FACTORY FIVE RACING

Mk4 Roadster Complete Kit Assembly Manual

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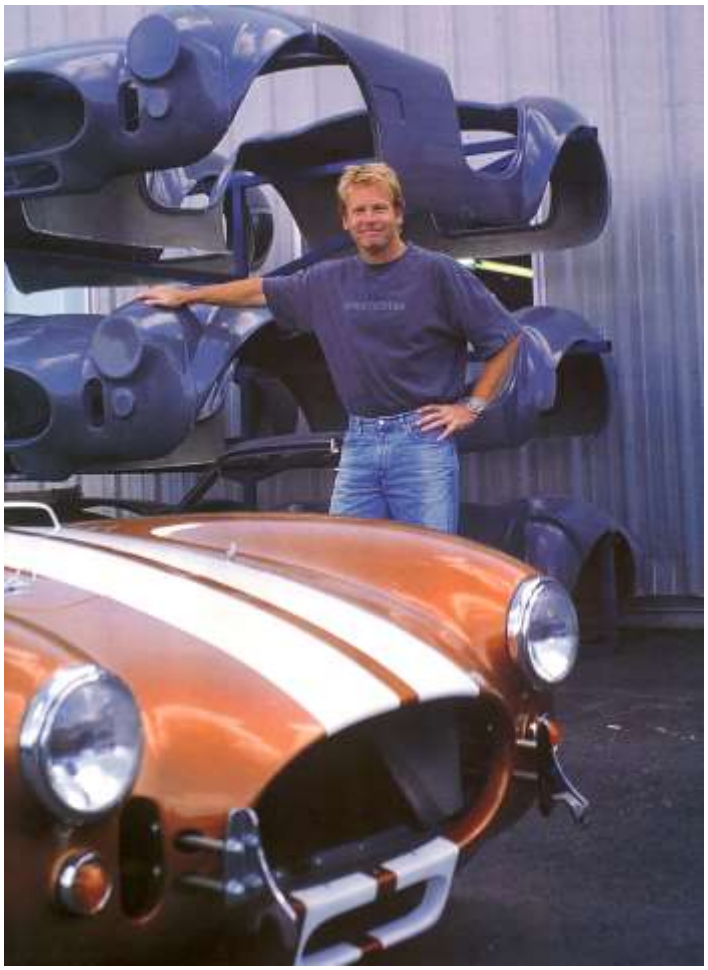
www.factoryfive.com 508-291-3443

Table of Contents

Chapter 1

General Information

Foreword



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

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

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

Carroll Smith

"Prepare to Win"

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

Lemans victories and his contributions to the motorsports community continues in his writings that are all at the top of my list of recommended readings for the car builder or racer.

After being honest about the skills, responsibility, and dedication required to build a car, I feel the need to talk about the PROCESS of building a car in an equally candid manner.

The process of building a car is a lot like the process of having kids. As a matter of fact, it's absolutely the best analogy I can find (apologies in advance to all of you without kids, try and bear with me). Both things are easy to get started. With a car project you order a manual, talk to car guys, get all excited over glossy photos and perhaps order a kit from us. With the whole pregnancy thing, well for most folks that's even easier to get started…

When my wife was pregnant with our first daughter, I was sure we would never have any more children. From the swollen ankles to the morning sickness, to the delivery room scene from the movie "Alien", the whole process was difficult, and while she didn't complain too much thru the nine months, it was obviously hard work. Another thing, she wouldn't have been the best salesman for others considering getting started on the baby thing.

When it comes to the car project, once the kit arrives and the process begins it is much the same as pregnancy. Frankly the degree to which a person breezes thru the project or languishes is commonly a factor of skill, but still, building a car for anyone is a tough job and there are inevitably issues. How many times have you gotten the wrong part at NAPA, gotten home to realize the alternator has a six ribbed pulley not five…? You will meet challenges building this car and you will be frustrated at times. Thankfully there are internet discussion forums where you can vent your frustrations and complain about the idiots who designed this kit. We smile when reading these posts because we know that while the pregnant woman complains, the mother loves her children in an unreasonable and perhaps even undeserved way!

All the way thru the process, as you build your car, the seasoned guys at Factory Five in tech support will help you. The larger community of Factory Five customers will also be there for you, as the one thing that really sets us above the crowd of other companies is the size, competence and enthusiasm of our customer community.

When the baby arrives and when your car is done, there will still be more work. With babies, it's up all night, diapers, and strange maternity contraptions that men don't speak of in the light of day… With the car it will be other challenges. Registration and licensing can be frustrating and laws vary from state to state. A wrench dropped from 25 feet away will inexplicably shoot sideways into any freshly painted surface and my favorite was my own engineers who felt the need to test out how long 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

While there are many things to love and be proud of in our country today there are a few things that we wish were different. With regret and a small amount of resentment we include the following warning and statement of non-liability at the advice of men with soft hands and necks the size of pencils.

Motorsports involves the operation of machines and materials near the limits of performance. Racing involves an inherent amount of risk. Any decision to proceed in the project of building one's own racecar must be made with the acceptance of personal responsibility. If, while building, driving or racing this Factory Five Racing kit, should you become injured or die, it will be the result of your own conscious decision and we at Factory Five Racing, Inc., disclaim any responsibility of any kind.

The procedures and recommendations contained in this book are to be used as a guide with the ultimate determination of safe construction and race-worthiness to be made by you. If you feel uneasy about whether you have the skills to build your own vehicle, DO NOT PROCEED. This project involves building a car from the bare frame all the way up to a finished vehicle. It is intended for individuals who have the skills and abilities commensurate with the scope of a project of this magnitude.

This kit is only a collection of parts designed for use primarily as a race car. Factory Five Racing does not build completed or partially completed vehicles. You are responsible for ensuring that the vehicle you build complies with all Federal, State and local laws regarding its use. Except as may be specified in writing, Factory Five makes no warranties, expressed or implied, on the products (parts, or kits) offered for sale. All implied warranties of merchantability and fitness for a particular purpose are expressly disclaimed by Factory Five.

While Factory Five products are thoroughly tested under actual race conditions, Factory Five cannot control the quality of the installation or application of these products. The products offered for sale are true race car components, the installment of which often requires considerable time and fabrication skill. Before attempting any installation or assembly, the purchaser should determine the suitability of the product for the intended use, the time, and level of skill necessary for correct installation or assembly.

Factory Five does not make any warranty, expressed or implied. 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.

Safety Tips

Read the manual. It is at least a good guide and place to start.

Don't take short cuts.

Before starting work, make sure you have the proper tools, the required parts, and sufficient space for the job. If you damage any parts, it will probably be because they were either not stored properly or, the wrong tool was used to install them.

Don't work when you're too tired or upset. The car you will be building is capable of supercar levels of performance, and your life depends on the quality of your workmanship.

Never work under a raised car unless it is well supported by stands intended for that purpose. Never work under a car supported by a jack.

Always observe good safety practices such as the use of eye protection, protective clothing, and gloves.

Keep the battery disconnected whenever you work on fuel or electrical systems and always keep a fire extinguisher handy.

Don't allow children in the work area.

Partially assembled cars attract a crowd. Keep garage doors closed or mark off work areas.

Make sure that all electrical equipment is grounded. If working alone, have someone check on you periodically.

When using an engine hoist, make sure that the working load rating is correct for the weight.

Work in a well-ventilated and well-lighted area.

Use portable safety lights for under-carriage work. Never use an exposed bulb type light.

Be mindful of the environment. Avoid spills of solvents or engine fluids. If a spill occurs, clean up immediately and dispose of it in hazardous waste containers

Never let a friend or someone else drive your car.

Always wear your harnesses.

Clean your build area after each assembly is completed. This will speed your build process as it ensures that you know where your tools are and prevents tripping injuries.

It is impossible to anticipate all of the possible hazards. Care and Common Sense will prevent most accidents

How to use This Book

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

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

ICON KEY	
	Valuable information
	Tools needed
	Parts Needed

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

What You Get

The Factory Five Mk IV Roadster kit gives you everything you need to build your car, in one big package. We include everything from the frame, body, complete interior, and all trim down to the smallest details like correct fasteners, brackets, and badges. We make it easy for you to use the engine of your choice with a list of available exhaust and motor/trans mount choices (no charge). For a complete packing list, see the Appendix.

Frame: Complete jig-welded tube frame. Includes all mounts ready to accept all Ford Engines: Small block, 4.6L, 427/428 FE, 429/460 engines.

Body: Hand laid $^{3}/_{16}$" laminate composite body and panels made with vinyl ester resin.

Chassis Aluminum Panels: 66 Laser cut, pre-formed 6061-T6 aluminum panels for cockpit, trunk, and engine bay. 1200 pre-packaged rivets.

Complete Front Suspension: Tubular upper and lower control arms, Koni™ brand high performance mono-tube, rod-end shock absorbers, Custom Spindles, Hubs.

Rear Suspension: 3-Link Suspension, tubular lower control arms, Koni™ brand high performance mono-tube, rod-end shock absorbers.

Front Brake System: Ford Mustang GT 11" front brakes including twin piston PBR™ aluminum calipers, brake pads, stainless braided brake lines, fasteners, pre-flared $^{3}/_{16}$" brake lines and emergency brake handle.

Complete Steering System: Manual steering rack, polyurethane bushings, nickel plated lower steering shaft, 14" wood steering wheel w/boss and ceramic Factory Five Badge.

Fuel System/Parts: Fuel tank w/mounting hardware, vent, gaskets, pick-up and fuel level sending unit, fuel filler neck and fasteners, pre-flared fuel lines (¼" and $^{5}/_{16}$") w/unions, barbs, hose clamps and high press flex lines, polished Aston Lemans aluminum fuel cap with gasket, ground strap.

Cooling System/Parts: Electric cooling fan and mounting hardware, aluminum radiator w/cap and in-line filler neck, stainless Steel radiator hose kit incl. adapter kits, fasteners, overflow tank w/cap, hoses, hose clamps, mounting hardware, 185° thermostat switch.

Engine/Exhaust: Includes all mounts ready to accept all Ford Engines: Small block, 4.6L, 427/428 FE, 429/460 engines. Side Exhaust with integral glass pack muffler, gaskets, fasteners, and choice of full-length headers, straight pipes, or catalytic convertors.

Driveshaft: Select from one of three available driveshaft's w/fasteners to match the engine/trans of your choice. Select one of the following…

28 spline driveshaft for T-5, AOD, or Tremec 3550's

31 spline driveshaft for Tremec TKO 500 or 600's

31 spline driveshaft for 4.6L engines w/T-45's or 3650's

Gauges and Dash and Electrical Assembly: Custom fit chassis wiring harness, ignition switch, headlight switch, Hi-Low beam switch, starter solenoid, horn button, dash indicator lights, insulated line clip hardware, Cable ties, battery ground strap, speedometer sending unit, 3.73 speedometer gear, and choice of modern or Vintage style gauges.

Complete Interior Accessories: Metal framed vinyl bucket seats, 5-point Simpson™ harnesses, carpet set, emergency brake boot, interior rear-view mirror w/fasteners, door latches, Wilwood™ pedal assembly, accelerator pedal, accelerator cable, aluminum clutch Quadrant, Firewall adjuster, adjustable door hinges with bronze bushings and shifter boot.

Exterior Accessories and Lighting: DOT approved windscreen, License plate light and bracket, Ceramic Factory Five nose and tail badges, DOT approved headlights, turn signals, and tail-lights, hidden trunk hinge kit, hood hinge kit with supports and fasteners.

Assembly Manual: Bound assembly manual that is full of pictures and diagrams.

Fasteners: Over 1600 top quality zinc plated, chrome and stainless steel fasteners, numbered and packed individually by assembly.

Engine: Small block Ford 289/302/351 with unequal length shorty headers, 4.6L modular engine with unequal length shorty headers, 5.0L Coyote engine*, or 427/428 FE engine. *Check our parts catalog online for Coyote instructions

Transmission: T5, Tremec TKO.

Rear End: 1987-2004 Ford 8.8" rear axle. 1987-1993 width is optimal

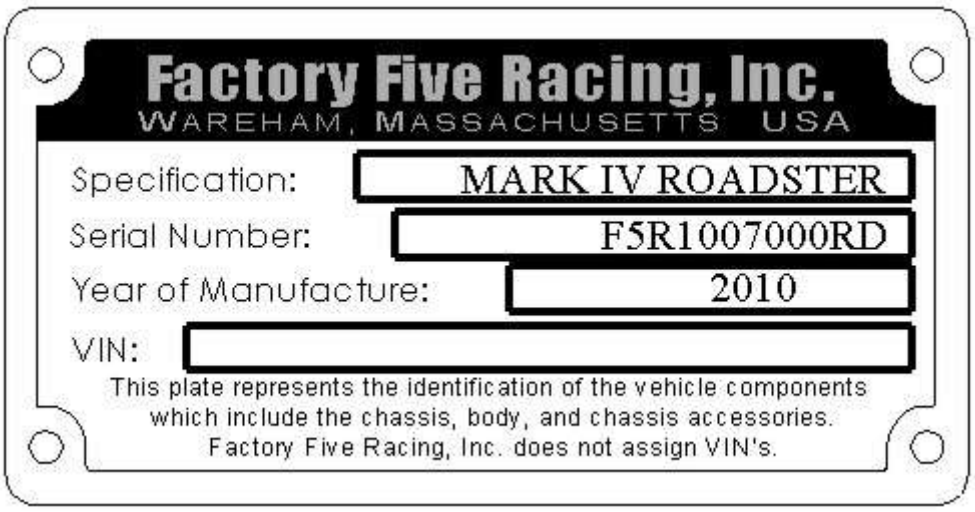
Paint: Most customers will send out the body and paint work to a professional body shop.

Fuel pump: You are responsible for purchasing an external carbureted or fuel injected inline fuel pump.

Battery: We recommend a group 58.

Wheels and Tires: See the appendix for complete recommended sizes.

Serial Number Identification



Factory Five Racing has included a Certificate of Origin along with a Nameplate for your kit. The serial number from the Certificate of Origin matches the number engraved on the 2"x 2" tube going across the car at the front of the cockpit. Below is an example of how the nameplate looks. The VIN number space is provided so that your state issued VIN number can be engraved if you so desire. This can be engraved at any Trophy or mall engraver.

Optional part Instructions

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

www.factoryfiveparts.com/instructions/

Tools 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 more reliable over discount tools.

Storage shelves for kit and running gear parts
Body storage area (can be outside)
SAE and metric socket set, a 52-piece set that includes an 18mm is a good choice
Deep sockets for some common sizes are helpful.
SAE Combination wrench set (3/8"– 15/16")

Metric combination wrench set (10mm – 18mm)
Full set of standard and Phillips head screwdrivers
Standard Hex key set
Long nose pliers, 4.5"
Snap ring pliers
Pop rivet tool with 1/8" and 3/16" heads
Drill
Drill bits (3/32", 1/8", 9/64", 3/16", 7/32", 5/16", 7/16", 1/2")
Driver bit set
Caulk gun
24 oz. Plastic Dead Blow hammer
Razor knife

Wire stripper/crimping tool
7/8", 1¼" and 2¼" hole saws (Body cut outs)

Bench top vise
Tape measure or straight edge ruler/T-square
Hydraulic floor jack
Work Bench or 2 Saw horses with 4'x 8' ¾" Plywood Top
Engine hoist
6' 5/16" chain (to lift engine)
4 Jack stands
Hack saw (metal blade)
¼" & 5/16" Fuel/brake line bender (hand held)
Jig saw (Body cut outs)
Torque wrench (Click style, 3/8" drive)
Eye protection
Gloves
The thing between your ears

Required Supplies

Stick with name brand products like Eastwood®, 3M®, and Duplicolor®. The Eastwood brand coatings are great for bringing weathered and oxidized parts up to show quality. PPG brand and DuPont brand paints are excellent.

_____ Engine degreaser
_____ Silicone Door and window sealant, GE Silicone II or equivalent - 4 tubes
_____ Blue Loctite/Threadlocker – 0.20oz (6ml)
_____ Coolant – 2 gallons of concentrate
_____ Engine oil – 5-8 Qts
_____ Gear oil, 80W-90 (for rear end) – 2 Qts.
_____ Transmission fluid, Mercon automatic Trans fluid – 3 Qts.
_____ Brake fluid, DOT 3 – 1 Qt.

_____ Oil filter
_____ Fuel filter
_____ Battery – Group 58
_____ Spark plugs
_____ 5-minute epoxy glue
_____ Black permanent marker with pointed tip – 2 ea.
_____ 2” Masking Tape – 1 roll
_____ Duct tape
_____ Electrical tape
_____ Bodywork supplies
_____ Rags
_____ Gojo® pumice hand cleaner
_____ Spray paint (pick a color) – 1 can
_____ Acetone, carburetor cleaner, or other solvent
_____ Aluminum polish/cleaner
_____ 3M Super 77 spray adhesive – 1 large can

Helpful Tools

_____ #8 hex driver attachment for cordless drill
_____ Adapter for cordless to use ¼” socket driver
_____ Wire brush or wire wheel attachment for drill
_____ Flare nut wrenches (⅜” x $^{7}/_{16}$”)
_____ Flat file and round file
_____ Scissors
_____ Aluminum snips
_____ Friends
_____ Pizza and beer for previous line item

Chapter

2

Disassembly of the kit

Unpacking Your Kit

- 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 in. The kit is packaged in the order that you will be using the parts.
- 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.
- It is a good idea to work 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:

13203	3-LINK UPPER LINK AXLE MOUNT	EA	1.00
13704	SIDE EXHAUST SIDE MOUNT PLATE	EA	2.00
13531	DOOR LATCH SPACER	EA	2.00
12470	QUICKJACK, LEFT SIDE (HOOK ON OUTSIDE OF CAR)	EA	2.00
12471	QUICKJACK, RIGHT SIDE (HOOK ON OUTSIDE OF CAR)	EA	2.00
12426	DRIVER SIDE 4 INTO 4 SIDE EXHAUST	EA	1.00
12427	PASSENGER SIDE 4 INTO 4 SIDE EXHAUST	EA	1.00

Carpet and Dash

- Razor Knife
- Interior Trim/Carpet Box

If you have the space, unpack your carpet and dash material and lay them out flat to store until you are ready for them. This will prevent difficult wrinkles and creases when you go to install them.
If there are small wrinkles in the dash, place it outside in the sun and they should disappear.

Body Removal

🛠 ⅝” socket, Ratchet, ⅝” wrench, gloves, 2 friends.

✋ Be careful of the raw fiberglass edges, they can splinter into your skin

Unbolt the door from the hinge leaving the hinge attached to the chassis. Cut the zip ties in the door latch area.

Remove the hood and unbolt the trunk from the chassis.

Unbolt the body sides from the chassis on the underside of the car.

Unbolt the Quick Jacks and remove the body. Two people can do this but it is much easier with a third person to pull the sides clear of the chassis.

When you store the body on the ground (unsupported) for long periods of time you may get slight distortion (bowing) around the walls forward of the doors. In order to avoid the chance of this happening, we recommend putting two short 2"x 4" braces (24" long) under the windshield holes

(running vertically to support the hood cowl area just forward of the doors under the windshield holes). Use these 2”x 4” ’s whenever the body is on the ground, otherwise make a body buck to support it. A body buck diagram is in the appendix. The dimensions do not have to be exact. A rough shape is all that is needed to hold the body.

Body buck

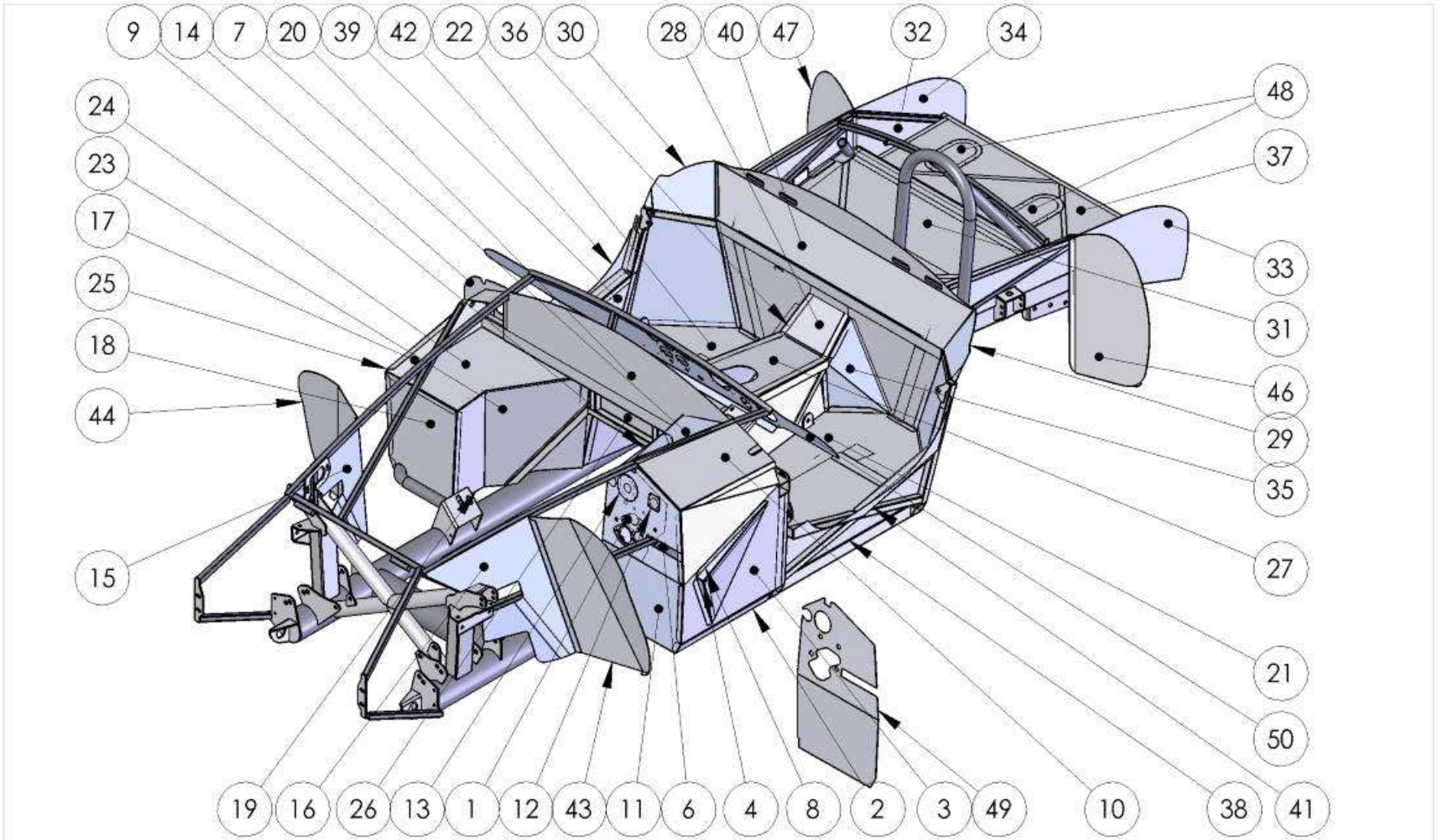
Aluminum Removal

🛠 ¼” nut driver, jack stands, marker.

✋ Do one panel at a time. Be careful of the sharp aluminum edges, they can cut you.

Using a marker outline the underside of each panel where it contacts the chassis. This is done to locate where to drill rivet holes when the panels are permanently mounted later on.

Mark each panel and take pictures of how the panels fit together (i.e. which is on top). Remove each panel after it has been marked until the chassis is bare. Keep the #8 screws to help with aluminum positioning later during build-up.



	UNLESS OTHERWISE SPECIFIED:		NAME	DATE
ROADSTER	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	JI	2010
		COMMENTS:		
	MATERIAL			
USED ON	FINISH			
APPLICATION		PRINTED	11/1/2019	

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Factory Five Racing, Inc.

TITLE:

ROADSTER KIT

SIZE	DWG. NO.	REV
A	10500 kit	mk4
SCALE: 1:18	WEIGHT:	SHEET 1 OF 5

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	13806	BRAKE MASTER CYLINDER FILL PLATE	1
2	12985	LEFT SIDE DROPPED FLOOR	1
3	15966	LEFT FOOTBOX, VERTICAL WALLS, OUTSIDE	1
4	15968	LEFT FOOTBOX OUTSIDE WALL EXT. FLNG, INSIDE	1
5	15969	LEFT FOOTBOX, VERTICAL WALL, INSIDE, TOP	1
6	15970	LEFT FOOTBOX, VERTICAL WALL, INSIDE	1
7	15973	LEFT FOOTBOX, TOP INSIDE	1
8	15967	LEFT FOOTBOX OUTSIDE WALL EXT. FLANGE, OUTSIDE	1
9	15521	LEFT FOOTBOX TOP INSIDE COVER	1
10	10858	LEFT FOOTBOX, TOP/OUTSIDE SECTION	1
11	16736	LEFT FOOTBOX FRONT- WILWOOD START 1/1/19	1
12	15802	WILWOOD PEDAL CLUTCH HOLE COVER	2
13	12407	FRONT HARNESS BLOCK-OFF PLATE	1
14	10963	ALUM PANEL, FIREWALL EXTENSION, RIGHT SIDE	1
15	10863	16671 - ENGINE BAY "F", RIGHT	1
16	10864	10864 - ENGINE BAY "F", LEFT	1
17	15015	RIGHT FOOTBOX, TOP/OUTSIDE	1
18	13138	RIGHT FOOTBOX, FRONT VERTICAL WALL	1
19	13634	RIGHT FOOTBOX, DROPPED FLOOR	1
20	10559	FIREWALL PANEL	1
21	10557	COCKPIT FLOOR, LEFT SIDE, W/TUNNEL WALL	1
22	10558	COCKPIT FLOOR, RIGHT SIDE, W/TUNNEL WALL	1
23	13139	RIGHT FOOTBOX, VERTICAL WALL, INSIDE WALL	1
24	10853	RIGHT FOOTBOX, TOP	1
25	10551	RIGHT FOOTBOX, VERTICAL WALL, OUTSIDE WALL	1
26	12806	TRANS TUNNEL FRONT VERTICAL WALL	1
27	10563	TRANSMISSION TUNNEL TOP COVER	1
28	10906	U-JOINT COVER	1
29	15022	15020 - COCKPIT REARCORNER, LEFT	1
30	15022	15021 - COCKPIT REARCORNER, RIGHT	1
31	10560	FRONT TRUNK FLOOR	1
32	15223	TRUNK WALL REAR SIDE COVER	2
33	15402	OUTSIDE TRUNK WALL, LEFT	1
34	15403	OUTSIDE TRUNK WALL, RIGHT	1
35	14583	TRANS TUNNEL, REAR CORNER, LEFT	1
36	13247	TRANS TUNNEL, REAR CORNER, RIGHT	1
37	15222	REAR TRUNK FLOOR	1
38	14582	COCKPIT SIDE, UNDER DOOR, LEFT	1
39	13642	COCKPIT SIDE, UNDER DOOR, RIGHT	1
40	10823	REAR COCKPIT VERTICAL WALL	1
41	13803	COCKPIT SIDE, UNDER DOOR, TOP, LEFT	1
42	14584	COCKPIT SIDE, UNDER DOOR, TOP, RIGHT	1
43	10861	SPLASH GUARD, LEFT	1
44	14587	SPLASH GUARD, RIGHT	1
45	15016	FUEL STRAP BLOCK OFF PLATE	1
46	14585	REAR SPLASH GUARD, LEFT	1
47	14586	REAR SPLASH GUARD, RIGHT	1
48	12959	BLOCK OFF PLATE	2
49	10904	LEFT FOOTBOX, FRONT - MUSTANG PEDALS	1
50	13544	CUT DASH	1

Use jack-stands to position your frame in your workspace with plenty of room to move things around.

Chapter

3

Chassis Assembly

Rivet Spacing Tool

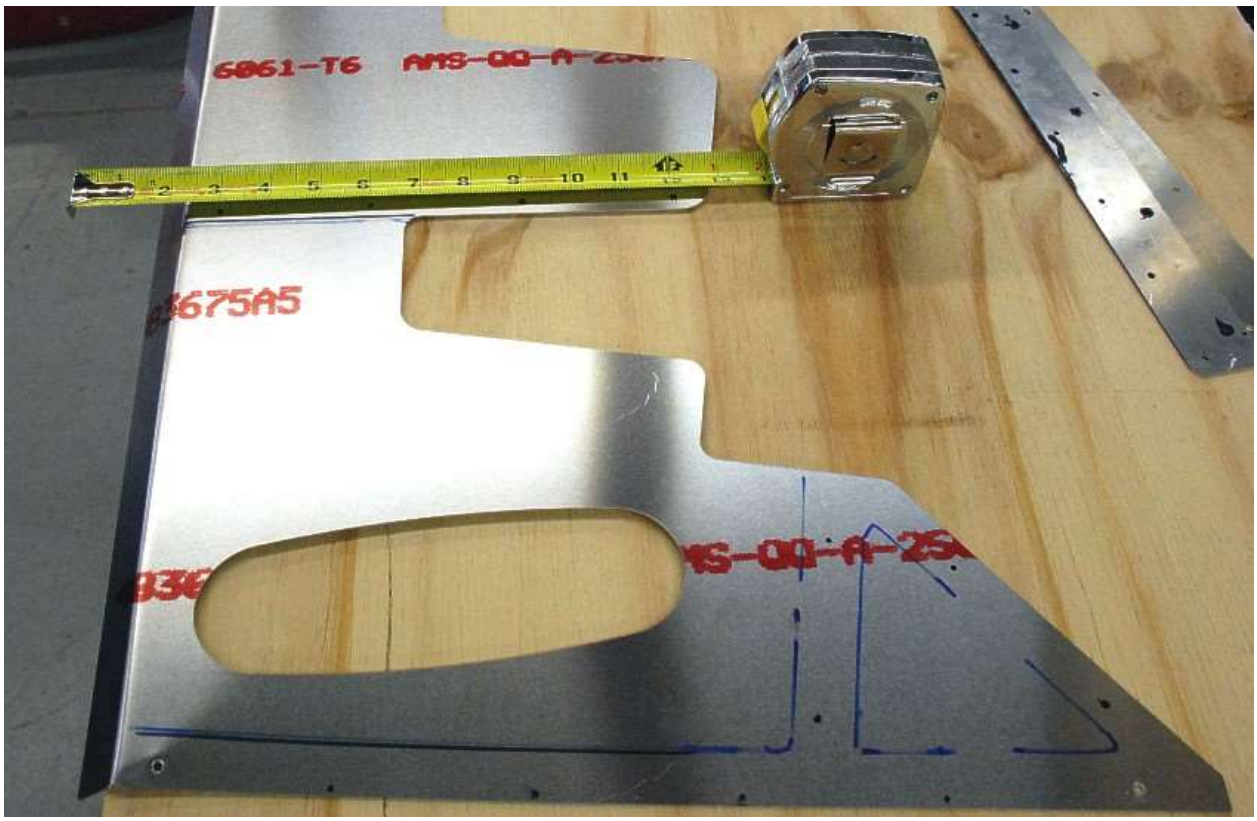
Packaged Aluminum

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

Use the ⅛” rivets for all of the aluminum panels unless otherwise directed.

Engine bay F panel aluminum

Marker, 1/8” drill bit, drill, Rivet gun, Silicone, Caulking gun, brake cleaner or acetone
Secondary Body Fasteners



The “F” shaped aluminum panels that mount behind the suspension are mounted first. Locate them and mark your rivet pattern in the location you traced.

Drill the panels using a 1/8" bit then clean the marker lines and labeling off using acetone or brake cleaner.

Apply silicone to the panel or chassis (whichever is easier) in the areas where they will make contact.

Use the original #6 screws to remount the panel then drill the 1/8" rivet holes through the panel holes into the chassis.

Rivet the panel in place using 1/8" short rivets, then remove the screws and replace them with rivets.

Repeat for the other side.

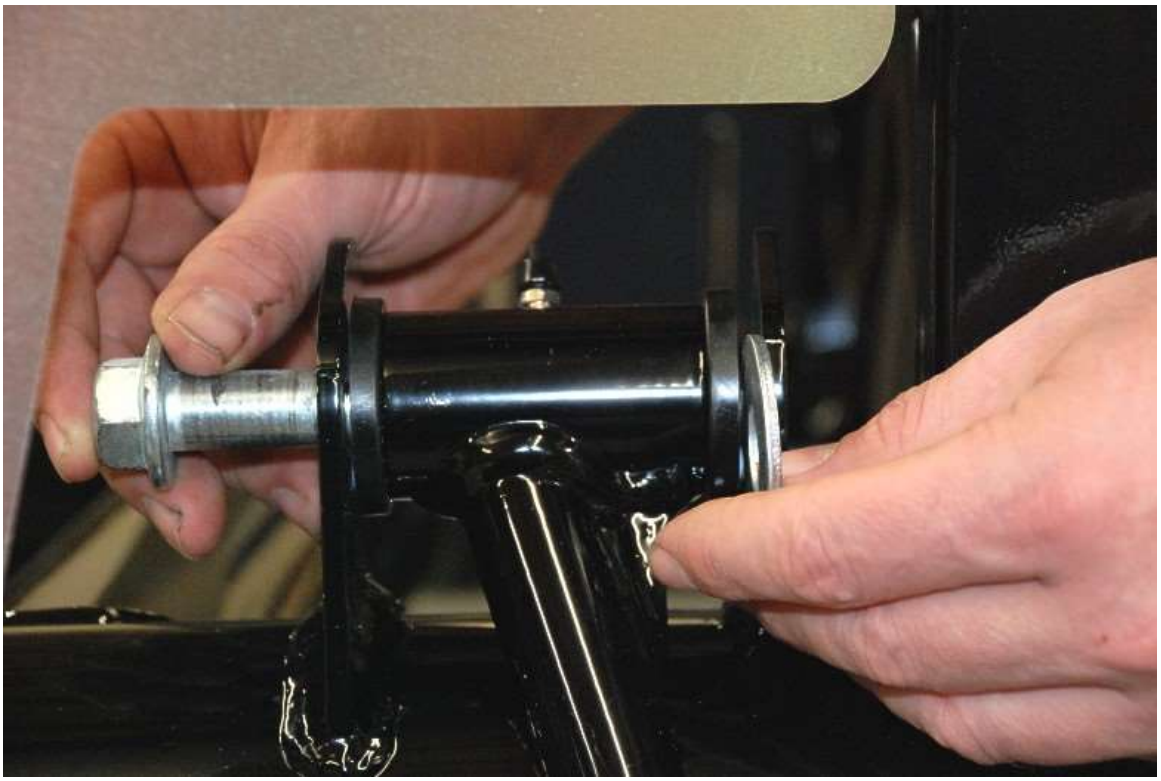
Front lower control arm

🛠 ⅞" socket, 5/16", 15/16" wrenches, Torque wrench
🚘 Front lower control arm assembly

Unpack the front lower control arms and hardware.

Screw the grease fittings into the arms using a 5/16" wrench.

Mount the lower control arms using the outer set of holes on the chassis using the supplied hardware.



The rear bushing mount on the chassis is wider to be able to accept OEM arms so use the large shim washers provided to take up the extra space.

While holding the arm parallel to the ground, torque the bolts to **135-149Nm (100-110 lb-ft)**.

Front upper control arm

🛠 Vise, Thread locker, ⅜”, ¾” wrench, ¾” socket, Torque wrench
🚘 IFS components

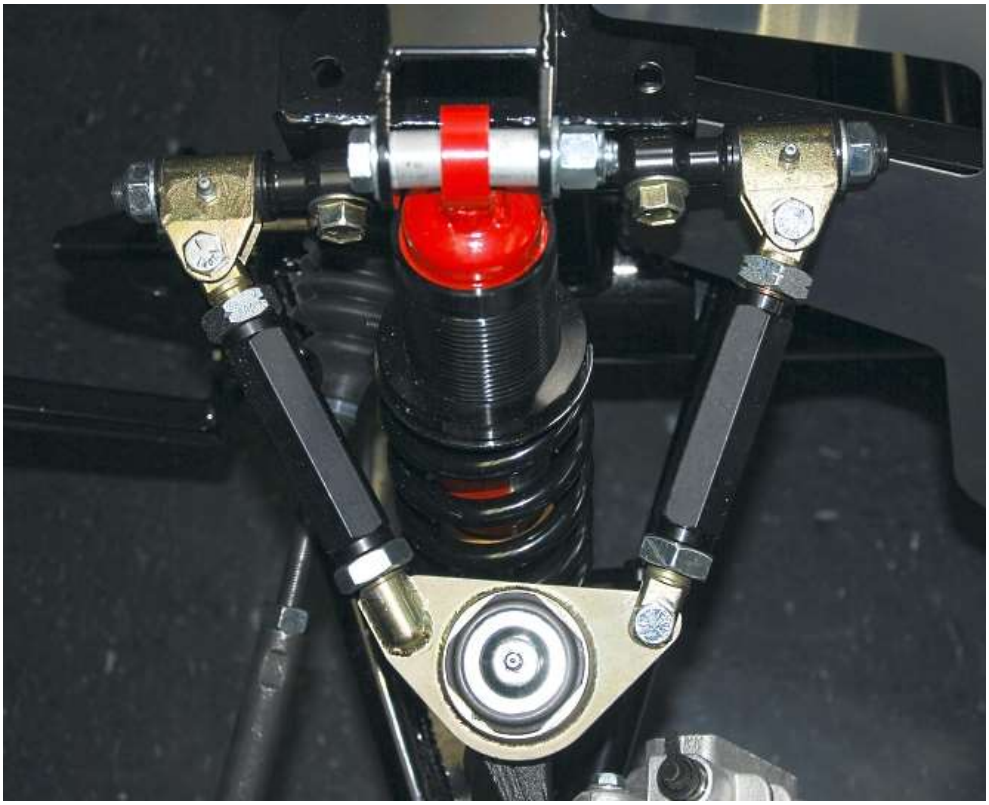
Unpack the upper control arm assembly.

Put thread locker on the upper balljoint threads.

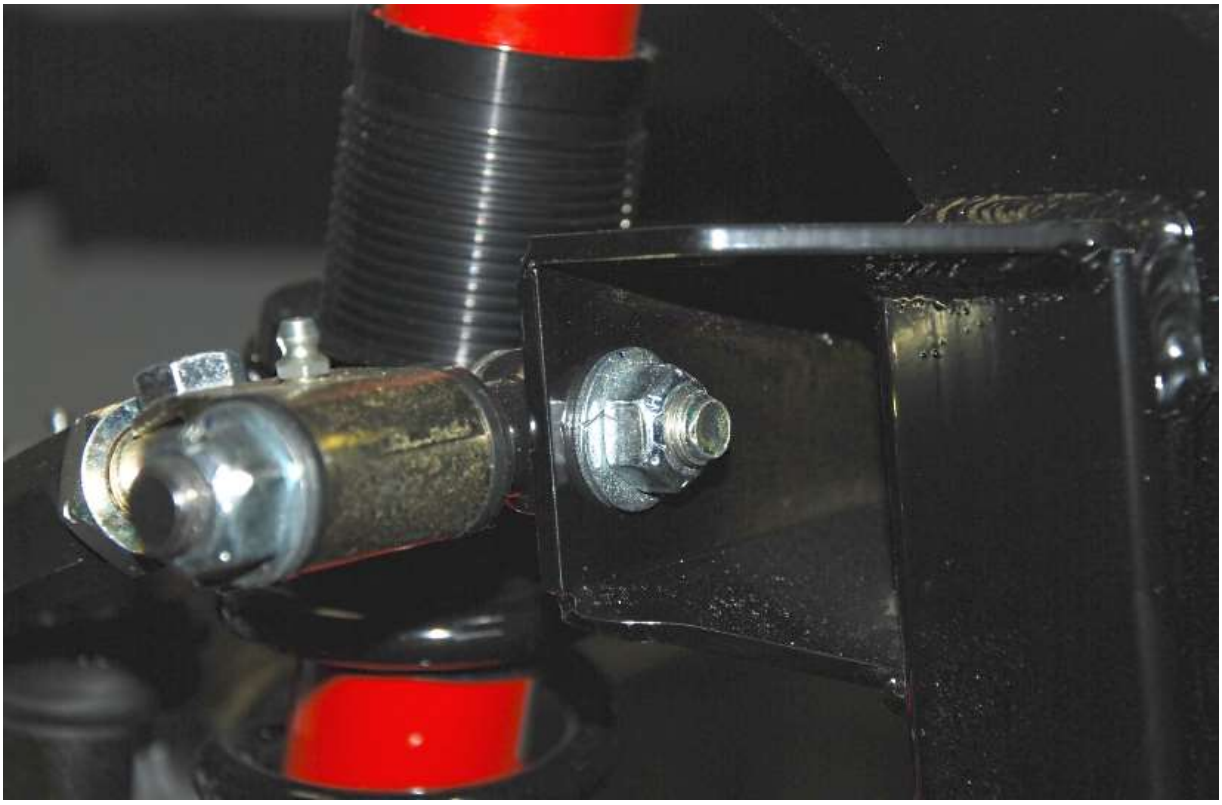
Screw the upper ball joints into the control arms so that the balljoint angles out on the bottom

Tighten the balljoint using the arm for leverage with a Vice holding the ball joint.

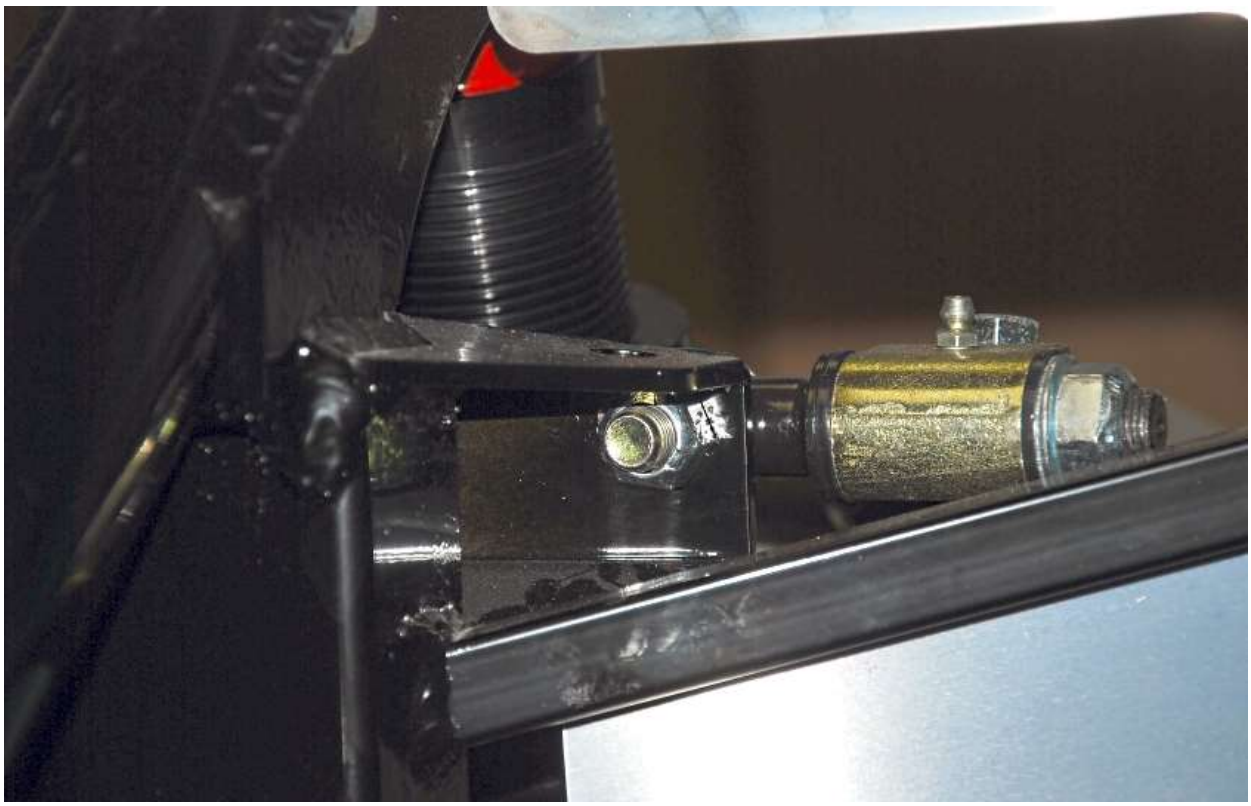
Screw the grease fittings in to the ball joints and tighten with a ⅜” wrench.



Mount the upper control arms to the chassis with the grease fittings pointed up. Use the mount holes that are vertical on the side of the 2”x 3” tube, not the top horizontal ones.



Use a washer with the front locknut.



Do not use a washer on the rear locknut.

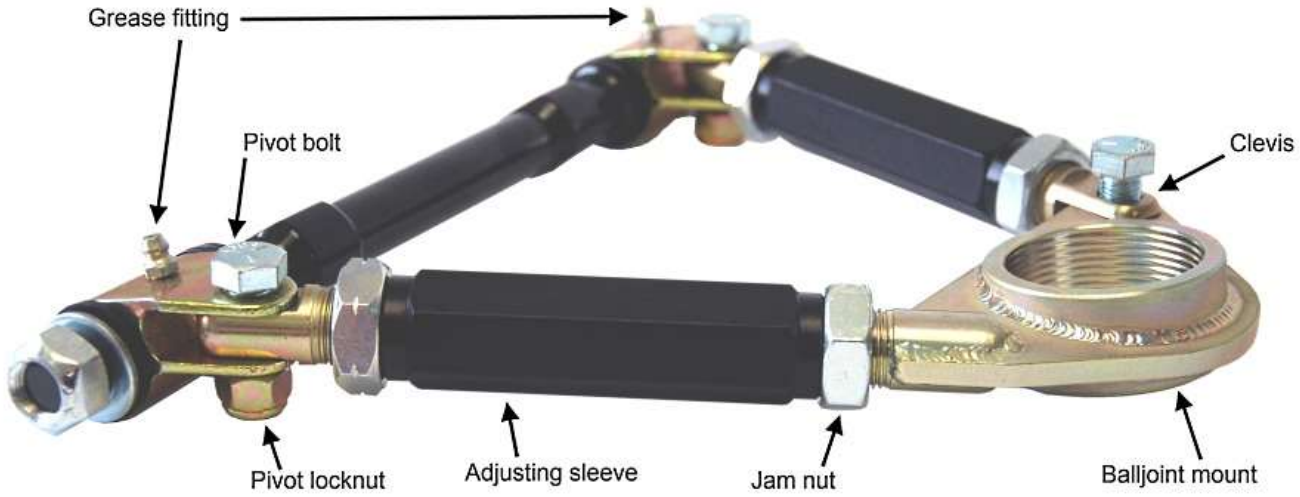
Torque the two bolts that hold the arm to the frame to **108-115Nm (80-85 lb-ft).**

Pivot endplay

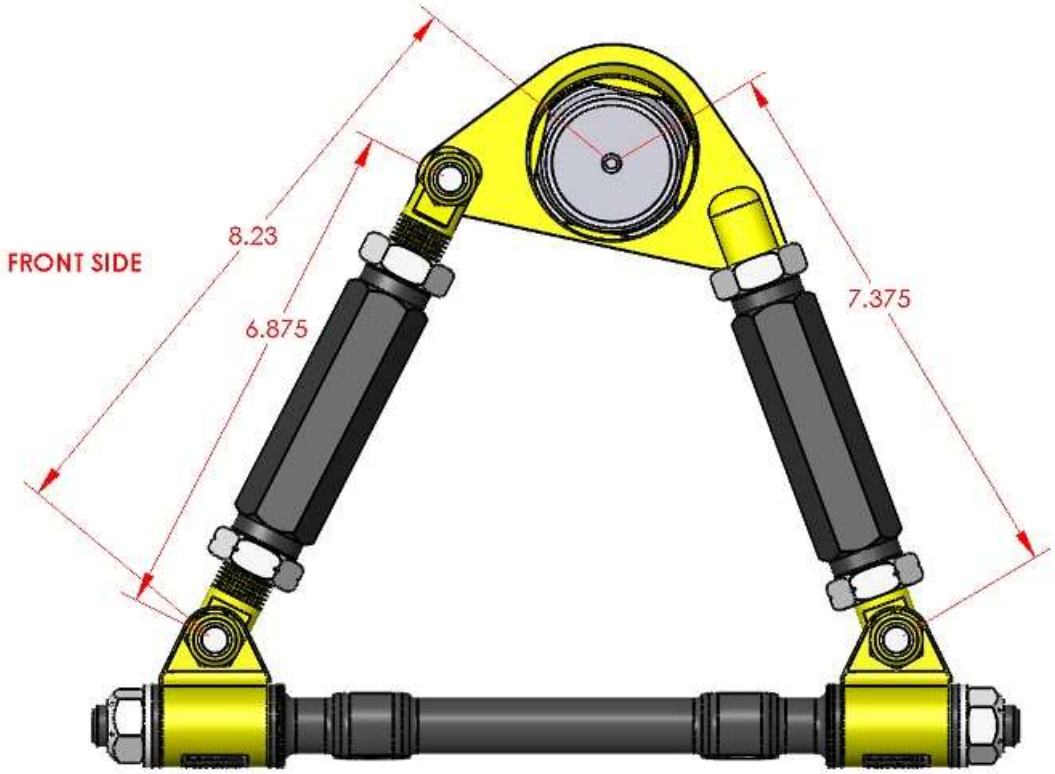
Adjust the locknuts on the ends of the pivot shaft so that there is minimal endplay but so the pivots can still rotate easily on the shaft.
The pivots may be a little stiff at first but once on the car they will loosen slightly.

Adjusting the upper control Arm

✋ Use the diagram below for reference.



Slightly loosen the three pivot bolts using a ⅝" and $^{11}/_{16}$" wrench.
Loosen the jam nuts on both ends of each adjusting tube using a 1⅛" wrench. Turn the adjusting tubes to lengthen or shorten the arm.



For a rough alignment using power steering (high caster) use the measurements above until you can get the car aligned. This picture shows the right side. Left side will have the solid side of the balljoint plate on the front side.

After you have adjusted the arm to the desired length, tighten down the jam nuts against the adjusting tubes, and then tighten each of the three pivot bolts. Torque the pivot bolts to **54 lb-ft**.
Grease both ends using chassis grease frequently to insure smooth, trouble free operation.

- If the pivots will not take grease, the endplay may be too tight.
- There should never be more than 1" of thread showing past the tightened down jam nuts on either end of both adjusting tubes.

The Pivot Bolts must be loosened while the car is being aligned and retightened afterwards

Front Coil-Over Shock Assembly

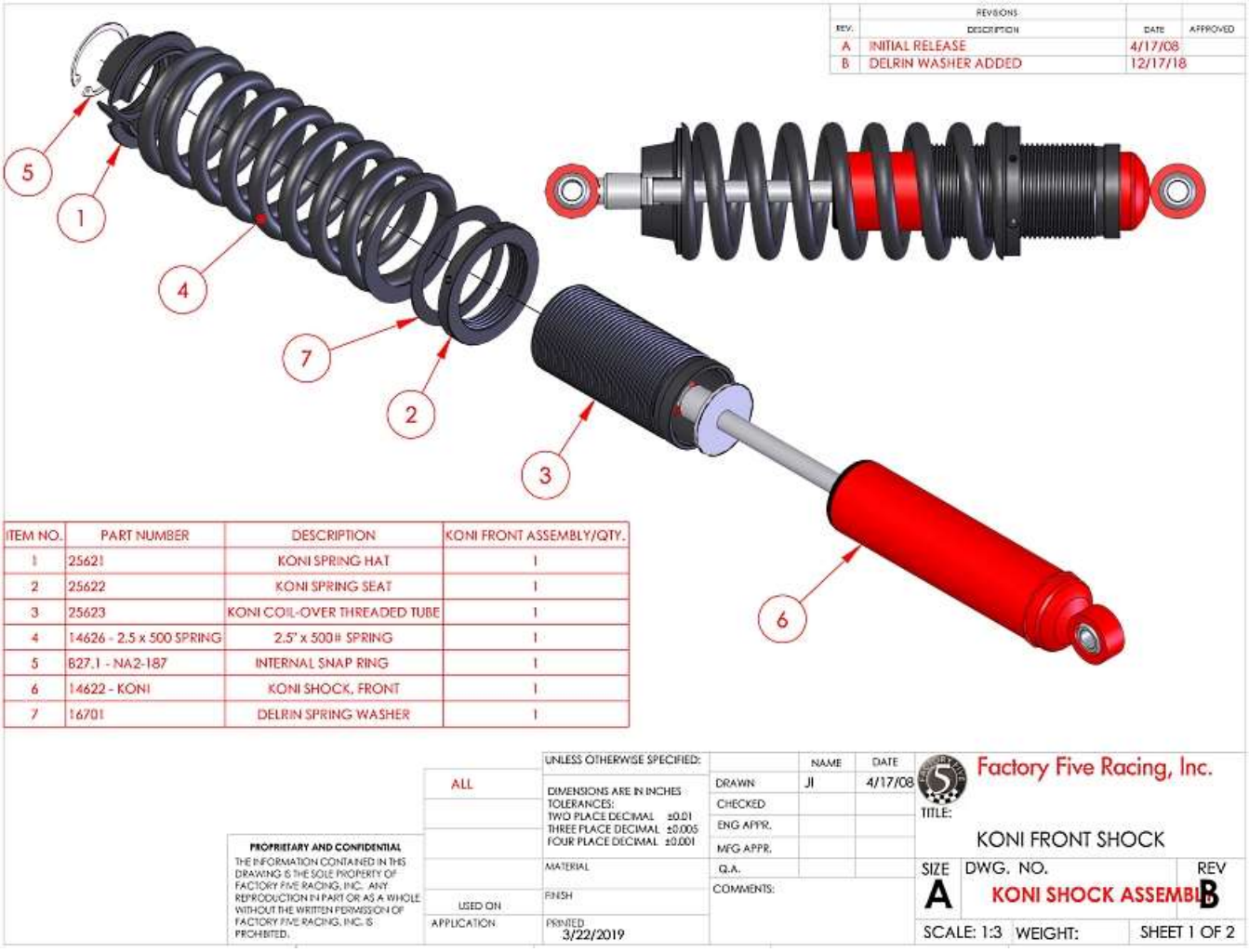
- Snap ring pliers, ¾" wrench, ¾" socket, Ratchet, Torque wrench, chassis or lithium grease.
- Front shock set, IFS Components, Insulated clip hardware.
- The front shocks are pre-valved at the factory in compression and rebound for good street use. The shocks can be adjusted in rebound as per Koni's instructions if so desired. The front springs are 500lb. Other springs are available for different ride characteristics.
- WARNING! Incorrect assembly and maintenance of this part can cause serious injury or death.
- The front shocks extended measurement is 15.15" center to center. They are 2.50" shorter than the rear 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 (shown without tube)

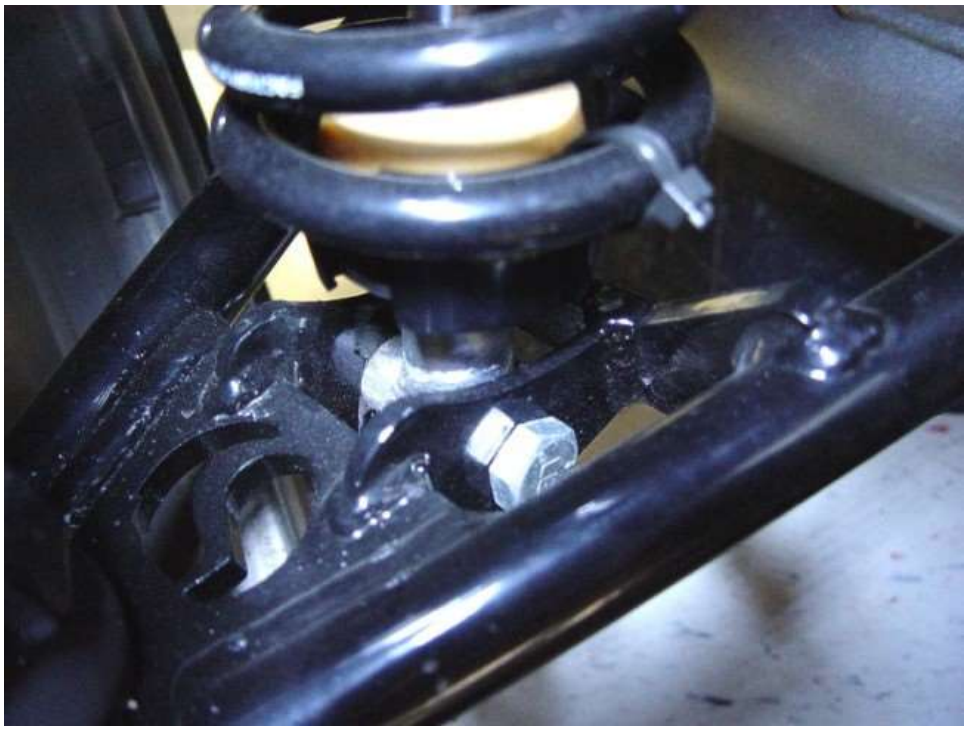
Slide the rubber bumper about two inches down on the shaft.

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.

Pass the shock assembly (**with the body of the shock up**) through the upper A-arm and attach them to the lower control arm using the 0.43" spacers that are supplied in the kit.

Check for shock clearance on brake lines, emergency brake cables, brake calipers, frame and axle parts. 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.

- If using the silver double adjustable shocks, these must be mounted with the body of the shock down in the top hole location.
- For the stock red Koni shocks, use the **lower** holes.

Fasten the shock to the top mount with the fasteners and 0.675" spacers provided and torque both upper and lower mounts to **40 lb-ft**.

Spindles

- $^{13}/_{16}$" socket, Torque wrench, Needle Nose Pliers, Rubber Mallet
- Spindle Assembly, IFS components.

Unpack and lay out the hardware for the spindle's assembly.

The spindles are marked DSS (Driver Side Spindle) and PSS (Passenger Side Spindle). These refer to the way they are mounted on the FFR Hot Rod which is rear steer. The FFR Roadster uses these as Front steer so they are mounted opposite, The DSS spindle is mounted on the Passenger side and the PSS spindle is mounted on the Driver side.

Make sure the grease boot is in place on the balljoint then mount the spindle to the lower control arm.

Place the spacer under the castle nut to ensure that the cotter pin is at the correct height. Torque to **108-122Nm (80-90 lb-ft)** and install the cotter pin.

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

The upper ball joint boot will look crushed and out of shape when the car is in the air, this is OK. The boot will seat when the car is on the ground.

Bolt the steering arms to the spindles so the tie rod end will mount from the bottom. Torque to **60 lb-ft**.

The hub is a snug fit on the spindle and may require a light tap with a soft mallet to get in place. Torque the hub nut to **305-338Nm (225-250 lb-ft)**.

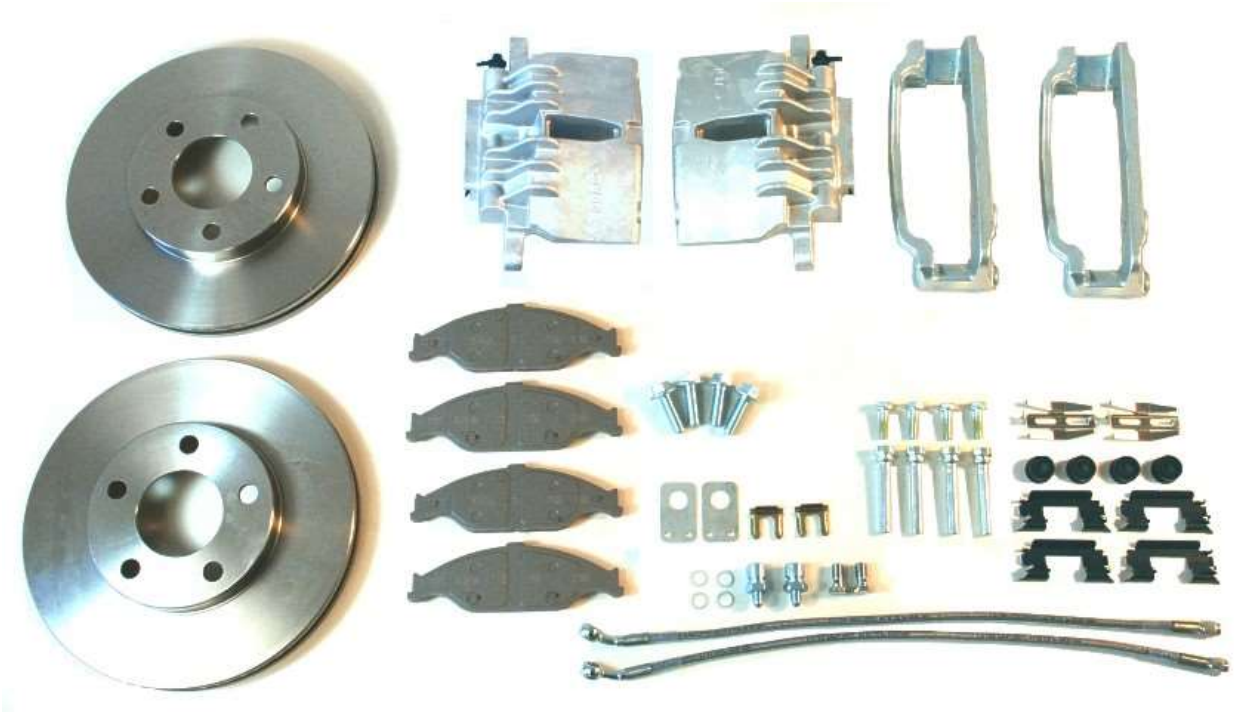
Using a large socket or a flat head screwdriver and rubber mallet, hit the dust cap onto the hub.

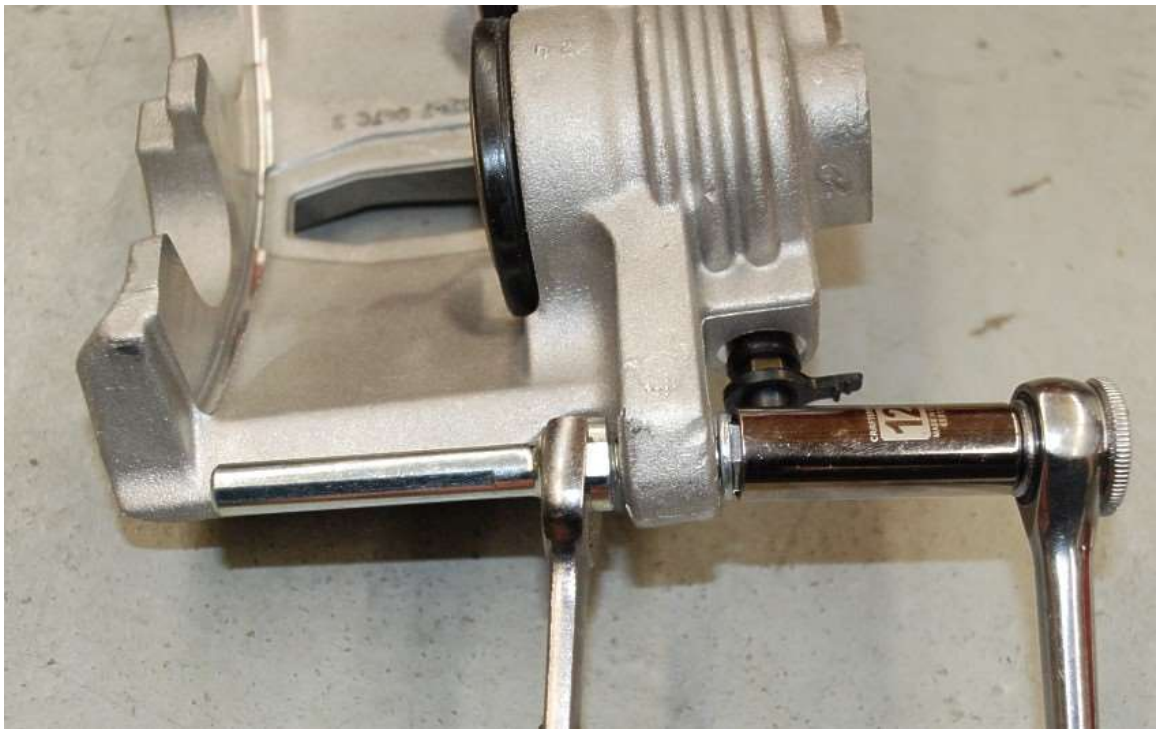
Front Suspension Torque Specs Chart

Item	Nm	Lbft
Front lower control arm to frame	135-162	100-110
Front lower ball joint to spindle	108-122	80-90
Upper A-arm to frame	108-115	80-85
Upper A-arm pivot bolts	73	54
Upper ball joint to Spindle	95-108	70-80
Spindle hub nut	305-338	225-250
Spindle steering arm to Spindle	81	60

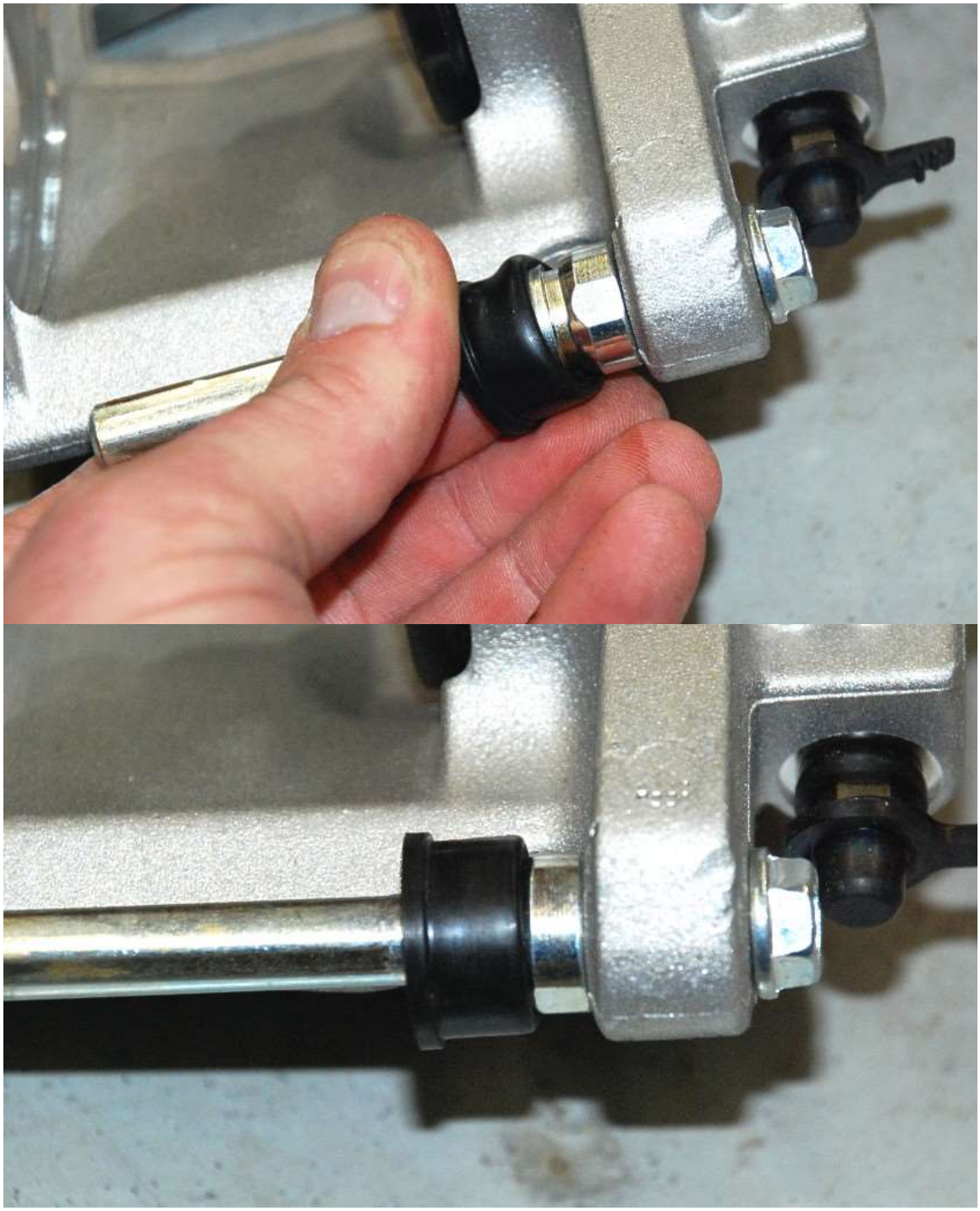
Front Brakes

- 12mm socket, Ratchet, 16mm wrench, Torque wrench, thread locker
- Front 11” Caliper/Rotor Assembly
- Check out www.factoryfiveparts.com for Wilwood brake options.



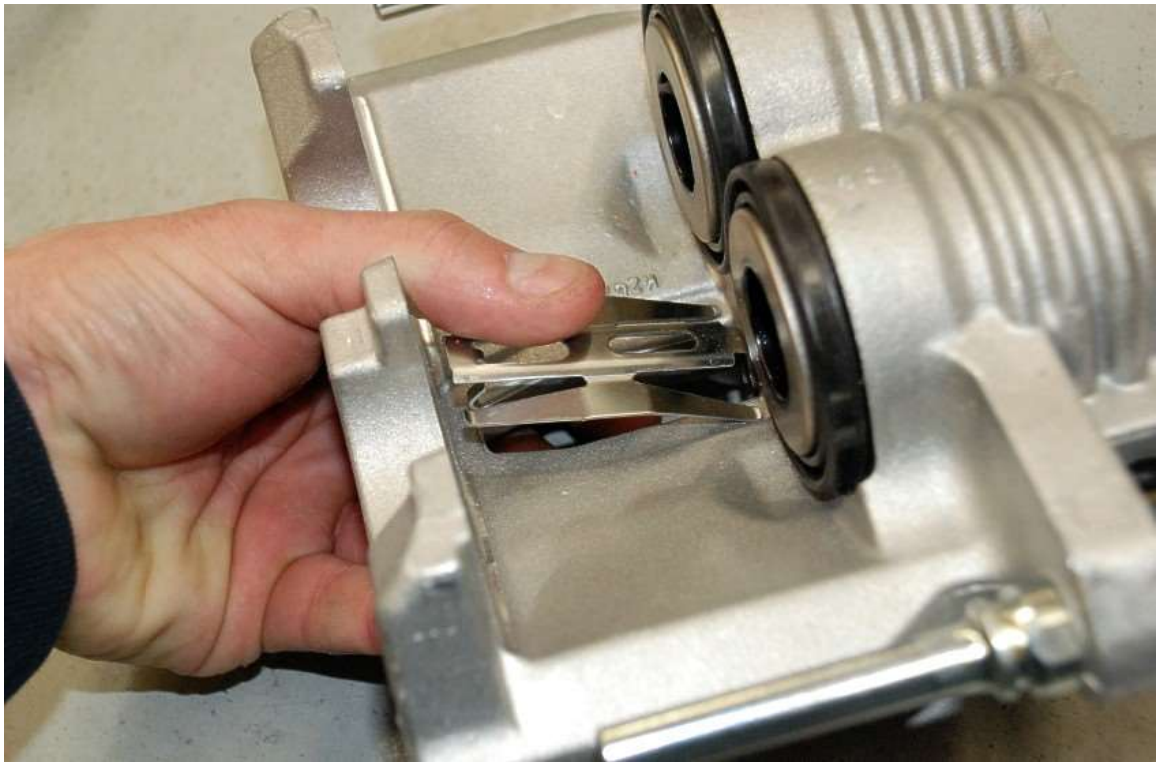


Install the caliper slider pins on the caliper using the supplied bolts and a 16mm wrench and 12mm socket. Torque to **23-26 lb-ft**.



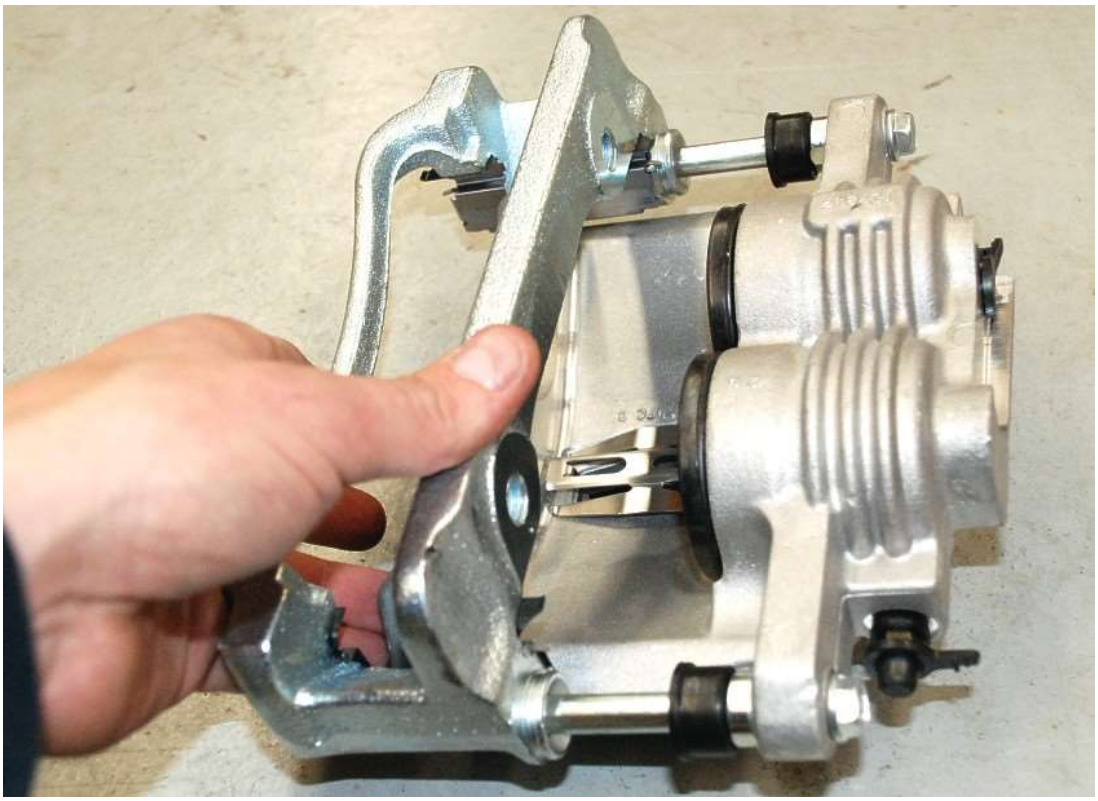
Install the slider grease boots on the slider pins.

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.

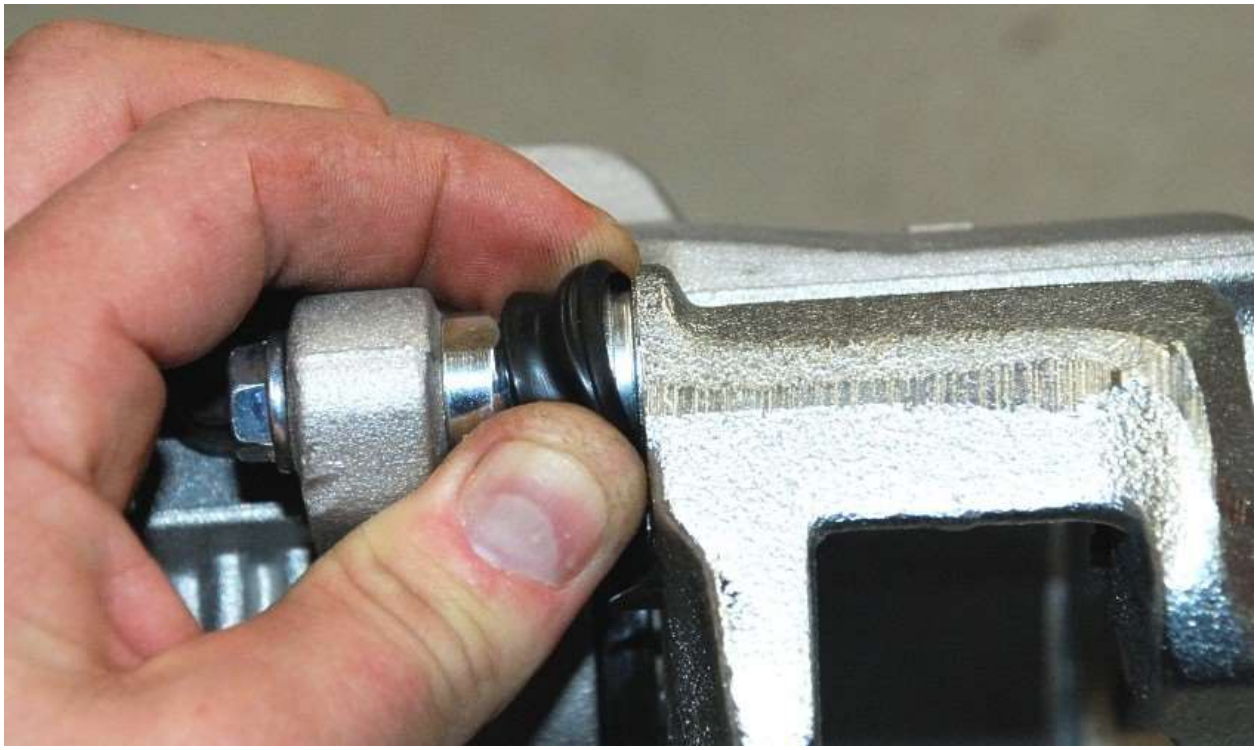


The two clips that are left go in the center of the caliper with the tab sticking up through the center hole. Insert the clip from the inside of the caliper through the large center hole with the larger tab on the side facing the pistons then press down on the outer part of the clip so the small clip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

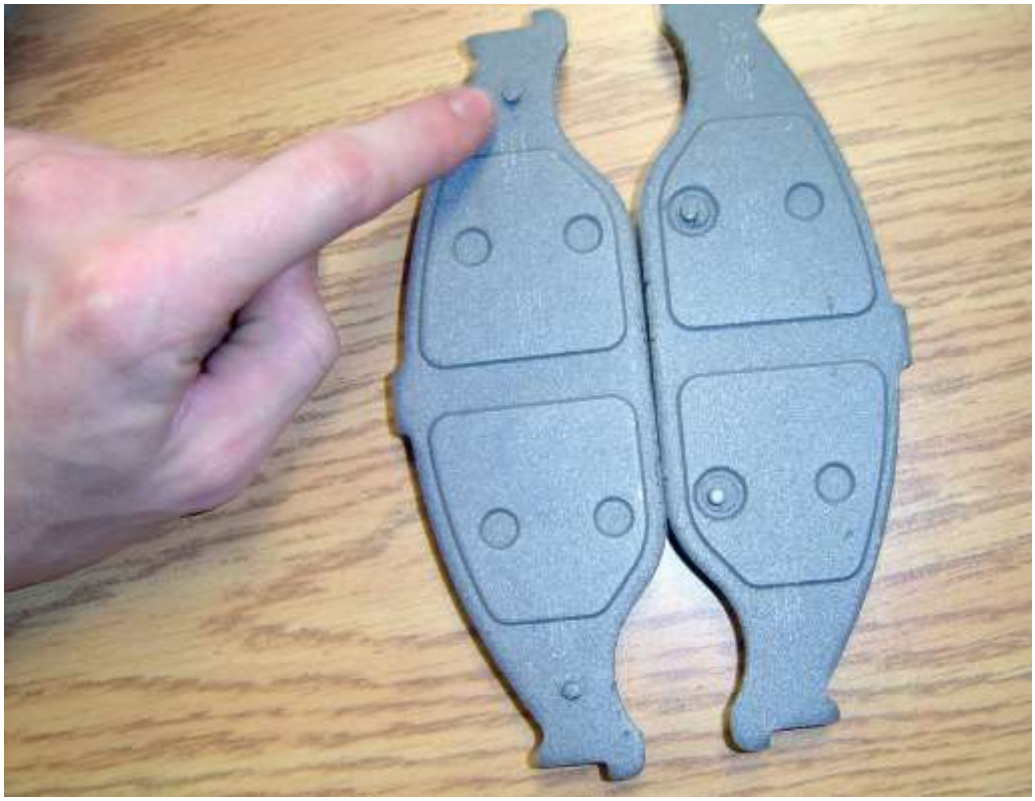
Grease the slide pins using the supplied grease.



