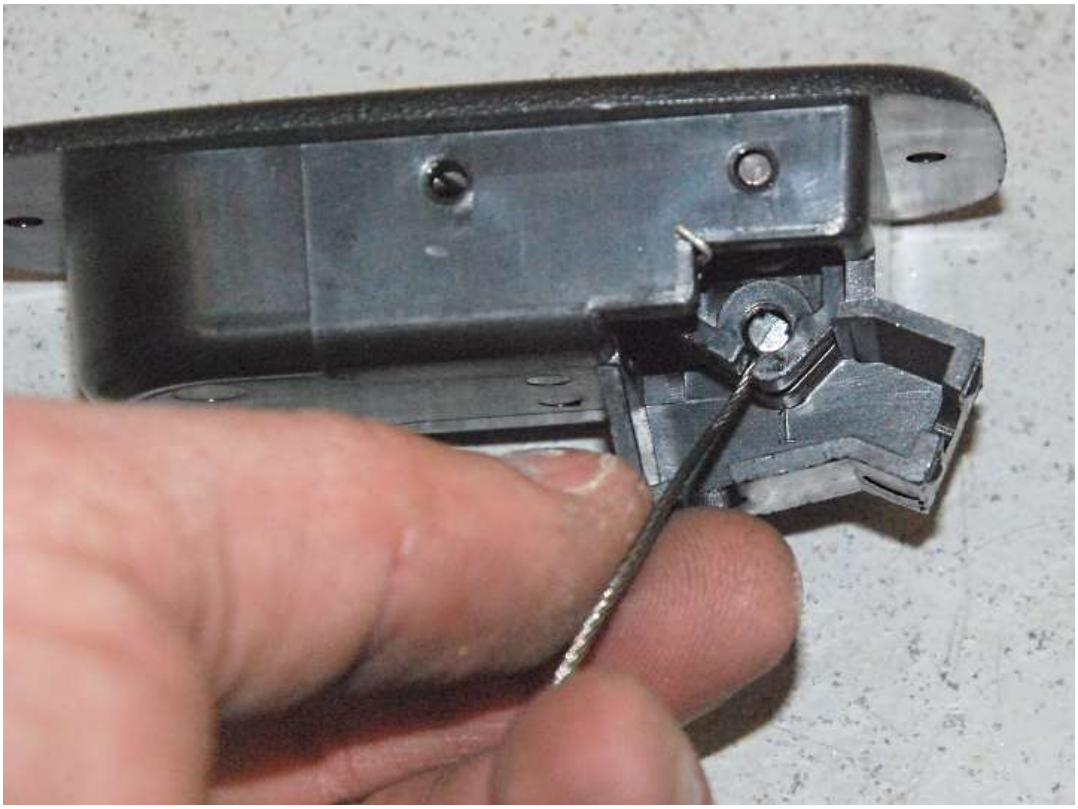
Hood cable release

- Drill, 3/32", 3/16", 11/32" drill bits, drill, rivet tool, air saw or jig saw, Philips screwdriver, marker, scissors.
- Hood hinge components, insulated line clips, secondary body fasteners.
- Make sure to leave clearance for the door when the door is shut.
- Brushed aluminum handles also available online.

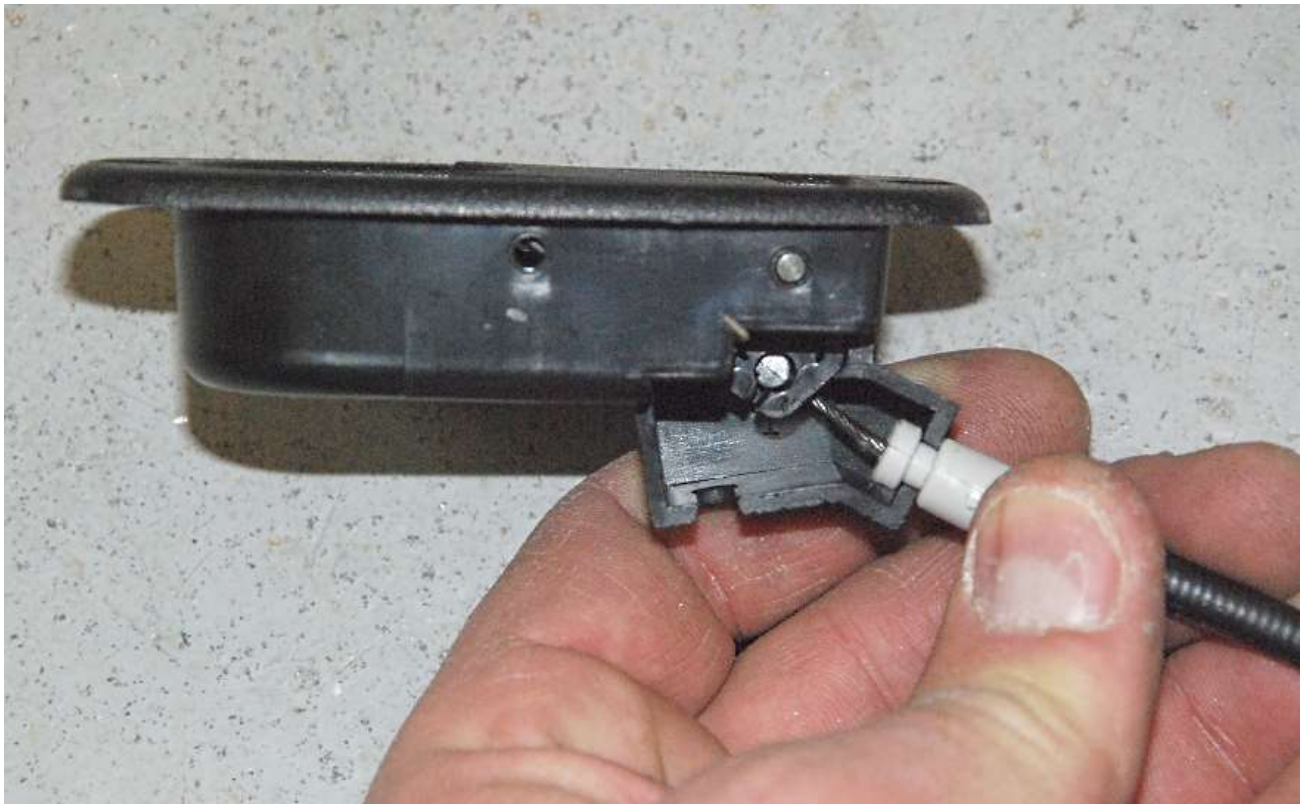


Use this template to mark the inside area to cut and to drill the 3/32" mounting screw holes. Use a ruler to check the scale before using.

Pull the cable so that it just comes through the hole.



Attach the cable to the handle the same way as was done for the trunk handle. At the handle end of the cable push the barrel end of the cable into the handle so that the wire can go into the slot and swing forward.



Push the cable sheath into the handle.

The handle can get mounted below the left side door using the #8 sheet metal screws if not using a trunk cable.

If using a trunk release handle, mount the handle under the dash using #8 sheet metal screws.

Route the cable into the engine bay so that the end will be in the middle of the firewall.

Windshield Install

🛠 Masking tape, marker, drill, ¼” drill bit, tape measure, 3mm hex key, 10mm wrench, Loctite™
🚘 Windshield
✋ These instructions correctly locate the Windshield to allow the use of the Optional soft top.

Put masking tape on the cowl area.

Use a tape measure at the front top corners of the door to locate and mark the middle of the front windshield area.

RH COWL EDGE
(HOOD GAP)
FRONT EDGE OF COWL
(HOOD GAP)
CENTERLINE
7.50
33 HOT ROD WINDSHIELD TEMPLATE 9/29/10
1. FIND CENTER OF BODY
2. ALIGN TEMPLATE WITH CENTER AND COWL EDGES
3. MARK HOLES ON BODY
4. VERIFY LOCATIONS WITH ACTUAL WINDSHIELD
LH COWL EDGE
(HOOD GAP)

From the beginning of the hood opening, measure back along the centerline and mark 7.50”. This is the location of the middle stud of the windshield.

Use the gasket to mark the front of where the windshield will sit.

Remove the mounting studs on the base of the windshield with a 3mm hex key.

Have a friend assist you and mock up the windshield on the body. Make sure to check the measurements from the door opening to the corners of the windshield to make sure the windshield is square.

If necessary, remove material on the windshield so that the correct angle is reached and the windshield sits flat on the gasket/body. This windshield had a small ridge in the area shown that had to be removed.

Once you are happy with its location, trace the outline of the base of the windshield on the masking tape.

Use the mounting gasket to locate the mounting stud holes.

Drill the ¼" holes in the body which you just marked which are the mounting points for the windshield.

- The windshield stud holes go all the way through the frame. Insert the stud by hand until you feel it touch the rubber gasket then stop!
- Do not over tighten.

Replace the studs in the windshield using Loctite™ on the studs and a 3mm hex key.

Having a friend help you, set the windshield back in place.

Use a 3mm hex key to hold the stud while tightening the lock nut.

In order for the soft top to mount correctly on the car, the angle of the windshield needs to be correct. Make sure the top corner of the windshield to the top rear of the door opening. If necessary, slot the holes slightly for the windshield.

Using the master cylinder access holes, reach in and install the fasteners on the windshield studs. Double check the angle of the windshield.

- If installing an A/C, now is a good time to cut the defroster vents.

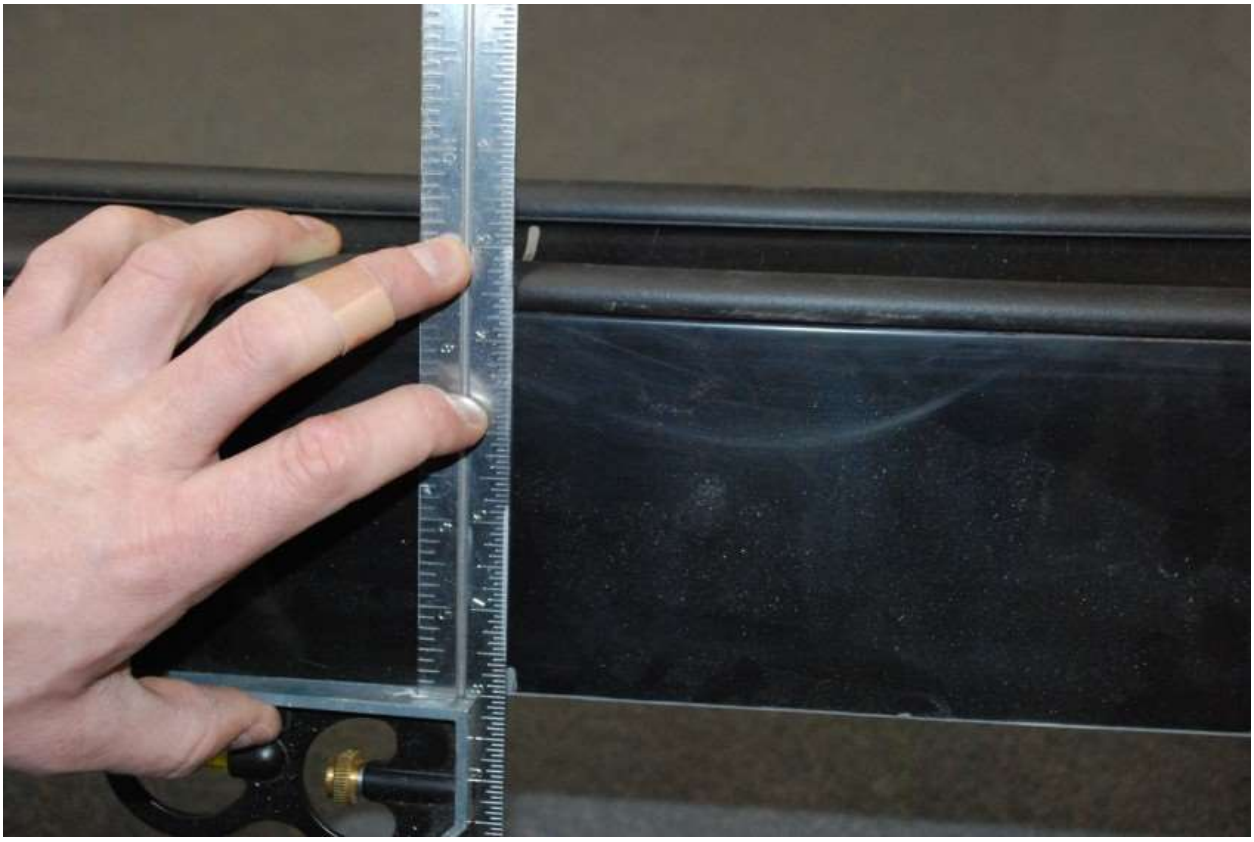
Hardtop (Optional)

- Drill, marker, masking tape, measuring tape, square, ¼", $^{25}/_{64}$" drill bit, ⅜" wrench, riv-nut tool
- Hardtop package
- Some pictures show an older hardtop style that had a liner inside.

With the Hardtop sitting upside down on the roof, attach the half-moon weather-stripping to the underside of the back of the hardtop along both the inside and rear edges.

Attach the half-moon weather-stripping to the underside of the front of the hardtop along both the inside and front edges.

Measure the width of the rear window on the Hard top and mark the center of the window (around 15.50”).



Use a square to mark the bottom of the Hard top from the window center mark made so that the middle rear of the top is found.

From the inside of the top rear flange mark 1” in from the inside edge on the center mark made.

Measure over 14” from the center and mark the flange.

Repeat for the opposite side.

- If the soft top will get used, the mount locations behind the doors should be made using the measurements for the body mount in the Appendix and not the measurement given below.

On the sides behind the window, mark 2.75” in from the inside window edge.

Measure from the inside edge and mark 1” at all of the locations marked.

- DO NOT drill in the center of the flange.

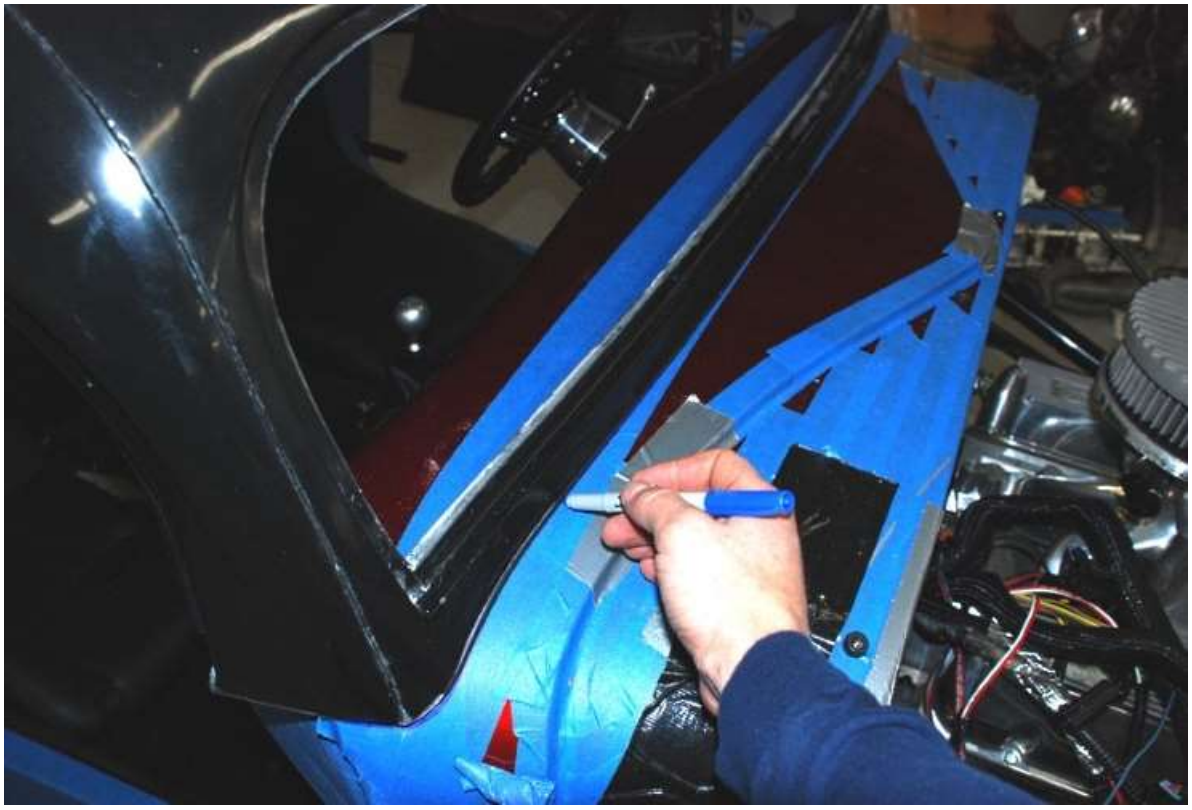
Drill ¼” holes at the locations marked.

If the body is painted, use painters tape around the rear 2” of the body around the cockpit and two 2” strips across the front of the cockpit starting at the front edge of the door as shown in the above picture.

With help, place the Hard Top on the body.

Align the front and rear edge of the door cut out with the molded trim line on the Hard top and make sure that the front windshield area sits on the body properly.

Clamp the hardtop in place so that it does not move.



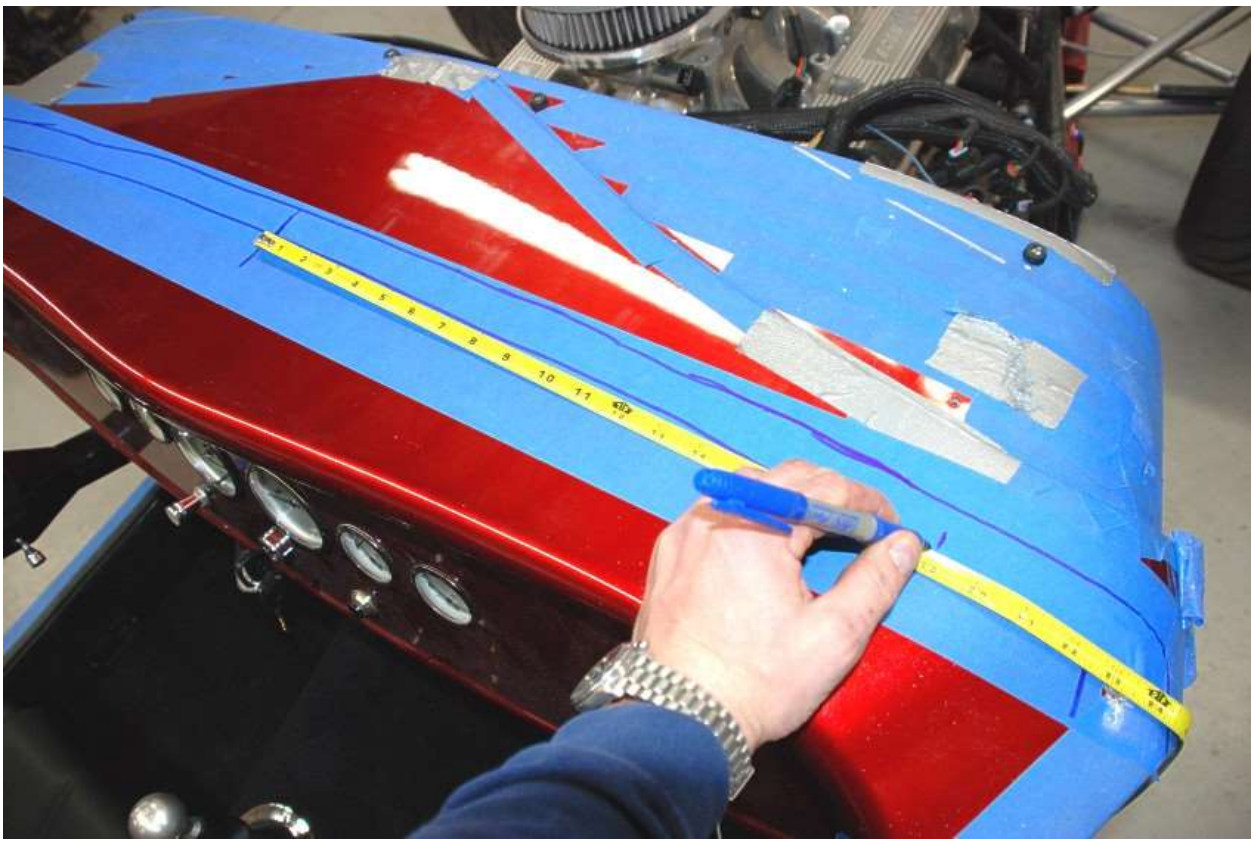
Mark around the inside and outside of the front of the Hardtop on the masking tape.

On the rear of the top, use a marker to mark the body through the ¼" drilled holes.

Remove the Hardtop and use a tape measure at the front top corners of the door to locate and mark the middle of the front windshield area.

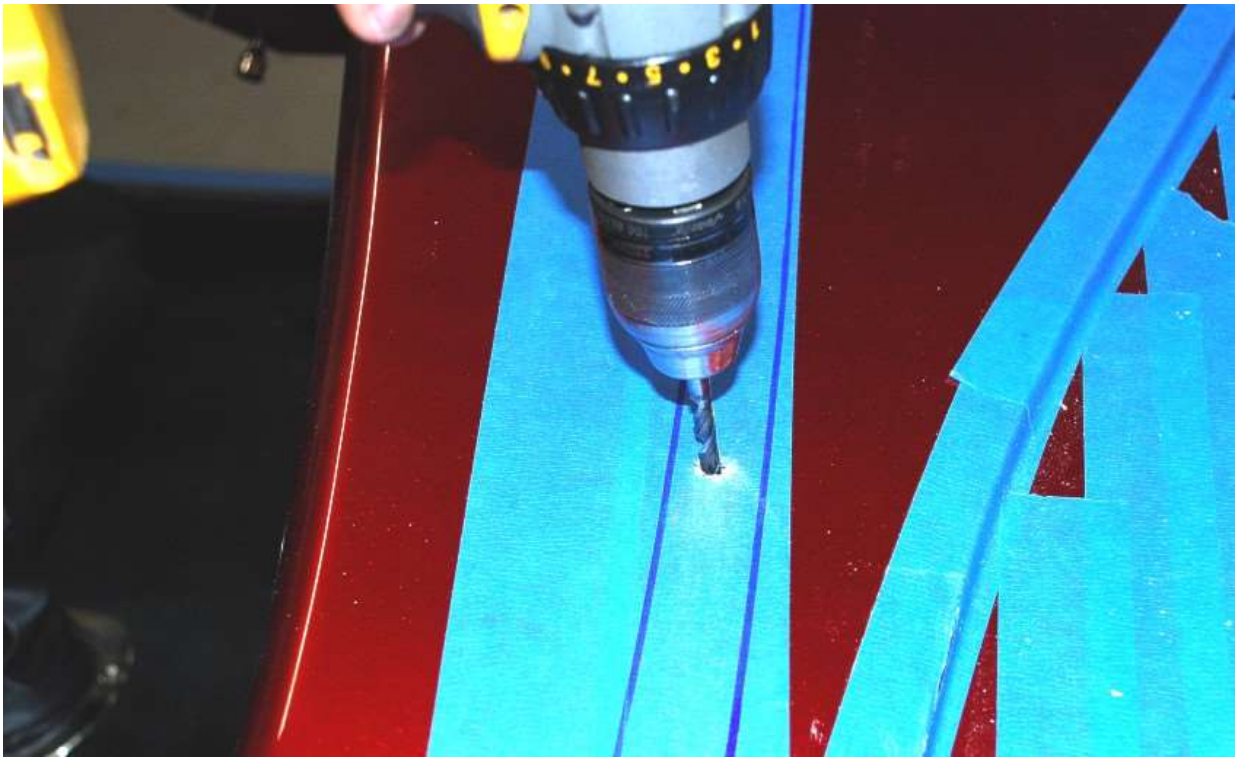
- If you plan to switch back and forth between the hard top and the roadster with a soft top, it is

necessary to check the windshield mounting measurements with those required for the soft top windshield location and the soft top bow mounts. Check www.factoryfiveparts.com/instructions to see the soft top instructions.



Mark 19” over from the center of the windshield area.

Repeat for the other side.



On the front windshield area, drill the three locations marked in the middle of where the windshield will sit using a ¼" drill bit. On the rear of the Hardtop area, drill the marked locations with a $^{25}/_{64}$" drill bit.

Insert and attach ¼" rivnuts in the $^{25}/_{64}$" holes drilled in the rear area of the body.

Place the Hard-Top back on the body and attach it at the locations just behind the door using the ¼" bolts provided and a $^{3}/_{8}$" wrench. Double check that the molded trim line on the top lines up with the door edges and that the front windshield area sits on the body properly.

From the underside of the body in the windshield area, use a marker through the ¼" holes drilled to mark the underside of the Hard-Top windshield area.

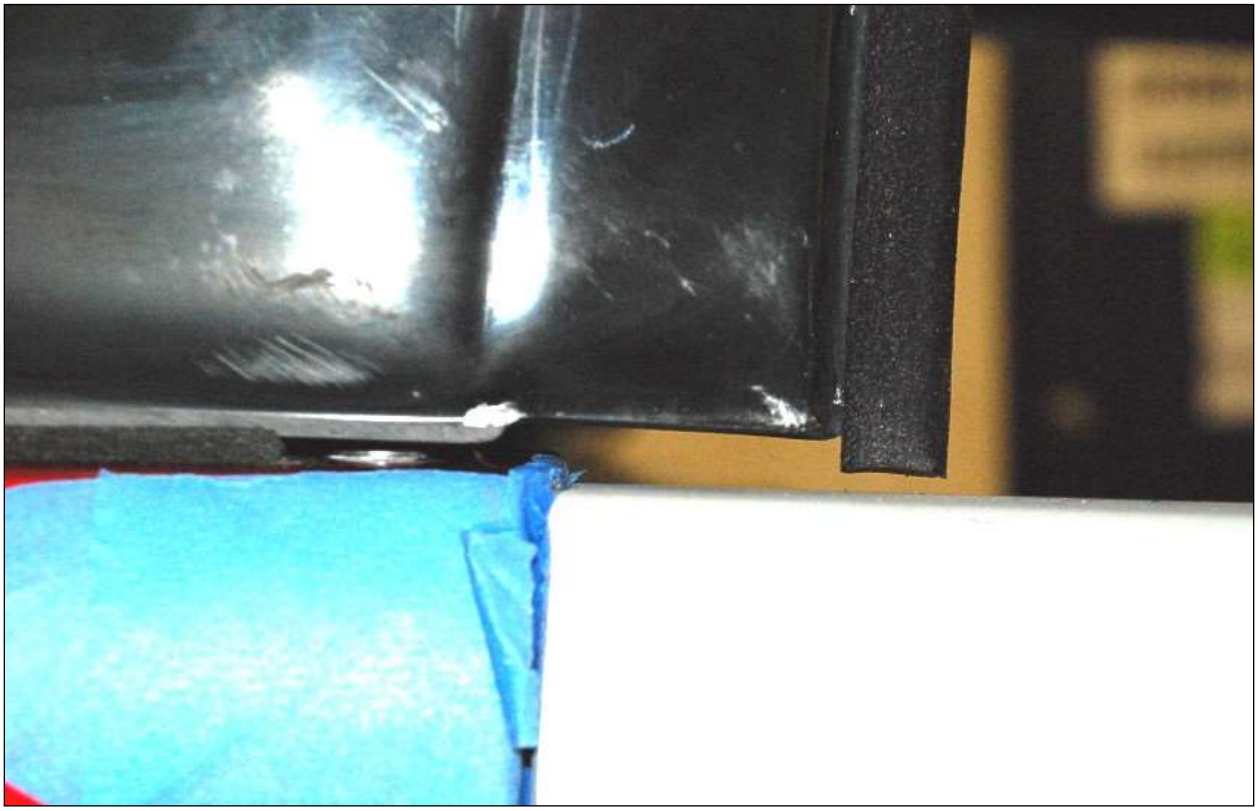
Remove the Hard Top again, put it upside down on the floor, and drill $^{25}/_{64}$" holes in the bottom of the Hard-Top windshield area in the center between the two weatherstrip pieces at the areas marked. If necessary, slot the holes in the body so that they will line up with the Hard-Top holes. DO NOT offset the holes in the hardtop.

Insert and attach ¼" rivnuts in the $^{25}/_{64}$" holes just drilled.

- If installing the rollbar under the hardtop, jump to the rollbar install then return here.

Remount the Hard Top for the final time and fasten the top to the body using the ¼" bolts from the underside of the dash in the windshield area

Fasten the top to the body using the ¼" bolts from the top on the back of the Top.

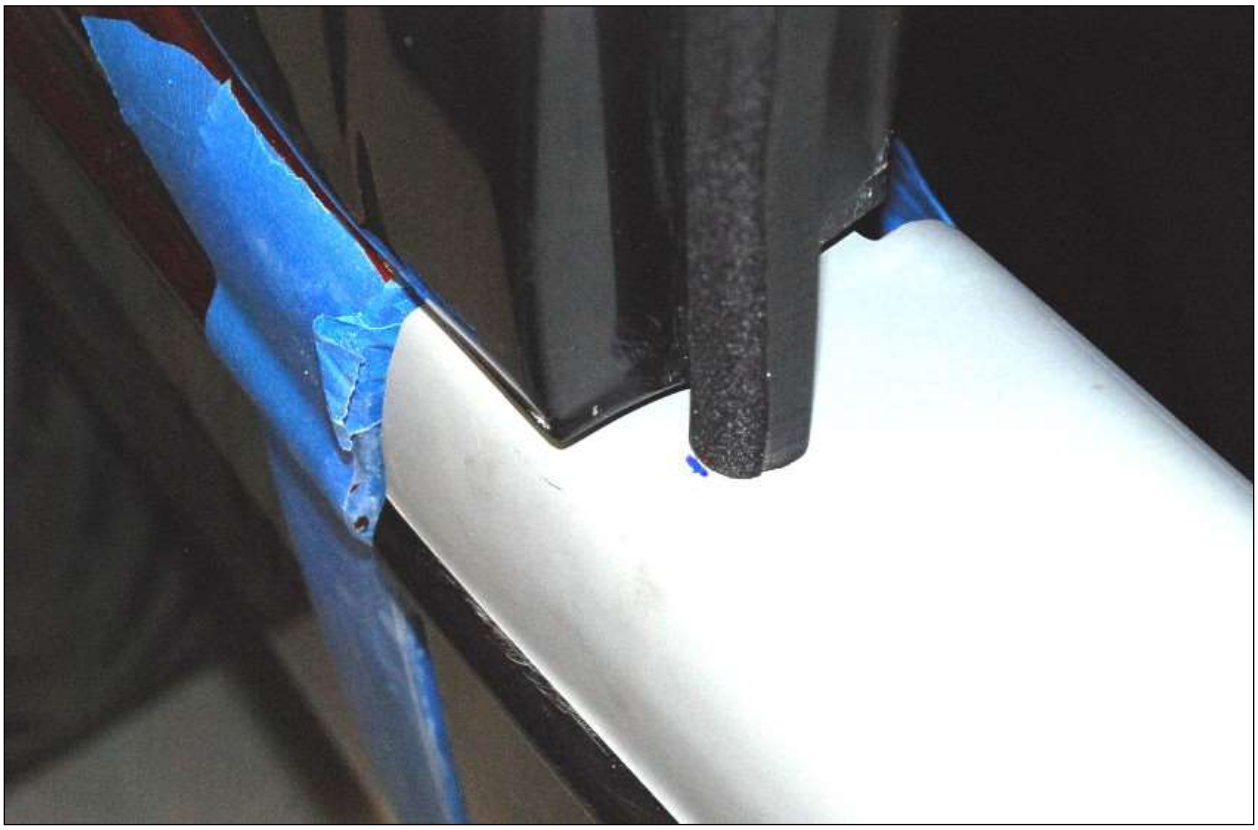


Start at the back of the window opening as close to the door as possible so the weatherstrip hangs below the Hard Top. Push the weather-stripping onto the flange around the door opening to the front of the door, again hanging below the Hard Top as close as possible to the door.