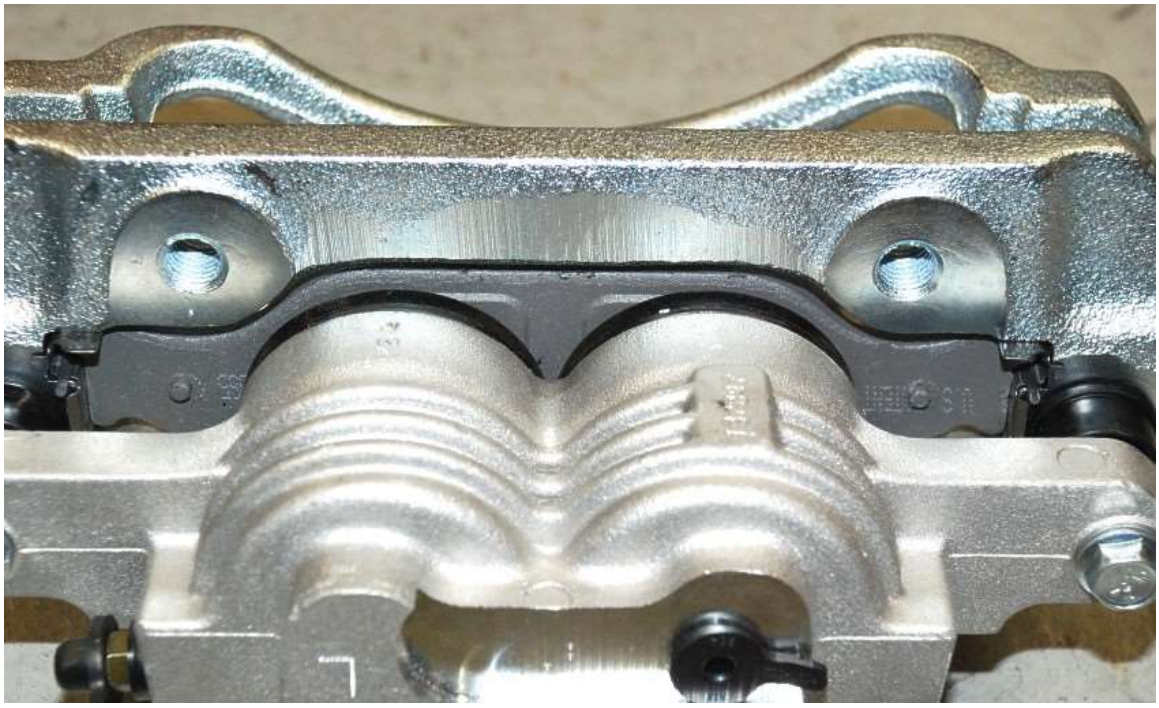
Slide the caliper hanger onto the caliper.



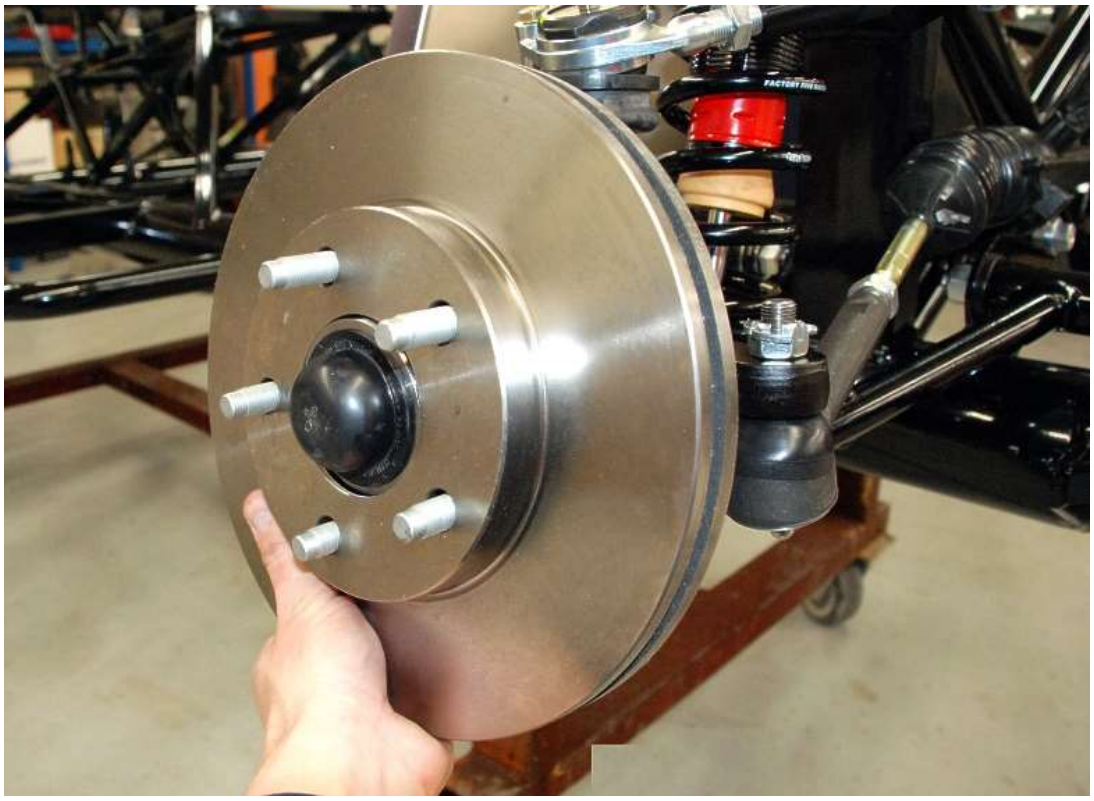
Push the rubber boots over the lip on the caliper bracket to seal the slider bolts correctly.



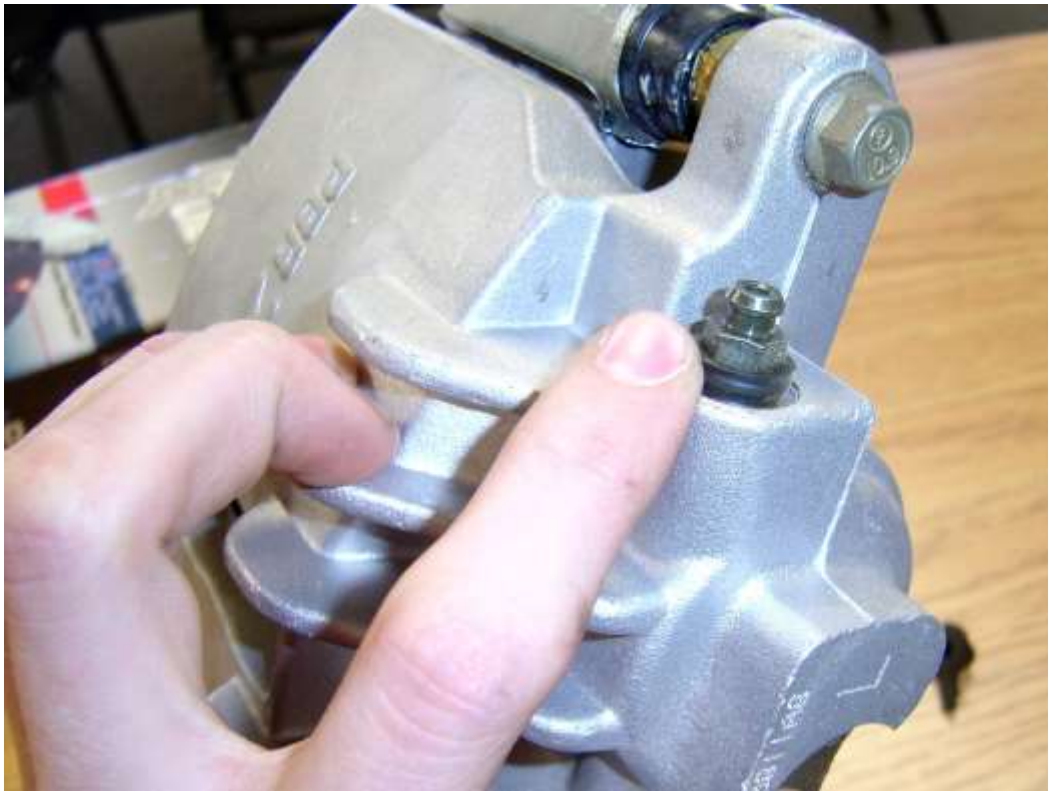
Look at the back side of each brake pad to find the inside pads and the outside pads. The difference is the location of the studs that are on the back of each pad. The studs on the inside pads are out near the ends of the pad, while the studs on the outside pads are near the middle.



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. Torque the caliper mounting bolts to **130Nm (95 lb-ft)**.

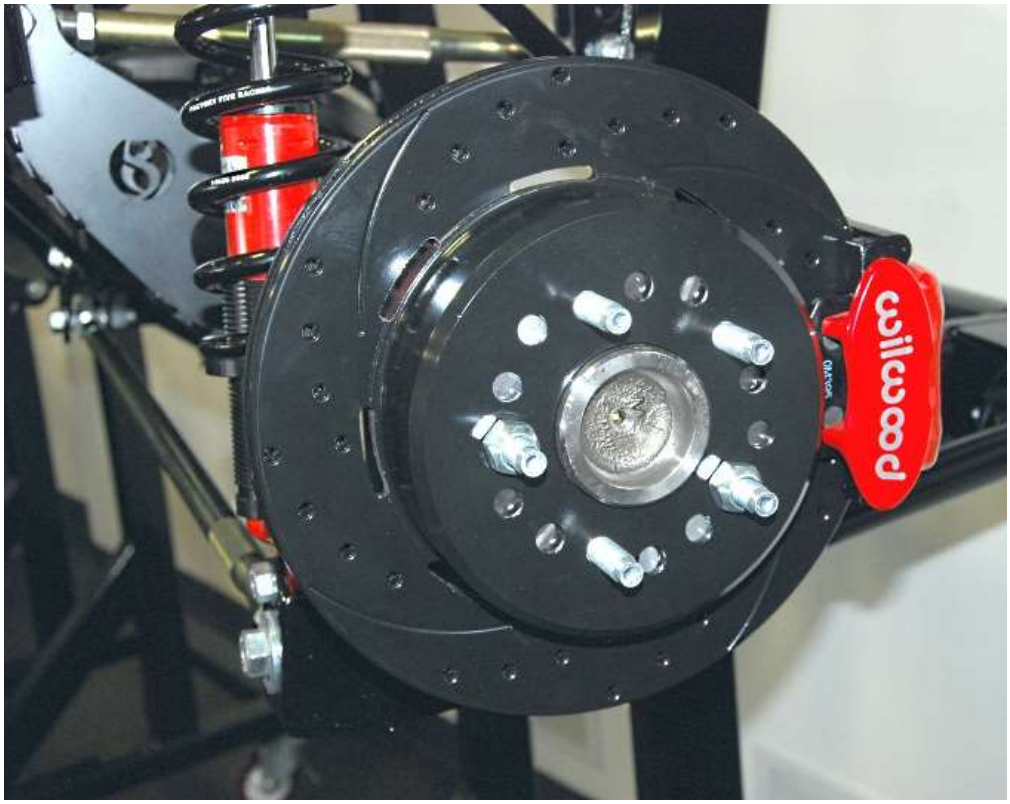
Solid Axle Rear Suspension

- Skip to the Independent Rear suspension if not installing a Solid axle.

Two bolts are included with the control arms, the other two are included in the kit with the Traction Lok Brackets.

Solid Axle Preparation

- ¾” sockets, ¾” wrench, ½” drill bit, drill, floor jack, jack stands, Torque Wrench
- 8.8” Rear axle assembly, Box 11 Solid axle Traction Lok brackets, Rear control arms.
- Use caution when working with the rear end assembly, it weighs 225 lbs.
- Two bolts are included with the control arms, the other two are included in the kit with the Traction Lok Brackets.



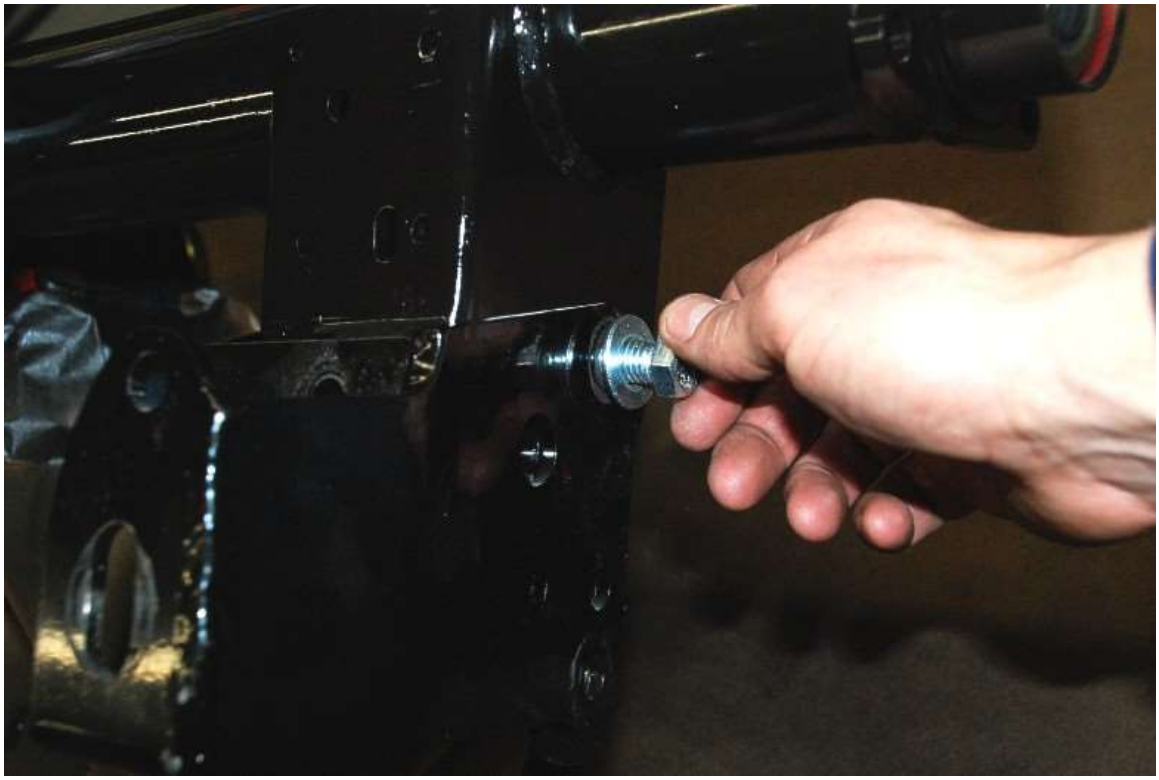
If not on the axle, attach the desired rear brakes to the axle.

- Check out the Appendix for the optional FFR brake install or www.factoryfiveparts.com for Wilwood brake options.

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.

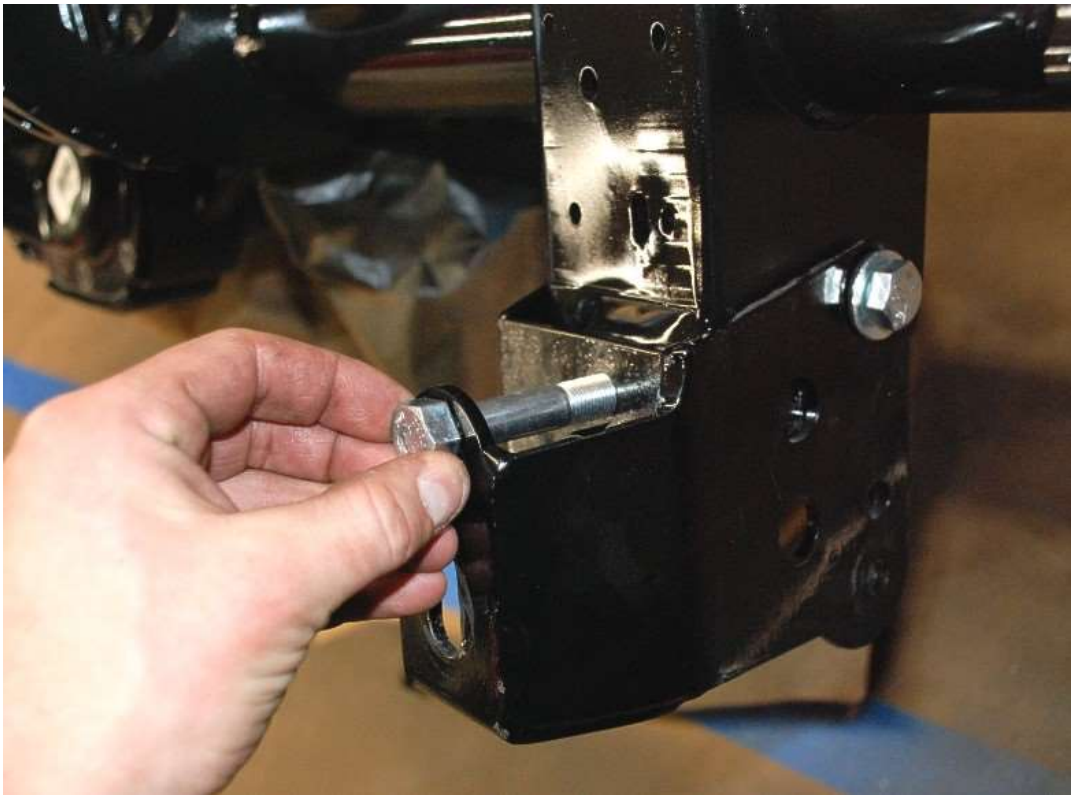
Drill the lower control arm mount holes with a ½" drill bit.



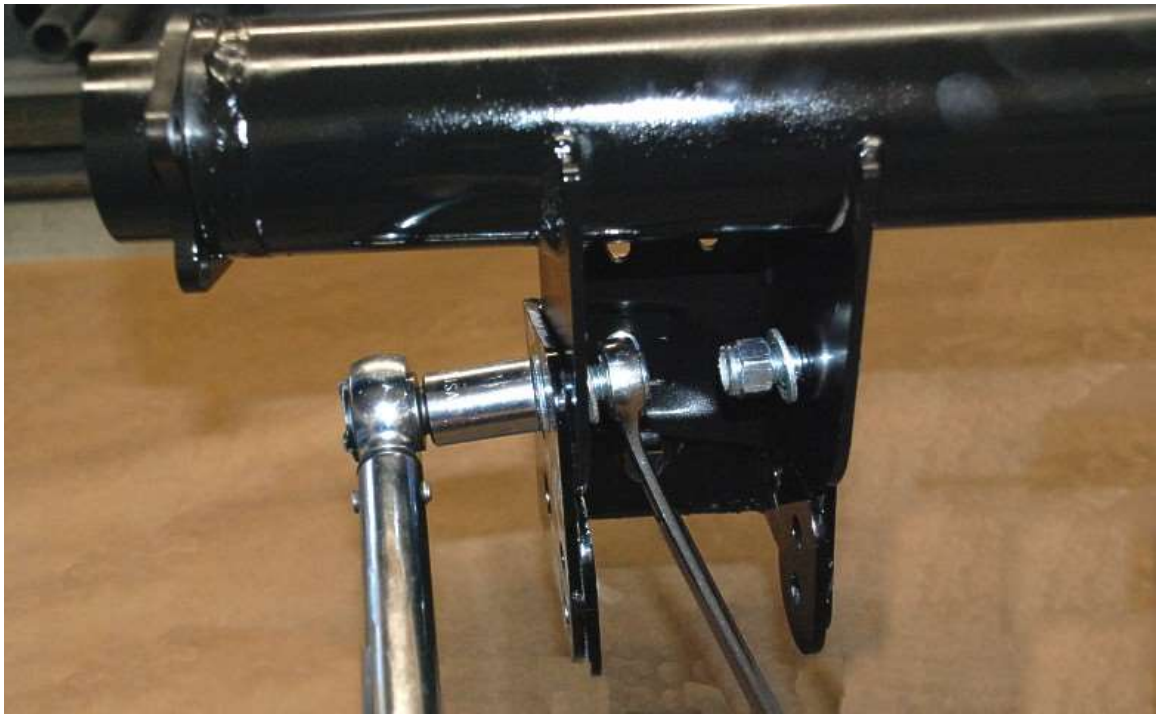
Position the Traction Lok brackets on the rear end with the bolts provided (the two short bolts go on the sides).

Axle Bracket Driver's Side

Axle Bracket Passenger Side



Temporarily put the lower shock bolt through the traction lock bracket and stock shock hole on the 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. Torque to 101-111Nm (**75-82 lb-ft**)

The lower bolt holes provide more traction than the upper holes.

3 Link Rear Suspension

🛠 $^{3}/_{16}$”, ⅜”, ½” drill bits, ⅝”, ¾”, $^{15}/_{16}$”, 1” wrenches, ⅜”, ⅝”, ¾”, $^{15}/_{16}$” sockets, $^{5}/_{16}$” Hex key, Ratchet, Torque Wrench, Drill, Ruler/Tape measure, Pliers, Flat head Screwdriver, Tin Snips/scissors/razor, Marker.

🚘 3-Link rear suspension with kit.

✋ The Panhard bar frame mount is mounted to the chassis during shipping

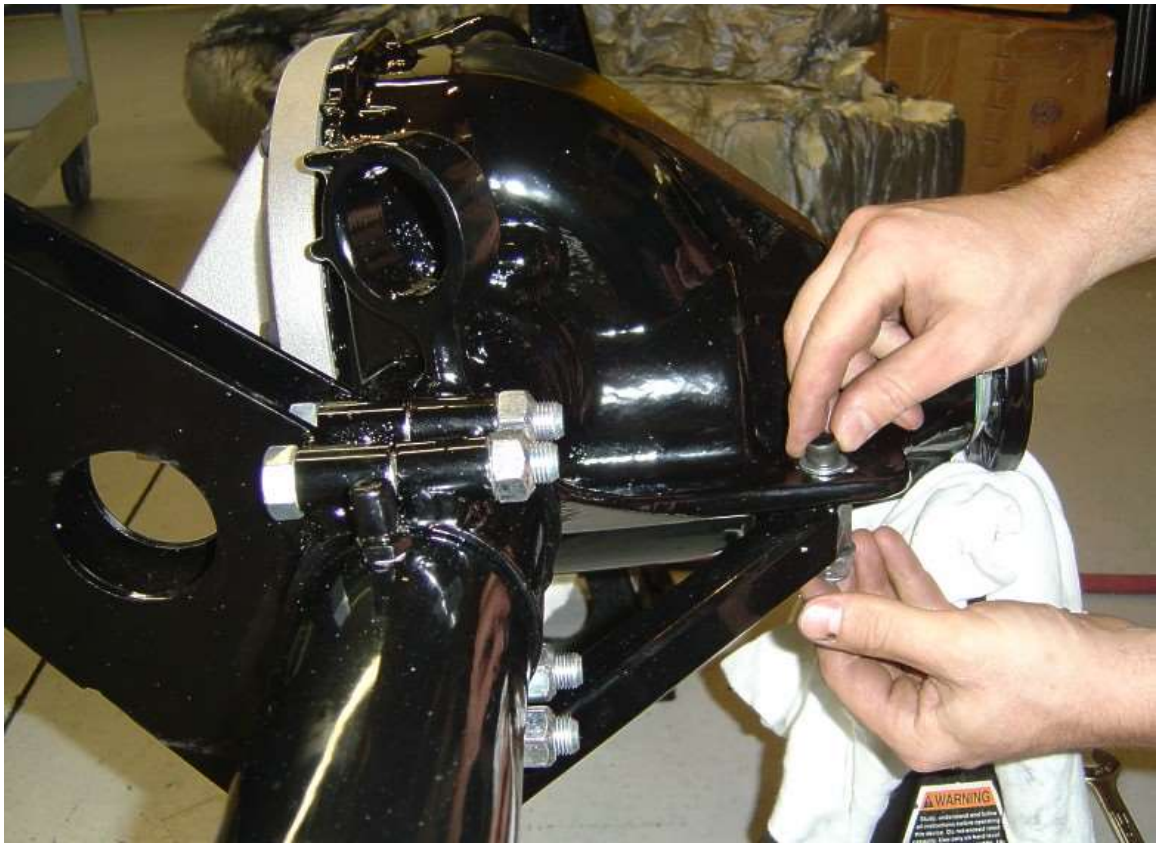
Upper Link Axle Mount

✋ If using the FFR Moser axle skip to the next section since the upper link bracket is welded to the axle.

Test fit the two halves of the upper arm mount together. If it is hard to put all of the bolts in the mount holes, put in as many as you can then use a ½" drill bit through the remaining bolt holes.

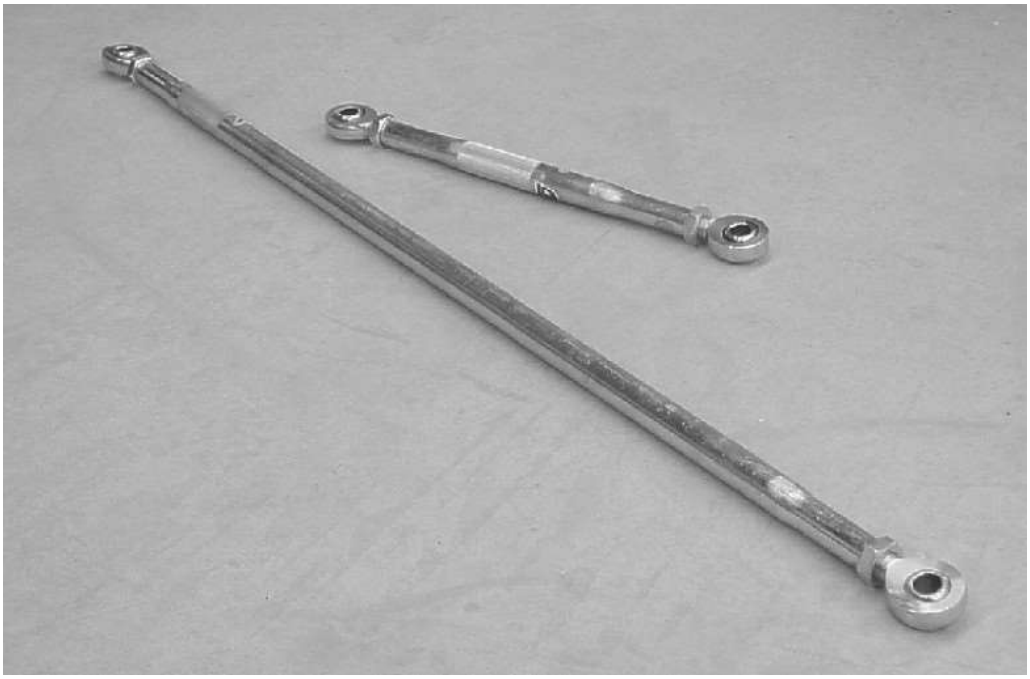
Attach the upper link bracket onto the axle using the fine hardware (FFR# 12217 & 12218).

The front attachment of the upper link axle mount 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 using the mount as a guide.



Attach the front of the upper link axle mount to the front axle flange.

Upper Link



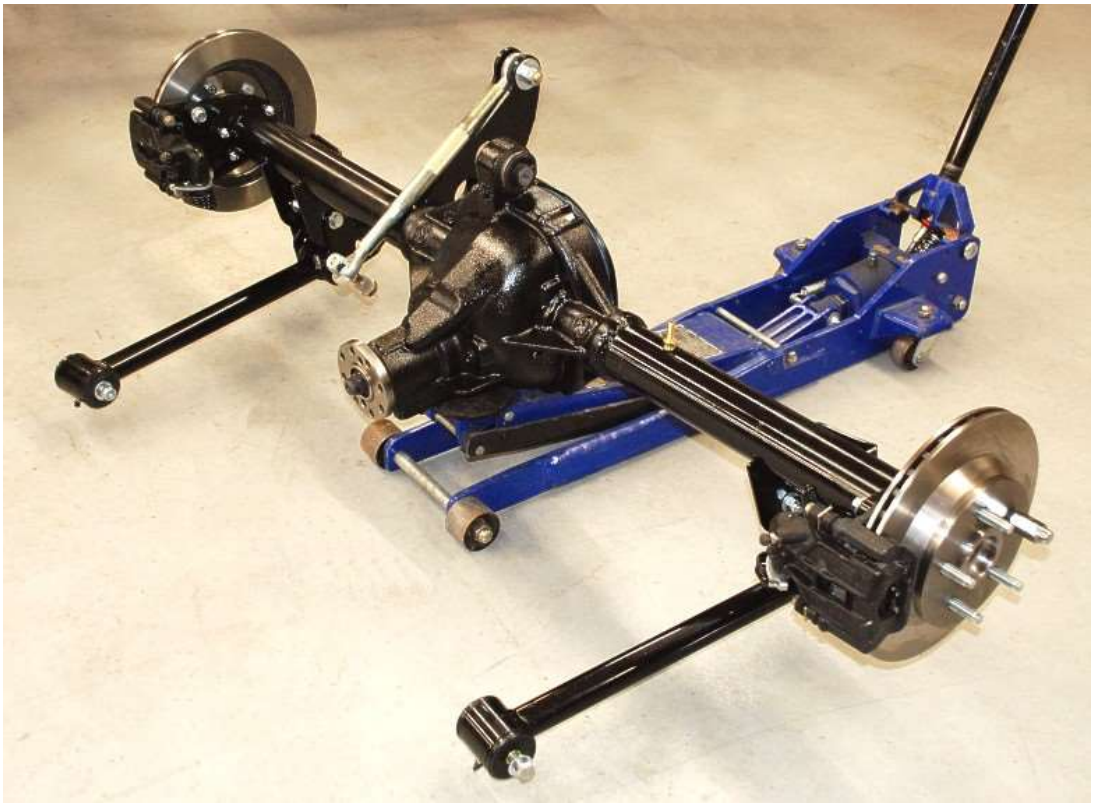
Install a jam nut on each of the rod ends, remembering that two of them are left hand thread.

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.

Attach the short upper link tube to the axle upper link mount using the ¼" spacers on either side of the rod end.

Rear Axle

✋ Have someone help with this step, the rear axle is very heavy and mistakes can result in serious injury.

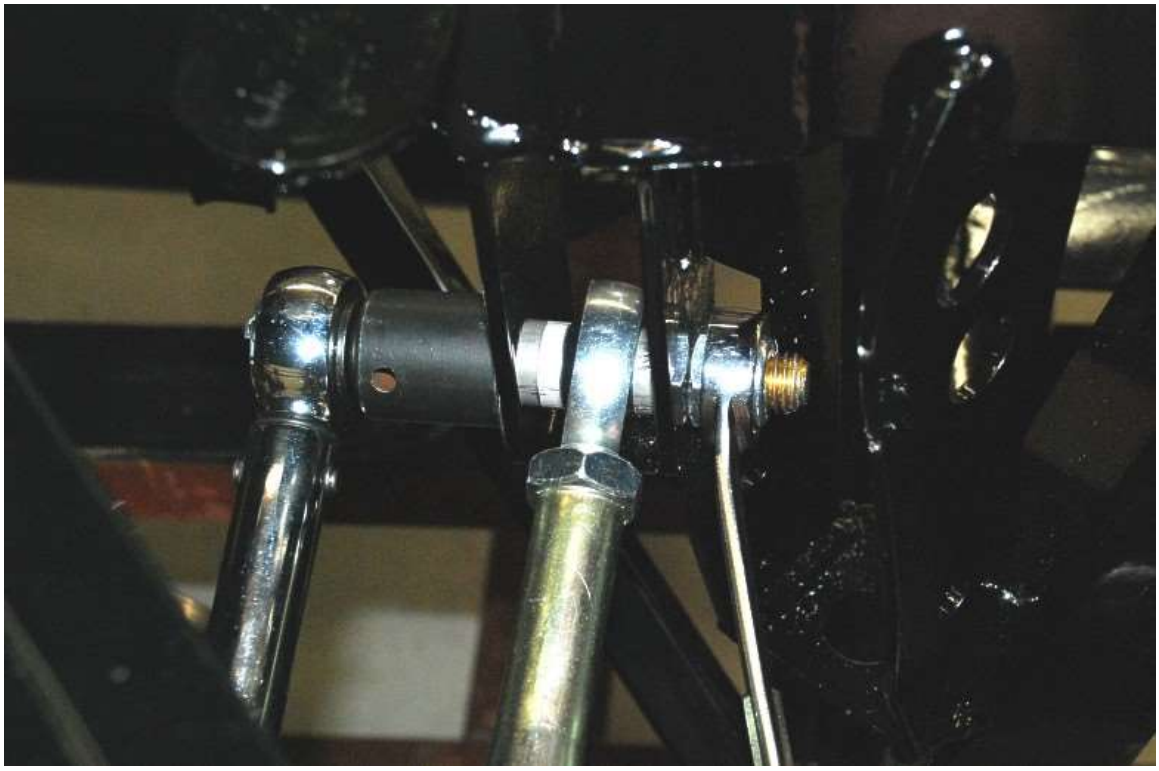


Use a floor jack to position the rear axle assembly under the frame.

- Make sure that the rear jack stands are positioned under the 4” round tube as far back as possible to prevent the frame from tipping up once the axle is mounted
- Do not hold the end of the axle from the bottom of the disc, if the axle falls, the axle can crush your fingers and result in serious injury.

With one person holding a side of the axle raise the axle so that the lower control arms can be bolted onto the frame.

Attach the lower control arms to the frame mounts.



Jack the rear axle up and attach the upper link to the frame.

Panhard Bar Frame mount

- The Panhard bar frame mount is mounted to the chassis during shipping

With the axle jacked up, attach the Panhard Bar frame mount to the inside of the quad shock brackets, the forward leg will attach to the back of the angled 2”x 3” tube. Do not tighten the quad shock bracket bolts yet.

For the front mount, use a ½” drill bit and drill through the sleeve on the mount. Make sure before drilling that the hole is away from the side of the 2”x 3” tube so that a nut can be attached on the back of the bolt from the bottom of the tube.

Install the ½”-13 x 2.5” bolt and tighten.

Tighten the bolts on the quad shock brackets.

Lower the rear axle.

- 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.

Rear Coil-Over Shock Assembly

- Snap ring pliers, ¾" wrench, ¾" socket, ratchet, ruler, marker, hack saw, chassis or lithium grease.
- Roadster/Coupe rear 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 350lb. 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.

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.
Screw the spring seat down on the sleeve so it is closer to the unthreaded end. The center high part of the set should be pointed away from the unthreaded end.

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

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

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

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

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

Put the spring on the shock, then install the spring hat on the shaft end of the shock and push the rubber bumper up against it.
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.

Use zip ties to hold the spring to the spring hat.

Assembled solid axle Koni coil-over shock.

- If using the silver double adjustable shocks, these must be mounted with the body of the shock down in the top hole location.
- For the stock red Koni shocks, use the **lower** holes.

Attach the body end of the shock to the upper shock mount using the two equal length (1.09”) spacers to the lower shock holes.

Jack the rear axle up so the rod end of the shocks can be mounted on the axle through the shock mount hole.

Passenger side

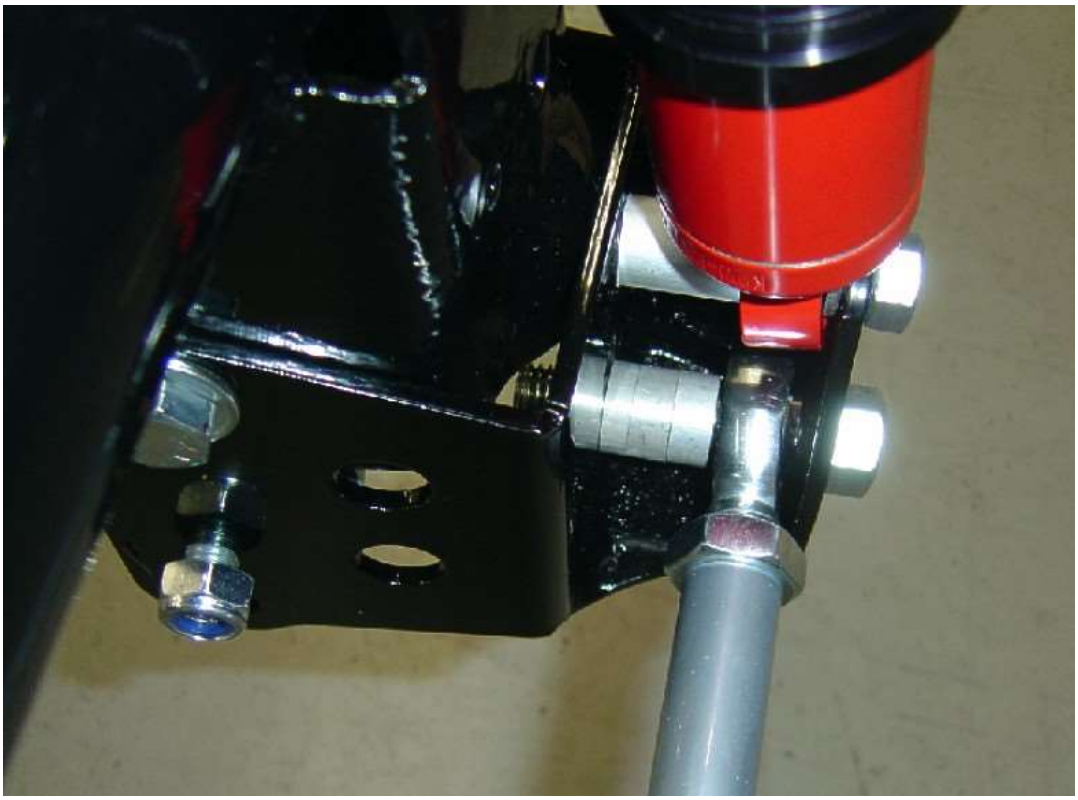
Driver Side

Install the kit ½”x 4” bolts are provided for each lower shock mount. From the rear, the bolt goes through the bracket, ⅛” shim, shock, then the long spacer (1.09”) followed by the bracket and axle. Use a ¾” socket and Torque wrench to tighten both upper and lower mounts to **40 lb-ft**.

Check for shock clearance on brake lines, emergency brake cables, brake calipers, frame and axle parts. 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.

Panhard Bar



The Panhard bar mounts to the car using the ⅝”x 3” bolts and spacers. Install the Panhard bar to the passenger side traction lock bracket. Three spacers are used in the front (2) 0.375" (FFR# 14064) and (1) 0.25" (FFR# 14065). The rear uses the thin 0.0625" shim (FFR# 13337). It will be necessary to adjust the length some to fit, make sure that you adjust the same amount on both sides. There should never be less than ¾” of threads screwed into either the Panhard bar or the upper arm.

Attach the Panhard bar to the frame mount using the spacers provided.

There should never be less than ¾" of threads screwed into either the Panhard bar or the upper arm.
To set the pinion angle, make sure that your ride height is where you want it, and then adjust the upper arm until the desired angle is reached. We usually run about 2° up on the rear axle, but you can adjust this to fit your particular set-up.
The Panhard bar can center the axle left to right in the frame.
At ride height, level the Panhard bar as much as possible.
Double check all your nuts and bolts, and make sure that all four jam nuts are tight.

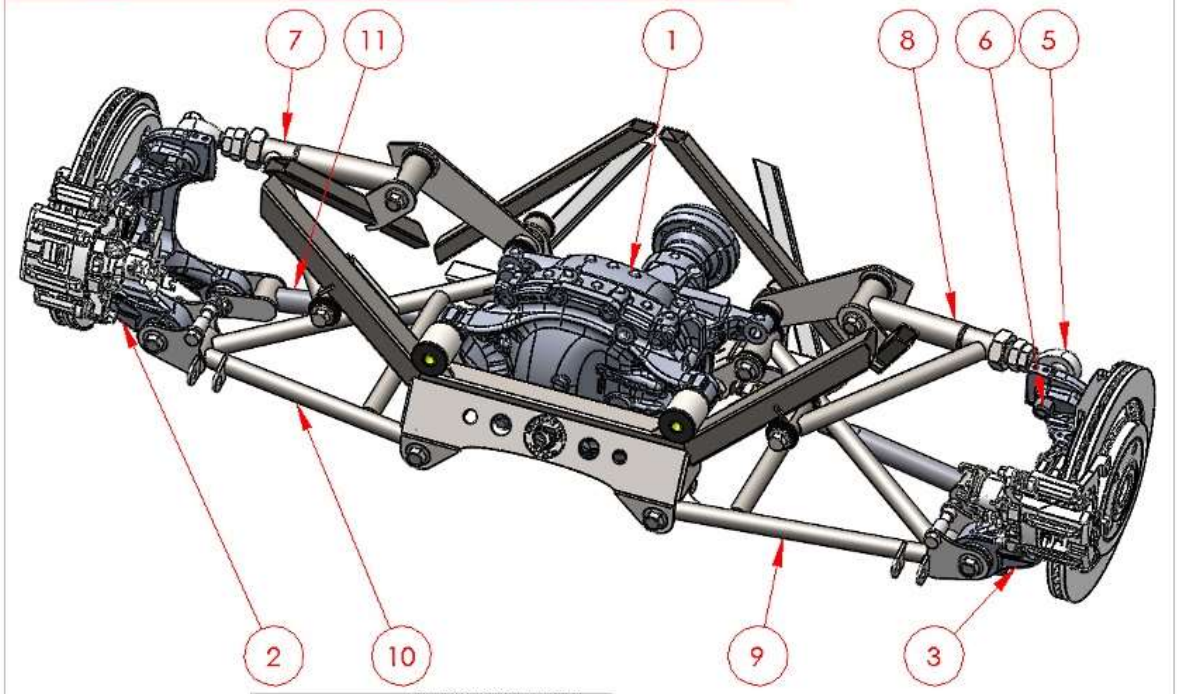
3 link Rear Suspension Torque Specs Chart

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

✋ If a 3-link was used, skip the next section on the IRS.

Optional Independent Rear Suspension – Standard width

ITEM NO.	PART NUMBER	DESCRIPTION	Roadster/QTY.
1	CENTER SECTION		1
2	LEFT SIDE SPINDLE		1
3	RIGHT SIDE SPINDLE		1
4	15857	ANGLED MOUNT ADAPTER	2
5	HBOLT 0.6250-18x3.5x1.5-N		2
6	NLN-625C	NYLON INSERT LOCKNUT	2
7	16078	IRS LEFT UPPER CONTROL ARM	1
8	15898	IRS RIGHT UPPER CONTROL ARM	1
9	15911	IRS RIGHT LOWER CONTROL ARM	1
10	15907	IRS LEFT LOWER CONTROL ARM	1
11	15902	IRS TOE ADJUSTMENT ARM COMPONENTS	2



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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 ROADSTER/COUPE
PRINTED 8/4/2015

Factory Five Racing, Inc.
ROADSTER/COUPE IRS COMPONENTS
NAME DATE
DRAWN JI 3/23/15
COMMENTS:
SIZE A DWG. NO. IRS Assembly REV A
SCALE:1:9 WEIGHT:

- 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

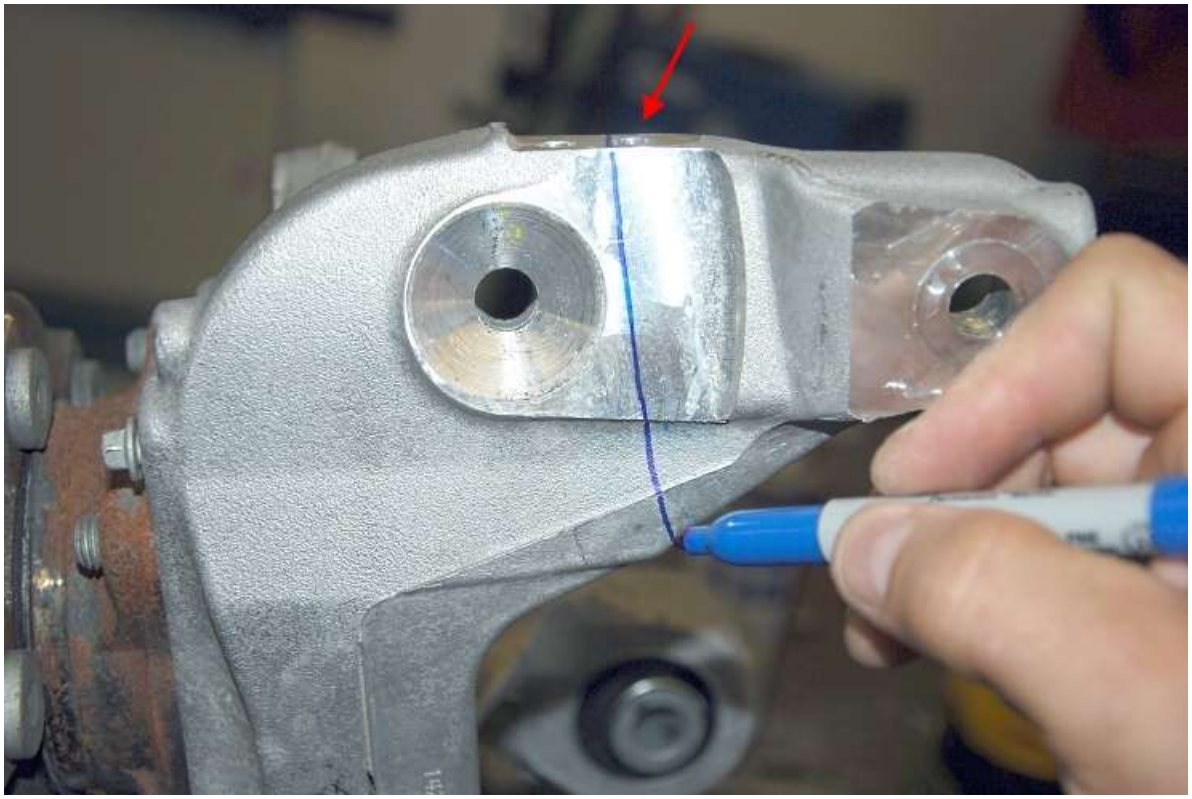
Parts preparation

Spindles

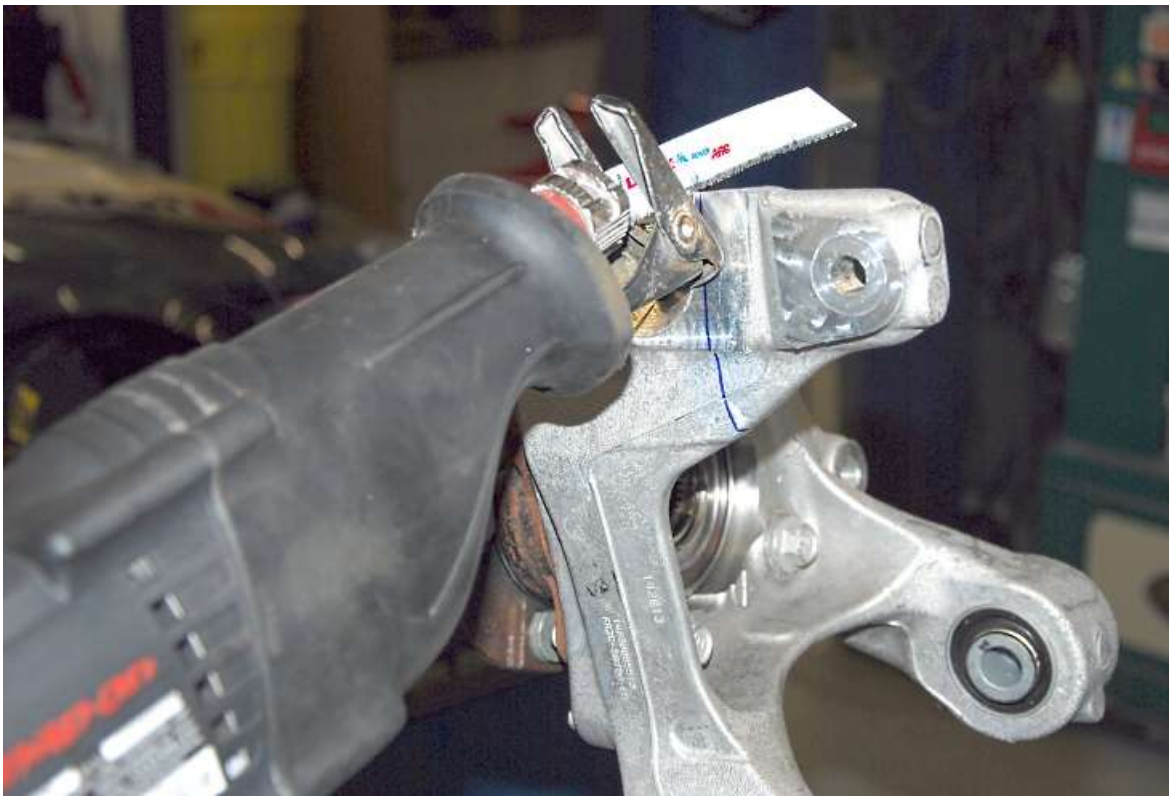
🛠 5/8" drill bit, drill, saw, marker

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.

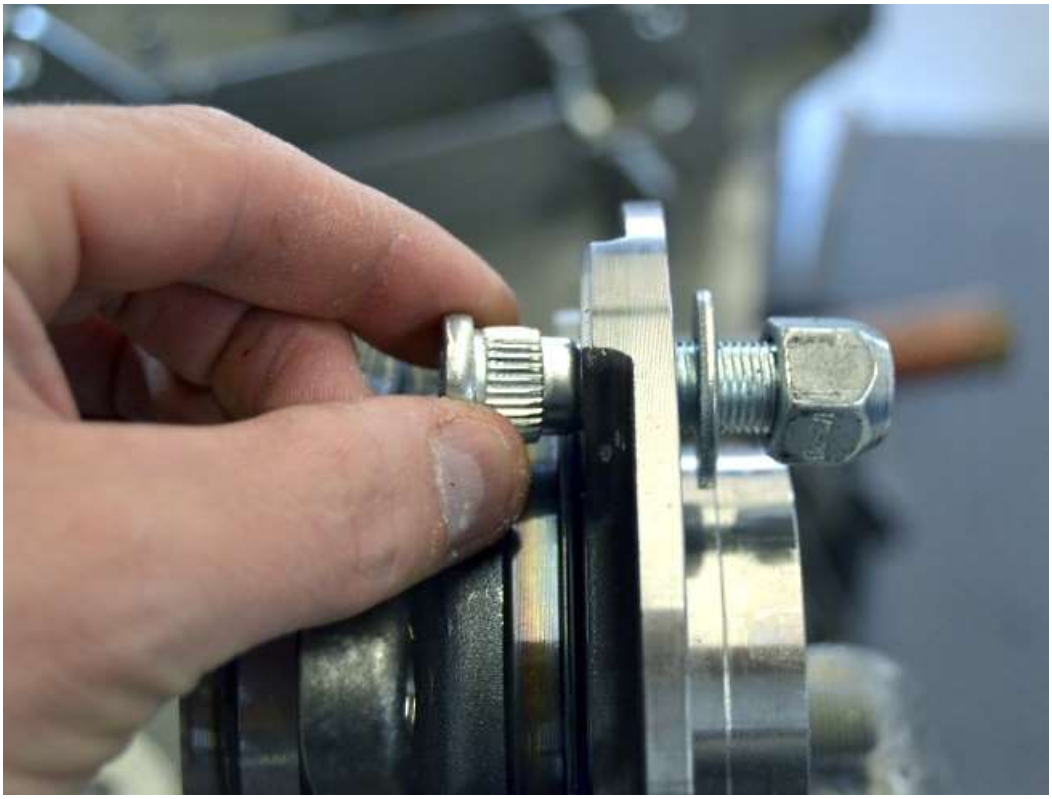


Use a saw to cut the ear off the spindle. If using a Sawzall or similar, use a wood blade; a 14tpi blade or finer will just get gummed up with the aluminum.

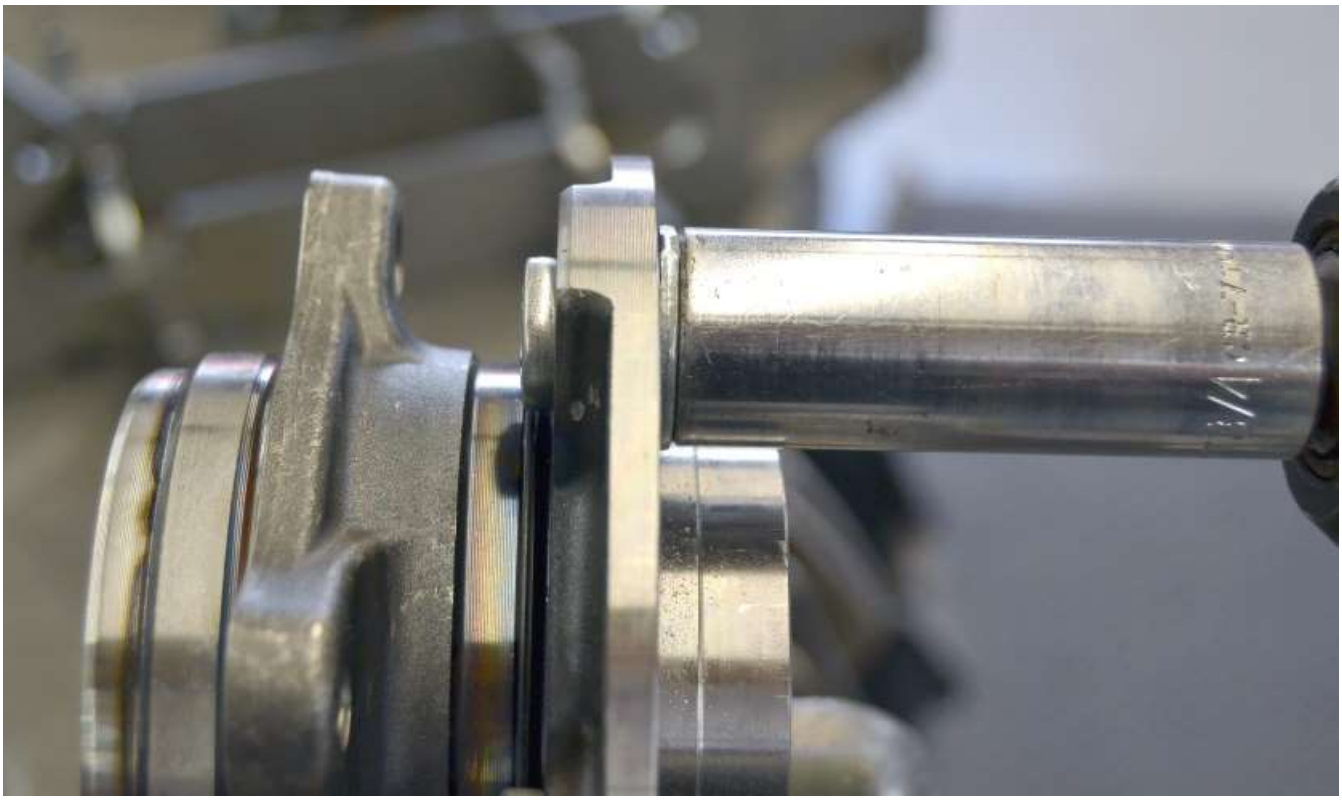
Hubs

🛠 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)**.

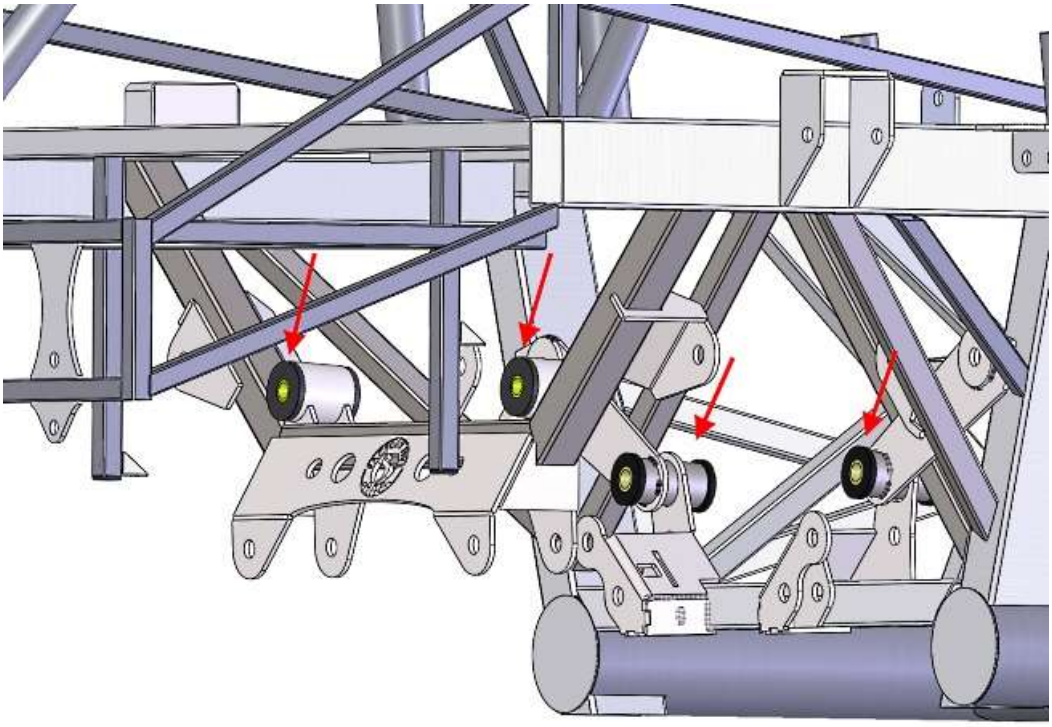
Center section

🛠 $^{5}/_{8}$" 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.

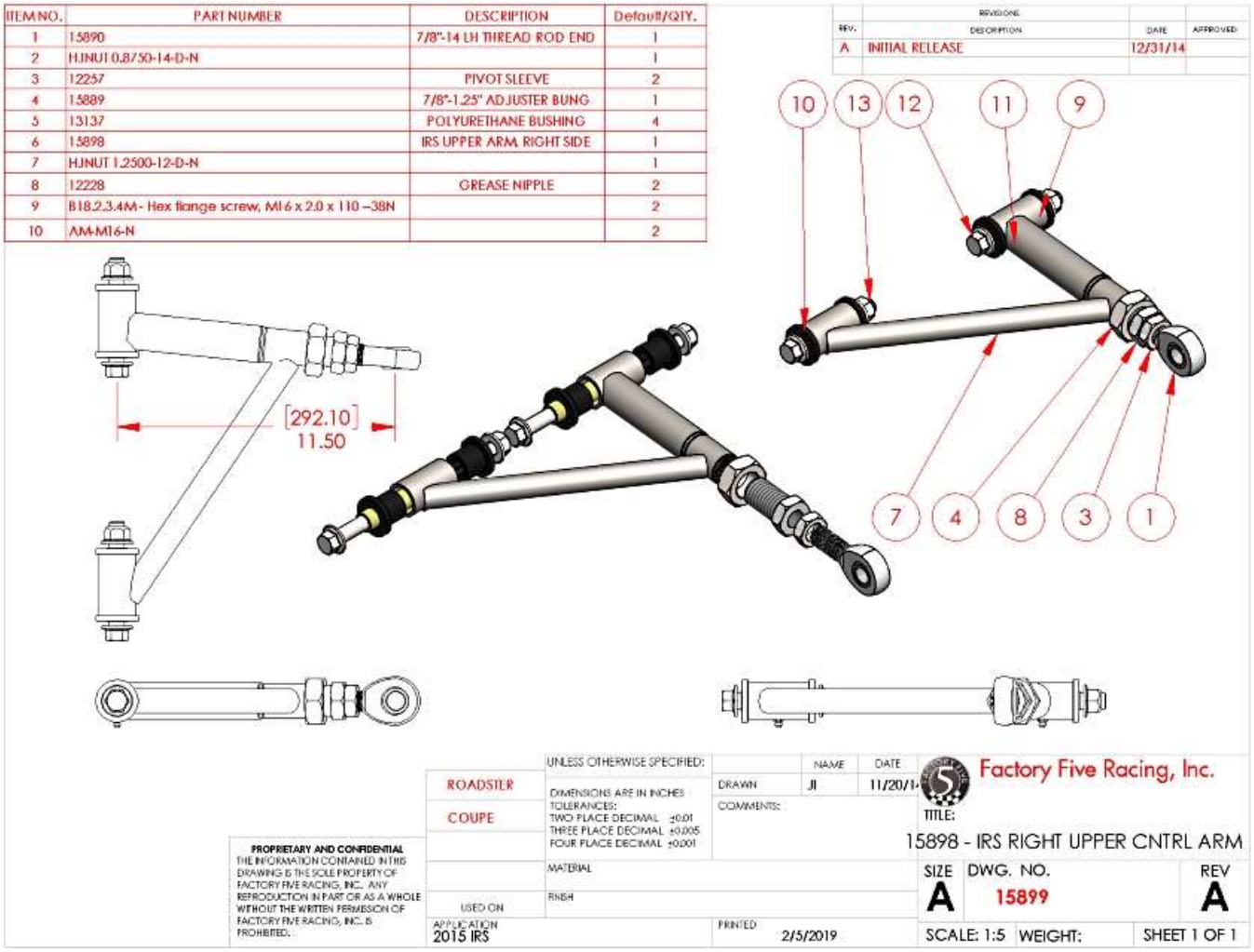
Use a plastic mallet to install the polyurethane bushings marked 2048 and the longer ($3^{1}/_{16}$”) sleeves where the front of the center section will mount.

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	Default/QTY.
1	15890	7/8"-14 LH THREAD ROD END	1
2	H.JNUT 0.8750-14-D-N		1
3	12257	PIVOT SLEEVE	2
4	15889	7/8"-1.25" ADJUSTER BUNG	1
5	13137	POLYURETHANE BUSHING	4
6	15898	IRS UPPER ARM, RIGHT SIDE	1
7	H.JNUT 1.2500-12-D-N		1
8	12228	GREASE NIPPLE	2
9	B18.2.3.4M - Hex flange screw, M16 x 2.0 x 110 –38N		2
10	AM-M16-N		2



Assemble each of the upper control arms as shown. Rough alignment length 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

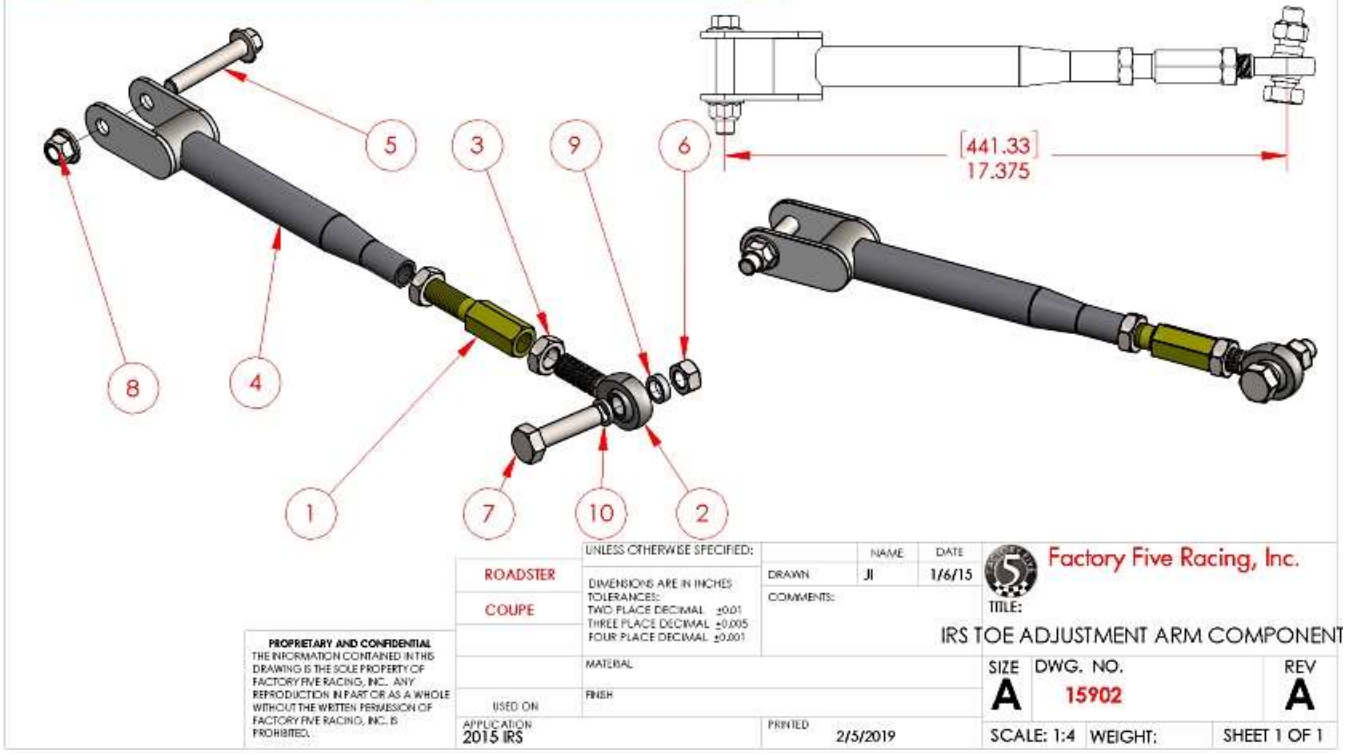
🛠 Grease gun

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	13938	1
7	HHBOLT 0.6250-11x2.5x1.25-N	13216	1
8	AM-M14-N		1
9	33240	14759 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:		
	MATERIAL			
USED ON	FINISH			
APPLICATION 2015 IRS		PRINTED 2/5/2019		

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Factory Five Racing, Inc.

TITLE: IRS TOE ADJUSTMENT ARM COMPONENT

SIZE	DWG. NO.	REV
A	15902	A

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

Assemble each of the toe adjustment arms as shown. Rough alignment length shown.

INSTALLATION

Center section

- Rubber/plastic mallet, torque wrench, 18mm, $^{13}/_{16}$" sockets, $^{15}/_{16}$" wrench.
- Differential mounting components.
- Use a friend to help with the heavy center section in the next steps.
- The vent nipple is usually taped to the inside of the box.

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.

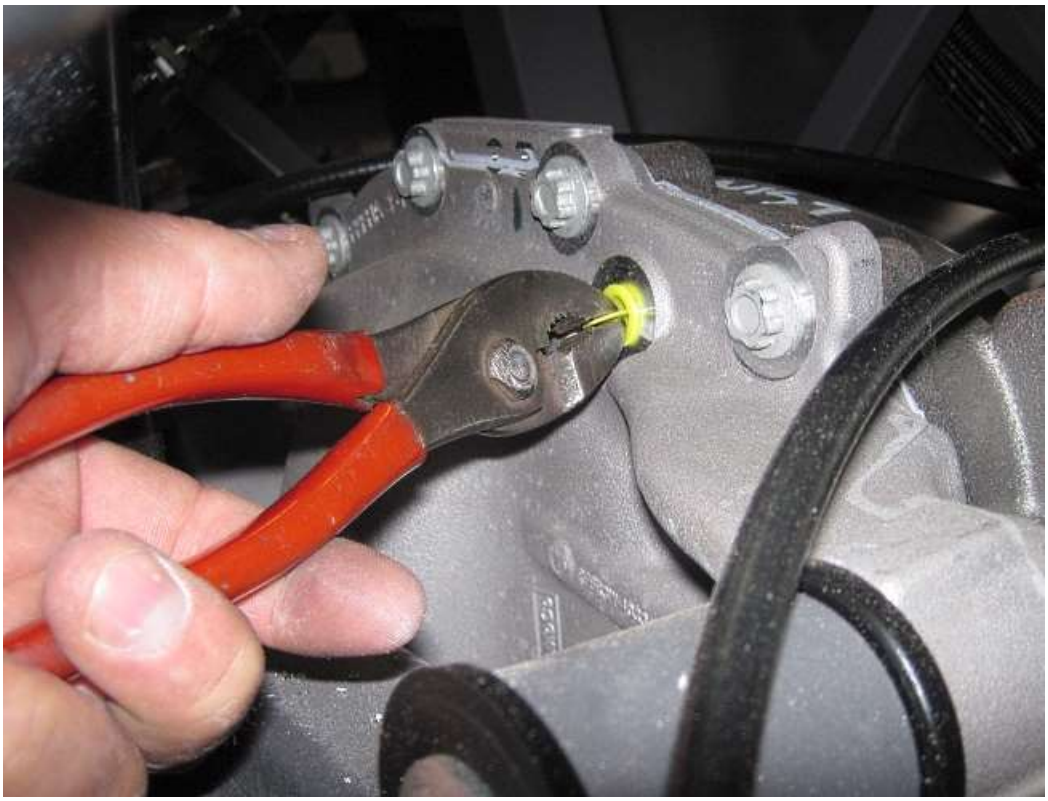
Flatten the center section out so it is horizontal then back it up so it is above the mount locations and lower it down so the bolts can be installed. The smaller/shorter bolts are used for the rear mounts.

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

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

Center section Vent

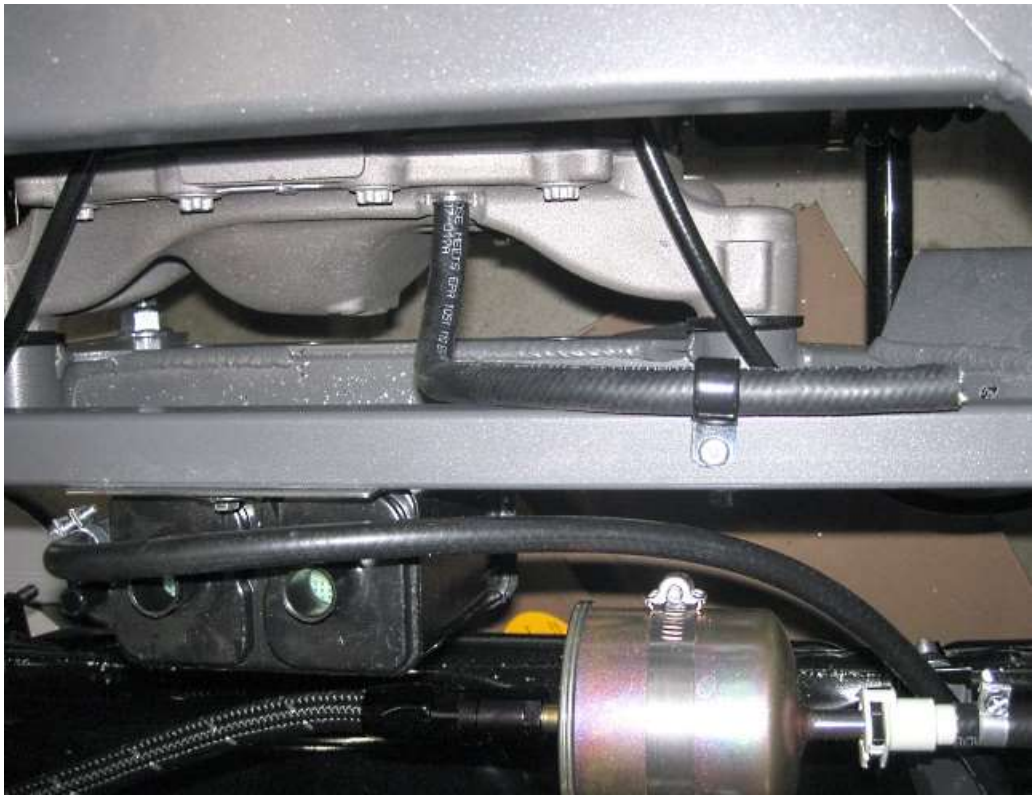
🛠 Pliers, wire cutters, hammer
🚘 Vent hose, vent nipple, insulated clips, secondary body fasteners.



Remove the plug at the top of the rear cover.

Use a hammer on the end of the barb to put the nipple in the rear cover.

Push the 12.00” piece of $^{5}/_{16}$” fuel hose onto the barb.



Run the hose up to the 1” tube that goes across the back of the IRS and use one of the kit $^{5}/_{8}$” insulated clips and $^{3}/_{16}$” rivet to hold it in place.

Toe Adjustment arms

- IRS Toe adjustment arm components
- $^{13}/_{16}$” socket, $^{15}/_{16}$” wrench, torque wrench.
- If using the sway bar option, pass the bolt through the frame mount bracket when installing the toe arms.

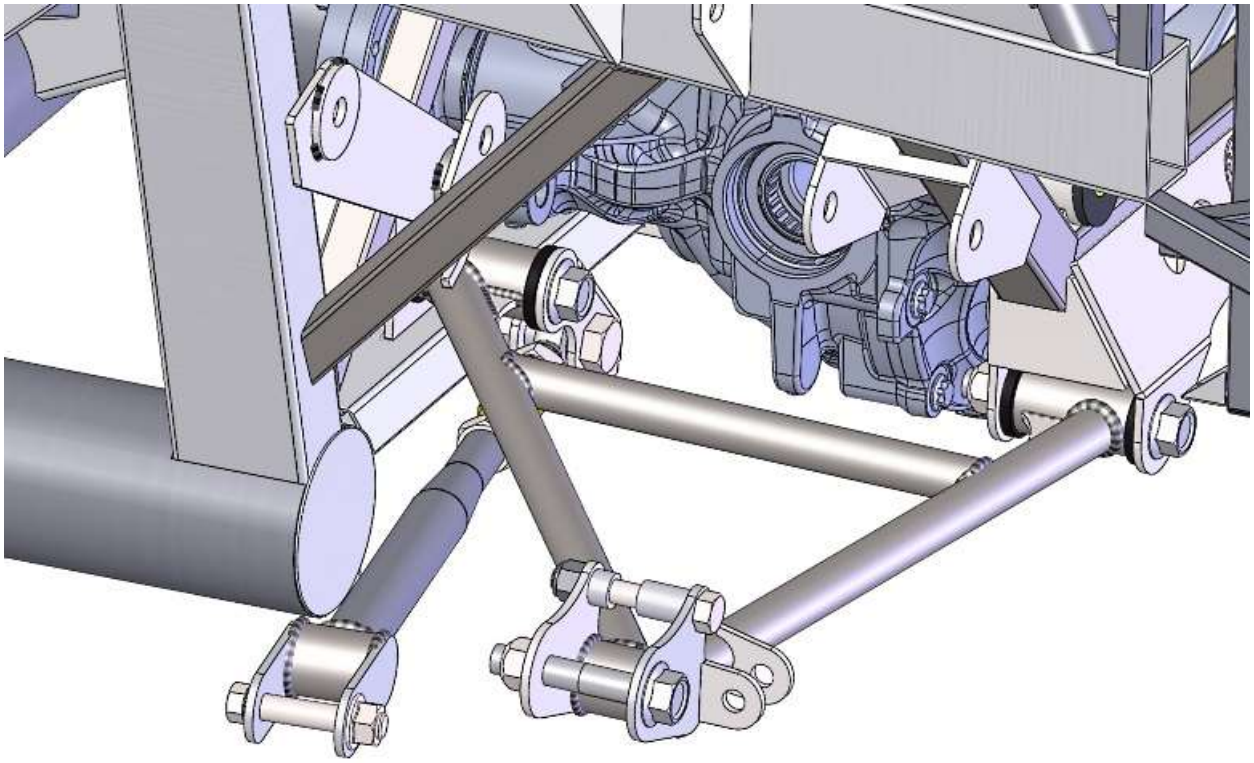
Attach the toe arms to the frame below the front lower arm mount using the 1/8" thick spacer in the back and the ¼" spacer on the front side of the rod end. Use the 5/8" x 2.25" bolts to attach them to the frame.

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

Lower control arms

IRS lower control arm components

13/16" socket, 15/16" wrench, torque wrench.



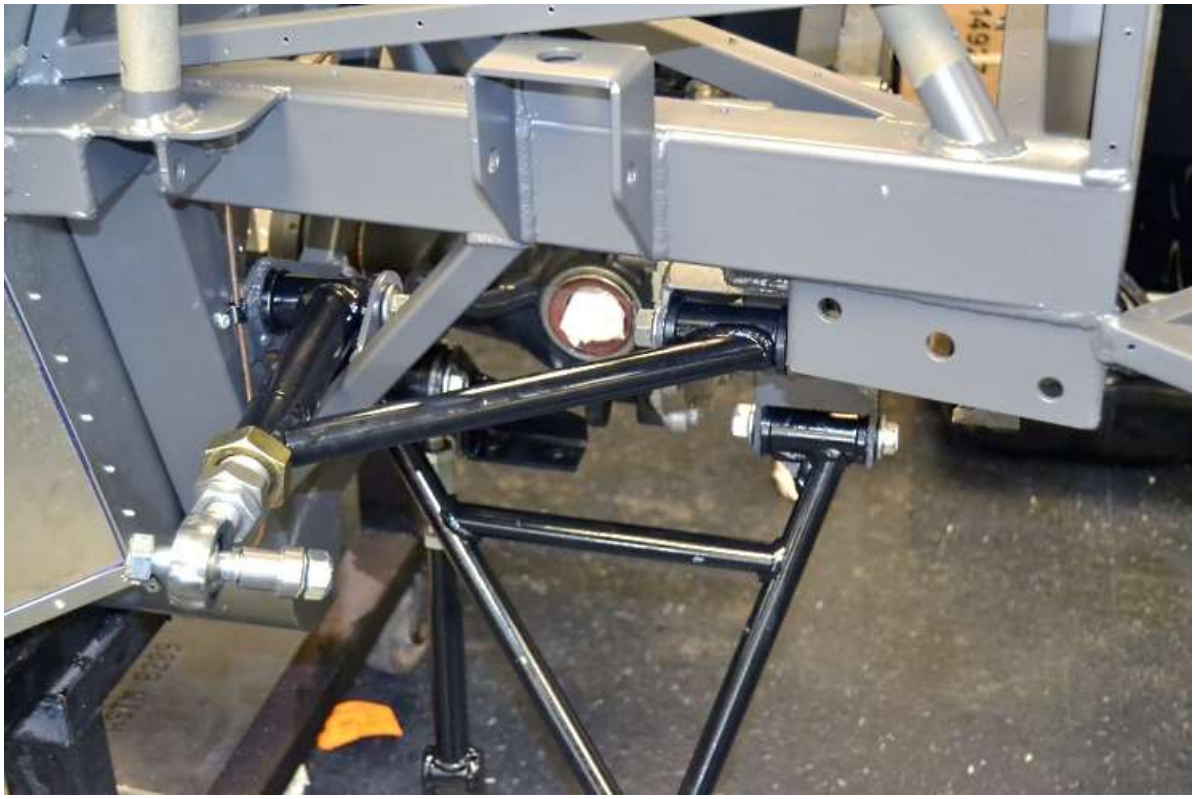
Attach the control arms to the frame with the shock mount towards the rear and spindle brackets up. Use the longer M16 x 110mm (~$4^{5}/_{16}$") bolts.

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.