Power windows (Optional)

- Air saw, marker, tape measure, 1/8", 5/32" Hex keys, 1/8", 3/16", ¼" drill bits, ¼" grinding bit, tape, 5/16", 3/8", 7/16" sockets, silicone.
- Power window components, secondary body fasteners
- Only do the window installation after the Hard Top has been bolted to the car. If this is not done, the door slots will be in the wrong place.
- If the switches do not fit on the flange with the mounting bracket, the switches can be mounted individually and sideways to the flange

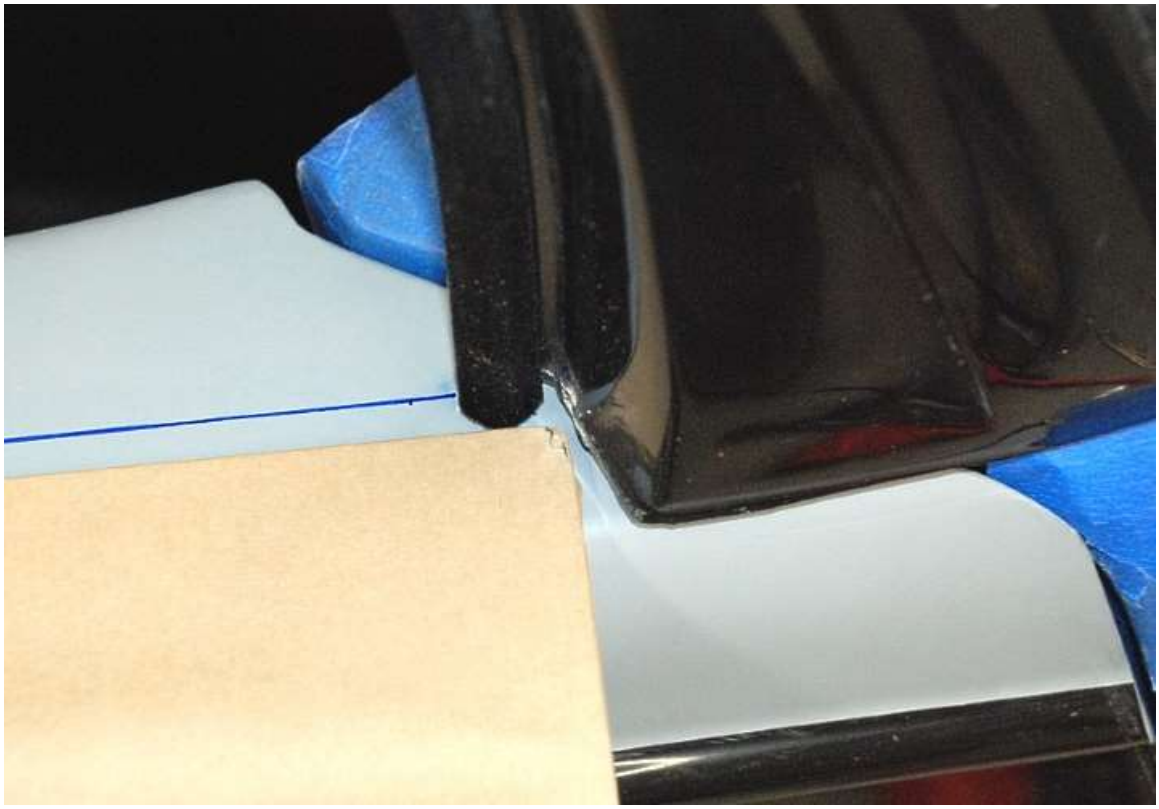
The window glass holder will have to be installed and uninstalled a few times so do not use Loctite on the fasteners until the door is assembled for the last time once the body has been painted.



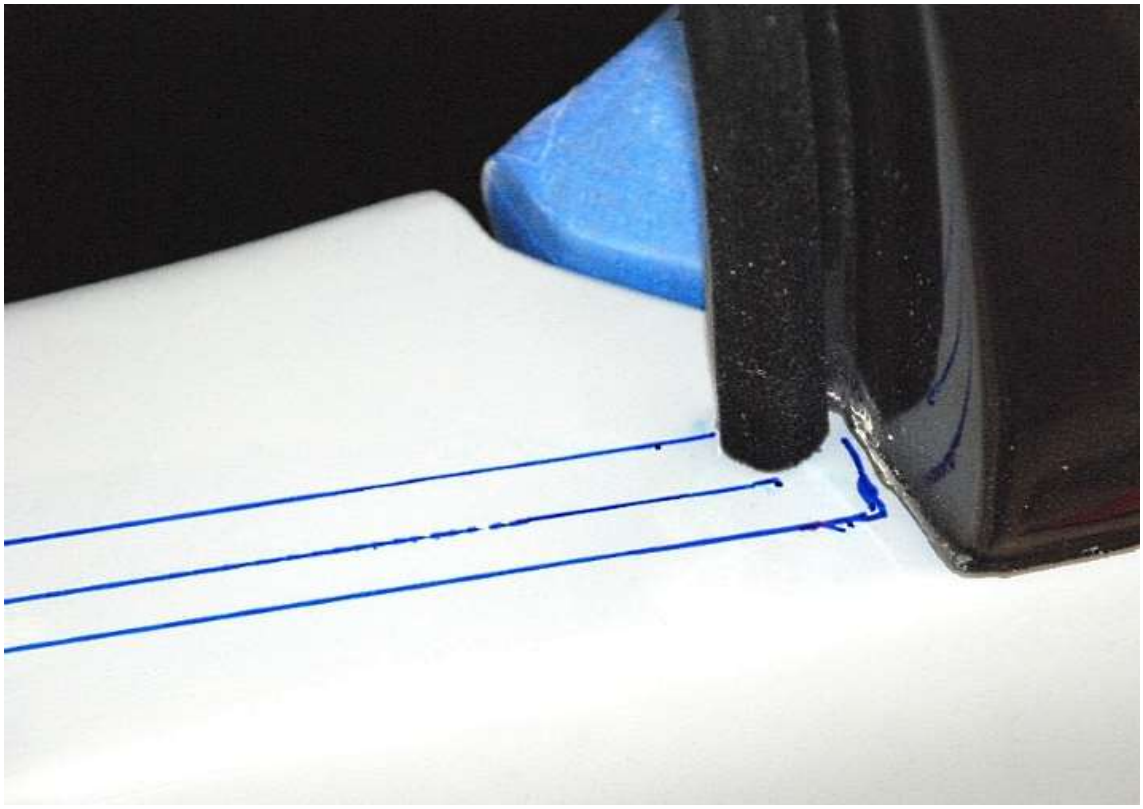
On the rear top of the door, mark where the weather-stripping bulb stops.

Repeat this at the front of the door.

Using a ruler, straight edge, or the bottom of the side window, draw a line connecting the two marks made.

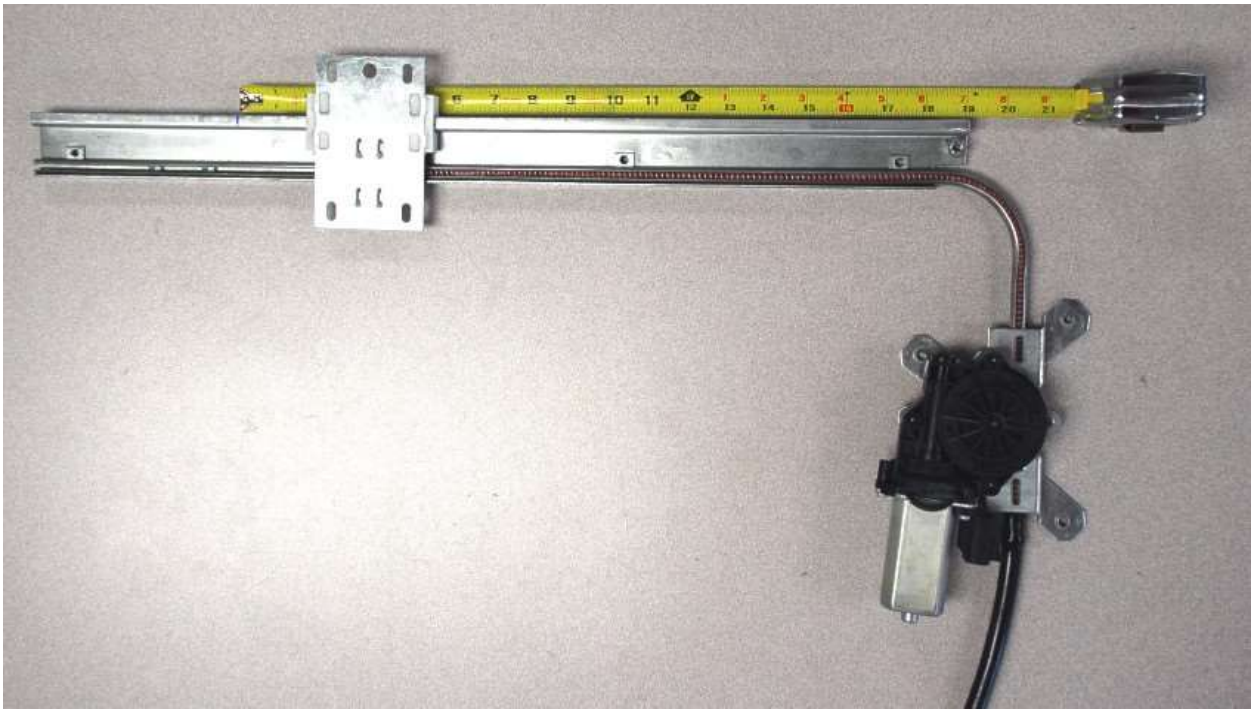


Measure ½” in from the line drawn and draw another line down the length of the door. Using the side window as a guide, mark the ends of the glass on the door.



Measure $^{3}/_{8}$” out from the line drawn and draw another line down the length of the door. Check the length of the cut out using both the edge of the glass and one of the precut window wipe rubber pieces.

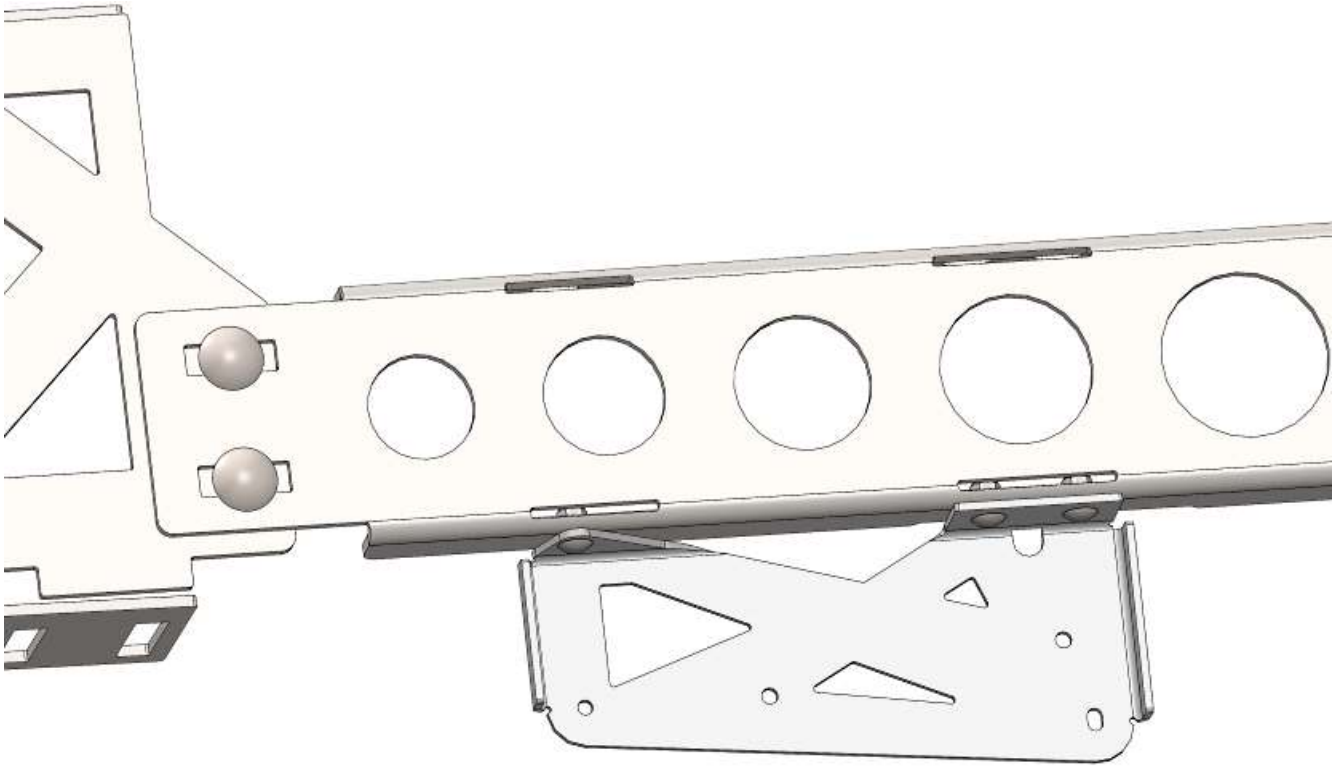
Cut the outer lines marked using a jigsaw or air saw. Check to make sure that the glass will fit in the length of the hole. If necessary, cut a little more on the length.



Hold a tape measure up to the track starting at the bottom and measure up and mark 19” from the bottom then hot wire the window motor by attaching a ground and positive to the wires on the plug pigtail to lower the rectangular plate so that it is below the mark made.

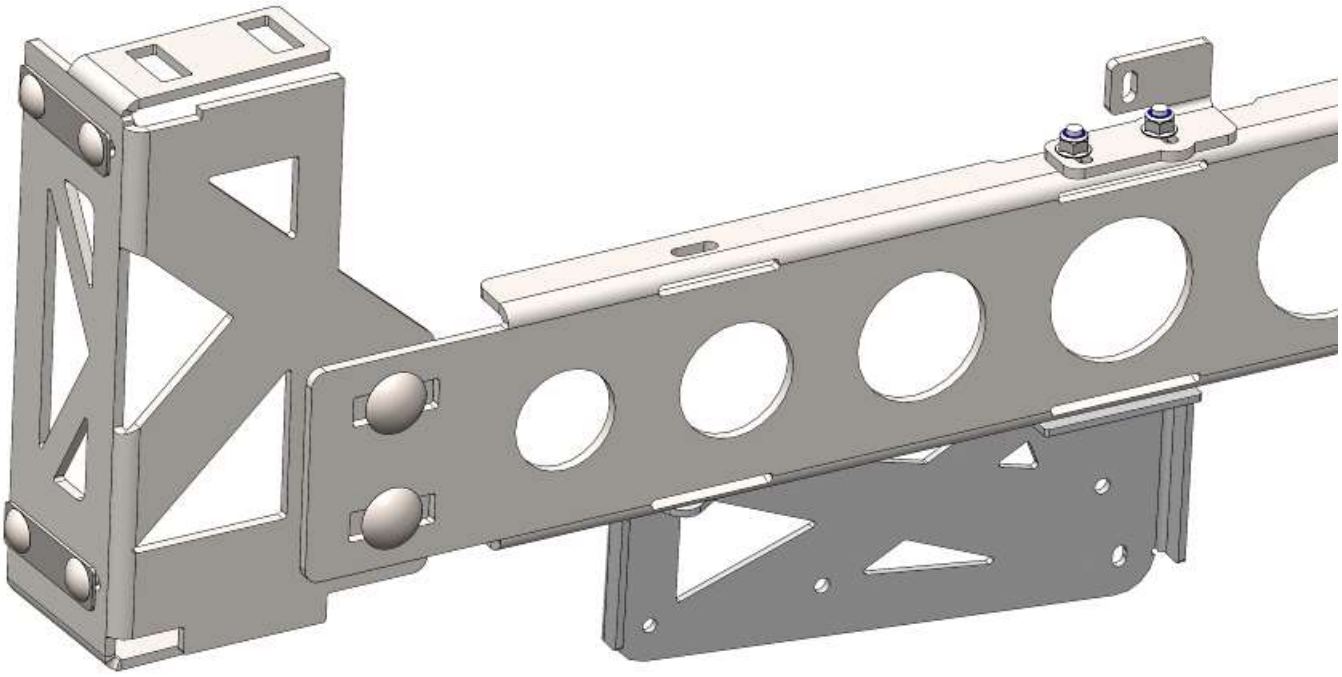
Cut the track at the mark made using a hack saw.

Insert the window track through the door opening with the motor towards the hinge end of the door.



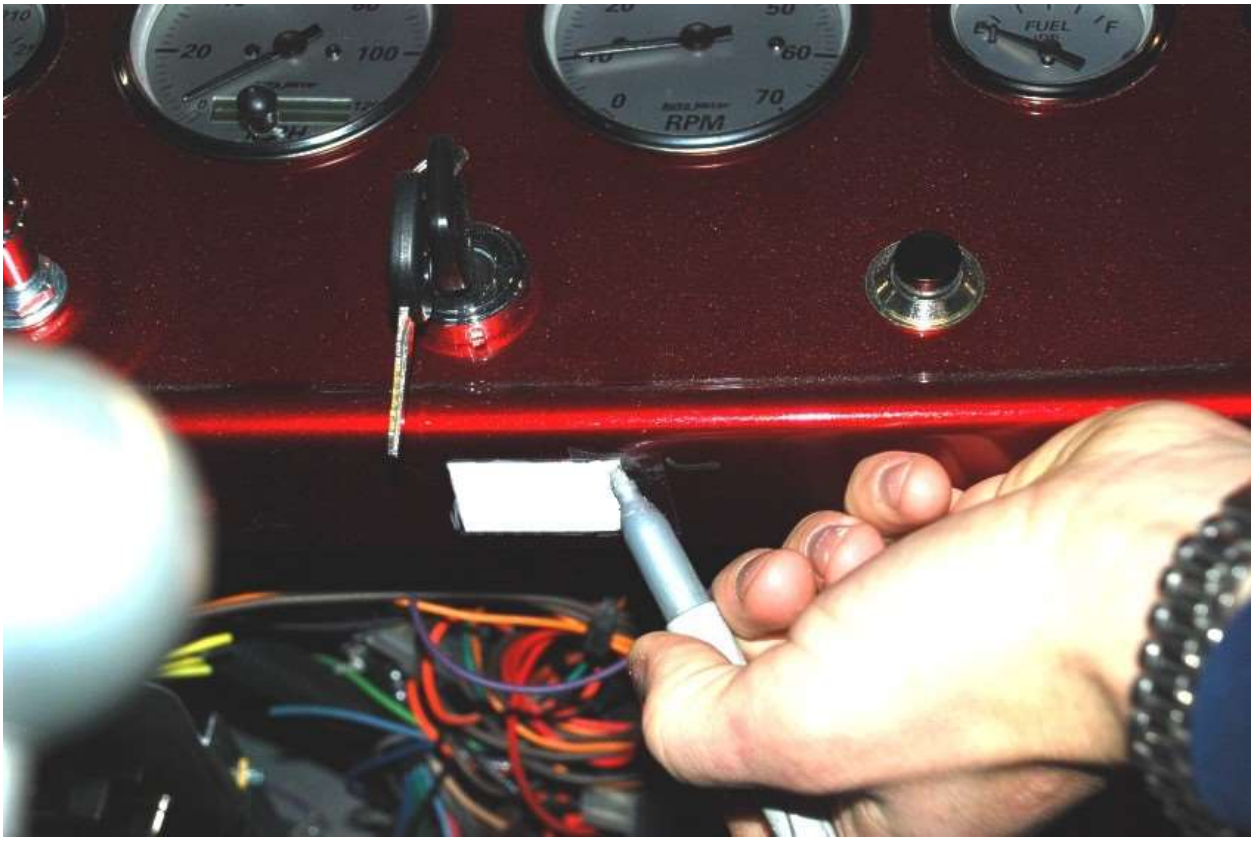
Attach the motor mount bracket to the door frame using the ¼” x ¾” carriage bolts and flange locknuts. Leave the nuts slightly loose to allow for adjustment.

Attach the motor mount bracket to the motor/track assembly using the ¼” x ½” screws.

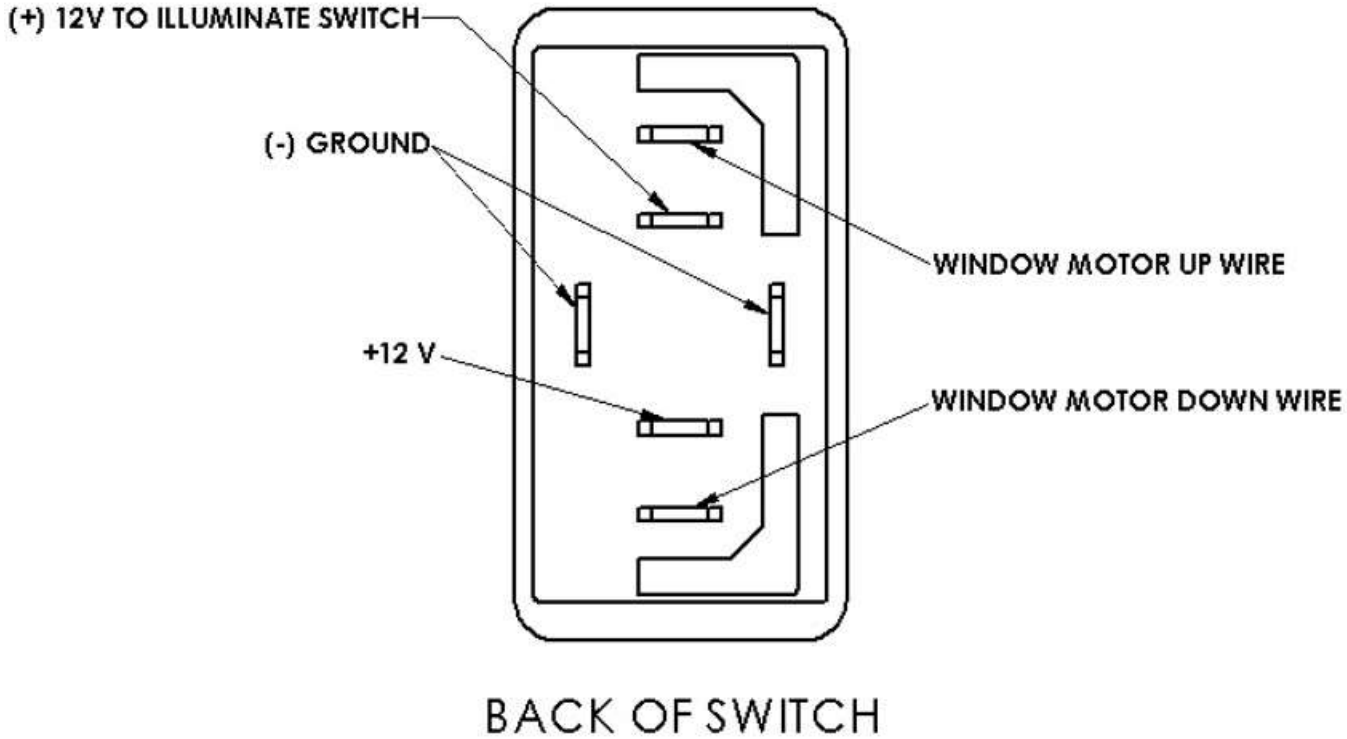


Attach the upper motor bracket to the door frame using the ¼” x ¾” carriage bolts and flange locknuts. Leave the nuts slightly loose to allow for adjustment.

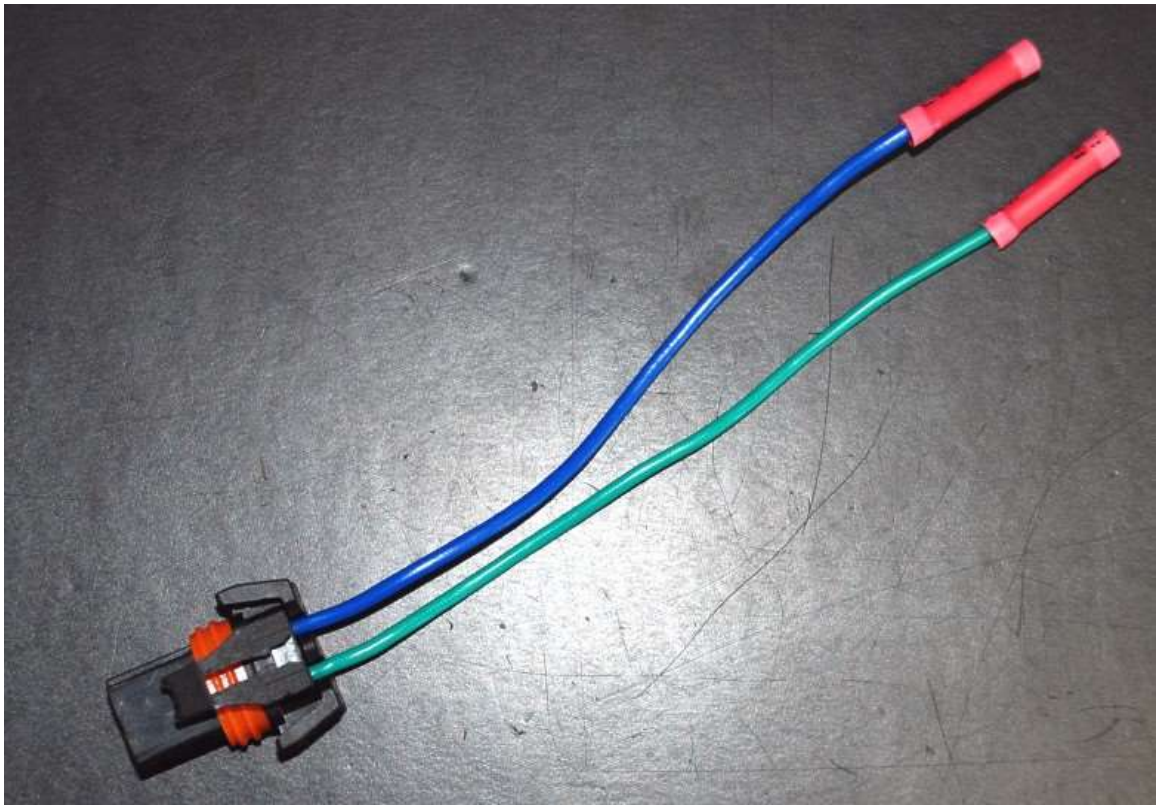
Attach the window track mount to the window track using the ¼” x ½” screws.



Use the power window switch mount to hold the switches or to mark the switch location between the seats on the bottom of the dash so the switches are not visible and can be reached by the driver if necessary. Wire has been included for this mounting location.

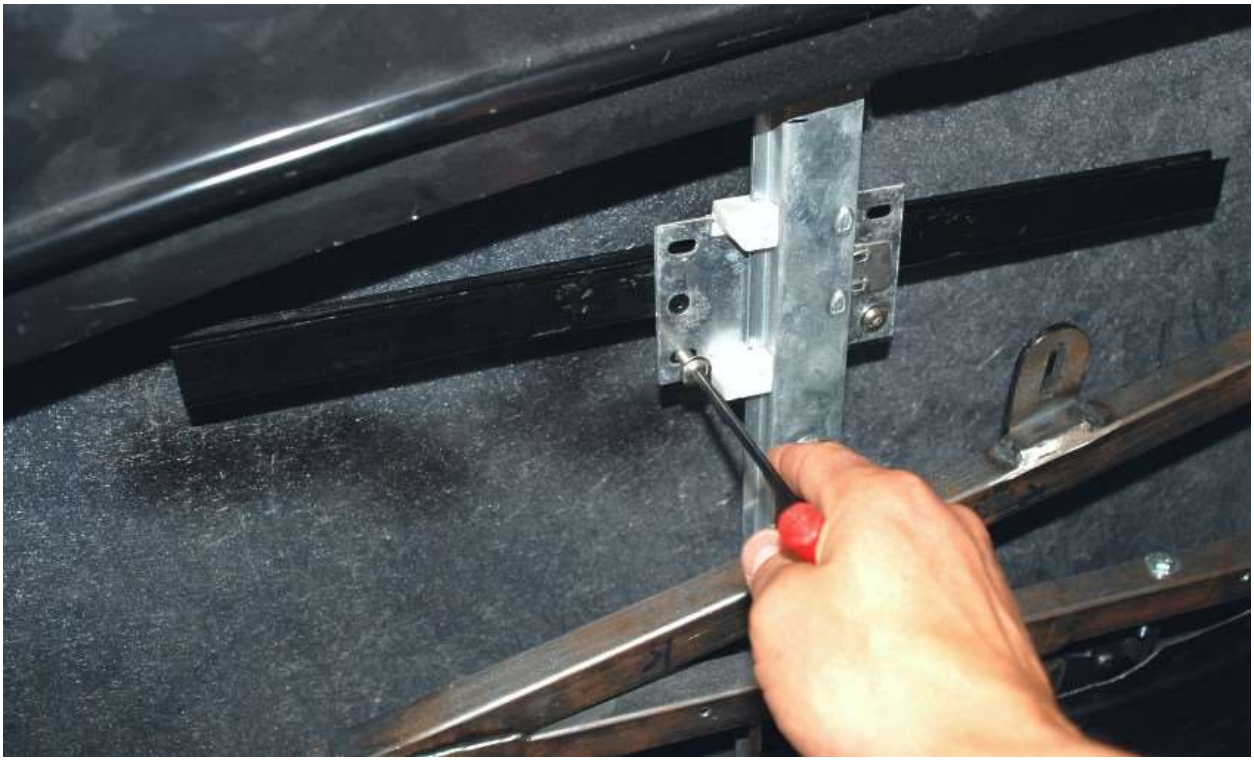


Use the diagram above to connect the power window switches to the chassis harness. The electric choke or Fuel injection harness wires for the power. Make sure to run the included 25A fuse on the circuit.



Use the red butt connectors to attach the included wires to the window motor pigtails.

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.



Attach the window glass holder to the lower holes on the track bracket. Center the bolts in the holes.

Raise the glass holder to door top height and see how the ends of the holder are compared to the top of the door. The holder should be parallel to the top of the door. This picture shows the front is higher than the back.

For this installation, the front glass holder hole needs to be lowered so lower the window track and remove the front glass holder screw.

Use a drill bit or grinding bit to slot the glass holder mounting hole.

Reattach the glass holder then raise it up and compare it to the door top again. Repeat until the holder is parallel to the top of the door.

Slide the glass down into the door and into the glass holder. The taller end of the window (logo end) goes towards the back of the car.

Close the door then raise the window up using the switch.

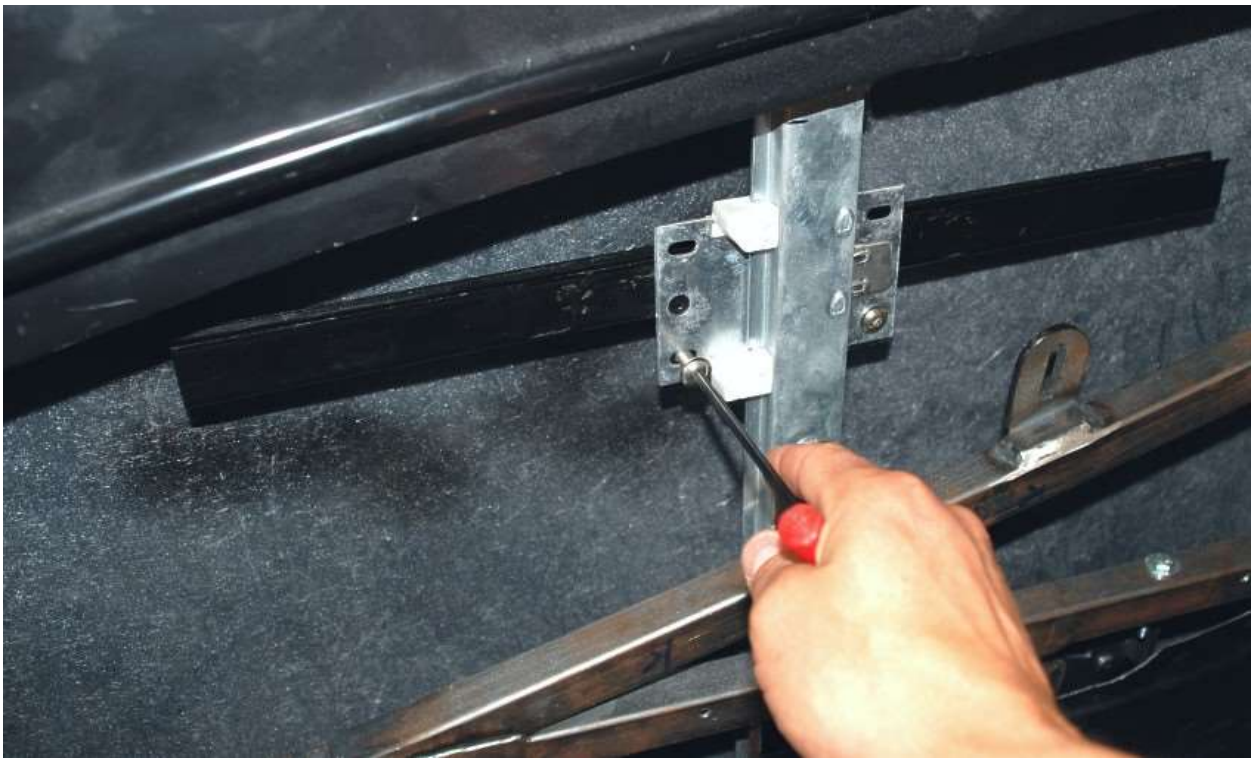

Slide the glass back and forth in the glass holder so that the gaps on each end are the same.