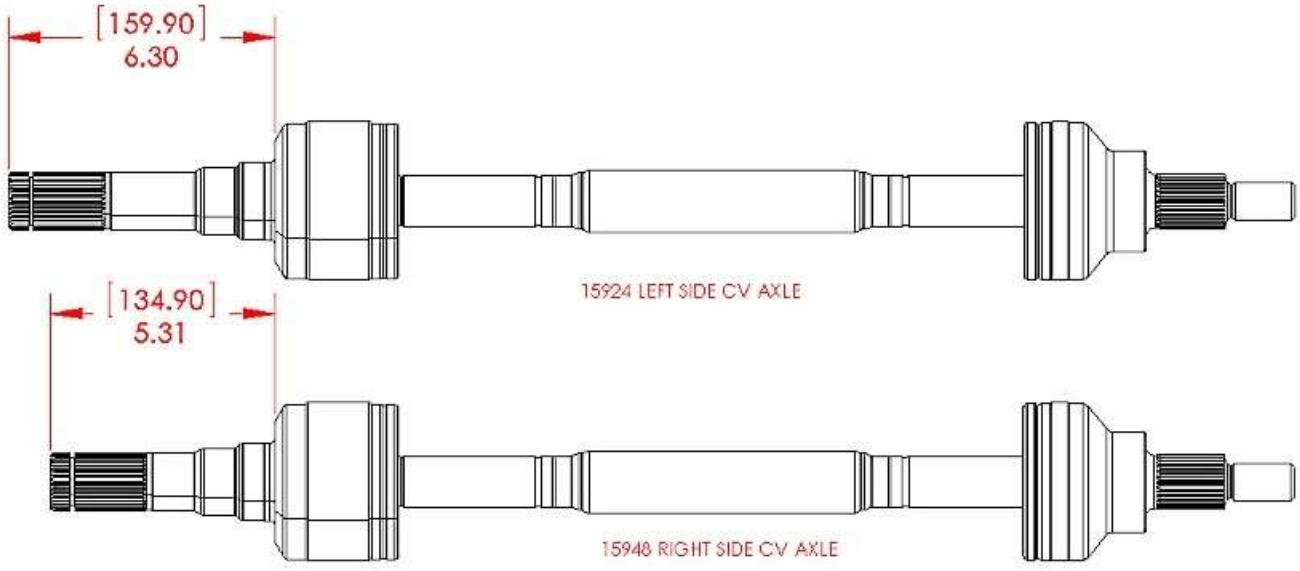


Pass the upper control arm thick tube through the triangular area as shown in between the frame mounts. Use the longer M16 x 110mm (~4$^{5}/_{16}$") bolts.

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

CV Axle

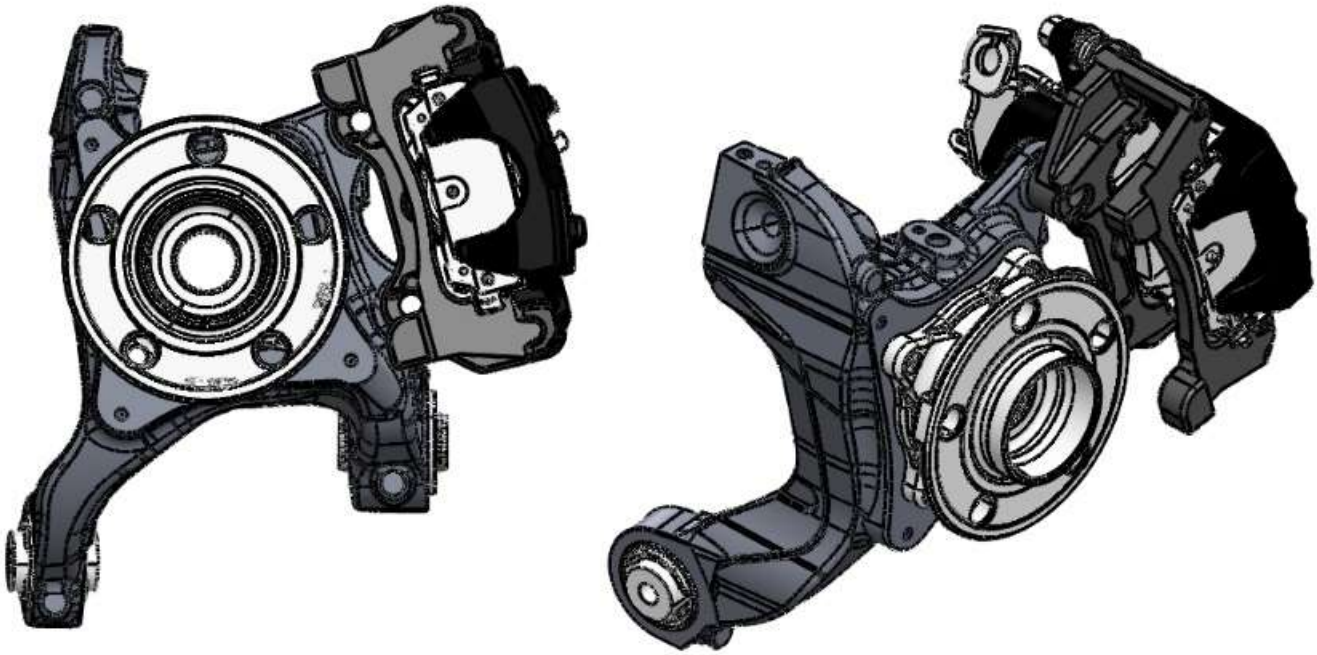
- CV Axles, spindles



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

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 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.

Toe Link

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

Repeat for the right-hand side.

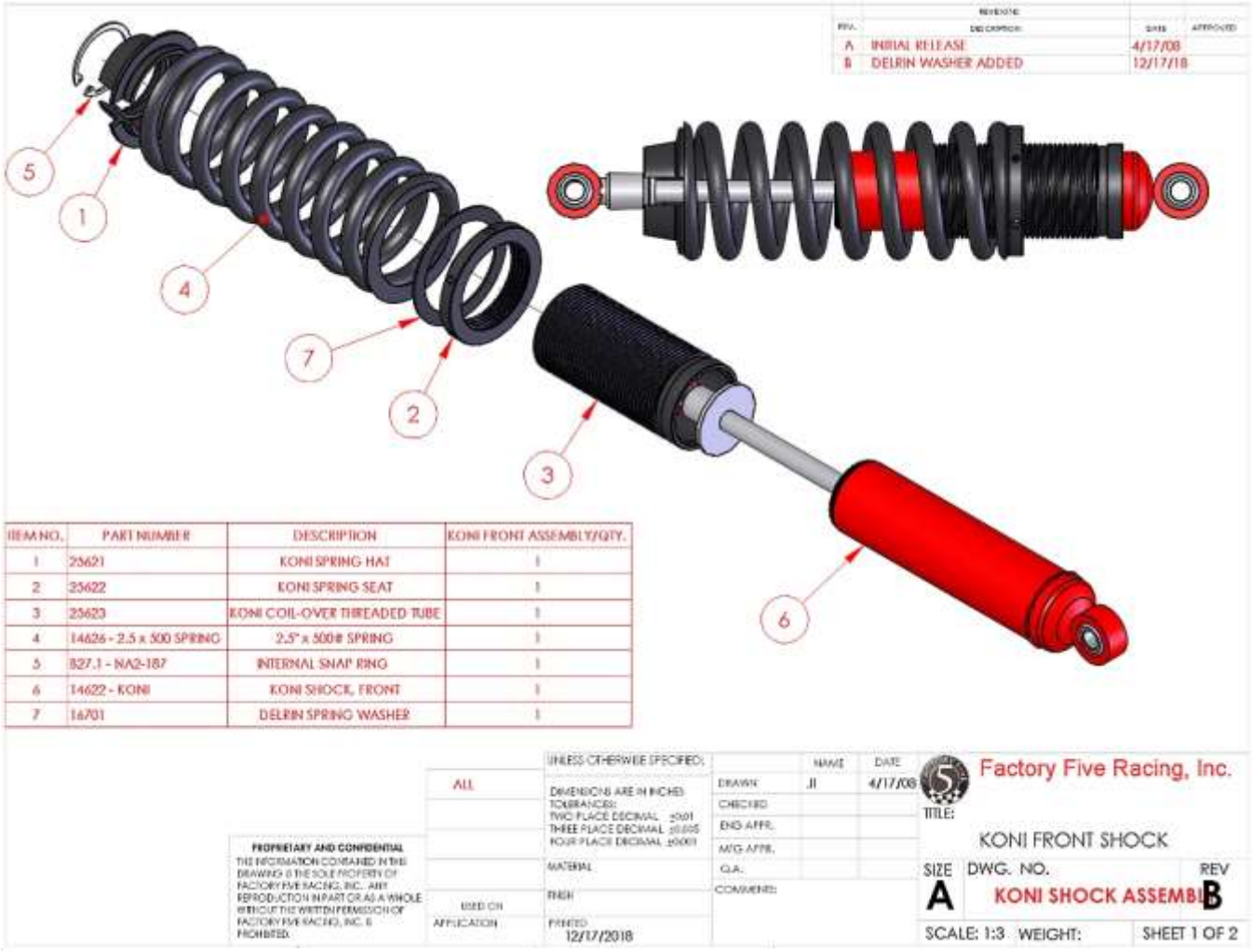
Use the torque specifications page at the back of the instructions to torque the control arm to spindle bolts.

Coil-Over Shock Assembly

- Snap ring pliers, ¾" wrench, ¾" socket, Ratchet, floor jack, chassis or lithium grease.
- 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.
- The Roadster/Coupe IRS springs are 400lb. 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.

Unpack the 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.
Screw the spring seat down on the sleeve so it is closer to the unthreaded end.



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

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

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

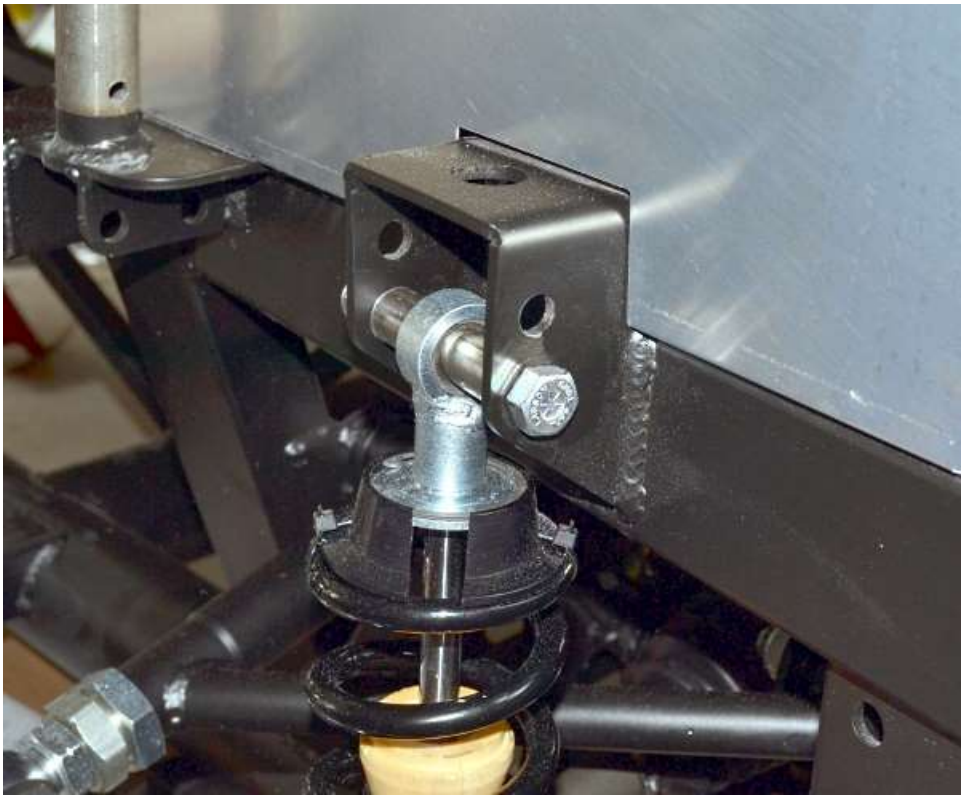
The coil-over hats have a snap ring which holds it in place. Remove this snap ring to assemble the coil over shock.

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

Put the 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.

- If using the silver double adjustable shocks, these must be mounted with the body of the shock down in the top hole location.
- For the stock red Koni shocks, use the **lower** holes.



Attach the rod end of the shock to the upper shock mount lower holes using the two equal length 1.09" kit spacers.

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.

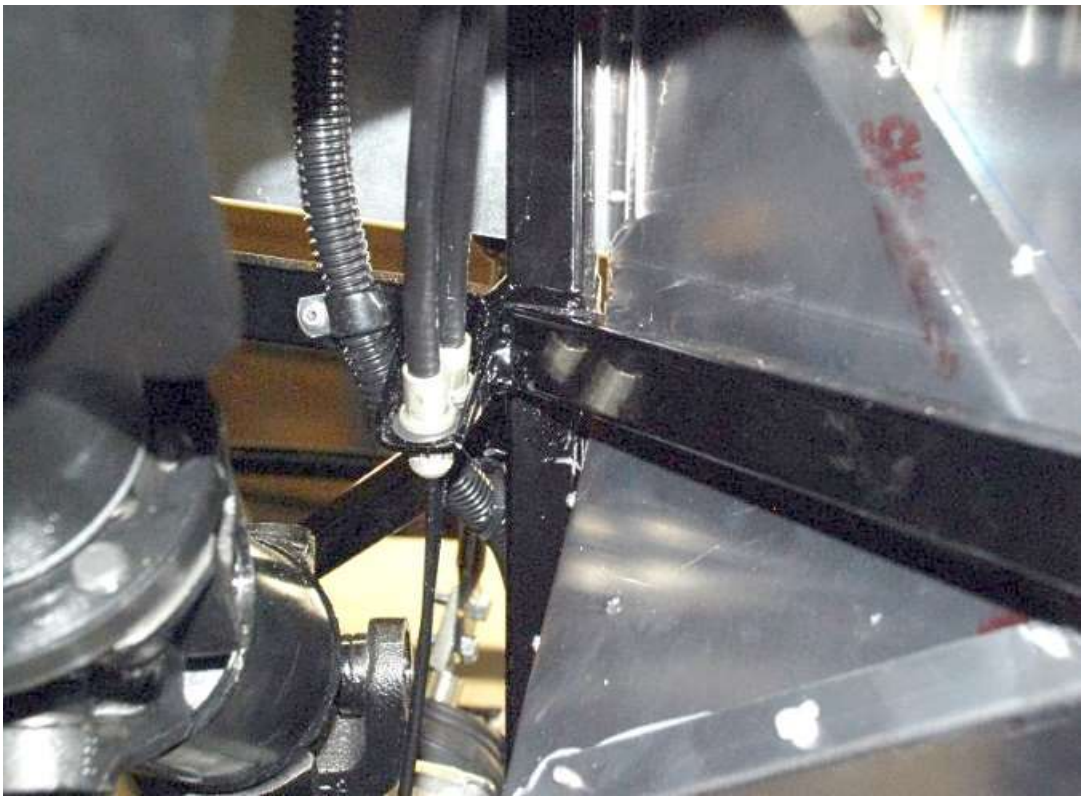
Optional IRS Brakes

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.

E-brake cables



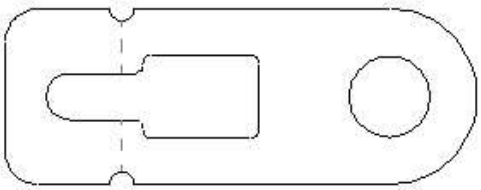
Make sure the FFR cables go through the upper bracket in the transmission tunnel until the sheath end clicks in place.

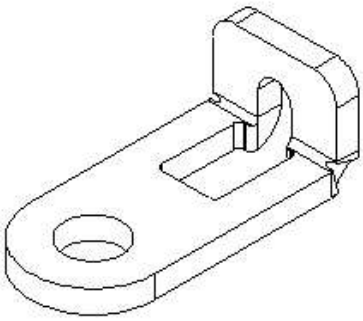
Wilwood brake routing

Run the left e-brake cable over the top of the center section and left rear mount then down 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.

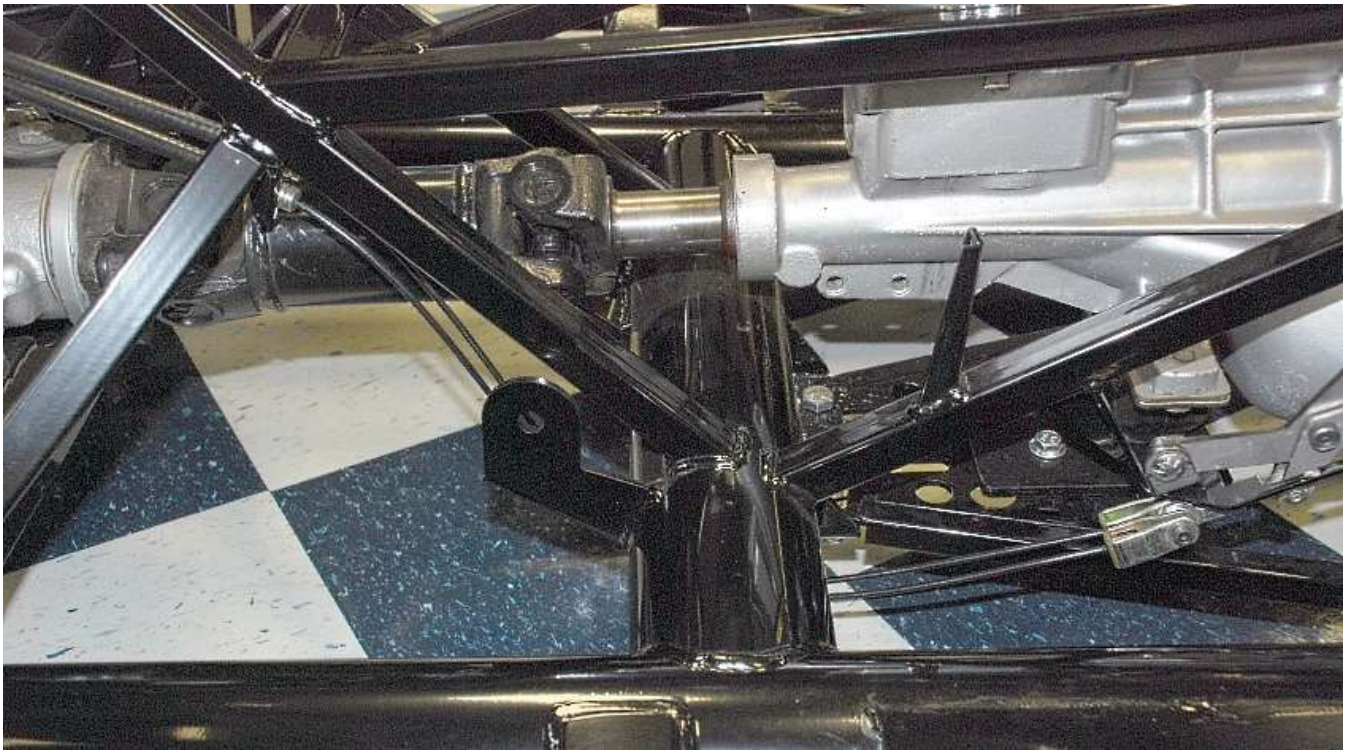
Wilwood e-brake adapter





WILWOOD CALIPER E-BRAKE ADAPTER

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



Make sure to run the other end of the brake cables under the 4” crossmember and connect them to the e-brake handle and adjust.

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	

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.

Firewall & Driver Front Footbox Aluminum

- 🛠 Drill, ⅛" drill bit, rivet tool, caulk gun, silicone
- 🚘 Firewall and Driver Footbox Front aluminum, Secondary body fasteners.
- ✋ If you are installing a heater/defroster it is much easier to cut the firewall before installing. Refer to those instructions for the template.

Mark the firewall and drill for riveting.

Rivet the firewall in position on the chassis.

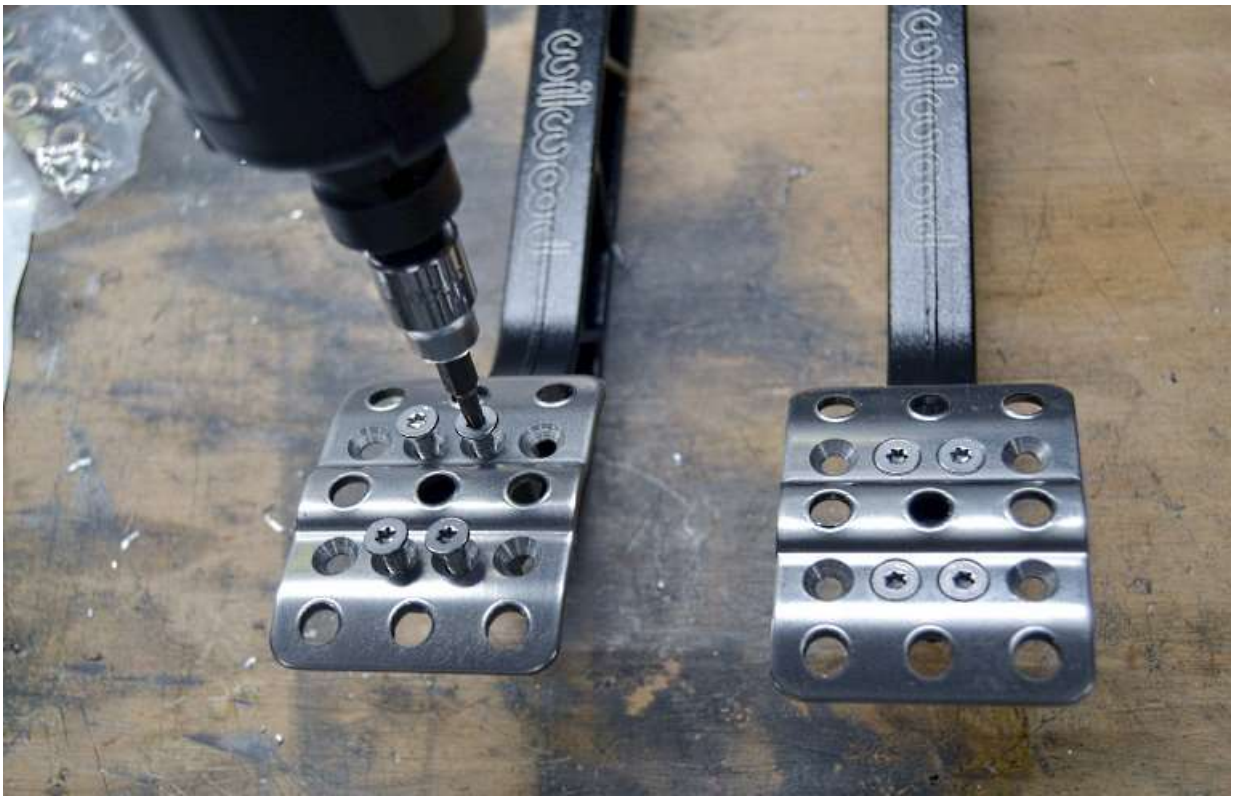
- The Footbox front for the Wilwood Pedal box is packaged with the pedalbox in the kit. The one that is shipped on the chassis is for the OEM Mustang pedalbox.

Mark, drill, and rivet in place the left side footbox front panel, do not silicone or rivet the right lower section that attaches to the ¾" vertical tube in order to allow the inside wall to slip underneath.

Pedal Box

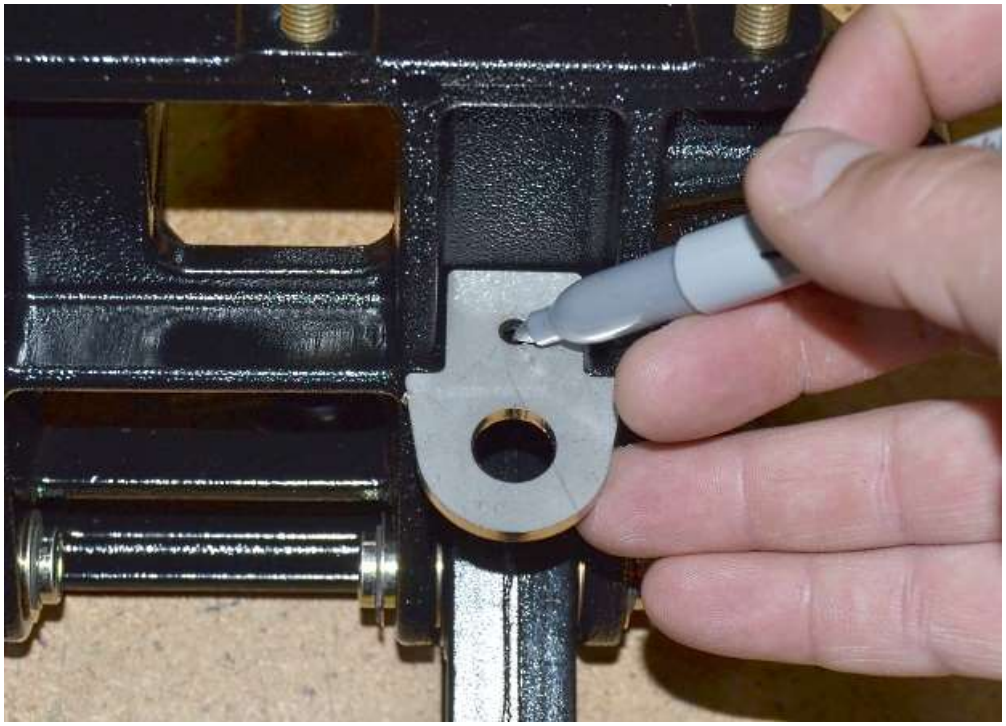
- ½”, 9/16” sockets, ⅜”, 11/32”, ½”, 9/16” wrenches, Drill, 3/16”, ¼”, ½” Drill bit, ⅛”, 9/32”, 5/16” Hex Keys, T-20 Torx bit, Hammer, Razor knife or file or grinder, snap ring pliers or two small screwdrivers.
- Pedal Components, pedal box hardware.
- If using an automatic transmission or a hydraulic clutch some of these steps will not apply.
- 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



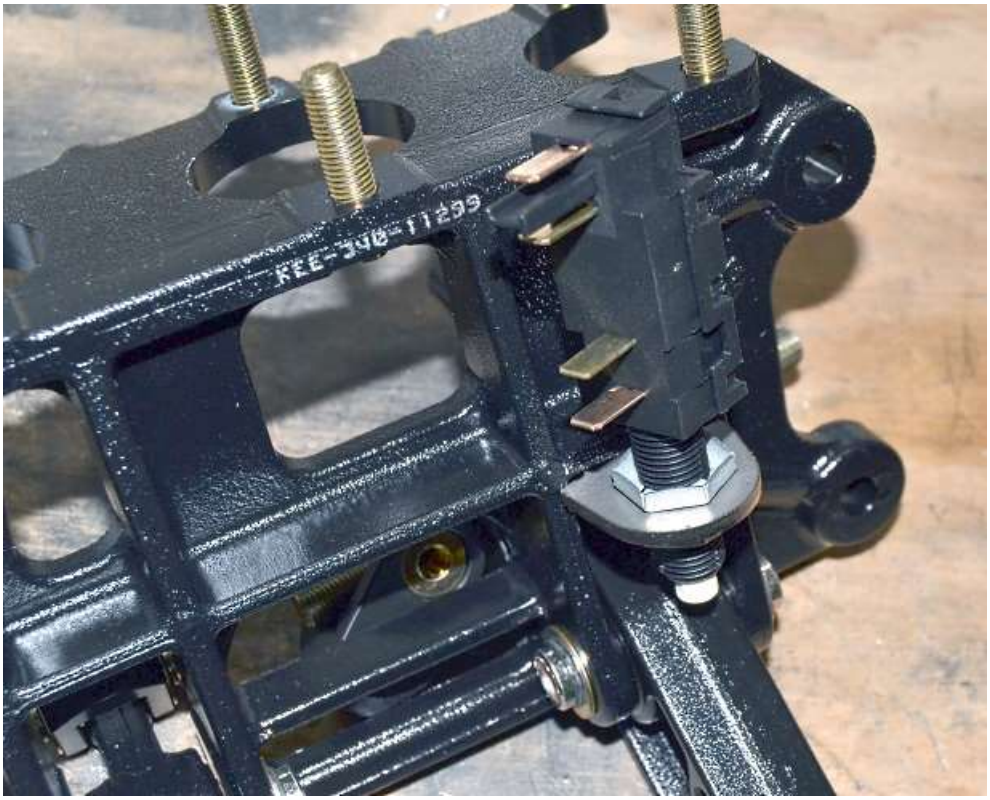
Attach the pedal pads to the pedals using a T-20 Torx bit. The pads mount holes allow the pads to be moved around if desired depending on foot room needed. Start with the pads in the middle holes. Once the seats are mounted in the car the pads can be moved or cut as needed.

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.

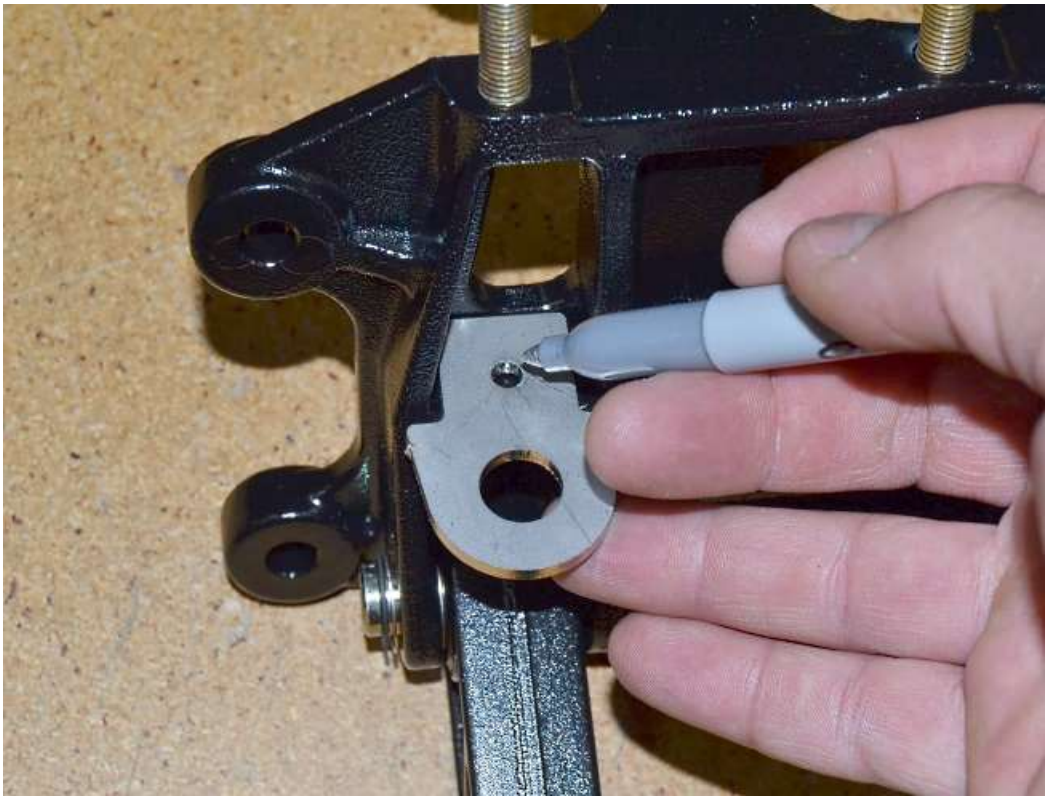
Attach the switch mount to the pedal box using the black #10 screw and locknut.



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.

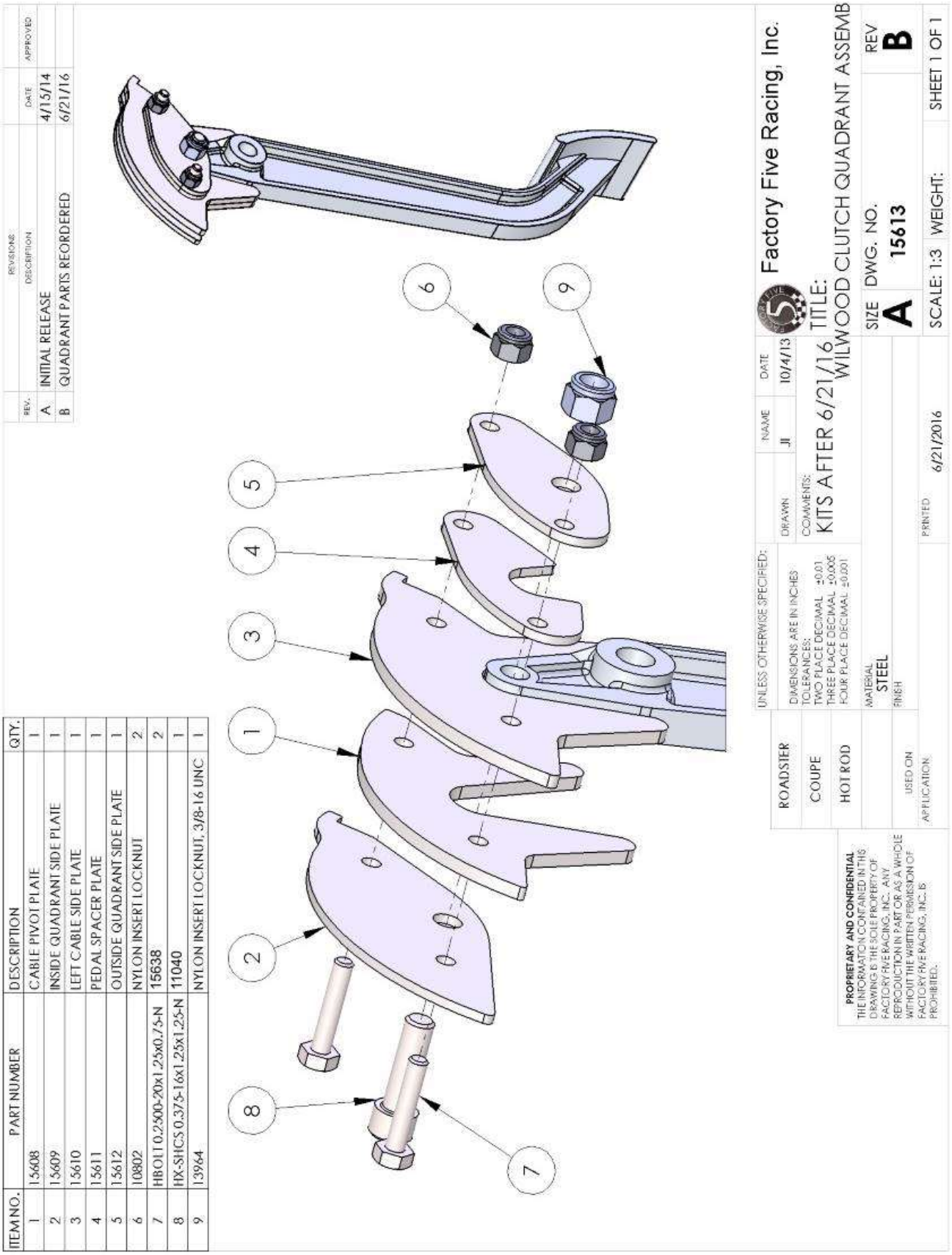
Connect the switch to the switch mount using a hex nut on each side of the mount bracket.

Clutch Cable Quadrant

If you are using an automatic remove the clutch pedal and disregard the next few steps.

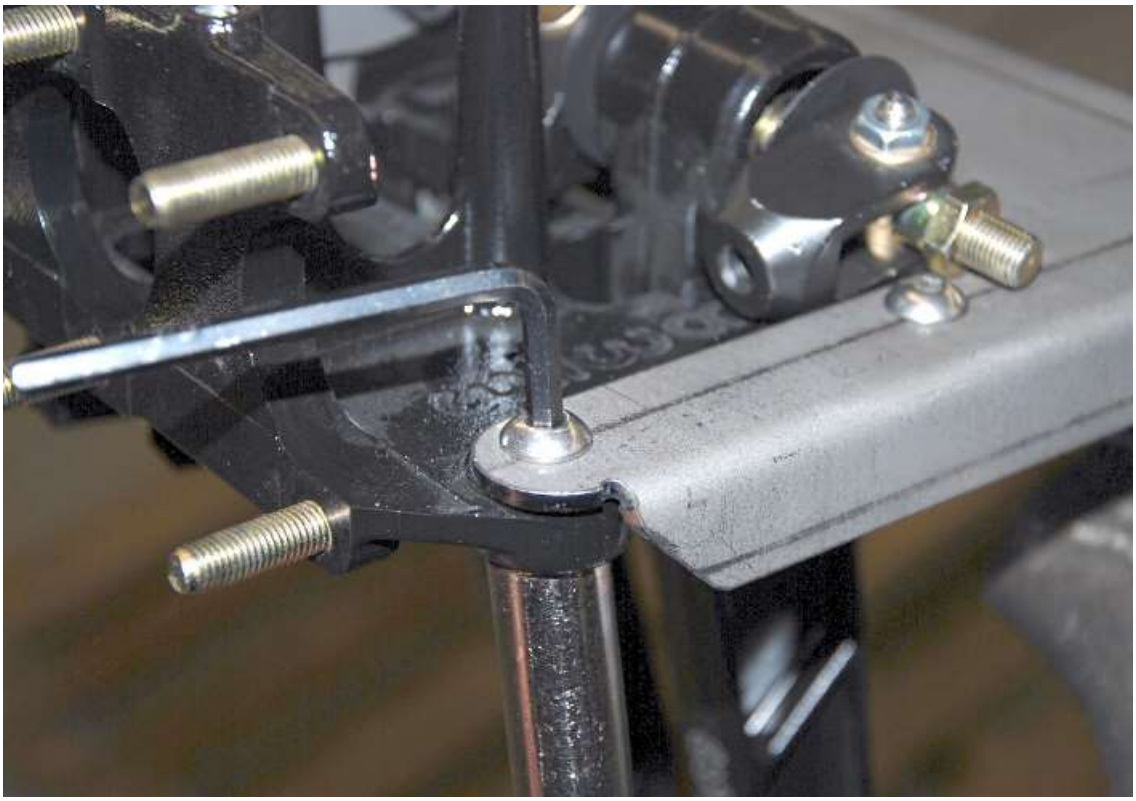
½", 9/16" sockets, ¼", ⅜", ½" wrenches, ¼" drill bit, drill, Philips head screwdriver, 3/16", 5/16" Hex Key, snap ring pliers

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



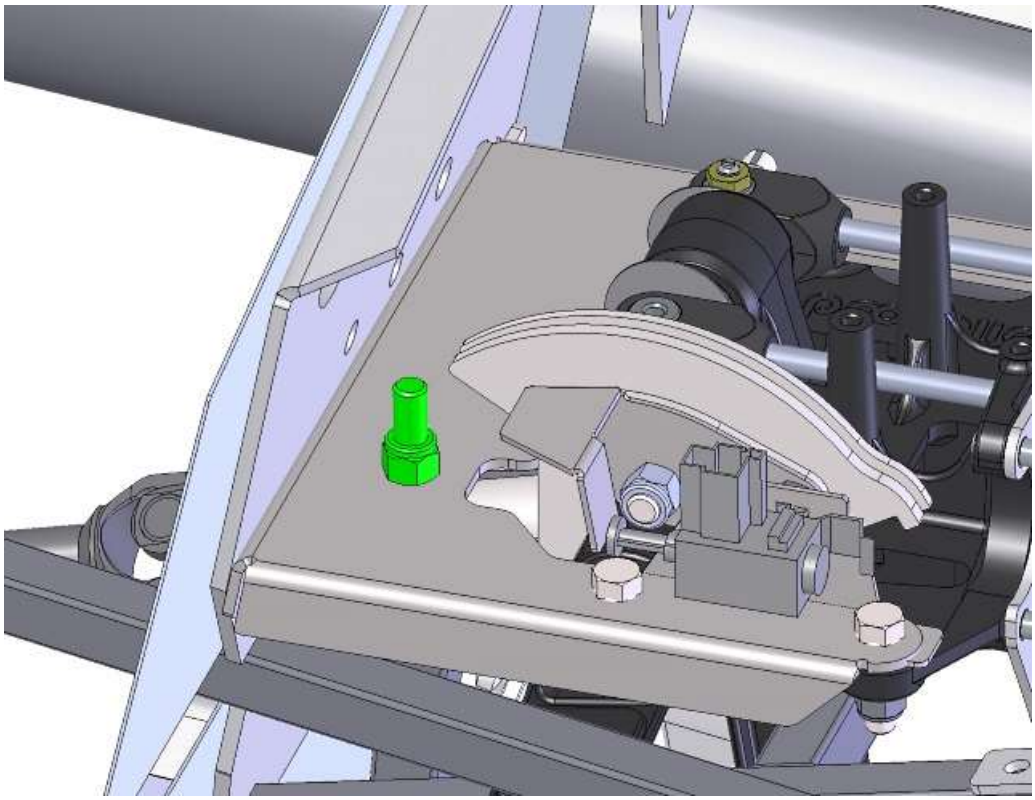
Assemble the clutch quadrant to the Wilwood clutch pedal as shown above.

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



Attach the Wilwood pedals to the **underside** of the mounting bracket using four 5/16" Button head screws, locknuts, 3/16" hex key and ½" wrench.

Clutch Quadrant stop



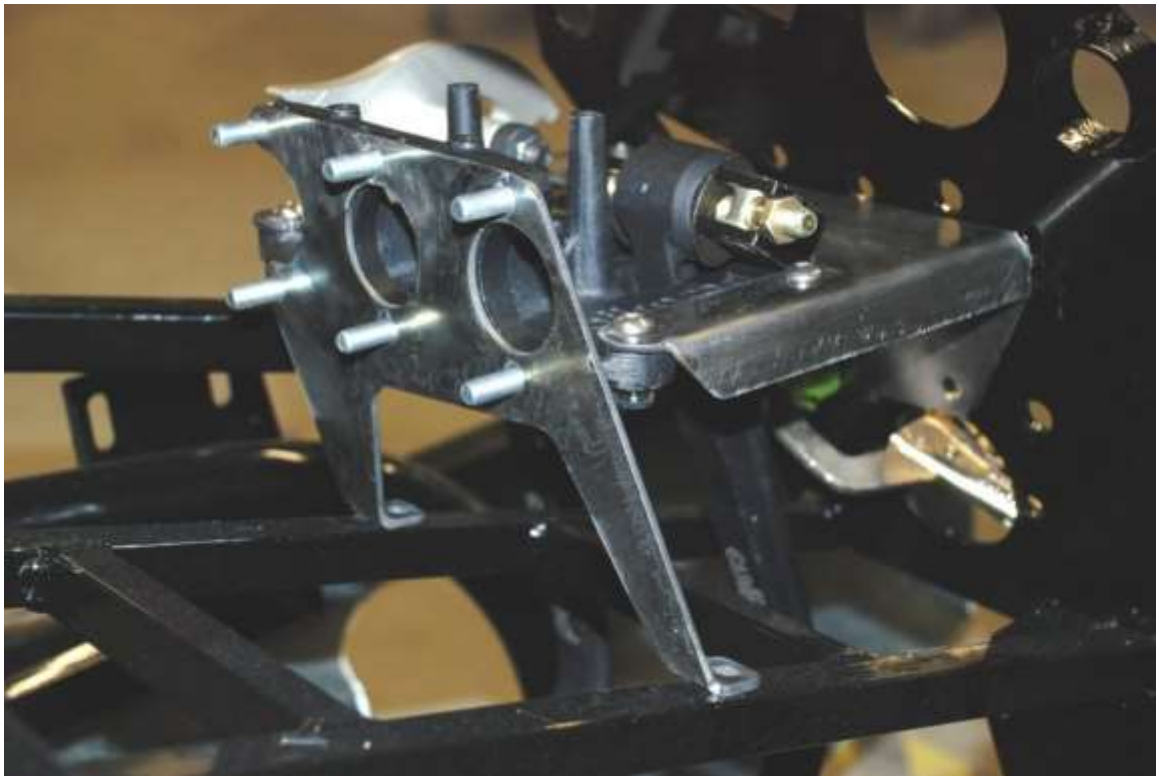
Install the clutch quadrant stop 3/8"-16 x 2" screw with the jam nut on the bottom and locknut on top of the pedalbox mount.

Frame Installation

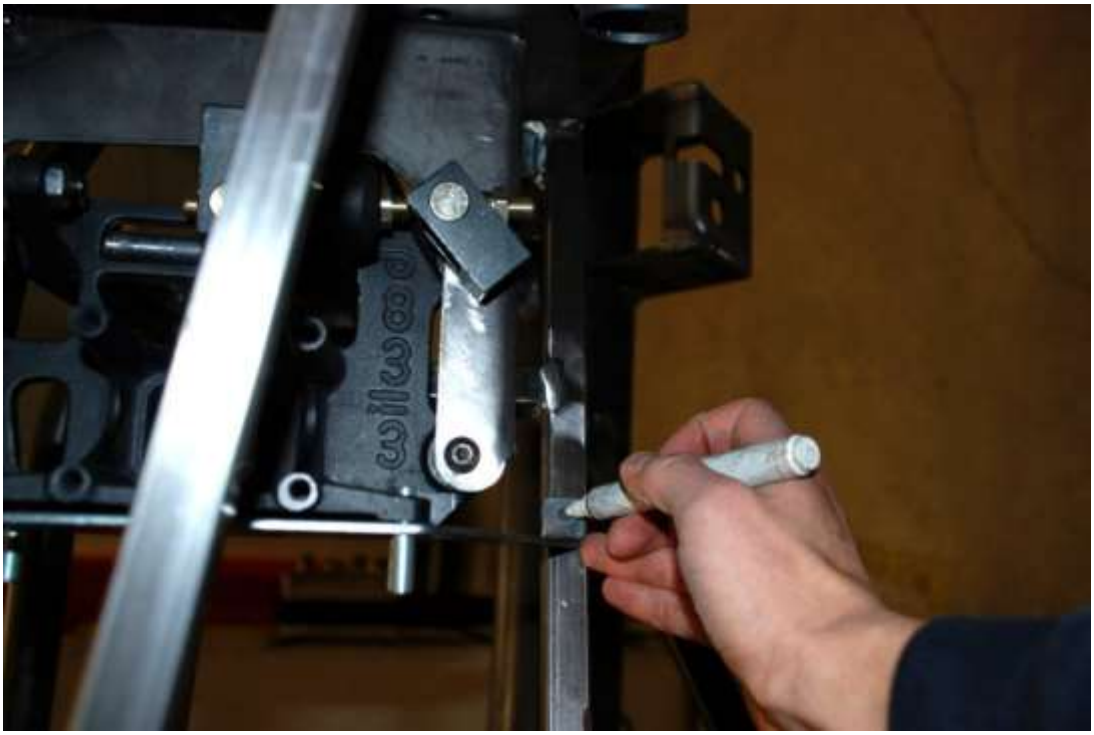
Place the pedal box assembly in the driver's footbox. Make sure that the brake pedal goes in front of the ¾" cross tube on the frame.

Unpack the pedal box hardware from the secondary chassis components box.

Insert three ⅜” x 1” socket head screws from the pedal box hardware assembly and the one included in this pedal assembly through the front of the footbox and through the pedal box mount.

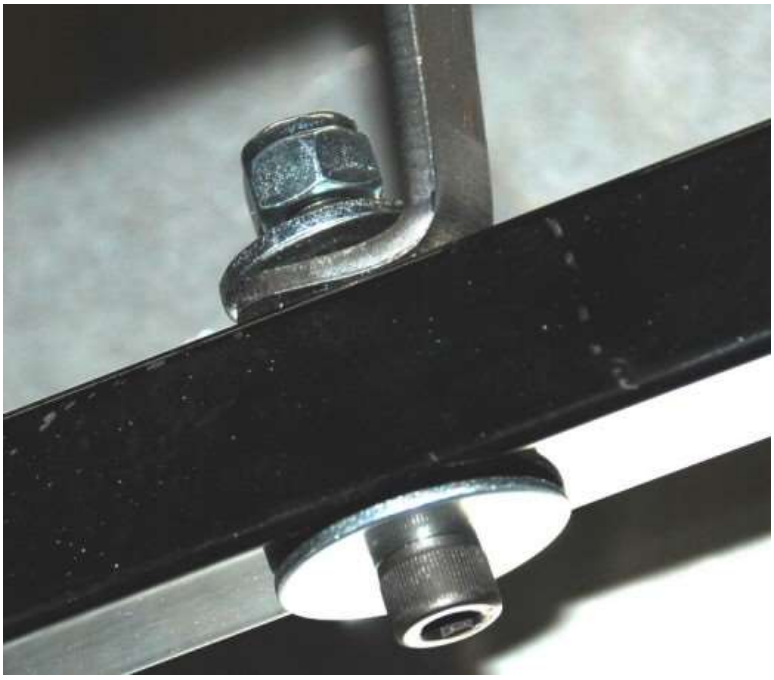


Push the rear pedal box mount onto the master cylinder mount studs and use a few of the jam nuts from the Wilwood pedal assembly to temporarily hold the rear mount in place.



Tighten two of the front ⅜” screws then use a marker to mark the locations of the rear mount holes on the ¾” tubes.

Loosen the bolts and remove the pedal box assembly from the footbox then use a ¼” drill bit and drill to drill through the ¾” tubes at the locations marked for the rear mount.



Reinstall the pedal box assembly in the driver's footbox; use the ¼"x 1.50" screws from the pedal box fastener assembly with a fender washer next to the head. Leave all the hardware hand tight.

Master Cylinders

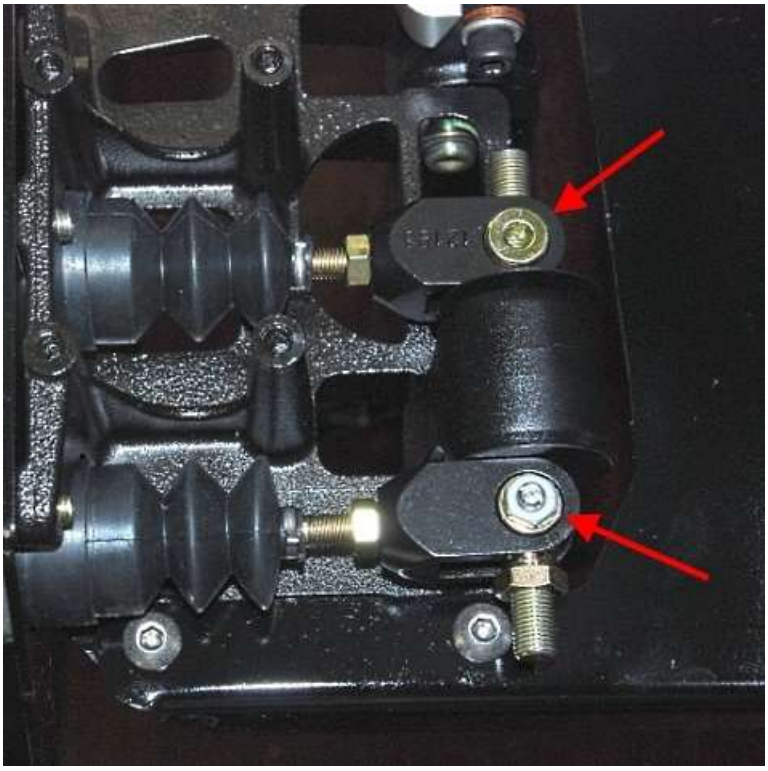
🛠 6mm socket, ½" deep socket, ratchet, ½" wrench, saw
🚗 Master cylinders

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.

✋ Pedal height will get adjusted after the brakes are bled.



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

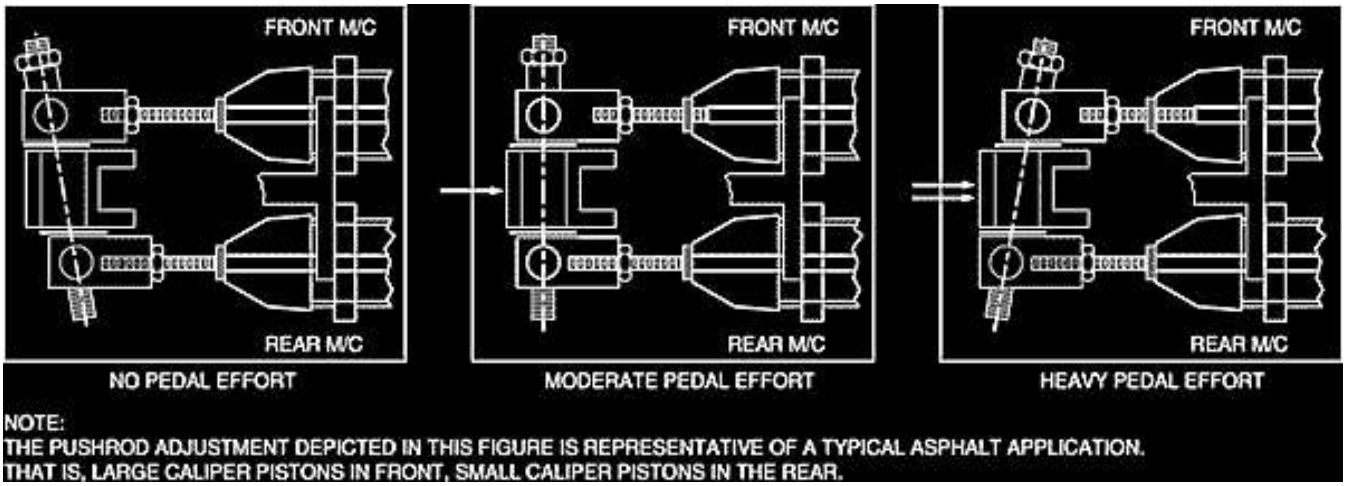
Attach and tighten the locknuts using a ½" wrench and ½" deep socket holding the master cylinder to the pedal box then repeat for the other master cylinder.

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.

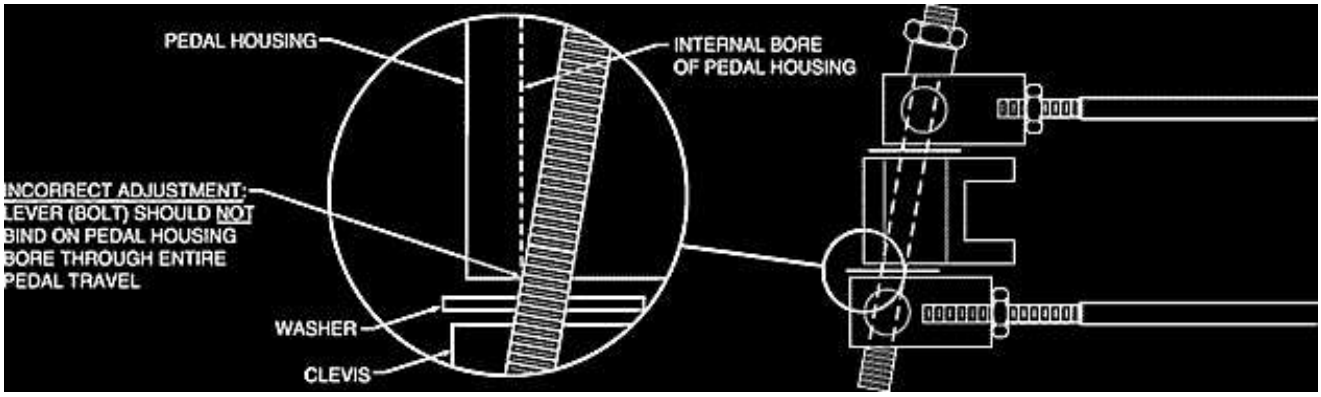
Balance Bar adjustment

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, given that 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.



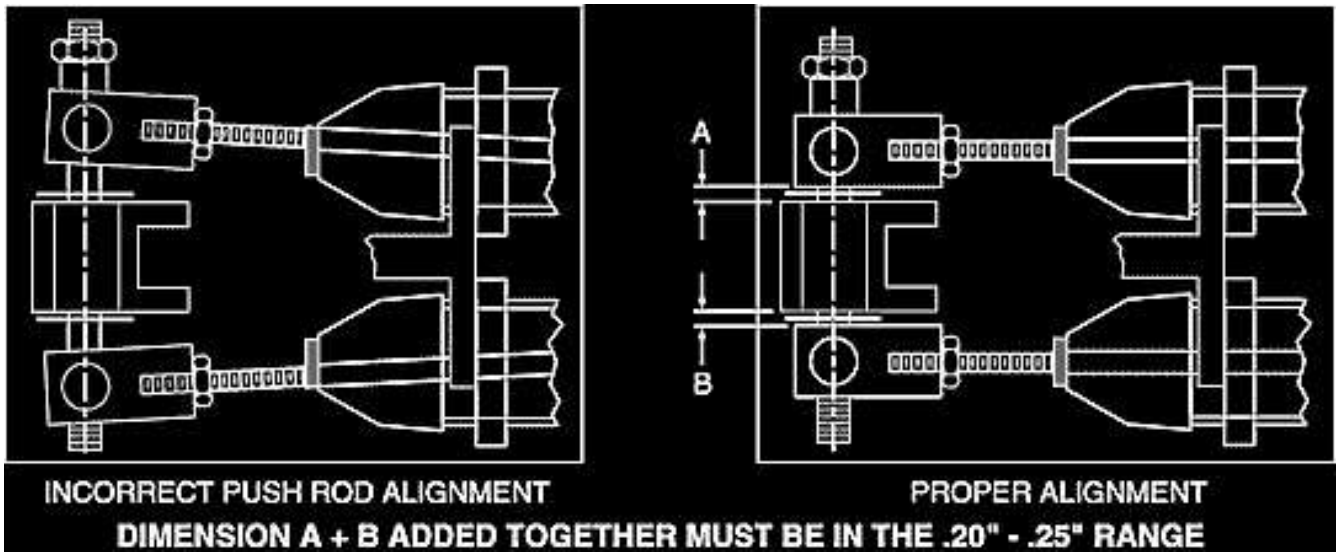
Sometimes this will lead to a “cocked” balance bar when the pedal is in the relaxed position, “no pedal effort”. This is acceptable as long as each master cylinder pushrod is completely free of pressure when the pedal is relaxed.

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.



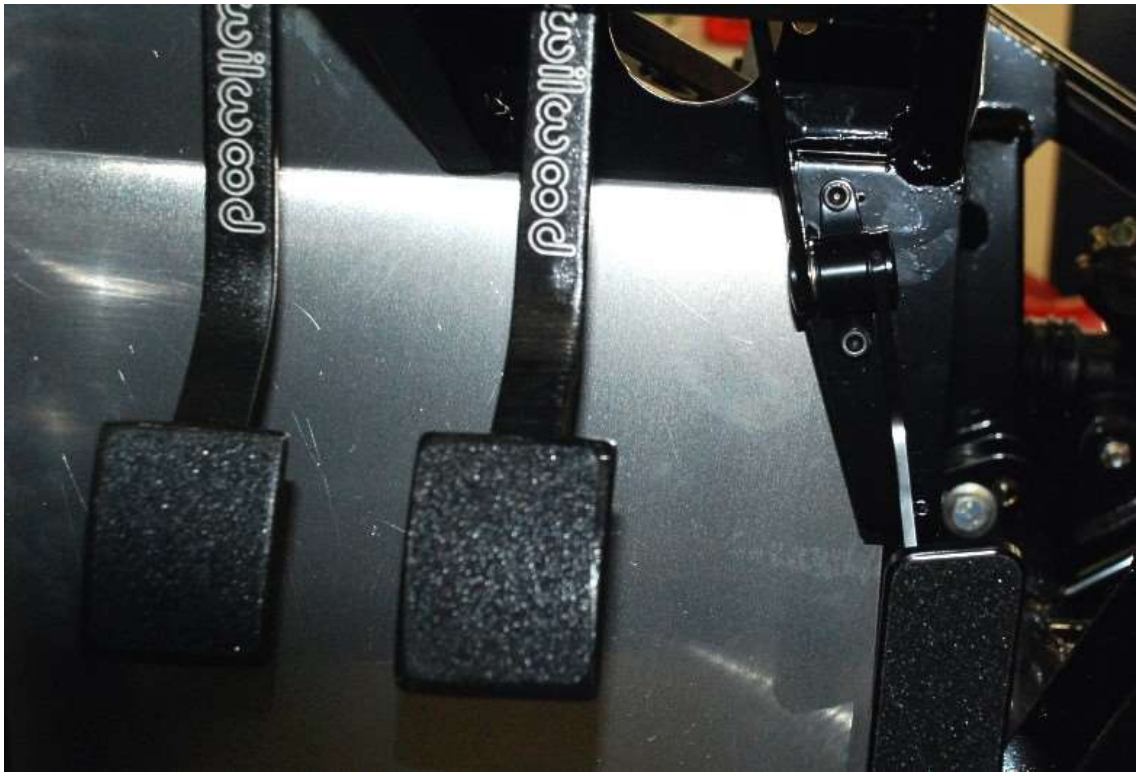
Make sure that the master cylinder pushrods remain true in relationship to the cylinder during entire pedal travel; pushrods should not be pushing master cylinder pistons at an angle.

- 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).

Accelerator Pedal

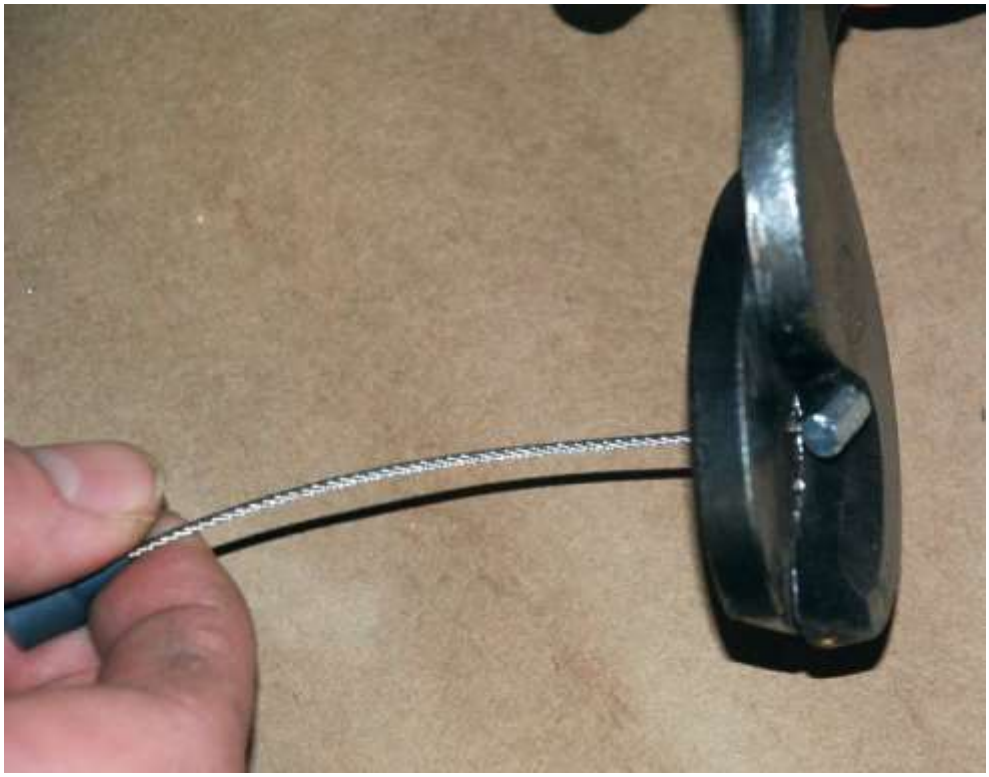
- $^{5}/_{64}$" hex key, ⅜", $^{7}/_{16}$", ½" wrenches, wire cutter, ¼" drill bit, drill, marker, masking tape.
- Accelerator cable components, accelerator pedal components, pedal box hardware.
- The Accelerator cable is designed to be used with all types of engines, carbureted or fuel injected. The stock cable has the barrel end on it for the 4.6L throttle body and the ball for a Mustang accelerator pedal.
- If installing a Coyote (fly by wire) install the mount and pedal now according to the coyote instructions

Unpack the throttle pedal and separate the arms. You can leave the screw loose for now as this will be adjusted for fit later.

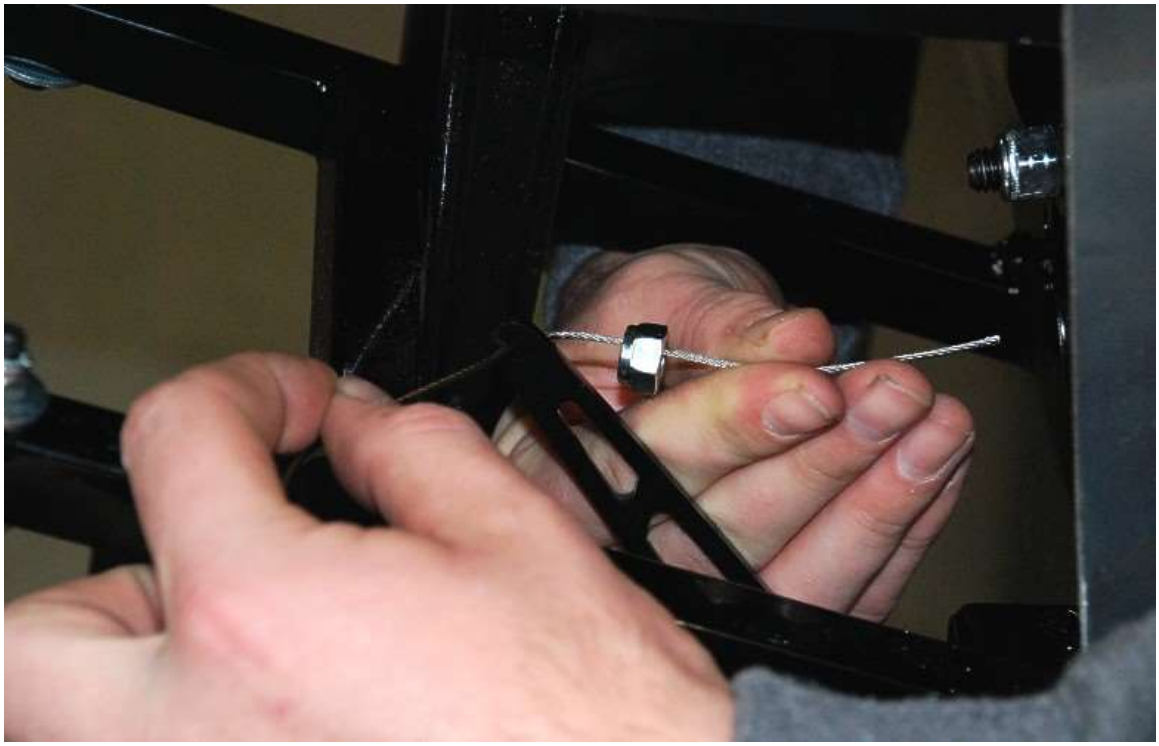


Use one ¼”x ¾” screw and locknut from the pedal box hardware position the accelerator pedal using the top hole in the accelerator pedal mount so that the top of the pedal lines up with the accelerator cable hole so the cable will come out straight. Mark the lower accelerator pedal mount hole then drill the plate to bolt the pedal in place.

Bolt the pedal to the mount plate using the ¼”x ¾” screws and locknuts



Unpack the throttle cable and cut the cylinder end off. Make sure your cutters are very sharp so as not to fray the cable.



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

Route the cable through the hole in the firewall and slide the sheath back over the cable.

Tighten the cable sheath to the firewall with the retaining nut. A piece of tape on the end of the cable will help prevent it from backing out of the sheath.

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

Steering Rack

🛠 Needle Nose Pliers, ¾" wrench, ¾" socket, Ratchet
🚗 Steering Rack Assembly, Steering System Hardware
✋ The inner Tie Rod Extensions are for **stock** Power Steering Racks only.
✋ The inner Tie Rod Extensions are **not** for the FFR manual steering rack.
✋ The inner Tie Rod Extensions are **not** for the FFR power steering rack.

Unpack the manual steering rack and the mounting assembly.

Push the bushings and sleeves into the mounting bosses on the rack.

Center the steering rack.

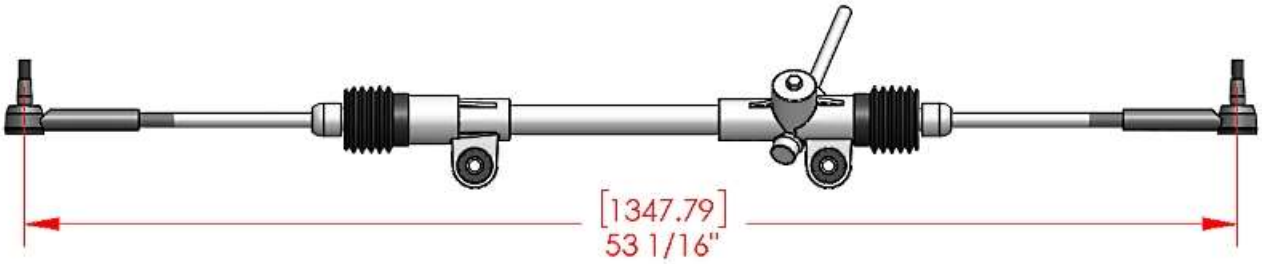
Bolt the rack into the frame. It is easier to do the driver side first then swing the passenger side down into the mount.

Screw the grease nipple into the outer tie rod end.

Thread the outer tie rod and jam nut 1”-2” down onto the steering rack inner tie rod.

The outer tie rods may come with either a castle nut and cotter pin or a nylon locknut.

Insert the tie rod ends into the spindles with the nut hand tight.



As a rough setting until an alignment can be done, the center to center distance for the top of the outer Tie Rod End stud should be 53.0625”. Try and keep the number of threads sticking out the same on both sides.

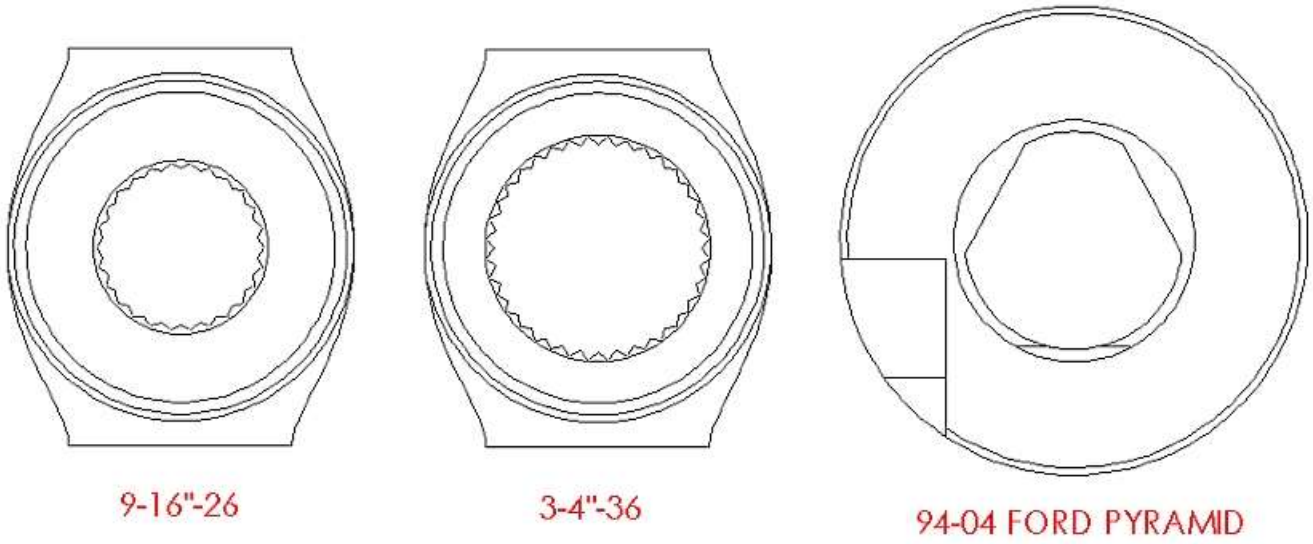
Torque the Tie Rod End nut to **25 lb-ft**. If a castle nut is used, torque the nut then install the cotter pin.

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

Steering Shaft

🛠 1/8", 5/32", 3/16" hex keys, ½", 9/16" wrenches, marker, drill, 3/16" drill bit, Philips head screwdriver, 15mm deep socket, ratchet.

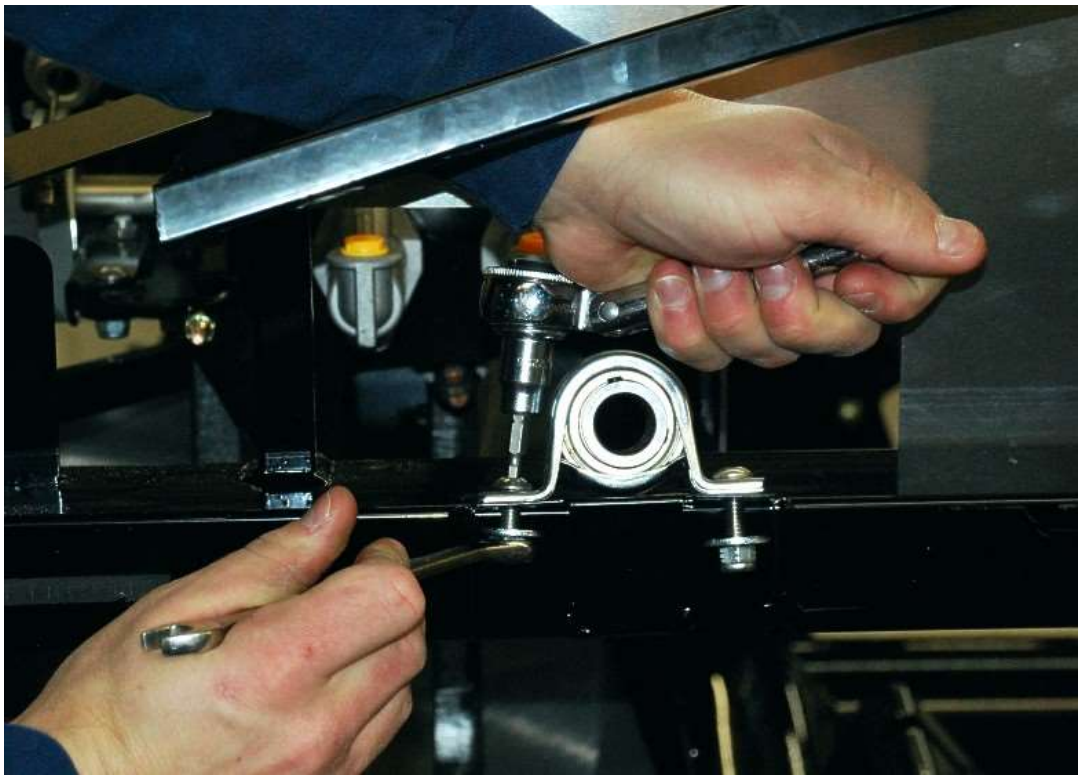
Steering bearings/Hardware, Steering system.



87-93 Power steering racks have a different spline than a manual steering rack and the 94-04 Power rack uses a "Pyramid" shaped end. All of these universal joints are available from FFR.

Unpack the steering parts.

Bearings



Loosely mount the top pillow block to the chassis with the set screw toward the rear of the car.

Attach the flange bearing to the front of the footbox with the set screw flange in the engine bay as shown using the $^{5}/_{16}$" x 1" button head screws, $^{3}/_{16}$" hex key and ½" wrench.

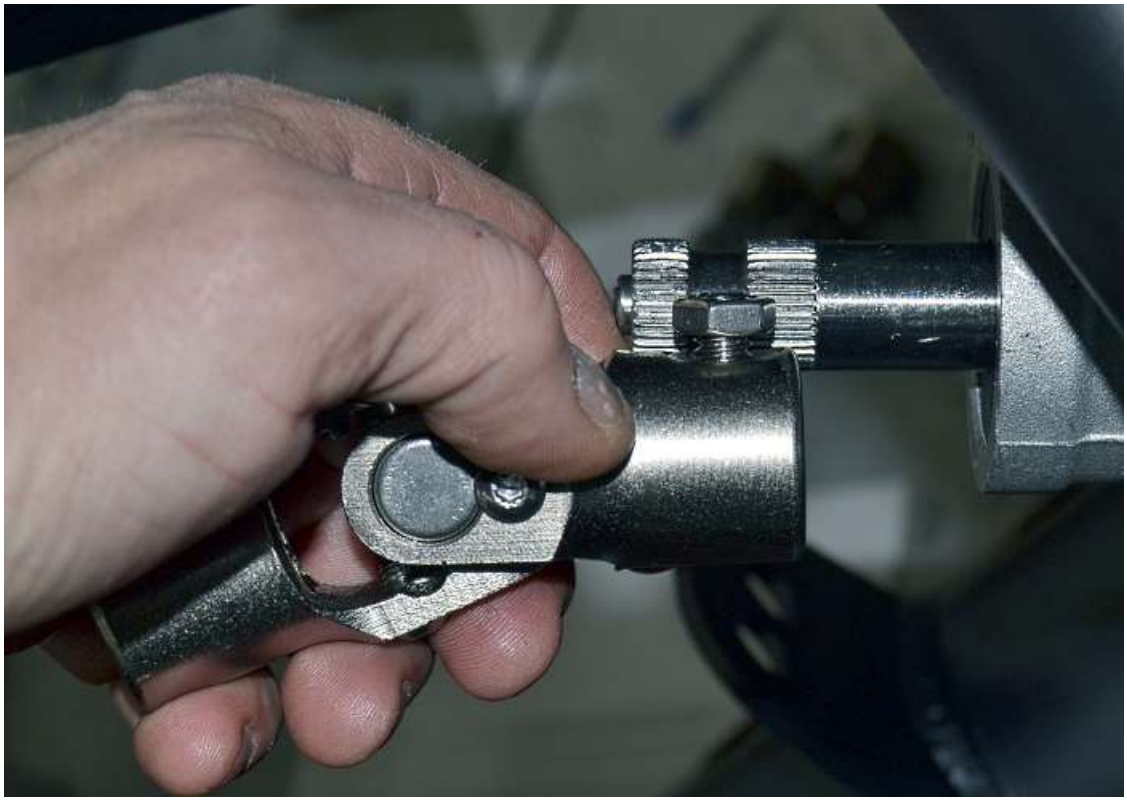
Manual steering

Loosen the set screw, align the set screw with the flat side on the input shaft then push the universal joint down onto the rack input shaft spline as far as possible.