Carefully open the door without moving the glass and mark the glass at the back of the holder. Remove the window carefully. This will make it easier to locate the glass in the future.

- The glass can get held in a few ways, the best way is to use Urethane, the same adhesive as the front windshield so this can be done when the Hardtop glass is installed later. The other option is to use the rubber included and shown in the following steps

Fold the 36” piece of window channel rubber in half and cut it in half. One piece will be used for each door.

Remove the glass from the door.



Remove the window glass holder from the door.

With the top of the glass resting on something soft such as a towel or a glove as shown, locate the rubber strip and window glass holder on the window using the glass marks made as a guide. Make sure that you have the glass holder the correct way around on the glass so it will mount correctly.

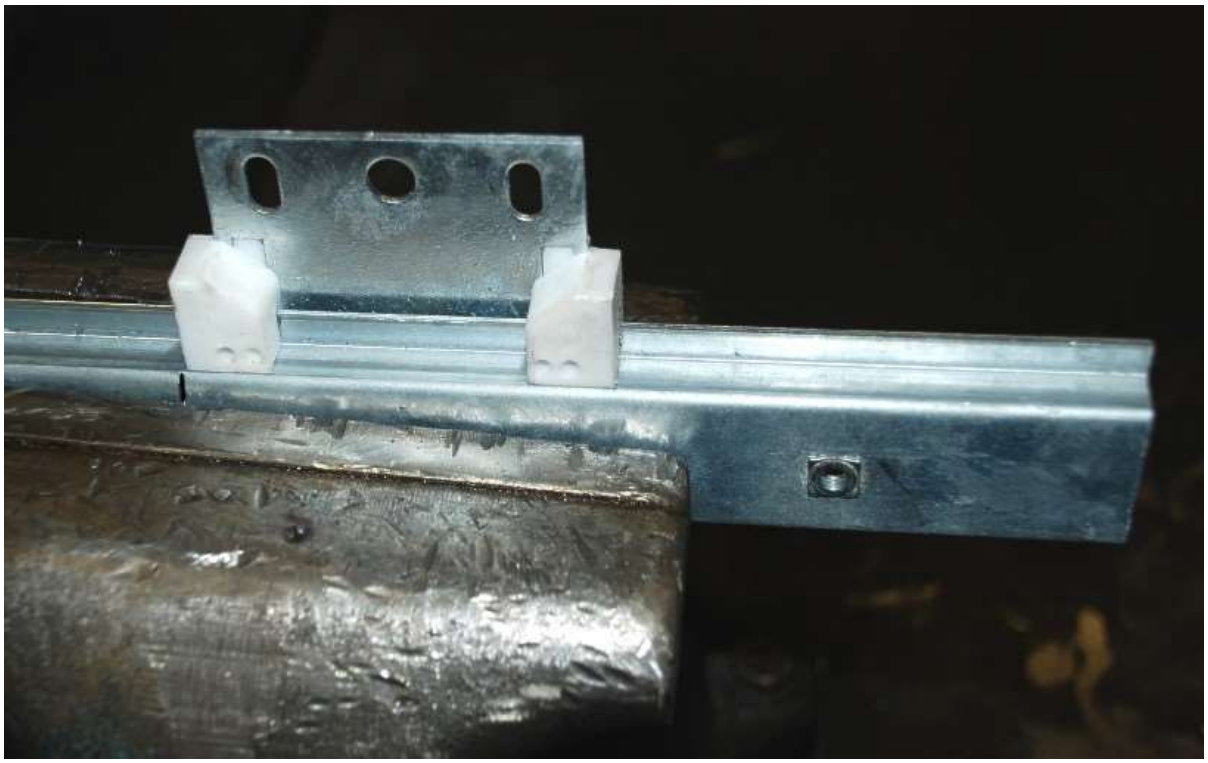
Use a plastic dead blow hammer to push the glass holder onto the glass. Do this evenly on each side of the mount bracket. The last couple of hits will have to be on the mount bracket edge so that it is completely seated.

Remount the glass holder with the glass back in the door.

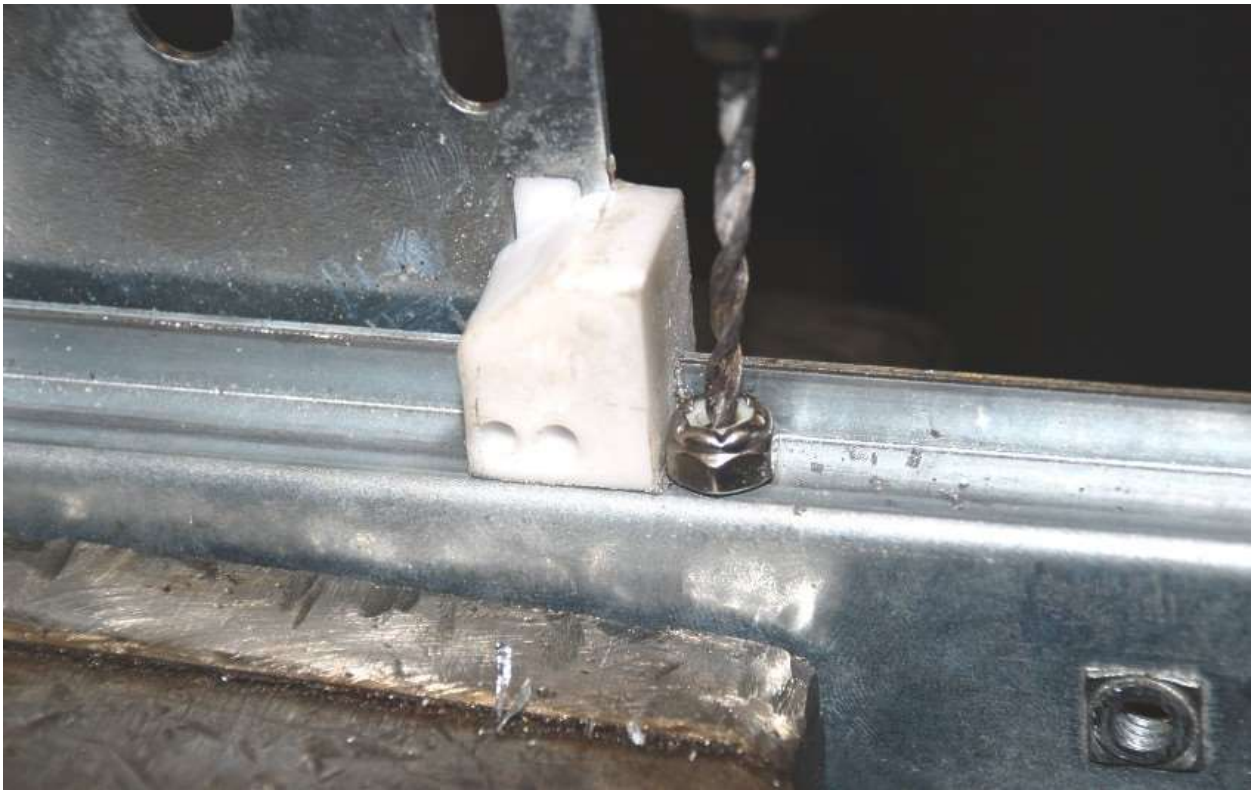
Close the door, and raise the window up to where you would like it to stop. Be careful doing this. Once this position is found, open the door and mark the window track where the bottom of the plastic guide is.

Lower the window so that the top of the glass is just below the top of the door.

Unbolt and remove the window track.

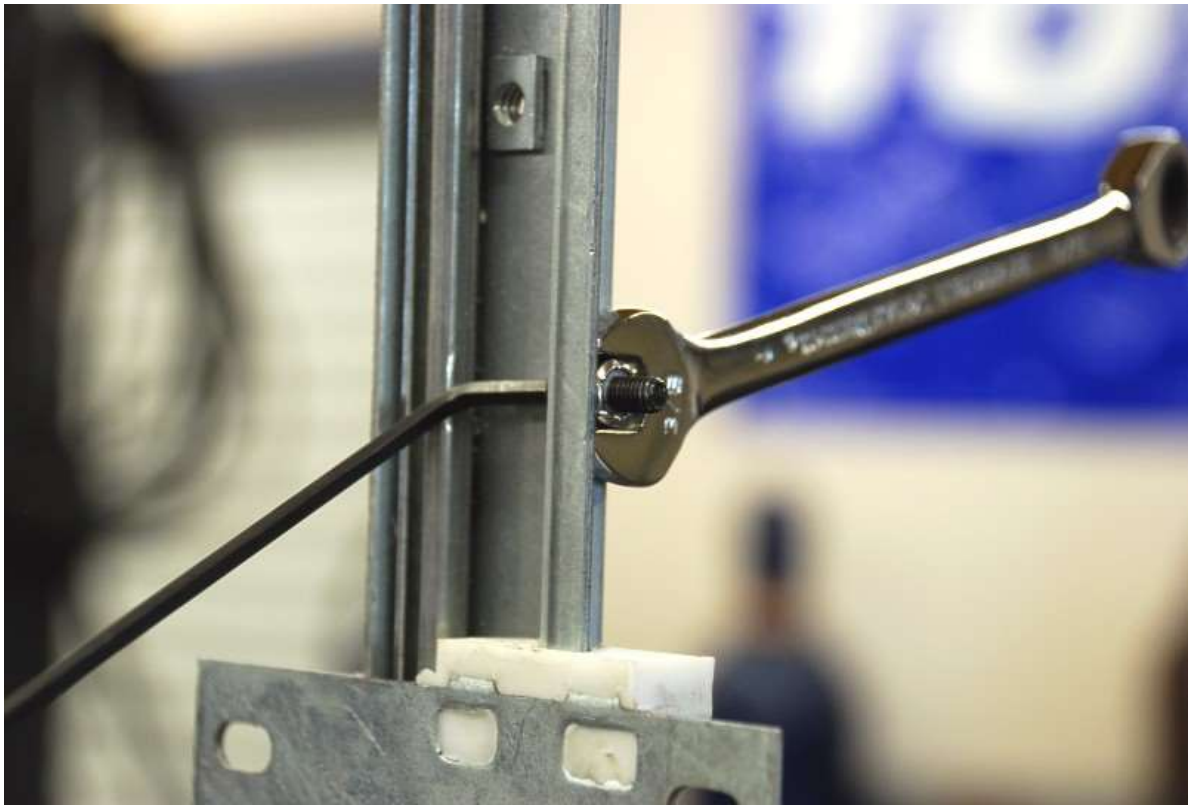


Align the track bracket with the mark made for the up-stop position.

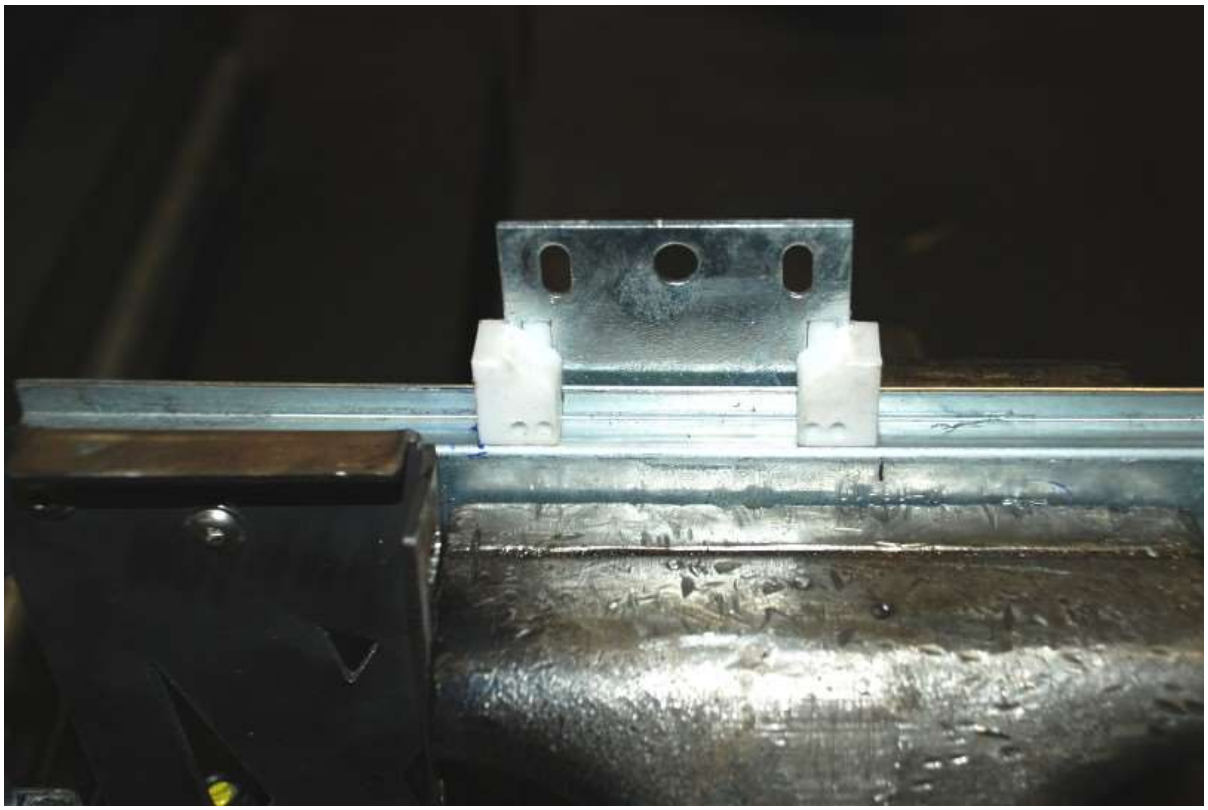


Place one of the 10-32 locknuts on top of the plastic guide on the window track then use a $^{5}/_{32}$" drill bit (the same size as the nylon locknut opening) and using the lock nut as a locator, drill through one side of the window track.

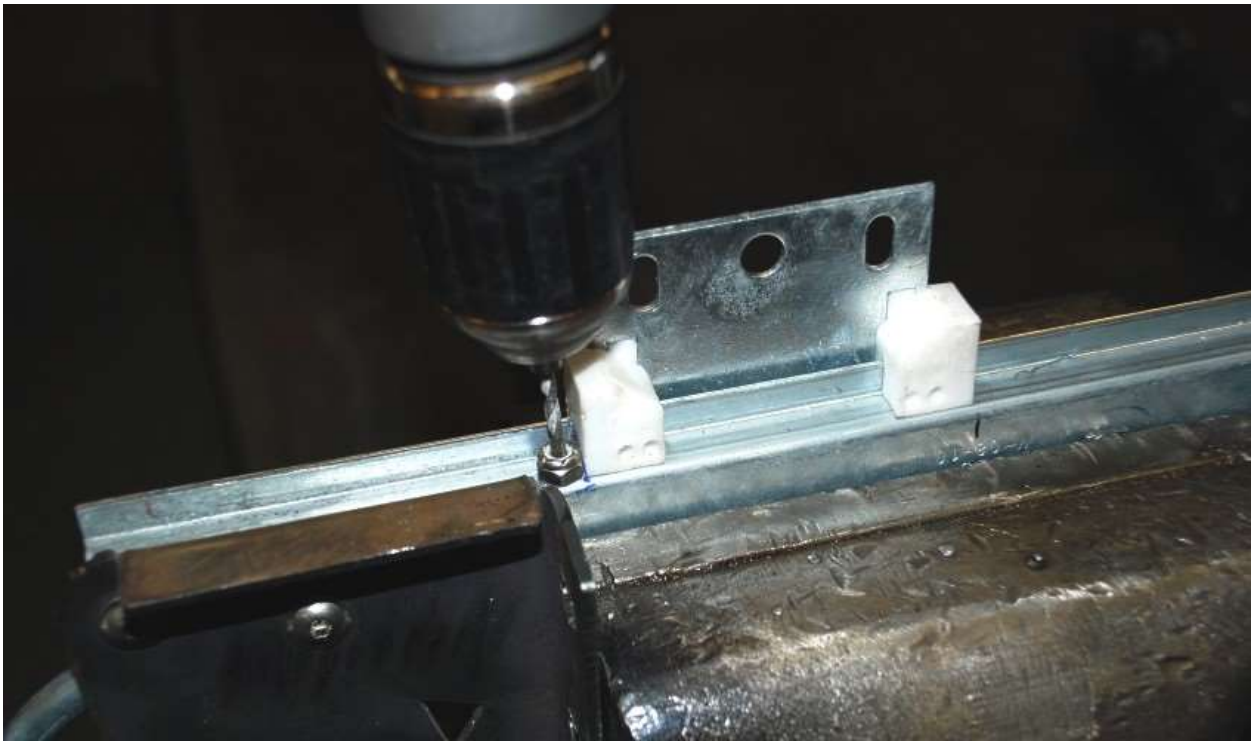
Remove the locknut and open the hole up to $^{13}/_{64}$".



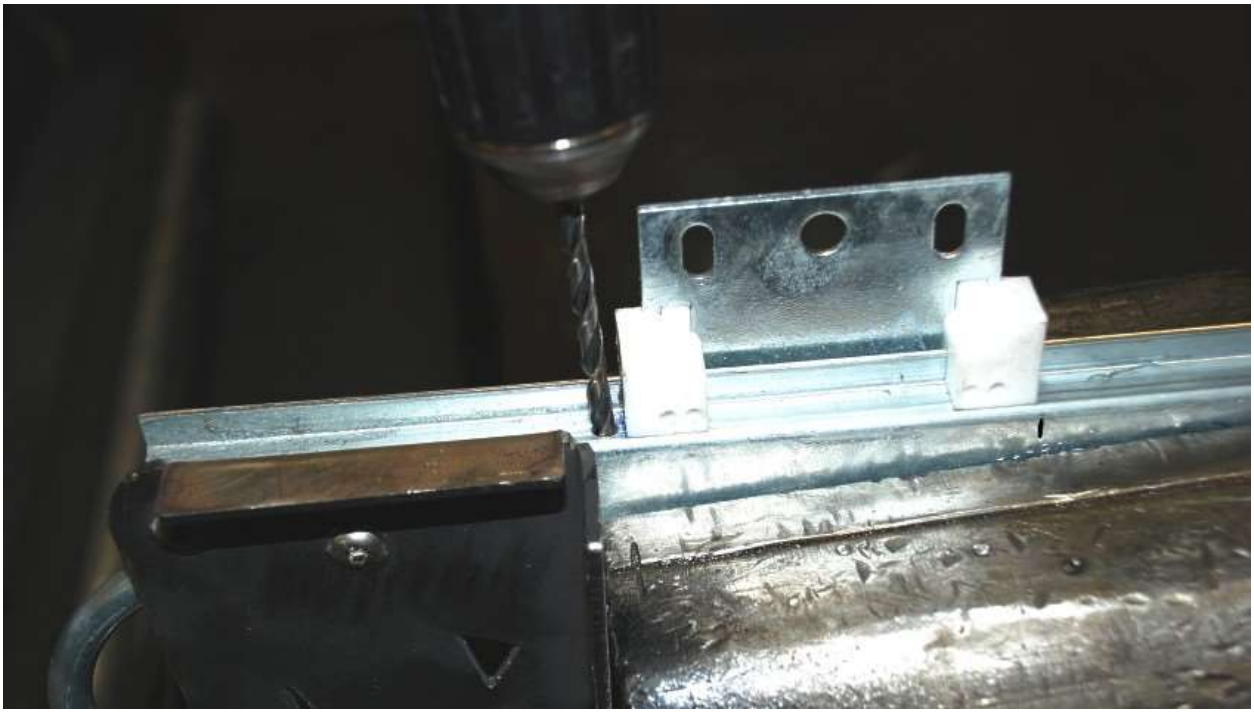
Move the track bracket down and attach the 10-32 x 5/8" stop bolt using a 1/8" Hex key and 3/8" wrench.



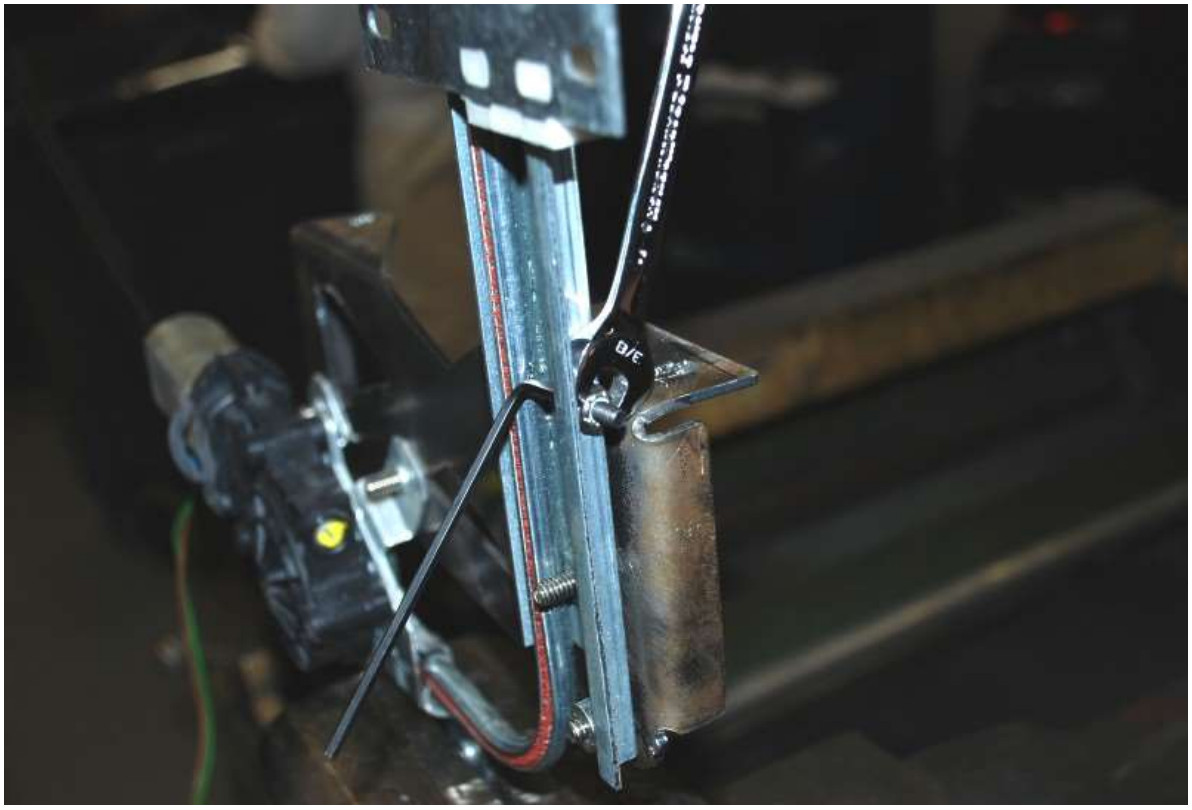
Align the track bracket with the lower stop mark made previously.



As done with the top stop hole, place one of the 10-32 locknuts under the bottom of the plastic guide on the window track and use a $^{5}/_{32}$" drill bit to drill through one side of the window track.



Remove the locknut and open the hole up to $^{13}/_{64}$".



Move the track bracket up and attach the 10-32 x 5/8" stop bolt using a 1/8" Hex key and 3/8" wrench.

Reinstall the window track in the door with the bolts slightly loose.

Slowly close the door checking the clearance of the glass at the front and back near the top then raise the window up and have a friend push the glass against the weatherstrip.

From inside the car look tighten the window track mounts so that the angle of the window in and out and going up and down is correct.
Lower the glass all the way.

Push the felted weatherstrip onto the shorter flange on the stainless window trim.

Carefully locate the window trim on the top of the door so the felted rubber seals against the glass. It may be necessary to open the top door slot up so that the stainless will sit flush on the top of the door.

Check the window up and down with the door open and closed. The idea is to have the felted seals to just touch the window and not put a lot of pressure on the glass to bog the motor down or push the glass in a

different direction than what you want. If necessary, trim more off the top of the door so on one side or the other to eliminate any excess pressure on the window. Tape the window trim in place if possible.

With the window trim in the desired position locate and drill a 3/16" hole through the door top at each end using the trim holes as a guide.
The stainless can be painted if desired.

Use some silicone on the edge of the stainless flange then push the weatherstrip back onto the flange.

On the backside of the weatherstrip under the top flange at the ends and middle of the weatherstrip, drill an 1/8" hole through the first side of the weatherstrip and the stainless **only**. **Not the flocked side.**

Use a kit 1/8" rivet to attach the weatherstrip to the stainless.

Bolt the trim pieces to the top of the door using the #8 screws and locknuts.

Exterior Door Handle

- The right side is shown for this installation.

Mark door for door handle center 4 ½” down from top of door.

Mark 3¼” from front of door.

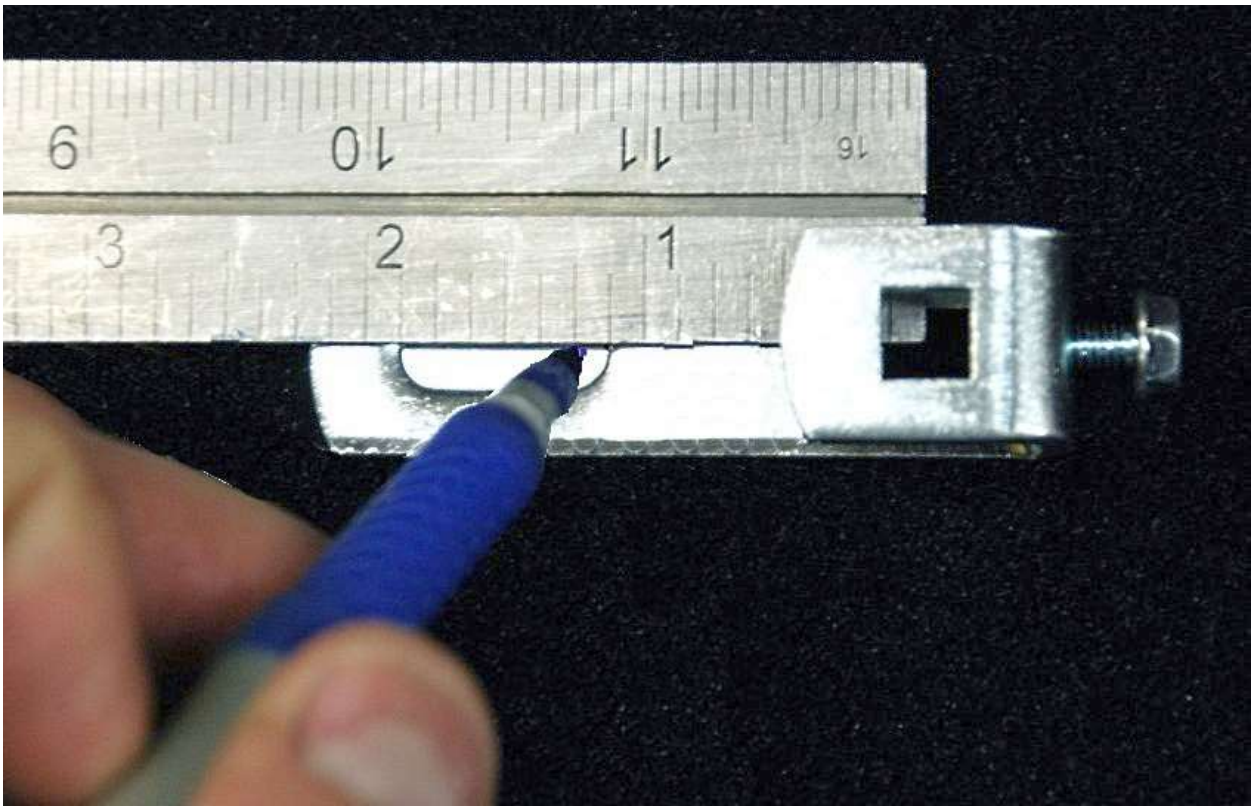
Use a 7/8” hole saw on the outer door skin at the point marked.

For easier access to the outer door handle parts it is recommended to have a hole in the angled part of the inner door liner which goes against the dash with the door closed.

To locate this hole, once the outer skin is cut, go through the inner door skin with the pilot bit of the hole saw only.

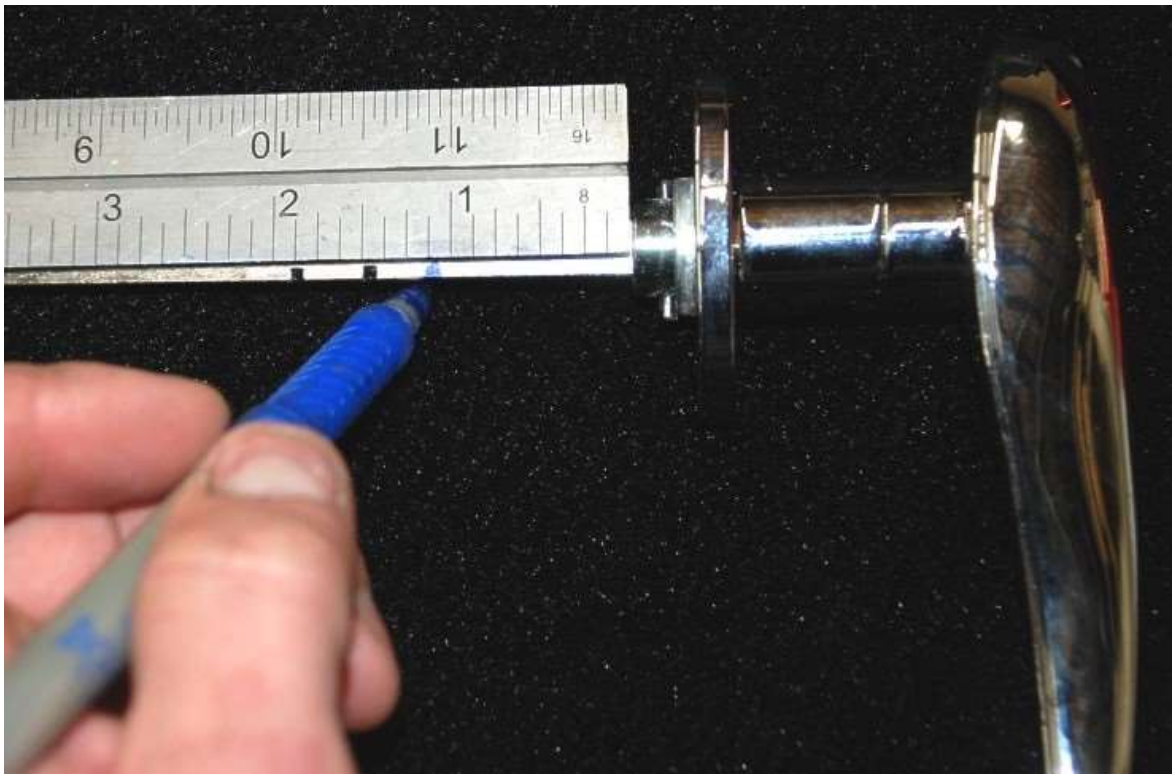
On the inner skin where the locating hole is, use a 1.75” hole saw through the inner skin only.

Place door handle in the outer door skin hole and mark the mounting holes vertically.
Drill $^{13}/_{64}$” holes at the points marked.



On the handle control lever measure and mark 1.25” from the center of the ¼” square hole.

With the lever in a vise or drill press, drill a $^{13}/_{64}$” hole in the center of the lever at the point marked.

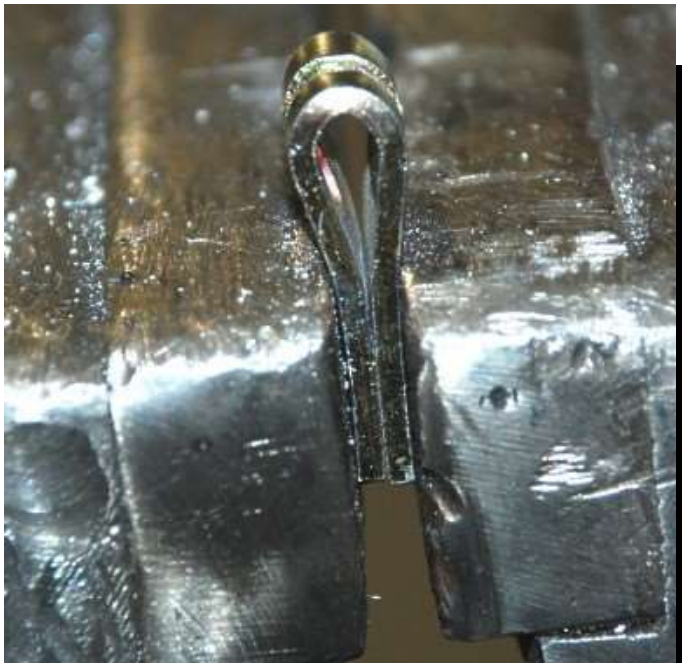


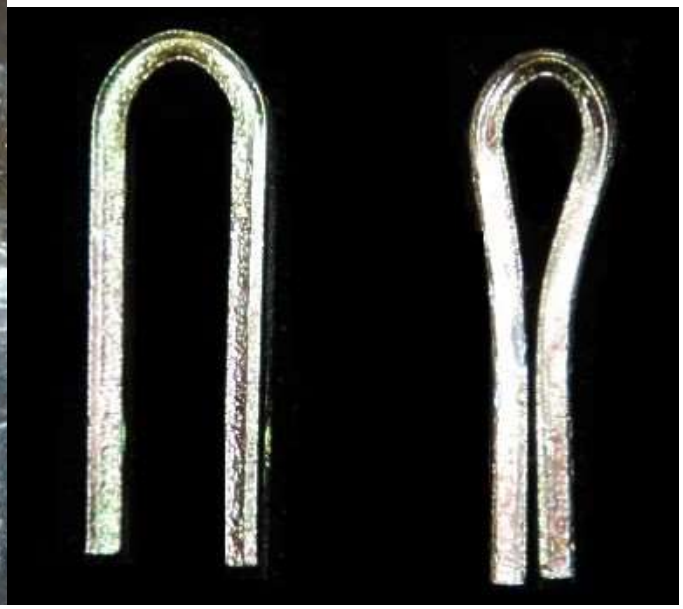
Mark the door handle shaft 1.125” from the shoulder.

Cut the door handle at the mark made.

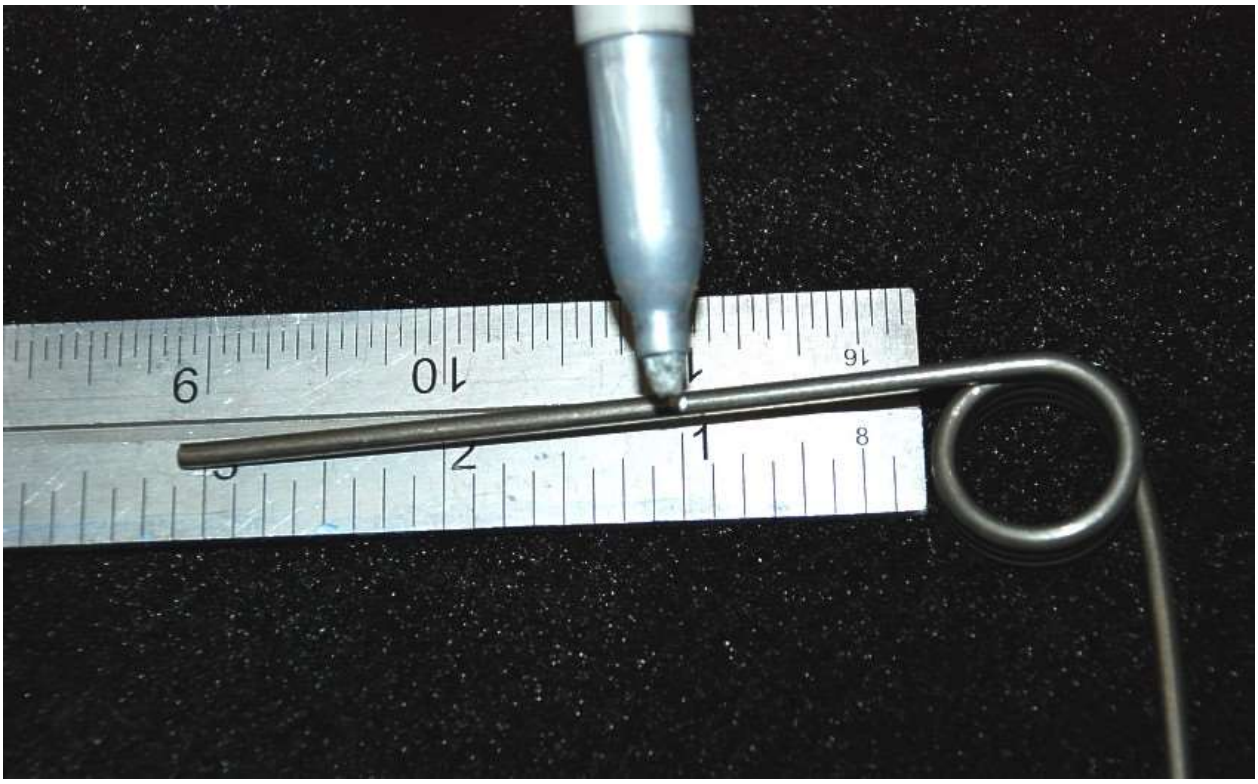
Use Lithium or chassis grease to lubricate the exterior door handle.

Pass the door handle through the mount gasket, door and Backing plate (bent part down).

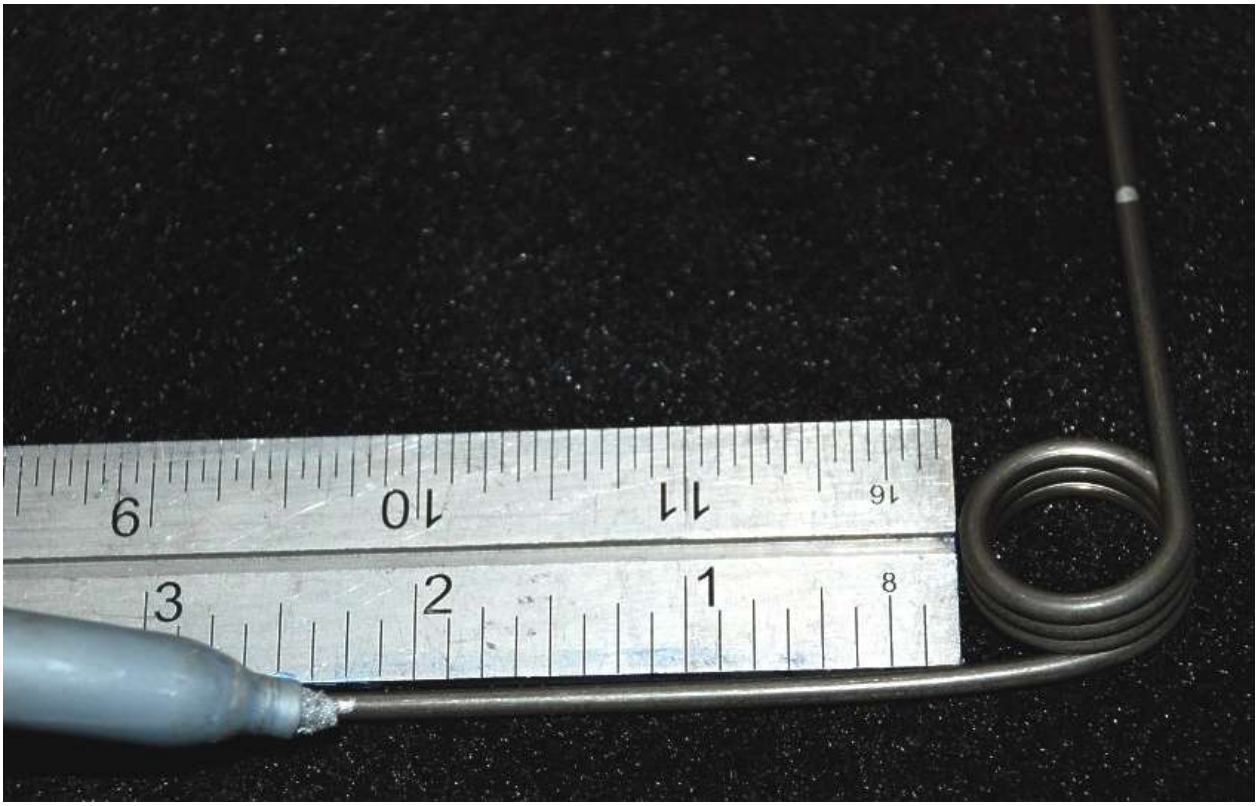




Use a vise or vise grip pliers to squeeze one of the cable clevis parts so that the legs touch just above the hole that goes through it.

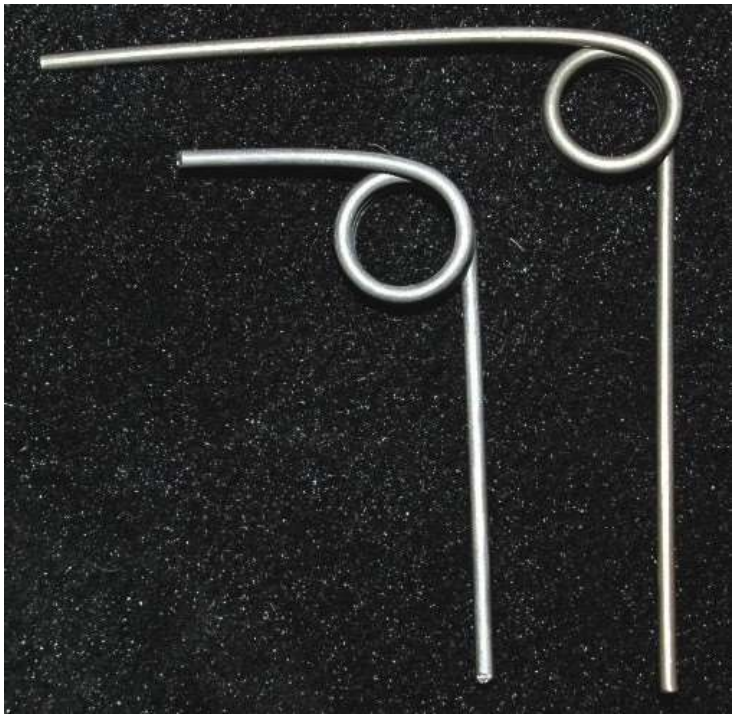


Mark the top leg of the right hand wound spring (shown) 1” from the spring coil.

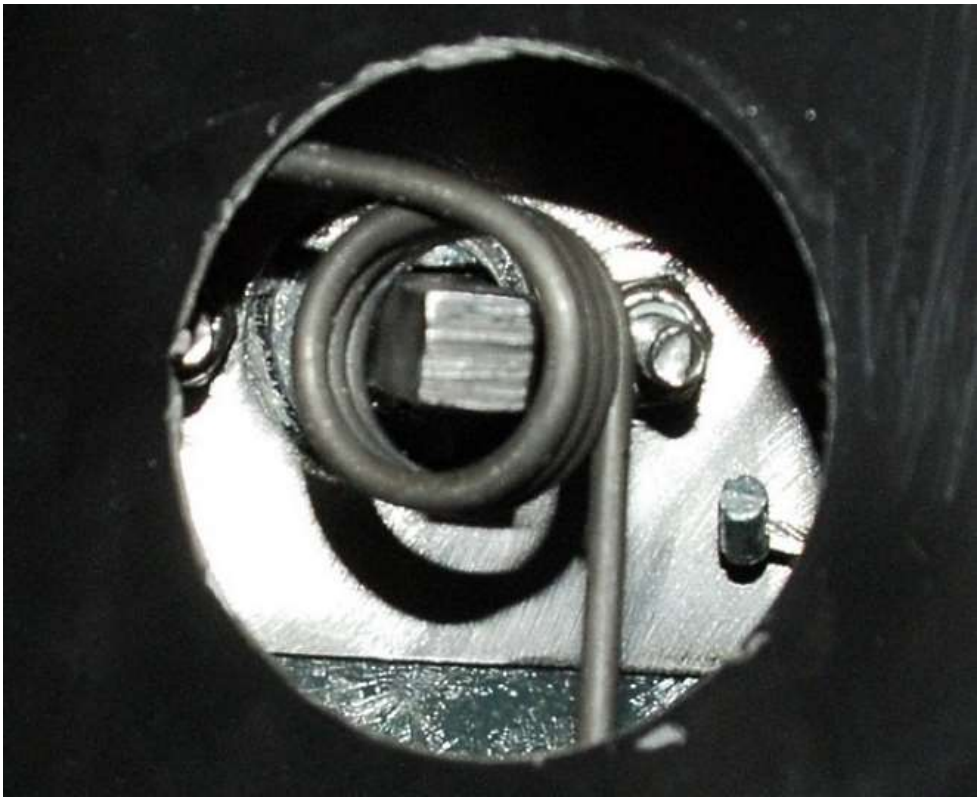


Mark the bottom leg of the spring 2.25” from the spring coil.


Use a heavy duty set of electrician pliers or a hack saw to cut the spring at the points marked.



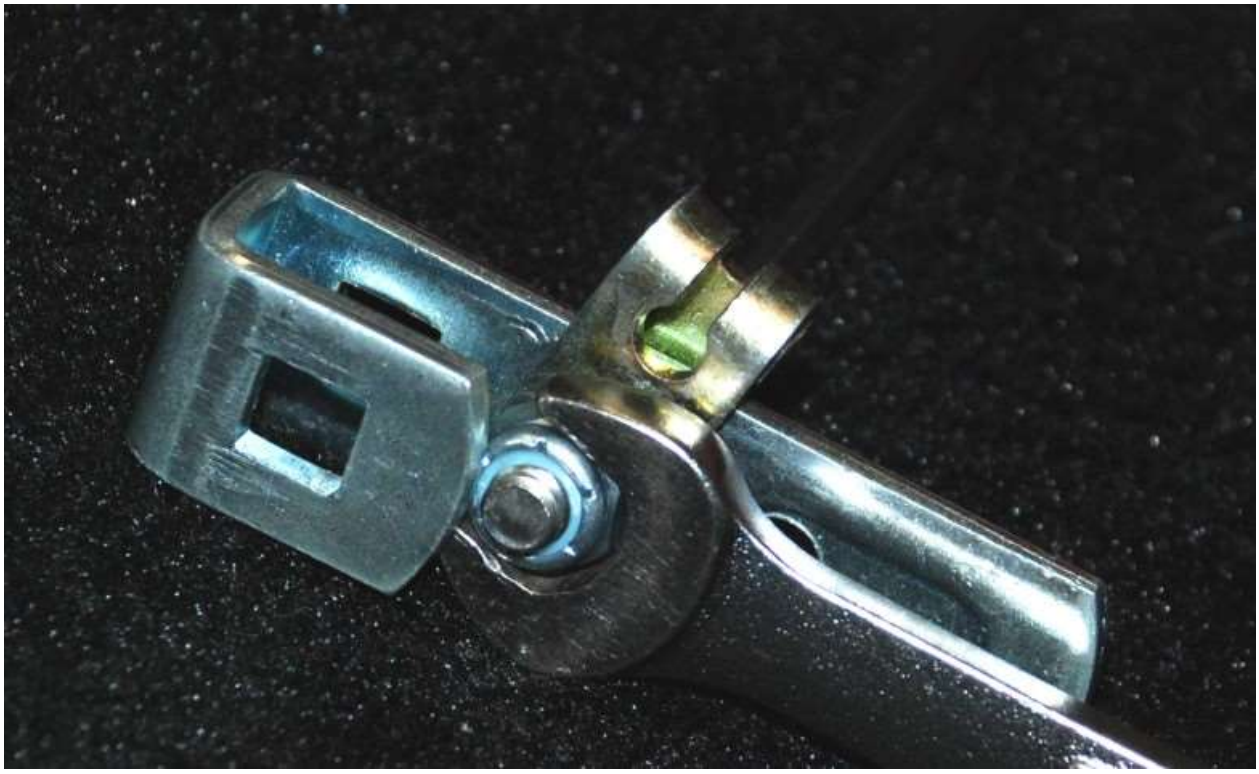
Picture of cut and uncut spring.



Push the spring over the handle shaft so that the short 1” end points towards the front of the car.

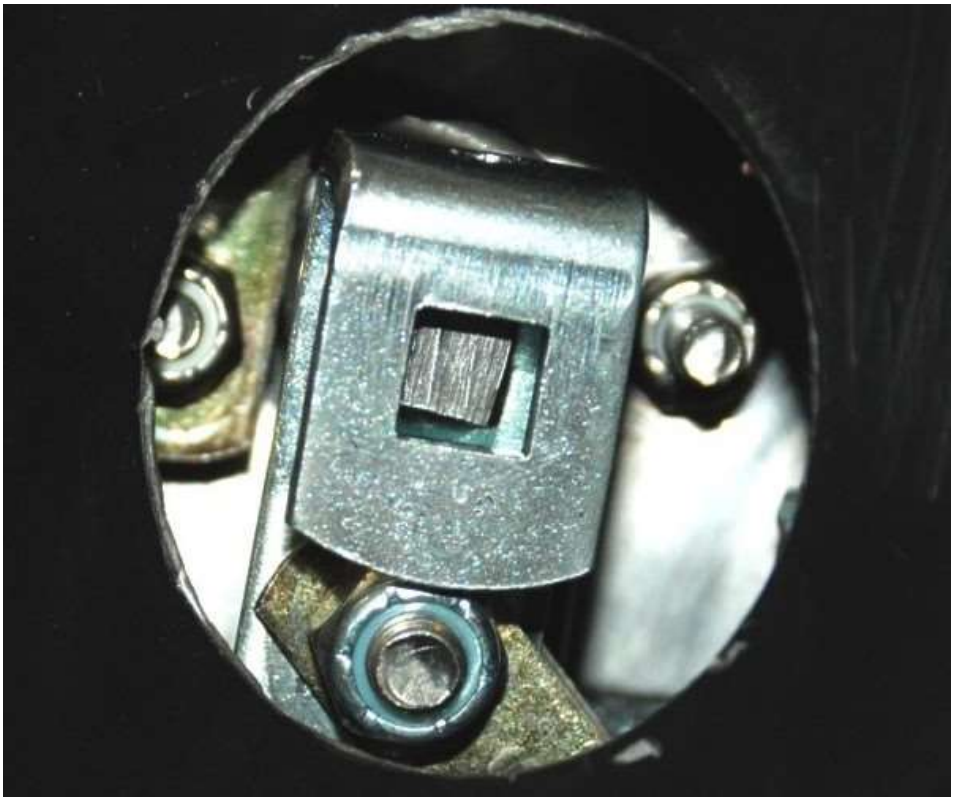
Rotate the spring so the short end is up and put the pressed clevis on the 1” end of the spring.

Attach the pressed clevis to the front handle screw using another 10-32 locknut and $^{3}/_{8}$” deep socket.

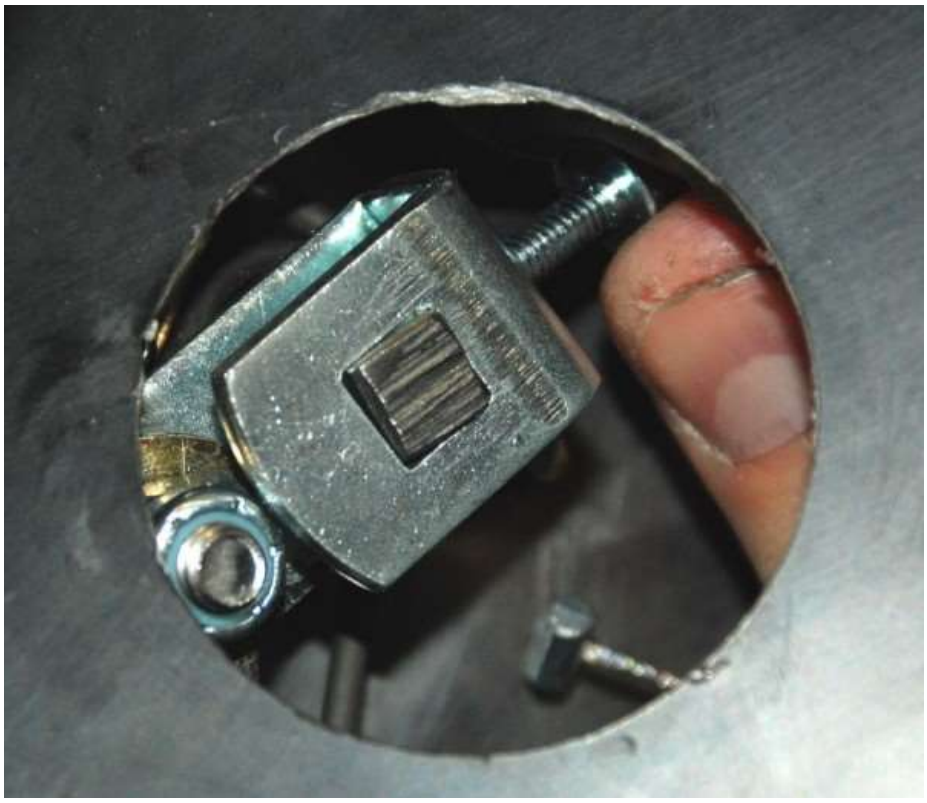


Attach one of the un-pressed clevis' to the control lever using one of the ¼" flange head screws and lock nuts along with a $^{3}/_{32}$" hex key and $^{7}/_{16}$" wrench in the hole closer to the square hole. Make sure that the clevis is attached with the large circular hole side as shown in the picture above. Insert the screw as shown and tighten it so that it can rotate easily but there is not a lot of slop.

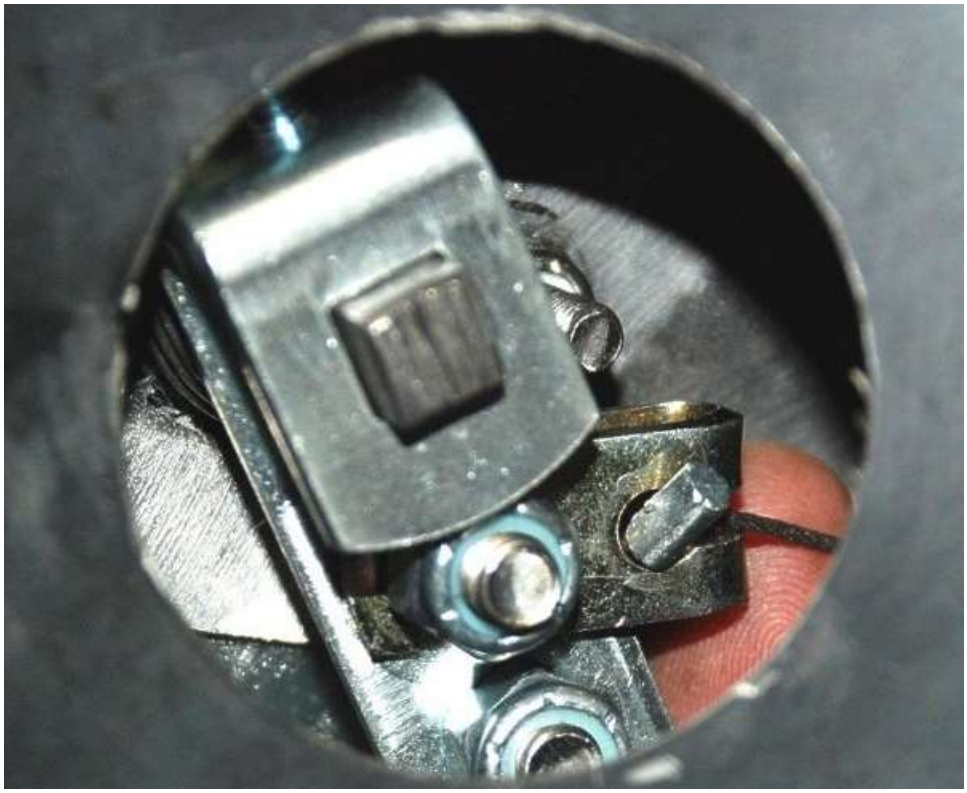
Attach another ¼" flange head screw in the other hole as shown above. Only tighten the screw so that the screw goes through the nylon on the locknut about one thread. Remove the set screw from the end.



Making sure that the exterior handle is positioned correctly, push the control lever assembly onto the square shaft so that it points down. Push the control lever on as far as possible.



Rotate the handle so that you can insert and tighten the set screw in the top of the handle.



Rotate the handle the other direction so that the clevis is closer to the cable and insert the barrel fitting into the clevis.

Move the long end of the spring so that it is on the other side of the lower ¼" screw head.

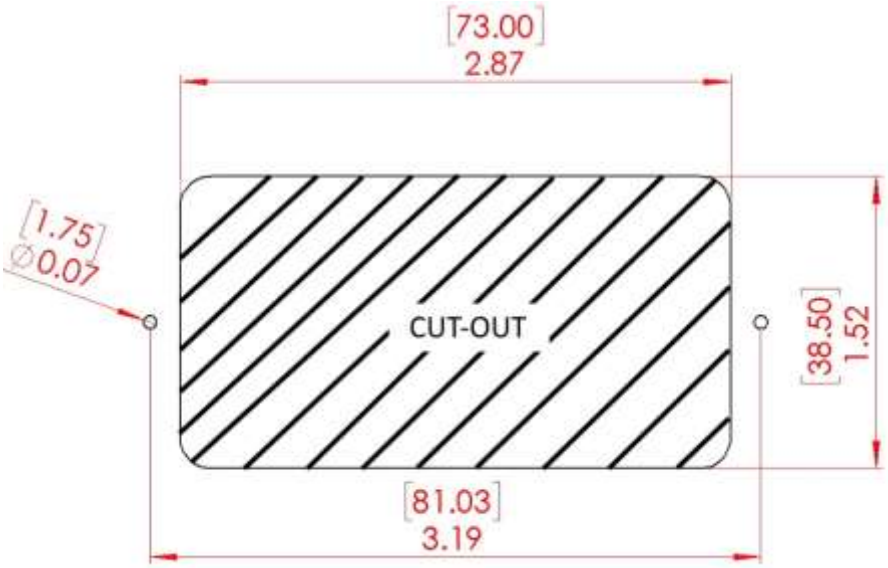
Without the door in place, this is what the exterior door handle assembly looks like.

Put a jam nut from the kit door handle fastener pack onto the threaded cable end.

From the handle run the cable down to the door frame mount and insert the threaded end of the control cable into the top hole on the door frame followed by another nut.

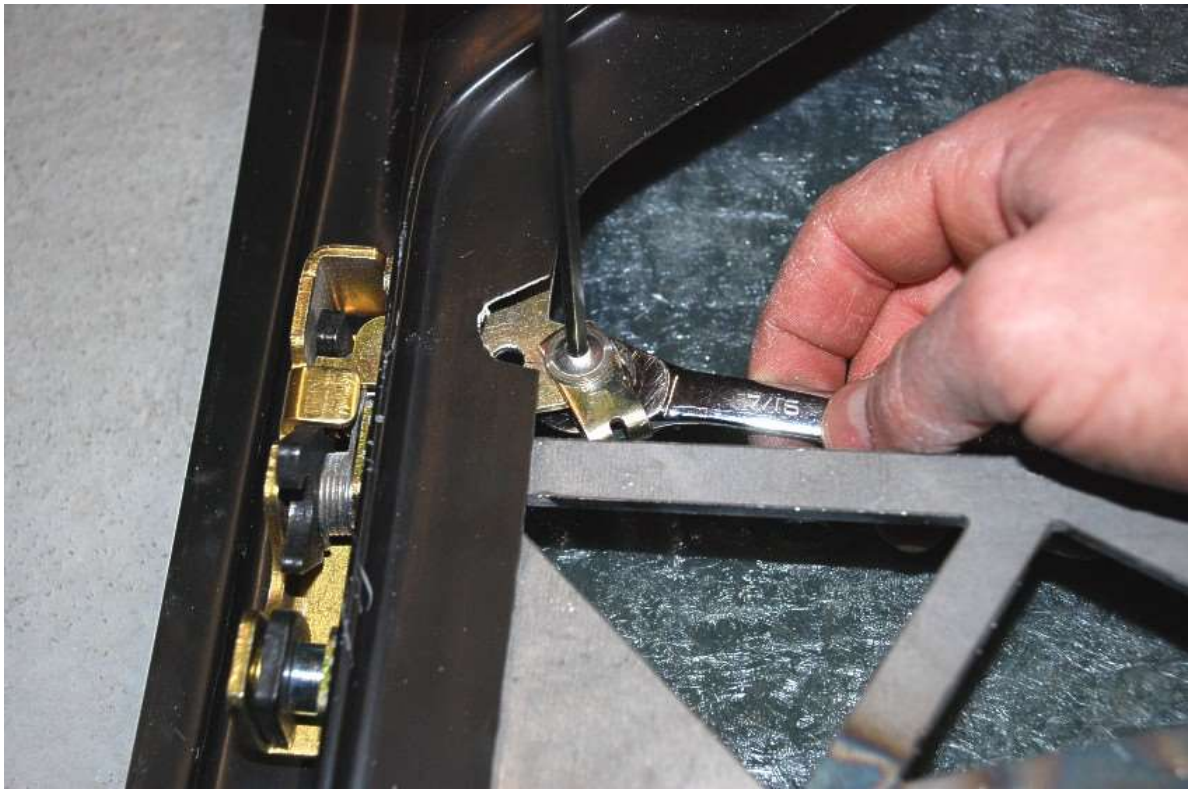
Interior Door handle (Optional)

Insert another control cable threaded end into the inside door frame hole.



Use the template above to mark the inside area to cut. Use a ruler to check the scale before using.

Attach the plastic end of the inside cable to the inside door handle.



Attach the clevis using a ¼" flange head screw and locknut along with a $^{7}/_{16}$" wrench and $^{3}/_{32}$" Hex key. Tighten the locknut so that the clevis can still rotate freely but there is not a lot of slop, this will bend the clevis slightly.

Install the cable ball end into the outer most clevis. Test the door handle. Adjustment can be made on the cable sheath threaded end if the latch lever does not return to its position or the latch does not unlock. Repeat for the opposite side using the left-hand wound spring (34147).

Headlights

Headlight components

¾" wrench, drill, $^{3}/_{8}$", ½" drill bit, drill, marker saw, tin snips, pliers.

With Fenders

If not running engine side covers and fenders skip this section.

Position the headlight bucket left to right on the front fender so that the bucket is about 2.75” away from the cowl.