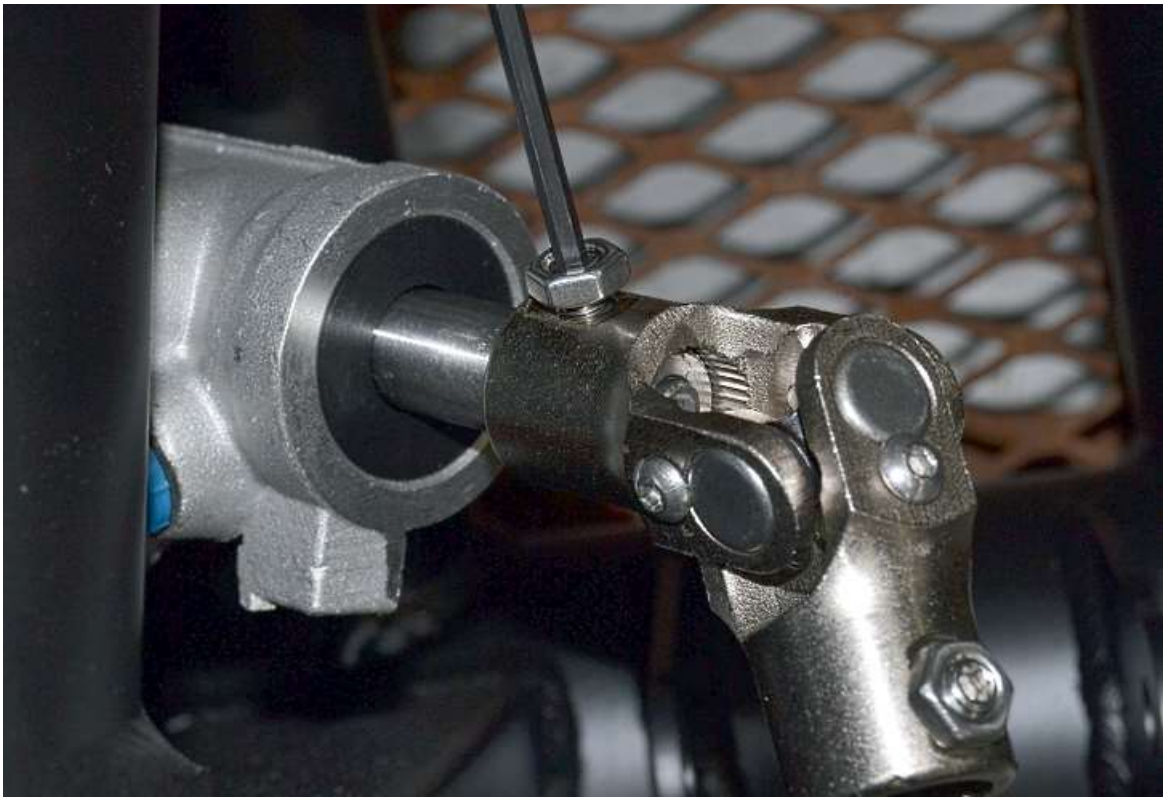
If necessary, use a plastic mallet to get the joint onto the spline, it is tight.

Tighten the set screw and jam nut using a 5/32" Hex key and ½" wrench.

Power steering



Note the location of the set screw on the splined end of the u-joint compared to the recessed unsplined area in the middle of the input shaft on the steering rack.

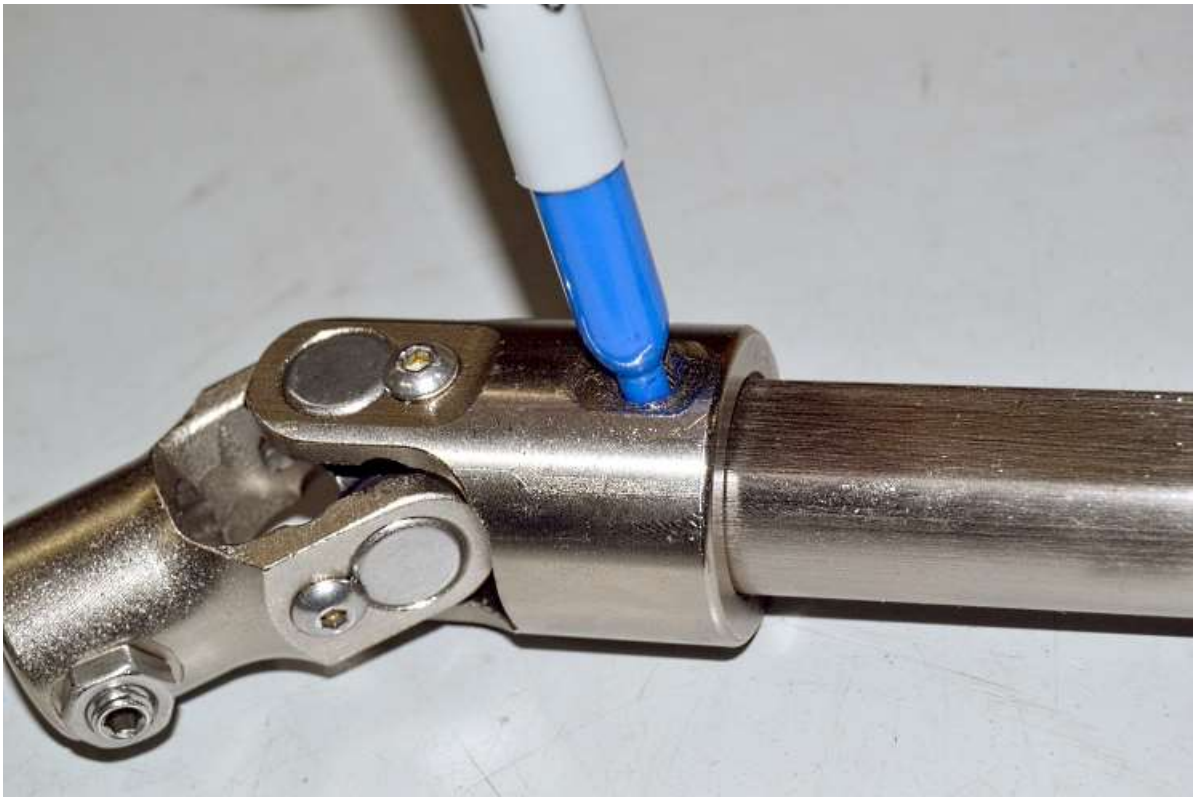


Push the shaft into the steering joint so that the set screw will go into the recessed area on the input shaft then tighten the set screw and jam nut using a 5/32" Hex key and ½" wrench.

1"DD tube prep

Remove the set screw from the 1"DD end of the 15840 universal joint.

Slide the 1”DD tube into the upper u-joint so that it is flush on the inside of the joint.



Mark the 1”DD tube through the set screw hole then remove the tube.

Use a $^{3}/_{16}$" drill bit followed by a $^{5}/_{16}$" drill bit at the point marked to create a slight recess for the set screw.

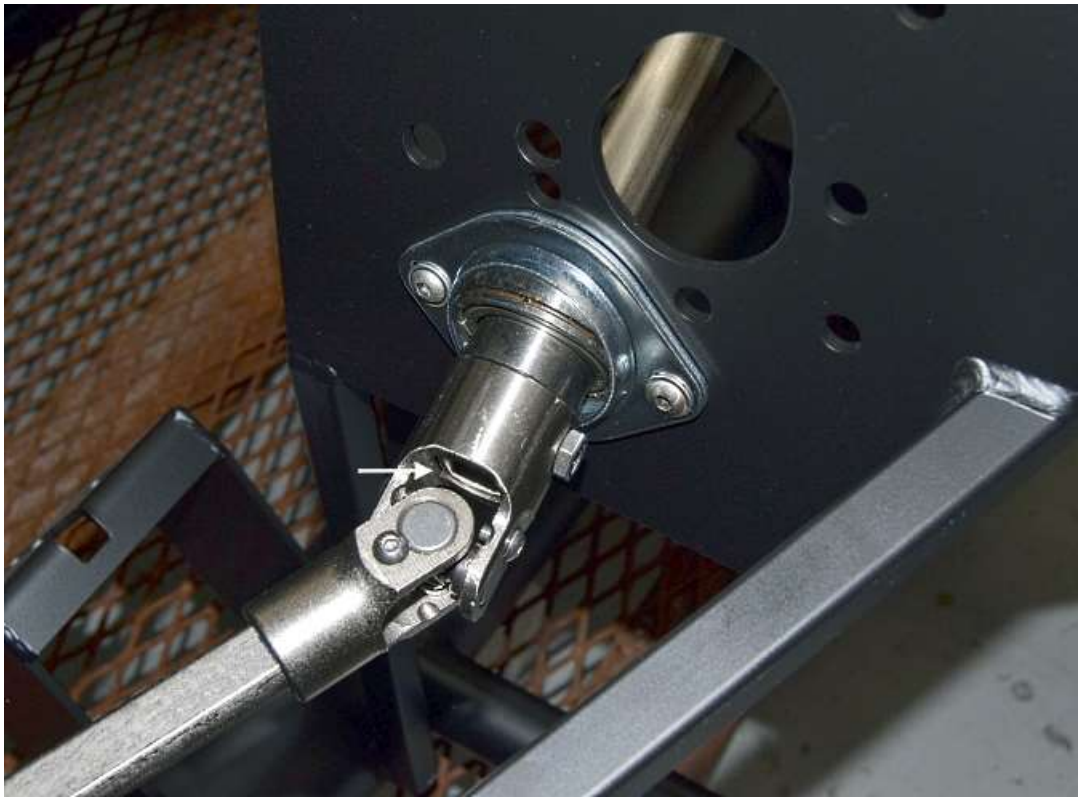
Reattach the joint to check the fit and position of the recess then remove the tube.

Lower shaft

Push the ¾”DD end of the u-joint onto the ¾”DD shaft.

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.

Insert the lower shaft into the steering rack joint.



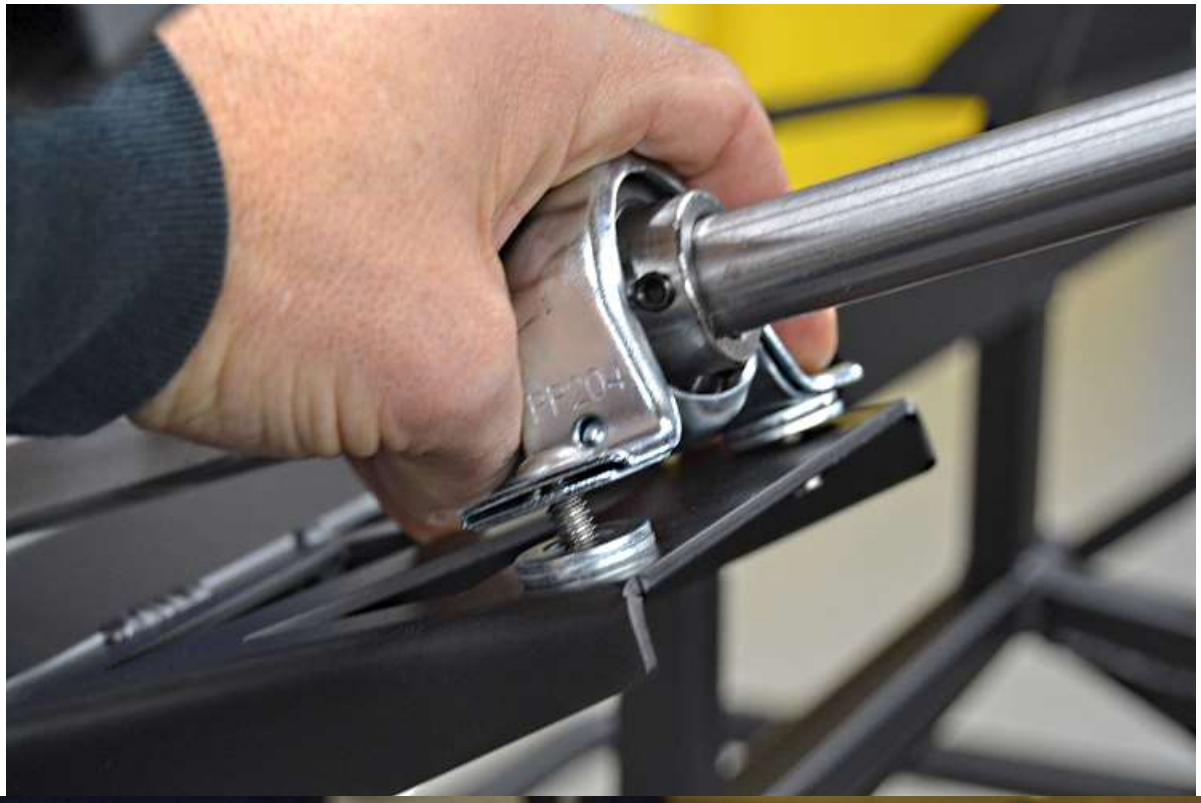
Slide the 1”DD tube through the footbox bearing into the upper u-joint so the set screw on the 1”DD tube goes into the recess made earlier.

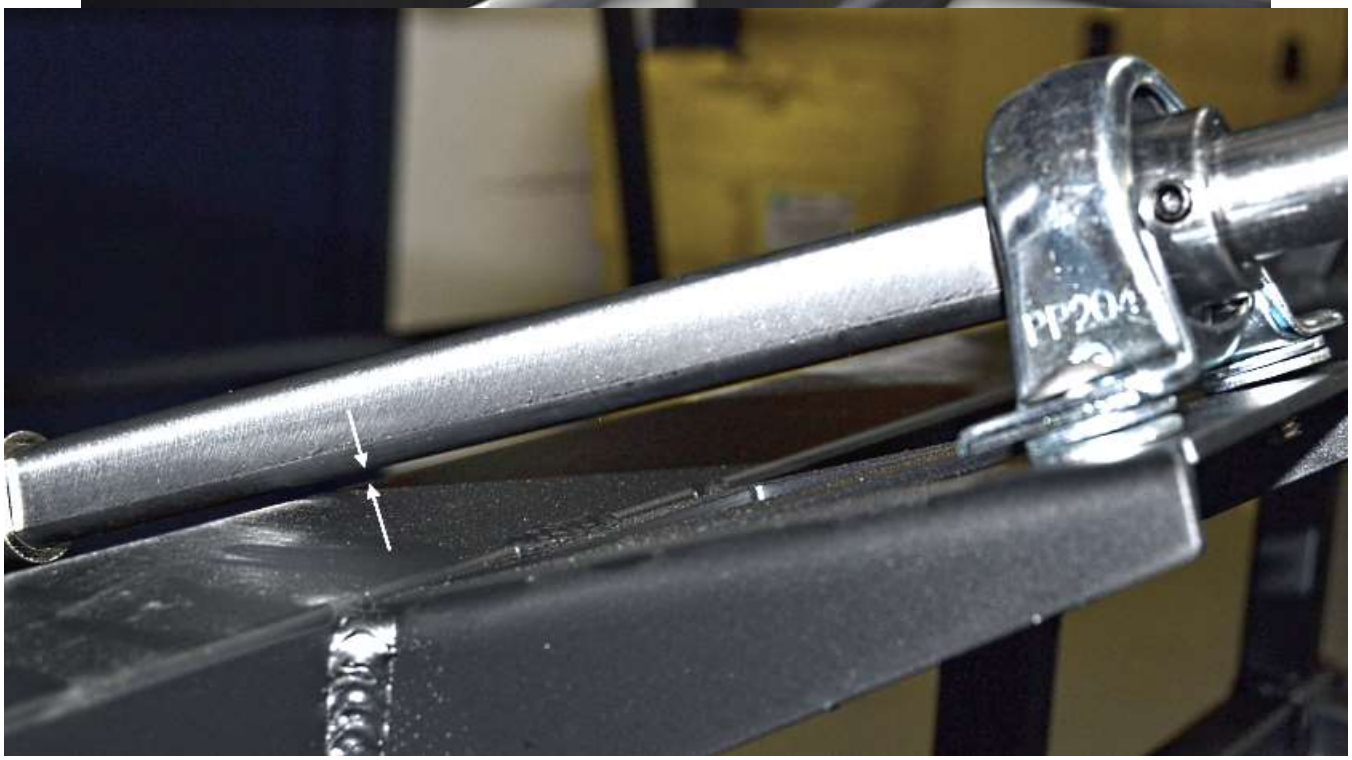
Upper Steering Shaft

- 🛠 $^{5}/_{32}$”, $^{3}/_{16}$”, $^{5}/_{16}$” hex keys, ½” wrench, rubber mallet
- 🚗 Steering system hardware
- ✋ Use thread locker on all the steering shaft screws that do not have jam nuts and the adapter screws.

Unpack the upper steering shaft from the primary chassis components box.

Slide the steering shaft through the upper bearing and start it in the lower shaft.





If necessary or to raise the height of the steering wheel, put washers under the upper pillow block bearing mount so that the upper shaft does not hit the frame or the wheel is at the height desired.

Tighten the upper and lower bearings.

On the lower shaft make sure the shaft does not go into the lower joint and is no more than flush on the inside.

Turn the steering shaft so the recessed bosses for the spring washers are facing up and set the washers in place. Then tap the upper shaft down until the upper clip just disappears into the lower shaft.

Tighten the set screws on the bearings using an ⅛” Hex key.

Cockpit Aluminum

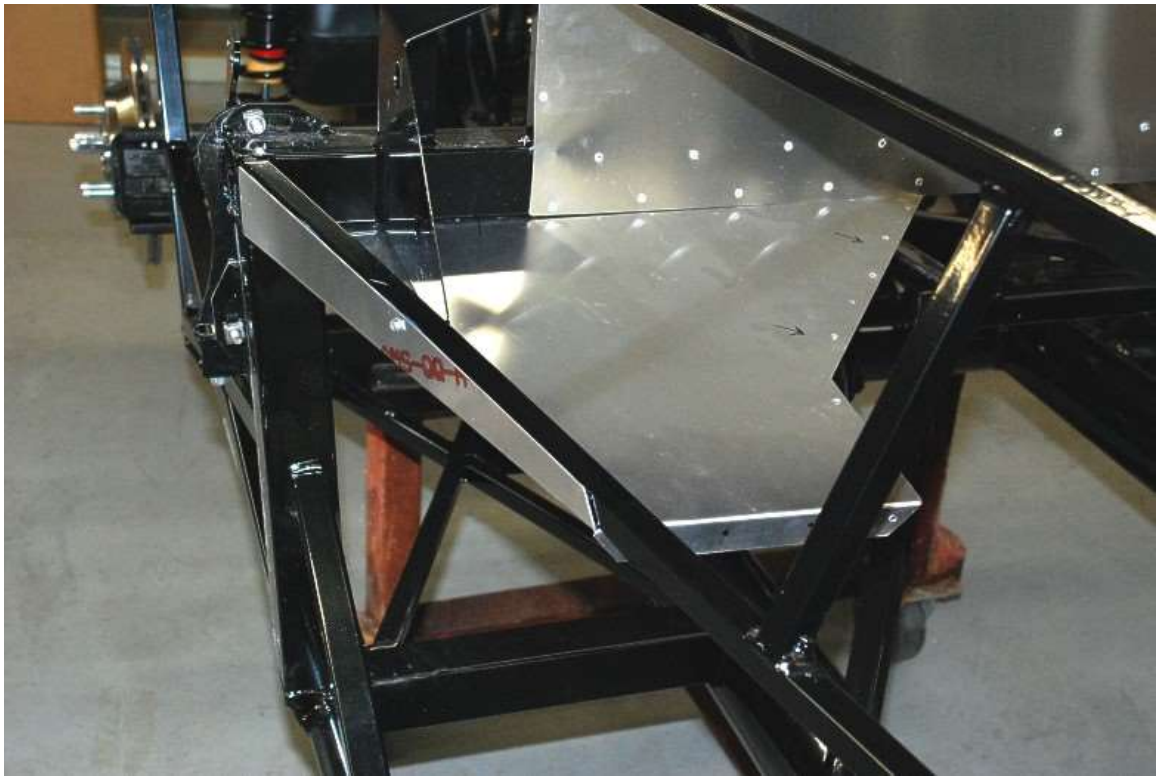
🛠 Drill, ⅛” drill bit, rivet tool, Silicone, caulking gun, #8 self tapping screws, #8 hex nut driver, ruler, marker, Acetone or carburetor cleaner, rags.

🚘 Packaged aluminum, mounted aluminum, Secondary body fasteners.

✋ Do one panel at a time. Be careful of the sharp aluminum edges, they can cut you.

Passenger Footbox

Locate the passenger footbox top and drill and mark the holes in the top flat surface only.



Silicone this panel where it meets the chassis and rivet along the bottom of the 2” square frame crossbar only. Use one of the original screws to temporarily hold it to the other small chassis tube.

Drill the tunnel front A-shaped piece where it meets the chassis and silicone and rivet it in place.

Mark and drill the two vertical edges of the passenger footbox inside wall.

Silicone and rivet the panel to the front tunnel “A” and the footbox top.

Mark the holes in the passenger footbox front panel upper and outer edges but do not drill yet.

Silicone the panel and install with the temporary screws then drill through both panels and rivet it in place.

Mark and drill all three flanges on the passenger outer footbox top.

Silicone the flange between the outer top and the outer wall and attach the two pieces together using the temporary screws.

Silicone the remaining flanges then install the outer wall/top on the footbox with rivets. Make sure the rear edge is flush to the chassis and not caught up on the door hinge before you start riveting.

Right Floor

Drill the right-side floor where it was marked to attach to the chassis. Mark the two front flanges but do not drill yet.

Silicone the chassis where the aluminum floor will touch. The main chassis rails are not riveted to but still need a bead of silicone run along the tops. The top edge of the tunnel is not riveted yet but gets silicone as well.

Drill and rivet the floor in place to the chassis. Use a couple clamps or tape to hold the tunnel top to the tunnel until the silicone sets.

Drill, silicone, and rivet the right side under door piece in place. Leave the rivets out of the rear vertical flange for now.

LEFT FLOOR

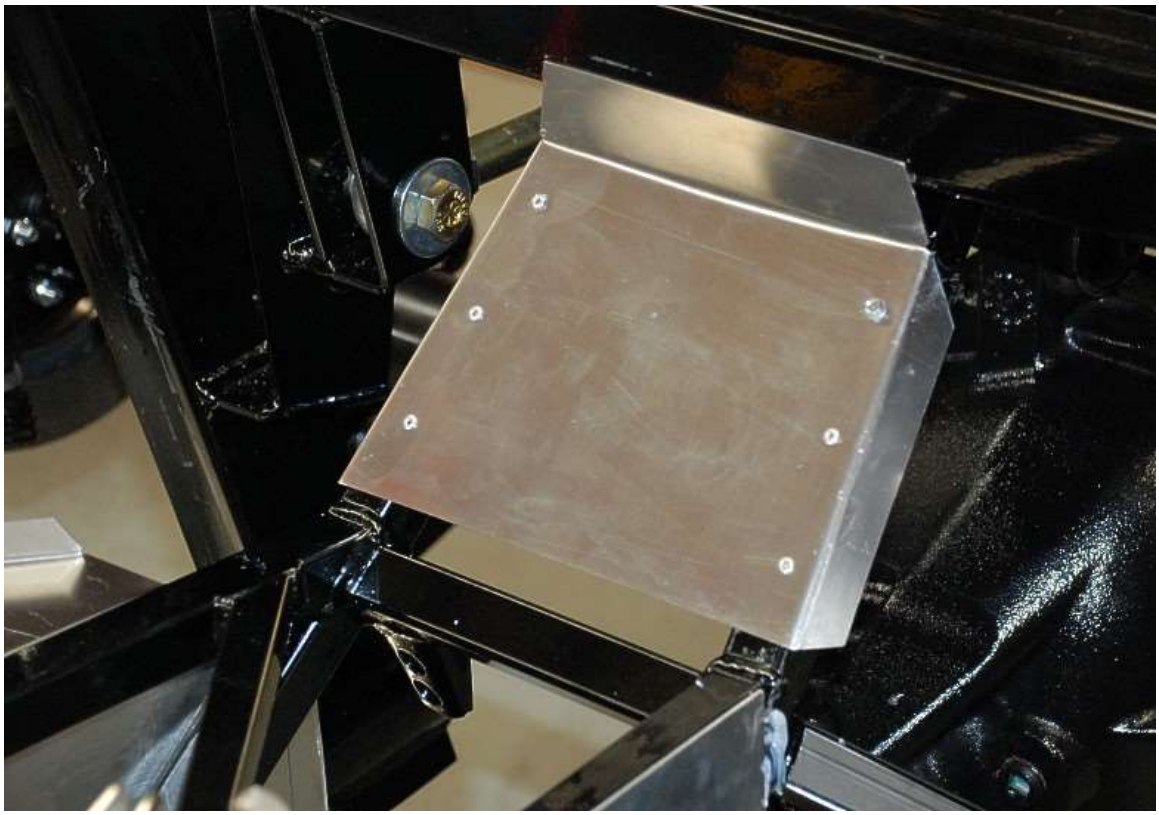
Drill silicone and install the driver's footbox floor. The outer flange does not get drilled yet.

Silicone, drill, and install the driver side floor.

Install the left side under door aluminum like the right side.

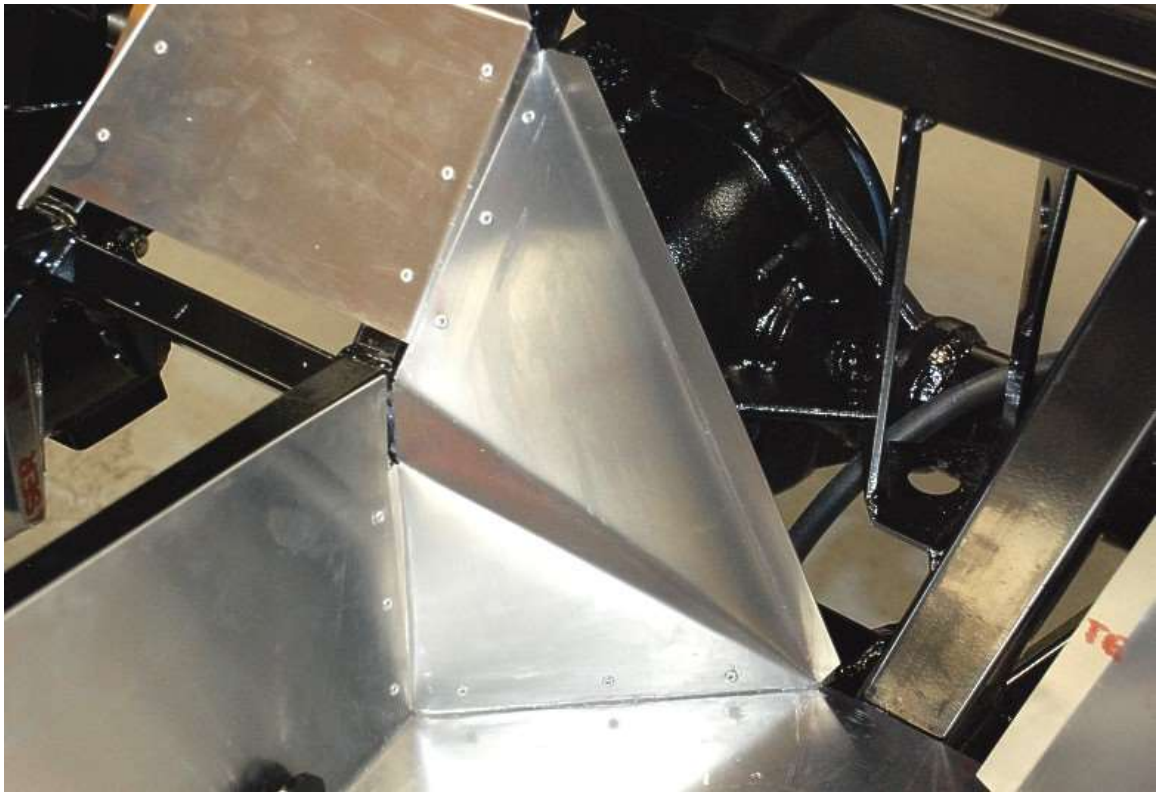
Drill, silicone and install the inner footbox wall. The front flange tucks in behind the front wall that was left unriveted. Put a little silicone on both sides of this flange.

U-Joint Cover



Mark the rear tunnel cover where it meets the chassis then silicone and rivet it in place.

Transmission Tunnel rear corners



The inner rear corner pieces tuck behind the tunnel sides and sit on top of the floor. Mark the rivet spacing on the top edge and silicone and rivet the three flanges that make contact.

Cockpit rear corners

The outer cockpit corners get marked on the bottom flange and where they meet the chassis. Drill silicone and rivet these in place.

Fuel System

🛠 $^{9}/_{16}$" and $^{5}/_{16}$" deep sockets, ratchet, $^{7}/_{16}$" wrench, rubber mallet, hammer, marker, punch or flathead screwdriver, $^{3}/_{16}$", $^{5}/_{16}$" hex key, floor jack, friend, WD 40 or other light lubricant, drill, ¼" drill bit.

🚘 OEM Fuel tank components, Secondary Body Fasteners Assembly, Fuel strap fasteners, fuel line components, fuel lines.

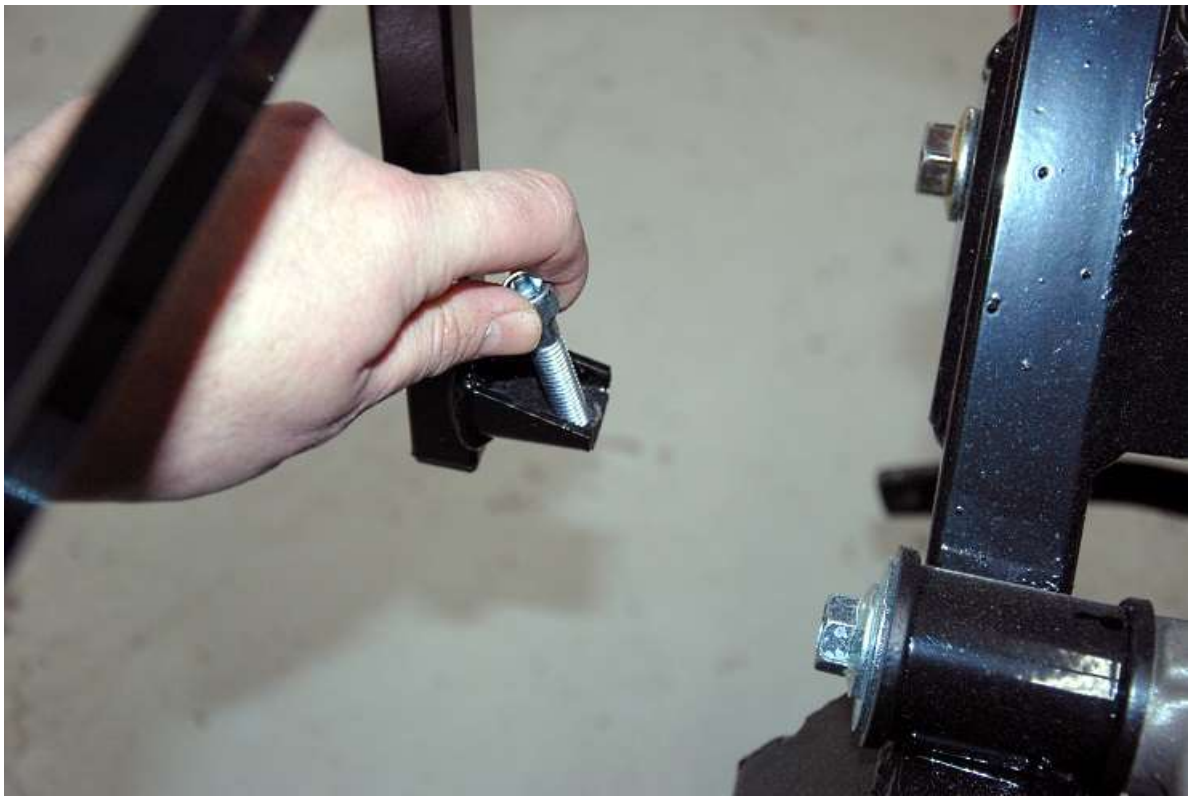
Frame prep

🚘 Secondary body fasteners, fuel tank straps, fuel strap fasteners

Unpack the fuel strap fasteners.

Unpack the ¾” square plastic end caps from the secondary body fasteners.

Push the two plastic end caps into the tubes hanging down in front of the gas tank area.



Put the Fuel tank bolts in the gas tank front frame mounts.

Hang the fuel tank straps from the rear mount of the chassis using two of the strap fasteners. The longer strap goes on the passenger side.

Fuel Tank Vent

🛠 ¼", $^{5}/_{16}$" sockets, ratchet, (2) $^{7}/_{8}$" wrench, Teflon tape, razor knife

Unpack the OEM fuel tank components including the tank and straps.

Screw the vent into the plastic bushing and tighten with a $^{7}/_{8}$" wrench.

Insert the small rubber vent gasket in the small hole on the top of the tank.

Push the vent into the grommet.

Fuel Pick-up

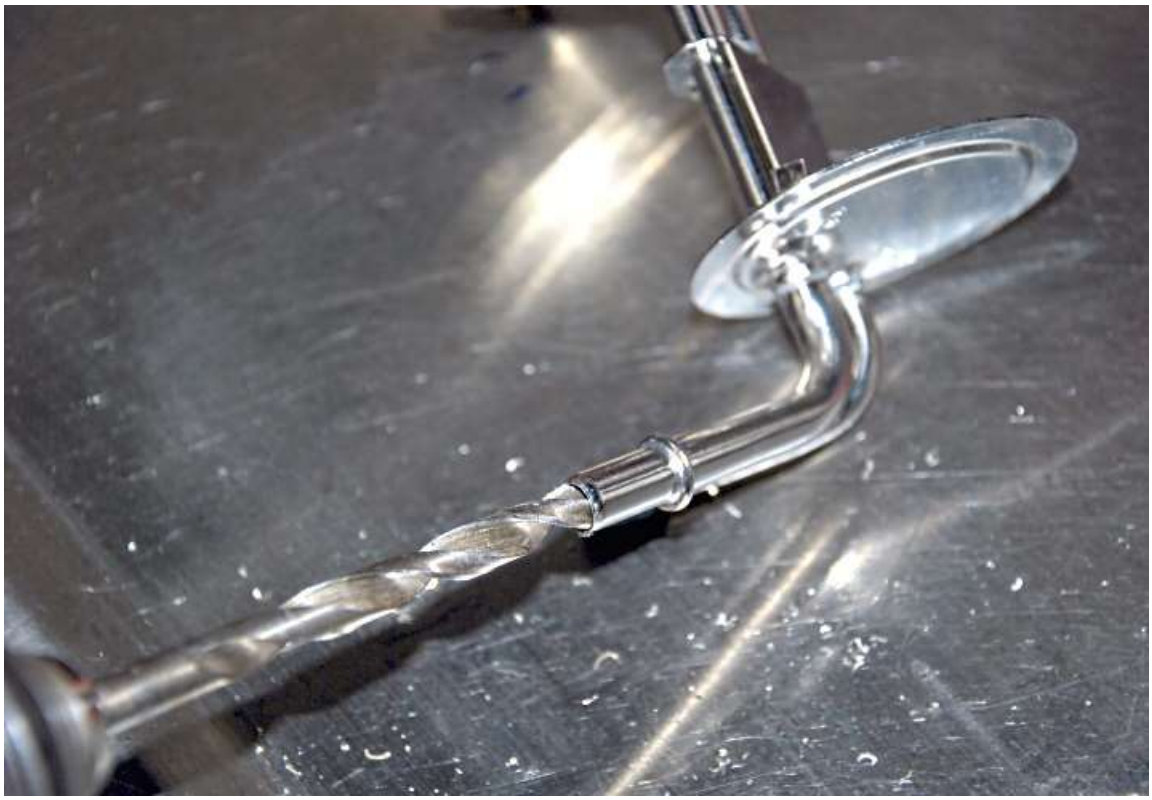
✋ This install shows the set-up for a pick-up with an inline fuel pump. See www.factoryfiveparts.com/instructions for in-tank fuel pump set-up.

Prep

✋ If the car will have a high horsepower fuel injected engine there are a few "tweaks" we recommend get done to the fuel pick-up.

🛠 Drill, pliers, 1/8", 5/32", 1/4", 9/32" or 19/64" drill bits

Remove and discard the rubber piece on the end of the return line, this can affect the fuel pressure at the engine.



Starting with a ¼" drill bit drill out the end of the send line then change to a $^{9}/_{32}$" or $^{19}/_{64}$" drill bit, the pressed end is a little restrictive.

Starting with a ¼" drill bit drill out the end of the return line then change to a $^{9}/_{32}$" or $^{19}/_{64}$"drill bit, the pressed end is a little restrictive.

Install

Set the rubber O-ring gaskets in place for the fuel pump pickup.

Slide the pickup down into the tank; you will have to rotate as you go to get the tubes into the sump and line up the tabs on the pick-up and slots on the tank. You can see this looking through the filler neck hole.

With the pickup all the way down slide the mounting collar and tap tightly into place with a punch and hammer.

✋ Make sure that the lock ring is held by all three locking tabs on the tank or the sender will leak.

Fuel Gauge Sender

Set the rubber O-ring in place for the fuel level sending unit.

Insert the fuel level sender into the tank.

]

Tap the locking ring tightly into place with a punch and hammer.

Make sure that the lock ring is held by all three locking tabs on the tank or the sender will leak.

Fuel filler neck

Insert the large rubber filler neck gasket in the side of the tank.

Slide the filler neck tube into the tank. A little oil or WD40 on the rubber gasket helps.

Slide the retaining bracket down the filler tube and mark its mounting location on the tank.

Move the retainer out of the way and make sure your mark is outside the weld that holds the two tank halves together.

Drill a ¼” hole through the tank flange on the mark made.

Use the ¼” bolt and locknut to attach the retainer to the tank.

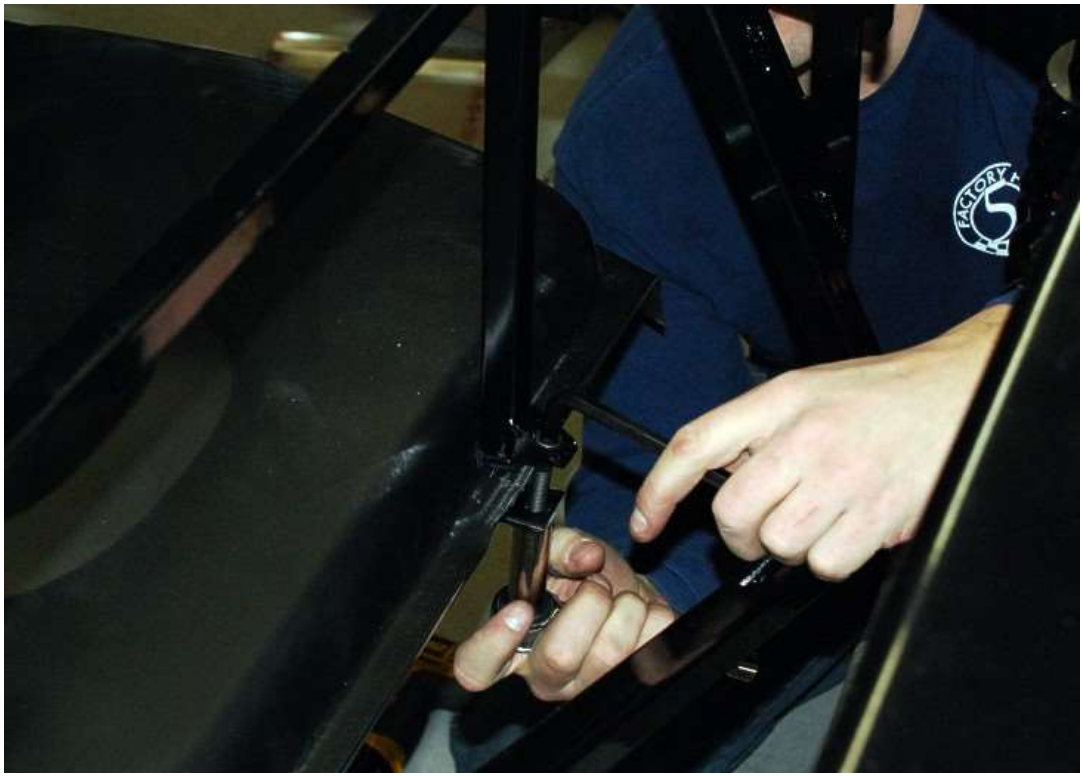
Fuel tank install

At the locations on the tank where the tank straps come near the tank, use a pair of pliers and bend the bent parts flat.

Put the metal tank in the plastic tank cover.

Using a jack, raise the tank up into place on the chassis. Make sure the plastic cover is in position below the tank.

Bolt the straps in with the strap fasteners and drop the jack.



Tighten only the driver's side strap as the passenger one will be removed for aluminum fitment later on.

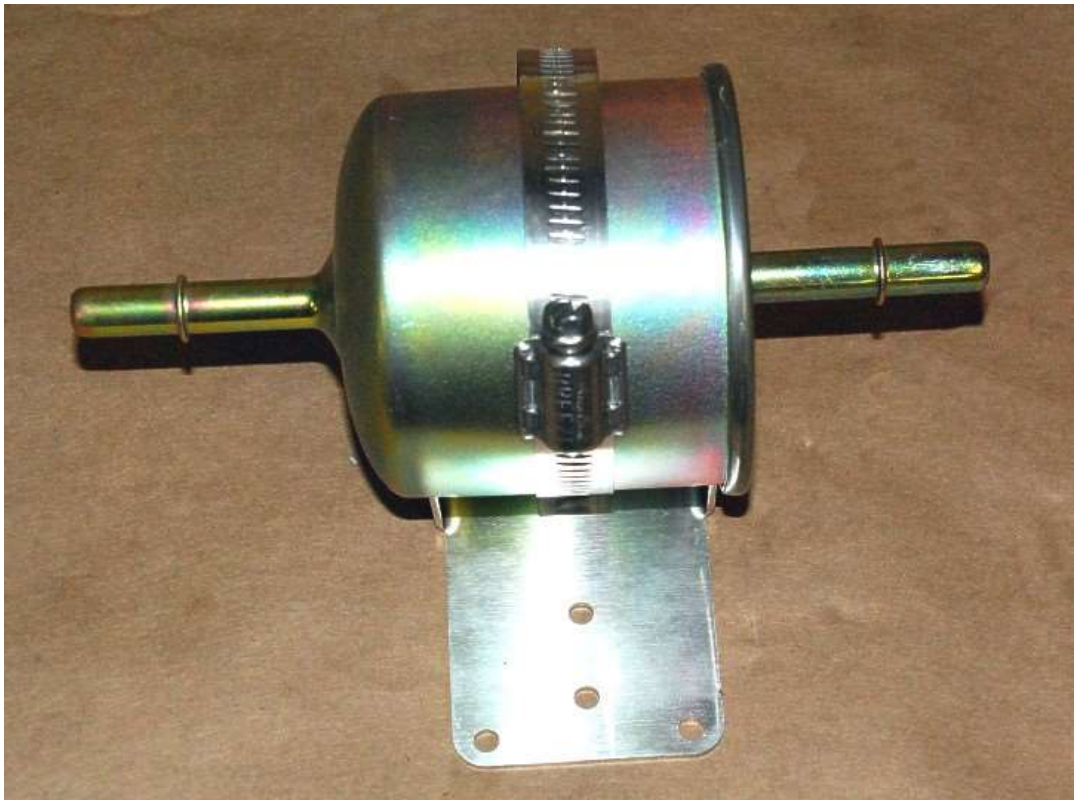
Fuel filter

🛠 Tube bender, 3/16" drill bit, drill, rivet tool, marker, tape measure, flat head screwdriver

🚘 Insulated clip hardware, Fuel line components, ¼", 5/16" fuel lines, OEM fuel tank components.

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.

Attach the short nylon fuel line to the filter and the tank to show where your mounting location must be. The elbow end can attach to either end as shown here; we have attached it to the tank.

Hold the filter up to the 2”x 3” chassis tube, mark the holes, then drill and rivet the bracket on using $^{3}/_{16}$” rivets.

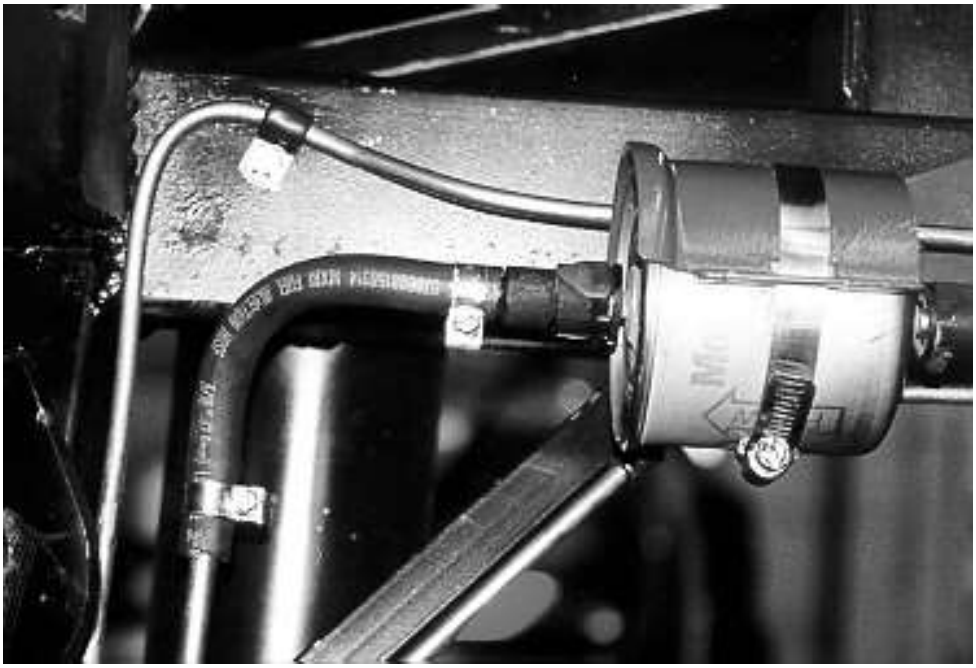
Hard lines

Unpack the fuel lines and the fuel line assembly which is in the secondary chassis components box.

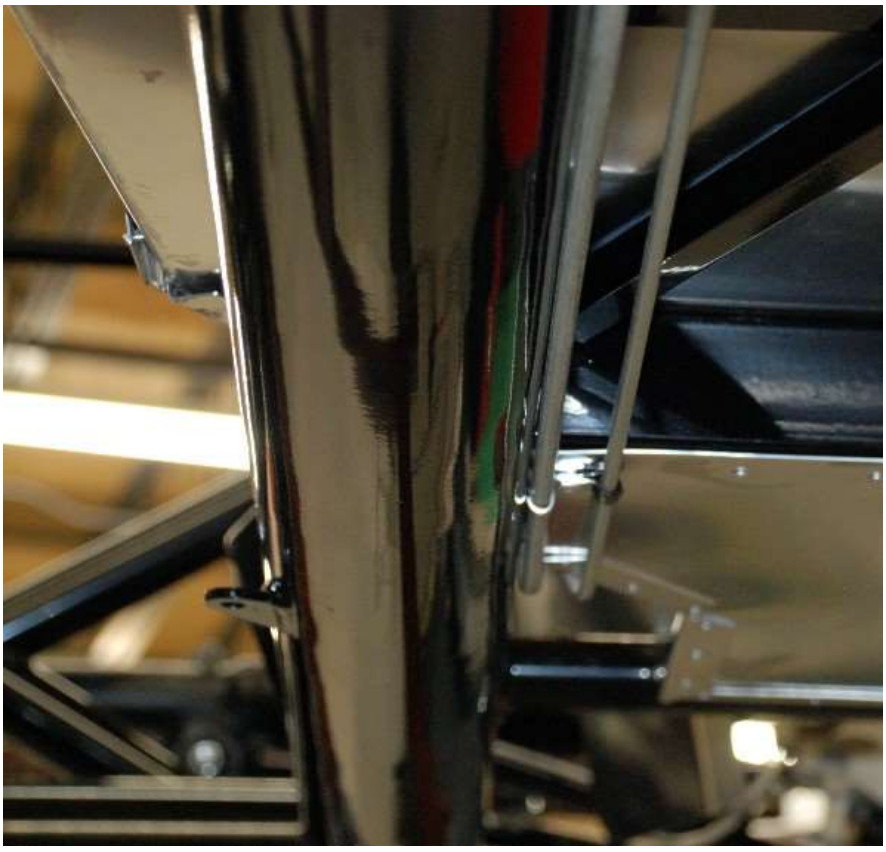
- The larger 5/16" line is the send fuel line to the engine. If you are running a return system then there is ¼" line provided for that as well. There are barbed fittings provided for both sizes.

- The fuel line routing will depend on your style of fuel pump, whether it is in-line, in-tank, or mounted on the engine.
- The most important things are: To route the lines so that they are protected by the chassis; not close to any heat source or moving parts; and provide enough slack in the rubber hoses for the engine to move.

Use the ¼" flexible line, 5/16" flexible line, and fuel injection hose clamps to connect the nylon fuel line connectors to the hard line.

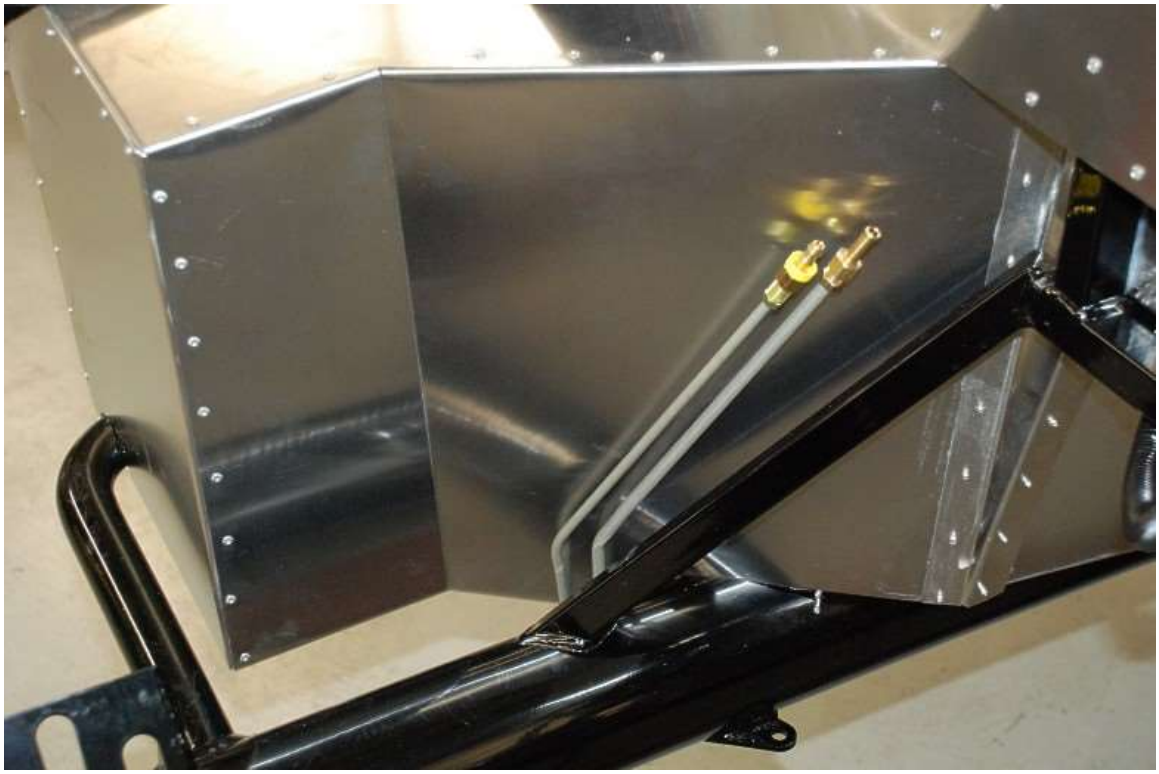


From the filter we generally run the lines down the 2”x 3” tube behind the rear cockpit wall and alongside the outside of the main 4” frame tube.



- Which side you run down may depend on where you are hooking up to your fuel rail, carburetor, or pressure regulator. We usually run the fuel lines on the passenger side of the car and the brake lines on the driver side of the car.

Fasten the lines to the 2”x 2” square cockpit outriggers with the insulated line clips and $^{3}/_{16}$” rivets.



Run the lines up the inside of the right footbox.

Attach a 25” section of $^{5}/_{16}$” fuel line and fuel line clamp onto the vent.

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

Brake System

- Tube bender, 3/16", ¼", 7/16", ⅝" drill bits, drill, rivet gun, marker, tape measure, razor knife, round file or sand paper, brake fluid, 5mm Hex key, 7/16" wrench.
- Pedal Components, Insulated clip hardware, Brake line components, 3/16" brake lines, Front caliper/rotor assembly

Brake reservoir

- 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.
- There are also two ways to mount the reservoirs, in the engine bay or over the pedal box. If locating them in the pedal box it is necessary to cut the access panel location in the body later in the build to allow filling of the reservoir. The some of the following pictures show the older style reservoir.

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.

- Make sure to mount the reservoir high enough so the top of the reservoir is higher than the master cylinder so the master can suck the fluid in to bleed the system.

Find a location for the brake reservoir, it can mount to the front of the footbox just inside the hood opening or behind the engine on the firewall but this would require making a bracket. Use the reservoir with cap and locate it so the reservoir cap can be removed and filled with the body on.

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.

The best way to pass the hose through the wall of the footbox is using the included bulkhead hose fitting.

Decide the routing of your reservoir to master cylinder hose and drill a ½" hole through the aluminum for the bulkhead fitting. The fitting is slightly larger than ½" so wiggle the ½" bit around to oversize it.

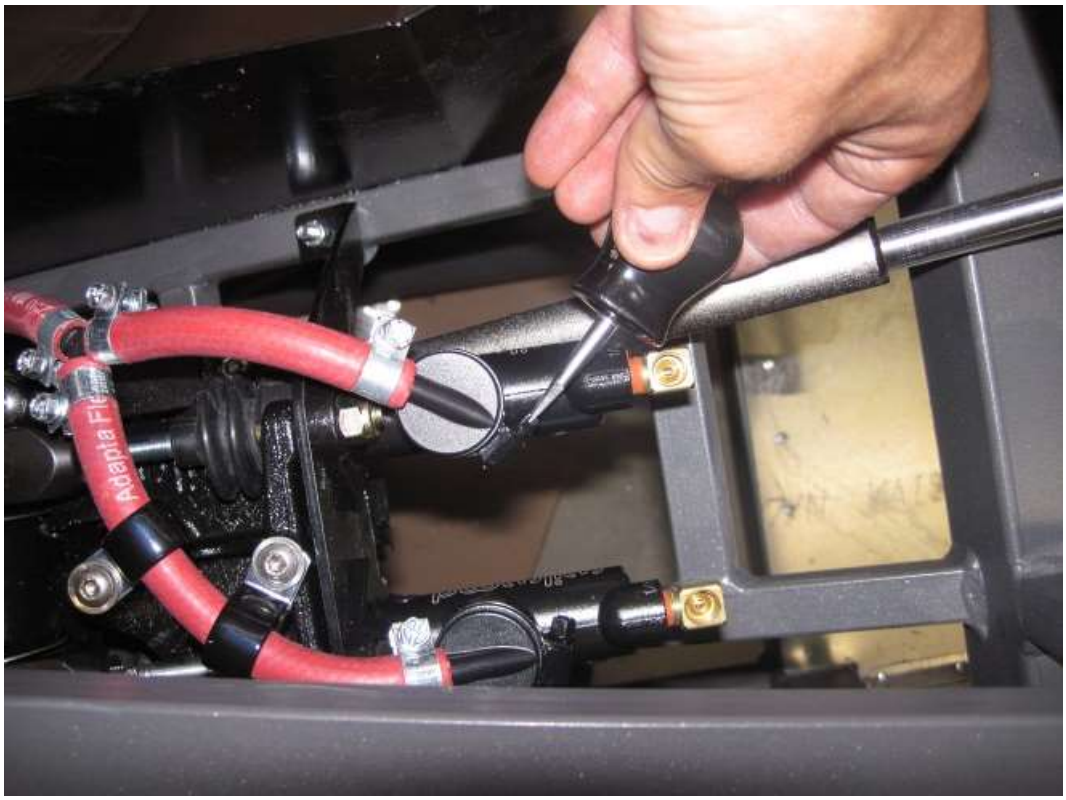
Insert the bulkhead fitting and spin the nut on the backside of the panel. Tighten the fitting using $^{7}/_{16}$" and $^{11}/_{16}$" wrenches.

Make sure to put the hose clamps on the hose before pushing onto the barb, it is hard to get the hose off the barb after.

Route the hose from the reservoir to the bulkhead fitting, push a hose clamp onto the hose then onto the barb. Tighten using a 7mm socket and ratchet.

Route the line from the reservoir the top of the brake pedal area then cut the hose.

Connect and split the hose to the two master cylinders using the Y provided. Make sure that the line cannot get in the way of moving parts, especially the brake pedal!



Attach the master cylinder hose adapter to the master cylinder and use insulated clips from the secondary body fasteners box or zip ties to hold the lines in place.

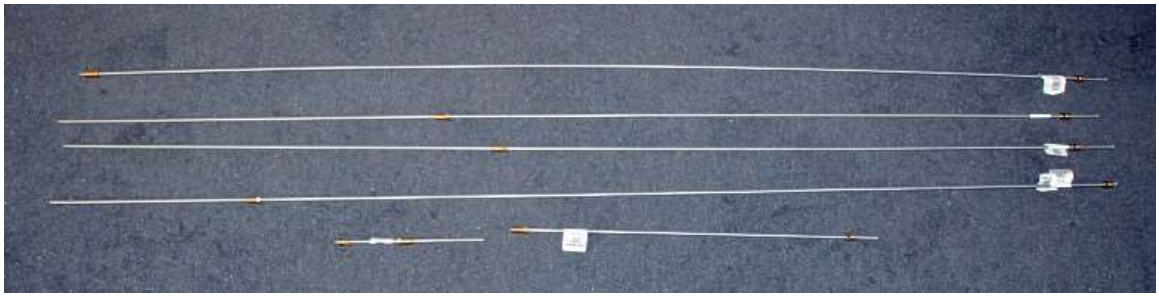
Front flexible brake lines

🛠 $^{7}/_{16}$”, ½”, ¾” wrenches, $^{3}/_{16}$” drill bit, drill, rivet tool, 9/16” socket, torque wrench.

Unpack the hardware from the brake line components.

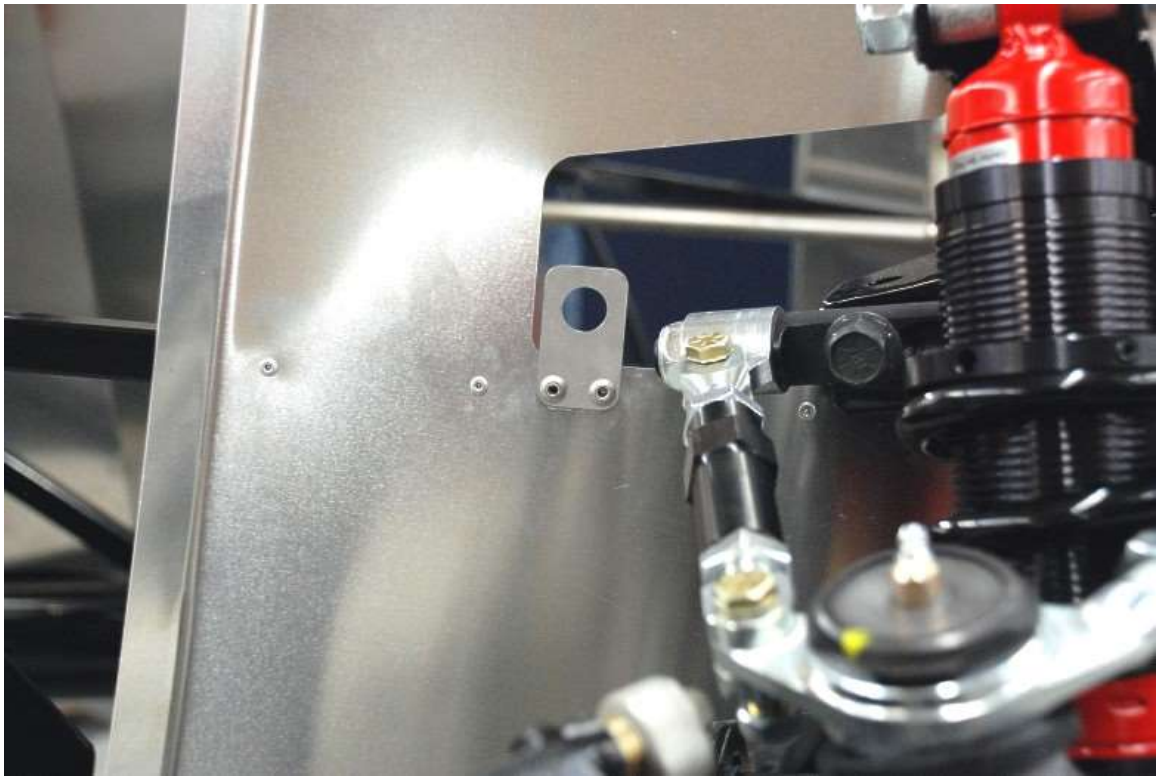
✋ The crossed off parts in the picture above are for the stock Mustang Master Cylinder and flexible brake lines so are not used. The U-nuts, washers and button head screws are for the e-brake handle mounting. The small black screws are for the e-brake boot

Unpack the remaining hardware from the front brake assembly.

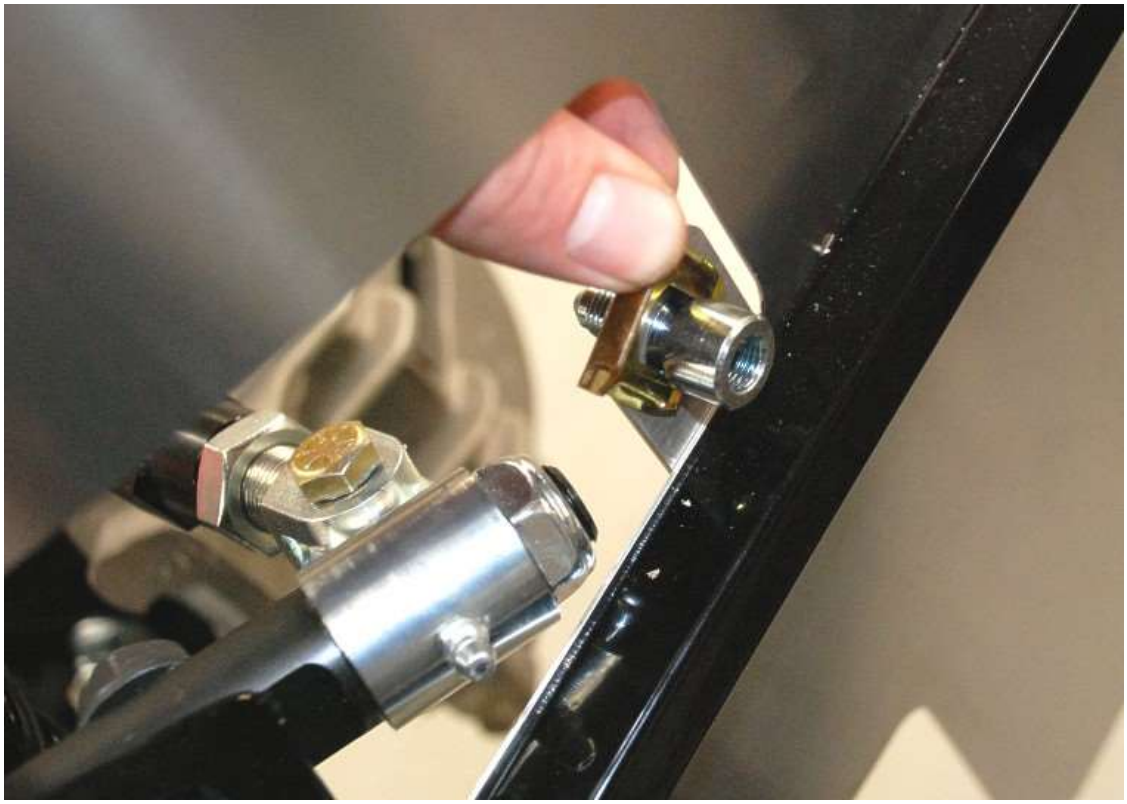


Lay out the various lengths of brake line so you can see what you have to work with. Like the fuel lines, there are many ways to run these lines but you must be very careful to keep them protected from moving parts, heat, or being too close to the bottom of the car.

- Which side you run down may depend on where you are hooking up to your fuel rail, carburetor, or pressure regulator. We usually run the fuel lines on the passenger side of the car and the brake lines on the driver side of the car.

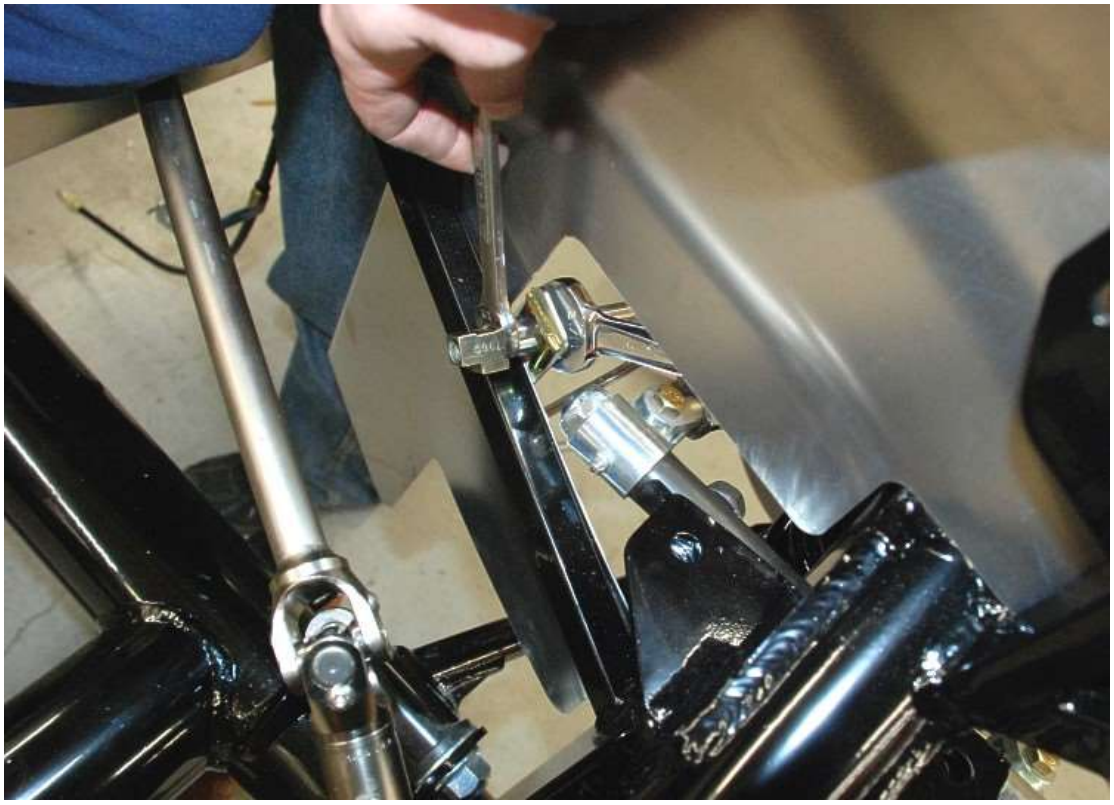


The laser cut stainless brackets from the front brake assembly attach to the chassis right behind the front upper control arms. Drill and rivet these in place using two $^{3}/_{16}$" rivets.

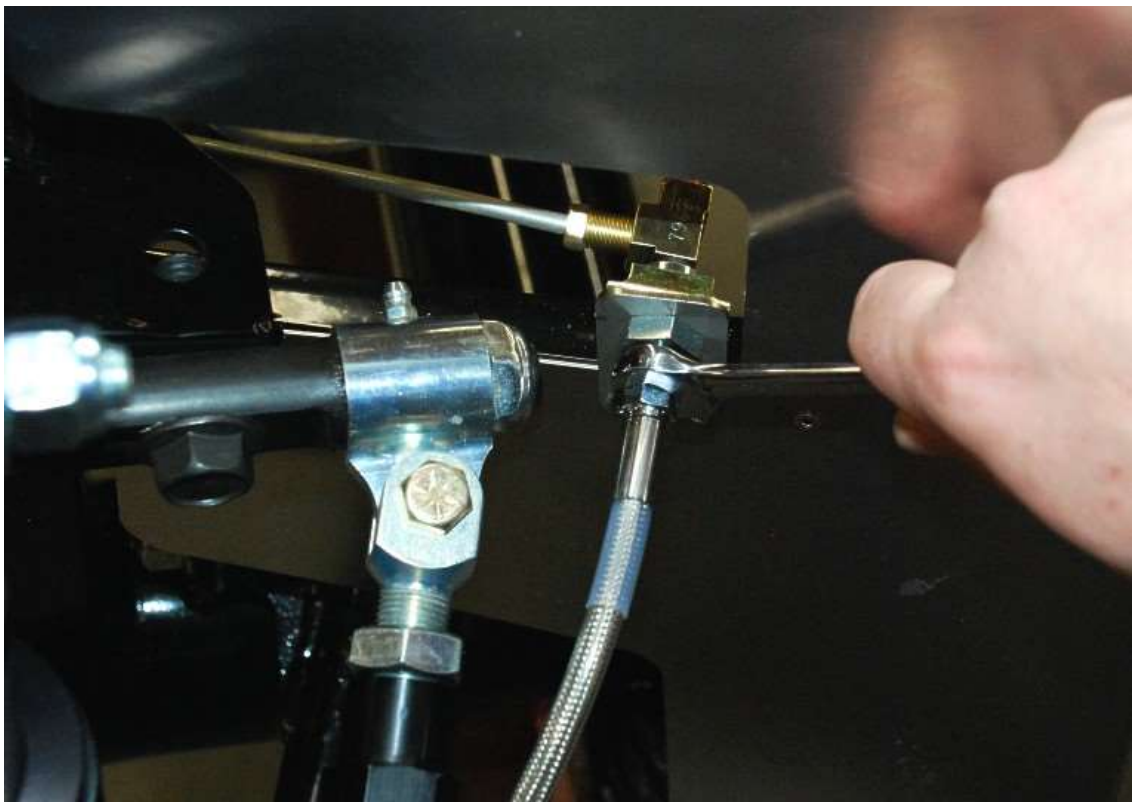


Push the brake line adapters through the brackets from the outside in and install the clips that hold them in place.

Attach the front brake line to the caliper making sure there is a crush-washer on either side of the fitting and then screw the other end of the line to the fitting on the chassis. Hand tight is fine on all these for now.



Screw the brake line T fitting into the end of the left side brake adapter and tighten with ½" and ¾" wrenches.



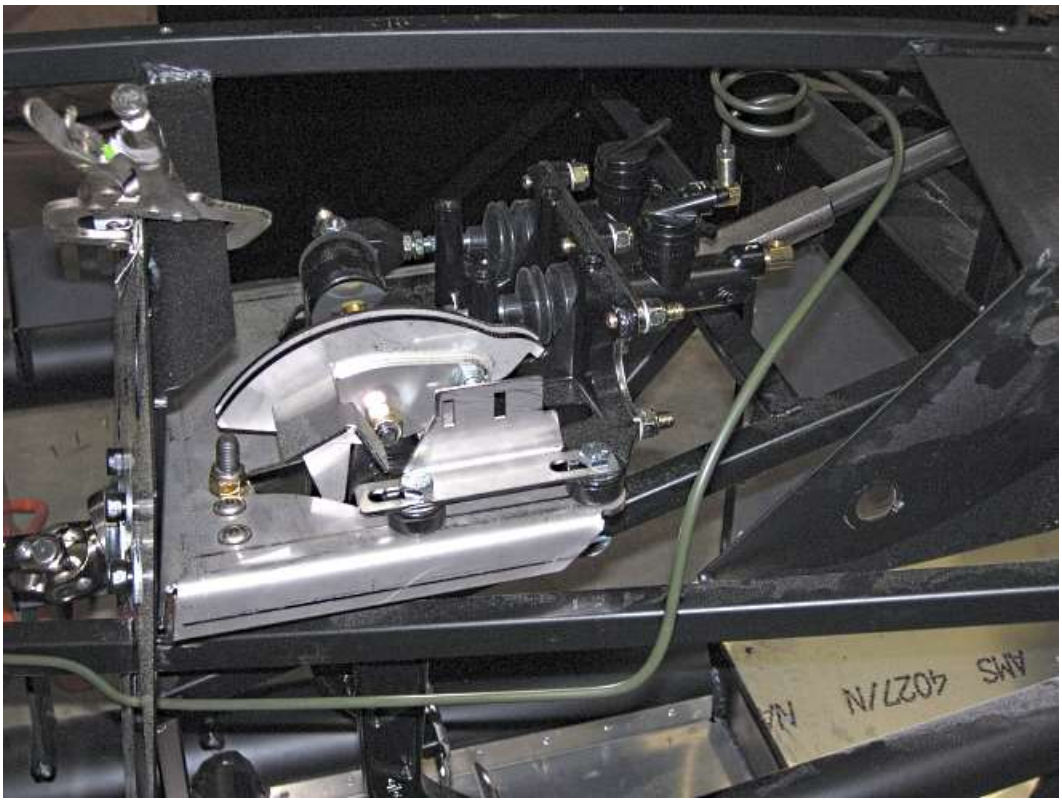
Tighten the flexible line to the adapter using $^{7}/_{16}$" and ¾" wrenches.

Make sure that your flex lines will not interfere with anything in the suspension, wheels during travel or turning full lock to lock.

Torque the front flexible brake line to caliper banjo bolts to 29 **lb-ft** with a torque wrench and $^{9}/_{16}$" socket.

Hard brake lines

Front



Run a 60" brake line from the front master cylinder out the front of the pedalbox along the ¾" tube to the front left brake line mount.

Attach the brake line to the end of the T.

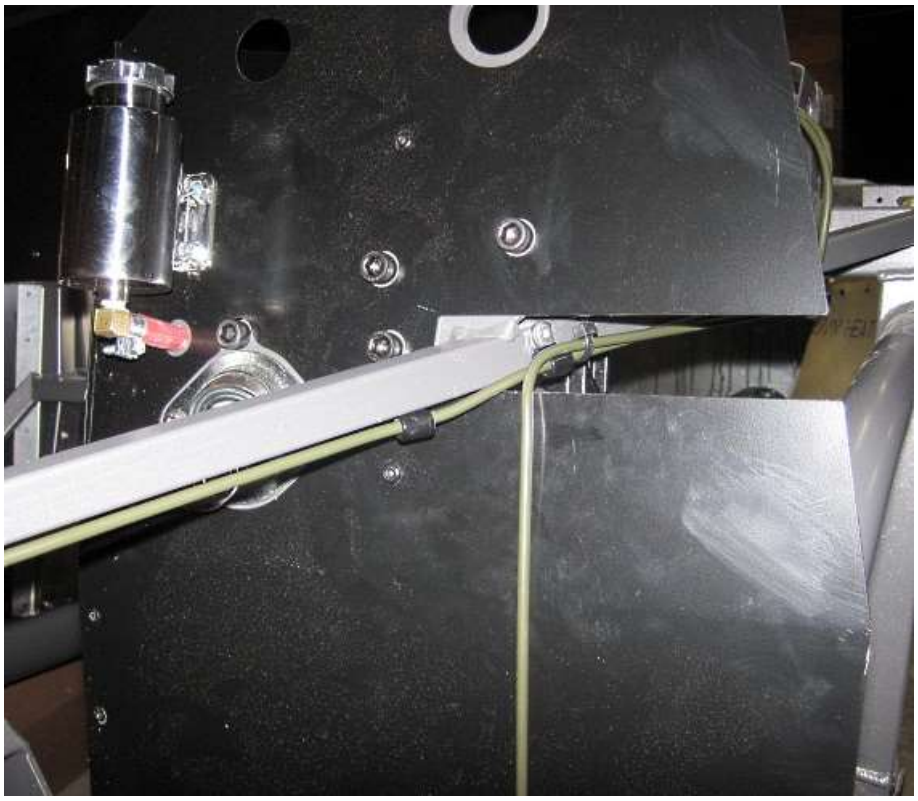
Attach the brake line to the frame using ¼" insulated clips and $^{3}/_{16}$" rivets.

Run another 60” brake lines from the T fitting over to the right-side flexible mount. The line will bend very easy but be careful not to kink it.

When you are happy with the routing use the small insulated line clips and $^{3}/_{16}$” rivets to hold it in place.

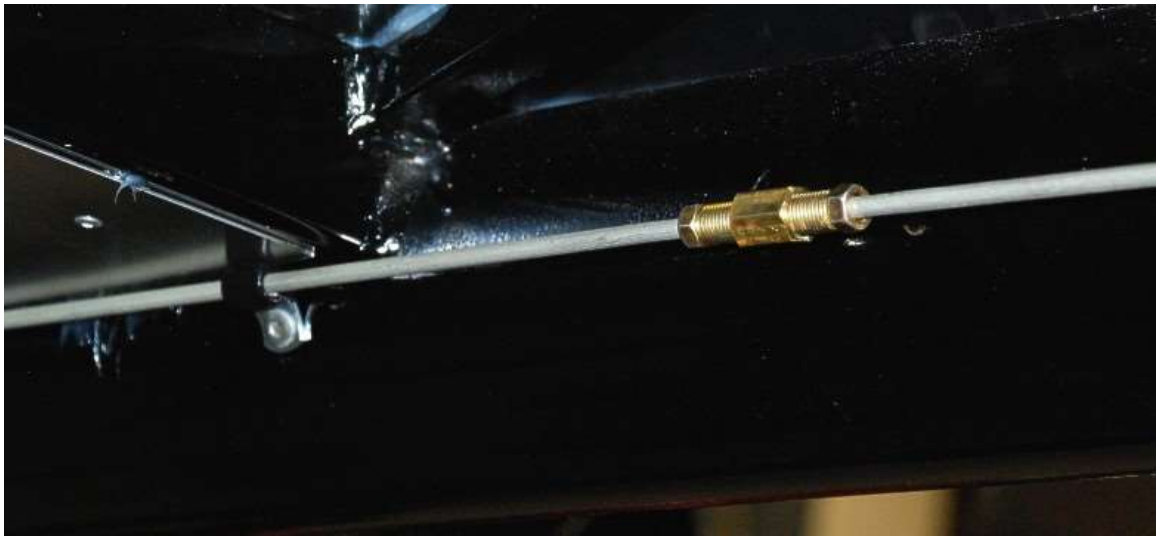
Mount the line clips and seal with silicone anywhere you pass into the passenger compartment.

Rear



Use a 60” brake line and route from the rear master cylinder out the front and down the front of the footbox.

From the front of the footbox angle into the 4” main tube under where the footbox floor would be.

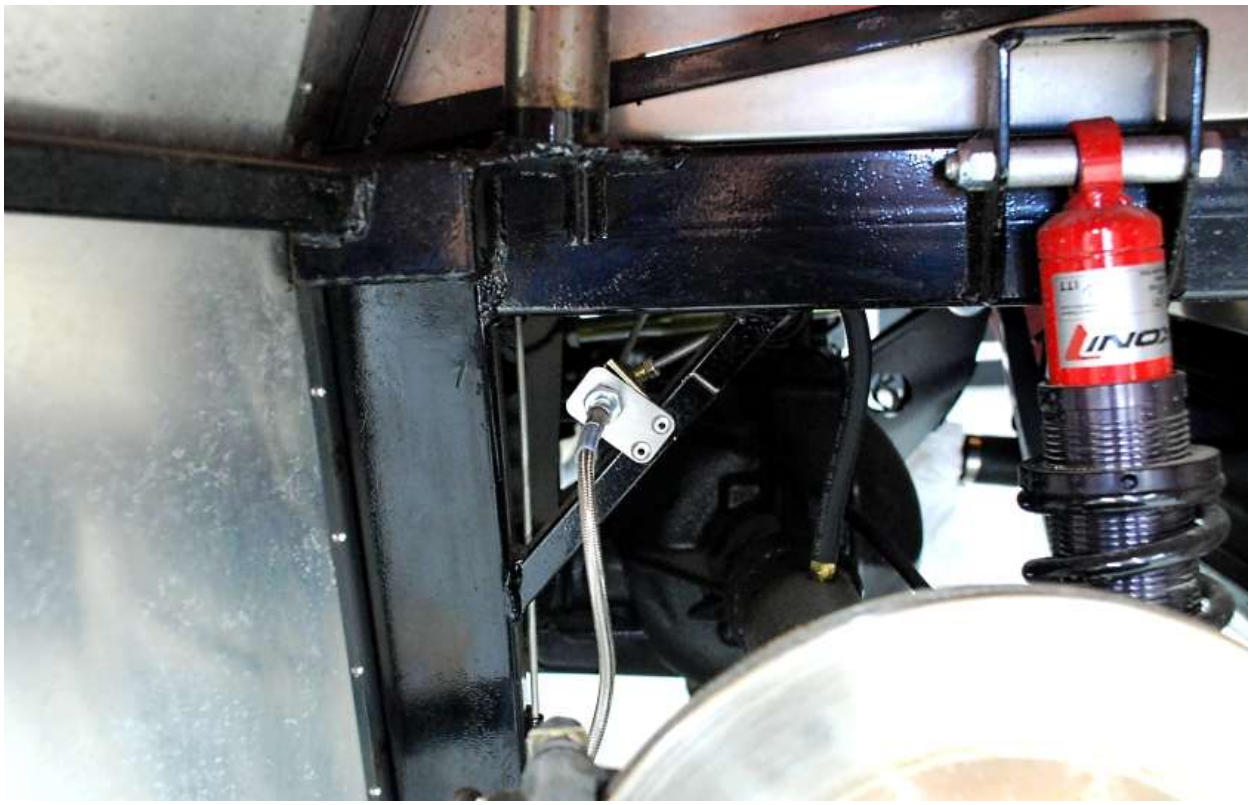


Use a union to attach the another 60” brake line.

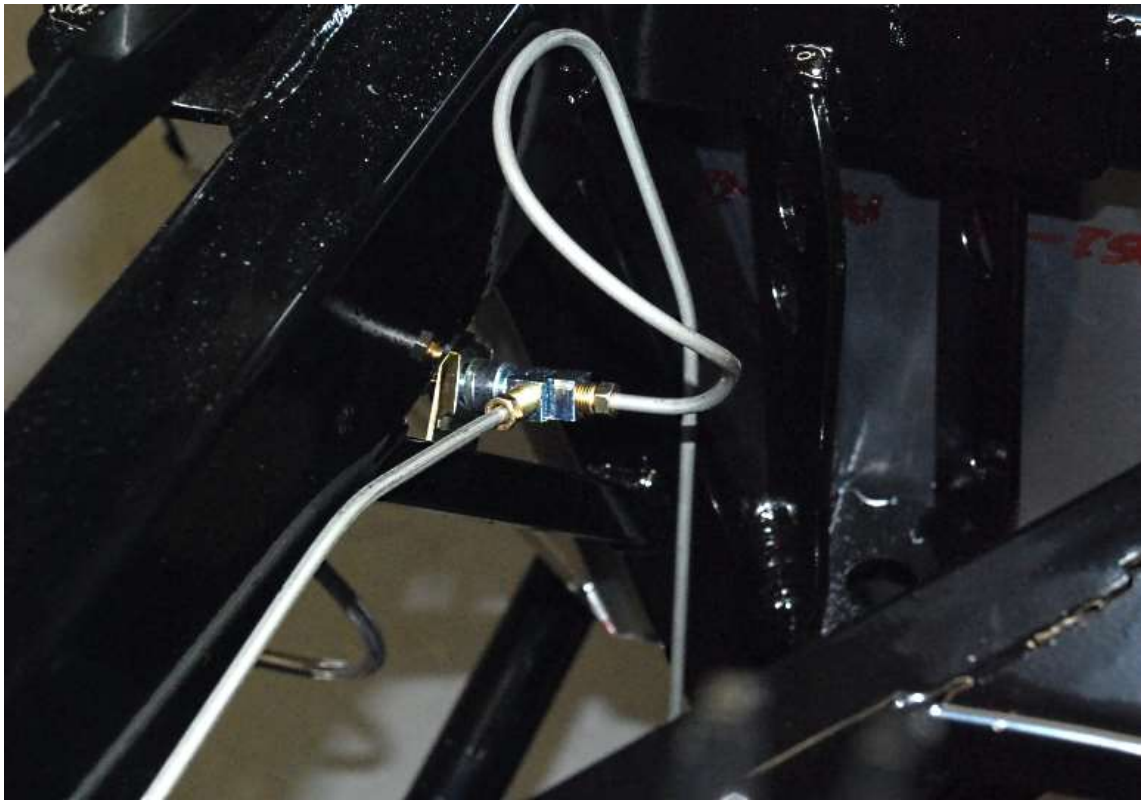
Run the brake line up the back of the 2”x 3” tube using line clips and rivets on the 2”x 2” tubes.

- At this point your routing will depend on your rear brakes. 87-93 Mustang solid axles have a single flex line that runs to the middle of the axle then out to the calipers. Newer axles and the FFR rear brakes run the flexible brake lines direct from the chassis to the caliper (the IRS is done like this, there is an extra length of line and a T to allow similar routing to the front.)

Solid axle

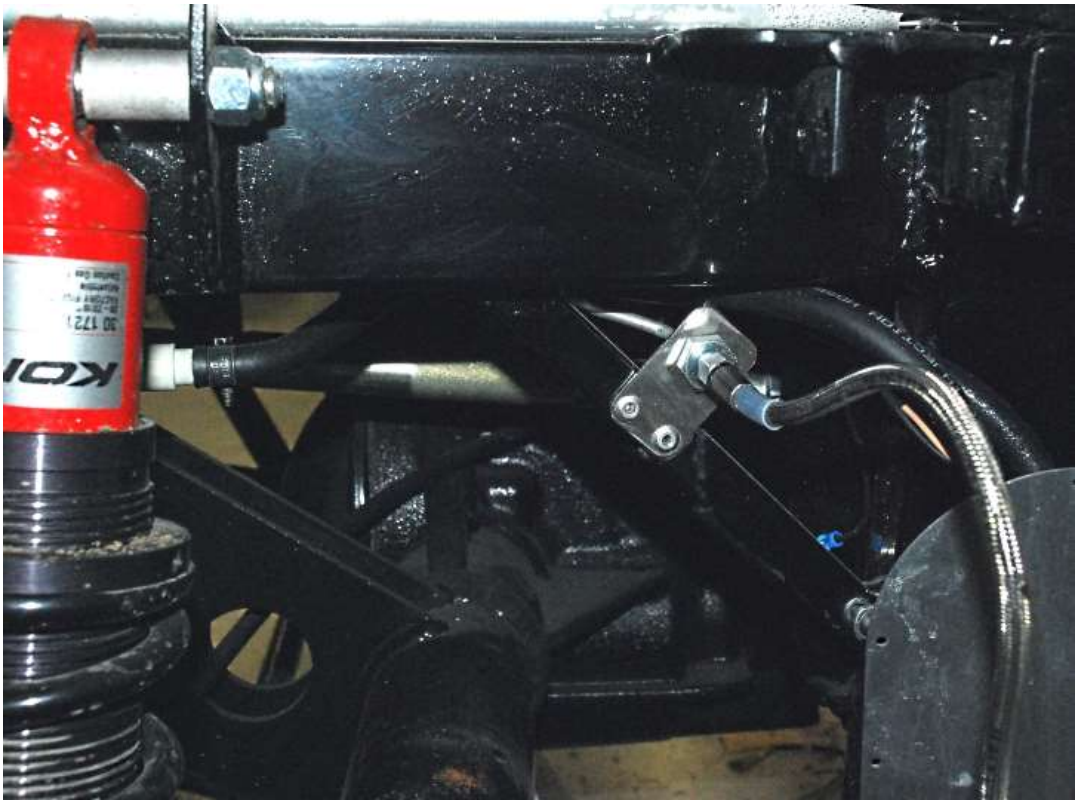


Using the FFR rear brakes, we attached the flexible brake line mount to the driver side diagonal ¾" tube with the brake line clip.



Attach the "T" adapter to the flexible brake line and route the hard brake line coming from the front to the "T".

Run a 60” brake line from the “T” up the ¾” tube to the front fuel tank mount tubes and over to the passenger side ¾” tube. An alternative to running it this way would be to run it across the backside of the 2”x 3” tube.



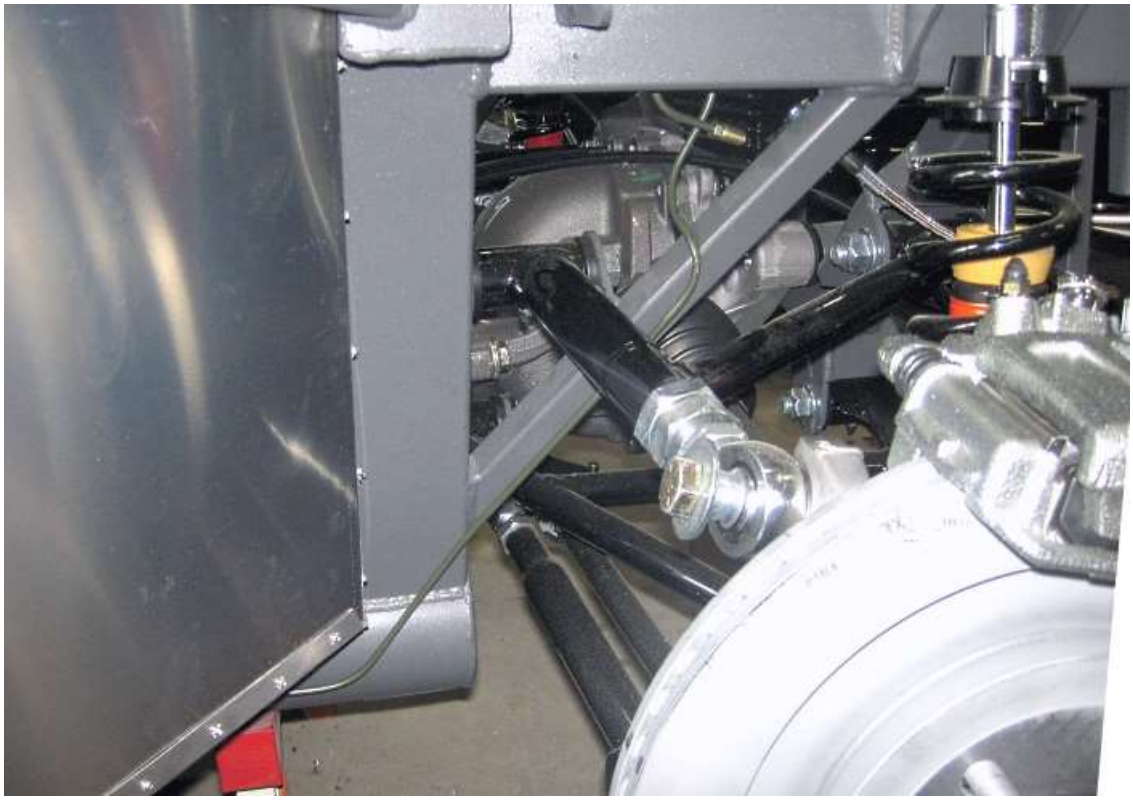
Attach the passenger side flexible brake line mount to the ¾” tube and attach the flexible brake line to the bracket with the brake line clip.

Attach the hard brake line to the flexible brake line.

- Make sure that your flex lines will not interfere with anything in the suspension, wheels during travel or turning full lock to lock.

Tighten the banjo bolts on the calipers

2015 IRS



Run the brake line up the 2”x 3” tube and 1” square tube.

The flexible brake line mount can be on the 1” square tube but the mount may need to be bent so the T clears on the inside.

For the right side run a 60” line from the end of the left side connector then forward to the 2”x 3” tube, across and back to the 1” square tube and flexible brake line mount.

Banjo bolt torque specs

Front Brake hose to caliper Banjo bolt – **(39Nm) 29 lb-ft**

Rear brake caliper hose to caliper Banjo bolt – **(43Nm) 32 lb-ft**

- When your system is finished being plumbed, go back and check all the fittings for tightness.

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.

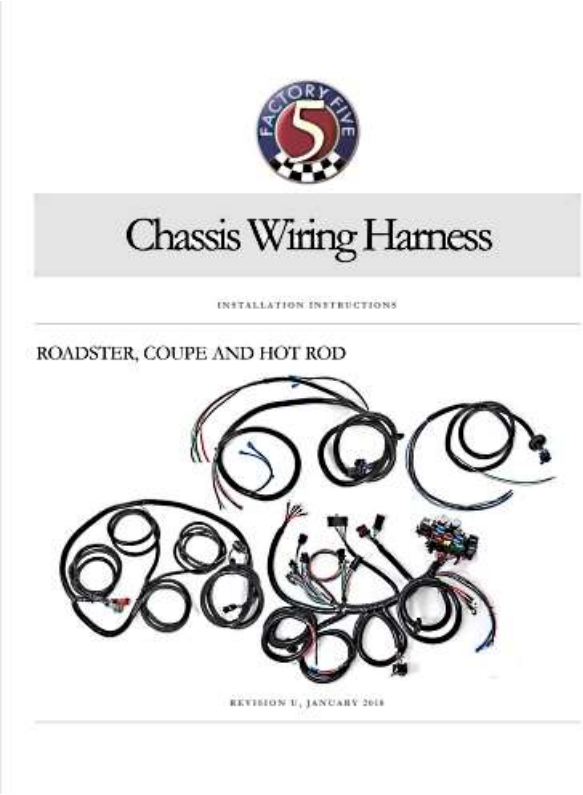
- Air can get trapped inside the caliper even if none is coming out of the cracked bleeder. In order to get this air out it helps to give the caliper a few light taps with a soft mallet to dislodge the bubble and get it up to the bleeder nipple.

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.

Pedal adjustment

Adjust the clutch pedal stop and master cylinder threaded shafts so that the pedal height is comfortable. In general, the clutch pedal is about 2” higher than the brake pedal and the brake pedal is higher than the accelerator pedal so that when the brakes are pressed the brake pedal is even with the accelerator pedal.

Chassis wiring harness



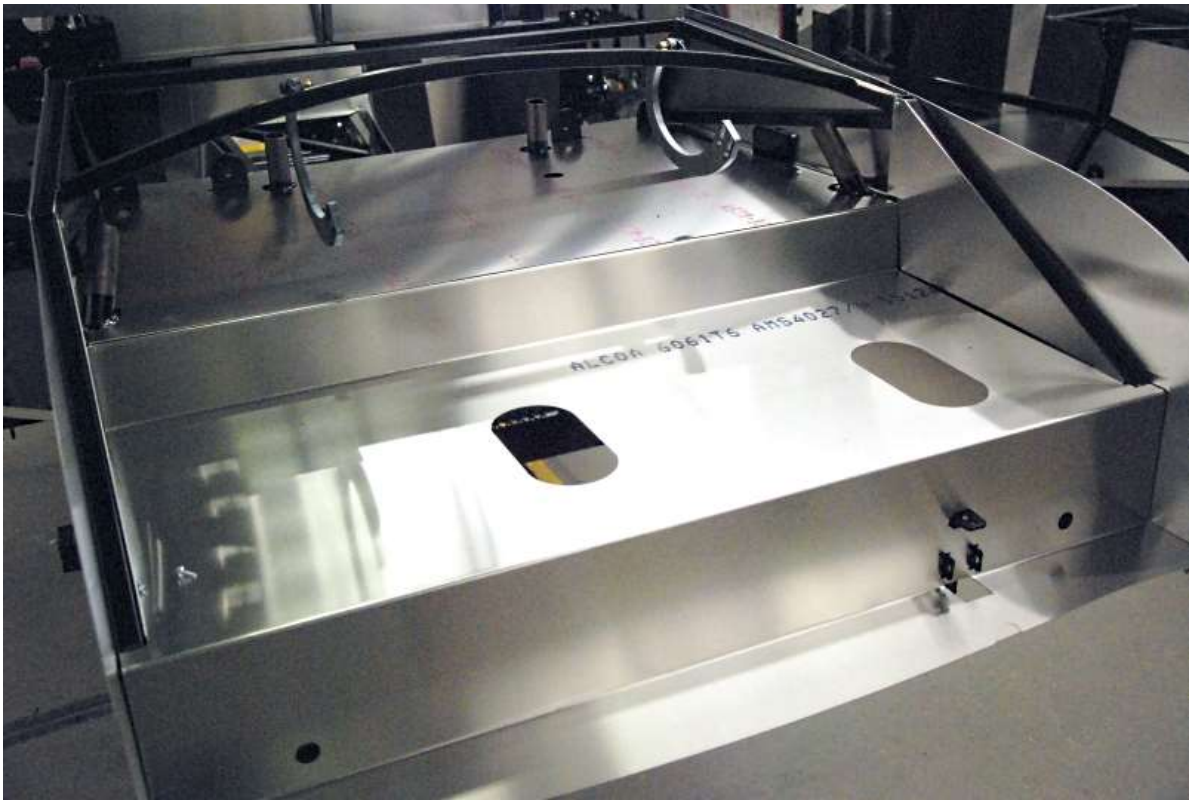
The chassis wiring harness routing and instruction are included with the harness.

Trunk Aluminum

🛠 $1/8$" drill bit, silicone, rivet gun, caulk gun, $9/16$" wrench, $5/16$" hex key.
🚘 Mounted Aluminum, Packaged Aluminum, secondary body fasteners

Silicone and rivet in the trunk side panels.

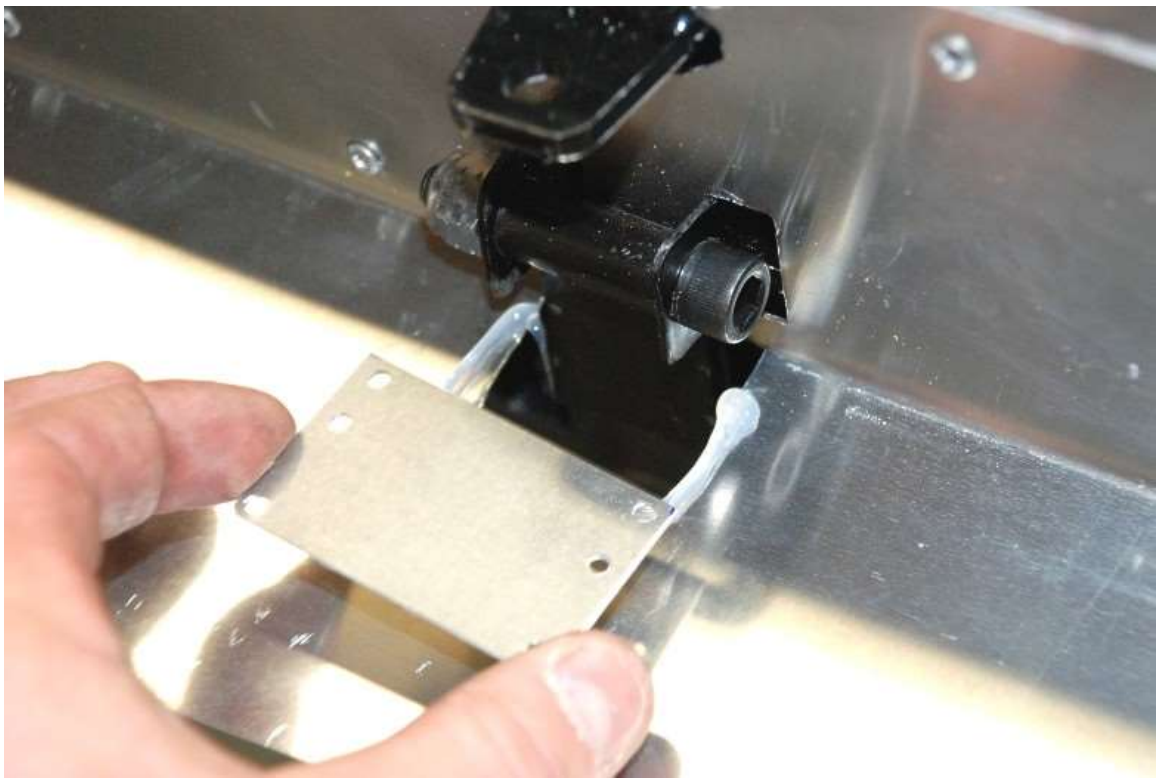
Remove the rear bolt of the passenger side gas tank strap.



With the rear taillight harness tied up and secure, silicone and install the lower trunk floor.

Re-install the gas tank strap and tighten.

Silicone and install the trunk inner corner pieces.



Silicone and rivet the fuel tank strap patch panel from the packaged aluminum assembly.

Drill and silicone the upper trunk floor. Bend it in the middle to get it into position.

Work the corners of the panel down over the roll bar mounts and seat harness tabs a little at a time on each side.

Once the panel lies flat, finish rivet it into place. The rivets along the front 2”x 3” tube should be close to the back as possible for drill and rivet gun access.

Cockpit rear wall

Mark and drill the rear cockpit wall. Silicone the chassis and aluminum flanges where it attaches and rivet it into place.

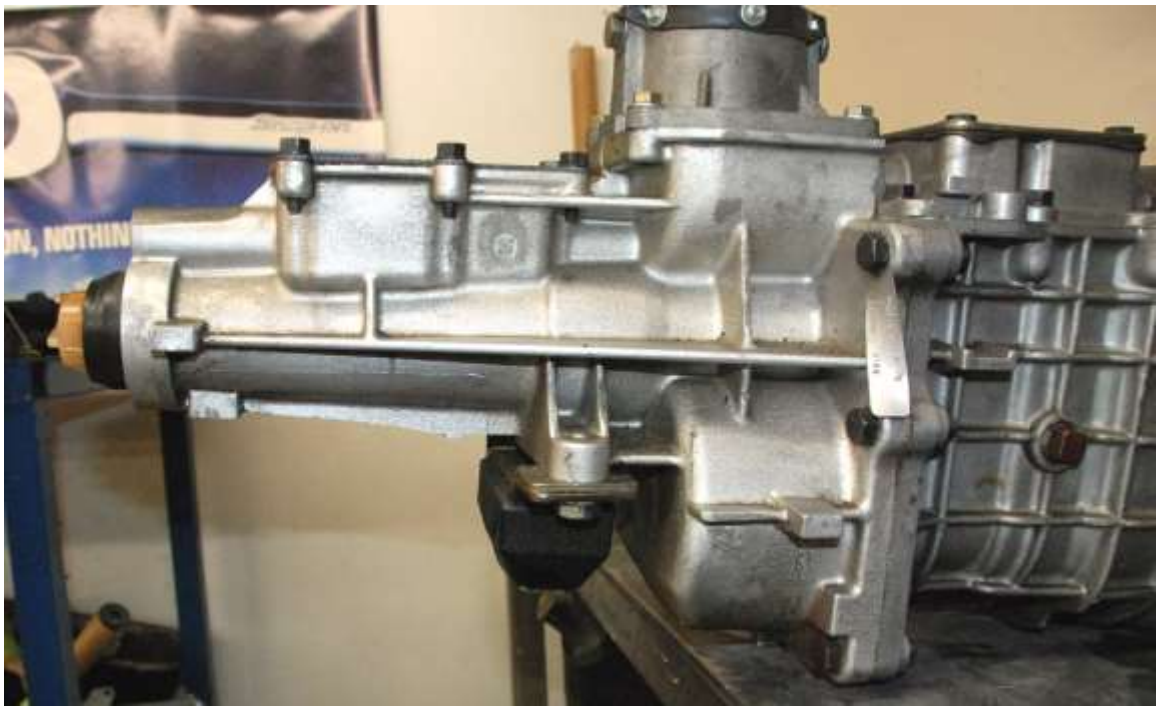
Drivetrain Install

If installing a Coyote engine, call or check our parts catalog online for install instructions

Transmission Prep

Hack saw or Reciprocating saw, ¾" socket, ratchet
Transmission, Polyurethane engine/transmission mount kit

If you are using a Tremec 3550, TKO 500 or, a TKO 600 you will need to trim off the unused mounting boss on the bottom of the case.



Trim it flush or just below the pad for the transmission mount.

Engine Prep

Engine hoist, chain, ¾", $^{15}/_{16}$" sockets, ratchet, extension
Engine, Polyurethane engine/transmission mount kit

- 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.…).
- If using a 4.6L or Coyote engine, a shallow oil pan is required. See www.factoryfiveparts.com/instructions for Coyote instructions.

Unpack the engine mounts and attach to the engine. Don't forget to attach the engine ground strap to a right-side engine mount bolt.

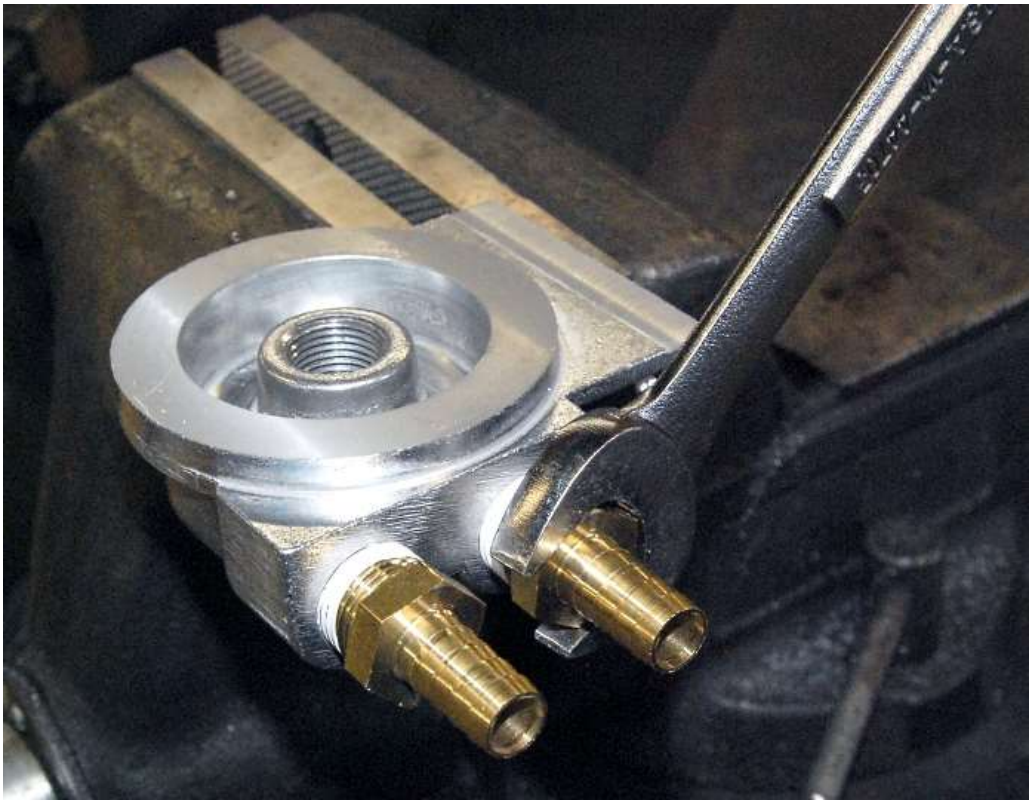
87-95 Oil Filter Relocator

- ⅞" wrench, razor knife, Teflon tape, chassis grease, ⅜" hex key
- Oil filter relocating kit, oil, oil filter
- This is only required if running a 302 and Mustang shorty headers.

Place the O-ring in the adapter groove.

- If the O-ring will not seat properly, put it in the freezer for 15 minutes and use a small amount of chassis grease to hold it in place while spinning on the adapter. Tighten ½ turn after solid resistance is felt. The outlets for the hoses should be facing **towards** the front of the engine.

Install the oil filter relocate base plate on the engine.
Install the block off plugs (with a ⅜" hex key) in the adapter holes not being used. Use the Teflon tape on the threads of the plugs as you tighten them. Wrap the Teflon tape so it stretches when you attach the plug into the threaded socket. **Max torque** for the fittings on the relocate kit is **28 lb-ft**.



Use Teflon tape on the threaded barbs and thread them into the oil filter relocator.

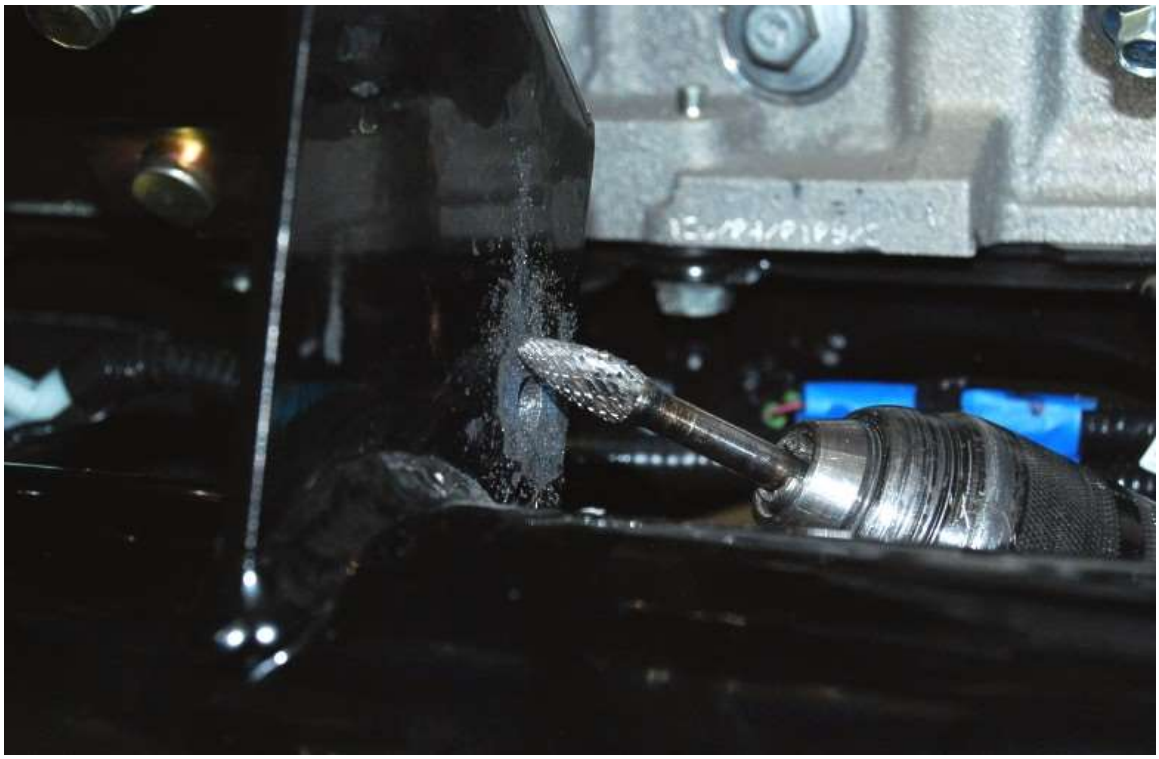
Thread the short end of the threaded nipple into the relocator.

Mark the hole locations for the oil filter relocator on the old AC bracket or on the front frame X member (preferred location). If you're going to mount the relocate bracket on the X member.

Drill the mounting holes for the relocator.

✋ Make sure to drill this before you install your engine. Otherwise, your drill won't fit in between the engine and the frame.

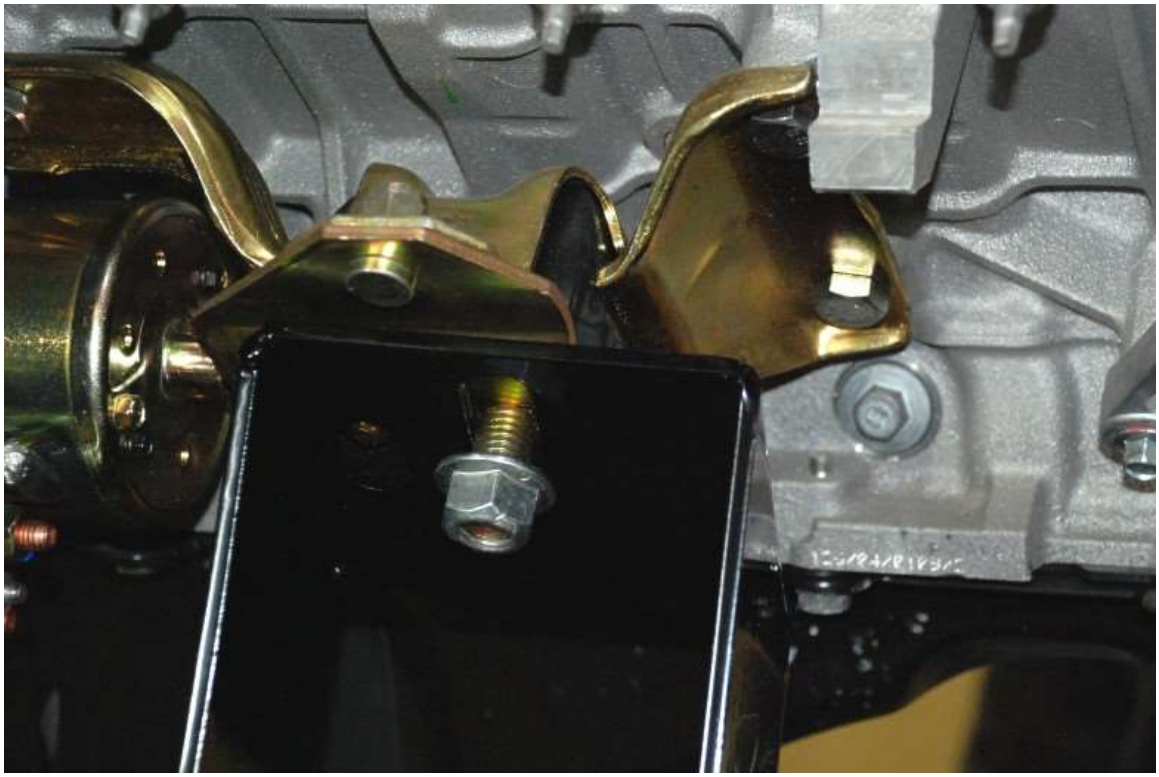
Frame prep



On the right engine mount there is a $^{5}/_{16}$" hole for the engine ground cable. Grind any coating from in and around the hole to give a good engine ground.

Engine/Transmission Installation

Lower the engine and transmission into place. The more hands you have to help the better. Go very slowly and make sure the transmission tail-shaft is above the rear cross-member.

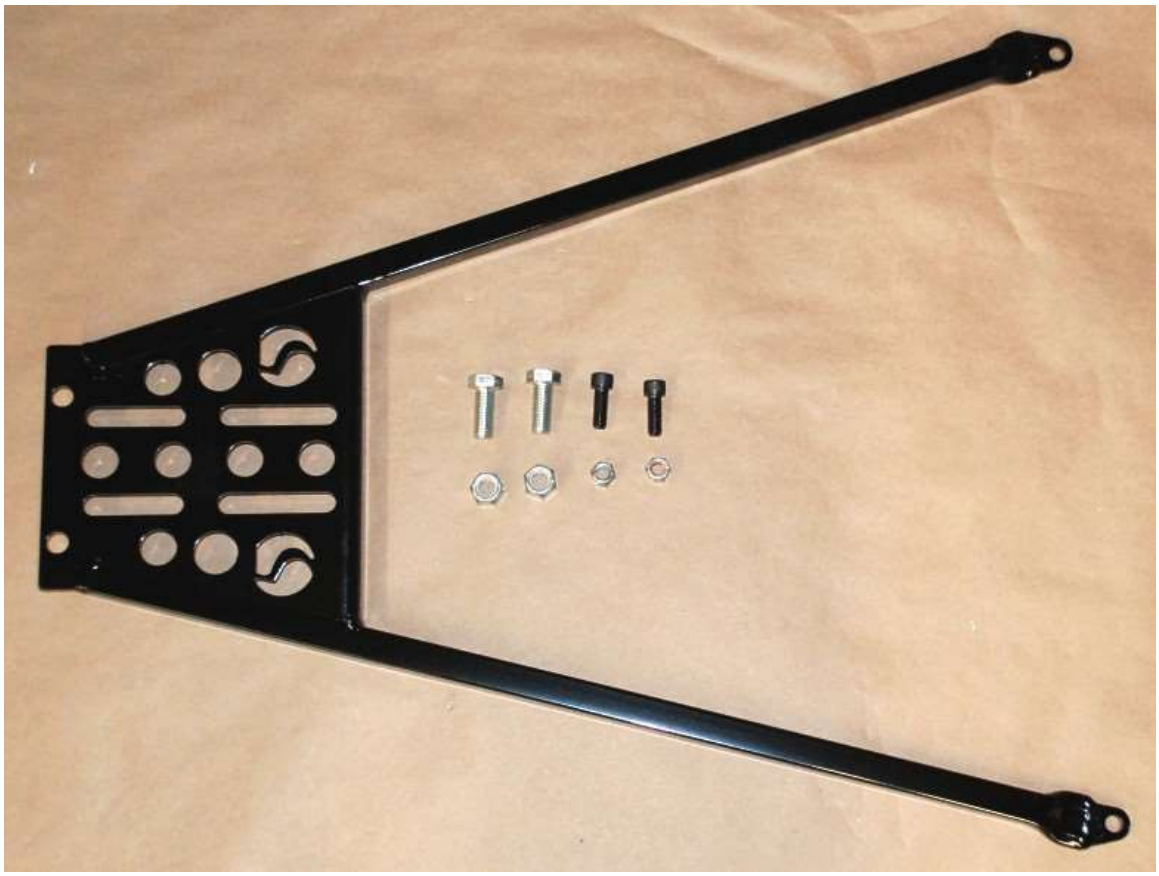


Install the engine mount to chassis nuts and tighten down all the engine mount hardware. Make sure the alignment pins on the mounts are in the holes on the chassis pads.

Transmission Mount

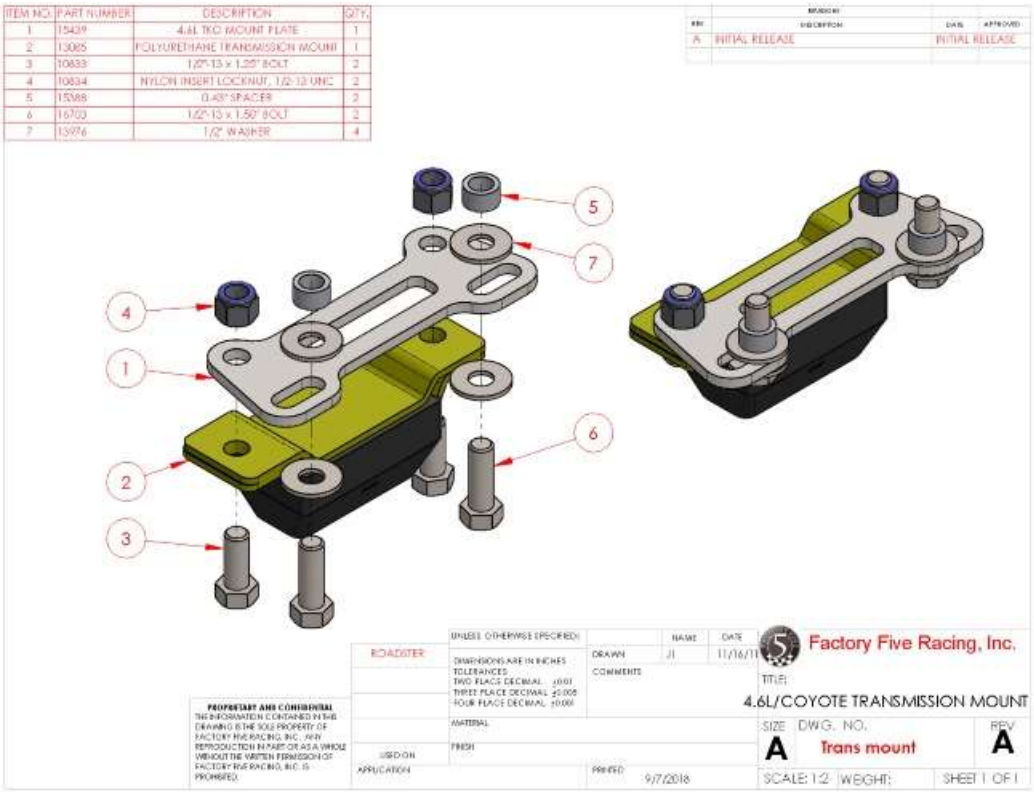
🛠 $^{5}/_{16}$" hex key, $^{9}/_{16}$", ¾" socket, ratchet, ¾" wrench, floor jack

🚘 Transmission mount/hardware



Unpack the A-frame transmission mount and hardware.

Jack the transmission up and mount the a-frame underneath it. Normally this mounts above the frame tabs but can be mounted underneath if extra clearance is needed.



Install the bolts that hold the transmission to the mount and tighten all the hardware on the mount and a-frame.

Engine Ground

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

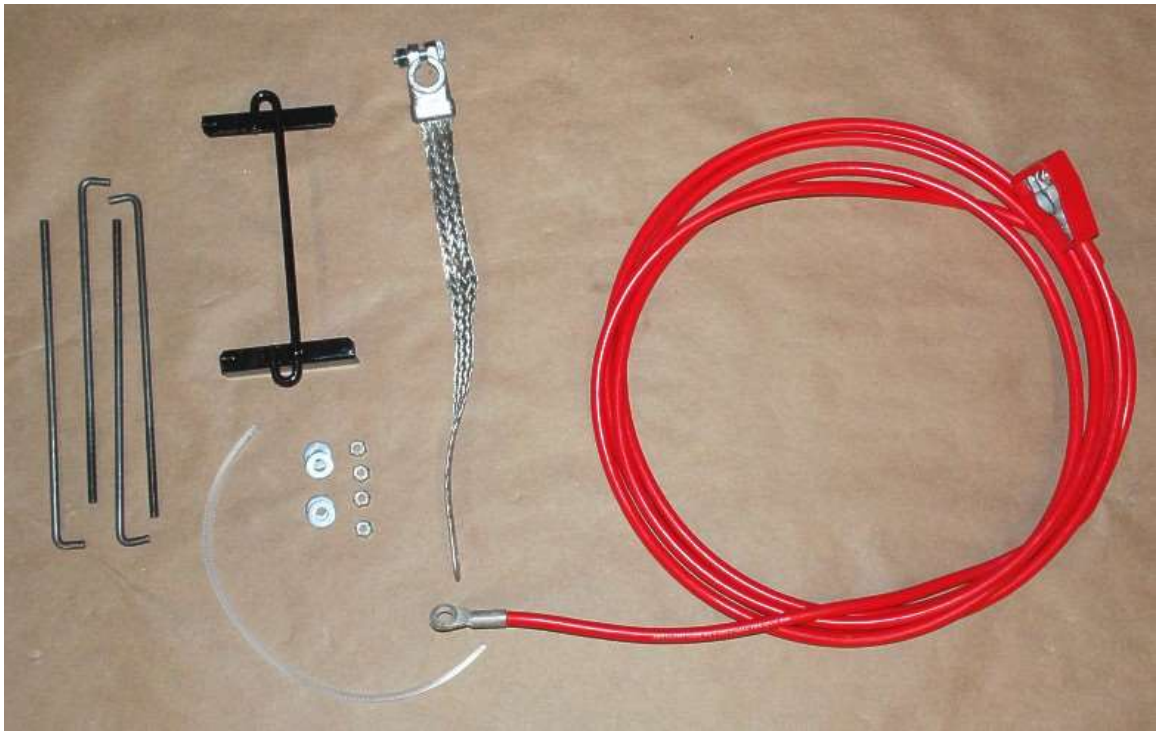
🚘 Electrical system completion components

Bolt the ground strap to the hole on the frame engine mount.

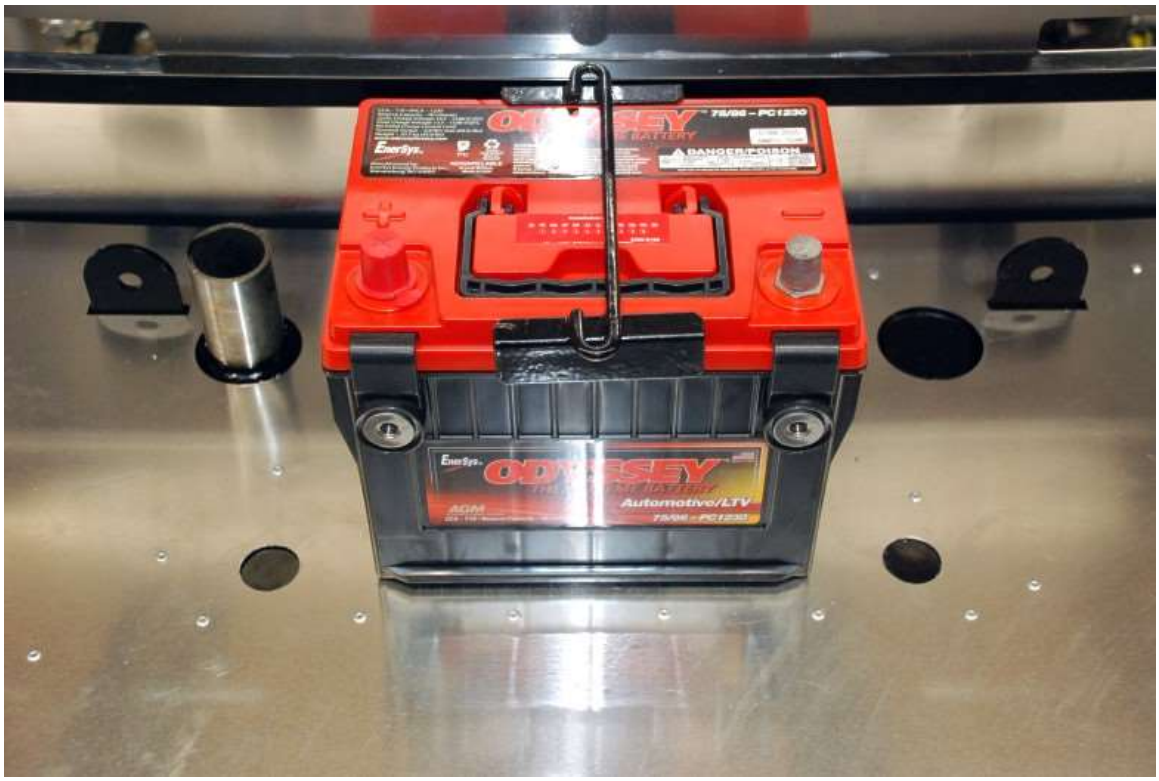
Battery Mounting and Cable

🛠 Drill, 1" hole saw, 3/16", ¼", 5/16" drill bits, rivet gun, marker,7/16" deep socket, ratchet, ½" wrench, 3/16" hex key.

🚘 Secondary Body fasteners, Battery mounting kit, Insulated clip hardware, misc. electrical components, battery



Unpack the Battery mounting kit.



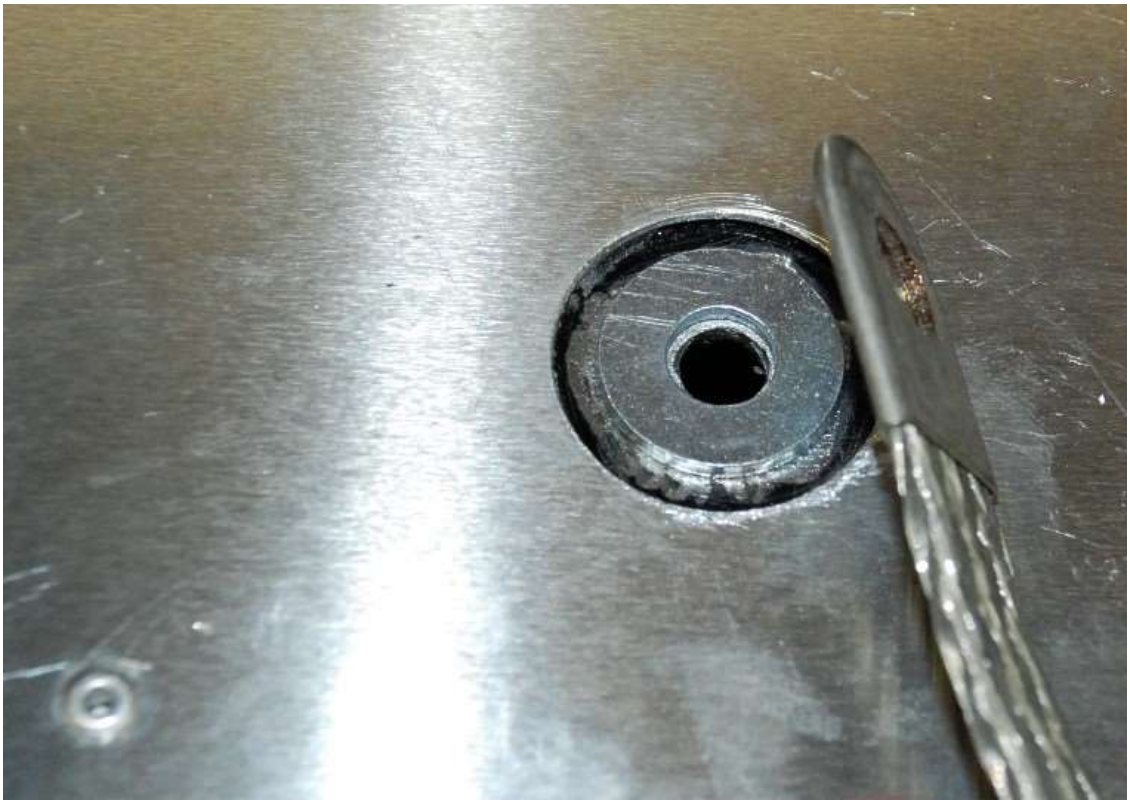
Position the battery with mounting bracket in the trunk for mounting. It is centered side to side with just enough room for the mounting bracket between it and the front of the trunk.

Drop the J-bolts in the mounting holes and mark where they hit the trunk floor.

Drill the ¼" mounting holes in the floor.

Hook the j-bolts through the floor and bolt the battery down. Hold the j-bolts with a vice grip and be careful not to over tighten and crack or distort the battery.

Remove any coating from the small circle in the trunk closer to the ground terminal of your battery.



Drill through the center of the circle and put a washer down in the cut out.

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.

Drill out the hole near the positive terminal with a 1” hole saw.

Install the grommet in the hole.

Push the small end of the battery cable through the floor from the top.

Attach the battery positive terminal and leave enough slack to be able to remove the terminal easily. Run the battery cable forward on the right side of the transmission tunnel to the starter.

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

Headers and J-pipes

🛠 $^{7}/_{16}$", $^{9}/_{16}$" wrenches, $^{7}/_{16}$" socket, ratchet, extension, $^{5}/_{16}$" hex key

🚘 Headers or straight tubes and shorty headers or catalytic convertors and shorty headers

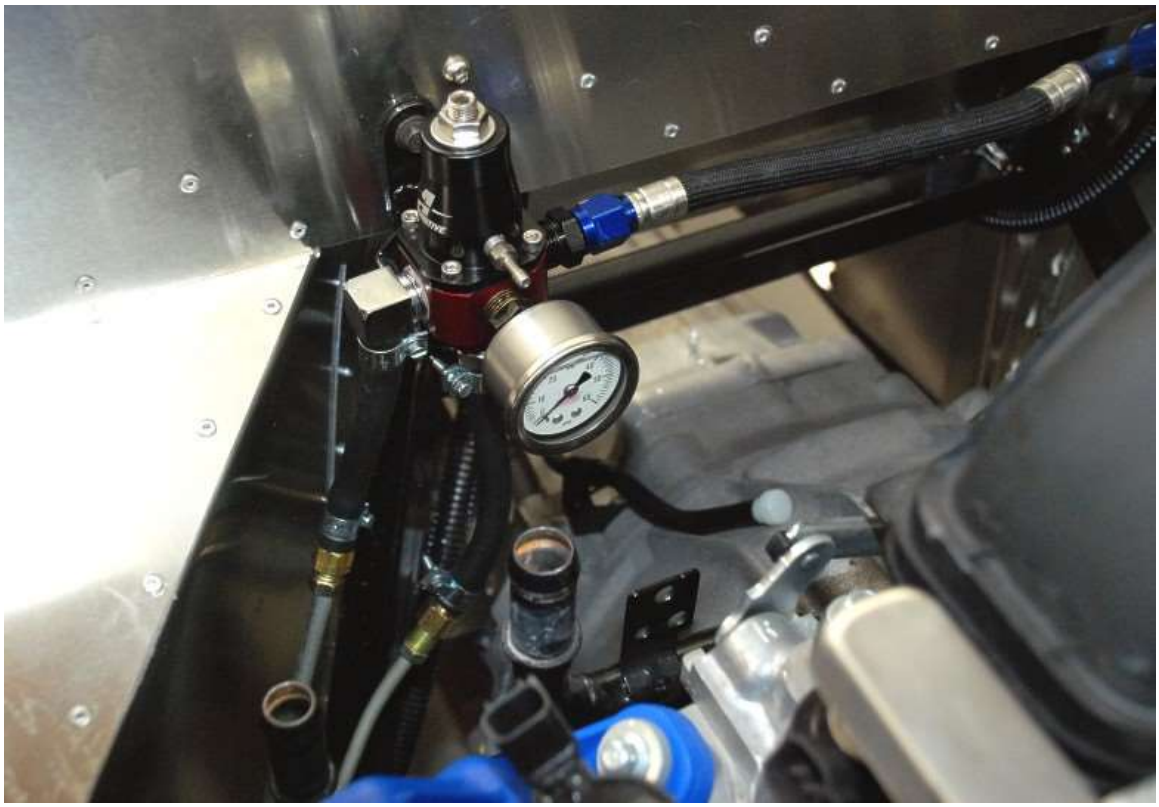
Mount up your headers to the engine. If you are using full length headers they bolt in place with the gaskets and hardware provided. Thread locker is recommended.

If you are using Shorty headers or stock manifolds bolt them back on. On a small block (302 or 351) the headers are switched side to side and on the 4.6 the headers are flipped upside down. In either case this puts the collector toward the front.

If you are using the cats or j-pipes bolt them to the headers. The shorter pipe will go on the passenger side.

Fuel line to engine

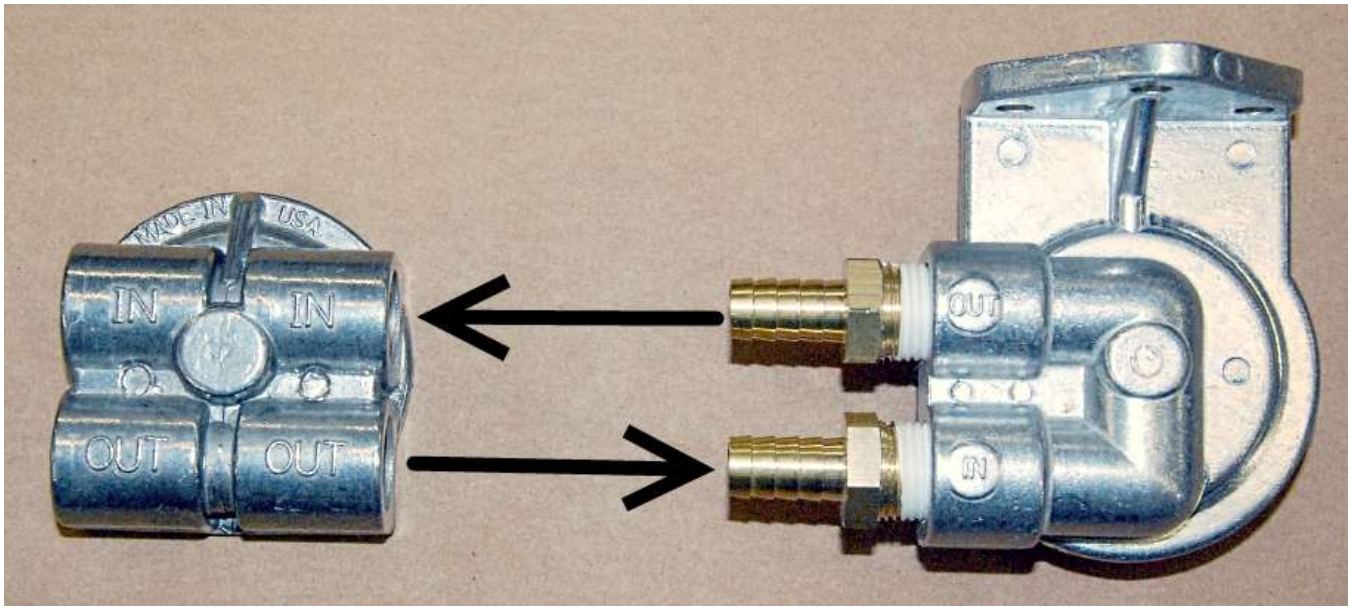
- flat head screwdriver
- Fuel line components, external fuel pressure regulator (if used)



Finish running your fuel system by hooking up either to your carburetor or fuel rail. Here we mounted a pressure regulator on the firewall and ran a single line over to the rail.

Oil Filter Relocator

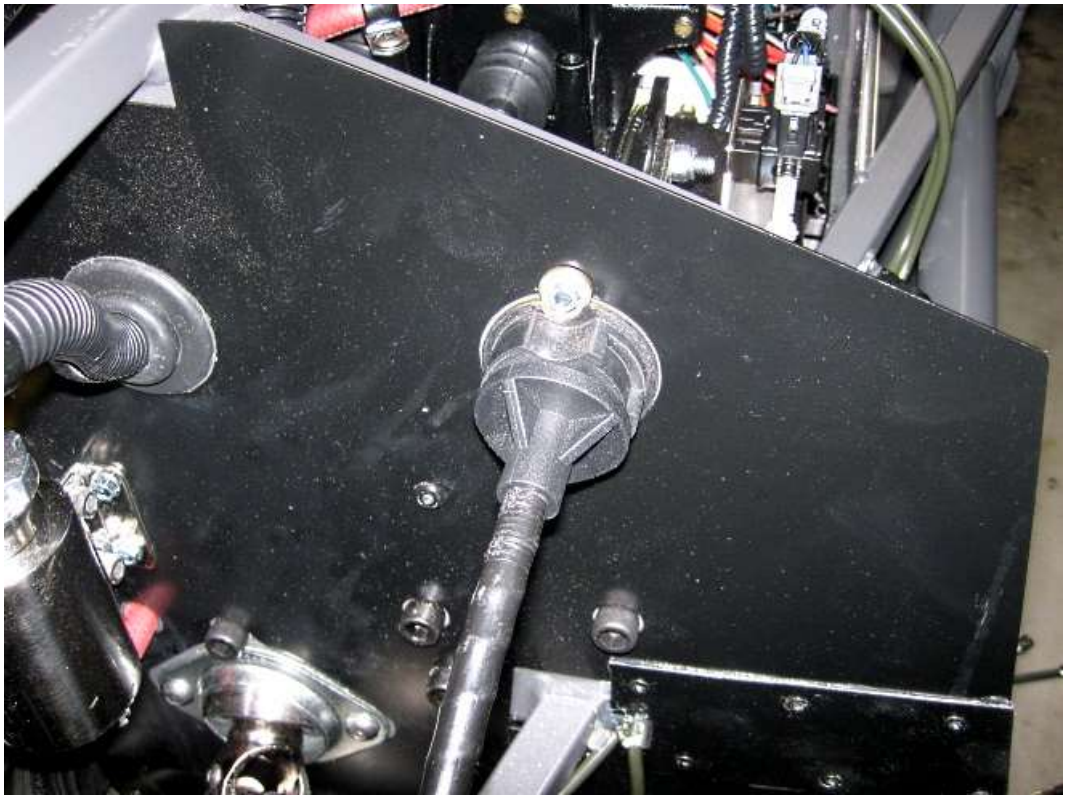
- Razor knife, flathead screwdriver
- Oil filter relocating kit, oil, oil filter
- This is needed for push rod 302/351 engines only. The coyote engine uses different exhaust and a different oil filter



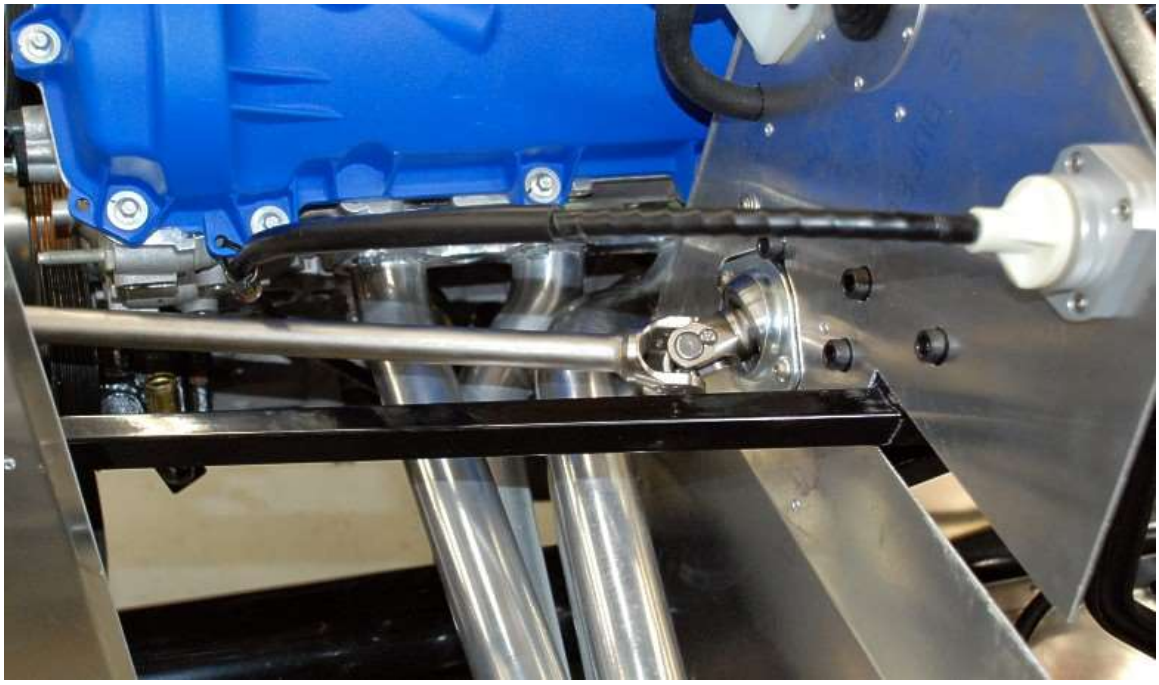
Hook the oil lines up to the Oil filter Relocator and the adapter on the engine. Make sure that the lines go to the correct ports or the engine will be starved for oil. The **out** on the engine goes to the **in** on the Relocator and the **out** on the Relocator goes to the **in** on the engine.

Clutch Cable

Slide the clutch cable boss through the firewall spacer and loop the cable over the quadrant.

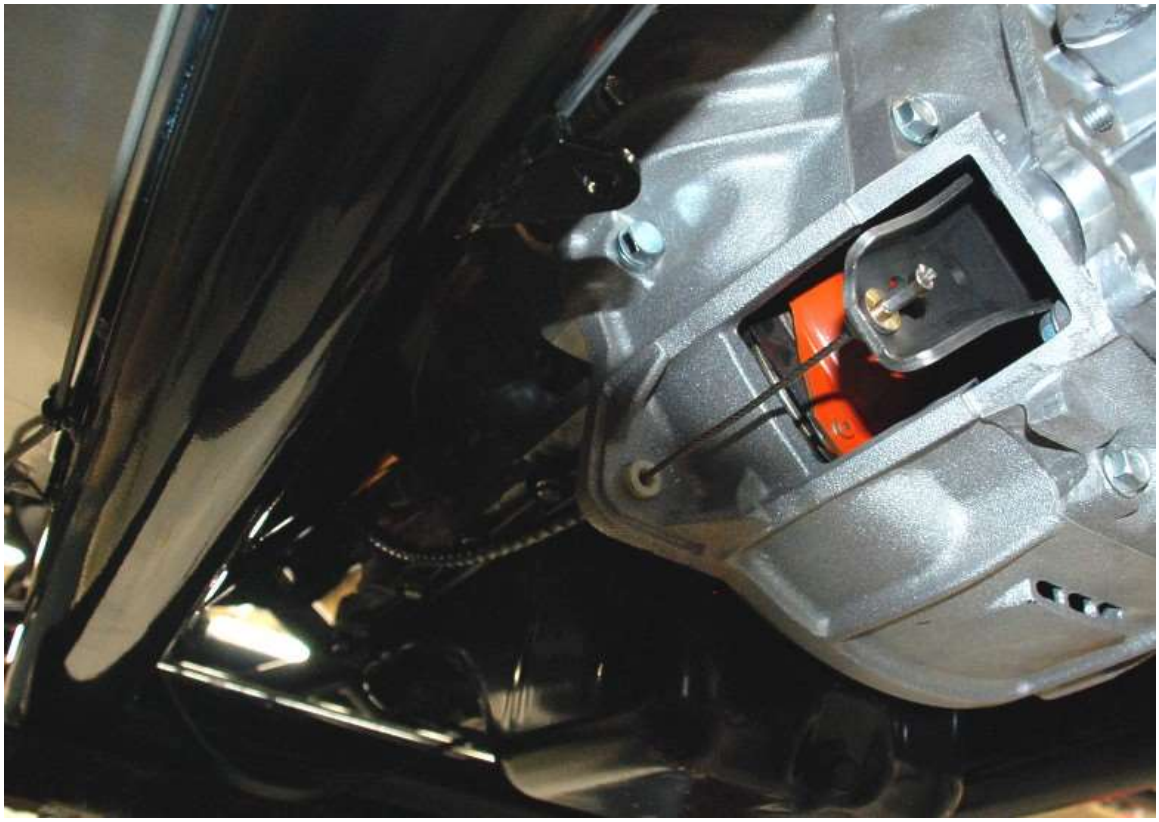


Attach the clutch cable to the firewall spacer using the small #6 screw provided and ¼" wrench.



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.

Accelerator Cable

- 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.

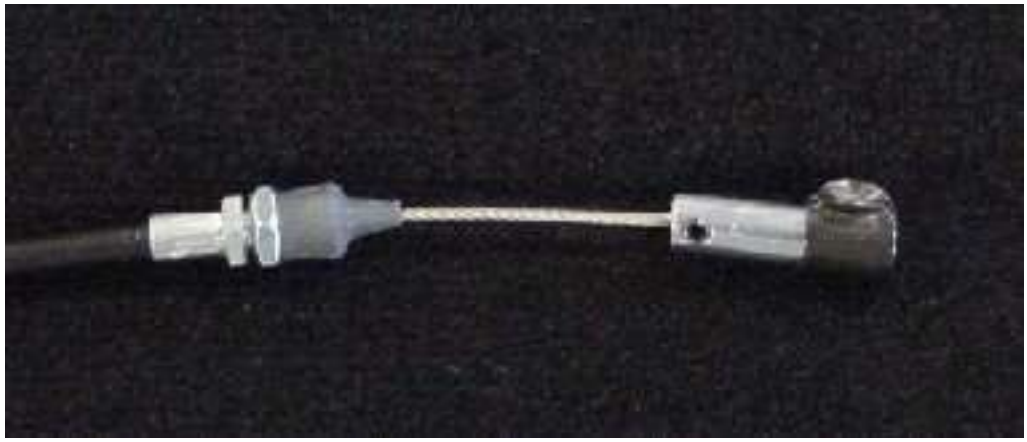
87-93 5.0L Fuel Injected Applications

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.

There is a ball stud and retainer in the accelerator cable components to help 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.

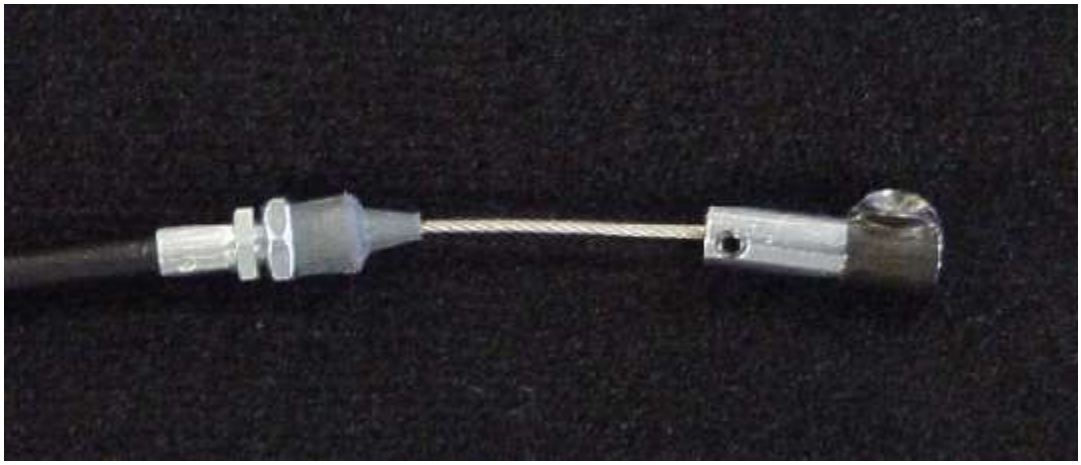
Make sure the accelerator cable is tied up and out of the way of moving or hot parts as well.

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, bend the small tab behind 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.

Carbureted applications

Attach the cable sheath to your cable mount on the engine.
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.

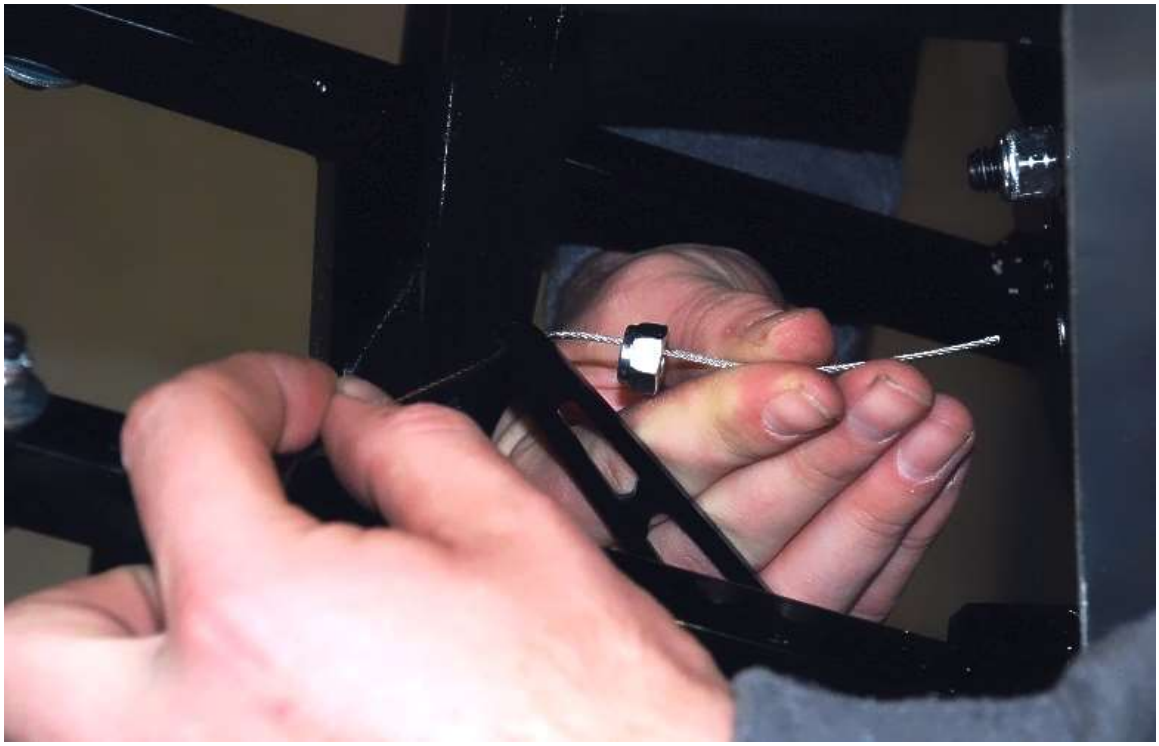


Push and twist the ball stud retainer onto the end of the cable and attach the ball stud retainer using a 5/64" hex key.

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

Interior Fitment

Clip off the ball fitting on the accelerator cable.
Pass the cable through to the cockpit.

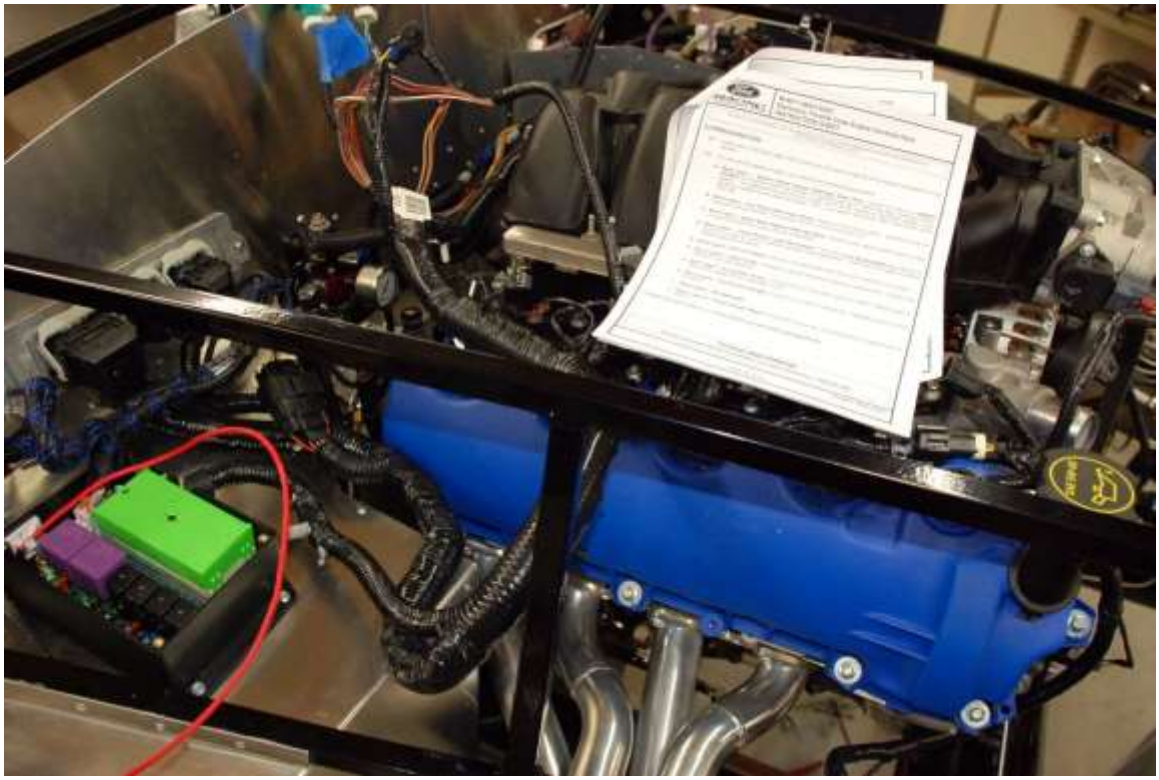


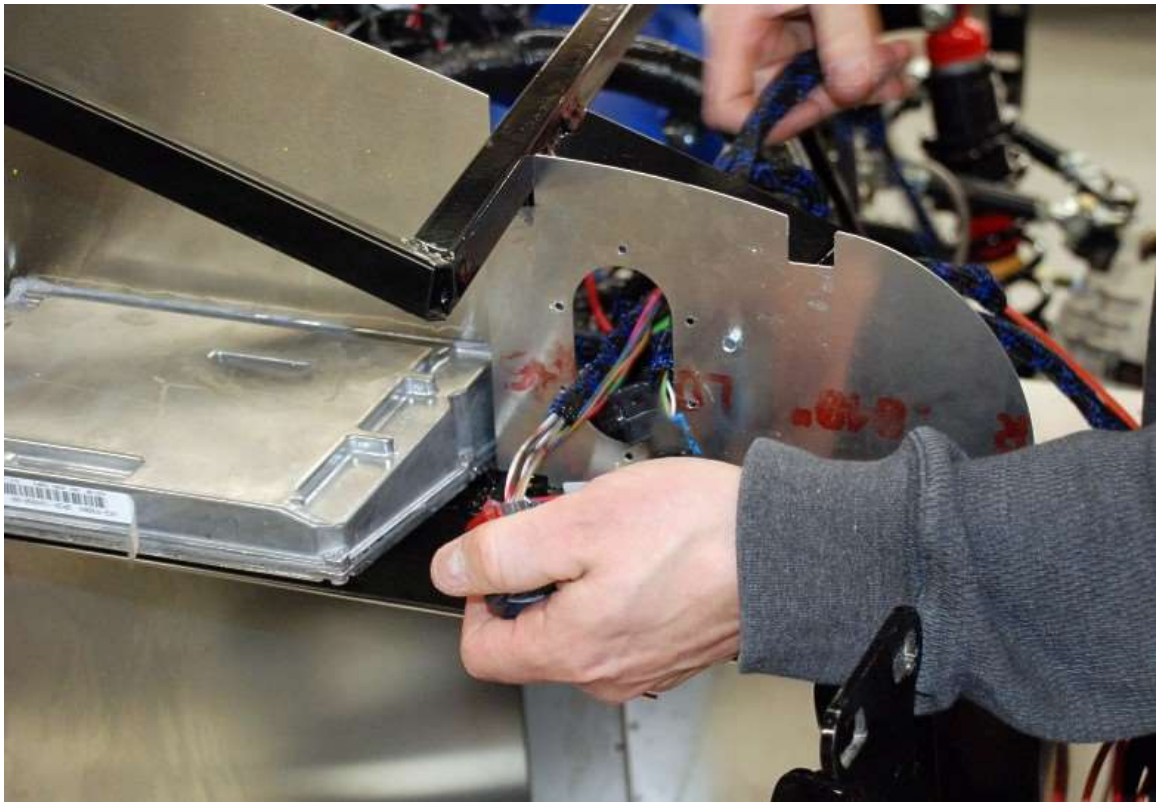
Thread the inner cable through the cable retaining lock nut from the accelerator cable components assembly.

Tighten the accelerator cable locknut.
Push the ball stud retainer onto the throttle pedal.
While pulling the cable tight, push the accelerator pedal up until it hits the frame and align the ball stud retainer with the cable.
Mark on the cable where the retainer ends.
Measure ⅜" from the mark on the cable towards the end of the cable and re-mark the cable.
Using a pair of wire cutters, cut the cable at the new location marked.
Remove the ball stud retainer from the accelerator pedal.
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 pedal location for optimum heal/toe and shoe size differences.