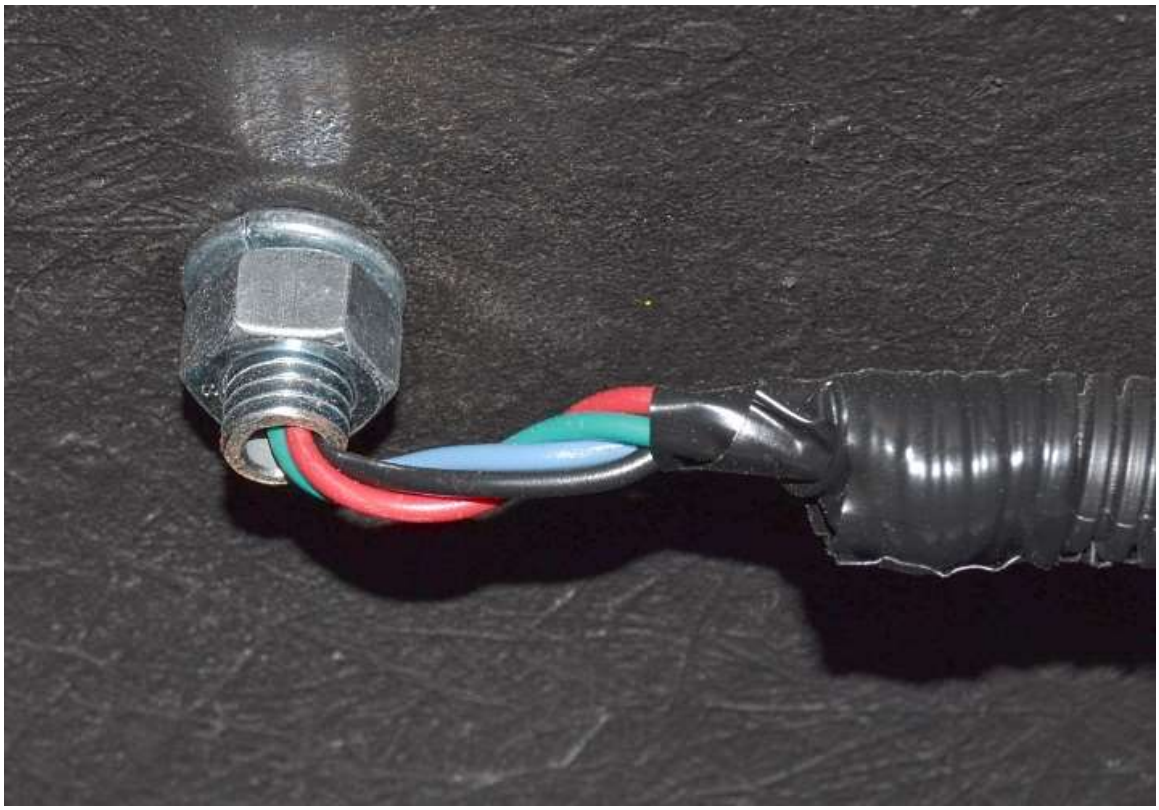
Front to back the front of the trim ring is even with the edge of the grill and the back is even with the back of the cowl.

Use a marker and tape to mark the position of the bucket stud.

Use a ¼” drill bit then open it up to ½” for the mounting stud.
Remove the trim ring from the bucket.
Test fit the bucket by fastening it to the fender with the nut.

Hold the headlight up to the mounted bucket so that the center bar is horizontal and the bulb is the correct way up so the writing on the bulb is at the top.

Use a marker to mark the side of the bucket if the locating bulges on the side of the bulb do not line up with the notches in the bucket.



On the underside of the fender, mark the stud two or three threads past the end of the nut.

Remove the bucket from the fender and the stud from the bucket.

Cut the stud on the mark made to ensure that the tire does not hit the stud. Use a file on the outside to take the sharp edge off and a 3/8" drill bit to chamfer the inside so that the wires do not get cut.

Use tin snips to cut the marked areas on the front face of the bucket for the bulb.

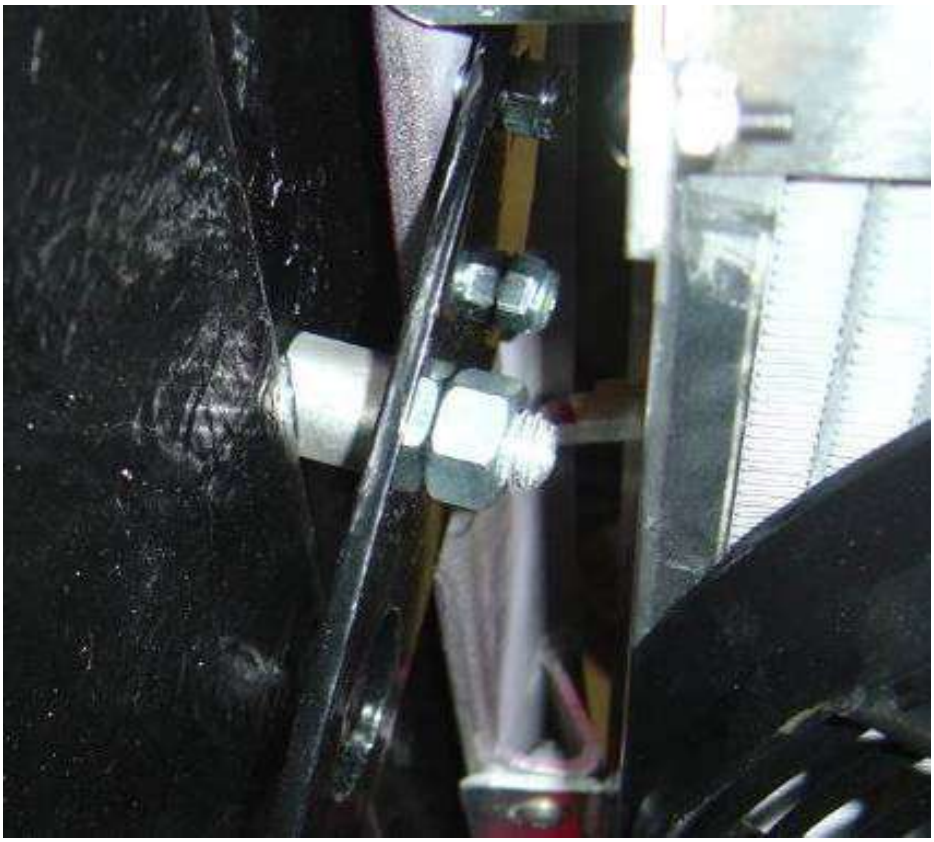
Use pliers to metal fatigue the small rectangle and remove them.

Test fit the bulb and then check the fit of the locking ring, it may be necessary to cut some off the ends so that the ring holds the bulb tight.

Check the fit/look of the lights and buckets on the body.

No fenders

Use the ½” hole in the grill mount as a guide to drill through the engine side cover.



Hold the supplied spacer between the engine side cover and the grill mount.

Pass the wires though the side cover, spacer and grill mount into the engine bay.

Fasten the headlight in place with the nut supplied with the headlights.

Rollbar

- 3/16", 5/16", ½" drill bits, 1" or 1.5" hole saw, drill, marker, measuring tape
- Rollbar fasteners, rollbar, rear cockpit cover
- The rollbar has been designed so that it will fit both inside the hardtop and can be used with the car as a Roadster.

Hardtop Rollbar Installation

- When the rollbar is sitting down on the frame there is 2"-3" clearance between the top of the rollbar and the Hardtop. It is possible to have more than one height mounting location for the rollbar if you plan to change back and forth between the Hardtop and the Roadster so that the rollbar is high and close to the Hardtop and then lower when used in the roadster configuration so it does not look strange with a high rollbar.

Slide the roll bar down into the frame mounts.

Place the Hardtop on the body and attach it using a couple of the rear mount points.

Raise the rollbar to the desired location but no closer than ½” or a finger width to the Hardtop so that there is no rubbing or contact with the top.

Measure from the bottom of the rollbar to the top of the 1.50” square tube.

Remove the hard top.

Remove the rollbar.

Measure and mark 1” down from the top of the frame mount.

Measure from the rollbar mark down to the lower rear cockpit cover mark on the aluminum.

Install the rear cockpit cover.

Measure up and mark the rear cockpit cover in the corners under the rollbar holes the distance just measured.

- The rear cockpit cover should now be marked 1” below the top of the rollbar frame mount.

Looking down from above so that you can see the rollbar mount, use a $^{3}/_{16}$” drill bit at the height marked to drill through the fiberglass and mark the side of the rollbar mounts.

Remove the rear cockpit cover.

Install the rollbar to the height desired.

Clamp the rollbar so that it cannot slide down into the mount tube.

Drill all the way through both the mount tube and rollbar using a $^{3}/_{16}$” bit first followed by a $^{5}/_{16}$” and then ½” bit at the point marked by the $^{3}/_{16}$” bit earlier.

Insert one of the supplied quick release pins through the mount hole, make sure it can go in and out smoothly and that the ball in the end of the pin goes completely through the mount tube.

Drill the other rollbar leg the same way and test fit the mounting pin.

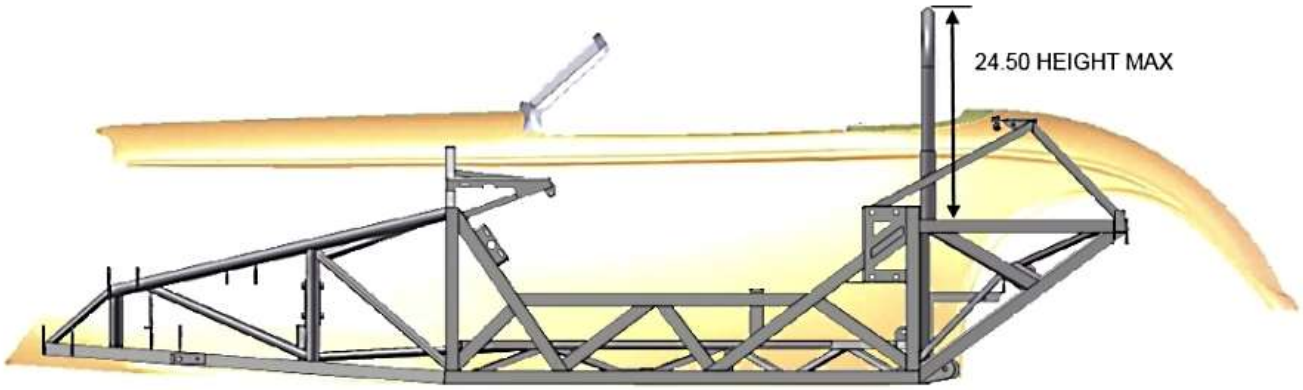
Remove the rollbar.

- The quick release pins can be used as is but a large 1.50” hole must be drilled in the rear cockpit cover for the ring or, squeeze the pin ring in a vise and a smaller 1” hole can be made. The hole is behind the seat and cannot be seen.

Drill the rear cockpit cover with the hole saw size appropriate for the way the quick release pins will be run.

Install the rear cockpit cover and test fit the release pin. If necessary open the hole up slightly.

Roadster Rollbar Installation



- If installing a soft top, the maximum height to the top of the rollbar is 24.50”
- If you plan to change back and forth between the Hardtop and the Roadster so that the rollbar is high and close to the Hardtop and then lower when used in the roadster configuration so it does not look strange with a high rollbar, two different holes must be drilled in the rollbar frame mounts.

Slide the roll bar down into the frame mounts.

Set a seat in the driver side of the car.

Set the rollbar to the desired height with relation to the windshield and driver height. You can cut the rollbar if desired but, it is recommended that the rollbar is mounted so that it is at least 1” higher than the top of the drivers head.

Remove the seat.

Measure and mark 1” down from the top of the frame mount.
Measure from the rollbar mark down to the lower rear cockpit cover mark on the aluminum.

Install the rear cockpit cover.

Measure up and mark the rear cockpit cover in the corners under the rollbar holes the distance just measured.

- The rear cockpit cover should now be marked 1” below the top of the rollbar frame mount.

Looking down from above so that you can see the rollbar mount, use a 3/16” drill bit at the height marked to drill through the fiberglass and mark the side of the rollbar mounts.
Remove the rear cockpit cover.
Install the rollbar to the height desired.
Clamp the rollbar so that it cannot slide down into the mount tube.
Drill all the way through both the mount tube and rollbar using a 3/16” bit first followed by a 5/16” and then ½” bit at the point marked by the 3/16” bit earlier.
Insert one of the supplied quick release pins through the mount hole, make sure it can go in and out smoothly and that the ball in the end of the pin goes completely through the mount tube.
Drill the other rollbar leg the same way and test fit the mounting pin.
Remove the rollbar.

- The quick release pins can be used as is but a large 1.50” hole must be drilled in the rear cockpit cover for the ring or, squeeze the pin ring in a vise and a smaller 1” hole can be made. The hole is behind the seat and cannot be seen.

Drill the rear cockpit cover with the hole saw size appropriate for the way the quick release pins will be run.

Install the rear cockpit cover and test fit the release pin. If necessary open the hole up slightly.

Final Prep

- Sand paper
- If using fenders, now is a good time to fit and prep them. Make sure the car is aligned before cutting if doing bike fenders.

All of the exterior body accessories, headlights, windshield and exhaust must be mounted to the car to obtain the correct body location in order to create the correct gaps and opening sizes on the car before it is painted.

One of the most important details in the bodywork is the finish on all the edges and openings. All of the following edges are visible on the finished car and need to be evened out and have a small radius sanded in for a good-looking finish.

- Doors
- Hood
- Trunk
- Exhaust
- Roll Bar cut outs
- Door openings
- Cockpit edges

The side body edges are not as visible but just taking a little time here to get the lines straight and a small radius makes a much nicer finish.

Mark the trunk and door hinges before removing the last time so that you can bolt them back together in the same position that they came off. They may still need minor adjusting during final body installation but this will get you much closer.

Body Painting

- Remove all trim, doors, windshield etc. before beginning body work

- The primer gel coat sands easily, and is a forgiving material to work with.
- The body comes out of the mold with a wax release compound and a thorough cleaning with a wax remover is the best way to begin this job.
- A lot of time and energy was spent on the mold so that the body work can be kept to a minimum.
- Allow the bodywork or repairs performed to sit for several days outside in the sun or at elevated temperatures to allow the repair materials to cure before final paint.

We like to blacken out the rear part of the body which is where the taillights are mounted to, this area can be seen.

While the body is being painted there are parts that can be assembled.

Final body and finish assembly

Pre-Body Mounting Steps

Trunk Aluminum

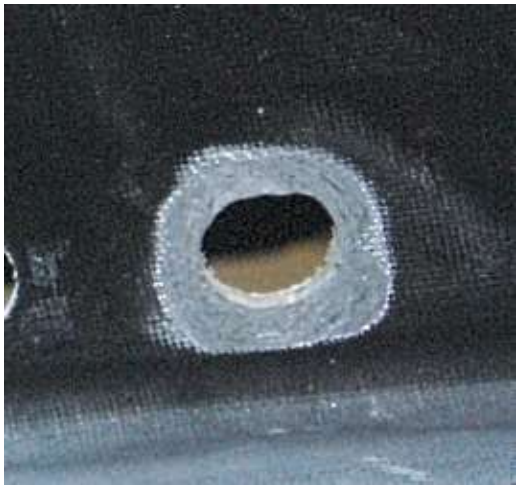
Check all of the fuel line fittings on and near the fuel tank to make sure they are tight.
Install the front wall of the trunk.

Dash/gauges

Pliers, wire cutters, wire crimpers
Gauge assembly, dash harness

Install the gauges and toggle switches in the dash.

- Do not install the headlight or ignition switches yet as these are easier to just leave attached to the chassis harness and install them after the body is mounted.

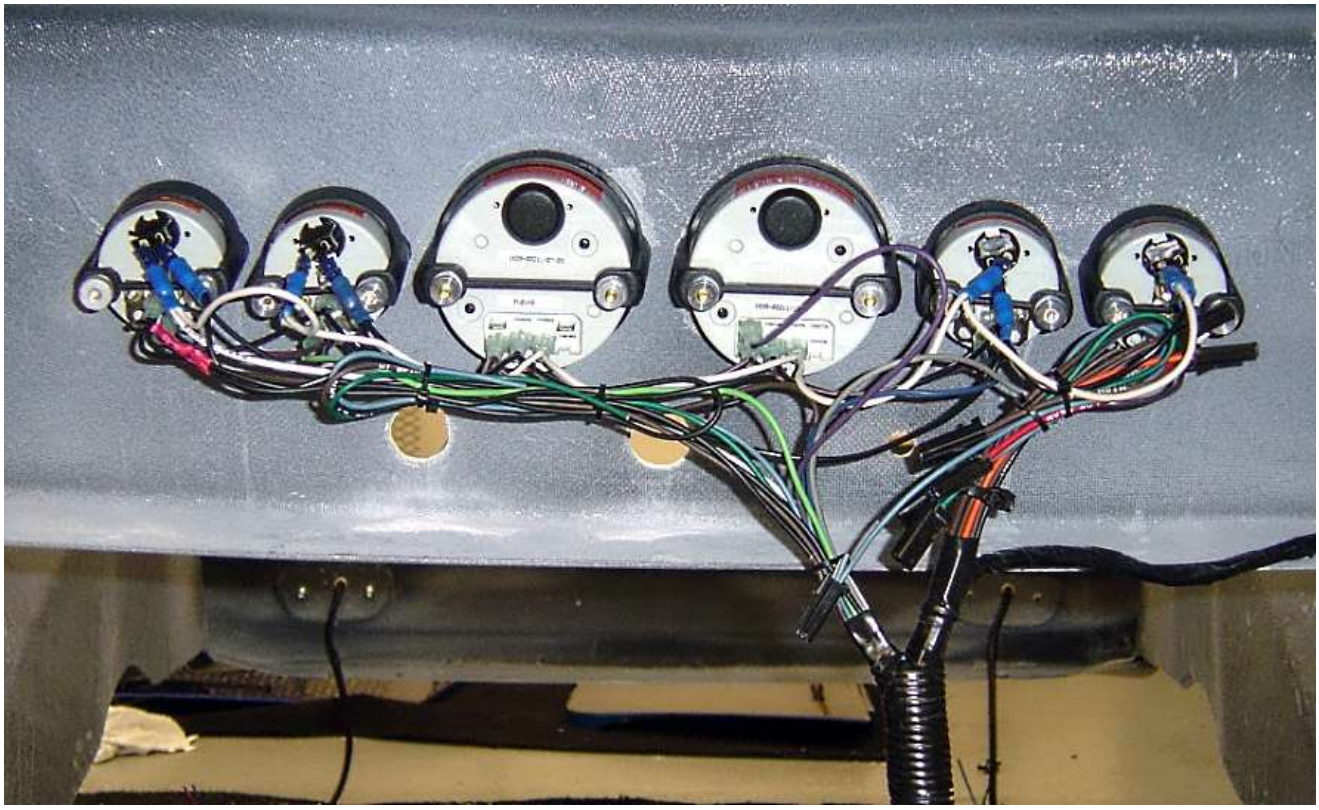


If the dash area where the ignition or headlight switches will mount is over ⅛" thick, sand the back of the dash area to ⅛" so there is enough thread engagement for the switch bezels.

Wiring

Use a pair of pliers to turn the bulbs in the gauges so that they are fully seated and will not pop out.

If not already done, in the dash harness, cut the rear turn signal light wires off the back of the connectors that are for the dash turn signal switch so that the turn signal lights do not send the brake light signal to the front lights.



Wire the gauges in the dash using the chassis harness dash harness. Use the connection instructions provided with the gauges.

Attach the gauge light power wire to one of the small gauges and connect the remaining small gauges in series using the small jumper wires included.

Attach the gauge ground wire to one of the small gauges and connect the remaining small gauges in series using the small jumper wires included.

Attach the gauge power wire to one of the small gauges and connect the remaining small gauges in series using the small jumper wires included.

Decide where you want to place your LED indicators.

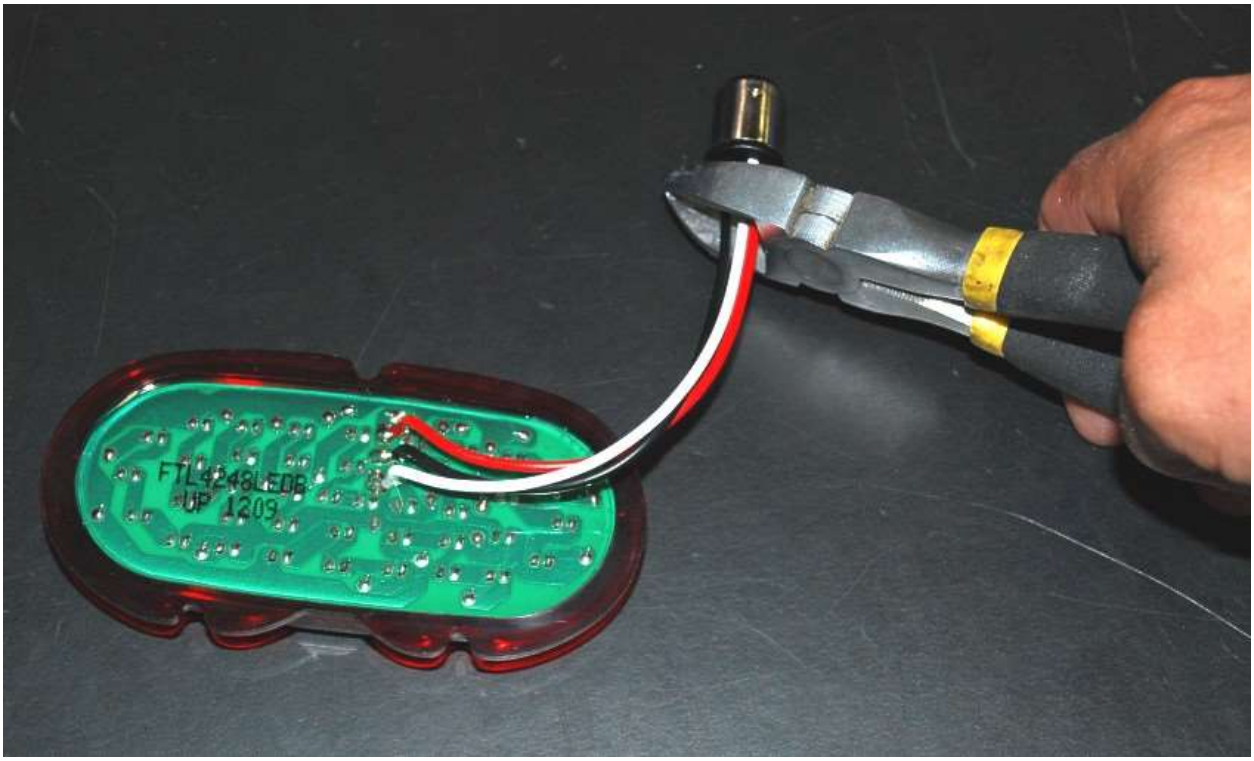
Drill the body using a $^{5}/_{32}$" or #20 drill bit to mount these in place.

Install the LED indicators into the body.

A/C DEFROSTER DUCTS

- If installing A/C, now is a good time to install the defroster vents

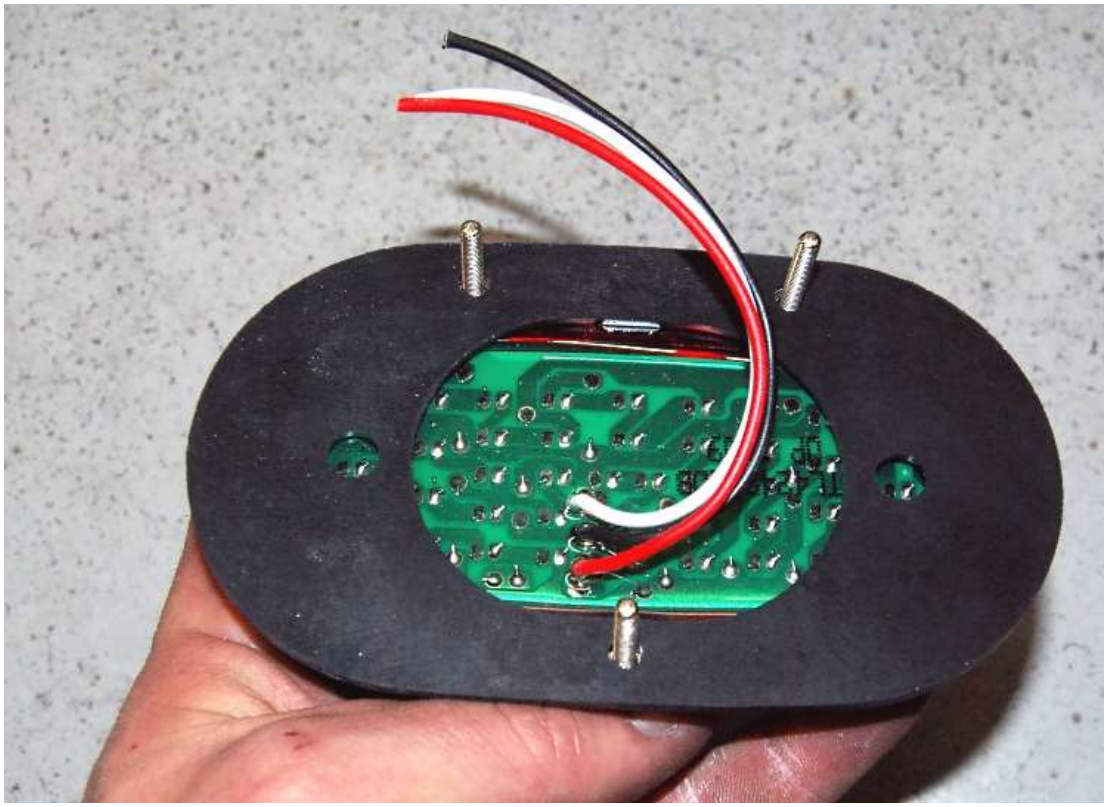
TAIL LIGHTS



Cut the original plugs off both taillights.

Remove the nuts and lock washers from the bezel studs.

Put the light in the bezel.



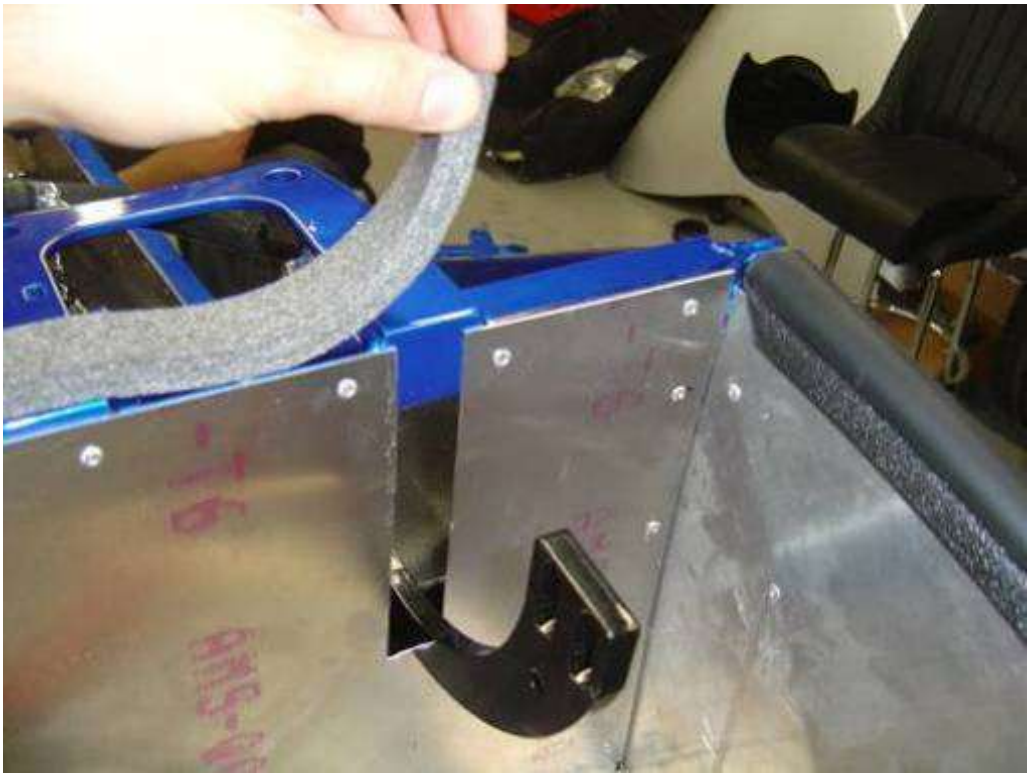
Put the gasket on the back of the light.

Insert the light wires through the body hole and insert the studs through the mounting holes.

Fasten the light to the body using the lock washers and nuts.

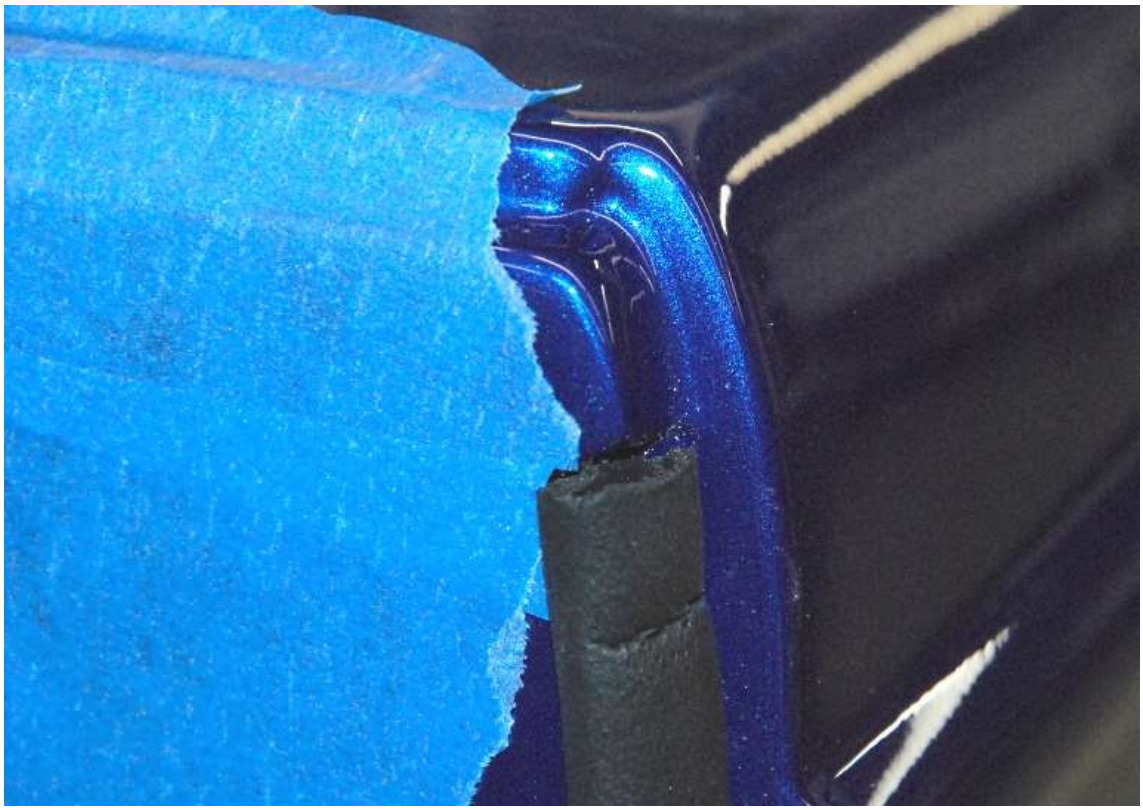
Extend the length of these wires by approximately a foot (wire included with kit) to allow the plug to pass through to the outside of the trunk. The color coding for the lights is: White (Ground), Black (Running light), Red (Stop/Turn signal).

Weather-stripping



Install a strip of the expanding weatherstrip (FFR# 13712) on the upper tank 1”x 1” frame rail at which is located at the front of the trunk opening.

Run the ½ moon weatherstrip around the door openings starting at the front.



Finish the ½ moon weatherstrip just below the top sill.

Push the aluminum weatherstrip onto the trunk sides.

Final Body Install

- Once the body comes back from paint, we recommend you to tape the panel openings with masking tape to prevent scratches.

We like to blacken out the rear part of the body which is where the taillights are mounted to, this area can be seen.

It is helpful to have a friend or two when mounting the painted body. One person on each side pulling out slightly and one in the rear is the easiest way to do this. Make sure that the exhaust tips are not installed as it protrudes though the body. You can leave the door hinge standoffs on the frame just be very careful with the body when pulling it out to go over them one at a time.

If running A/C, make sure that the hoses do not get crushed when putting the body on.

Slide one of the $^{5}/_{16}$" washers onto the button head bolts and run the $^{5}/_{16}$" bolt through the body.

Place the spacer on the bolt and screw the button head bolt into the cage nut using a 3/16" hex key.
Check the cockpit 45.50" measurement again; Raise or lower the body if necessary then tighten the button head screw.

Firewall

Clamp the dash area to the firewall.

Attach the aluminum firewall and footboxes to the body using either $^{3}/_{16}$" rivets or screws.

Drill and rivet the sides of the body to the frame using the screws used before paint as a guide for locating.

Rear body

Drill mount holes in the sides of the body under the doors into the 1.5” square tube. Mount the body to the chassis with $^{3}/_{16}$" rivets.

Optional Hood

Mount a few rubber bumpers on cowl. Use the small and large bumpers included with the kit to set the height of the panel so that they are flush with the body. If necessary, cut the large bumpers to the correct height if the small ones are too small.