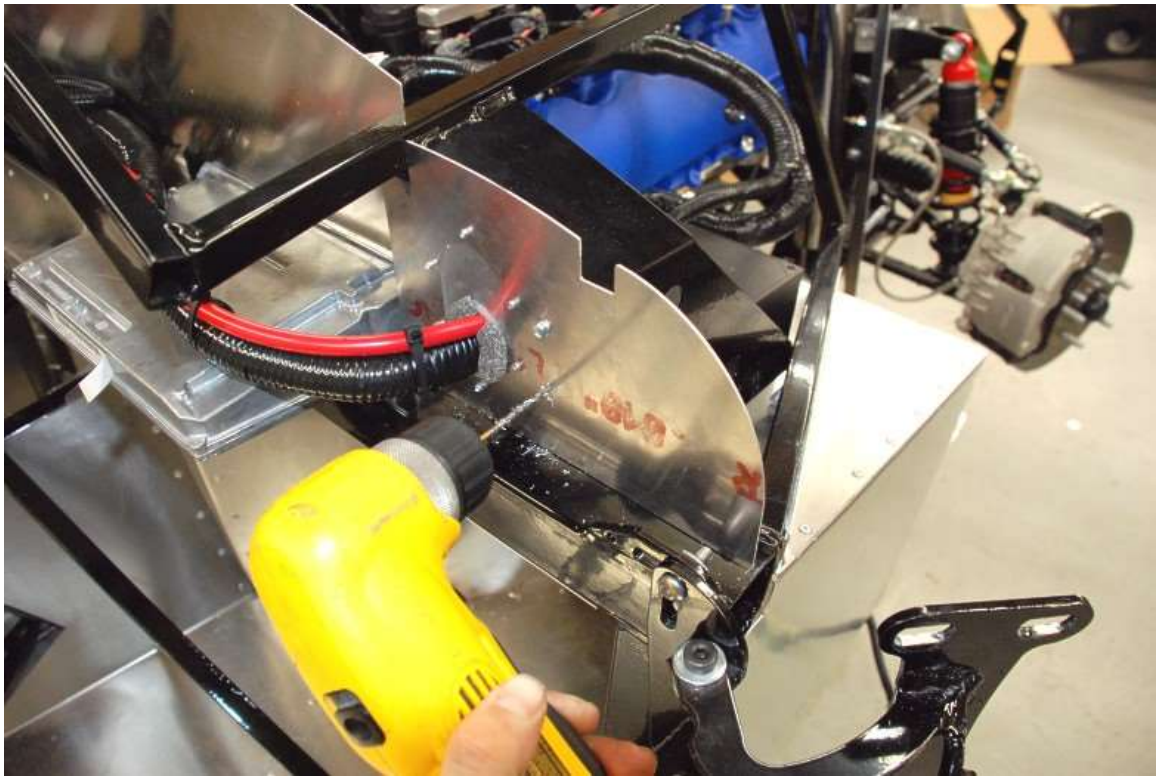
Engine Wiring

- Drill, $^{1}/_{8}$" drill bit, silicone, caulk gun, rivet gun
- Mounted aluminum, secondary body fasteners
- Refer to either the chassis harness instructions or if you are running a stand-alone harness refer to those instructions.





The hole in the firewall extension can be used to pass wires through from the engine to behind the dash and we often mount the computer inside the cockpit with the wires running through here. There is a cover plate that can be drilled to a smaller hole as well.



Silicone and rivet the dash extension in position.

Cooling System

🛠 Marker, Hack saw, Insulated Clip hardware, Drill, ¼" drill bit, 3/16" Hex key, 7/16", ½" wrenches, ruler, flathead screwdriver.

🚗 Fan mounting components, Stainless Radiator Hose kit, Roadster cooling system, insulated clip hardware, packaged aluminum

Unpack the roadster cooling system assembly.

Fan Mounting

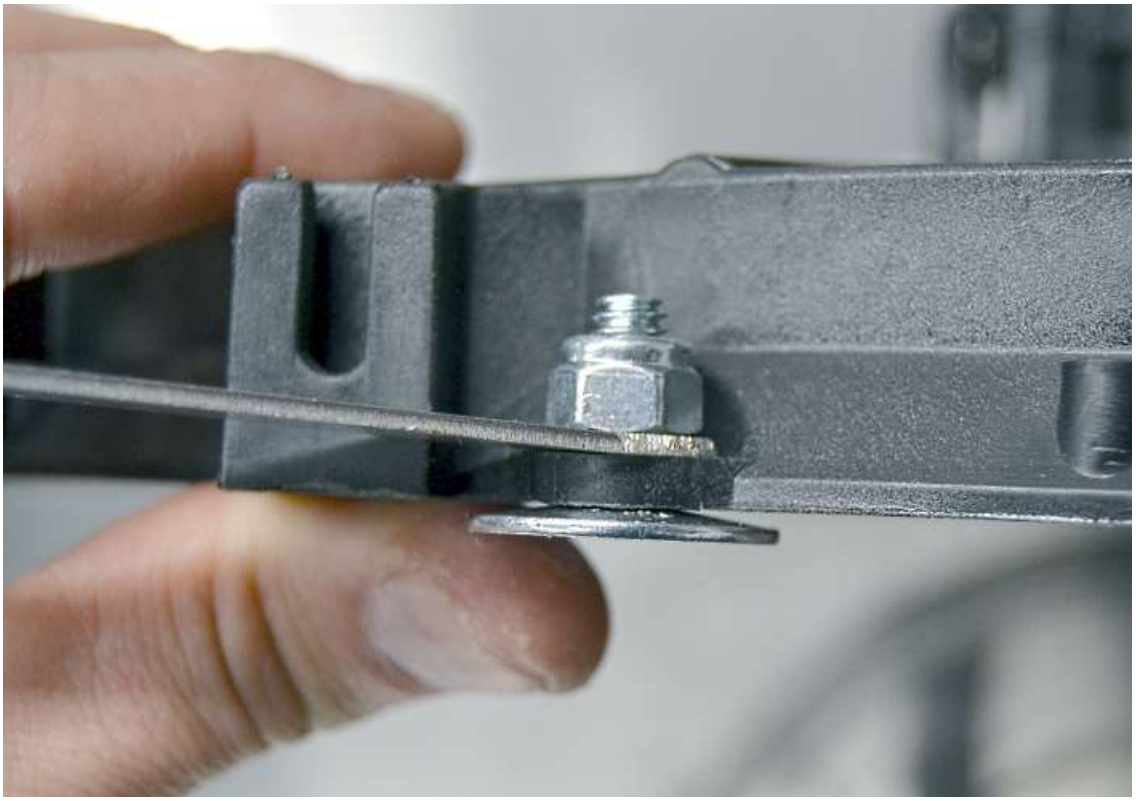
🛠 1/8" hex key, 3/8", 7/16" sockets, 3/16" drill bit, drill, ratchet.

Up pack the fan mounting hardware.

Insert an elevator bolt into the fan from the bottom.

Put the fan mounting strap on top of the fan using the larger single hole at the end.

Thread on the lock nut and tighten with a $^{7}/_{16}$" deep socket.



Tighten so that the square neck gets pulled into the plastic fan mount.

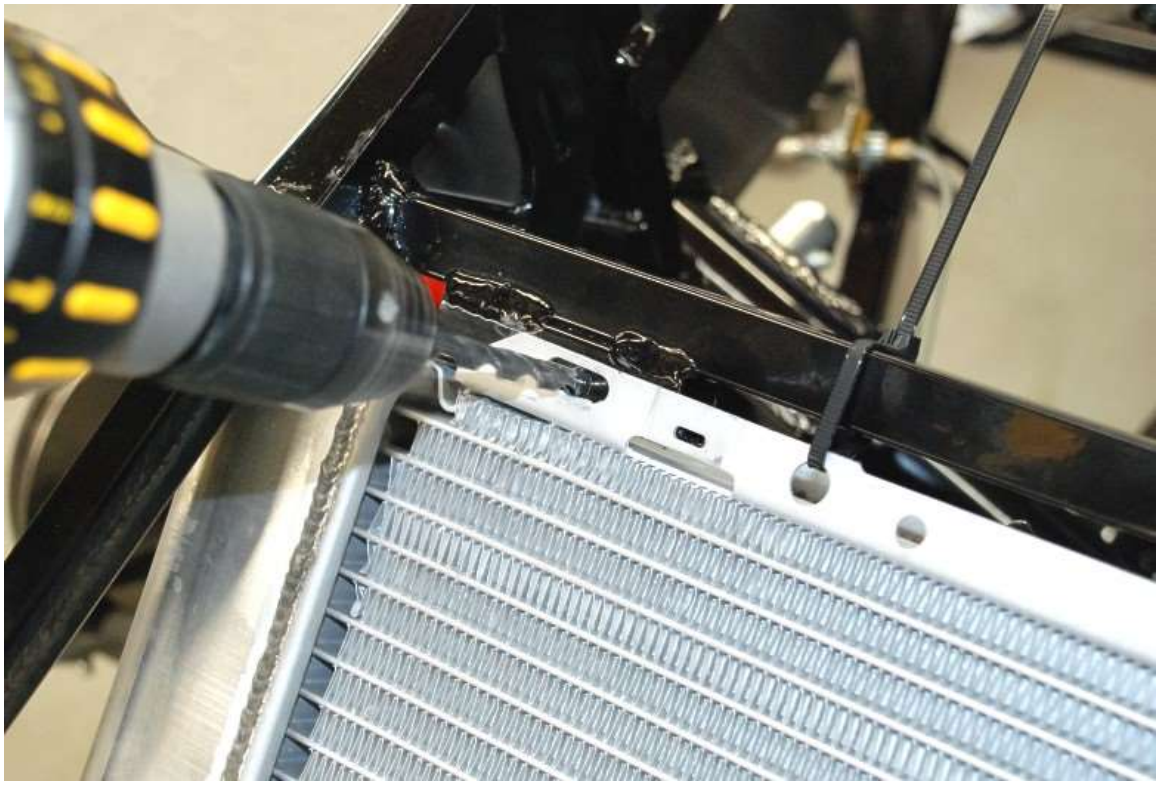
Place the fan on the radiator and rotate the mounts so that the smaller holes line up with the radiator flange.

Drill $^{3}/_{16}$" holes through radiator flange using the mounting strap holes as a guide.
Attach the radiator mounting strap to the radiator using the #10 button head screws, nuts, $^{1}/_{8}$" hex key and $^{3}/_{8}$" socket.

Radiator Mounting

Zip tie the radiator in place on the chassis. The bottom section can just hang by a couple ties looped around the lower outlet and the drain.

Mark the center of the radiator and the center of the chassis and offset the radiator by ⅝".



Drill the holes to mount the radiator top flange to the two small mounting tubes on the chassis.

Mount the radiator top to the flange with the hardware provided. The bottom stays zip tied for now.

Stainless Radiator Hoses

Unpack the stainless radiator hose kit and remove the hose connectors from the boxes.

Use the smaller sections of tube inside the adapters to fit them to smaller fittings on the radiator and intake.

Then fit the larger adapters over them.

Upper radiator hose

Start at the engine and route the tube above the “X” and to the upper radiator hose location.

Mount the inline filler neck where it is both accessible and as high as possible in the upper hose.

Mark the tube where it needs to be cut so that the tube will just touch the attaching location. Remove the tube from the vehicle.

Cut the tube using a hack saw or if available a cut-off wheel. If necessary clean the end up with tin snips or a grinder.
Shake and blow the tube out so that no metal pieces are in the tube.
Reattach the tube assembly to the engine and tighten the hose to the radiator.

Lower radiator hose

Connect the lower radiator tube to the engine.
Run the tube next to the 4" main rail and under the steering rack to the radiator. Route the lower tube with enough slack to be able to adjust the radiator for the nose aluminum.

Make sure that the lower hose is not hanging down. If necessary, zip tie the hose to the frame.

Mark the tube where it needs to be cut so that the tube will just touch the attaching location.
Remove the tube/hose assembly from the vehicle.
Cut the tube using a hack saw or if available a cut-off wheel. If necessary clean the end up with tin snips or a grinder.
Shake and blow the tube out so that no metal pieces are in the tube.
Remount the tube assembly and tighten the hose clamps on the mount locations.

Where the tube goes under the X use one of the extra adapters and some kit zip ties to hold it against the X to prevent any shaking while driving.

- 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.

Overflow Tank

Pick the mounting location for the tank and mark the holes. Make sure the tank is accessible and visible inside to check the level on the finished car then bolt it in place.

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.

Route the overflow hose from the filler to the overflow tank.

Make sure you attach the hose to the tube that runs off the bottom of the tank and not the one that extends up into the tank.

Put the radiator cap in place on the filler for now so it doesn't get lost.

- There is a thermostatic fan switch provided that can be used to activate the fan. When the engine reaches 185°F, the switch will ground which will ground the relay in the fuse panel and turn the fan on. There is also a wire for this located with the fan wires at the radiator if desired.

In your engine block or cylinder head, locate a coolant access point to install the thermostat switch and screw it in.

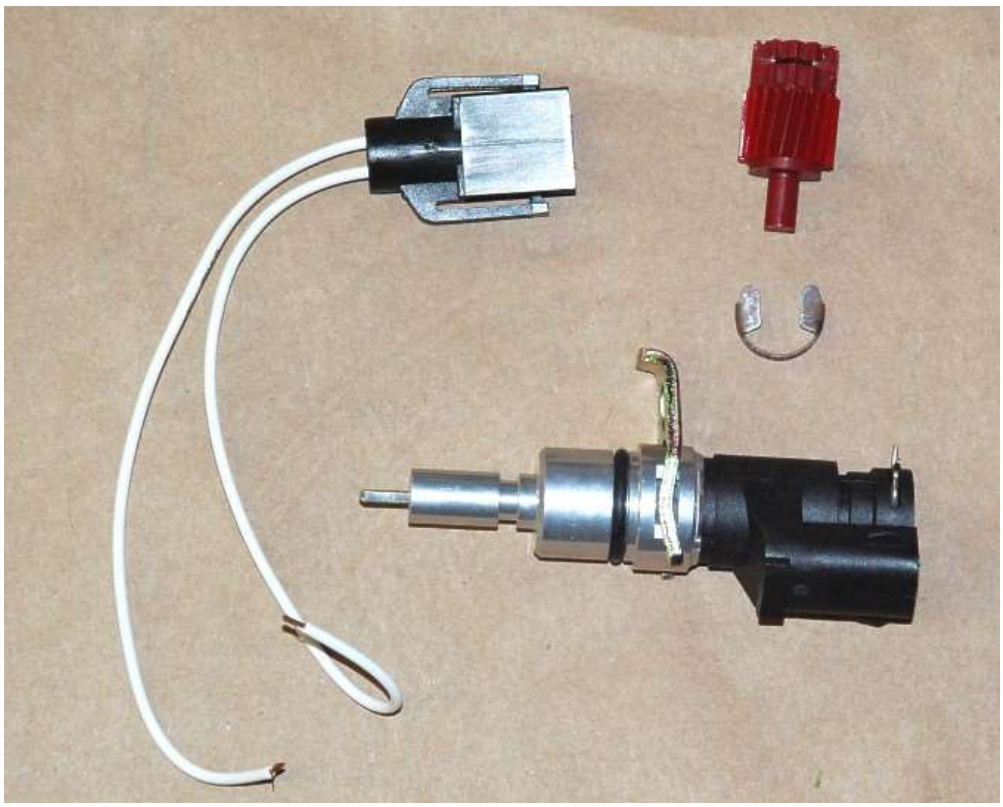
Fan Wiring

- Wire crimp tool
- Misc. electrical components.

Attach the cooling fan wires according to the wiring harness manual.

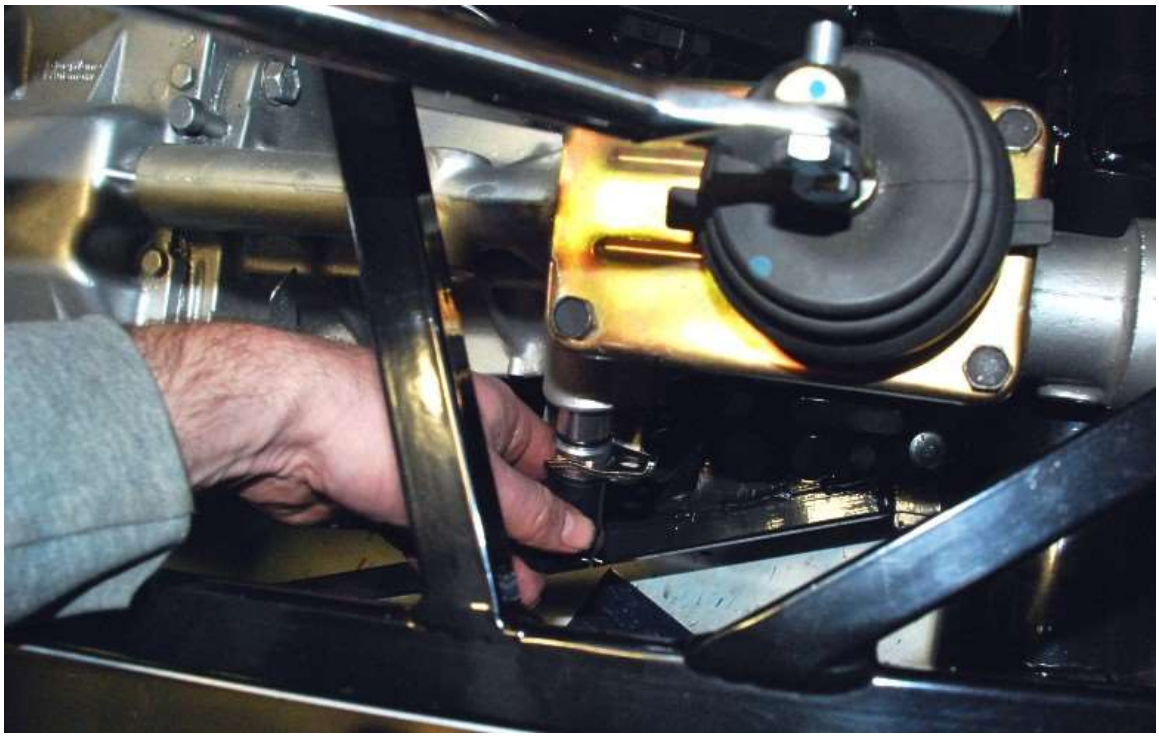
Speedometer Sending Unit

- 11mm deep socket, ratchet, wire crimping tool
- Speedometer sending unit components, misc. electrical components
- The sending unit connection is only needed if the Speedometer is not GPS controlled.
- If the transmission does not have a block-off plate, the sending unit will need to get installed to prevent a transmission fluid leak.



Unpack the speedometer sending unit components.

Install the gear on the end of the sender and hold it in place with the clip.



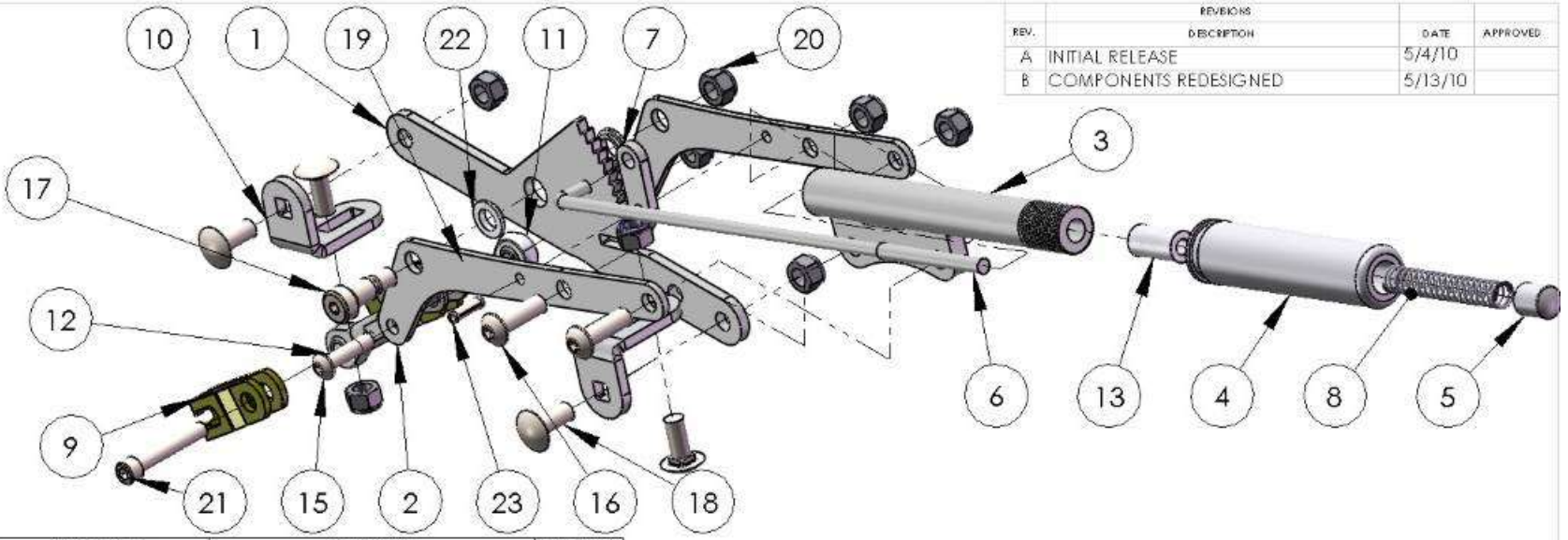
Put a little oil on the O-ring and install the sender in your transmission. Use the original bolt to hold the sending unit in place.

Connect the plug and plug it into the sender. If you are running fuel injection you may also need to send this signal to the computer as well depending on your system.

Emergency Brake

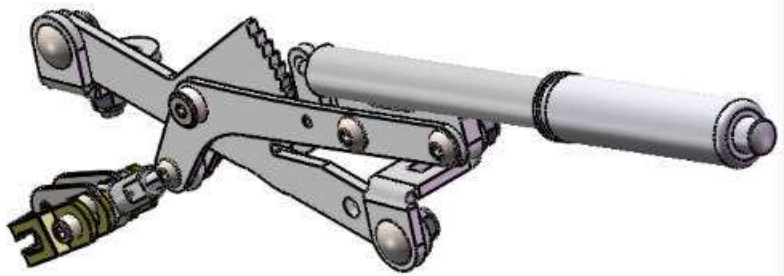
E-brake Handle

- 🛠 $^{5}/_{32}$", $^{3}/_{16}$" hex keys, $^{7}/_{16}$", ½" wrenches, channel lock pliers, WD-40
- 🚘 E-brake handle assembly, brake line components



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/4/10	
B	COMPONENTS REDESIGNED	5/13/10	

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	15167	FIXED GEAR	1
2	15168	HANDLE TO RATCHET MOUNT	2
3	15176	LOWER HANDLE ASSEMBLY	1
4	15173	HANDLE GRIP	1
5	15174	E-BRAKE BUTTON	1
6	10801	ANCHOR BOLT, 1/4-20 x 10", 4.25" THREAD LENGTH	1
7	15169	RATCHET TOOTH	1
8	COMPRESSION SPRING	2.625" 6.0#/in COMPRESSION SPRING	1
9	15181	E-BRAKE CABLE CLEVIS	2
10	15170	MOUNT BRACKET	2
11	15177 - 1-4 MALE ROD END	1/4" MALE ROD END	1
12	15180 - 1-4 FEMALE ROD END	1/4" FEMALE ROD END	1
13	Nylon Spacer	0.50" OD x 0.25"ID x 1" NYLON SPACER	1
14	15672	WILWOOD E-BRAKE CABLE ADAPTER	2
15	SBHCSCREW0.25-20x1-HX-N	25461	2
16	SBHCSCREW0.3125-18x1-HX-N	11024	2
17	SHSSCREW0.375x0.5-N	13325	1
18	RHSSNBOLT0.3125-18x0.75x0.75-N	25562	4
19	10802	NYLON INSERT LOCKNUT	3
20	NLN-3125C	NYLON INSERT LOCKNUT, 5/16-18 UNC	7
21	HX-SHCS0.25-20x1.5x1-N	12336	1
22	15165	NYLON BUSHING	2
23	SPS0.1875x0.625	15178	1



ROADSTER
COUPE
HOT ROD
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

	NAME	DATE
DRAWN	JI	4/26/10

COMMENTS:
8.12:1 LEVERAGE RATIO

PRINTED 5/17/2017

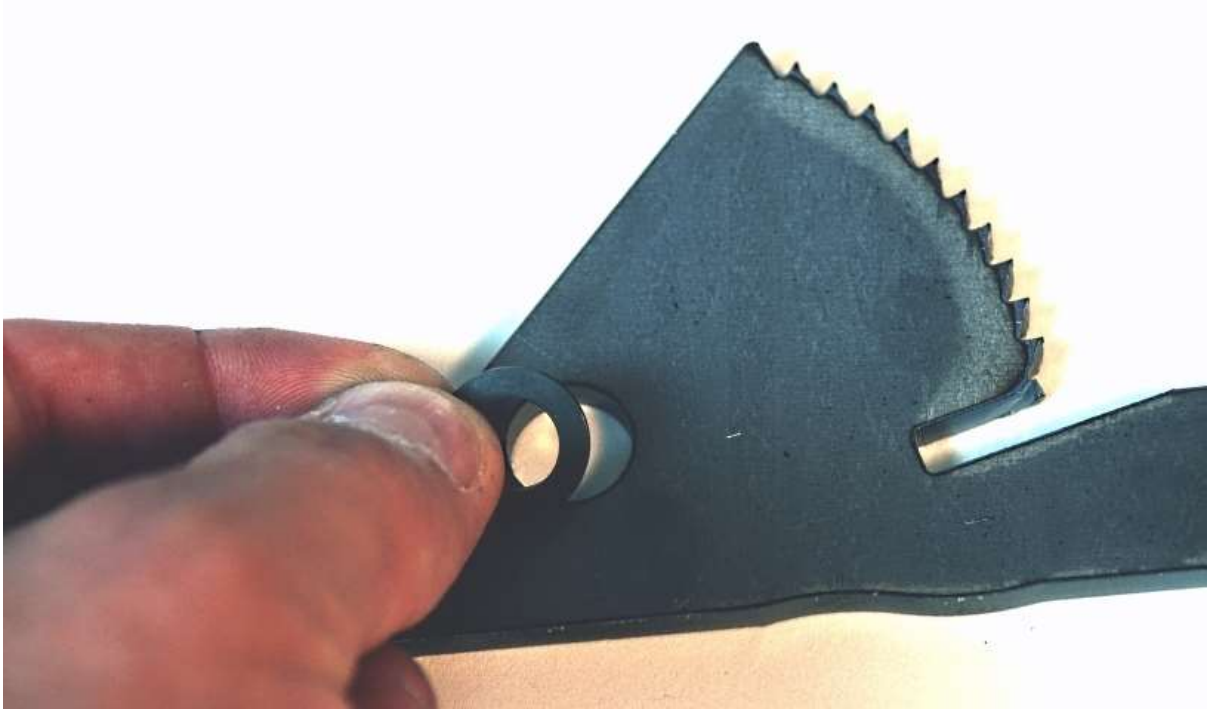
Factory Five Racing, Inc.

TITLE:
E-BRAKE HANDLE

SIZE	DWG. NO.	REV
A	15183	B

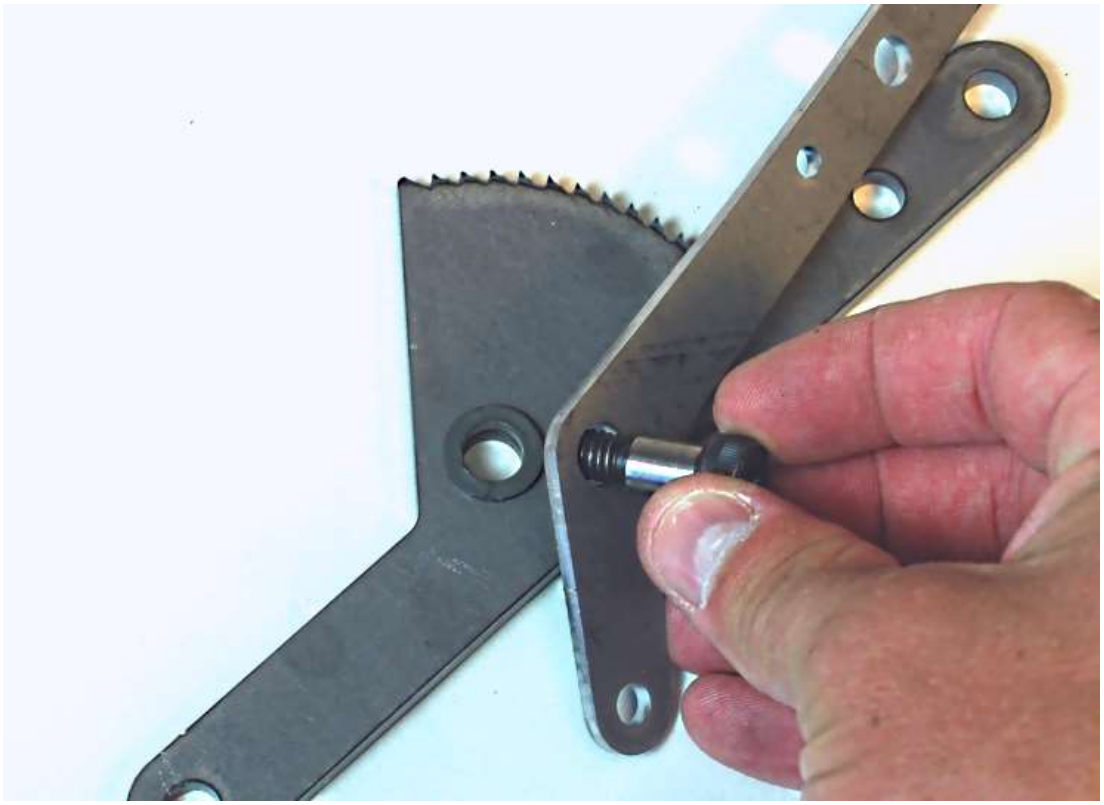
SCALE: 1:2.5 WEIGHT: SHEET 1 OF 3

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.

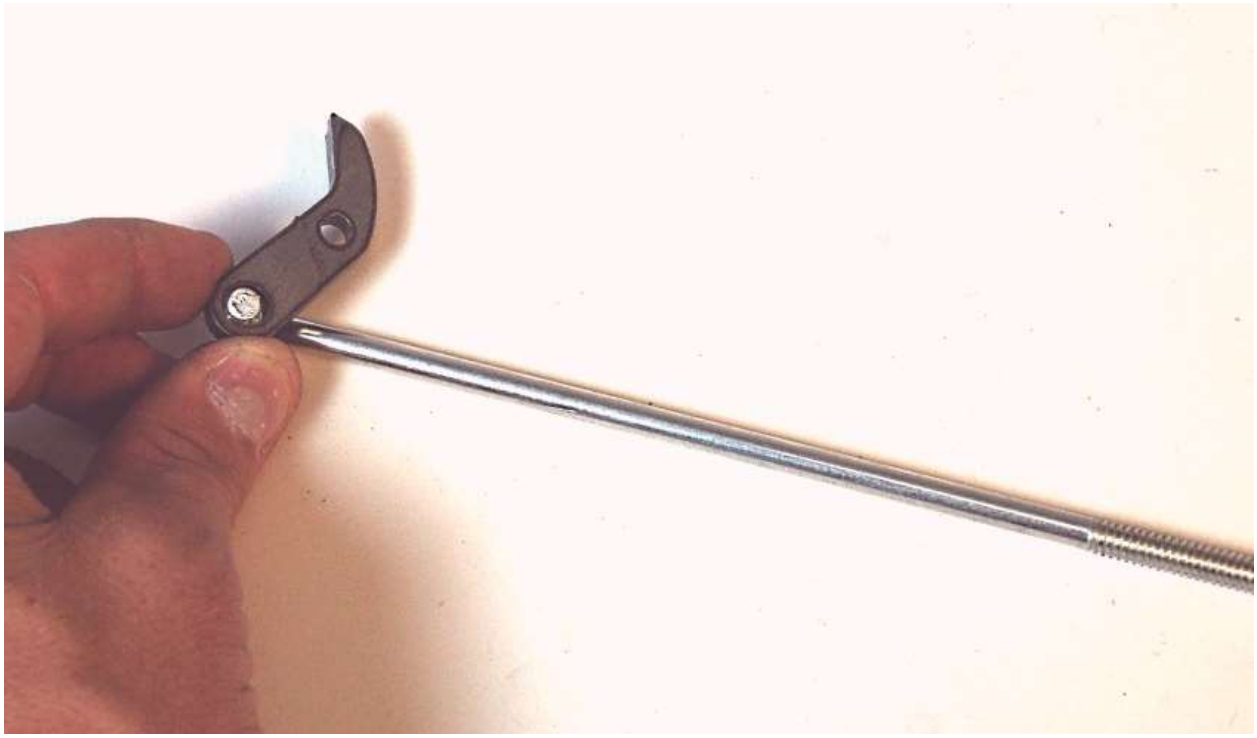


From the right side of one of the Handle to ratchet mounts, insert the shoulder bolt through the ratchet mount and then the fixed gear.

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 below.

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.

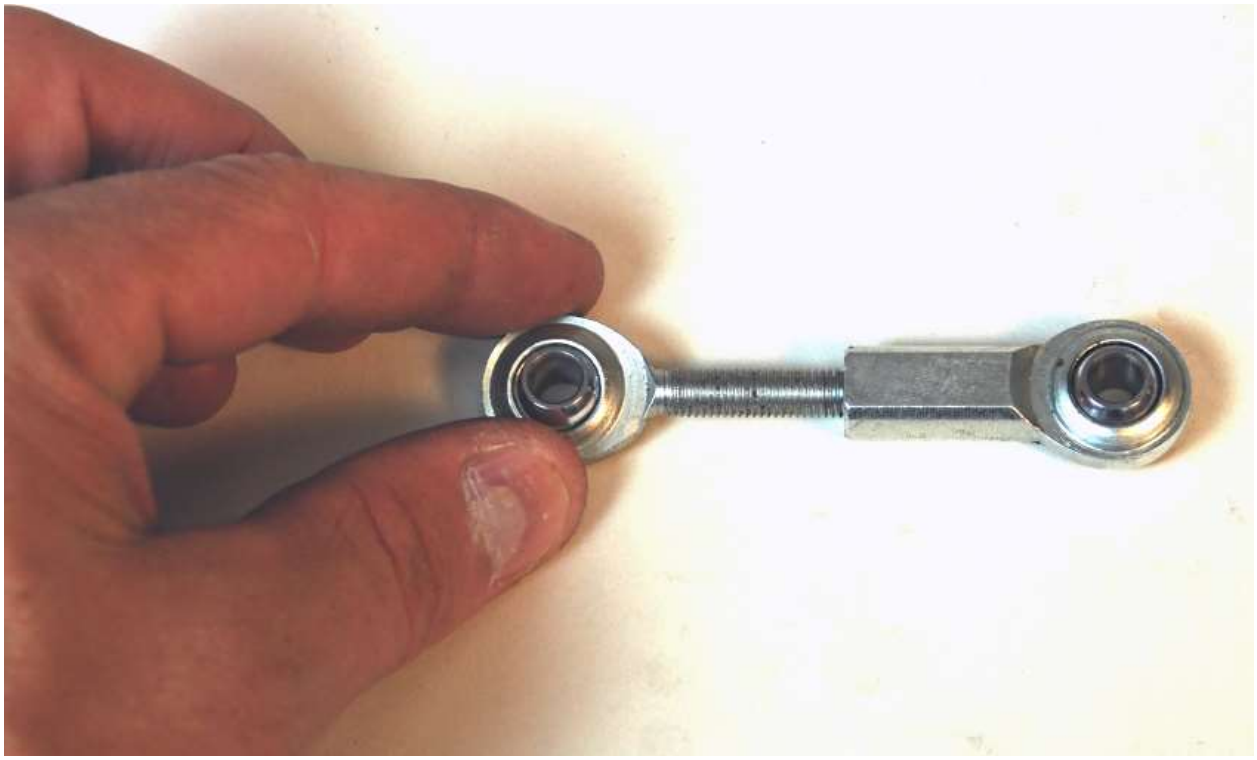
Slide the 1” nylon spacer onto the end of the anchor bolt.

- 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.



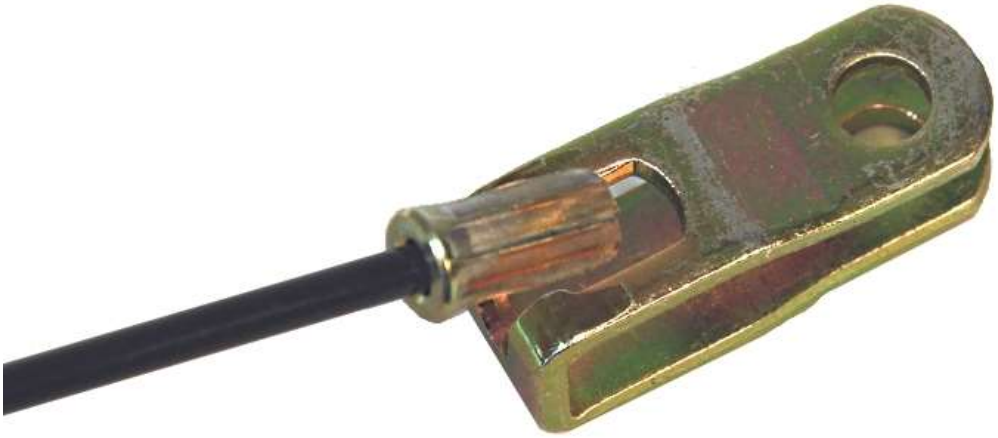
Screw the male and female rod ends together.

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

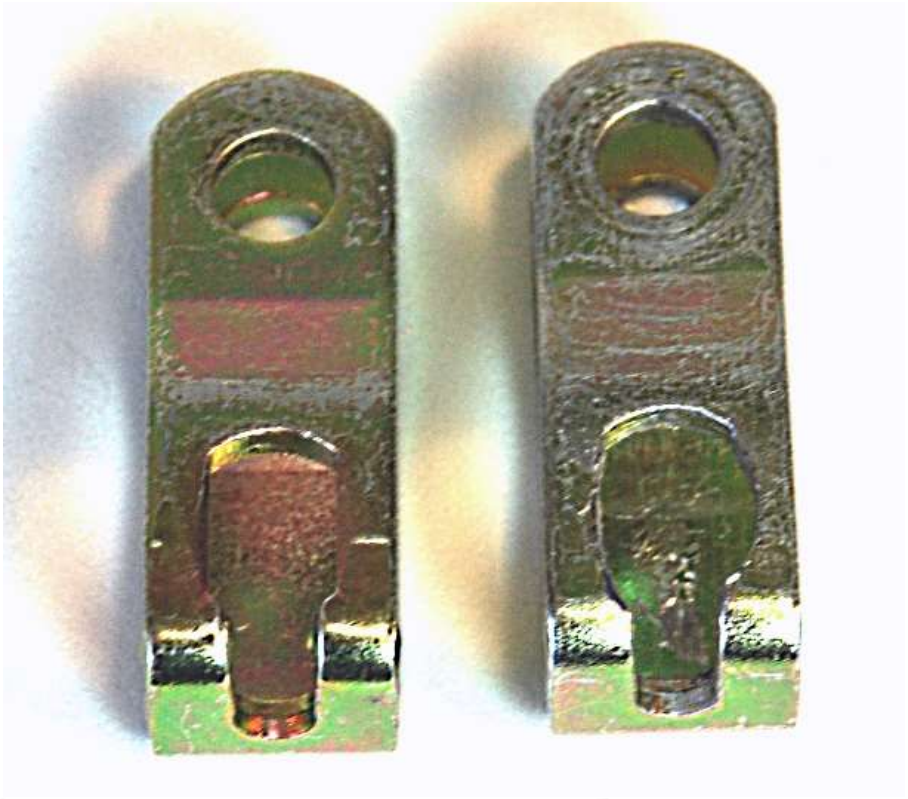
Slide the male rod end between the ratchet to handle mount plates and attach it using the ¼" flange head bolt and locknut.

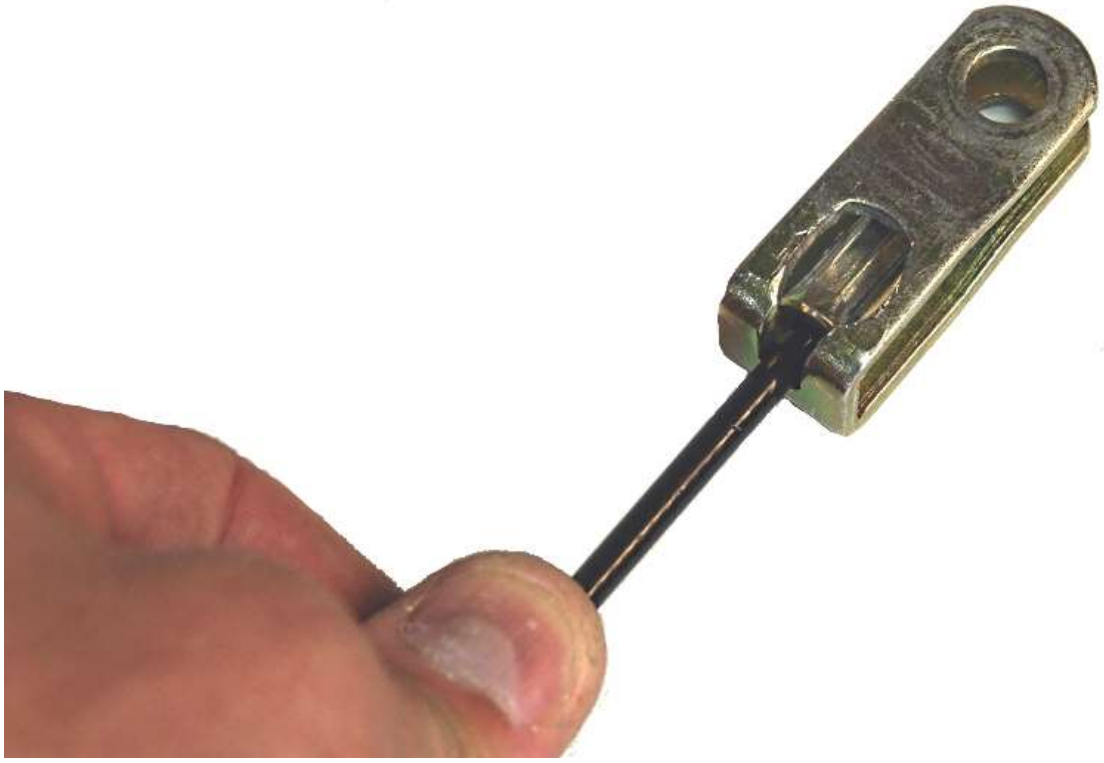
Insert a $^{5}/_{16}$" carriage bolt into one of the bent mount brackets so the square shoulder is in the square hole.

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



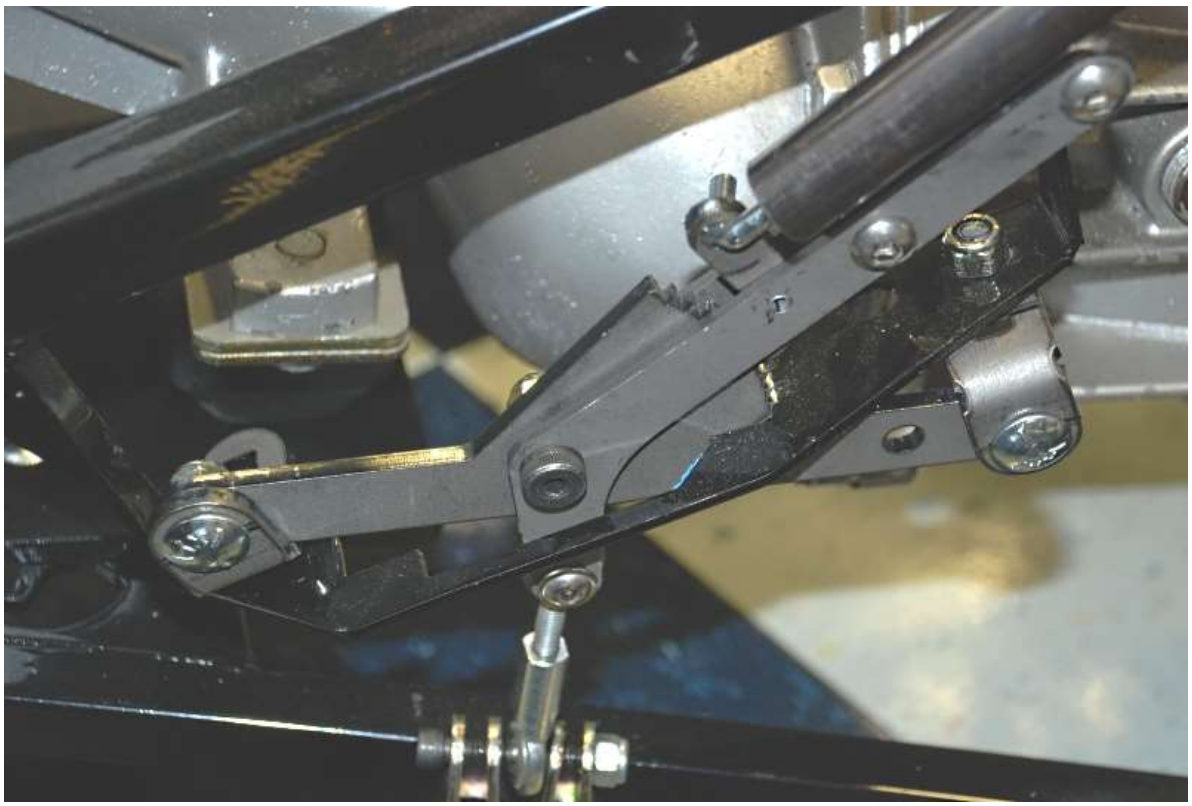
Check the fit of the emergency brake cable end in the brake cable clevis.





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.



Attach the handle to the frame using the $^{5}/_{16}$” carriage bolts. Leave the locknuts loose enough so that the mount bracket can still slide on the frame mount. The front mount bracket goes under the frame bracket while the rear goes on top. The fixed gear straddles the frame mount.

- This picture is shown without aluminum for easier viewing.

Tighten the mount bracket to fixed gear carriage bolts.

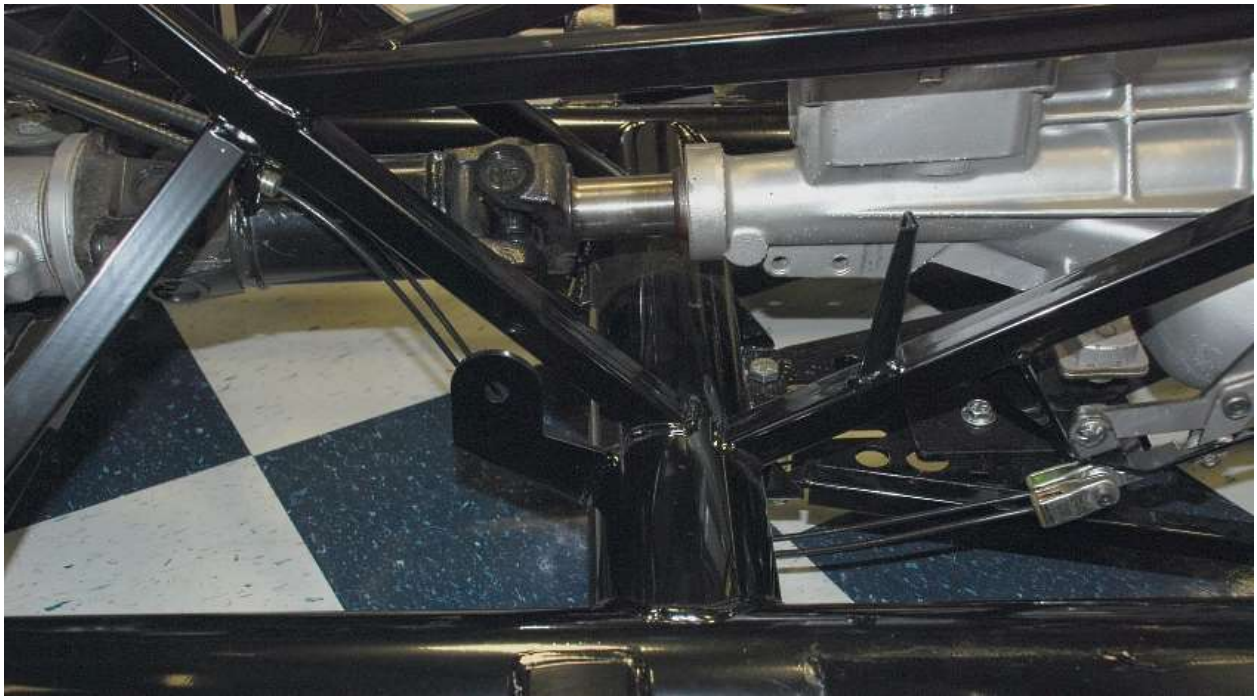
CABLES

Solid Axle

- Your E-brake cables should be from the same car as your rear brakes.
- 87-92 Mustang cables or the FFR cables mount to the bracket up near the 2”x 3” tube. 93-04 Mustang cables mount to the bracket near the handle.

For 87-92 and FFR cables route them through the upper bracket in the transmission tunnel until the sheath end clicks in place.

The following picture is shown without aluminum for easier viewing.



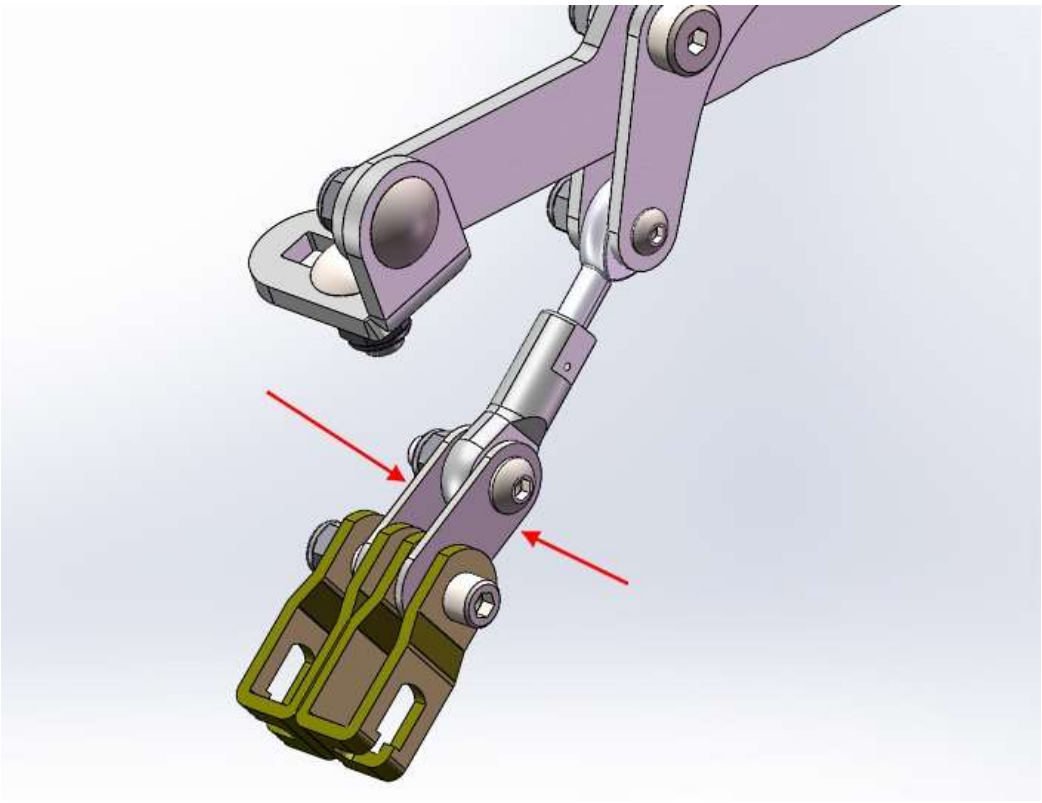
For 87-92 and FFR cables route the inner cable down under the chassis 4" crossmember.

Solid Axle

Route the cables back to the calipers and attach. Make sure your routing is out of the way of any moving parts and the cable has slack to move with the axle.

Emergency brake cable in caliper bracket.

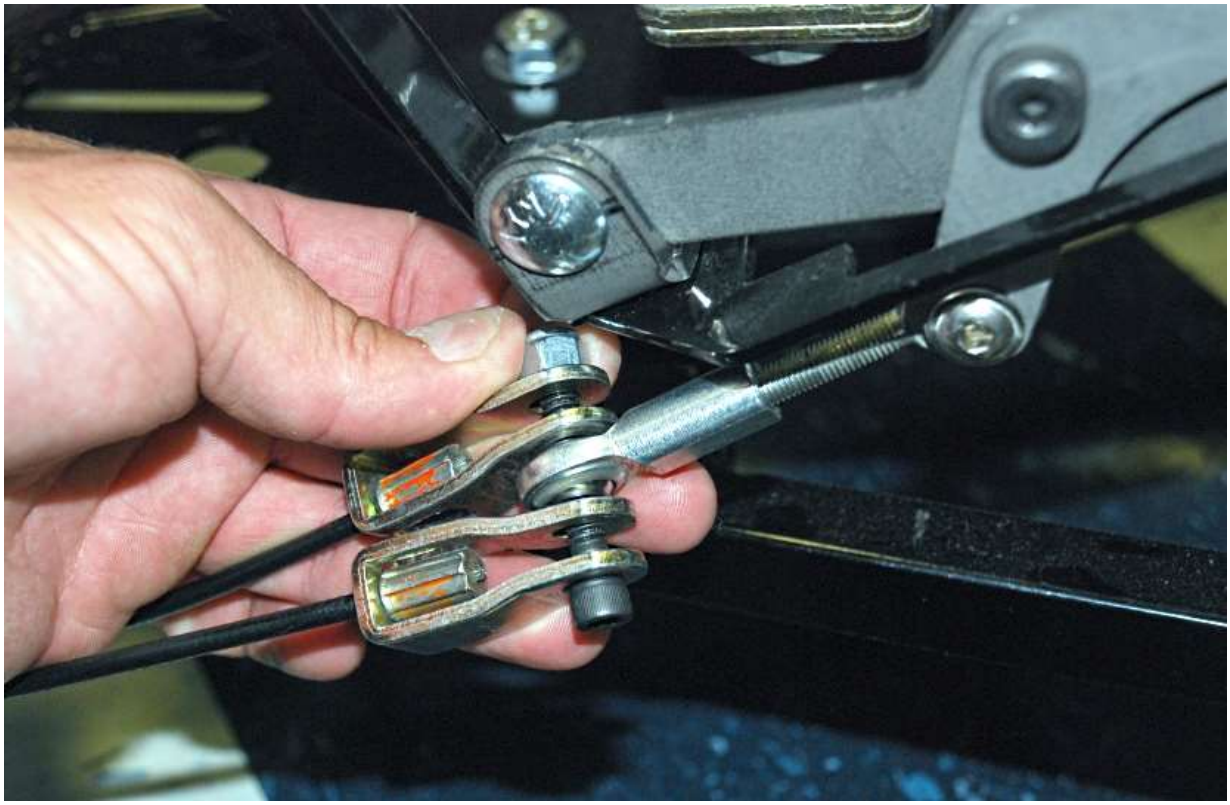
Handle and Cable Adjustment



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

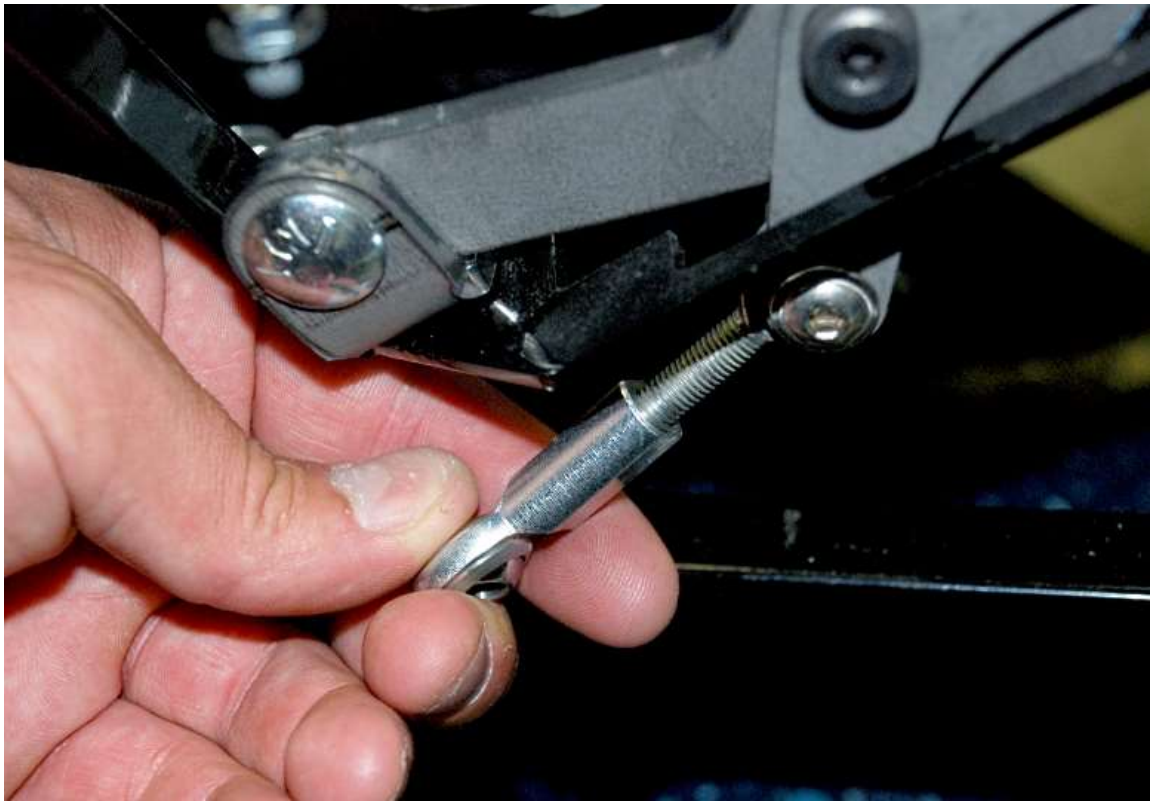
Remove the cable clevises from the rod end and attach them to the cable ends.

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

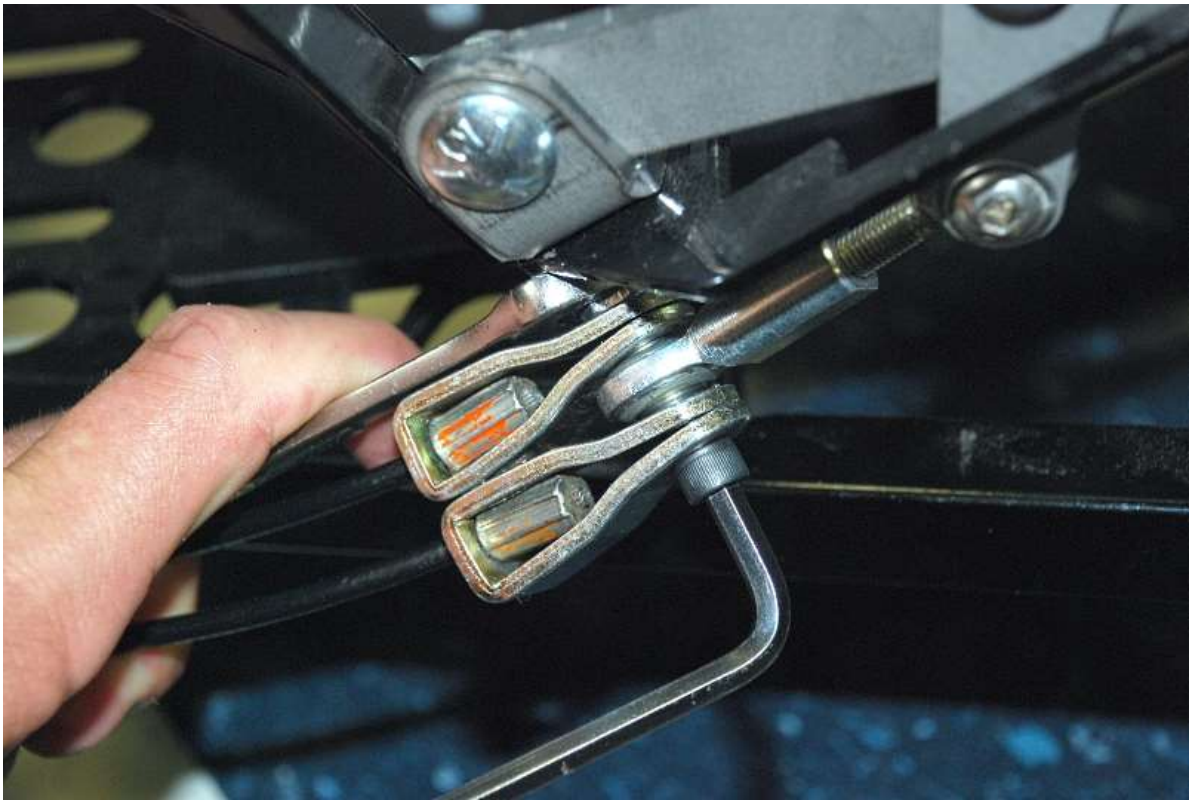


Put the locknut back on the ¼” bolt hand tight.

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.

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.

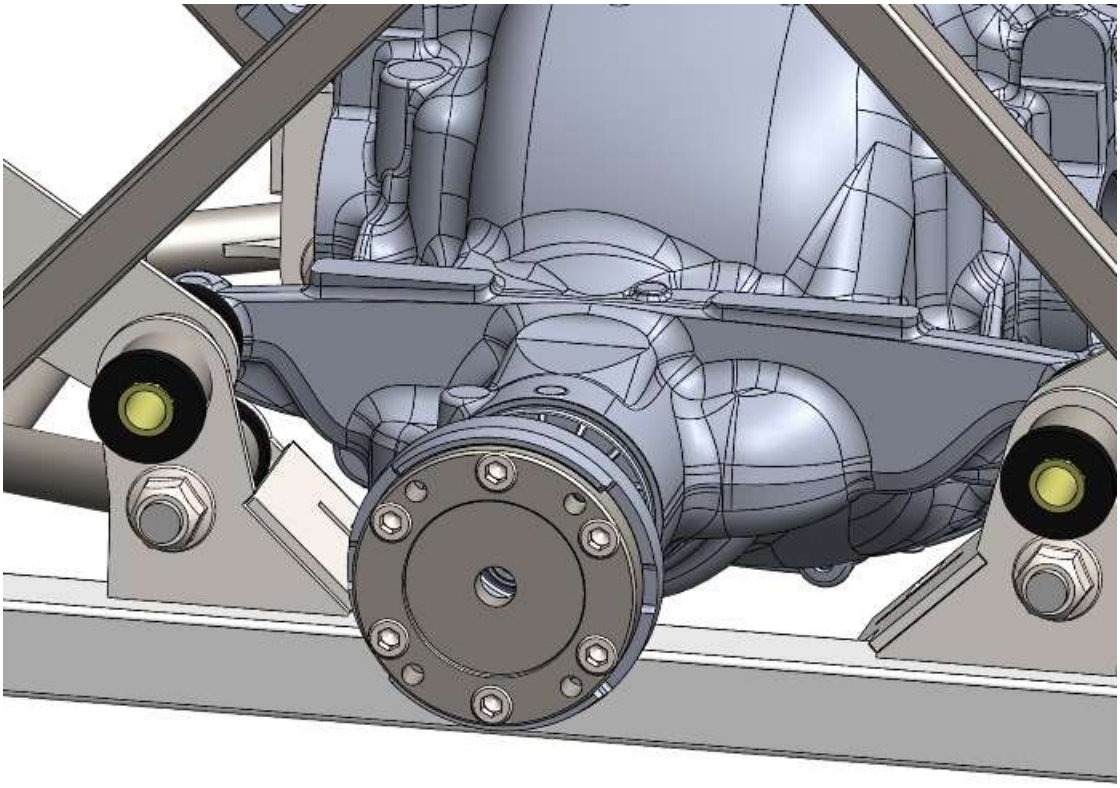
Use a 36mm deep socket and impact wrench to tighten the CV axle nut until it touches the bearing.

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)**.

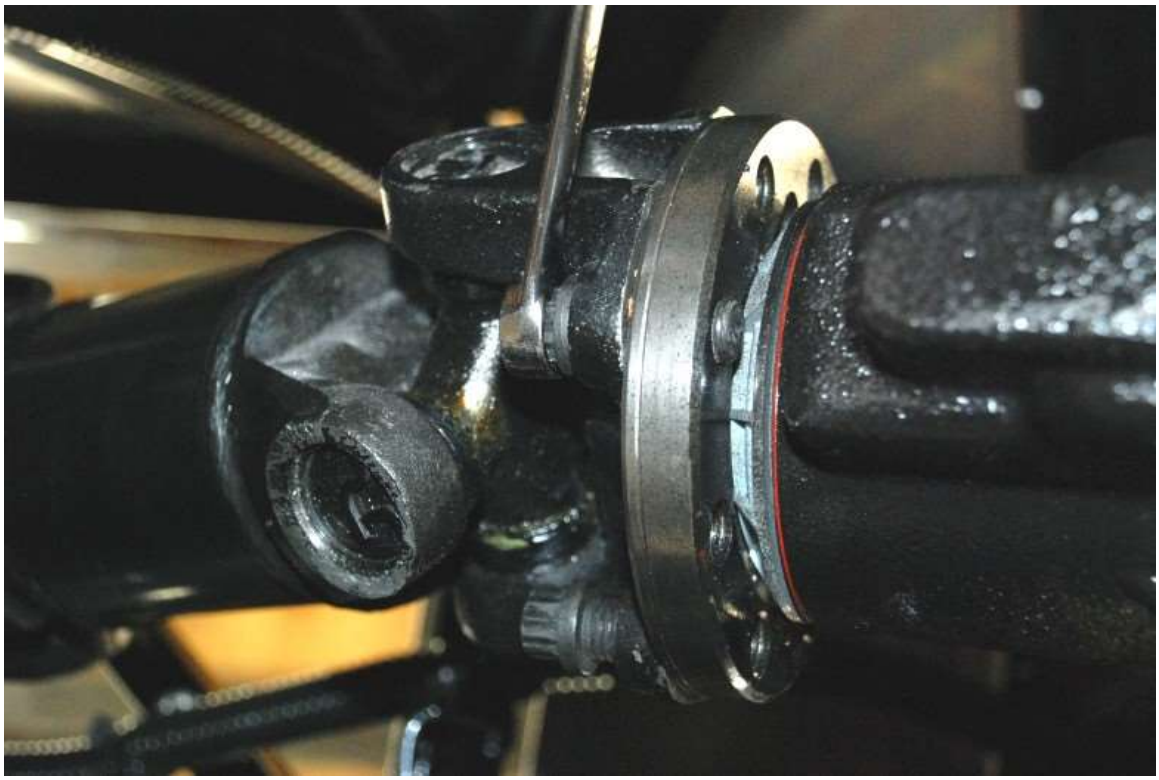
Driveshaft

🛠 14mm wrench, thread locker
🚘 Driveshaft

Unpack the driveshaft and slip it up into the rear of the transmission. The most room to do this is usually to hold the shaft just above the center section and come in from the driver's side.

Solid axle

The driveshaft bolts are in the box with the driveshaft and should have thread locker on them already. If thread locker is not there, put a small bead on each bolt.

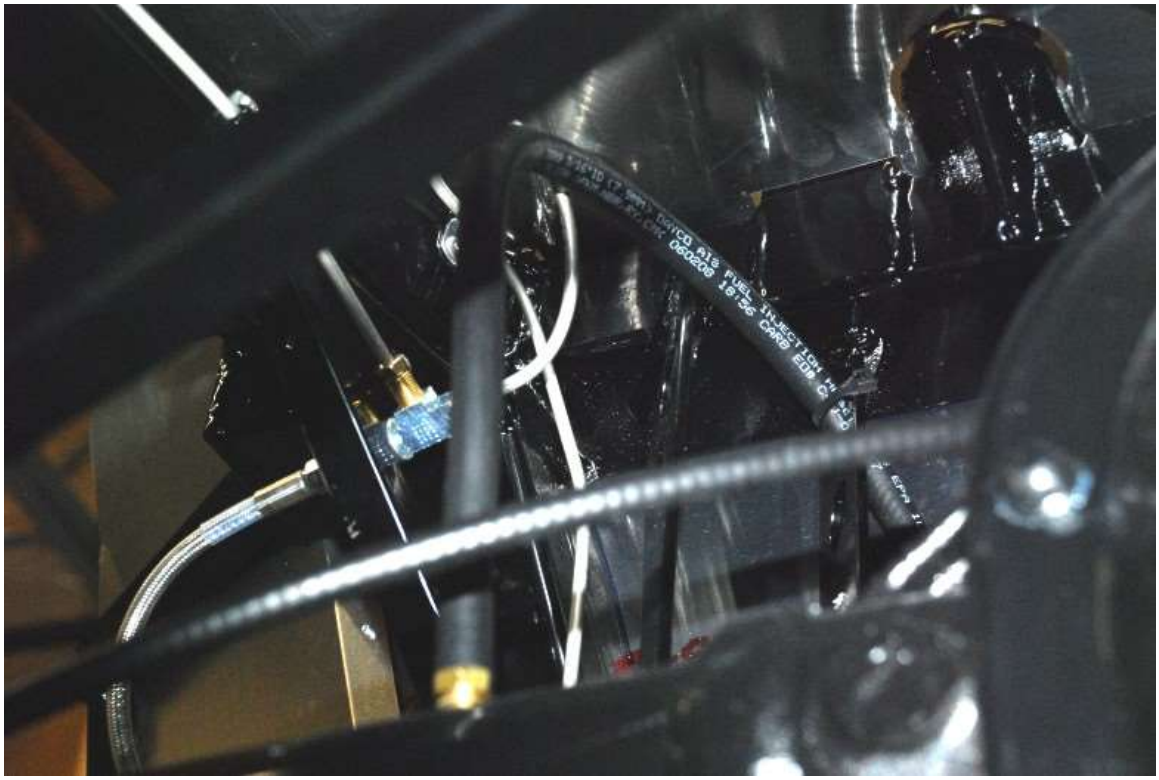


Fit the driveshaft snug against the yoke and install the bolts and tighten. You can put the transmission in gear to stop the driveshaft from turning while you tighten. Torque the bolts to **95Nm (70 lb-ft)**.

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

Axle and Fuel Tank Vents

- Razor knife
- OEM fuel tank components, insulated clip hardware



If using the FFR rear axle, attach the ¼" rubber fuel line to the vent tube on the rear axle or center section. Tie the top of the tube up high under the trunk allowing room for the axle to move.

Attach the two-foot section of ¼" rubber fuel line to the fuel tank vent and run the line up high under the upper trunk and tie in place.

Transmission Tunnel Cover

🛠 Drill, 1/8" drill bit, Silicone, Caulking gun, Rivet gun
🚘 Roadster Secondary Body Fasteners Components, Packaged Aluminum, mounted aluminum

Silicone and install the transmission tunnel top.

Silicone and install the shifter hole cover. Make sure it does not interfere with the movement of the shift lever.

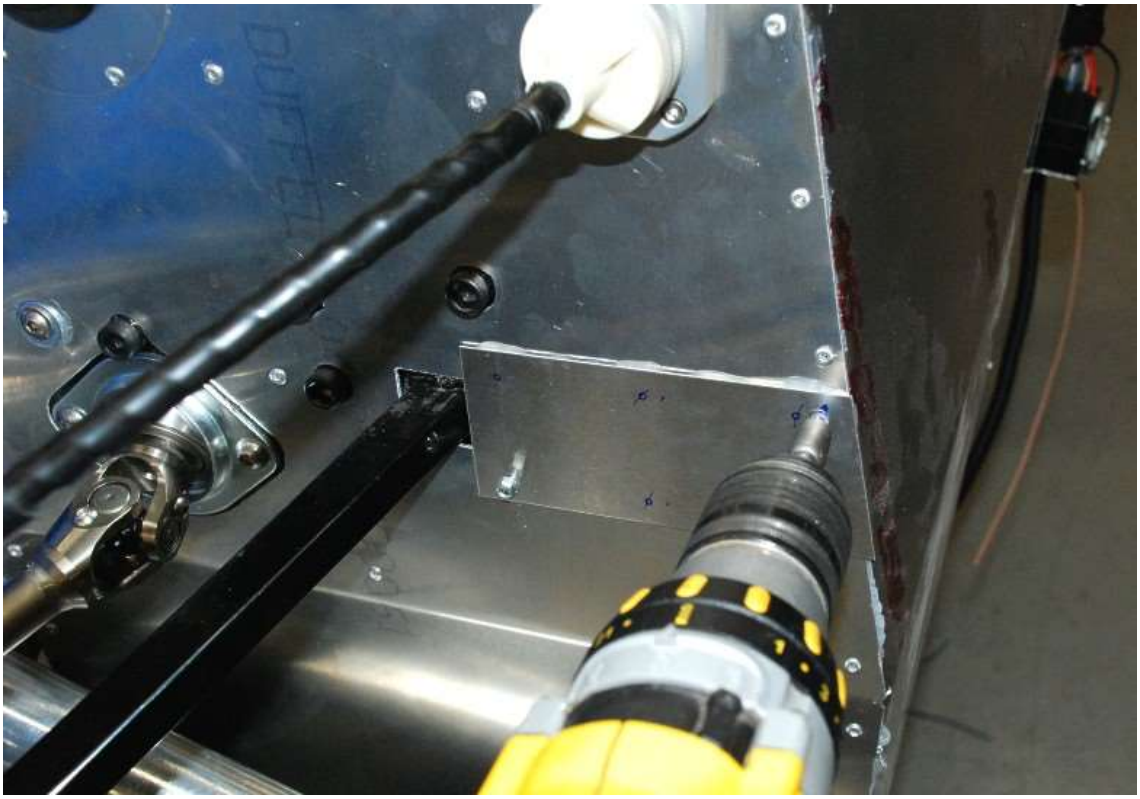
Silicone and install the tunnel plug patch panel.

Driver Footbox Side Aluminum

🛠 1/8" drill bit, drill, rivet gun, caulking gun, silicone

🚗 Mounted aluminum, packaged aluminum, secondary body fasteners

Silicone and install the driver's side footbox outer wall. The front flanges tuck in behind the footbox front panel.



Silicone and install the front patch panel.

Seats

🛠 5/16" drill bit, drill, 3/16" hex key, ½" deep socket, marker
🚘 Seat mount hardware, seats

Unpack the seats and set them in the cockpit.
Sit in the seats and locate them in the position you are most comfortable. This is a critical fitment so take your time and make sure you are happy with the location.

Lift up the bottom of the cushion to reveal the seat frame.

Using the rivet heads as a guide mark where the rails of the seat frame are above the seat mounting plates.

Drill the first hole for the seat mounting and install the bolt.

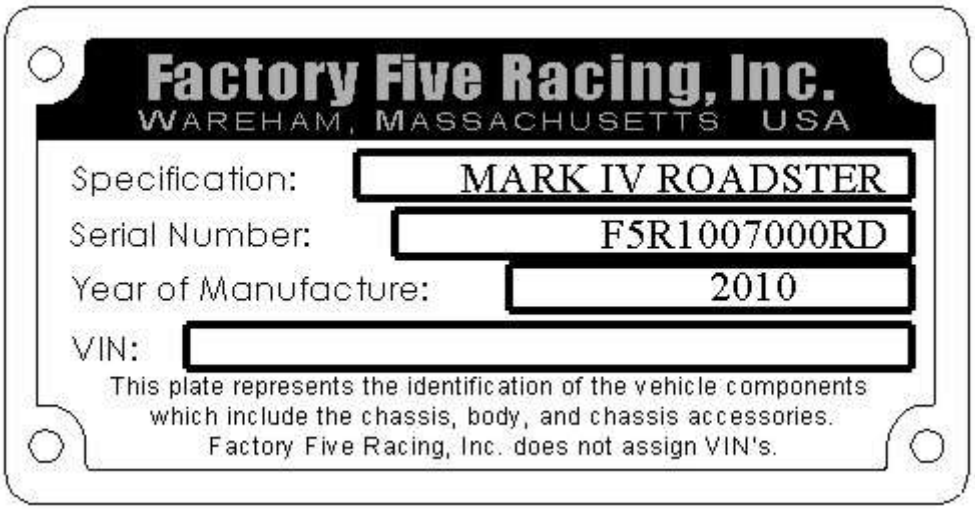
Drill the remaining holes for mounting the seats and install the bolts.

Nameplate

🛠 $^{1}/_{8}$" drill bit, rivet gun, drill

🚗 Secondary body fasteners, certificate of origin envelope

- Factory Five Racing has included a Certificate of Origin along with a Nameplate for your kit. The serial number from the Certificate of Origin matches the number engraved on the 2”x 2” tube going across the car at the front of the cockpit on the driver side. Below is an example of how the nameplate looks. The VIN number space is provided so that your state issued VIN number can be engraved if you so desire. This can be engraved at any Trophy or mall engraver.