Trunk Aluminum

🛠 Tin snips, ⅛" drill bit, drill, rivet tool, silicone
🚘 Secondary body fasteners, trunk aluminum.

Push the bulb weatherstrip with the bulb on the side around the trunk opening starting at the bottom center.

Install the lower trunk floor.

On the rear edge of the lower trunk where it meets the body, attach the trunk floor to the body with $^{3}/_{16}$" rivets. Apply a liberal amount of silicon between this panel and the body.

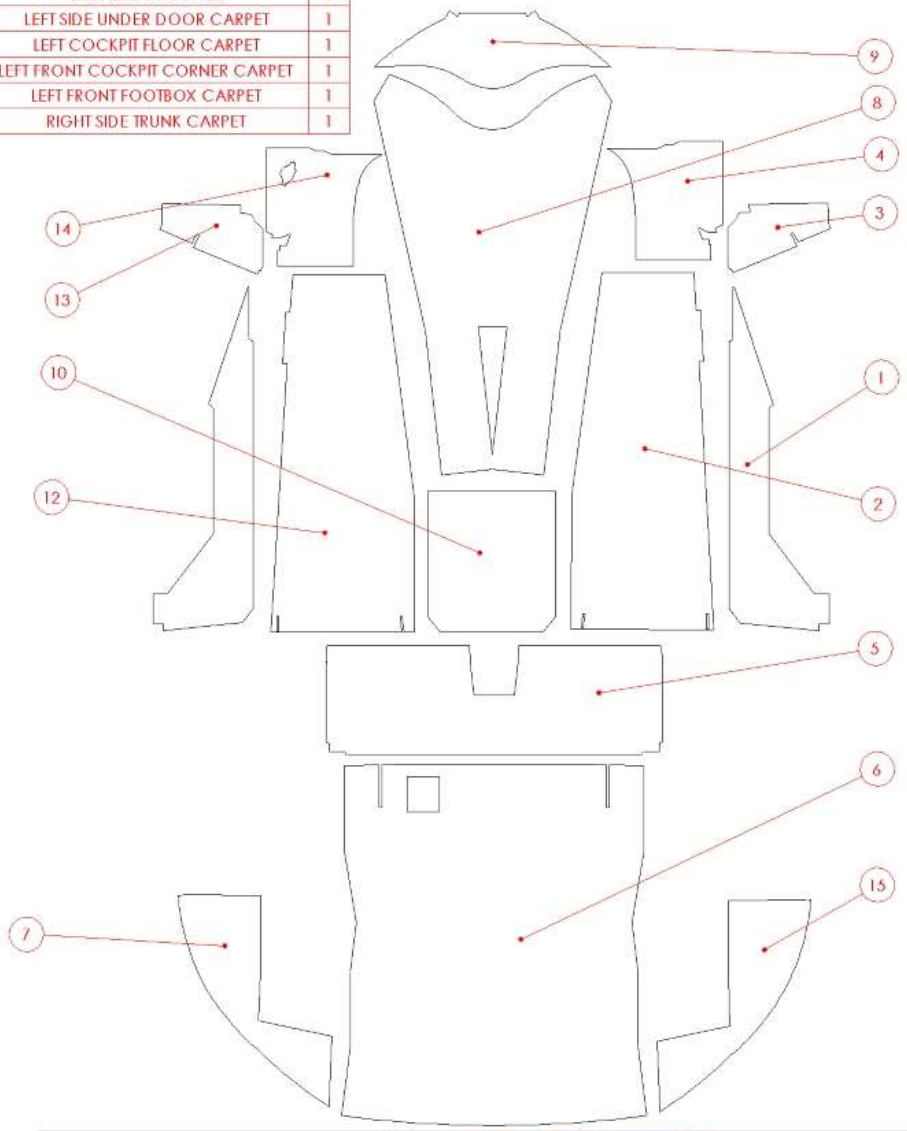
Optional Insulation

If installing the optional sound and heat insulation, now is a good time to do this.

Carpet

- Razor knife, spray adhesive (we recommend using 3M® Super 77 or Super 90 spray adhesive)
- Carpet
- Test fit the carpet before gluing.
- Clean the surface of aluminum where the carpet will be installed so there are no aluminum shavings or other material or liquid on it.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	34886	RIGHT SIDE UNDER DOOR CARPET	1
2	34888	RIGHT SIDE COCKPIT FLOOR CARPET	1
3	34893	RIGHT FRONT COCKPIT CORNER CARPET	1
4	34891	RIGHT FRONT FOOTBOX CARPET	1
5	34892	COCKPIT REAR WALL CARPET	1
6	34059	TRUNK FLOOR CARPET	1
7	34060	LEFT SIDE TRUNK CARPET	1
8	33929	REAR TRANS TUNNEL COVER CARPET	1
9	33930	FRONT TRANS COVER CARPET	1
10	34895	DRIVESHAFT COVER	1
11	34885	LEFT SIDE UNDER DOOR CARPET	1
12	34887	LEFT COCKPIT FLOOR CARPET	1
13	34889	LEFT FRONT COCKPIT CORNER CARPET	1
14	34890	LEFT FRONT FOOTBOX CARPET	1
15	34061	RIGHT SIDE TRUNK CARPET	1



MATERIAL
FINISH
USED ON
APPLICATION
PRINTED 12/13/2018

Factory Five Racing, Inc.
DRAWN NAME DATE
COMMENTS:
HOT ROD CARPET
SIZE A DWG. NO. 34894 REV.
SCALE:1:20 WEIGHT: SHEET 2 OF 2

Start with the Front transmission tunnel cover. If you cannot get it to sit on the curve correctly, cut the piece if necessary.

Next do the rear transmission tunnel cover. You may need to cut a hole for the shifter depending on the transmission used. Glue the center of the carpet first. Then, work your way around to the base of the tunnel in a few steps gluing a few inches at a time.

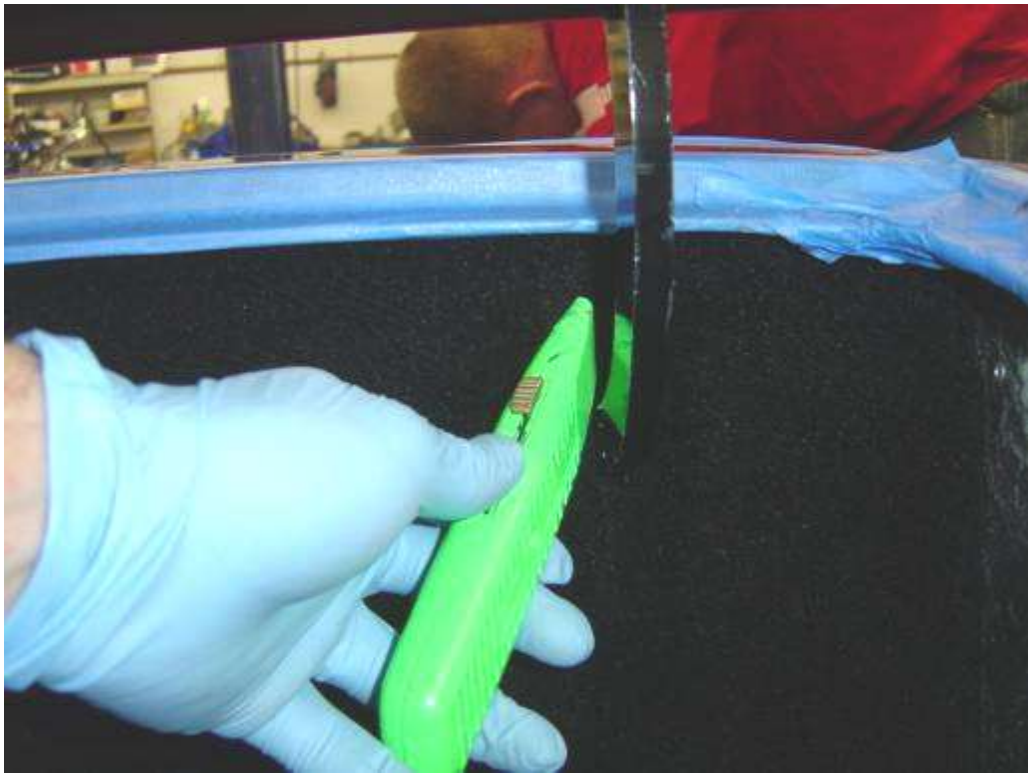
Install the rear cockpit wall carpet.

Install the front footbox wall carpet next. This piece wraps around the down tube at the front of the panel. Cut any holes made for mounting the accelerator pedal so they are easy to find. The pedal will cover the holes.

Install the under-door carpet.

Install the floors last. Cut holes where the seat mounting bolt holes are make install easier later. The seats will cover them so it is ok to go larger.

Carpet the trunk. Start with the center section of the trunk. You will also have to slice a little section out for the prop rod stud and the trunk latch bracket mount.



The best thing to do for the spot where the hinges pass through the front vertical wall is to simply slice the carpet with a razor knife. Then push the carpet back to allow the hinges to pass through them.

Shifter, boot and trim ring

- 🛠 Philips head screwdriver, ⅛” drill bit, drill, razor knife
- 🚘 Shifter boot components

Once the carpet is installed install the shifter handle, boot and trim ring. We suggest you bend and form the trim ring to the contour of the tunnel.

E-brake boot

Push the emergency brake boot over the handle.

Look at the boot and floor and decide where to bend the wire in the boot so that it will sit flat.

- Drill and mount one screw at a time

Hold the cover in place and drill a $^{3}/_{32}$" hole through the cover near the ring that is captured in the boot and the cockpit aluminum.

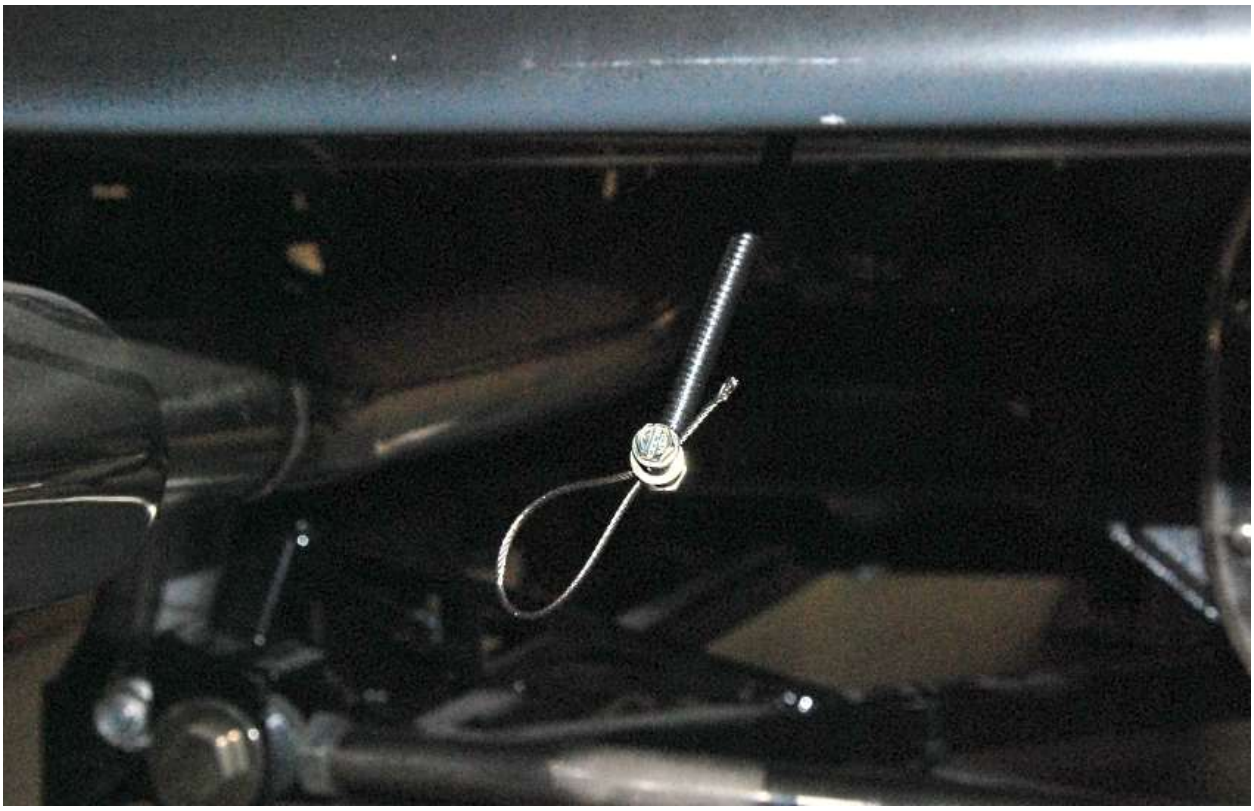
Attach the boot to the cockpit aluminum using the screws provided.

Repeat the drill and screw procedure around the boot so that the boot will seal against the floor.

Trunk Latch cable

🛠 $^{3}/_{16}$" drill bit, drill, rivet tool

🚘 Insulated clip hardware, trunk latch assembly



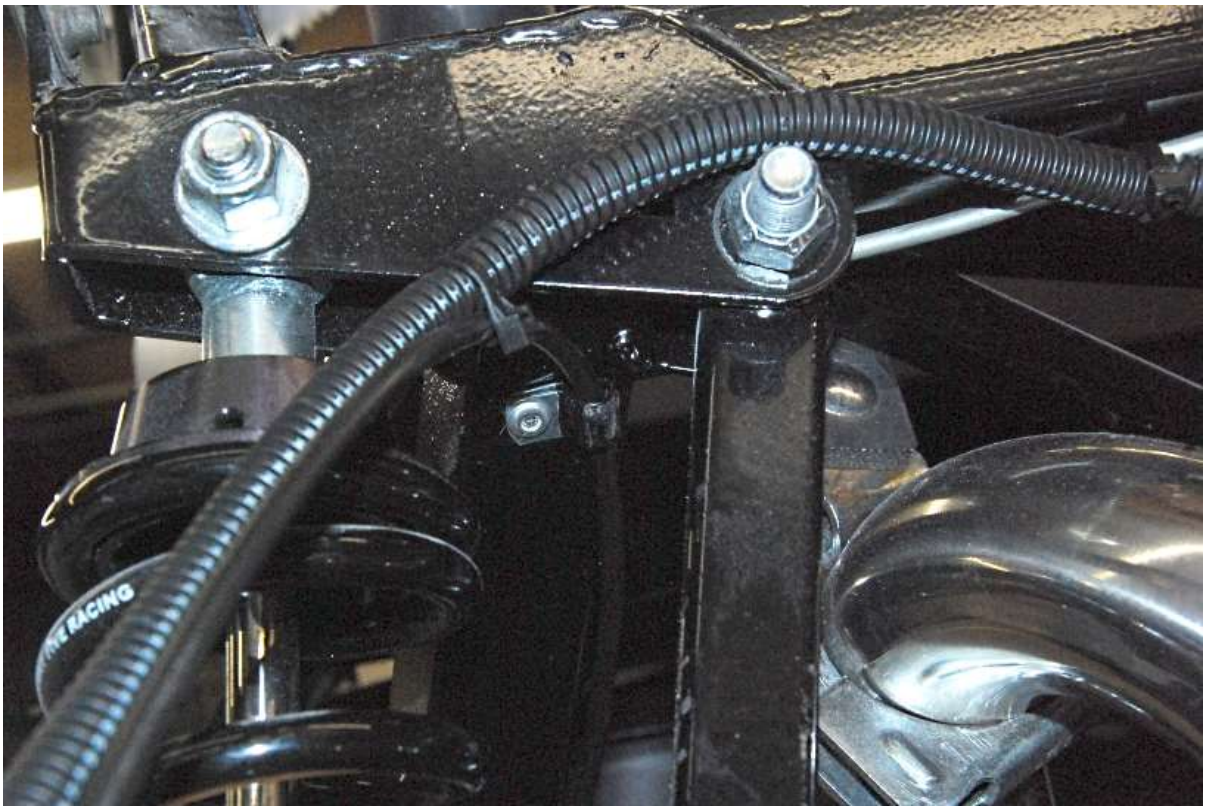
- There are a couple ways to connect the trunk latch cable. The instructions and kit provide a latch and cable to get mounted in the cockpit. An alternative would be to cut the cable and leave it directly under the trunk.

Drill an $^{11}/_{32}$" hole in the left side of the trunk to run the trunk release cable through.

Push the included grommet onto the trunk latch release cable so that it is oriented as shown in the picture above.

Spray some WD40™ on the cable and slide the grommet so that it is about two feet from the other end of the cable.

- The following pictures show the body off the frame, this is done for easier viewing.



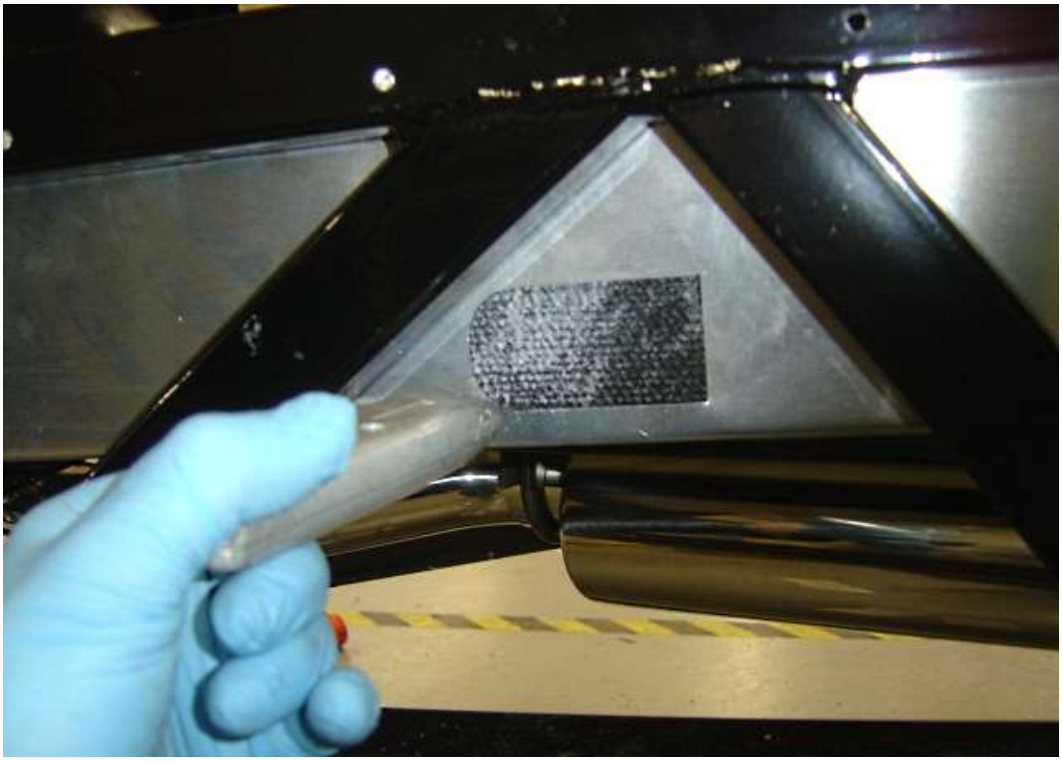
Run the release cable up behind the shock then down the 1.5” square tube.

- Do not fasten the cable to the frame until after the cable is connected at both ends.

Run the cable forward along the 1.5” square tube to where the handle will attach

Trunk release handle

🛠 Philips head screwdriver, ⅛” drill bit, drill, razor knife
✋ If not installing a trunk release handle, skip this section.



Using a razor knife, cut the trunk release hole on the driver's side of the car.

Pull the trunk release cable through the hole and attach it to the handle.

Push the handle into the opening.
Use the handle as a guide to drill ⅛” mounting holes through the aluminum.

Attach the handle to the aluminum using a Philips head screwdriver and oval head screws.

Attach the release cable to the frame using the small insulated line clips and $^{3}/_{16}$" rivets.

Trunk Latch

🛠 $^{3}/_{16}$" drill bit, drill, rivet tool
🚘 Insulated clip hardware, trunk latch assembly

Attach the release cable to the trunk latch assembly.

Remount the trunk latch assembly in the trunk using $^{3}/_{16}$" rivets.

Prop Rod

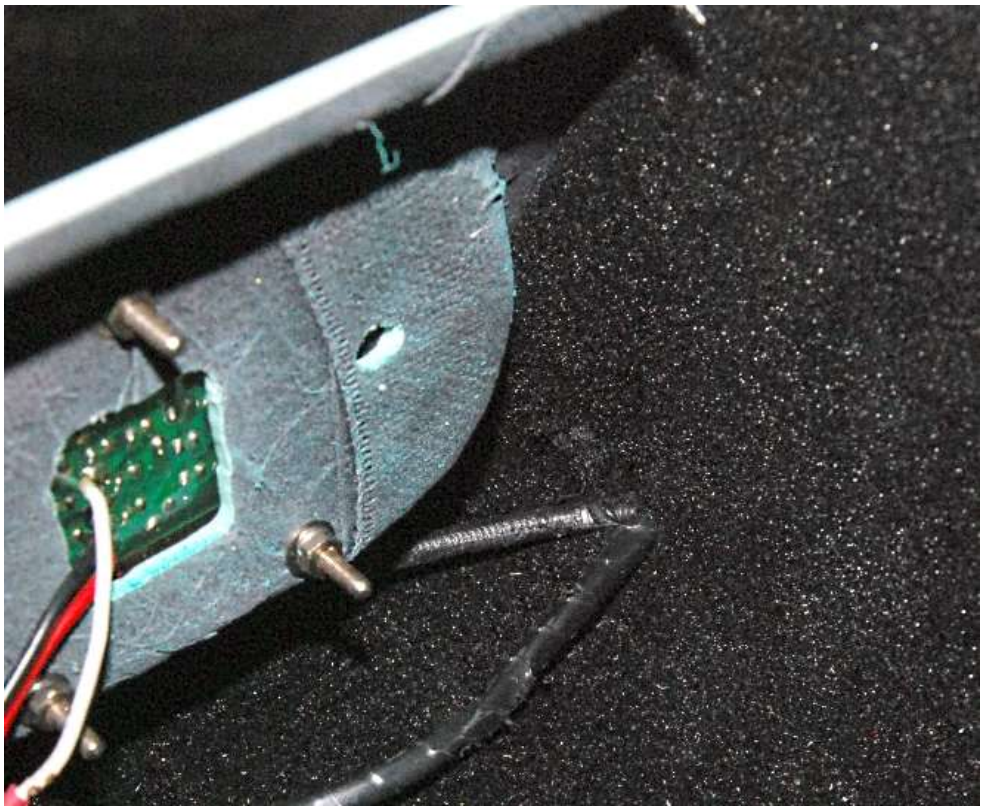
Reattach the trunk prop rod mount to the trunk aluminum using either $^{3}/_{16}$" rivets or the aluminum screws.

Remount the prop rod clip to the trunk aluminum. You can space the clip out from the carpet using a small rubber bumper behind the clip to give more clearance if desired.

Tail lights

🛠 Wire strippers, wire crimpers, electrical tape, drill, $^{11}/_{32}$" drill bit

🚘 Electrical system components, 33 tail light components.



Drill an $^{11}/_{32}$" hole in the left side of the trunk to pass the harness wires into the trunk.

Install a grommet in the aluminum hole.
Pull the wire loom back on the wires.
Note which wires the license plate wires are connected to.
Push the tail light wires through the grommet into the trunk so they will reach the light.
Strip the ends of the tail light wires and the harness wires.

- The lights **DO NOT** get wired to the Brake light purple wire

Function	Harness wire color	Tail light wire color
Ground	Black	White
Turn/brake	Turn signal wires	Red
Parking light	Tan	Black

Wire the tail lights to the harness using either butt connectors or solder.
Cut the wire loom outside the trunk so that the loom ends at the grommet.
Put the wire loom on the wires in the trunk.
Drill an $^{11}/_{32}$" hole in the right-side trunk wall.
Install a grommet in the aluminum hole.
Pull the wire loom back on the wires.
Note which wires the license plate wires are connected to.
Cut the connector off the tail light wires which will also cut the license plate wires.
Push the tail light wires through the grommet into the trunk so they will reach the light.

Strip the ends of the tail light wires and the harness wires.
Twist the license plate wires back onto the correct harness wires.
Wire the tail lights to the harness using either butt connectors or solder.
Cut the wire loom outside the trunk so that the loom ends at the grommet.

Put the wire loom on the wires in the trunk.

Doors

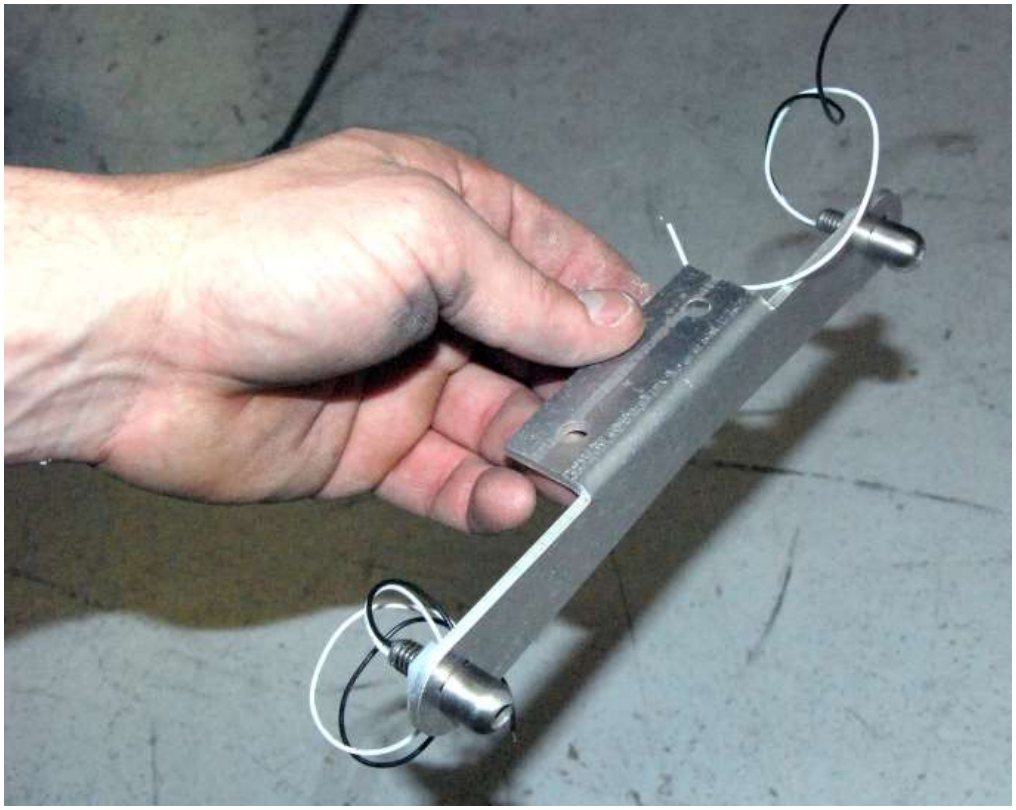
Reattach the doors to the door hinges.

Trunk

Reattach the trunk to the trunk hinges.

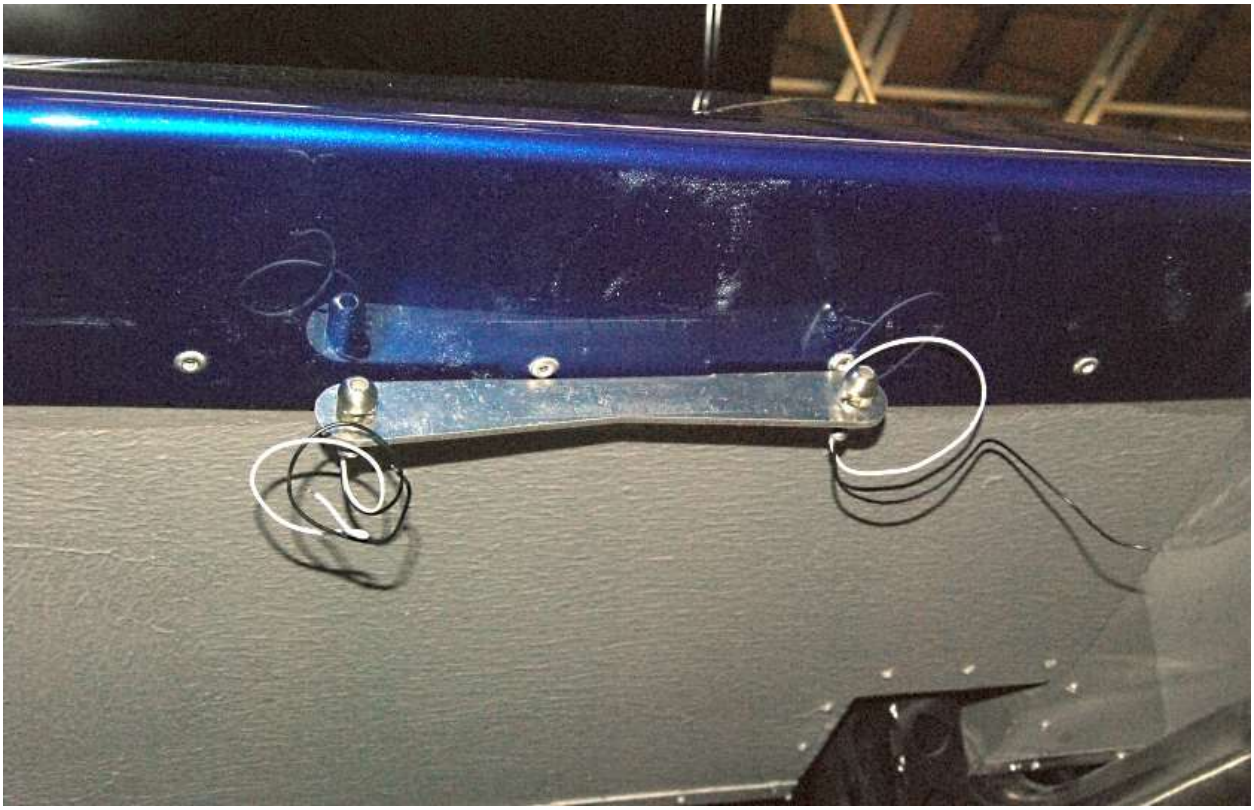
License plate bracket

🛠 Wire strippers, wire crimpers, electrical tape, drill, 3/16" drill bit, rivet tool, measuring tape, marker
License plate mounting components, secondary body fasteners.
The license plate lights are also the mounting bolts for the license plate, they cannot get wired until after a plate is mounted.



Put the license plate lights in the license plate bracket.