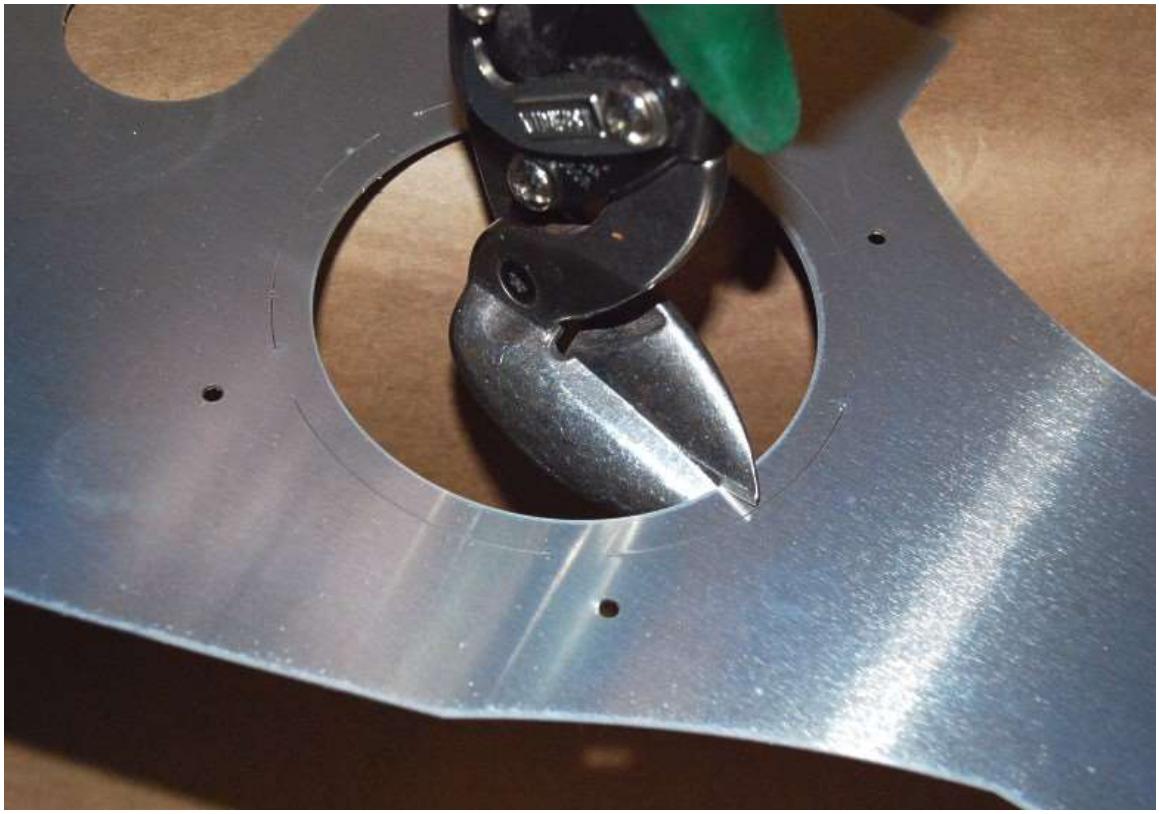


A few places that people have riveted these plates are: front of the 2”x 2” hoop in the cockpit to the left of the steering shaft; on top of the driver footbox; on top of the passenger footbox

Gauges and Dash

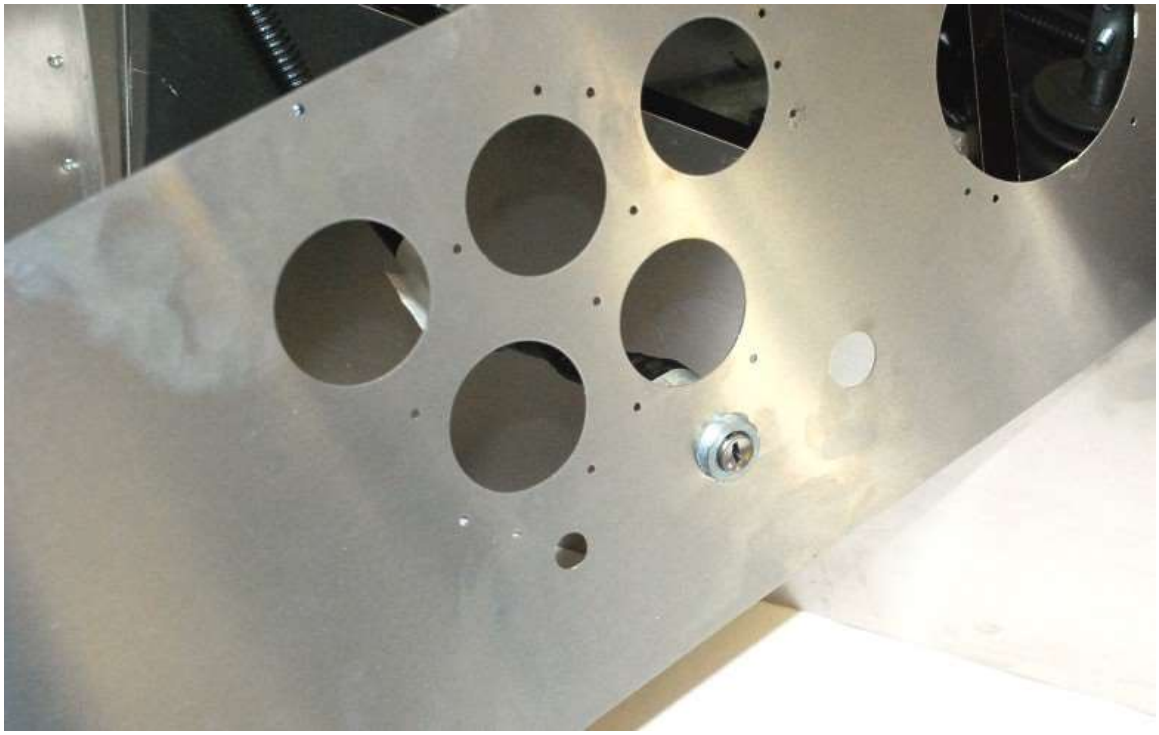
- Tin snips, pliers, spray glue, brake cleaner, razor knife, drill, $_1/_8$”, $_3/_{16}$” drill bit, silicone, caulking gun, rivet gun, wire crimper, wire stripper, Philips screwdriver.
- Gauge set, dash electrical components, cut dash, packaged aluminum, Interior trim/carpet box, electrical system completion components.
- Factory Five has a padded vinyl dash with glovebox available as an option for use with the Vintage gauges.
- The factory Five Vintage gauges have built-in indicator lights so the large dash mounted ones included are not necessary.

Unpack the dash, dash cover and the gauges.



Depending on which gauges you are using you may need to open up the dash holes for the tachometer and speedometer. If you need the larger holes the take a tin snip and cut through from the smaller hole to the tracing for the larger one halfway between all the tabs.

Take a pair of pliers and snap the tabs off to get the larger opening.



The ignition switch hole also needs opened up the same way. File the hole smooth and test fit the switch.

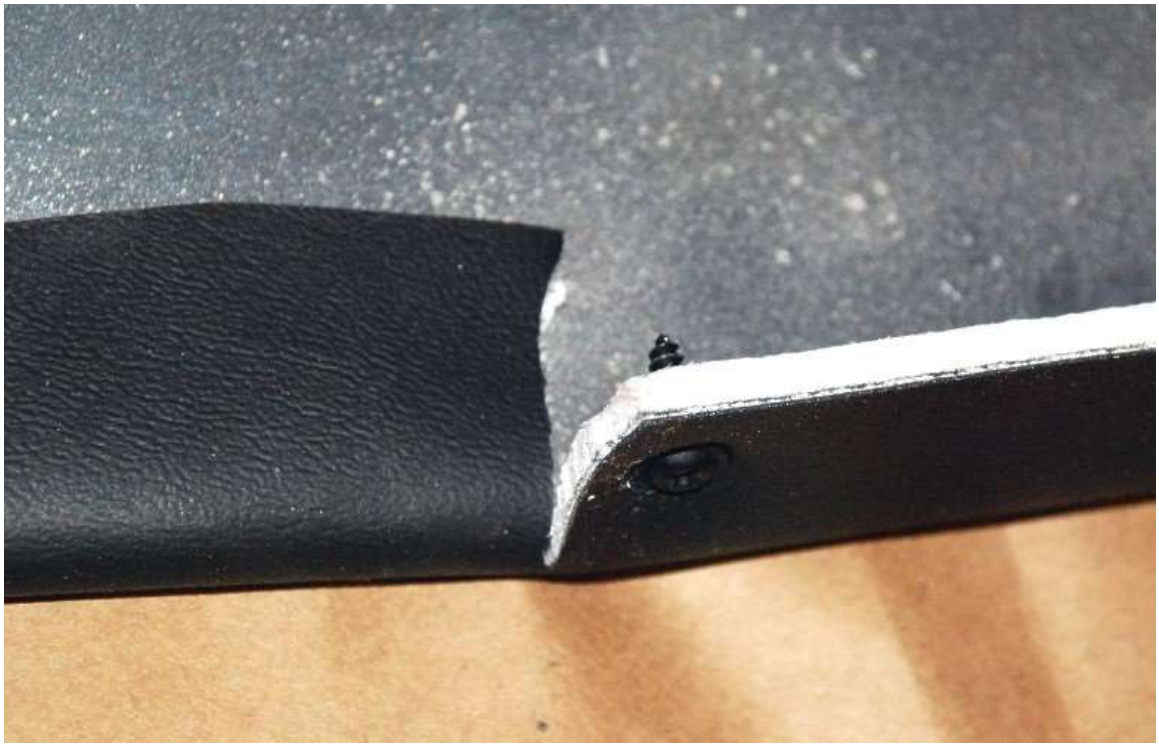
Clean the dash off with some brake cleaner or acetone and spray the front surface and the back surface of the dash pad with adhesive. (3M super 77 or super 90 work great).

Stick the dash to the pad leaving about an inch border all around the top, the bottom will be bigger for the flange. Taping the ends of the pad helps to keep it flat.

After giving the front adhesive time to set spray the bottom flange and pad and adhesive them together. This is a fairly tight corner so hold the dash in position with pressure on the mating surface with some full paint cans or something else heavy.

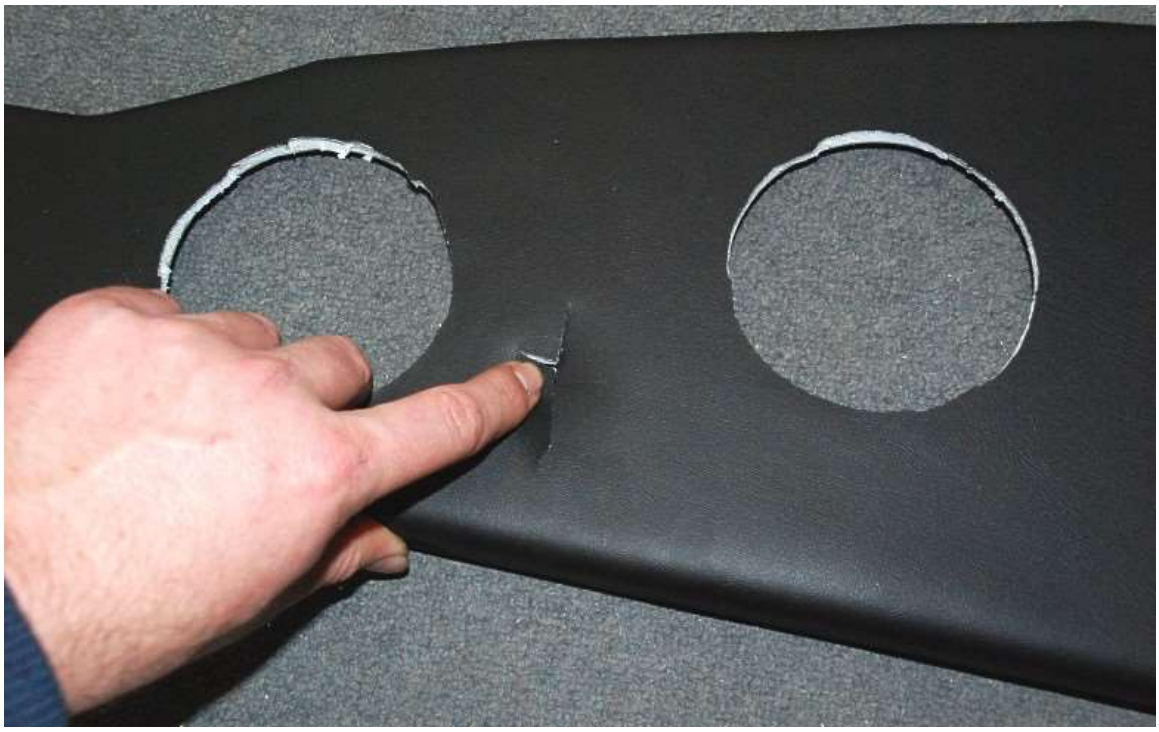
Cut the dash pad in angle shaped cuts every 2” (even closer in the corners) up to about ¼” from the dash.

Wrap the dash pad around to the back and glue it. Use some heavy books to hold the pad in place until the adhesive has a chance to dry.



If you are having trouble getting the pad to stick on the bottom of the dash you can screw the corners down using some of the trim screws provided with the dash hardware.

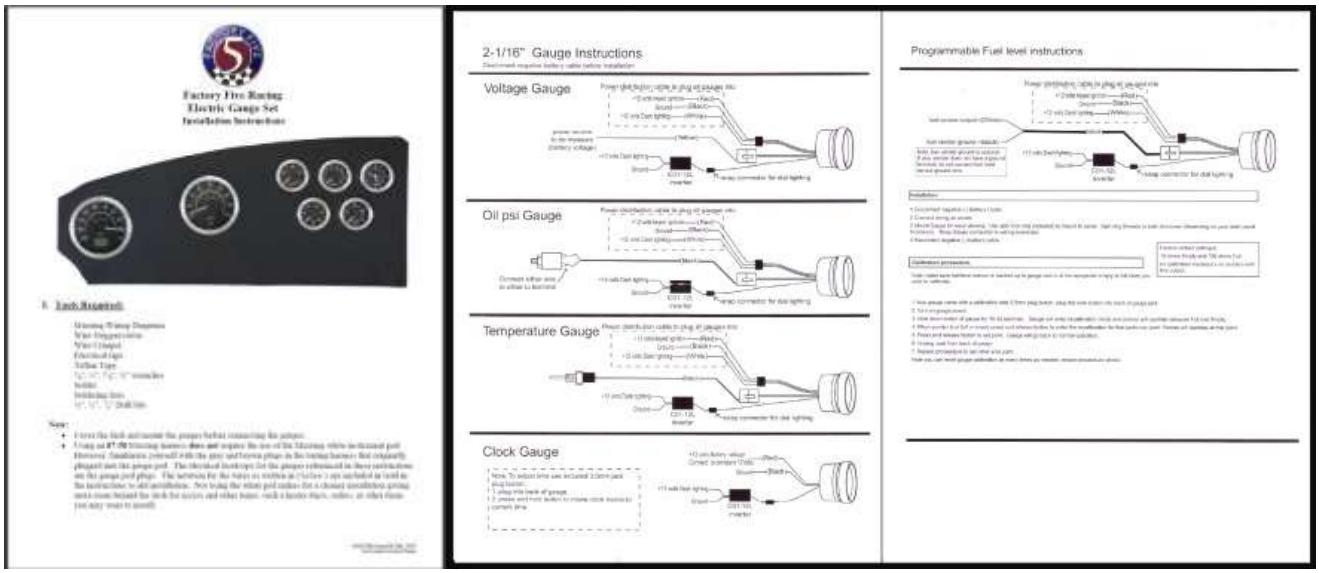
Using a razor knife, cut the gauge holes and switch holes out of the dash pad, cut the holes in from the aluminum about 1/8". DO NOT cut out the steering shaft hole.



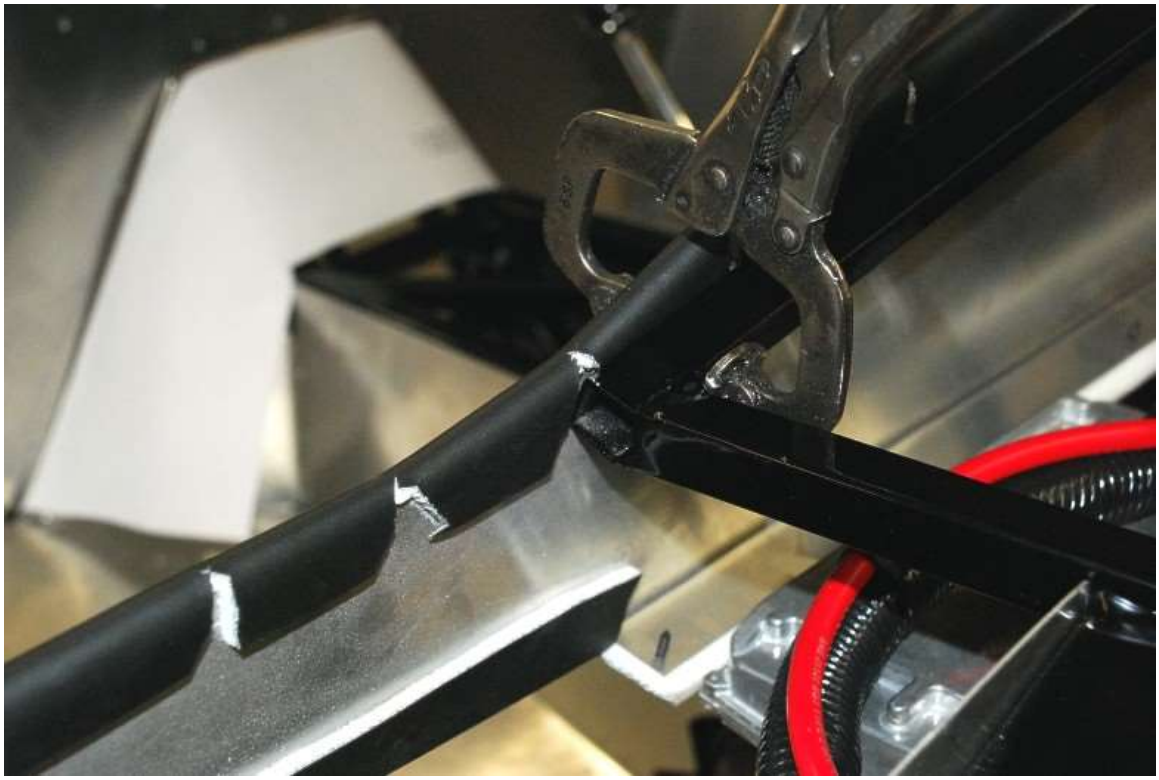
Using the razor knife cut a "+" sign pattern into the middle of the steering shaft hole.

With the dash lying face down on a clean tabletop, bend the edges of the dash down 1.25” in from the ends so they are at a 45° angle.

Install the gauges in the dash.



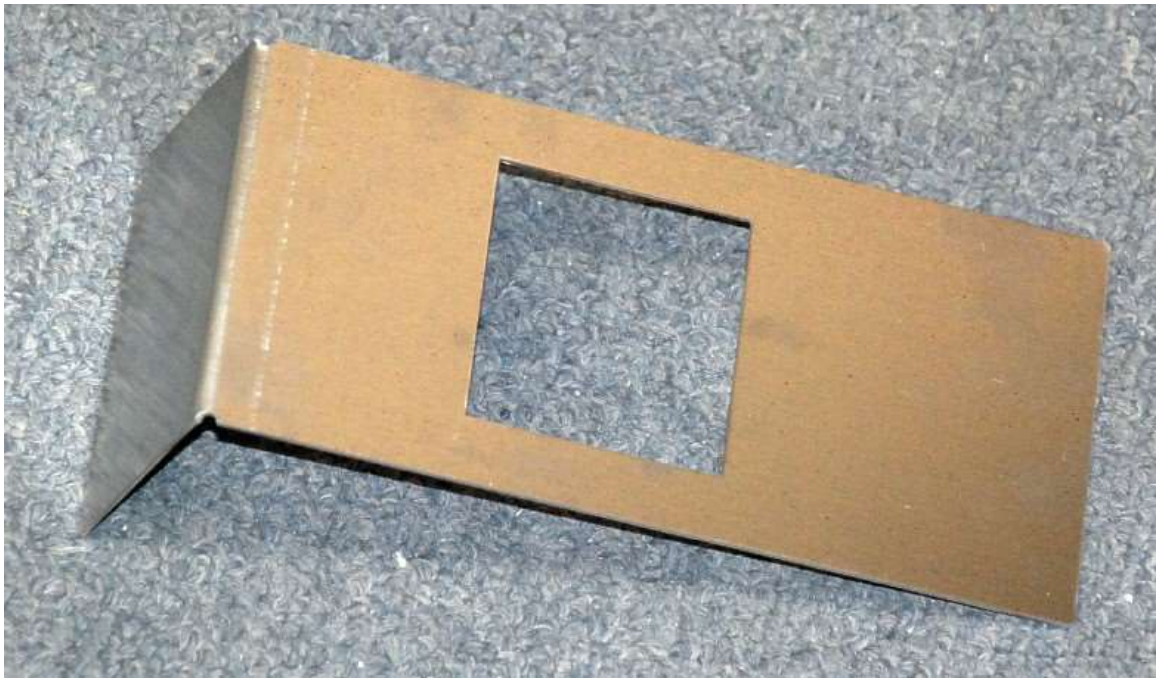
Wire the gauges according to the instructions provided with them and with the dash section of the chassis harness.



Line the dash up with the hoop on the chassis. The corners of the dash support tube are $^{3}/_{16}$" below the top edge of the dash. The tube will be lower as it goes to the middle.

Drill for the dash mounting screws (5 evenly spread) through the dash and chassis with a $^{1}/_{8}$" drill bit then drill back through the dash only with a $^{3}/_{16}$" bit and screw the dash to the chassis.

Push the ends of the dash behind the top of the door hinge and screw through the hinge into the dash end.



Unpack the dash support panels from the packaged aluminum. One has a single square hole while the other also has a round key hole in it.

The panel with the key hole can be used to mount the headlight switch if desired. If using the panel for the switch, locate it so it can be reached by the driver.

Rivet the panels to the chassis and then use the trim screws to attach them to the bottom of the dash.

Install your switches and horn button.

- The factory Five Vintage gauges have built-in indicator lights so the large dash mounted ones included are not necessary.

Mount the turn signal switch and high low beam switch as well as indicators in the dash. These can be mounted wherever you like, use a ½" drill bit for the holes on both the switches and indicator lights.

Horns

🛠 14mm wrench, wire cutters, wire crimpers, 5/32” hex key, drill, 3/16” drill bit, 3/8” socket, ratchet.

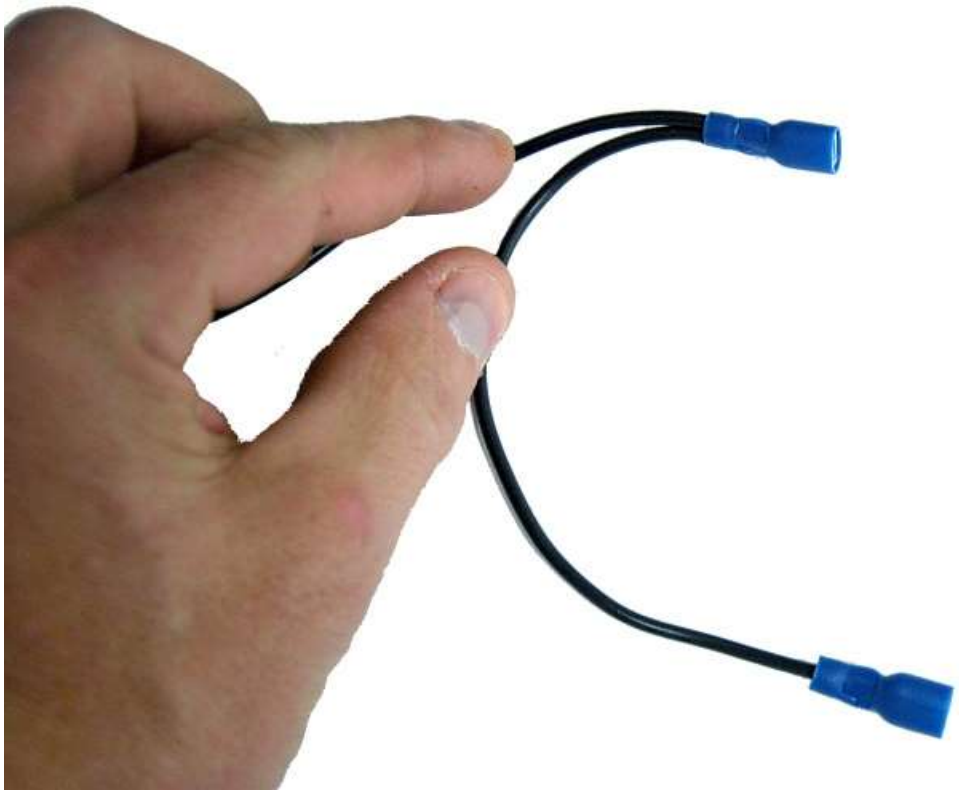
🚘 Electrical system components

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.

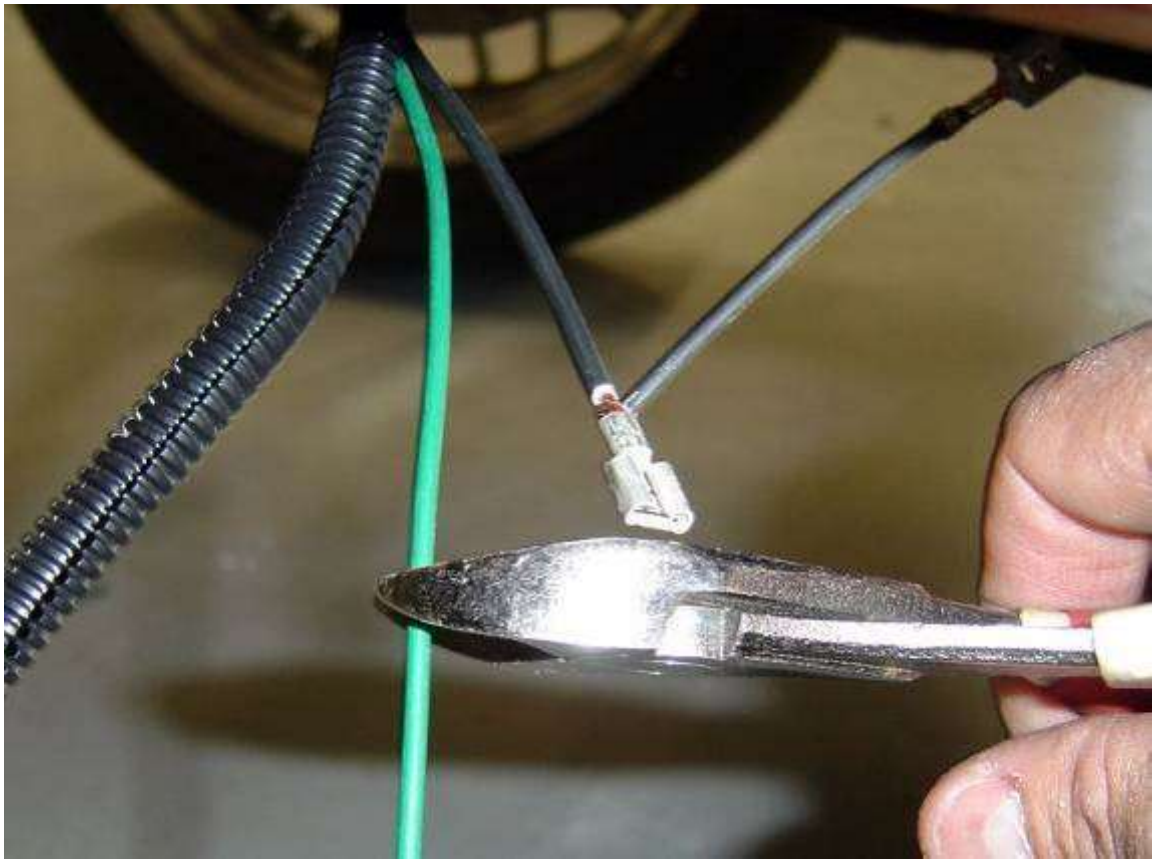
Mounting brackets on the horns

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

Locate the chassis harness horn wires on the front chassis harness. Cut 2” off the end of the chassis harness horn ground wire and strip the end of the chassis harness ground wire.

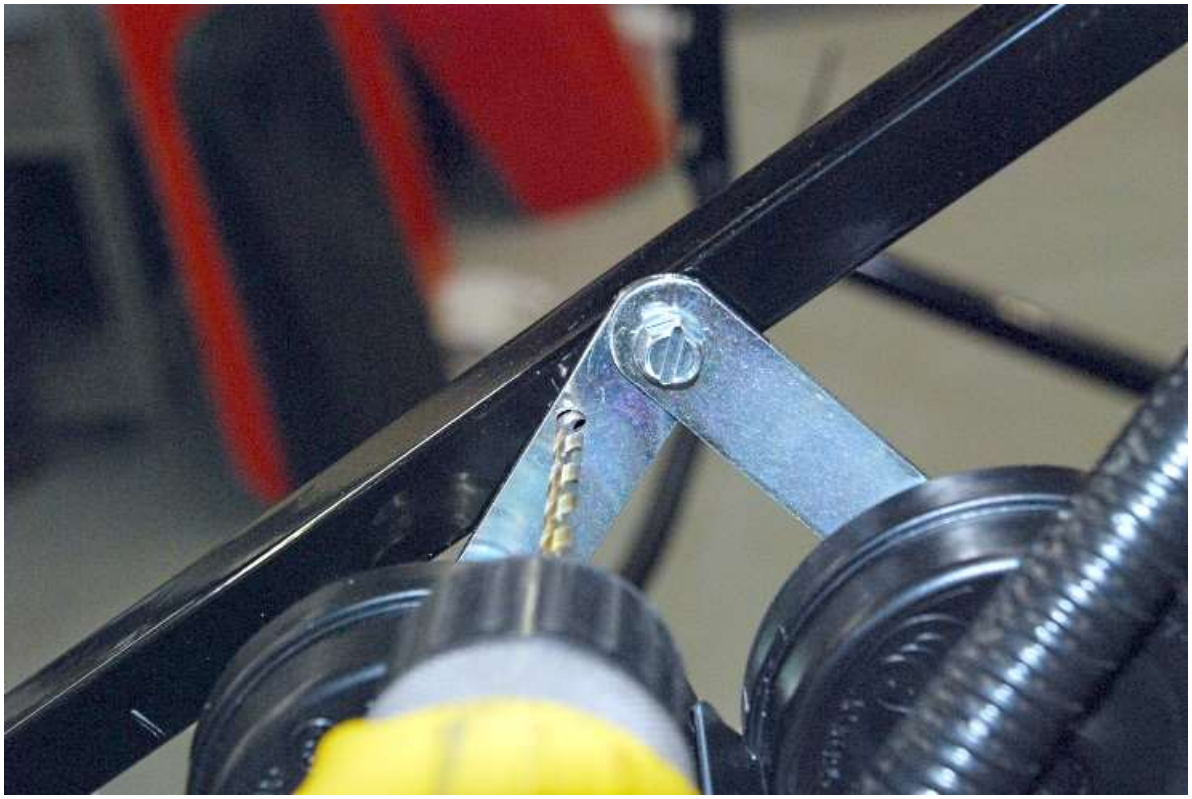


Twist the chassis harness ground wire and small wire ground together and insert them into one of the ¼” female connectors included then crimp the connector on.



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

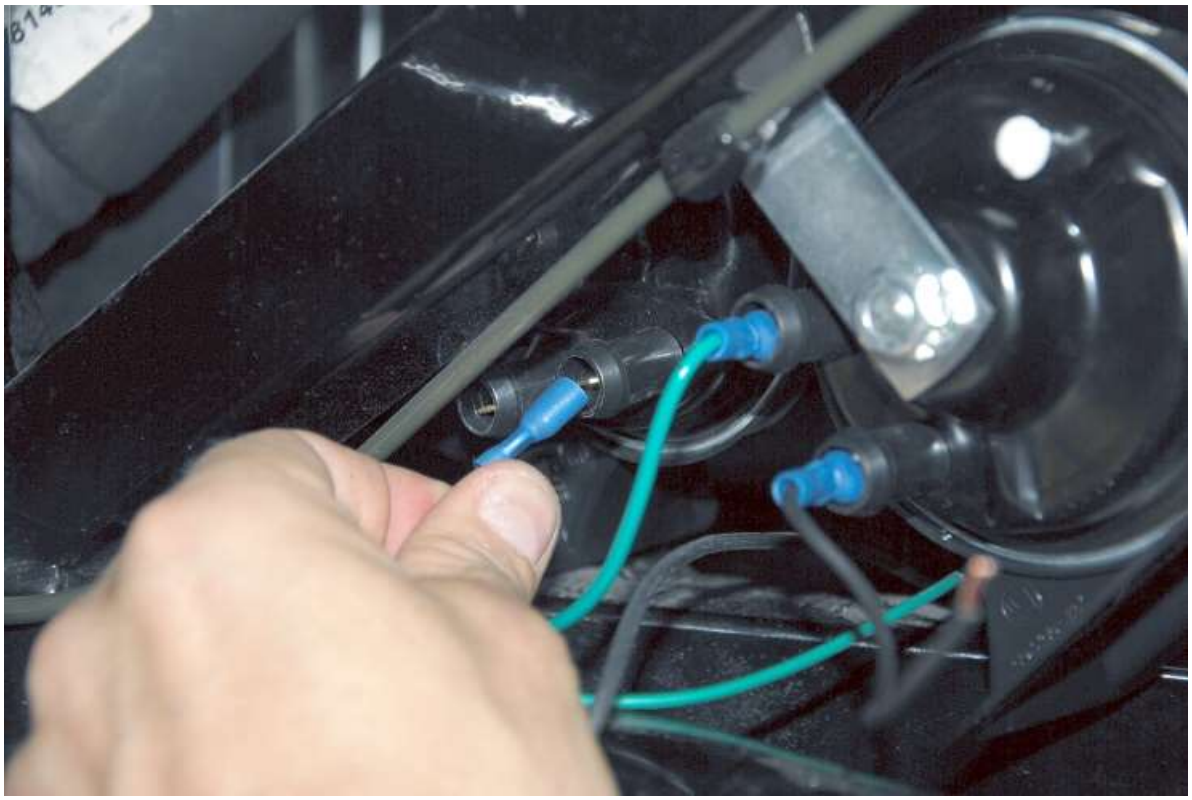
Locate the horns on the upper radiator down tube and drill a $^{3}/_{16}$” mounting hole.



Attach the two horns to the radiator down tubes using a supplied #14 screw. Then drill a second $^{3}/_{16}$" hole so the horns will not rotate.

Attach the second #14 screw.

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.

Steering Wheel

🛠 Philips head screw driver, 10mm wrench, $^{5}/_{16}$" hex key
🚘 Steering wheel/Hardware

Unpack the steering wheel hardware.

Bolt the steering wheel to the boss. The pattern is not symmetrical so it will only line up in one direction.

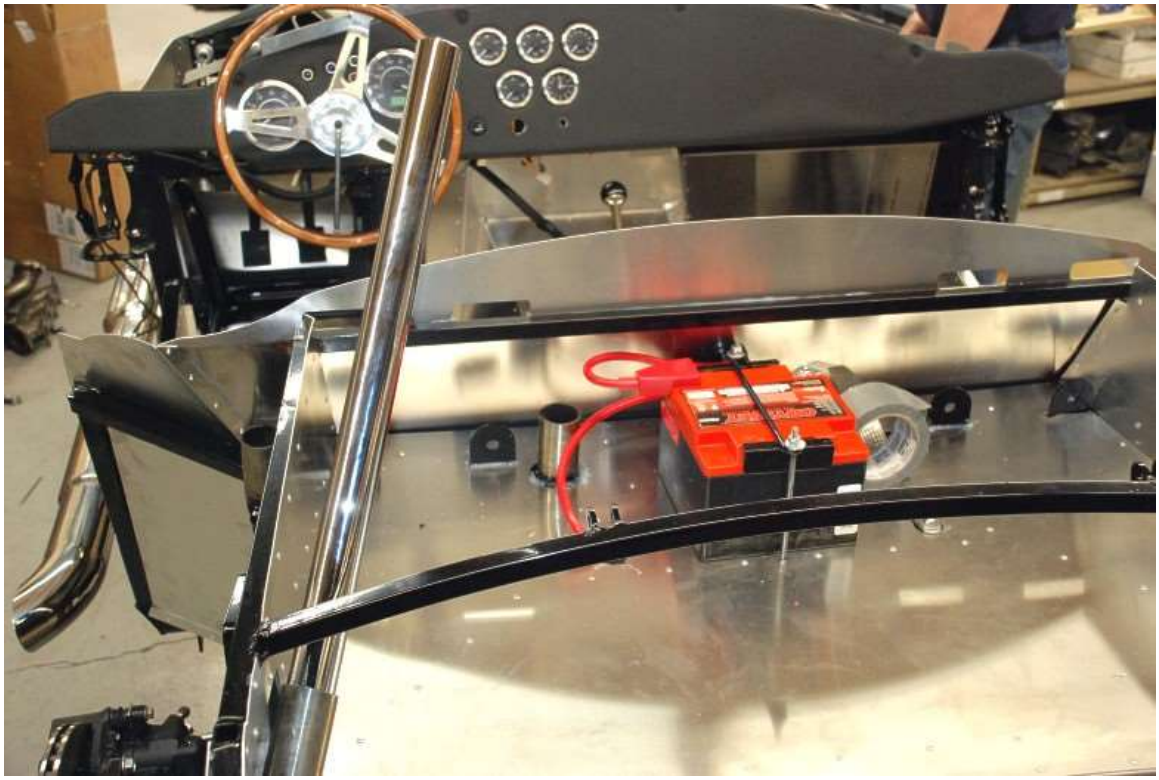
Bolt the steering wheel assembly to the steering shaft. Use thread-locker on this bolt.

Rollbar

🛠 ½" wrench, 3/16" hex key, 5/16" drill bit, Drill

- Driver side Rollbar Assembly

Unpack the rollbar and mounting hardware.



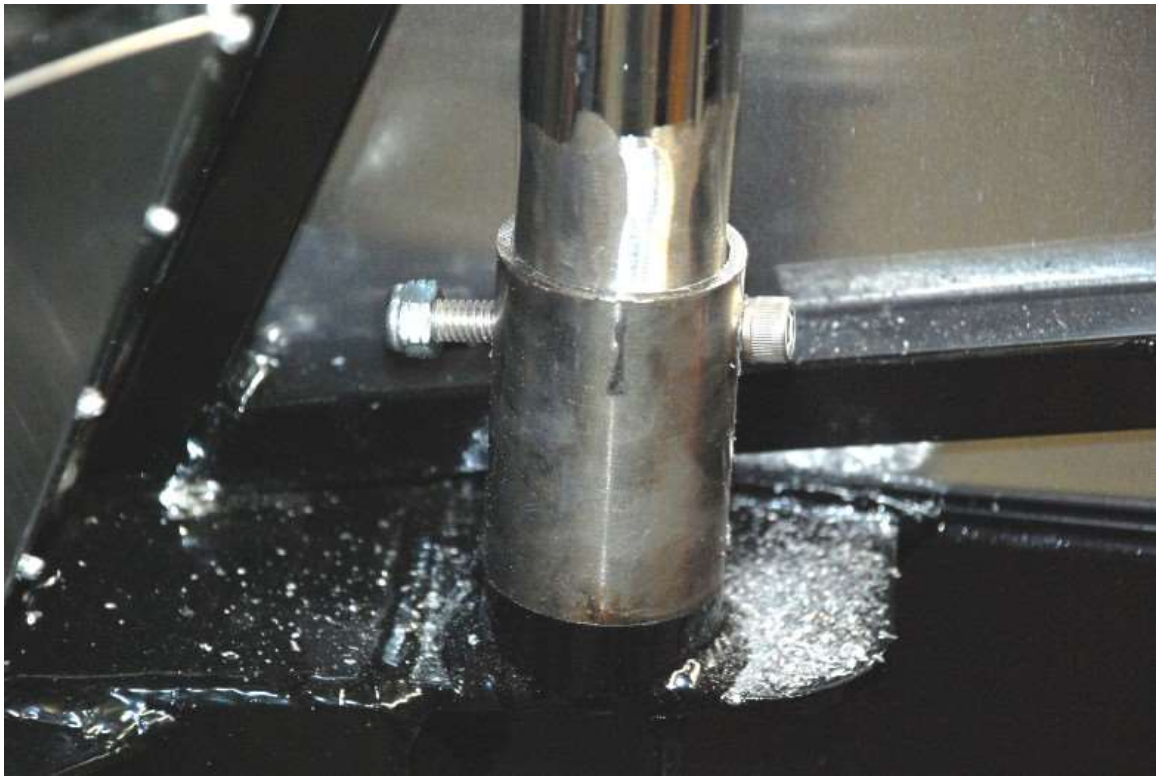
Slide the rear leg of the bar down into the chassis mount.

Slide the main hoop into the chassis mounts and wiggle or tap with a soft mallet until it lines up with the rear leg.

Slide the rear leg up over the mount on the hoop and make sure it comes all the way up flush. Clamp the rear leg up with a pair of vise grips. The front hoop will angle back about 6° or so.

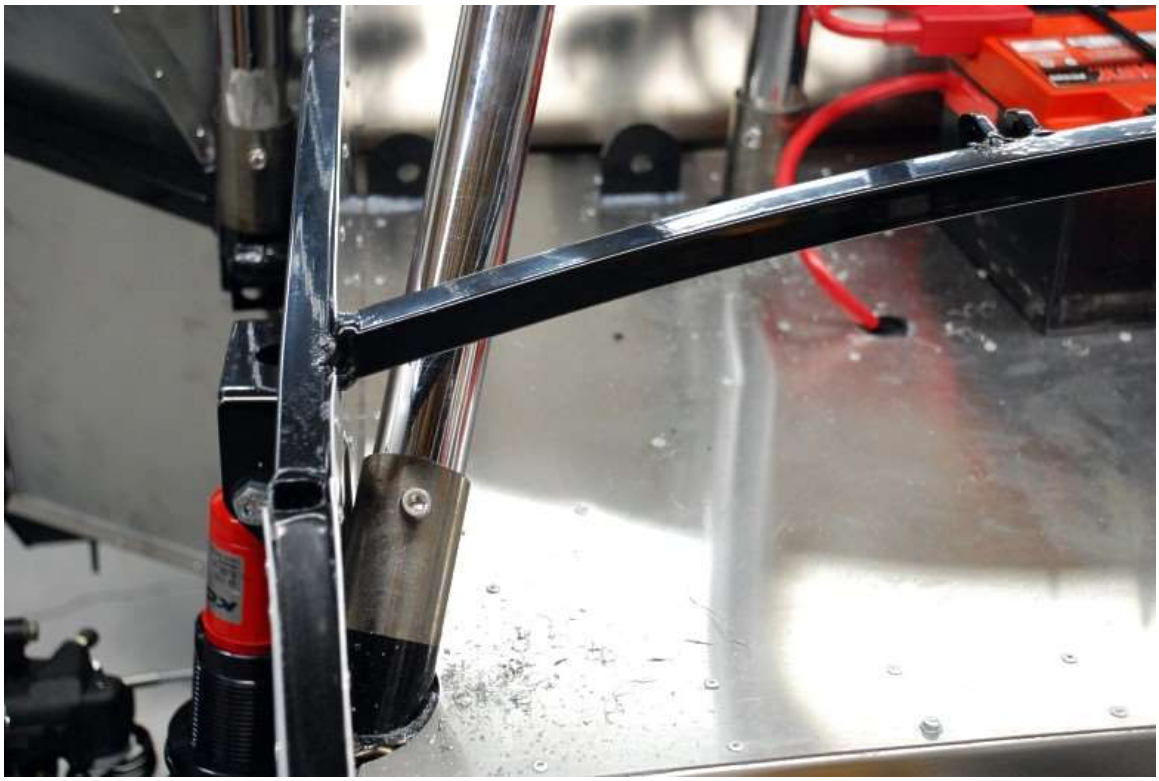
Drill a hole all the way through each of the lower mounts and rollbar main hoop.

- With the thick tubing and curved surface, it is much easier to start small and work your way up to a $^{5}/_{16}$" drill bit.



Insert one of the bolts after drilling each hole to ensure that the rollbar does not move.

Make sure the rear leg is tight up against the main hoop and drill the upper hole. This bolt will be visible so keep this in mind when deciding the orientation. Install the bolt loosely to keep the leg in place.



Drill the remaining mount and install and tighten all of the bolts.

Front Suspension

Now is a good time to 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.

Fluid Levels and Grease

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

IRS

Fill the rear differential with gear oil. Any 8.8 in. ford has a fill plug that is removed and filled until the oil just reaches that level. The IRS has it in the rear cover and the solid axle has it in the front.

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 1/3 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.

IRS Axle Nuts

🛠 Torque Wrench, 36mm socket
🚘 IRS components

Have a friend sit in the car and step on the brakes. Torque the rear axle nuts to 175 **lb-ft**.

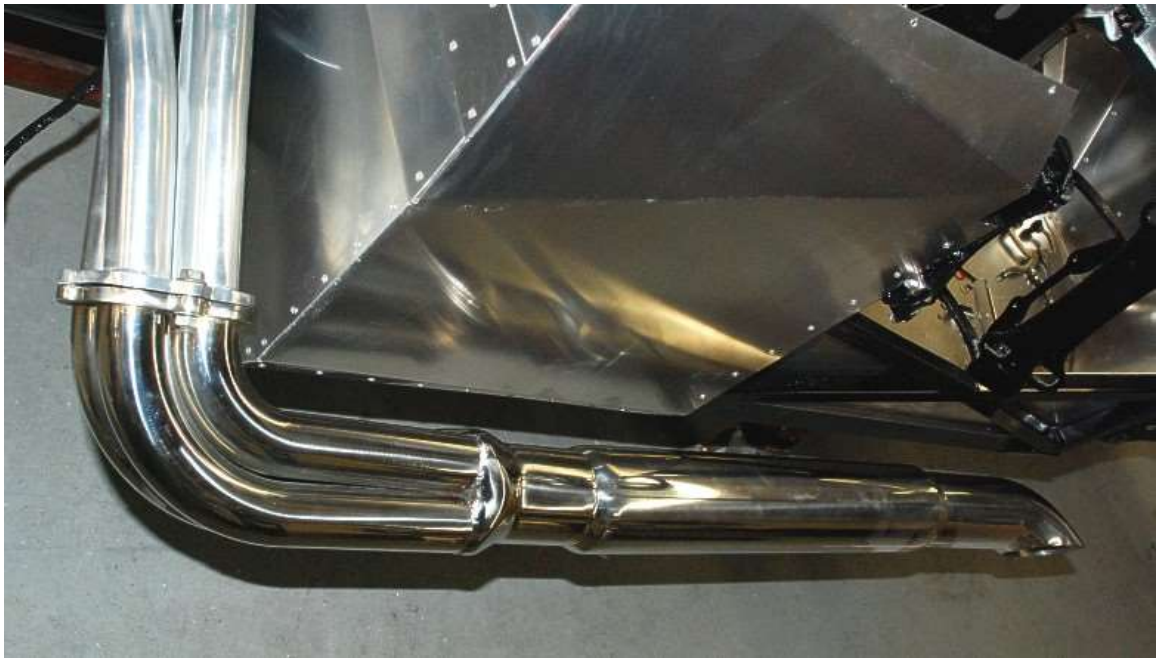
Wheels

Install and torque your wheels. Make sure they rotate freely and do not interfere with the brake calipers, lines, or any suspension components.

Rattle Patrol

Review the race car check list in the Appendix.
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 need to you can temporarily bolt your side-pipes in place to keep things quieter.

If you have the space in your driveway or have access to a small parking lot it is very helpful to drive the chassis around a little to make sure everything is working before you seal it all up.

 **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
- Dash – All gauges working - Gauge lights work – indicators and switches working
- 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.

Footbox Fitment

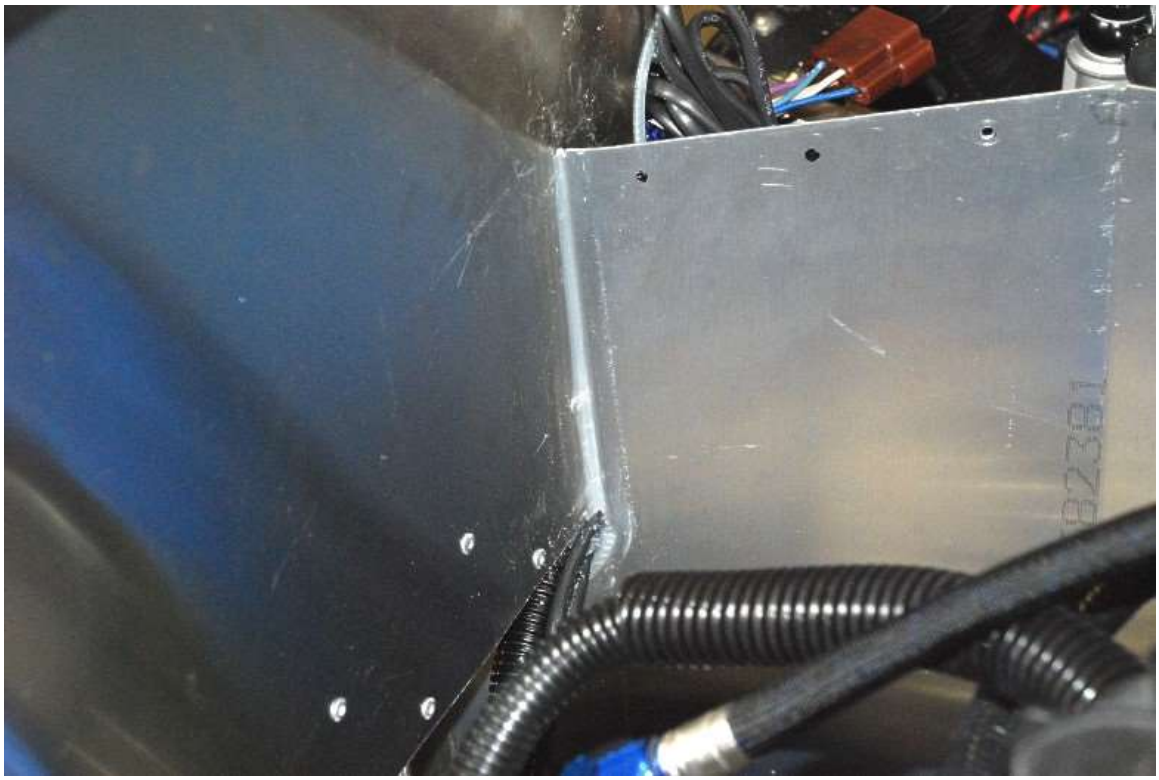
One of the most important things you can do to make sure you enjoy your car is to make sure the fit and comfort of the cockpit is right for you. While you still have easy access to the footboxes is the best time to do this. Set the brake pedal height by screwing the pushrods in or out of the master cylinders, because of the pedal pivot location a small adjustment will make a large difference. Set the pedal height of the

clutch with the stop and cable adjuster, usually about ½" above the brake pedal. Make sure that your feet are comfortable on the pedals and you can press them all without hitting the others. You can also move the steering wheel in and out to get your arms at a comfortable angle until the set screw is tightened.
If you just can't get comfortable with the standard configuration some things you can do to increase room or comfort include:

- Trim the pedal pads for more room between pedals.
- Cut down or remove altogether the gas pedal pad.
- Add a dead pedal to the outside footbox wall at clutch pedal height.
- Shim under the upper steering bearing to raise the steering wheel
- Use a smaller steering wheel
- Different shoes can make a large difference in foot room.

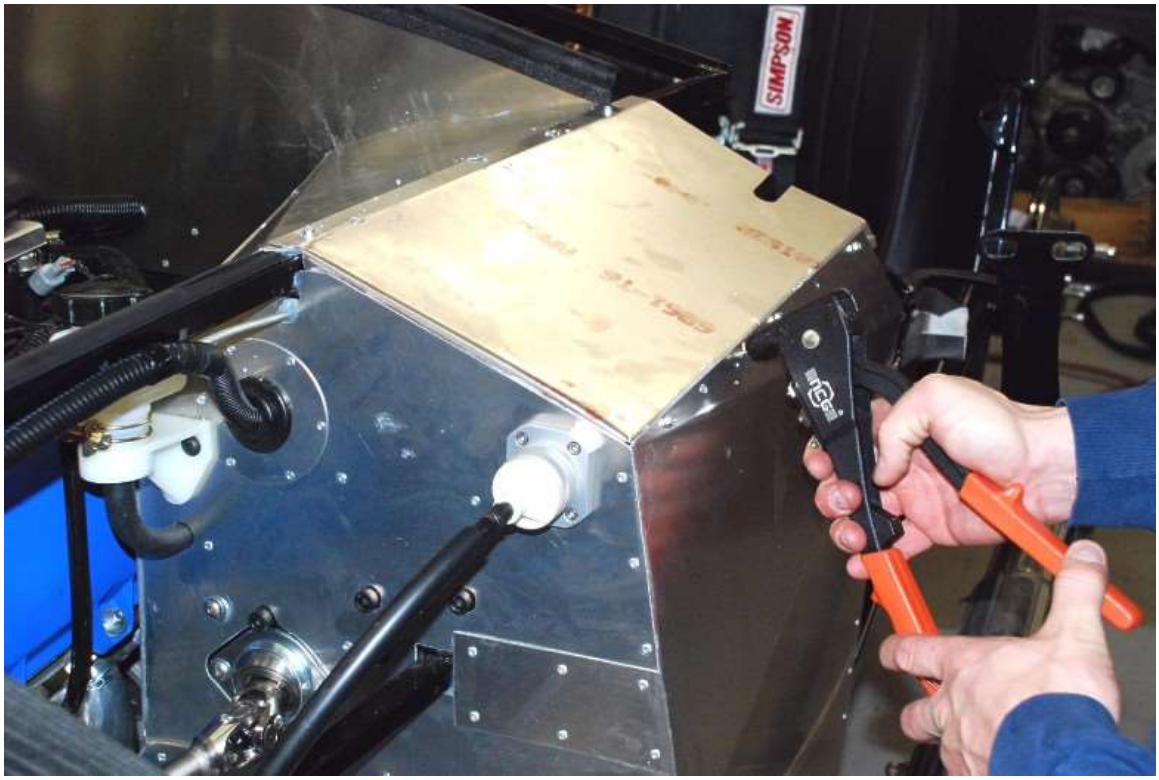
- Racing seats with less padding give more room, the more upright the angle of the seat the more room to straighten out your legs.

Driver Footbox Aluminum



Rivet the remaining inner cockpit wall flange to the firewall.

Silicone and install the footbox inside top panel. Leave the top flange un-riveted for now; use some clamps or tape to hold it in place.



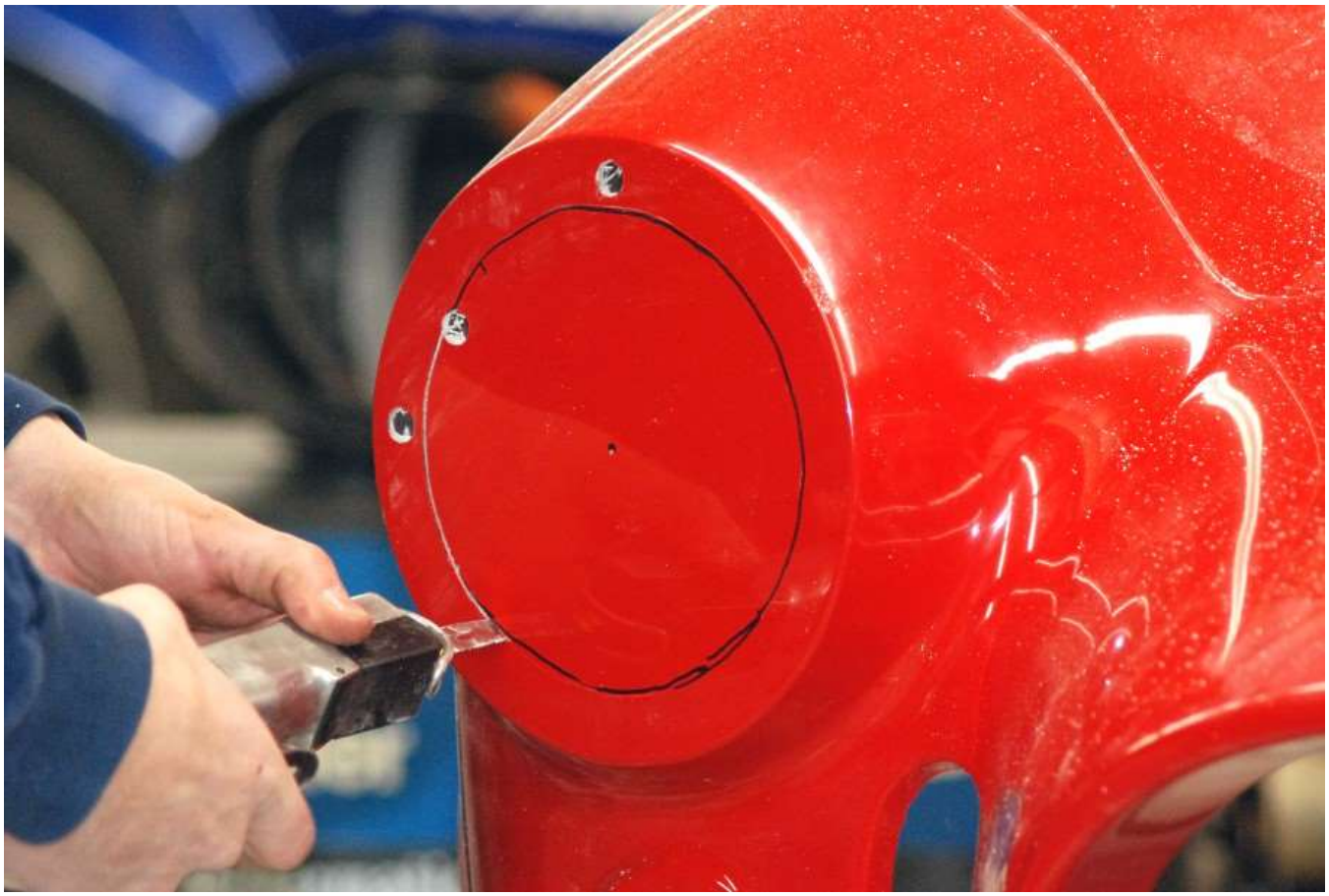
Silicone and install the outer footbox top section.

Your rolling chassis is now complete!

Chapter

4

Body Section



The Body and panel mounting are a critical part of how your car will end up looking when it is finished. Whether you are having a body shop paint your car or doing it yourself, the best results will be from fully mounting the body, all the panels and getting them to fit properly and then removing the body for the paint process. If you are not doing any of the body work yourself this means for best results, the entire car should go to the body shop for panel fitting, in this case, you should take extra precautions to tape/protect/remove anything that you don't want paint or primer on. All of the panels have been trimmed oversized so they will need material removed for a perfect fit. The easiest method for getting the best fit is to sand or trim the panel edges just enough so they will sit down in the openings, then fully mount them with hinges and latches. Once the surfaces are all matched between panels and the body then trim away the edges until the gaps are all even and slightly larger than you want them on the finished car. The paint will fill in from both sides and tighten the gaps so we usually run about $^{3}/_{16}$" of gap prior to painting. If you are planning on stripes it is also best to line them up with the body and all panels mounted.

Frame preparation

- Tin snips, razor knife
- Secondary body fasteners

To ensure that the body is in its proper location, the weather stripping should be installed on both the frame and the firewall even if you are just test fitting the panels.

Locate the adhesive backed rectangular foam weather strip (part #10857) and the press on bulb seal (part #10761) from the secondary body fasteners assembly.

The rectangular adhesive backed weatherstrip runs along the top of the chassis tubes on either side of the hood opening and the top of the curved trunk hoop.

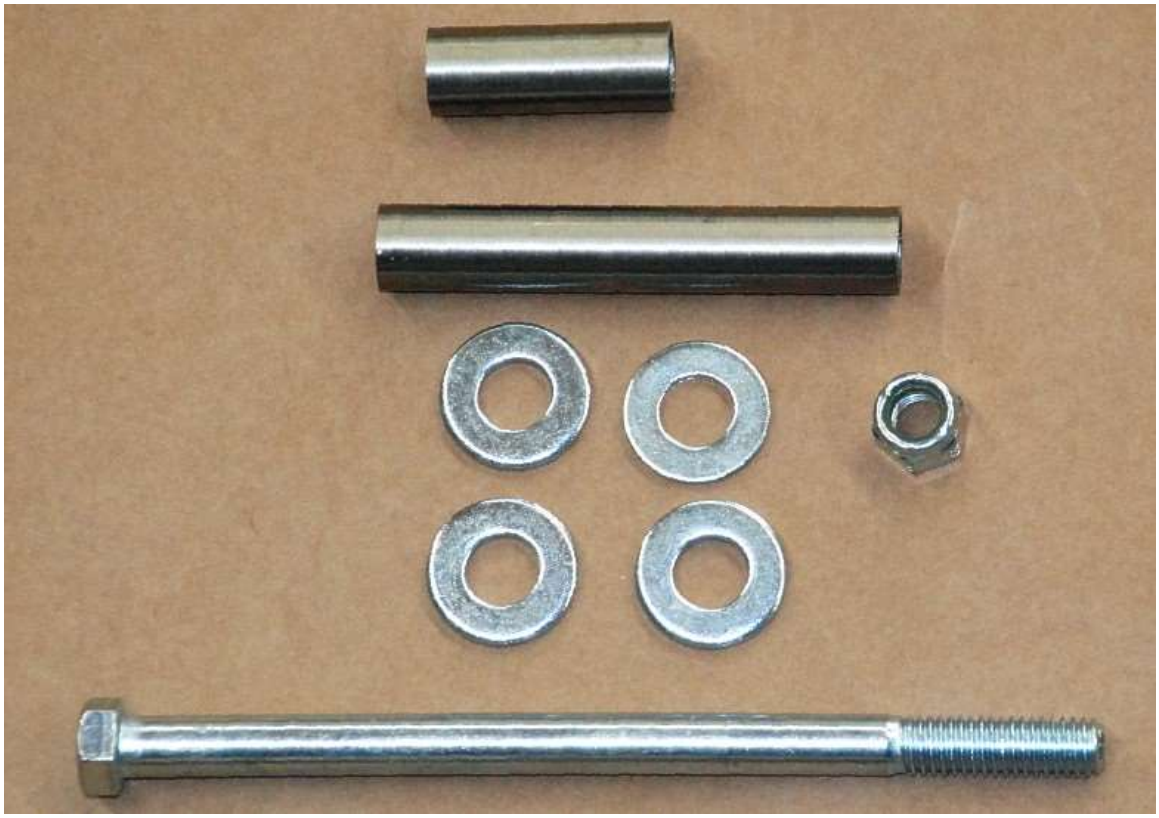
The push-on weather strip goes across the top of the firewall

The push-on weather strip goes across the top of the trunk walls and rear floor.

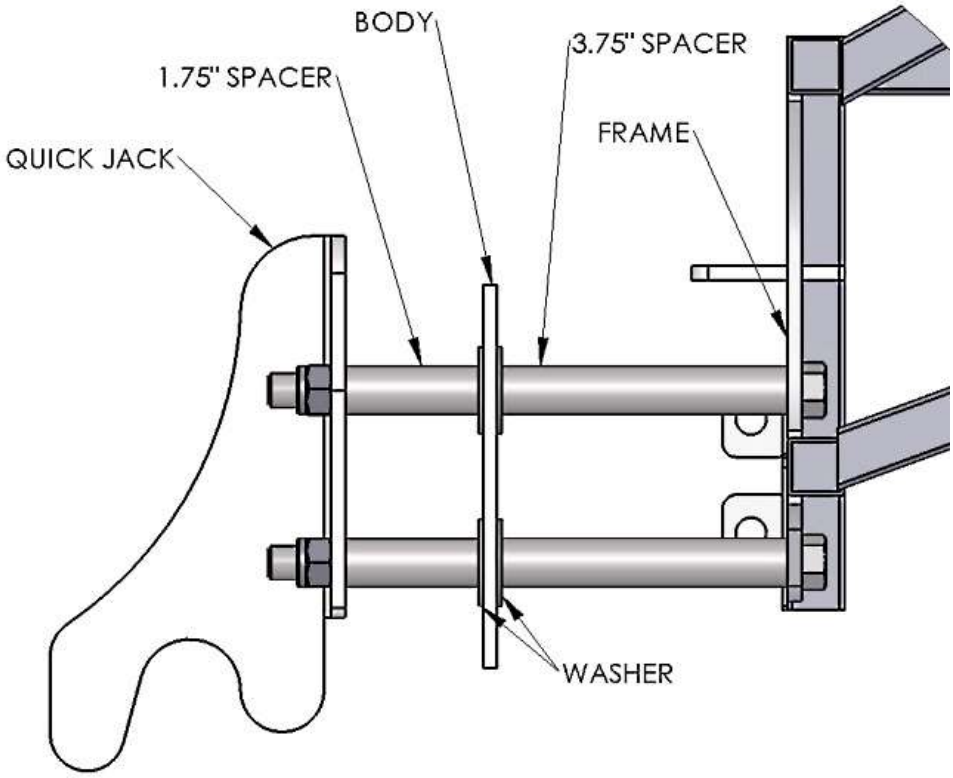
Mounting the Body

Rear Quick Jacks

- 🛠 ⅝” wrench, ⅝” socket, ratchet
- 🚘 Quick jack bumper components
- ✋ The main locating points for the body are the rear quick jack mounts; these will set the body in the correct position front to back as well as locating the rear half up and down and side to side.
- ✋ When bolting the body down the first time to do the fitment you can leave the quick jacks off and only use the hardware, this makes it easier to maneuver around and safer when crawling out from under the car.



Find the quick Jack hardware that came mounted on the chassis.



The long sleeves go between the body and chassis with washers on both ends of all sleeves.

The nut and bolt use a ⅝” wrench and socket to attach the rear quick jack bolts to the frame and body.

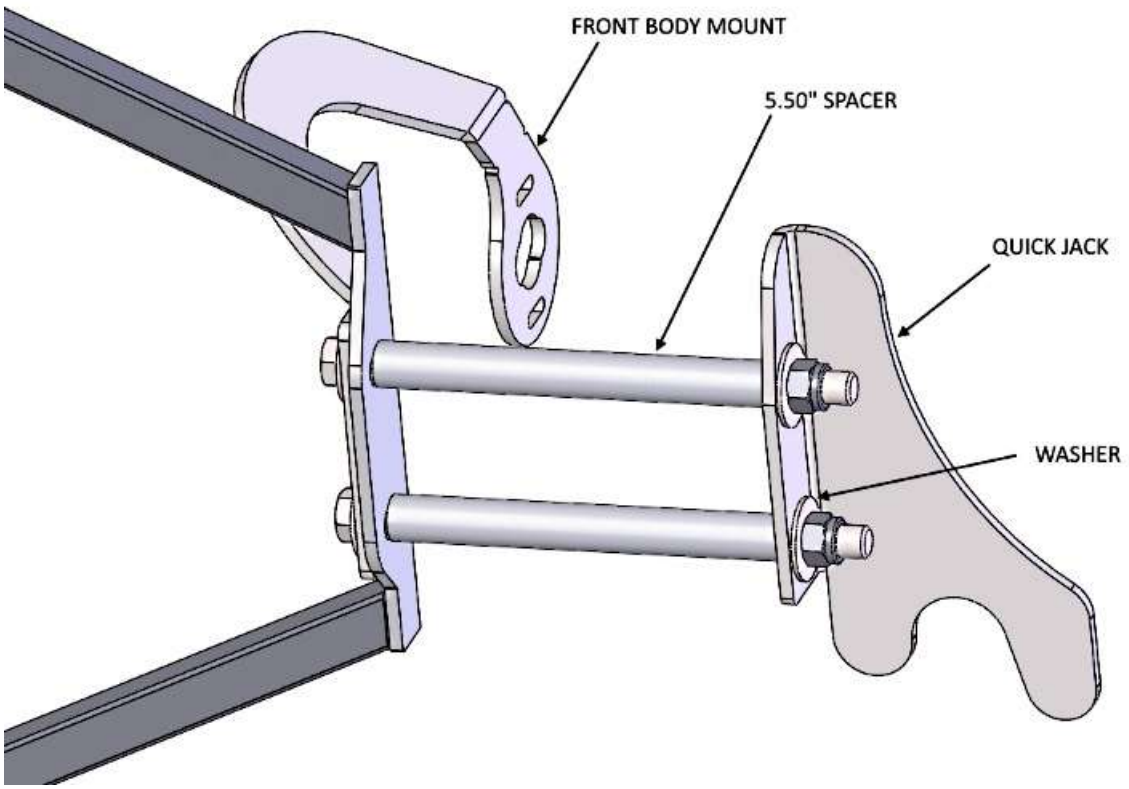
Even with the quick jacks removed, it is still a good idea to wrap the bolts with some rags and duct-tape to save yourself from painful cuts or bruises.

Front Quick Jacks/Front mounts

🛠 ⅝” wrench, ⅝” socket, ratchet

- Quick jack fasteners
- Do not tighten the bolts until directed to do so.

The body mounting bracket goes on the back side of the frame front mount.



Assemble the quick jack parts in the order shown, the bolts can be installed either way around depending on personal preference.

Use the shipping carriage bolt through the turn signal mounting hole until the turn signals are mounted.

Center the body over the frame using a tape measure to measure from the lip of the body to the rear mounting plate of the front coil-over bracket. Check the alignment to make sure the tape measure is going straight across the car by lining it up with the front "X" member so that the tape measure is

parallel. Make this measurement on each side of the body so that the front of the body is centered over the frame.
Move the front of the body as necessary. If the body will not stay where you put it, put a screw through the hood lip of the body into the ¾" tube.
The hood opening is attached to the ¾" frame rails using countersunk sheet metal screws or the small bumpers during the hood fitment next.

With the Body centered left to right and the quick jack sleeves centered in the holes, tighten the bolts.

Use a jack temporarily hold the bottom side of the body up to the frame.

Check the outside corners of the dash tube. Make sure there is a ½" or so gap between the body and frame. Try pushing down on the body here, it should move.

If the tube touches it will affect the door front corner fitment. Use an adjustable or ¾" wrench to bend the tube down a bit, it will go easily the tubing has a thin wall.

Hood

Fitment and bumpers

Orbital sander, air saw, 1/8" drill bit, drill, rivet gun

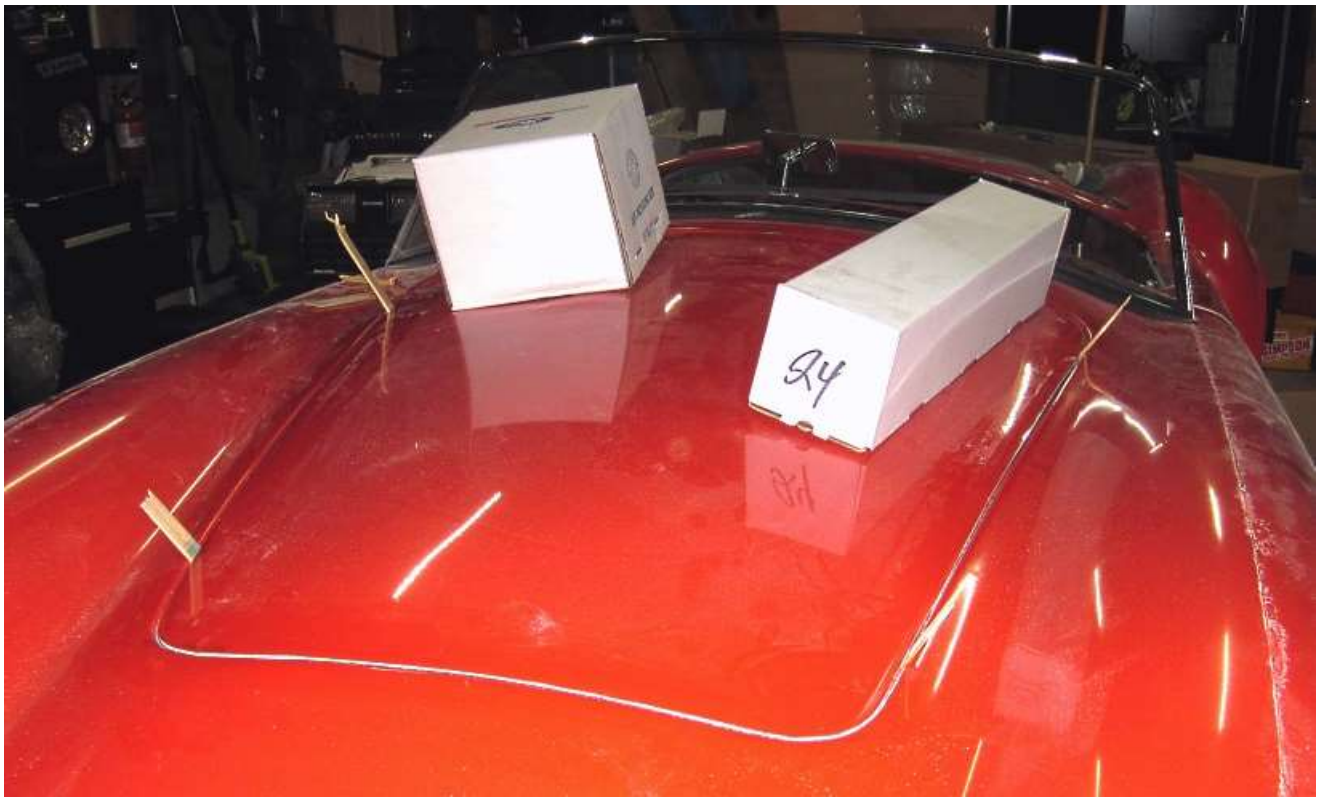
Hood, Secondary body fasteners

The hood has been trimmed slightly oversized to allow the panel gaps to be sanded down to fit. Set the hood in place and make sure it will fit the opening in the body, if needed sand or file the edges to allow the panel to just fit with a very small gap all around.

- The bumpers are used to get the hood to the correct plane with the body, you can shave small amounts off either or put washers as shims to fine tune as needed.

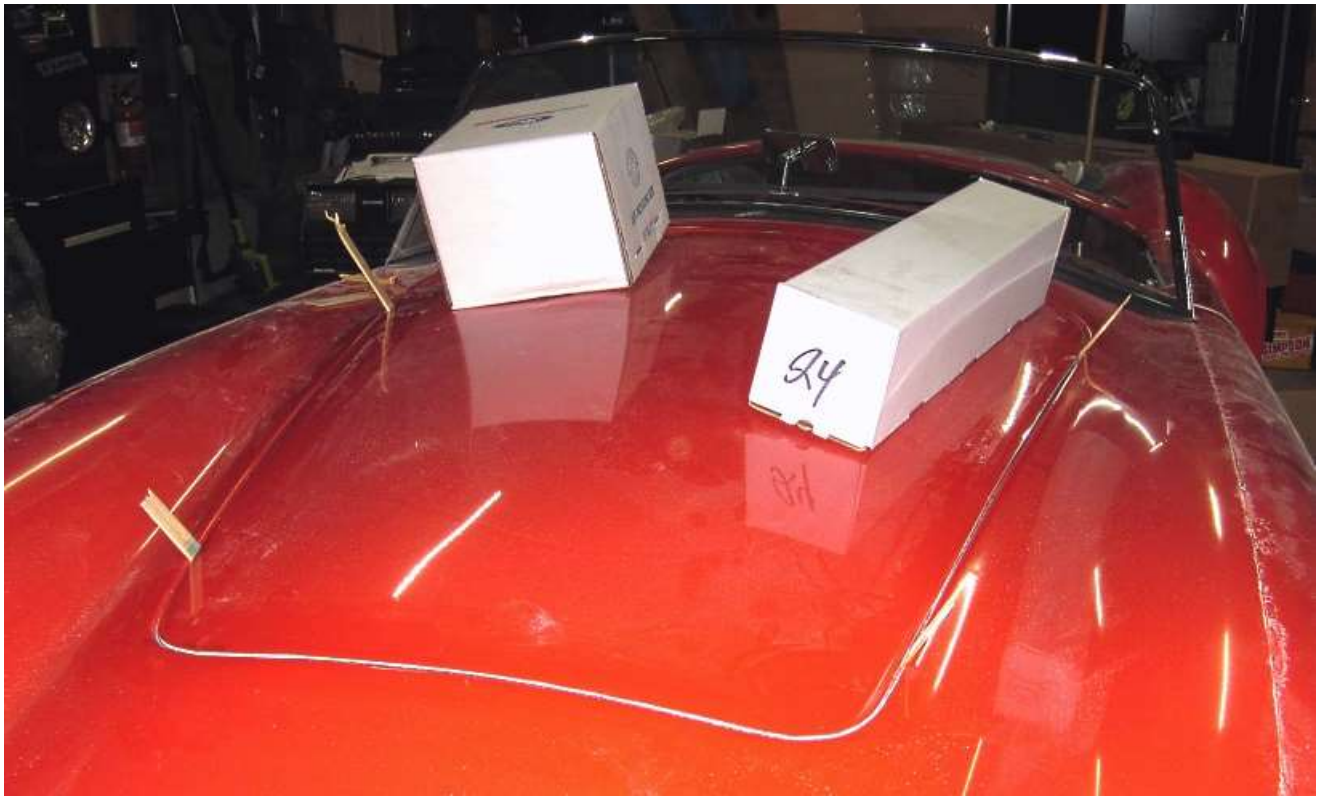
Put the small bumpers around the edge of the hood opening and try closing the hood. If it is too low try the large bumpers.

Use 1/8" long rivets to attach the bumpers through the body and into the frame.



Once you are happy with the alignment you can set the panel gap and radius the edges. Place a couple of heavy objects like an alternator or driveshaft on the hood so that it will not move around then center the hood by eye. An easy way to set the gap is by using a marker. Run a marker around the edge of the panel so that it rubs the body lip all of the way around. This will leave a line on the panel that may be thicker or thinner in areas.

Sand, grind or cut the panel back so the marker line cannot be seen. Remount the panel and the resulting gap should be the same around the whole panel, about $^{3}/_{16}$".



Use paint sticks around the edge to check the gap.

Repeat this gap procedure later after mounting the doors and the trunk.

Hood Hinge

🛠 $^{3}/_{16}$" Drill bit, drill, measuring tape, rivet gun, marker, $^{3}/_{16}$" hex key, ½" wrench

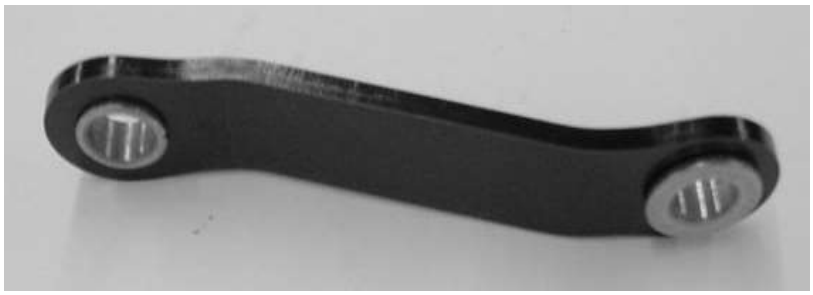
- Hood hinge

The hood hinge pivot mounts attach to the hood using rivets, the holes are predrilled in the hood liner but you may need to clean them out with a 3/16" drill bit. This is the initial install so you only need a few rivets if you are going to remove the hinge brackets prior to body painting (recommended).

Install the ball pivots for the hood struts on the hood using 3/16" rivets. The ball points toward the inside of the car.

Press the bronze bushings into the holes in the hinge arms as shown. The short hinge arms are both the same. Left side long arm shown.

Right side long arm with bushings pressed in



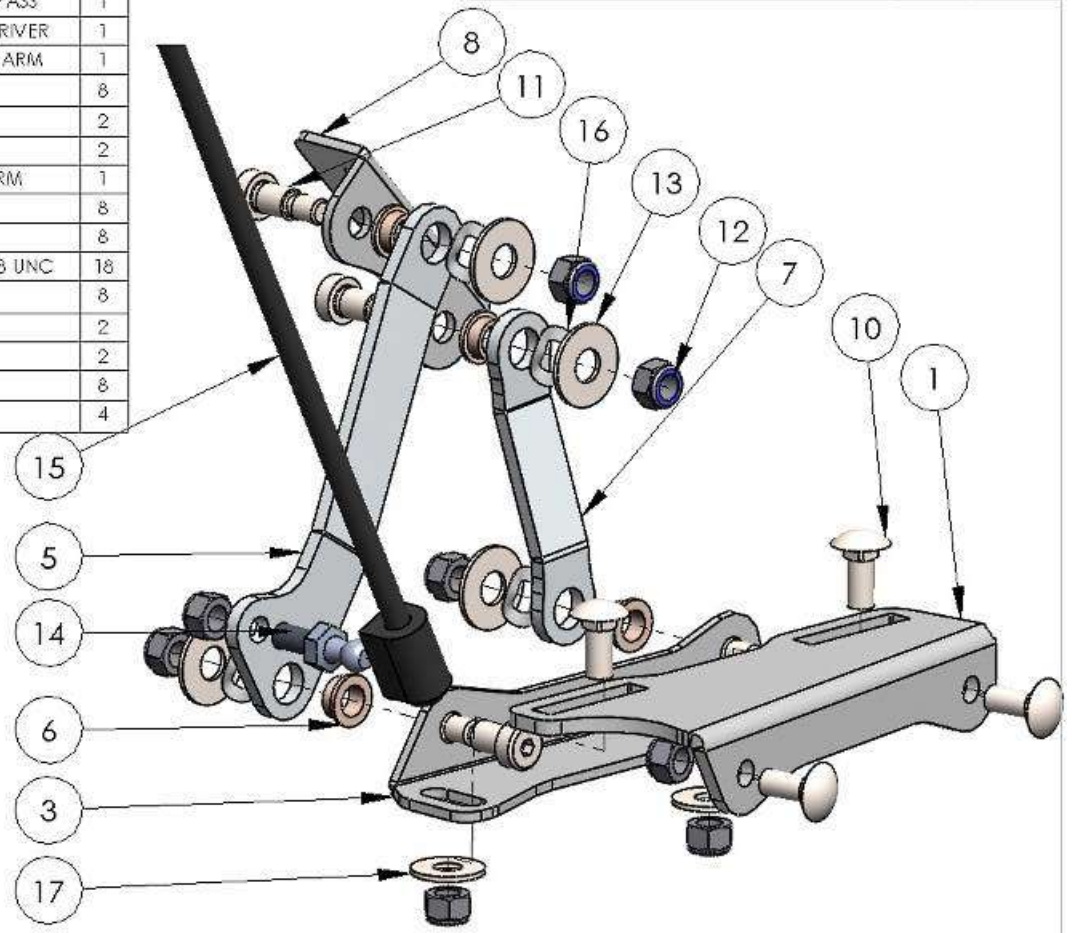
Short arm with bushings pressed in.