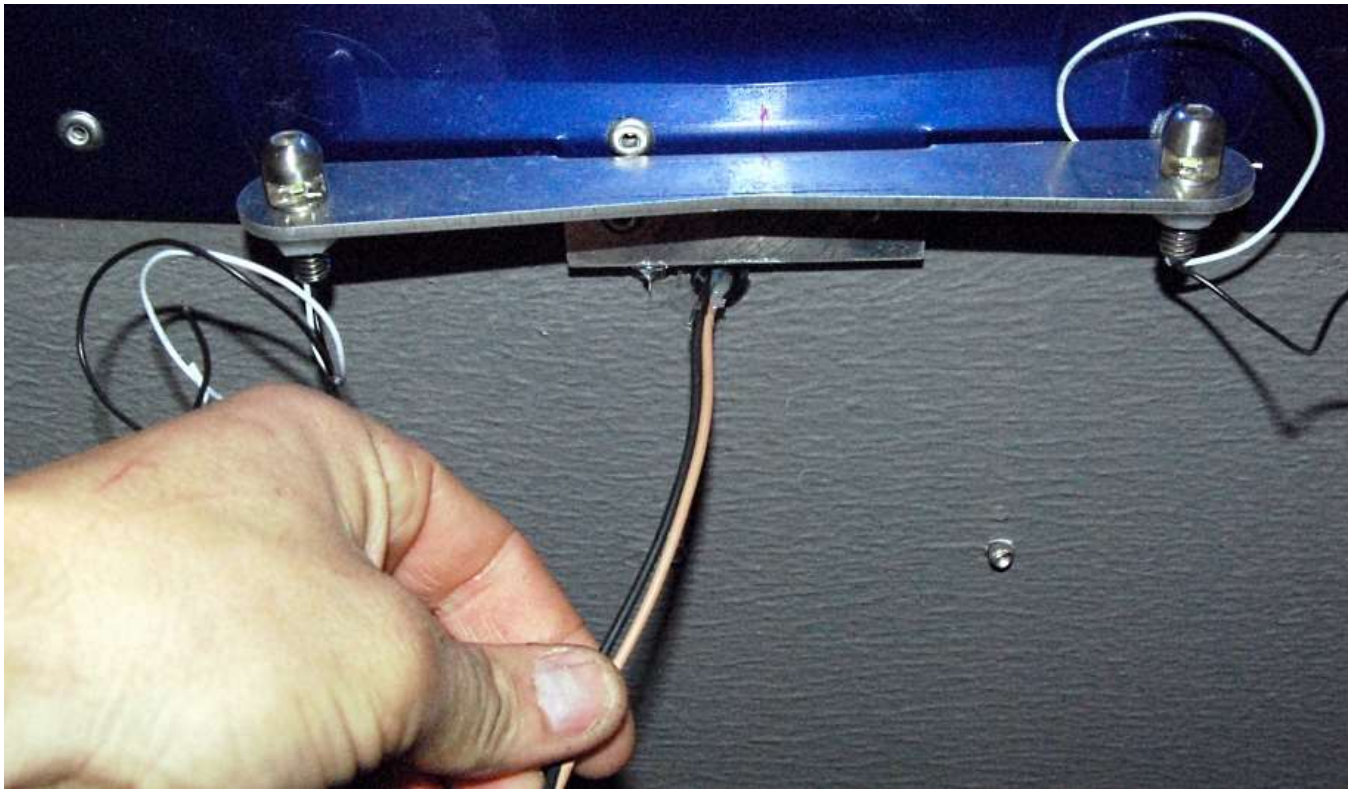
Mark the bottom center of the license plate bracket.
Under the car, use a measuring tape to locate the center of the trunk and mark the bottom of the trunk aluminum near where the body ends.
Center the bracket on the trunk, align it with the rear edge of the body and mark the mounting holes.
Drill one of the mounting holes using a 3/16" drill bit.



Attach the bracket with one $^{3}/_{16}$" rivet first then drill and attach the second rivet.

Drill a $^{11}/_{32}$" hole for the license plate wires behind the license plate bracket.
Install a grommet in the hole.

In the trunk, run the license plate wires over to the center of the trunk and push the wires through the grommet.



Pull the wires through the grommet so that the wires are tight in the trunk.

Cut the harness wires so they are about 6” long.

After the license plate is installed connect the white wires together and the black wires together.

Connect the white wires to the brown wire and black wires to black wire.

Test the lights and rotate them as desired.

Put wire loom over the wires.

Put silicone on the wires/grommet where they go through the trunk to seal the hole and hold the wires.

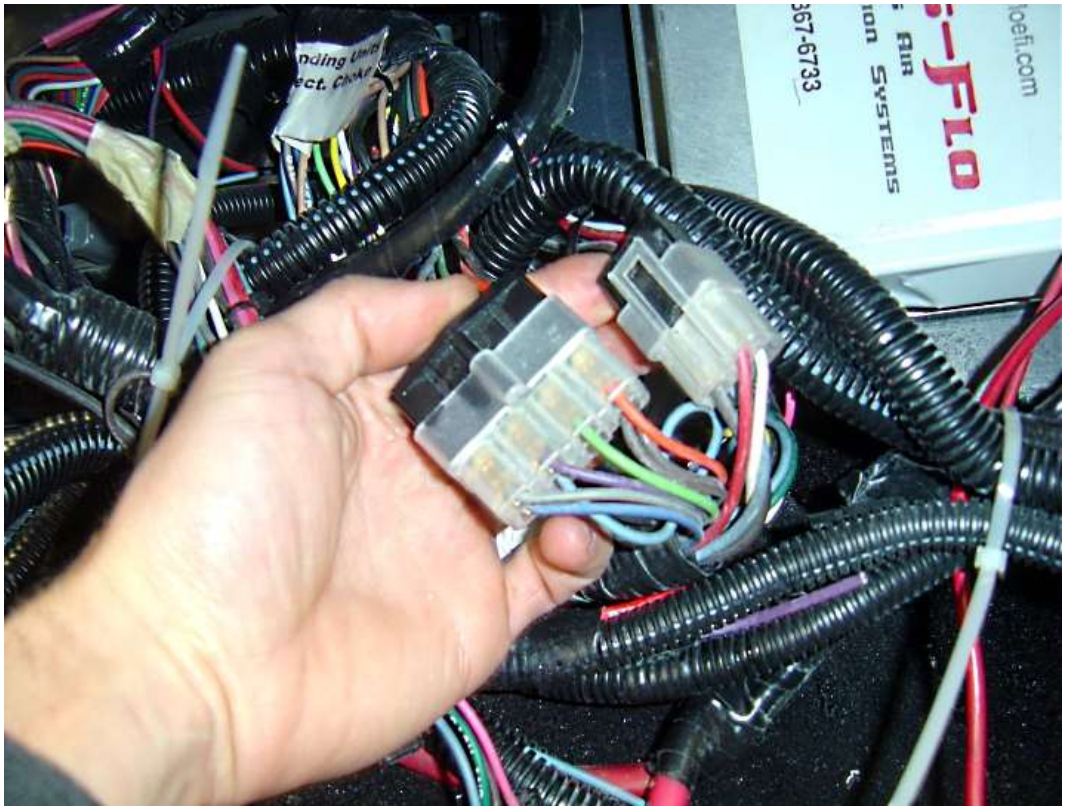
- Silicone the grommets/wires for the tail lights at this time as well.

Final Dash Wiring and Assembly

- Make sure the headlight and ignition switches are wired before mounting.

Install the headlight switch in the dash from the backside of the dash, thread the mounting nut into the housing itself to secure it in place. Place the knob over the switch shaft and then tighten the setscrew locking it in place.

Install the ignition switch in the dash from the backside. Secure it in place with the threaded ring from the front. It may be helpful to sand the backside of the body if the front threaded ring is not engaging far enough onto the ignition switch itself.



Connect the dash plugs to the main section of the wiring harness.

Screw the dash to the body using the

Inner Door Panels

- Marker, razor knife, cardboard,$^{7}/_{64}$”, ⅛”, ¼” $^{17}/_{64}$”, $^{5}/_{8}$” drill bits, drill, tin snips, Philips head screwdriver, masking tape
- Upholstered interior parts, door handle components

Left side door panel and arm rest.

Place the inner door panel on top of the door so that it sits on the door release lever.

Mark around the lever on the back of the door panel.

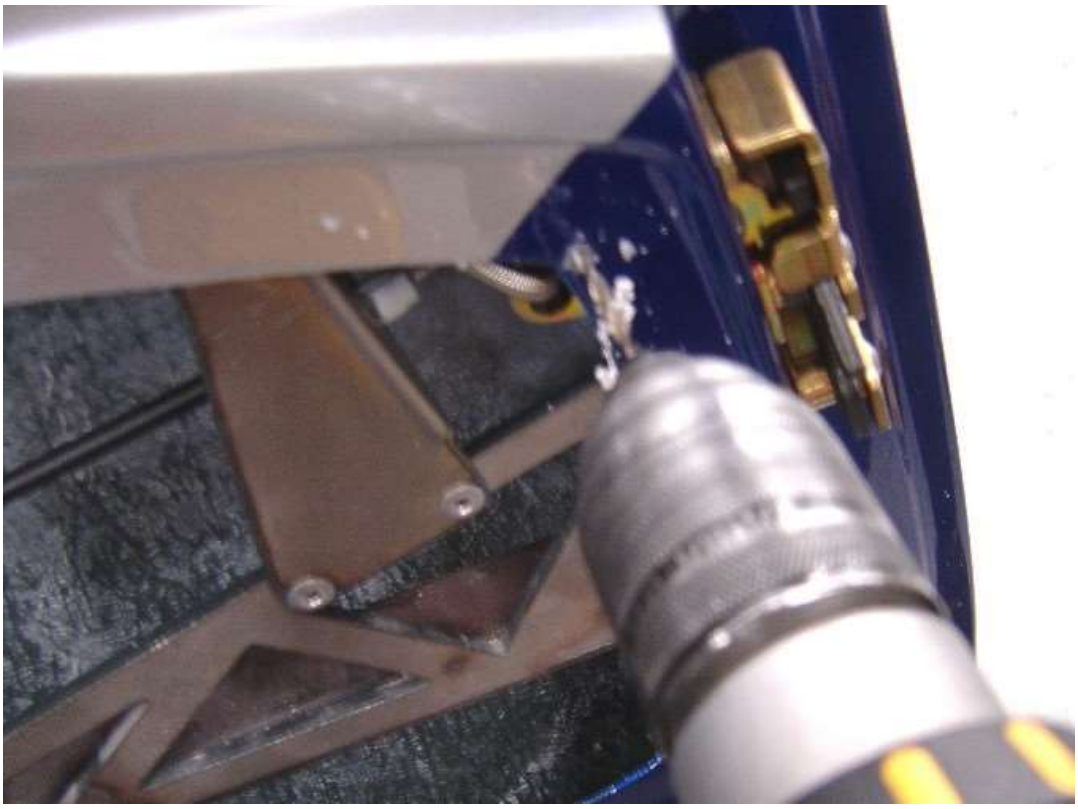
Pull the lever so that it is at the other extreme of its travel and mark the back of the panel again.

Use the trim piece included as a template and center the two locations marked in the ends of the template. Make sure it is pointed the correct way.

Mark around the inside of the trim piece.

Use a ¼” drill bit followed by a $^{5}/_{8}$” drill bit to drill the two circle locations.

✋ Do not go too big or the trim piece screws will not mount correctly.
Use tin snips to connect the drilled holes along the line marked.



Enlarge the holes using a $^{17}/_{64}$" drill bit.

Push the panel into the holes in the door.

Put the trim piece over the release lever and make sure that the lever is centered at one end then pull the lever making sure that the trim piece is centered at the other end as well.

Use the trim piece as a template and drill $^{7}/_{64}$" holes through the trim part.

Screw the trim piece onto the door liner.

Check the door release lever to make sure that it works correctly. Repeat this for the other side.

Center Armrest

- Marker, ⅛”, 17/64” drill bits, drill, masking tape
- Upholstered interior parts
- This is only used if using bucket seats.

Install the center armrest over the tunnel aluminum.

Cockpit rear cover

- Super 77 spray adhesive, razor knife, measuring tape, sand paper, masking tape.
- Carpet box – Vinyl roll, fiberglass rear cockpit cover
- The rear cockpit cover can be sent out for paint with the body or sent to get covered or covered using the vinyl included.

There is always more than one way to finish a part, below are some options.

The above picture shows a rear cockpit cover that has been sent out for covering. The sewn lines that are in the seat and the top trim cover were added to the vinyl.

The picture above shows the rear cockpit cover painted to match the body.

This is a picture showing the kit vinyl installed which is detailed below. Note the cut under the right side rollbar.

Vinyl installation

Sand the surface of the rear cover so that the glue will “bite”.

Center the vinyl on the rear cockpit cover left to right as well as up and down and tape the center.

- The vinyl is very elastic but the inside corners are still very hard to do without cutting the vinyl, the glue will pull away.

Rough cut the vinyl on the sides just past the rollbar holes. This will get trimmed after gluing. This will give you 3 pieces. The idea will be to do something similar to the sewn version above.

Flip the middle large vinyl piece over in the center and spray glue on the back of the vinyl and the fiberglass.

Work from the middle towards the top and bottom then towards the side, smoothing the vinyl out on the fiberglass. Trim the vinyl as you go so there is 1" of overhang that will go onto the back of the fiberglass panel.

- Do not trim the rollbar area yet.

Spray glue on the back of the side piece of vinyl.
Overlap the side piece on the rear vinyl and smooth the vinyl over the side of the fiberglass part.
Use a masking tape to get a straight in the corner going through the rollbar hole.
Cut through both vinyl pieces with a sharp razor knife along the straight edge of the masking tape.
Remove the scrap side piece then pull back the side piece to remove the scrap center piece.
Re-smooth the vinyl, if necessary, spay more glue to ensure that I will stick.

Turn the rear cockpit cover over.

Spray the back of the fiberglass, edge vinyl and rollbar hole areas with spray glue.

Cut the rollbar hole vinyl into pie pieces and roll them through the hole and stick them to the back side.

Fold the vinyl over the edges of the fiberglass and stick it to the back side of the fiberglass.

Install the rear cockpit panel in the frame and attach with black trim screws, rivets or preferred fastener.

Final Seat Installation

Reposition the seats in the cockpit.

Pull the seat buckle through the seat if using a bench.

Reattach the seat in the holes drilled before using the fasteners provided.

Rear cockpit trim panel

- Upholstered interior parts
- Only used when no top is attached

If building the car as a roadster, install the rear cockpit trim piece. The hardtop footprint is covered by this piece if you are going to run both. Attach this piece so you can remove it by using Velcro, silicon or anything of your choice.

Final Hardtop installation

Inside headliner flocking

- masking tape, towels or something soft to put the hardtop on.
- Hardtop flocking kit
- Do not place the hardtop upside down on a fresh paint or the fabric that you are placing it on may imprint into the paint.

With the help of a friend, turn the hardtop upside down and place it on towels or something to protect the paint.

Mask the areas off that you do not want flocking on.

Follow the directions with the Flock-it kit.

Final Install

Reattach the hardtop using the fasteners used during the first fitting.

Headlights

Wire cutters, soldering iron, wire strippers, ruler, electrical tape, ⅛" drill bit, drill, tin snips, file.

Headlight assembly, extra harness wires.

There are two ways to wire the center bar on the headlight. The center bar can be a white Daytime Running Light (DRL) and also the orange turn signal. The kit includes wire for the use of the turn signal function only.

Headlight connections

	Chassis harness	Headlight plug pigtail
Ground	Black	Black
High Beam	Brown	Red
Low Beam	Red	Green
Park	Tan	Red
Left Turn	Dark Green	Blue wire
Right Turn	Light Blue	Blue wire

Bulb extra wires	Function
Red	DRL – Daytime Running Light
Red + Green	Turn signal

Remove the headlight mounting nut, lock washer and base.

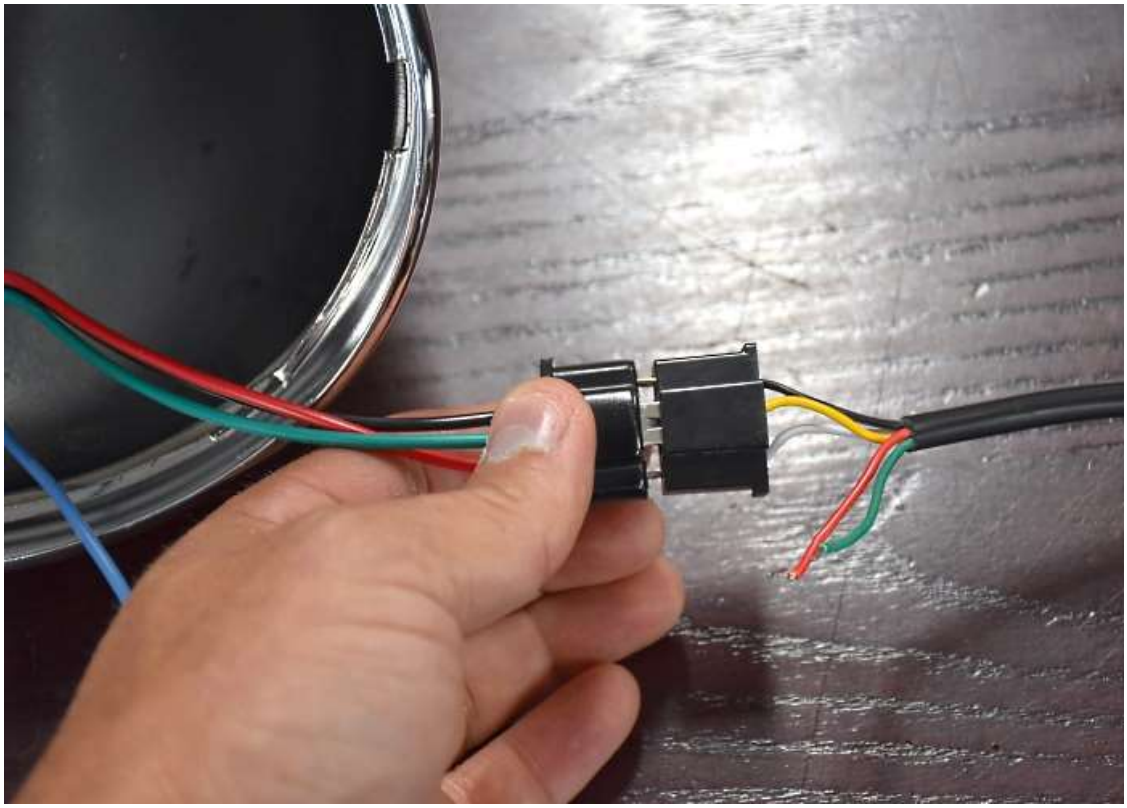
If included, remove and discard the small adapter harness, it is not used for our application.

Cut the 4’ blue wire in half.

DRL and Turn signal

- If not running both DRL and turn signals, skip to the next section.
- If you want to use the DRL function, two wires need to get added to the wires going through the mounting bolt. The kit included blue wire for the turn signal and an additional 16 ga wire that must get wired to key on +12V.
- If running the DRL, the additional wire must get run to key on power in the fuse panel such as the choke wire if not being used.
- If wiring the DRL, the red DRL wire on the headlight must get +12V all the time in order for the turn signal to work

Push one of the blue wires and a longer wire through the headlight bolt together.



Connect the headlight pigtail to the bulb.

Solder and tape the blue wire to the green headlight wire.

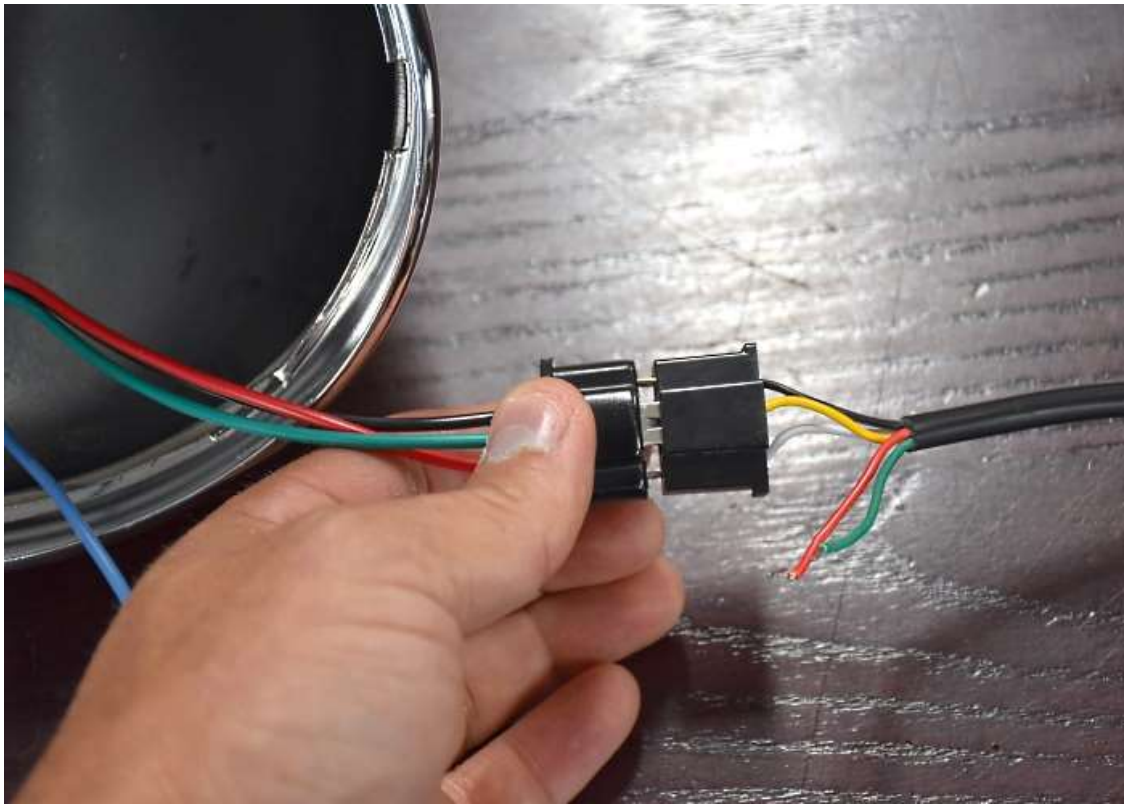
Solder and tape the additional wire to the red DRL wire.

Once the headlight is attached to the body, the additional wire must get run to key on power in the fuse panel such as the choke wire if not being used.

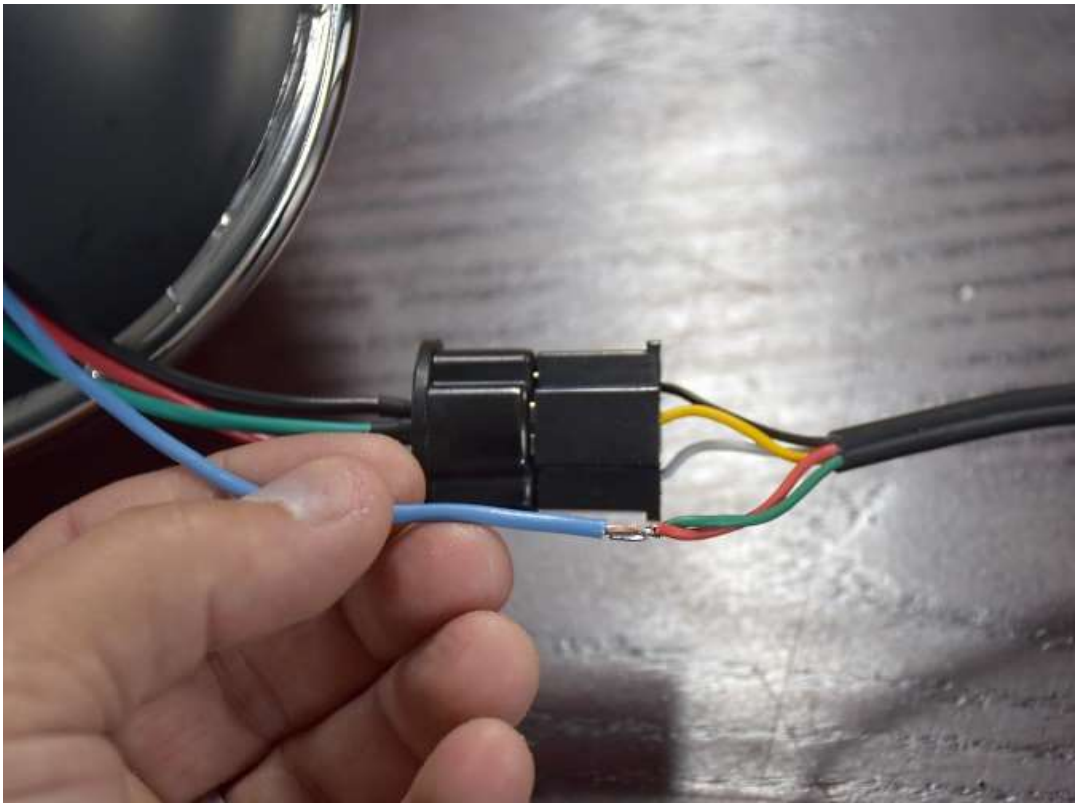
Skip to the installation section.

Turn signal only

Push one of the blue wires through the mounting bolt.



Connect the headlight pigtail to the bulb.



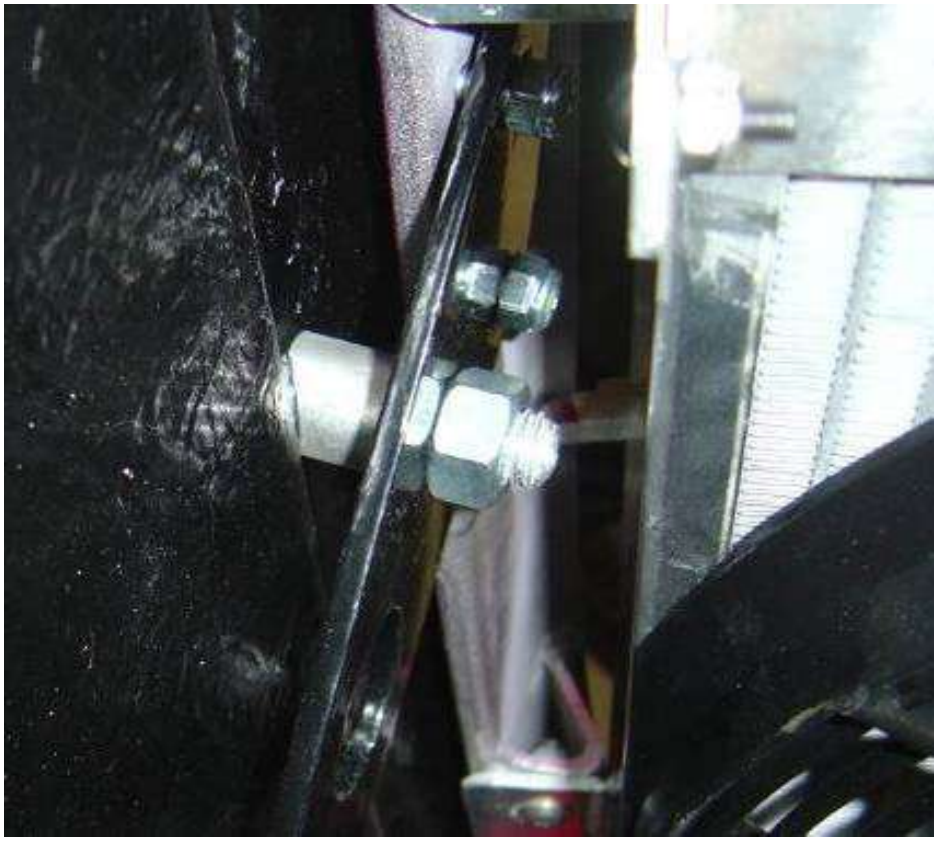
Solder the green and red light wires to the blue wire.

Electrical tape the soldered wires.

Installation

Place the headlight into the housing and attach the locking ring to the bucket.

Pass the wires though the radiator mount into the engine bay.



Install the supplied spacer between the engine side cover and the grill mount. Fasten the headlight in place with the nut supplied with the headlights.

No engine side covers

Headlights are bolted to the radiator mount.

Solder the wires from the headlight to the chassis harness using the following chart as a reference:

	Chassis harness	**Headlight plug pigtail**
Ground	Black	Black
High Beam	Brown	Red
Low Beam	Red	Green
Park	Tan	Red
Left Turn	Dark Green	Blue wire
Right Turn	Light Blue	Blue wire

- If running the DRL, the additional wire must get run to key on power in the fuse panel such as the choke wire if not being used.
- If wiring the DRL, the red DRL wire on the headlight must get +12V all the time in order for the turn signal to work.

Side Mirrors

- Side mirrors
- Masking tape, marker/pen, drill, $^{5}/_{16}$" drill bit, ½" deep socket, ratchet.

With the help of a friend, hold a mirror up on the door or between the door and the hood. Locate the mirror for the best viewing over the rear fender/tire.

Place masking tape on the body at the location picked and draw around the base.
Use the gasket as a template to locate the holes.

Use a $^{5}/_{16}$" drill bit to drill the holes for each mirror.

Use Loctite on the stud threads to hold the studs in the mirror.
Use a ½" deep socket or wrench to attach the mirror to the body.

Congratulations

We would like to congratulate you on finishing your Hot Rod.
Recheck the ride height of the frame. Weight has been added since initially done.

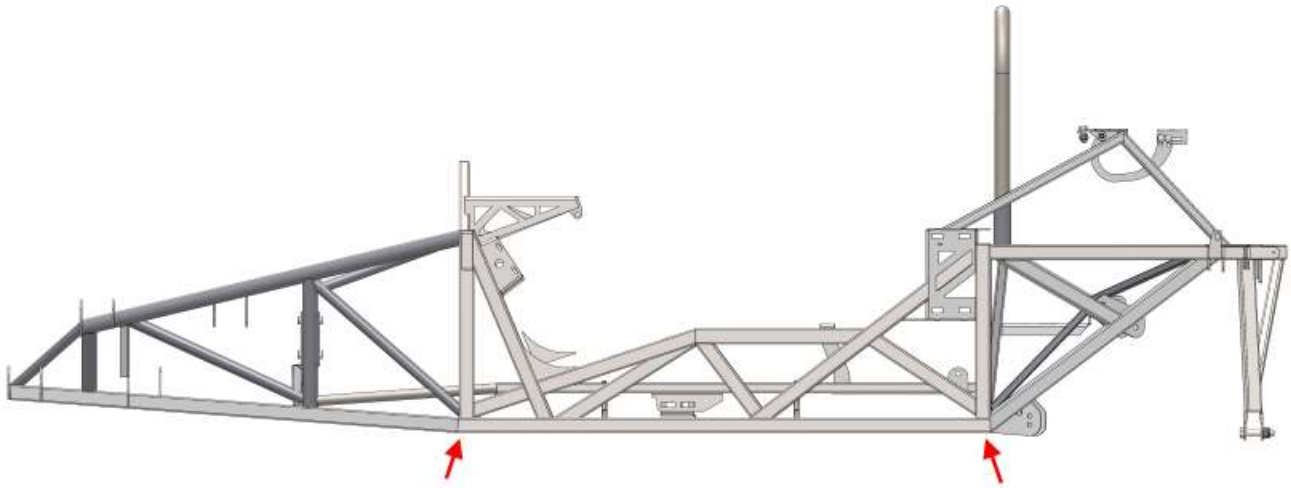
- Check the Appendix for alignment, ride height and headlight alignment specs and procedures.
- Recheck the car using the suggested "Final check" sheet in the appendix

Appendix A: Alignment and Ride Height

Alignment Specifications

	Total Toe In (inches)	Camber (deg)	Caster (deg)
Manual steering	1/16	-0.5	3-4
Power steering	1/16	-0.5-0.75	6-7

Ride Height



Measure the suspension ride height at the points shown above.

Upper suspension holes

Front	4.5”
Rear	5”

Measured from the ground to the bottom of the frame.

Lower suspension holes

Front	5.5”
Rear	6”

Measured from the ground to the bottom of the frame.

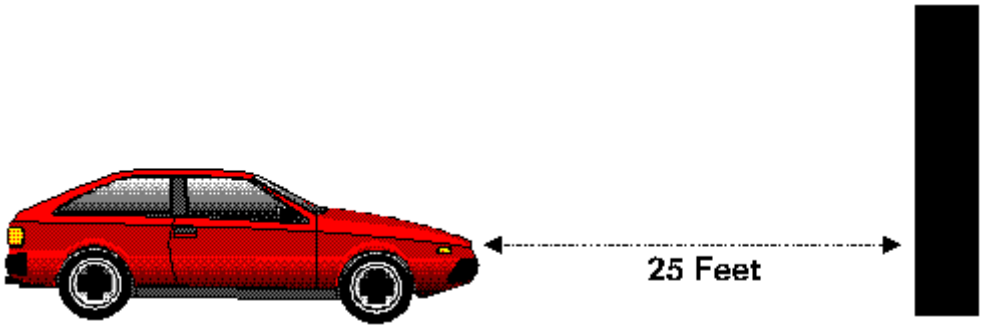
Appendix B: Headlight Alignment

- 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.

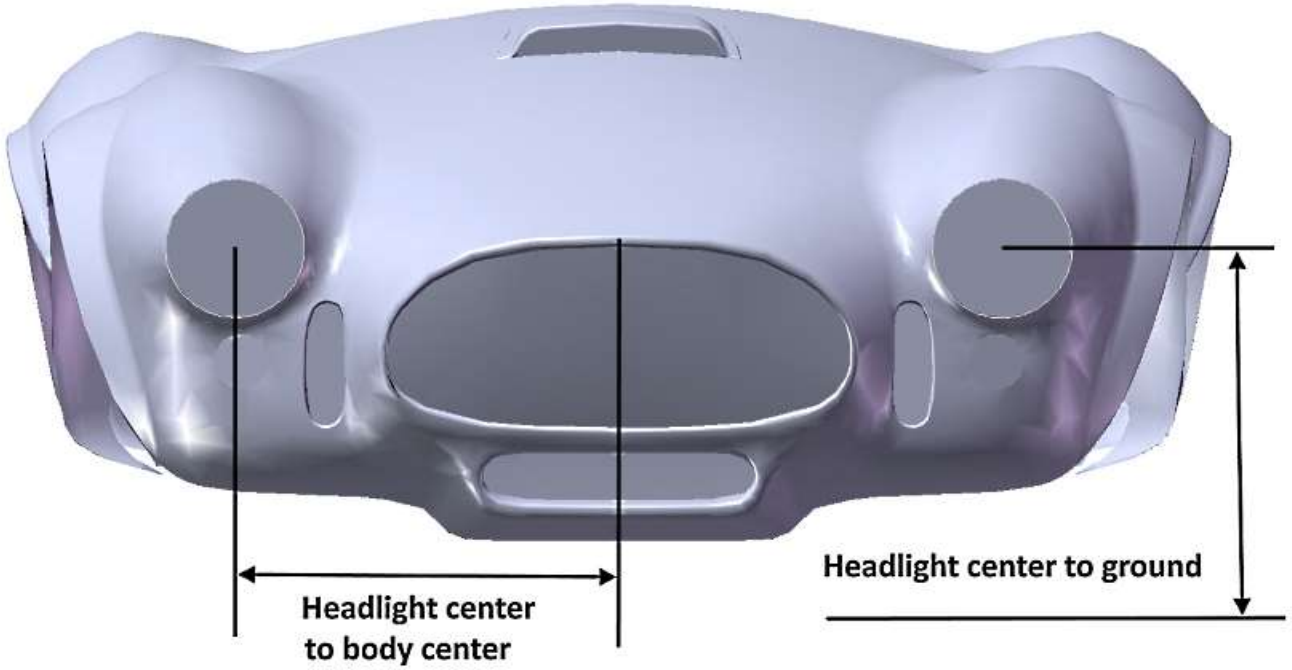
Find a flat level surface next to a vertical white wall where the car can be parked (a garage door is an ideal location at home).

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.

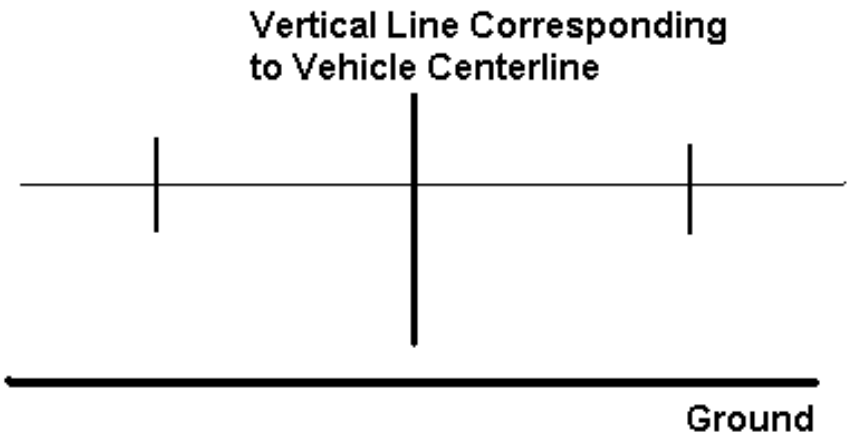


Make the following two measurements and write them down:

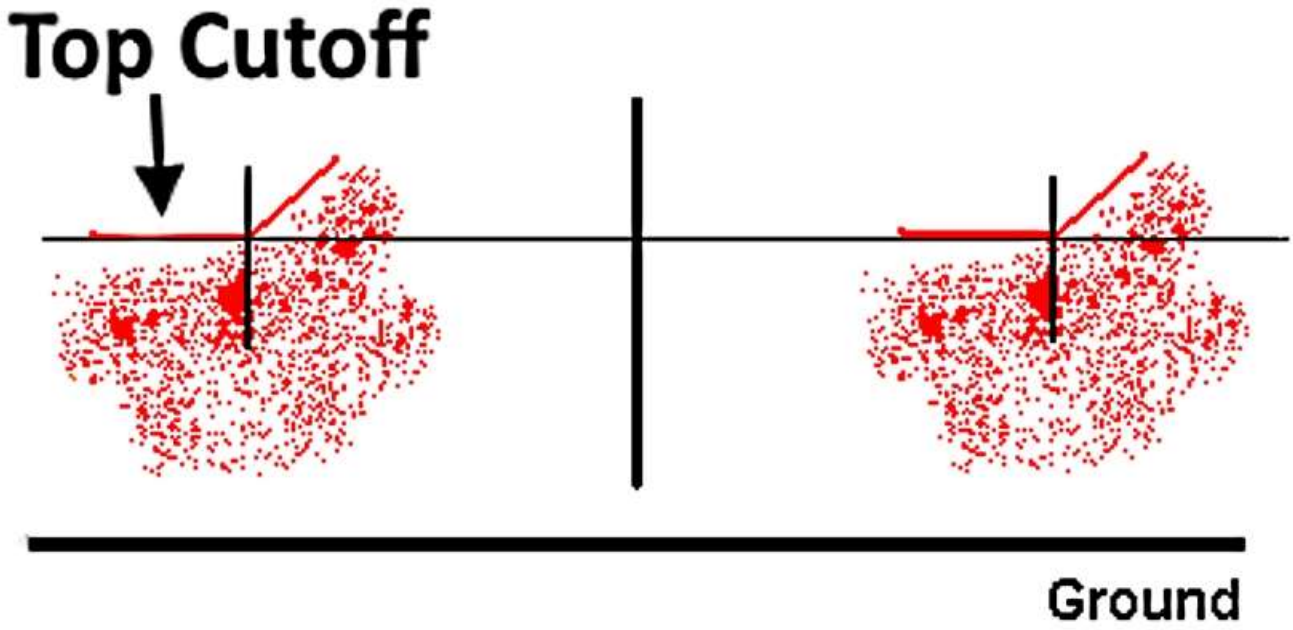
Measurement A: From the ground to the geometric center of one of the headlight lenses

Measurement B: From one of the low beam headlights to the vehicle centerline.

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.



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.

Appendix C: 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. It is also a good idea to check these items on a yearly basis or sooner depending on how hard the car is driven.

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/bleeders 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 D: 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 E: 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 or www.thefactoryfiveforum.com . 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 F: Mustang Specifications

- All information is based on V8 Ford Mustangs from 1979 to 2004
- This is for those that want to use parts from a Junk Yard.

Engines

Year/Engine	Horsepower	Torque Rating	Induction	Comp Ratio
1982 5.0L V8	157 @ 4200	240 @ 2400	2V carb	8.3:1
1983 5.0L V8	175 @ 4200	245 @ 2400	4V carb	8.3:1
1984 5.0L V8	175 @ 4200	245 @ 2400	4V carb	8.3:1
1984 5.0L V8	165 @ 3800	245 @ 2000	CFI	8.3:1
1985 5.0L V8	210 @ 4400	270 @ 3200	4V carb	8.4:1
1985 5.0L V8	180 @ 4200	260 @ 2600	CFI	8.4:1
1986 5.0L V8	200 @ 4000	285 @ 3000	SFI	9.2:1
1987-93 5.0L V8	225 @ 4000	300 @ 3000	SFI	9.0:1
1994-95 5.0L V8	225 @ 4000	300 @ 3000	SFI	9.0:1
1996-97 SOHC	215 @ 4400	285 @ 3500	SFI	9.5:1
1998 SOHC	225 @ 4400	290 @ 3500	SFI	9.0:1
1999-04 SOHC	260 @ 5250	302 @ 4000	SFI	9.4:1

Transmissions

Year	Type	1st	2nd	3rd	4th	5th	6th	R	Max torque lb-ft	Part Number	Weight
1983.5	T-5	2.95	1.94	1.34	1.00	0.725	N/A	2.76	265	E3ZR-7003-A	75
1984	T-5	2.95	1.94	1.34	1.00	0.625	N/A	2.76	265	E4ZR-7003-DA	75
1985-89	T-5	3.35	1.93	1.29	1.00	0.675	N/A	3.15	265	E(5,6)ZR-7003-(FA,FB)	75
1989-93	T-5	3.35	1.99	1.33	1.00	0.675	N/A	3.15	300	F(Z,9,0)ZR-7003-(A,AA)	75
1994-95	T-5	3.35	1.99	1.33	1.00	0.675	N/A	3.15	300		75
1995	TR-3550	3.27	1.98	1.34	1.00	0.680	N/A	3.00	350		100
1996-98	T-45	3.37	1.99	1.33	1.00	0.670	N/A	3.22	325		109
1999-02	TR-3650	3.38	2.00	1.32	1.00	0.620	N/A	3.38	360		120
2003-04	T-56	2.97	2.07	1.43	1.00	0.800	0.62	3.28	450		129

Rear axle ratio

	Manual	Optional	Automatic
2004	3.55		2.49
2003	3.55		3.27
1996-2002	3.27		3.27
1995	3.08		3.27
1994	3.08		3.27
1987-1993	2.73	3.08	3.27

Rear Brakes

1987 to 1993 Mustangs used a 4.25” 4-lug bolt pattern drum brake. From 1994 to 2004 Mustangs switched to have a 10.5” diameter 4.5” 5-lug bolt pattern solid rear rotor with a single piston cast iron caliper. All Cobra and the Cobra R versions of the Mustang from 1993 had an 11.65” rear vented rotors with the same calipers that the 10.5” rotors used, however the caliper slider brackets were slightly different. Because the 10.5” rotors were solid and the 11.65” rotors were vented, the caliper slider bracket is manufactured with a slightly wider opening for the rotor. All flexible brakes lines and their mounting brackets are required donor parts for FFR kits. Emergency brake cables will clip right into a Factory Five kit. (More brake component information can be found in the High-Performance Braking Systems section of this Manual)

Year	Rear End Width	Rear Brake Type	
87-93	59.25"	9" Drum	
94-98	61.125"	10.50" Solid Disc (GT)	11.65" Vented Rotor (Cobra)
99-04	62.52"	10.50" Solid Disc (GT)	11.65" Vented Rotor (Cobra)

Rear axle

From 1986 to 2004 8.8” rear axles were used in Mustangs. In 1994 they went from a 4.25” 4-lug bolt pattern to a 4.5” 5-lug bolt pattern. Most wheels fit the 59.25” width the best. Make sure you know what axle you have before ordering wheels.

Starter

From 1979 to 1991 the V8 starters used were all the same one wire starters. In 1992 Ford switched to a lighter, more powerful starter which had a built-in solenoid.

Mass Air Sensor

Mass air sensors are devices used to measure air flow into the engine for the vehicle’s computer. These started to be used in Mustangs in 1989 and are still being used.

1986-1988 engines measured air pressure in the intake to provide information for the computer. Mass air sensors send more accurate information to the computer than speed density sensors. A speed density (’86-88) controlled vehicle can be converted to mass air by changing the computer, adding the sensor, and running 4 wires (two to the computer, one positive, and one ground). There is a flexible rubber elbow that connects the mass air meter to the throttle body, which is required for use in a Factory Five kit.

Oxygen Sensors

Oxygen sensors are placed in the exhaust to measure the oxygen content of the exhaust. This measurement is used by the computer to determine whether fuel delivery to the engine needs to be increased or decreased. From 1986-1995 Ford Mustangs used two oxygen sensors, one in each side of the exhaust system. From 1996-2004 Mustangs used four oxygen sensors, two per side. At full throttle the oxygen sensor signals are not used by the computer, because the computer has a built-in program to run the engine rich at wide open throttle. Oxygen sensors will usually be most effective when placed near the collection point of headers because the exhaust will remain very hot, and an average measurement of all of the cylinders can be taken. All oxygen sensors are recommended to be used when placing a fuel injected motor into a Factory Five kit, however in the 1996-2004 models with 4 oxygen sensors, it is suggested to purchase a bypass kit to eliminate two of the sensors. This can also be done with modifications to the wiring harness.

Exhaust headers

1986 to 1993 Mustang headers have 1.5” tubes, and remained the same shape. 1994 to 1995 Mustang headers still have 1.5” headers, but the collector flanges have a larger ball and socket joint. 1996 to 2004 Mustangs used cast exhaust manifolds. SOHC engines had circular exhaust ports, and the DOHC had oval ports; however, the collector flange changed in 2003 and 2004. For those installing 351 Windsor engines there are a few companies including Ford Motorsport that carry exhaust headers for the installation of a 351 Windsor into a 1986-1993 Mustang which should be used.

Appendix G: Wheel/Tire Specifications

- These values represent wheels and tires used by Factory Five on the ’33 Hot Rod and do not imply any limits on max / min diameters, widths, backspacing, etc. 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.
- Information is separated into groups of wheels/tires used on Hot Rods without fenders and those with fenders, and it is also important to note that this information is based on using a standard width (59.25”) Ford 8.8” solid axle.
- See factoryfive.com for more pictures of Hot Rods in the Galleries.

- See factoryfiveparts.com for wheels offered by Factory Five.

Hot Rods without Fenders

Bullet wheels
Rear: 20x10 295/30-20
6.88” backspace / 35mm offset
Front: 17x8 245/40-17
5.33” backspace / 30mm offset
Notes: Purchased from Tire Rack. Rears used with 1” spacer for body clearance (brake clearance was not an issue). Wheels were only available in 6.88” backspace.

Billet Specialties Apex-G wheels
Front: 18x9 255/35-18
5.5” backspace
Rear: 20x12 335/30-20
5.75” backspace
Notes: Purchased from Billet Specialties, ordered with Mustang Cobra brake clearance

I Forged Seneka wheels
Front: 18x9.5 275/35-18
6” backspace
Rear: 19x11 305/30-19
6” backspace
Notes: Nickel Silver center finish with polished lip. 255 width would be more ideal than the 275 used.

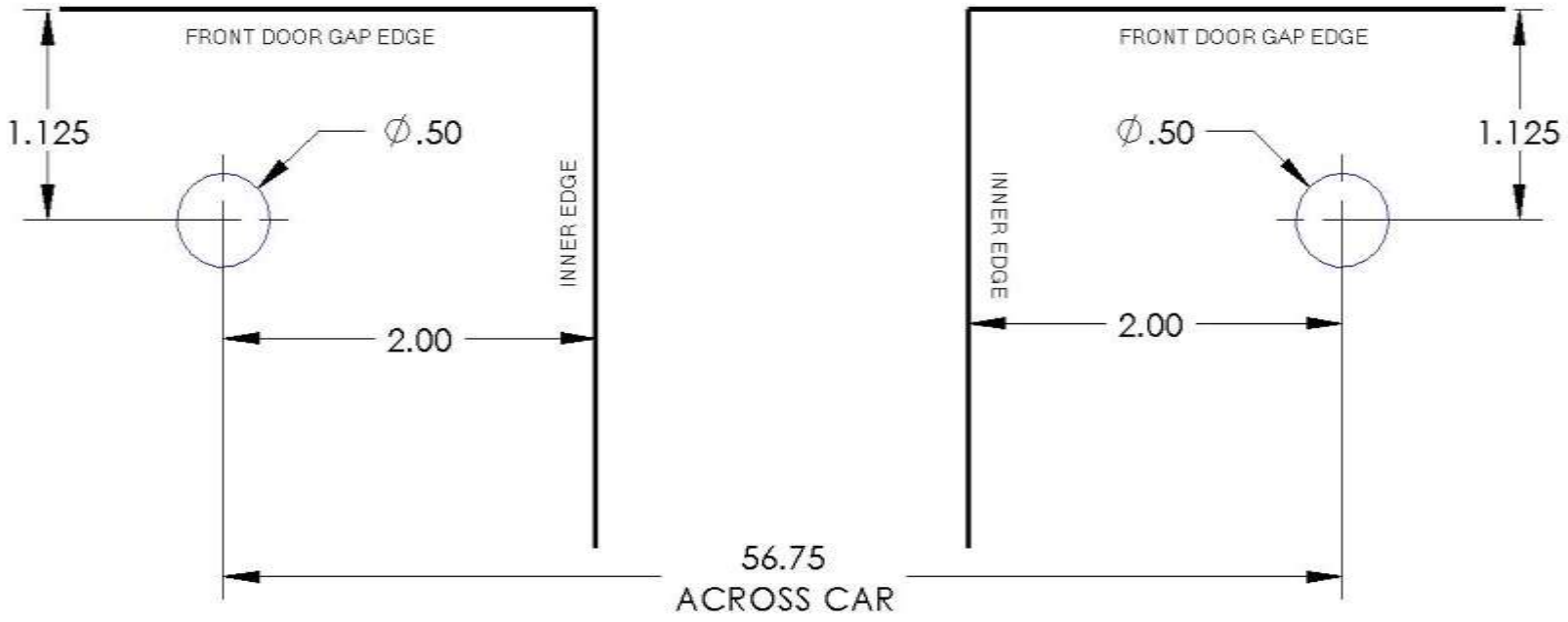
Hot Rods with Fenders

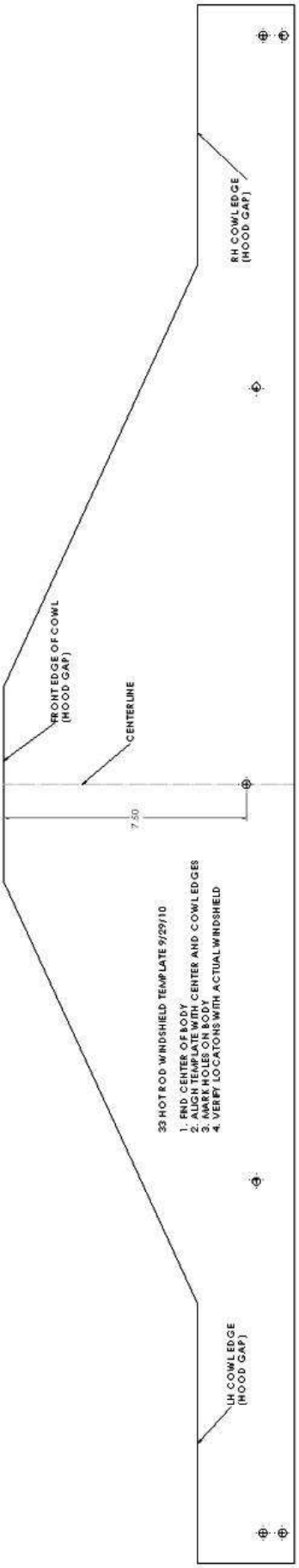
The following wheel and Tire recommendations will allow the wheels and tires to fit under the optional Fenders:

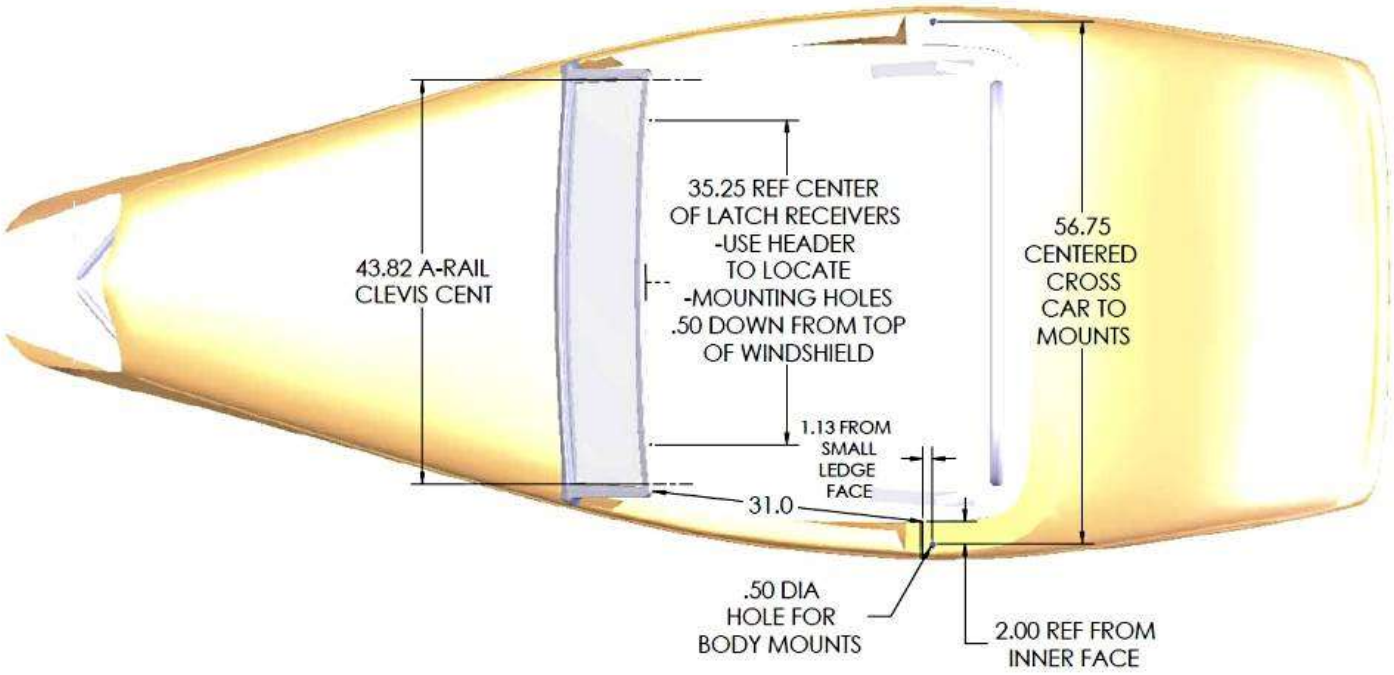
Front maximum wheel width and Backspacing: 9.00” with 5.50” Backspace
Front maximum tire width: 255mm
Rear maximum wheel width and Backspacing: 11.00” with 6.00” Backspace
Rear maximum tire width: 315mm
Front / Rear maximum tire diameter: 25.7”

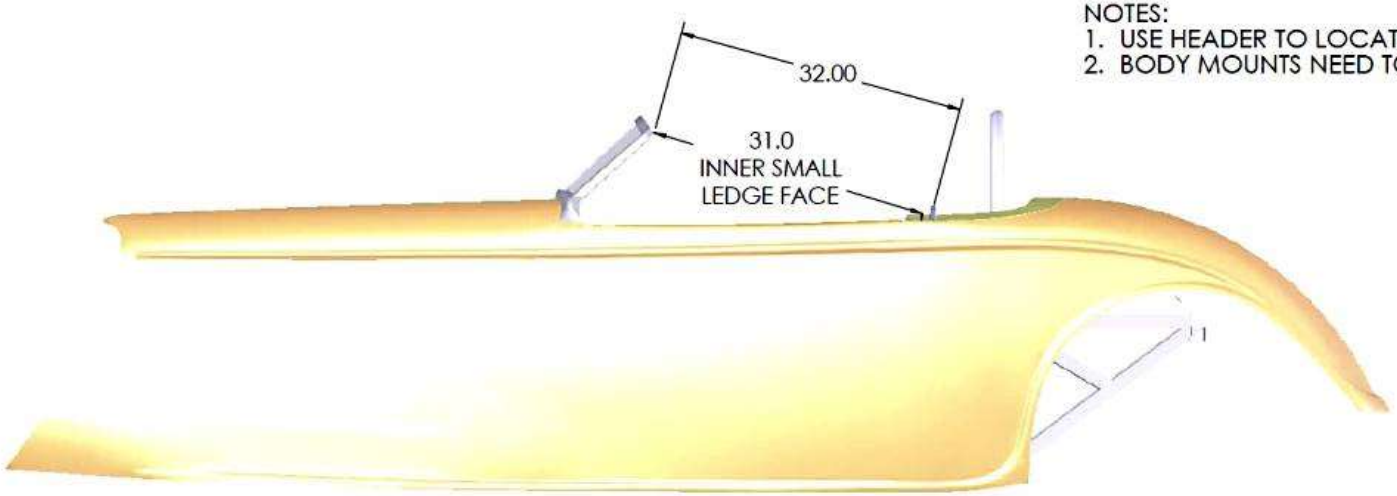
Appendix H: Soft Top Diagrams

CONVERTIBLE TOP BODY MOUNT TEMPLATES




RH COWL EDGE
(HOOD GAP)
FRONT EDGE OF COWL
(HOOD GAP)
CENTERLINE
7.50
33 HOT ROD WINDSHIELD TEMPLATE 9/29/10
1. FND. CENTER OF BODY
2. ALIGN TEMPLATE WITH CENTER AND COWL EDGES
3. MARK HOLES ON BODY
4. VERIFY LOCATIONS WITH ACTUAL WINDSHIELD
LH COWL EDGE
(HOOD GAP)





NOTES:
1. USE HEADER TO LOCATE WINDSHIELD RECEIVERS
2. BODY MOUNTS NEED TO BE VERTICAL (LEFT TO RIGHT)

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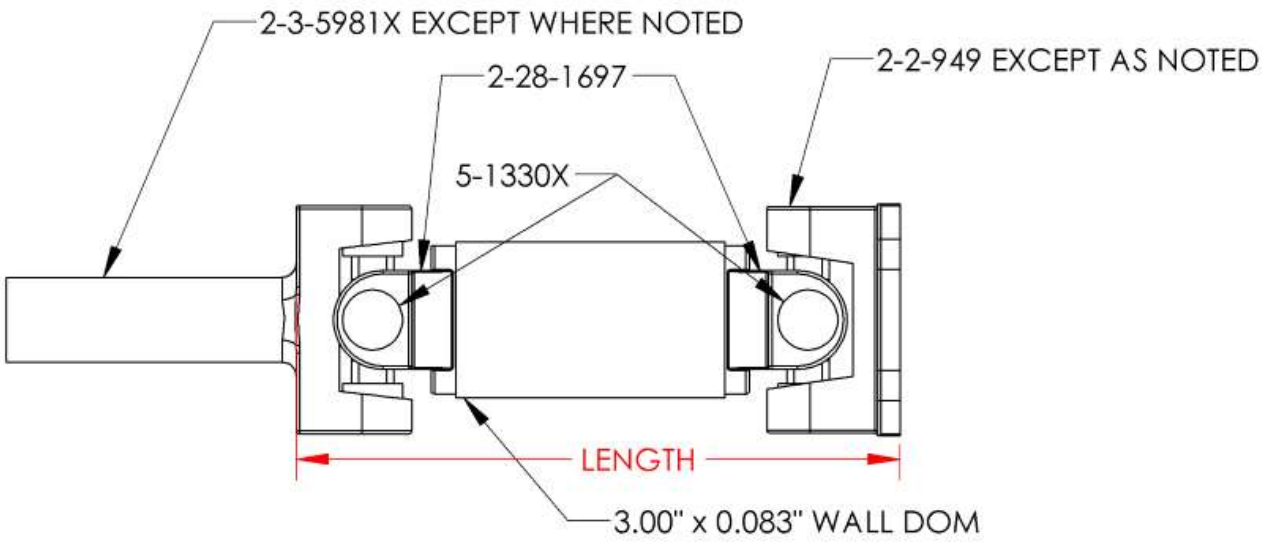
Factory Five
'33 HOT ROD CONVERTIBLE TOP
INSTALLATION INSTRUCTIONS
10/21/10 *Rod Tops*

Appendix I: Driveshaft lengths

MODEL	FFR#	SPLINE	DESCRIPTION	LENGTH
COUPE	60375	31	COYOTE w/2015 IRS, 6SPD MAGNUM, 2-3-6041X YOKE, 2-2-489 FLG	9.75
COUPE	60453	28	302/351 w/2015 IRS, T-5/AOD, 2-2-489 FLG	10.50
COUPE	60450	31	302/351 6 SPD MAGNUM, 2-3-6041X YOKE	10.50
COUPE	60175	31	302/351 w/2015 IRS, TKO, 4.6L/COYOTE TKO ROADSTER, 2-3-6041X YOKE, 2-2-489 FLG	10.50
COUPE	60455	31	COYOTE 6 SPD MAGNUM, 2-3-6041X YOKE	12.75
COUPE	60376	31	COYOTE w/2015 IRS, TKO, 2-3-6041X YOKE, 2-2-489 FLG	12.75
COUPE	60454	28	302/351 T-5/AOD	13.50
COUPE	16349	31	302/351 TKO, 2-3-6041X YOKE	13.50
COUPE	60452	31	COYOTE TKO, 2-3-6041X YOKE	15.75
HOT ROD	34048	27	CHEVY w/2015 IRS, 700R4/4L60/4L65E (EXCEPT VETTE), 2-3-12051X YOKE, 2-2-489 FLG	31.00
HOT ROD	34049	31	302/351/4.6L/COYOTE/HEMI w/2015 IRS, TKO, 2-3-6041X YOKE, 2-2-489 FLG	31.25
HOT ROD	34050	28	302/351/4.6L/COYOTE w/2015 IRS, T-5/AOD, 2-2-489 FLG	31.25
HOT ROD	34046	31	CHEVY w/2015 IRS, TKO, 2-3-6041X YOKE, 2-2-489 FLG	32.1875
HOT ROD	34880	27	CHEVY 700R4/4L60/4L65E (EXCEPT CORVETTE), 2-3-12051X YOKE	35.00
HOT ROD	34881	28	302/351/4.6L/COYOTE T-5/AOD	35.25
HOT ROD	34882	31	302/351/4.6L/COYOTE/HEMI TKO, 2-3-6041X YOKE	35.25
HOT ROD	34883	27	CHEVY 4L60/4L65E, 2-3-12051X YOKE	35.75
HOT ROD	34884	31	CHEVY TKO, 2-3-6041X YOKE	36.1875
ROADSTER	15956	28	302/351 w/2015 IRS, T-5/AOD, 2-2-489 FLG	8.375
ROADSTER	16038	31	302/351 w/2015 IRS, TKO, COYOTE/LS T-56, 2-3-6041X YOKE, 2-2-489 FLG	8.375
ROADSTER	16348	28	302/351 T-5/AOD	11.25
ROADSTER	16350	31	302/351 TKO, 2-3-6041X YOKE	11.25
ROADSTER	16349	31	4.6L/COYOTE/LS TKO/T-45/3650, BIG BLOCK TKO, 302/351 TKO COUPE, 2-3-6041X YOKE	13.50
35 TRUCK	35201	28	302/351/4.6L/COYOTE USING T-5/AOD, USE 2-2-489 FLG	42.50
35 TRUCK	35202	31	302/351/4.6L/COYOTE/HEMI USING TKO, USE 2-3-6041X YOKE AND 2-2-489 FLG	42.50
35 TRUCK	35203	27	CHEVY USING 4L60/4L65E (1998+), USE 2-3-12051X YOKE AND 2-2-489 FLG	42.50
35 TRUCK	35204	27	CHEVY USING 700R4/4L60 (93-97 EXCEPT VETTE), USE 2-3-12051X YOKE AND 2-2-489 FLG	43.00
35 TRUCK	35205	31	CHEVY USING TREMEC TRANS. 2-3-6041X YOKE AND 2-2-489 FLG	43.4375



NOTE: 1. FOR ALL OTHER TRANSMISSIONS, INSTALL TRANS. AND MEASURE.
2. 94-95 BELLHOUSING AND T-5 TRANS ARE LONGER SO SHORTEN DRIVESHAFT BY 0.75".

ROADSTER
COUPE
HOT ROD
35 TRUCK
USED ON
APPLICATION

DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
PRINTED 11/11/2022

Factory Five Racing, Inc.

DRIVESHAFT DIAGRAM

	NAME	DATE
DRAWN	JI	12/18/03

COMMENTS: 2015 IRS USE SPICER 2-2-489 PINION FLANGE

SIZE A | DWG. NO. 13023 | REV. X
SCALE:1:3 | WEIGHT: | SHEET 1 OF 1

Appendix J: Additional Torque Specifications

General Bolt torque specifications (standard)

Thread	SAE English
	Zinc Plated
	lb-ft
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	SAE Metric
	Zinc Plated
	lb-ft
M8	18
M10	33
M12	61
M14	98
M16	120

Appendix K: Fluid Specifications and Capacities

	Engine	
	Oil Type	Capacity
302	10W-30	5.0 qts.
Coyote	5W-50	8.0 qts

	Transmission		
Oil Type	T-5	TKO/TKX*	T-56
Mercon/Dexron III Trans. Fluid	2.8 qts.	2.64 qts.	4.0 qts

* Recommended fluid is Pennzoil Synchromesh

8.8 Solid Rear Axle		
Oil Type	Capacity	Friction Modifier
80W-90 Gear oil	1.875 qts.	4 oz.