Attach the hinge arms to the arm support plate as shown on the following pages using the ⅜" shoulder bolts, wave washers, washers and nylon lock nuts. The flange of the bronze bushings should contact the arm plate. Tighten the nuts against the shoulder bolt shoulder. The spring washer will set the preload on the arms.

✋ Use the thin stainless washers on the underside of the arm support plate

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	15036	14006 - FRAME ADJUSTMENT PLATE, PASS	1
2	15036	14006 - FRAME ADJUSTMENT PLATE, DRIVER	1
3	15038	13520 - ARM SUPPORT PLATE, PASS	1
4	15038	13452 - ARM SUPPORT PLATE, DRIVER	1
5	15145	15144- PASSENGER SIDE LONG ARM	1
6	13183		8
7	25410 - SHORT ARM	SHORT ARM, (R,L)	2
8	13946	HOOD MOUNT PLATE	2
9	15145	15143- DRIVER SIDE LONG ARM	1
10	RHSNBOLT 0.3125-18x0.75x0.75-N		8
11	SHSSCREW 0.375x0.5-N		8
12	NLN-3125C	NYLON INSERT LOCKNUT, 5/16-18 UNC	18
13	Regular FW 0.375		8
14	13469 - THREADED BALL STUD	THREADED BALL STUD	2
15	14007	14007 - GAS SPRING	2
16	92161A030		8
17	Regular FW 0.3125		4

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
B	ARMS CHANGED, SLOTS LENGTHENED	2/10/10	
C	WAVE WASHER ADDED	2/5/14	



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ROADSTER	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 9/1/10
		COMMENTS: RIGHT SIDE SHOWN	
	MATERIAL		
USED ON	FINISH		
APPLICATION		PRINTED	5/9/2017

Factory Five Racing, Inc.

TITLE: ROADSTER HOOD HINGE

SIZE	DWG. NO.	REV
A	15131	C

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

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	15036	14006 - FRAME ADJUSTMENT PLATE, PASS	1
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REVISIONS			
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B	ARMS CHANGED, SLOTS LENGTHENED	2/10/10	
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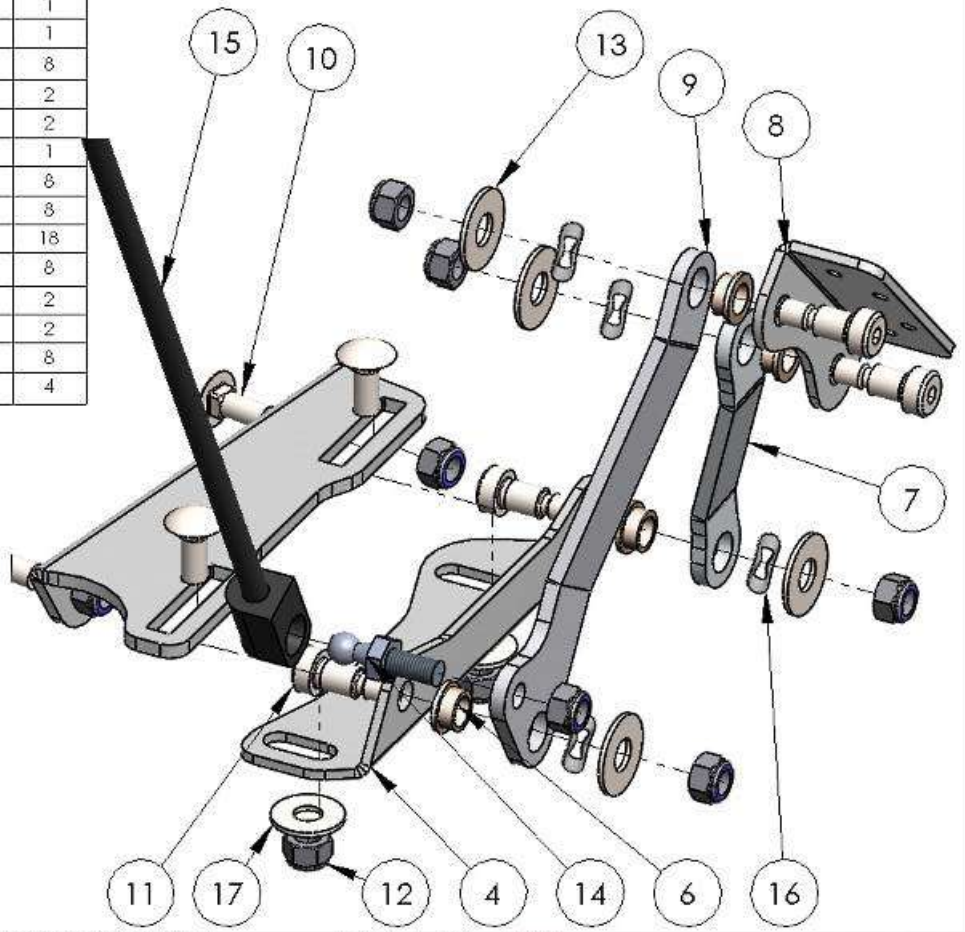


ROADSTER

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

	NAME	DATE
DRAWN	JI	9/1/10

COMMENTS:
LEFT SIDE SHOWN

PRINTED 5/9/2017

Factory Five Racing, Inc.

TITLE:
ROADSTER HOOD HINGE

SIZE	DWG. NO.	REV
A	15131	C

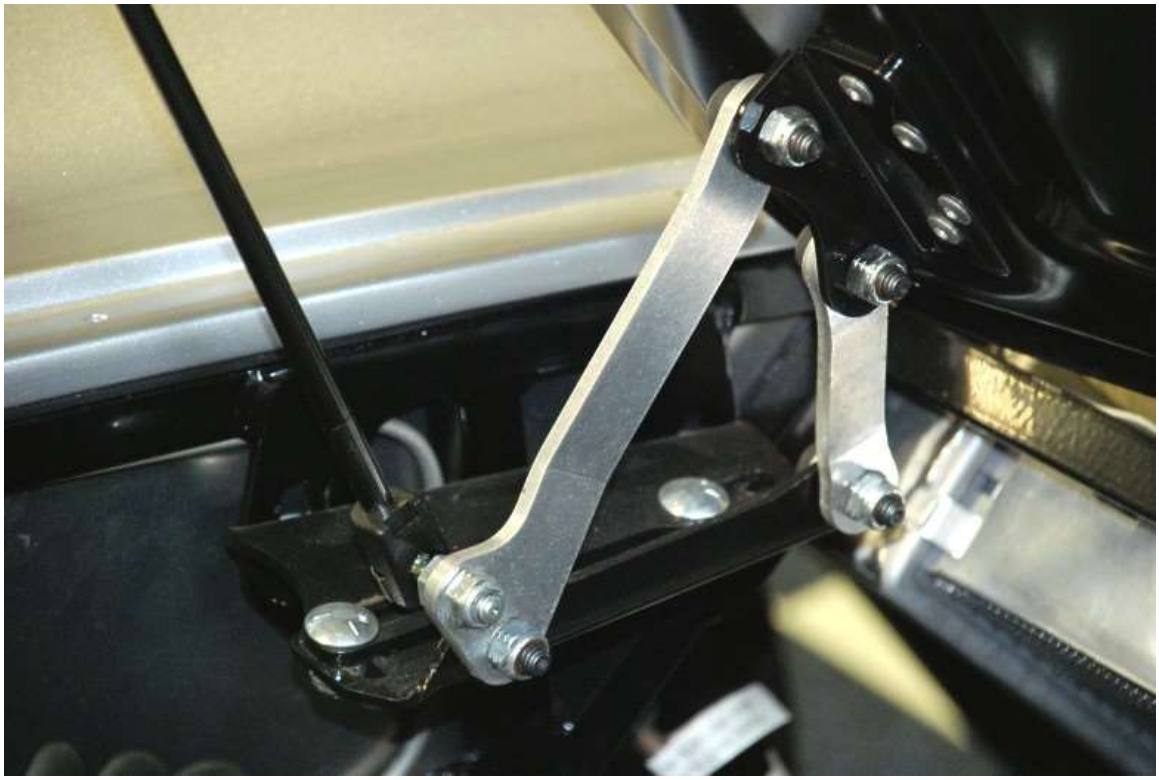
SCALE: 1:2 WEIGHT: SHEET 2 OF 2

Right side shown

Attach the hinges to the chassis using the carriage bolts, these push in from the outside for easier adjustment.

Leave the bolts loose enough so that the hinge assembly can be positioned to match the hood.

Set the hood in place and attach the two arms to the brackets from the underside of the body.



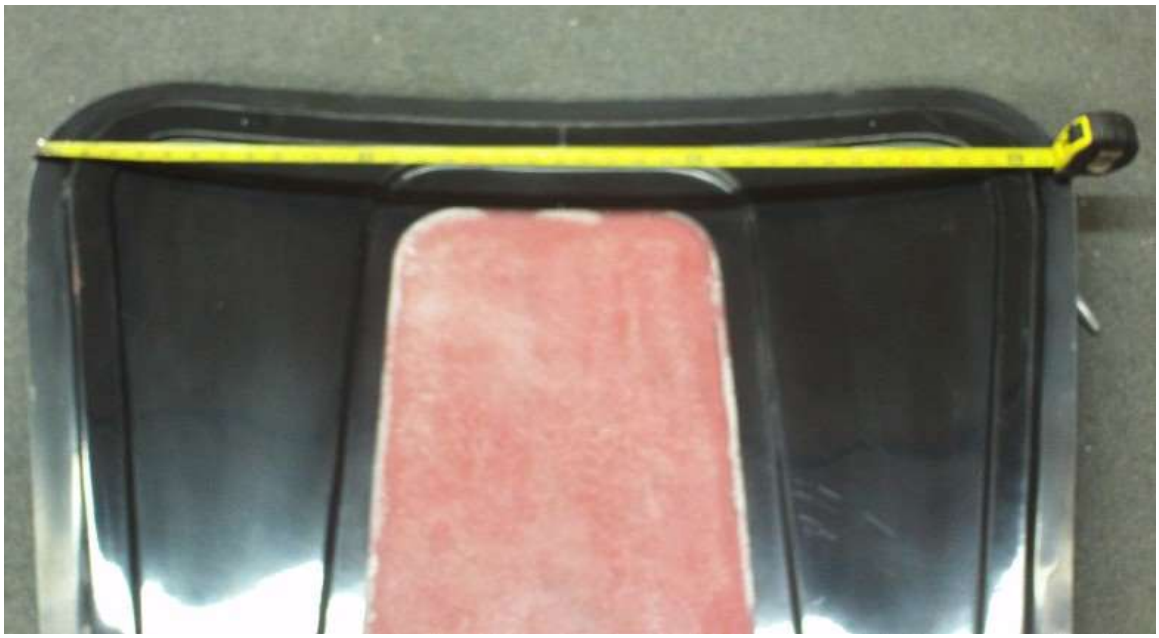
If not already done, install the threaded ball studs in the hole on the long hinge arms with the ball pointed toward the outside of the car using a $^{5}/_{16}$" locknut. Then snap the gas piston shaft onto the ball.

Attach the piston body end to the ball on the hood.

Hood Handles

🛠 1/8", 7/64", 3/16", 5/8" drill bits, drill, measuring tape, Philips head screwdriver, pliers, marker, 2.5mm hex key, file.

🚘 Three lock set and fasteners



Measure the center of the hood liner rib along the trailing edge of the hood and mark it.

Measure out from the hood center 12" on each side and mark the middle of the hood liner rib for the hood handle location. If the hood sticks up slightly at the corners, change this measurement to 13"

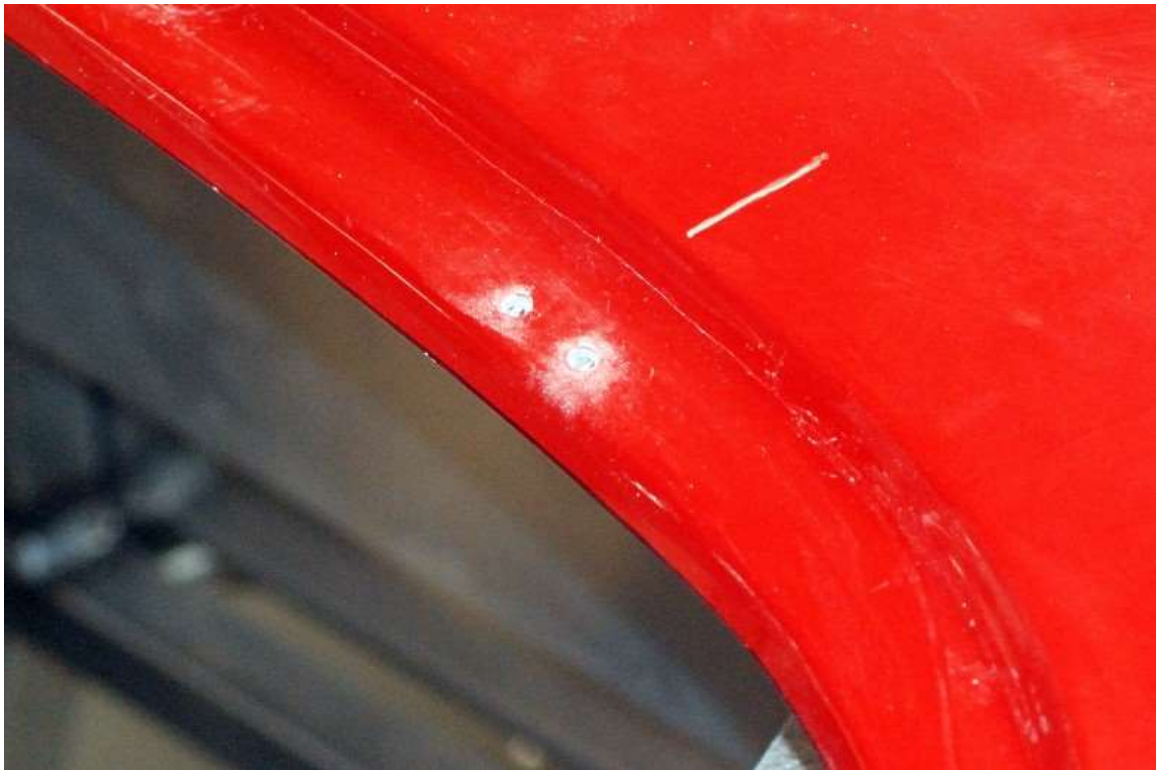
Drill through the hood and the liner starting with smaller bits working up to a ⅝" hole. The larger bits sometimes work better by running the drill in reverse so they do not tear the fiberglass.

Remove the hood handles from the three-lock set and break off the bottom small tabs with a pair of pliers.

Set the handles in the holes drilled in the hood so that they are lined up squarely with the edge and mark the screw holes on the hood.

Drill the holes with a $^{7}/_{64}$" bit then screw the handles down using the screws from the set.

Shut the hood and mark the body where the hood handles line up.



Open the hood and drill two 3/16" holes in the hood opening recess ¼" on either side of the centerline and ¼" back from the edge of the opening. These are for mounting the hood catch brackets.

The latch brackets are in the handle assembly, center them on the line with the corner edge up against the inner radius of the hood opening and mark the two holes.

Drill the two holes just marked with a 7/64" bit and file the edged of the bracket round with a file or grinder for a nice finish.

The four remaining screws are used to hold these brackets in place. They can either be countersunk into the body or used to hold down the hood bumpers to hide them completely.

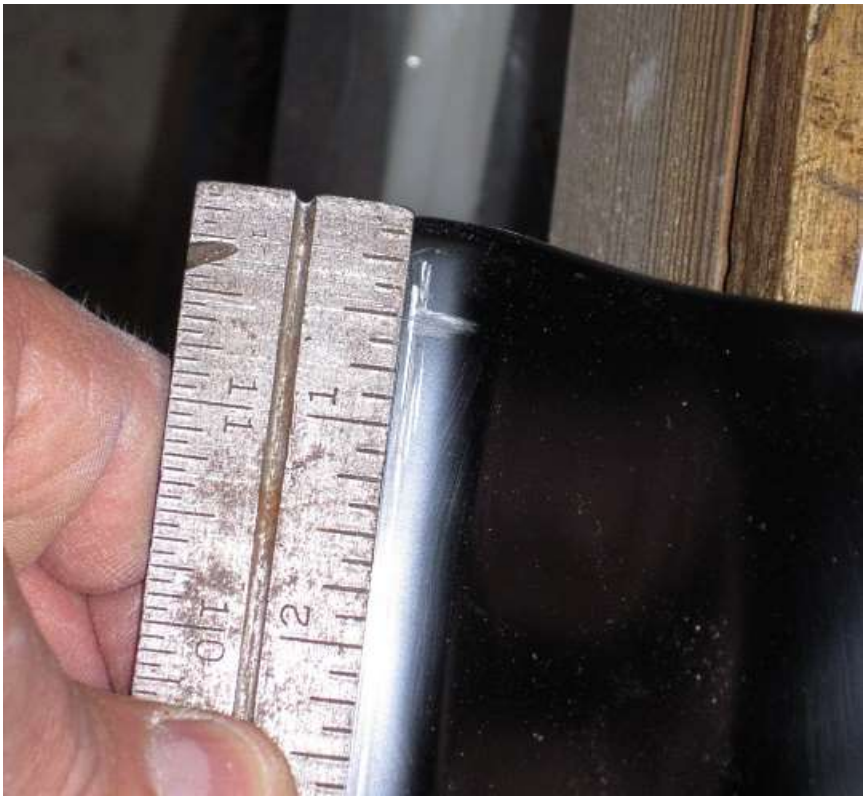
Attach the cam wedge to the underside of the hood handles and adjust for tightness using a 2.5mm hex key.

Hood Scoop

🛠 Drill, $^{3}/_{16}$" drill bit, marker, ruler, tape measure.

- Hood scoop, secondary body fasteners.

On the top side of the hood scoop mark a line 0.25” in from the edge of the hood scoop flange all the way around the scoop.



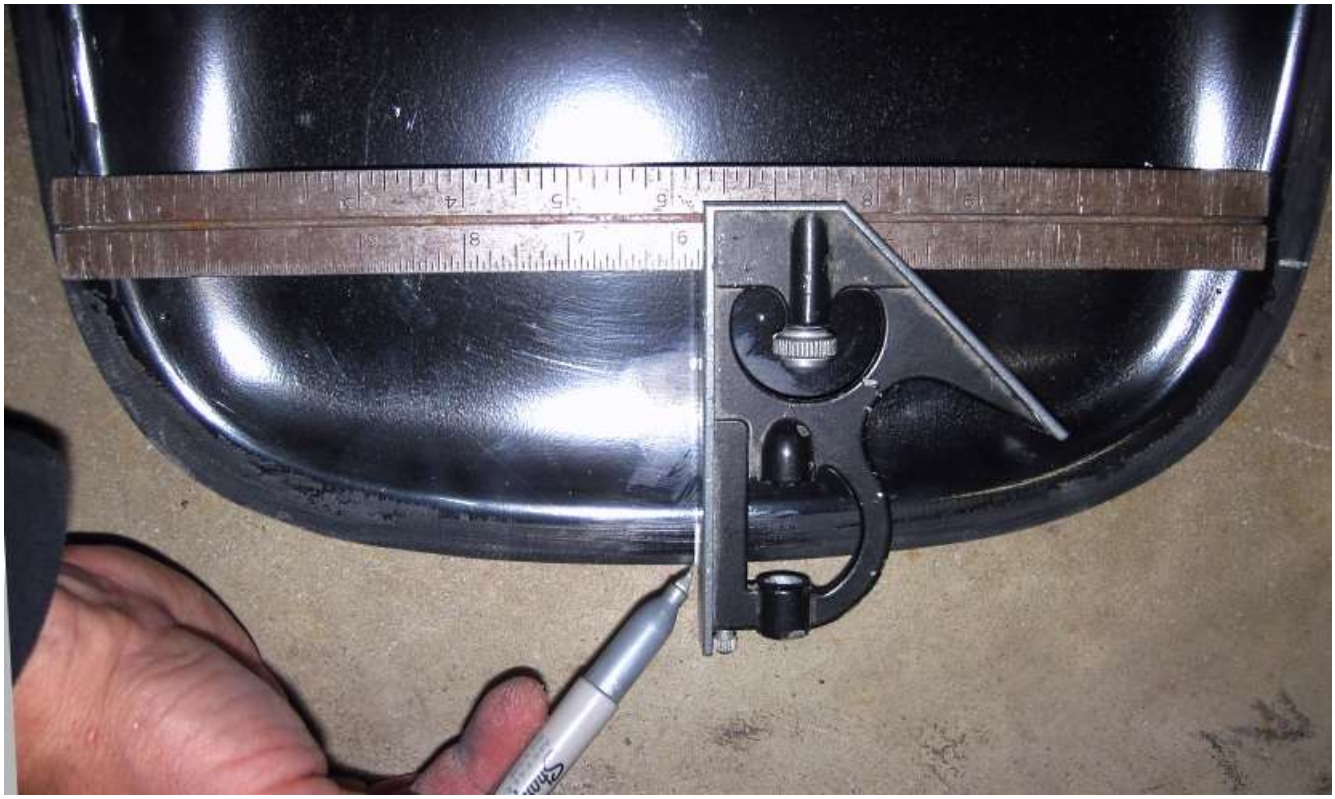
Mark the line 0.50” back from the front edge of the scoop.

Mark the scoop every 3” along the straight sides of the scoop.

At the front of the scoop, measure across the front and find the center then mark the top of the scoop.

On the underside of the scoop, measure from the front back 19.50” and mark the scoop on both sides.

At the lines marked, measure across and mark the center of the scoop.



Use a square to transfer the mark to the back edge of the scoop then mark the top side of the scoop as well.

Where the scoops starts to curve measure from the last straight rivet location 2.50” back and mark the line then another 2.50”.

This should make the rivet spacing look even and have a rivet hole in the back center.

Drill $^{3}/_{16}$" holes around the edge of the scoop.

Hood fitment

🛠 Drill, $^{3}/_{16}$", $^{3}/_{8}$" drill bit, marker, ruler, tape measure, jig saw or air saw, rivet gun.

- Hood, secondary body fasteners.

With the hood marked for its centerline, transfer this to the underside with another piece of tape.

From the front edge of the hood measure back 19” and mark the underside of the hood.

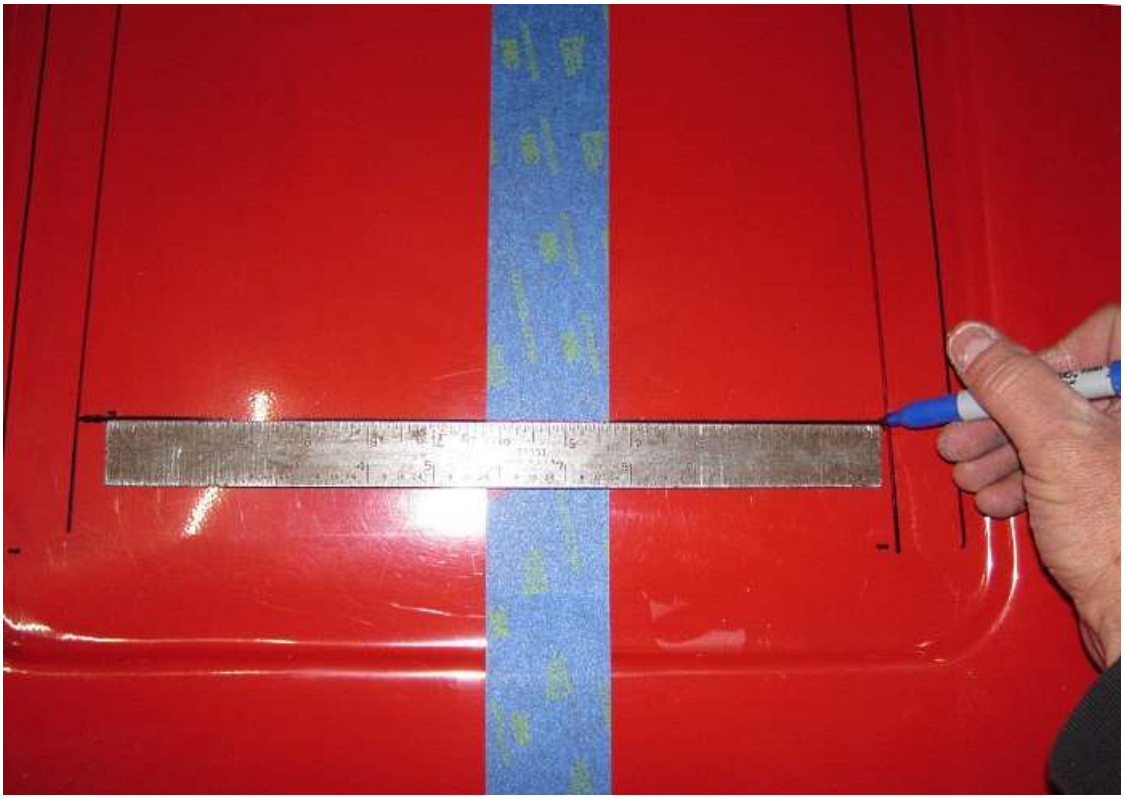
Place the hood scoop on the underside of the hood then use a square to locate the scoop left to right and the front marks to locate it to forward/backward.

Mark around the edge of the hood scoop

Mark 1” in from the sides.

Use the hood scoop to mark 1” in for the curved end.

Mark the hood 2” back from the 19” front mark.



Use a ruler to connect the two sides at the 2” mark.

Mark the inner line to make sure the wrong line is not cut.

Drill ¼” holes at the front corners of the area marked

Cut the opening in the hood using a jig saw or air saw.

On the top side of the hood measure back from the front and mark the hood at 19”.

Locate the scoop using the straight edge and two marks.

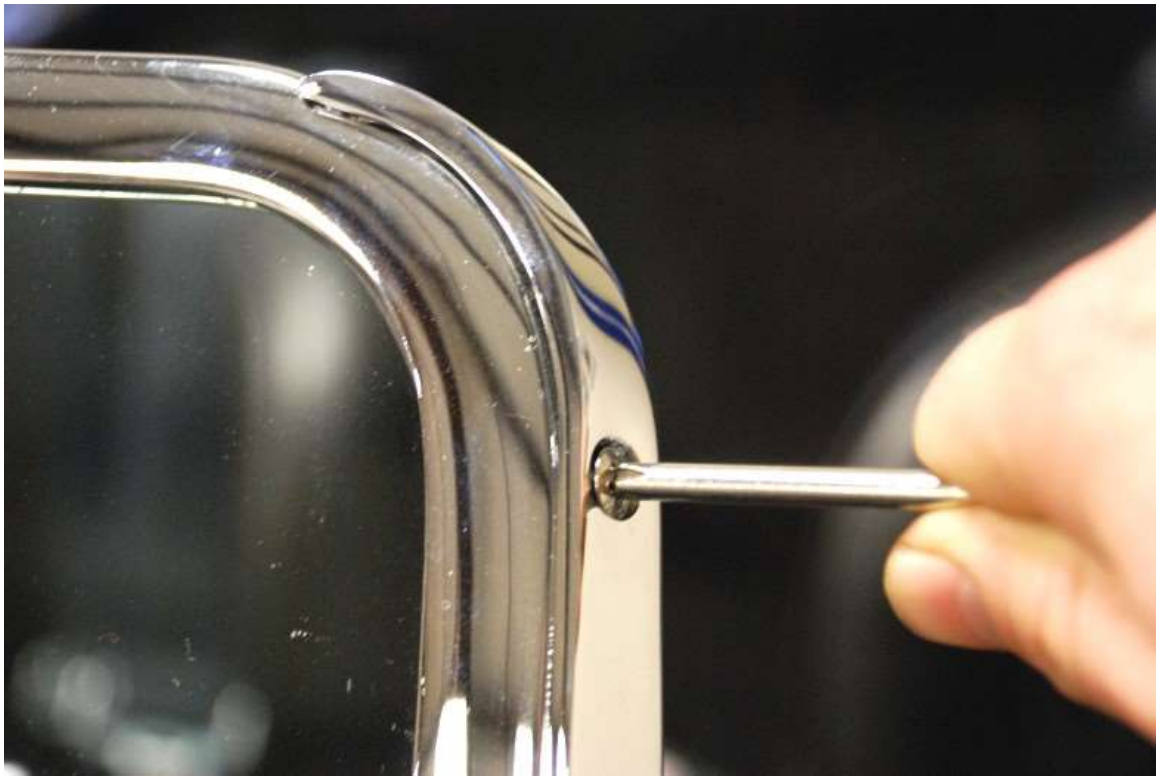
Drill two of the rivet holes on opposite sides of the scoop and the back-center rivet hole using an 1/8" drill bit. After drilling each hole place a rivet in the hole so that the scoop does not move.

Drill out the remaining rivet holes putting a rivet in each hole as you go.

Separate the two pieces for painting.

Windshield

- Philips head screwdriver, marker, ½" drill bit, drill, hack saw, ¾" wrench, ratchet, ¾" socket, friend.
- Windscreen box.
- The strips along the sides of the windshield that the screws go into are brass. The brass threads strip easily so take your time and make sure that they thread correctly.
- Windshield cut outs may need to be expanded to get the windshield angle desired.



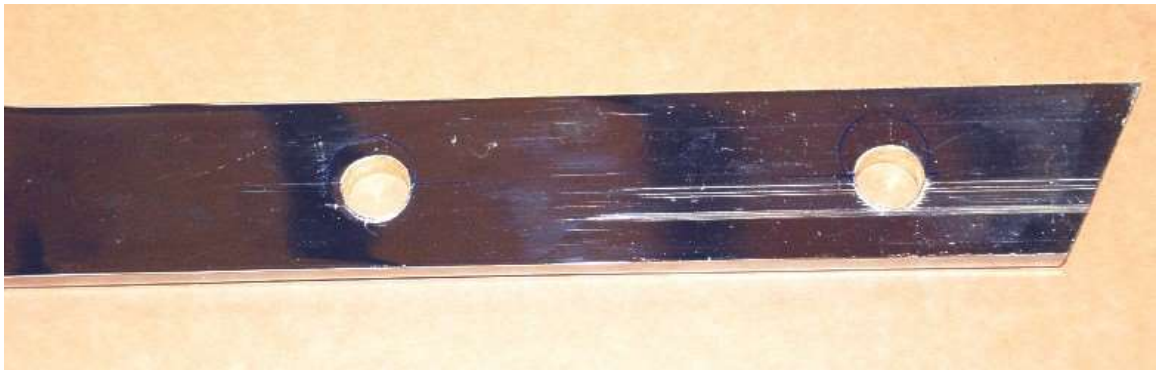
Unpack the windshield components and carefully screw the sidebars onto the windscreen.

With the help of a friend, slide the windshield down through the slots in the body until the bottom seal is resting on the body.

Angle the windshield so that the measurement from the center of the top side bar screw to the inside corner of the door opening is 27”.

Mark the chassis mounting holes on the arms. If the arms are too long and prevent the windshield from sitting down then pull them back out and trim off the excess.

Remove the windshield from the car and then remove the sidebars from the windshield.



At the marks made on the sidebar, measure and mark the center of the sidebar to give the correct angle adjustment on the windshield. Drill the holes with a ½" bit.

Remount the sidebars on the windshield.

Slide the windshield into position and bolt in place using the windshield mounting hardware. Snug the bolts up so that the angle can get set.

Measure from the middle of the top windshield screw to the inside corner of the rear door, this should be set at 27.00". If necessary slot the holes more so that the angle can get set and there is no side loads on the windshield frame.

Tighten the windshield bolts using a ¾" wrench and socket.

The windshield should remain bolted down while you fit the doors.

Doors

3/16" hex key, marker, ⅝" socket, ratchet, air saw, orbital sander, 3/16" drill bit, drill, rivet gun

Door hinges, doors, secondary body fasteners.

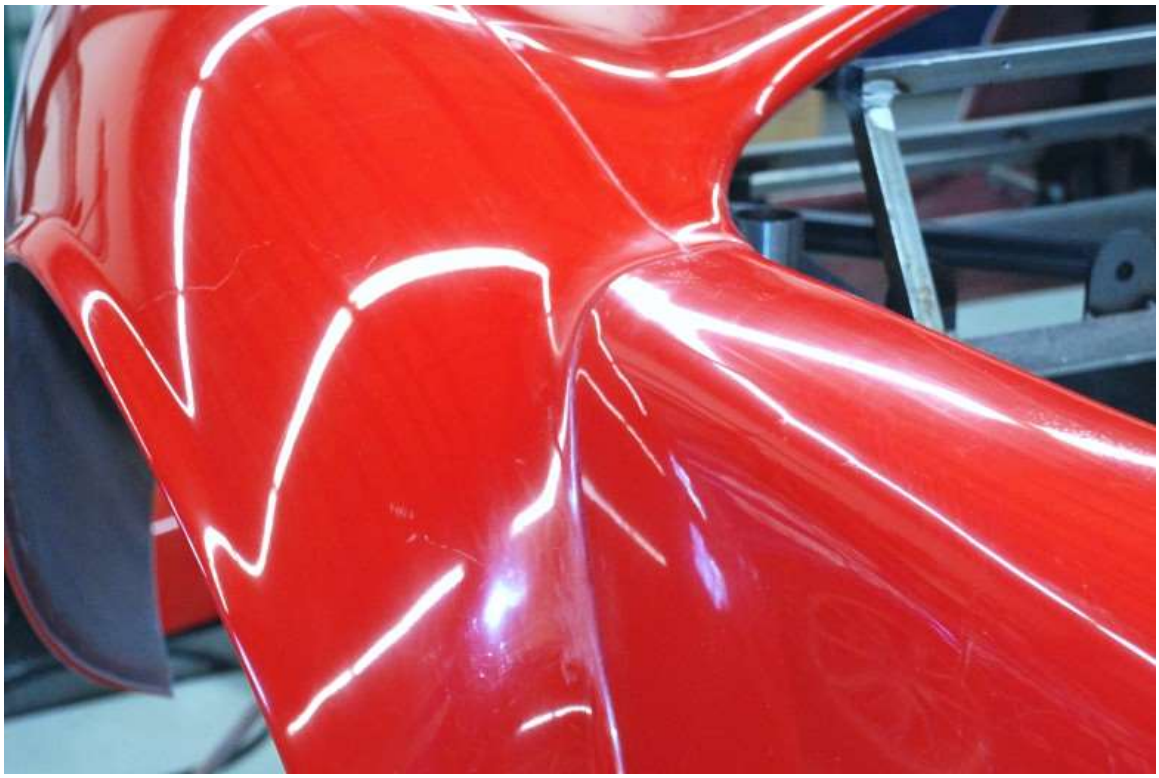
The windshield, inside rearview mirror, and trunk side aluminum with bulb weatherstrip must be installed in order to mount the doors correctly.

If you have removed them, remount the door hinges on the chassis. The square nuts sit alongside the tube so only one hex wrench is needed for adjustment.

Use a jack under the side of the car to make sure the body is up against the bottom of the frame. Leave the jack so that the body can be moved in and out when pulled. Start with the body all the way in.

Position the door in the body to see where it may need to be trimmed to fit the opening. Mark the door and only remove enough material to get it to fit.

Hold or tape the door in position and attach the hinge to the studs.



Adjust the door with the hinge until the panel surfaces are lined up with the body. Start at the top of the door and match the curved surfaces.

Once the front of the door is good, reuse one of the #10 self-tapping screws that the body was originally mounted with to lock the location in. Screw it up into the 2”x 2” tube near the front of the door.

Push or pull the back of the body to line it up with the door if necessary.

Once the body is painted and final mounted rivet the bottom lip of the body to the chassis using the long $^{3}/_{16}$" rivets.

Set the gaps on the doors as you did with the hood using a marker.

Door Latch

🛠 ½" wrench, $^{1}/_{8}$" drill bit, drill, Philips head screwdriver, marker, Lithium or silicone grease.
🚘 Door components

Remove the door latch striker from the original mounting bracket and keep only the striker and the washers. The bracket and nut will not be used.

Bolt the striker onto the chassis putting enough shims on the striker to bring the base of the striker head flush with the door latch pad when the door is closed.

Latch the door latch onto the striker and close the door. Adjust the striker if needed to fit the latch to the door cut out. You can also use the door latch spacers to help with this alignment.

With the door lined up and the striker in place, mark and drill the 1/8" holes for the door latch.

Lubricate the moving parts of the latch using Lithium or silicone grease. This will make the latches easier to use and prevent any binding.

Bolt everything together to double check fit and operation. The door latches will be tight at first but break in quickly with use.

Trunk

🛠 air saw, orbital sander, marker
🚘 trunk

Trim the trunk lid edges enough so that it just fits into the opening.

Trunk Hinge

🛠 ½" wrench, 3/16" hex key
🚗 Trunk hinge components.

Press the bushings into the hinge arms from either side.

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.

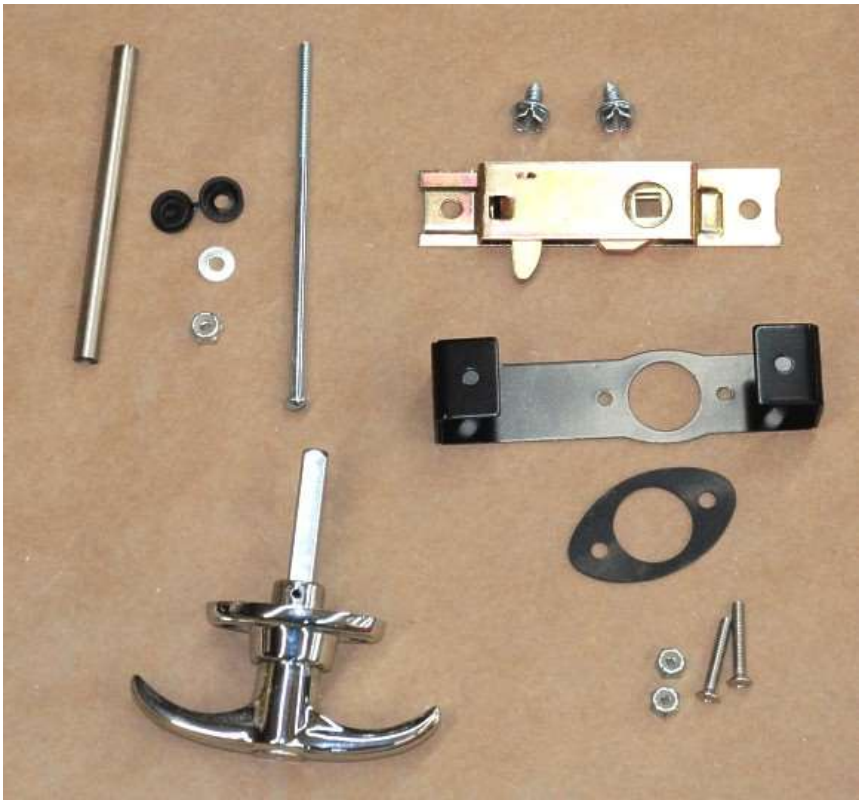
Hang the hinge arms on the chassis using the shoulder bolts. You do not need the nuts for just doing fitment.

Screw the trunk to the mounting pads also leaving them loose enough that they will just move.

Close the trunk and wiggle it into position then open and tighten the bolts. This may take a little adjustment to get the trunk to sit down right. You can also use some of the rubber bumpers from the hood opening as a temporary means of holding the surfaces level.

Trunk Latch

- ⅜" socket, ratchet, flat head screwdriver, Philips head screwdriver
- Three-lock set and fasteners

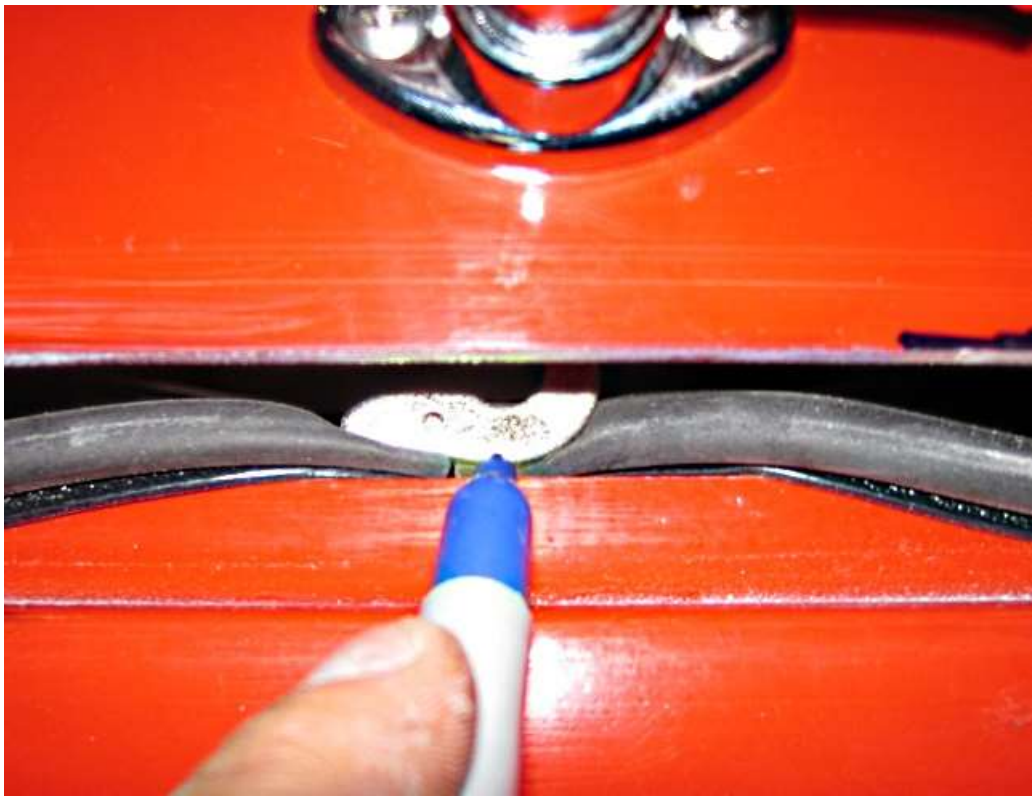


Find the trunk latch and components in the Three-lock set.

Screw the trunk latch to the holder with the short #14 screws lining the small square hole with the hole for the handle.

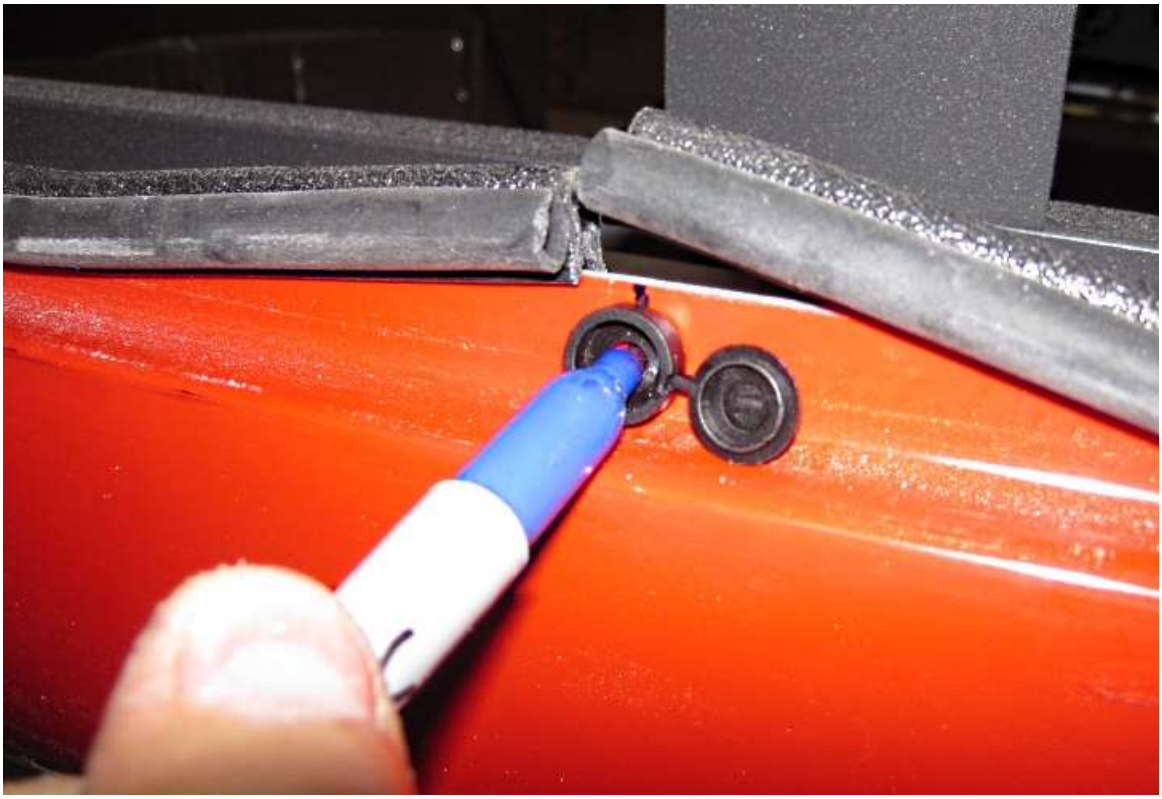
Bolt the handle to the trunk running the bolts through the trunk and the latch mount.

Latch pin



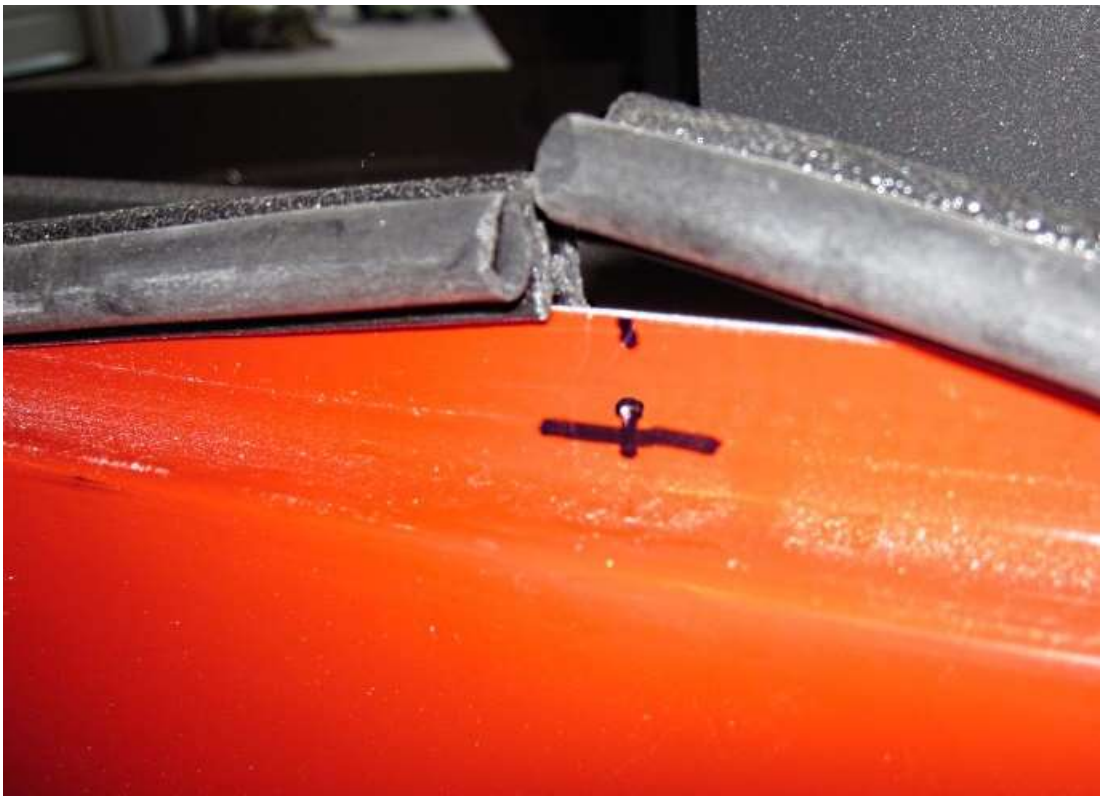
Close the trunk and with the latch in the locked position, mark the lip of the body where the latch is located.

Use the latch sleeve on the latch to see the center height of the latch sleeve compared to the edge. Make sure the sleeve is 90 degrees to the latch. In the picture this is just above the edge but this is dependent on the gap around the trunk that you make.



Use the screw head cover and put is on the body latch line as low as possible and mark the center on the body.

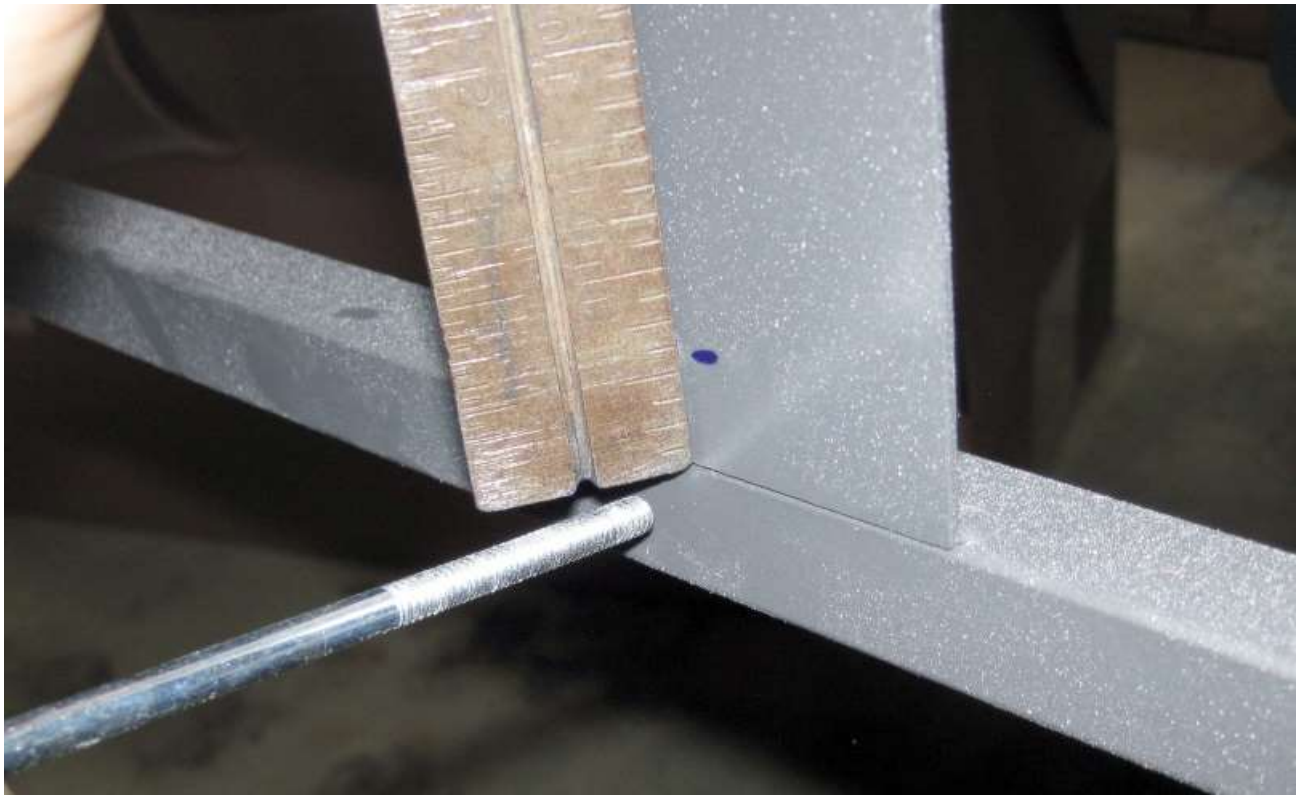
Use a paint stick or what was used to set the gap of the trunk to draw a line on the body where the edge of the trunk will be.



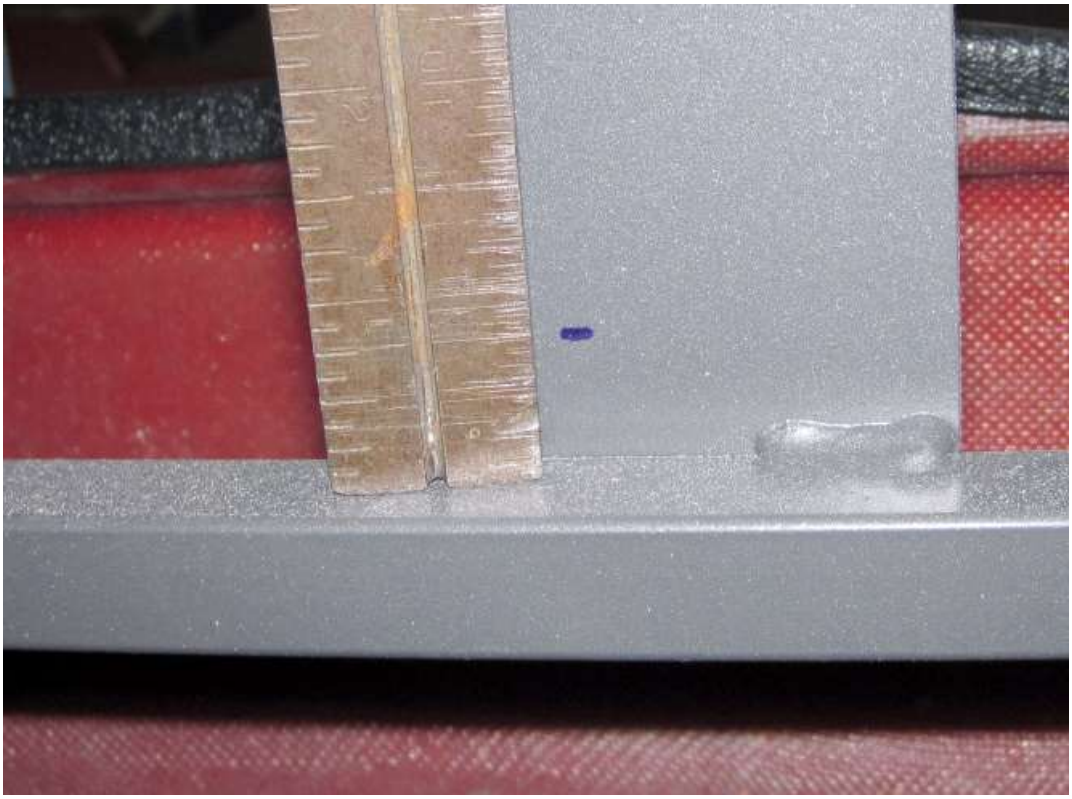
With the pin location compared to the trunk edge known and the trunk edge marked on the body along with the lowest mount point of the pin cover marked, the locations should match up. The latch cover may need to be trimmed slightly to go onto the radius of the body.

Drill the body location with a $^{3}/_{16}$" drill bit.

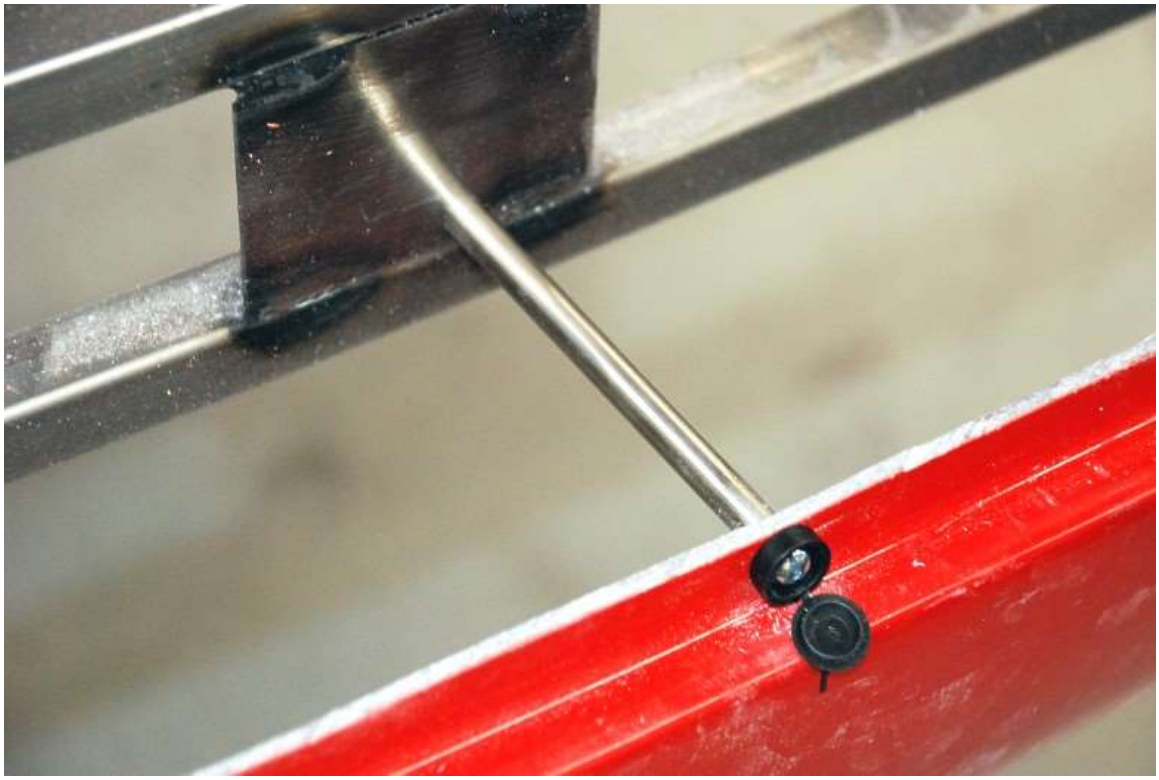
Put the pin screw through the body and up to the frame. Use a level and a square to locate the end of the screw.



Measure the height of the screw location from the lower ¾” tube.



Transfer this measurement to the backside of the plate. Do the same for the side location.



Install the long screw that holds the latch pin in place. It goes through the plastic cap then the body then the sleeve and into the chassis plate.

Close the trunk and test fit the latch.

If the latch is loose, it can be bent with channel lock pliers to snug it down.

Side Mirror

🛠 Drill, $^{13}/_{64}$" or $^{7}/_{32}$" drill bits, marker, $^{5}/_{16}$" wrench, masking tape.
🚘 Rearview mirrors/fasteners.

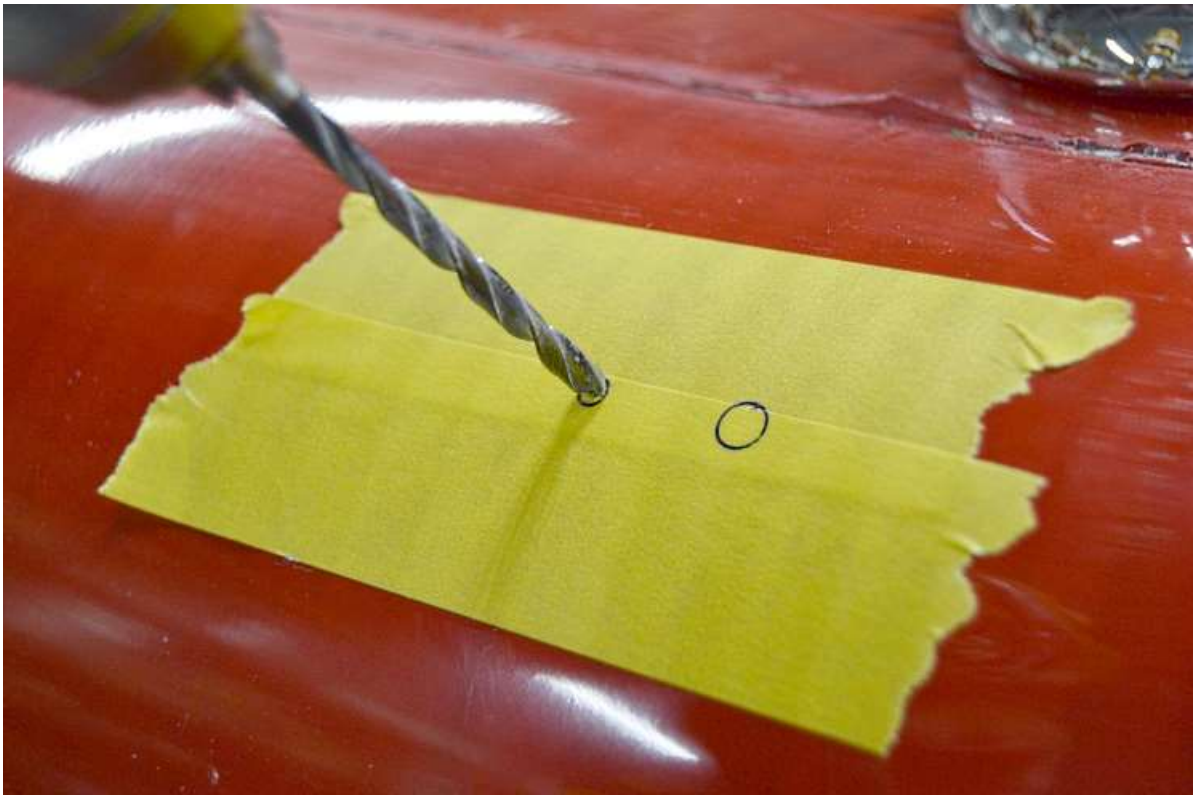
Only a driver side mirror is included with the kit. A passenger side one is available if desired.

Put the gasket on the bottom of the mirror so the holes line up with the threaded hole locations.

Put masking tape in the rough location of the mirror.

Sit in the seat to find a good location you can see the mirror from and see clearly over the rear fender.

Hold the gasket in place, remove the mirror and mark the location of the mounting holes.



Remove the gasket and use a $^{13}/_{64}$" or $^{7}/_{32}$" drill bit at the points marked.

From the underside of the body, use a $^{5}/_{16}$" socket to attach the mirror to the body.

Body Stripes/centerline

Use the outside radius of the headlight area to measure across and find the center of the body on the front deck.

Use the oil cooler hole to find the center in this area.
Use the inside rearview mirror for the center near the cockpit.

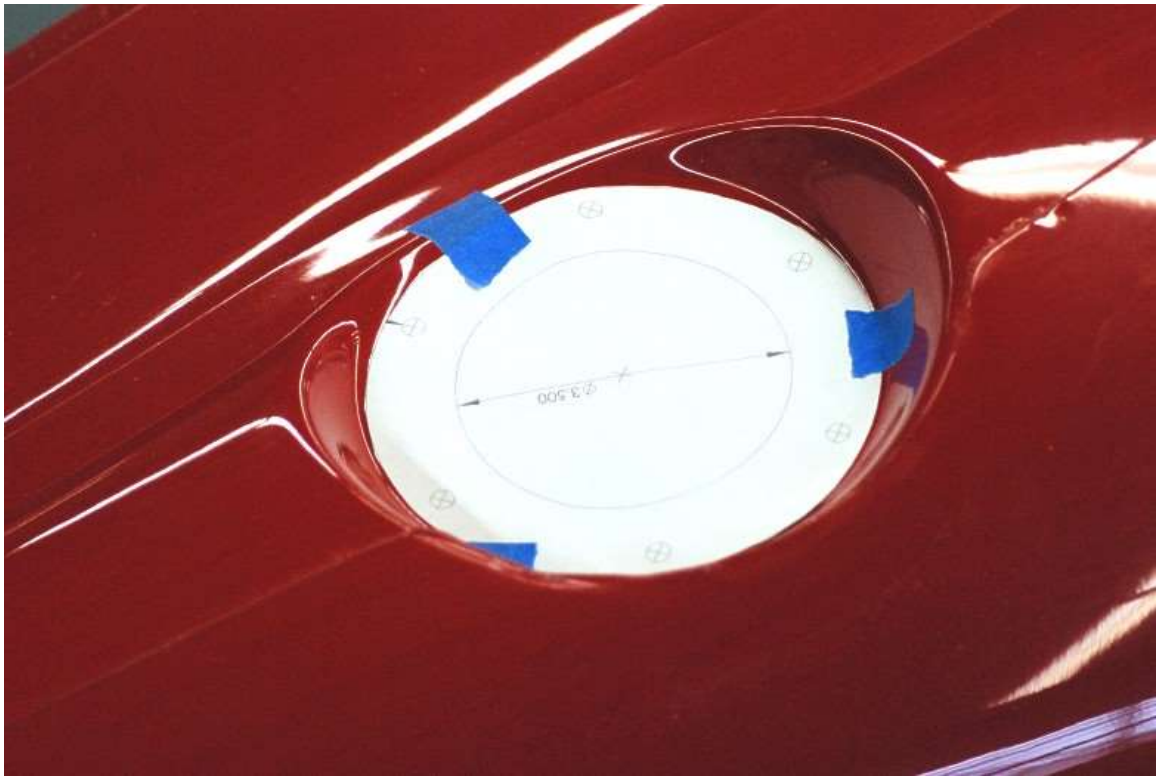
At the top front of the trunk measure across and mark the top of body area.

Use the trunk latch hole for this area of the body.
Use a single piece of masking tape from the front lower oil cooler area to the bottom back of the body then cut the cockpit area out, trunk gaps and the hood gaps.

Body Cut-outs

FUEL FILLER

Drill, ⅛", 7/32" drill bit, 3½" hole saw or air saw or jig saw, masking tape, scissors.
Fuel filler template, Aston Lemans Cap components.



Locate the template in the appendix and only cut out around the outside diameter of the circle. Tape the circle in the gas cap recess of the body.

Use a 3½" hole saw for the center opening. If you do not have a hole saw this size, you can cut the center circle out of the template and use the remaining template to mark for a jig-saw instead.

Locate the cap in the hole so that when open the cap will not hit the body and you will have access with a gas station filler handle.

Use an ⅛” drill bit through the flange holes to mark all of the outer screw holes on the body.

Remove the cap and finish drilling the 1/8" holes.

For one of the holes on the inside of the body Use a 7/32" bit drill for the grounding strap bolt.

TAIL LIGHT

🛠 Drill, 7/32" drill bit, 1¼" hole saw, file, scissors.

- Tail light template, Red rear light

Use a 7/32" bit to drill the two outer holes for the taillight studs then cut out the center using a 1¼" hole saw. There are marks on the body that locate these holes. If the marks do not show there is also a template in the back of the manual.

Test fit the lights and file the holes to fit if needed.

Turn Signal

🛠 Drill, 7/32" drill bit, 1¼" hole saw, marker.
🚘 Turn signal template, Amber front turn signal lights

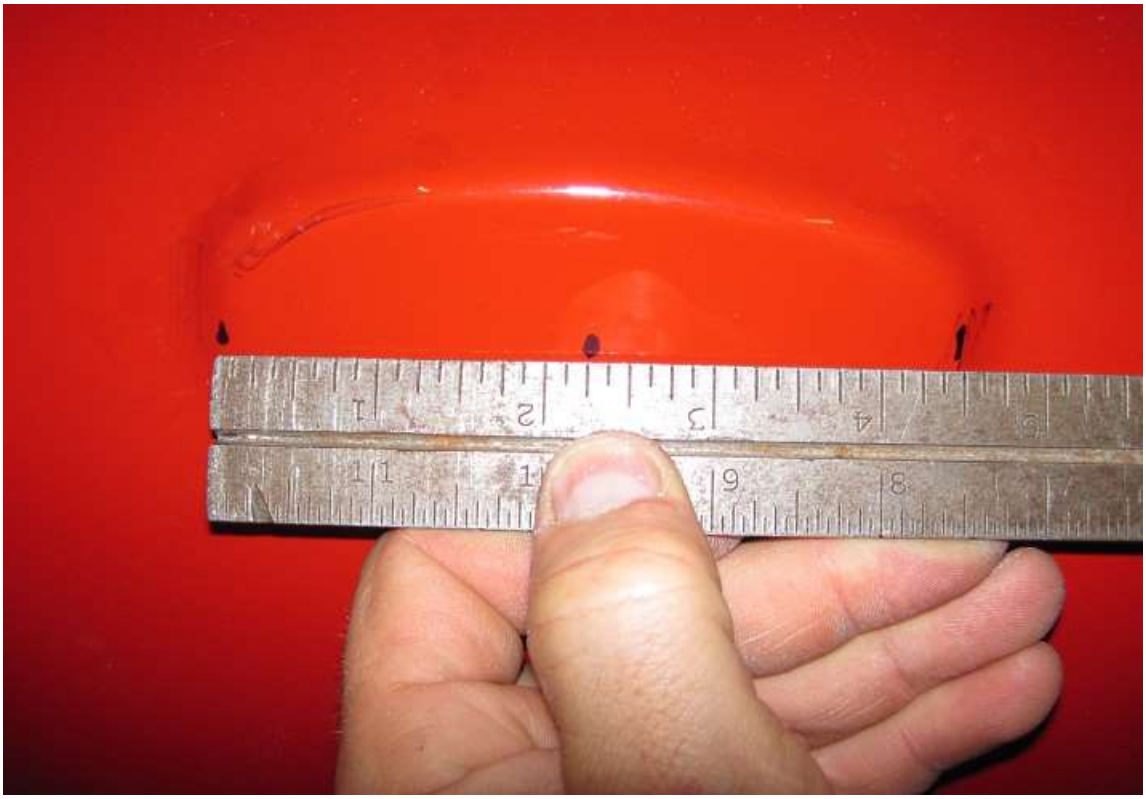
Remove the gasket from the turn signal box and use it to center and trace the mounting holes and large center hole for the turn signal.

Drill the outer holes with a 7/32" drill bit and the inner with a 1¼" hole saw.

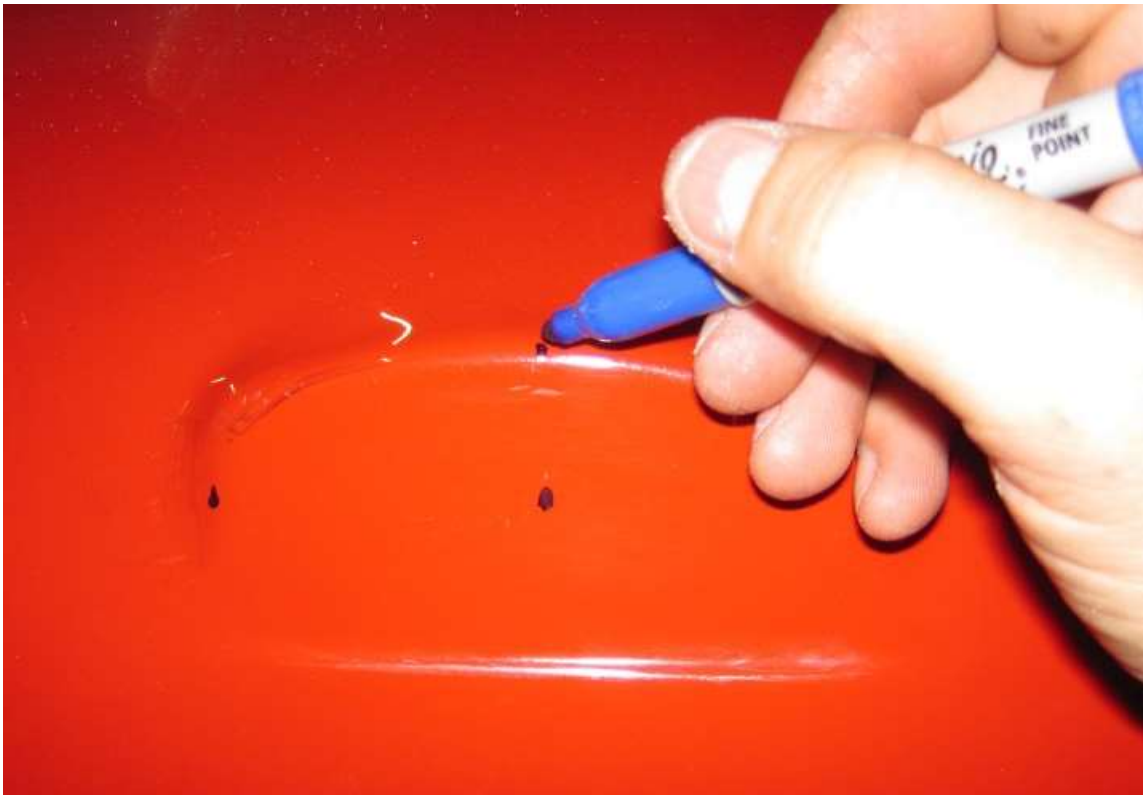
Test fit a light and adjust if needed.

License plate light

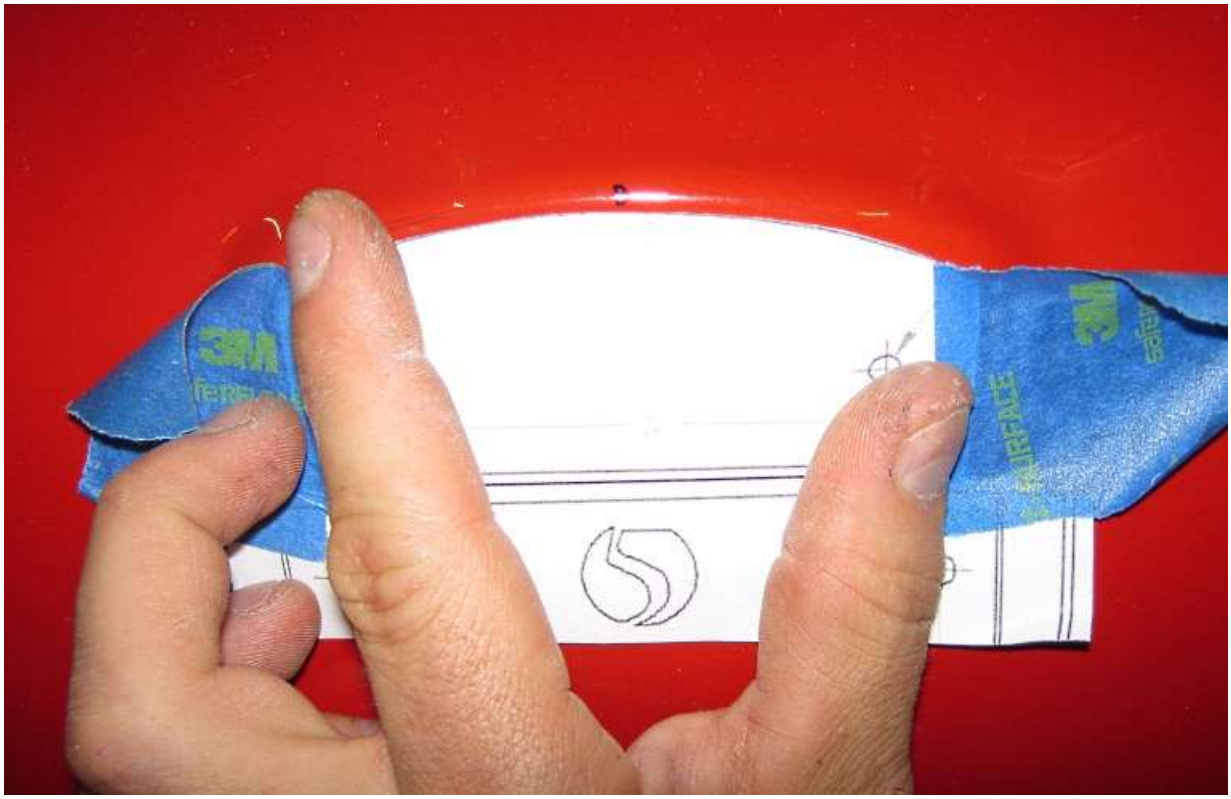
- 🛠 Drill, ¼”, ⅜” drill bits, scissors, masking tape, marker, ruler
- 🚘 License plate light template, license plate light and bracket.
- ✋ This kit is only a collection of parts designed for use primarily as a race car. Applying the license plate bracket does not mean that this vehicle is street legal. Factory Five Racing does not build completed or partially completed street vehicles. If you choose to title, register and operate your kit on public roads, you are responsible for ensuring that the vehicle you build complies with all Federal, State and local laws regarding its use.
- ✋ The inclusion of the license plate bracket does not indicate that this kit complies in any way with these laws.



Use a ruler to measure and mark the ends and the middle of the light area.

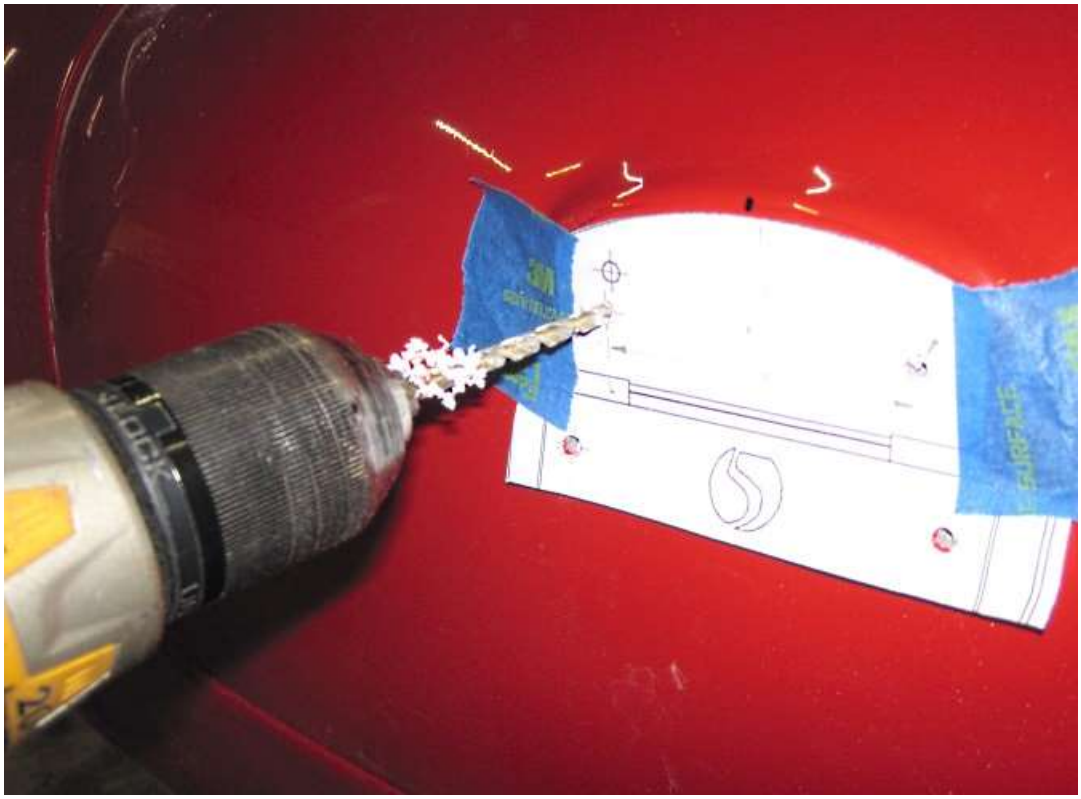


Mark the top center of the light area.

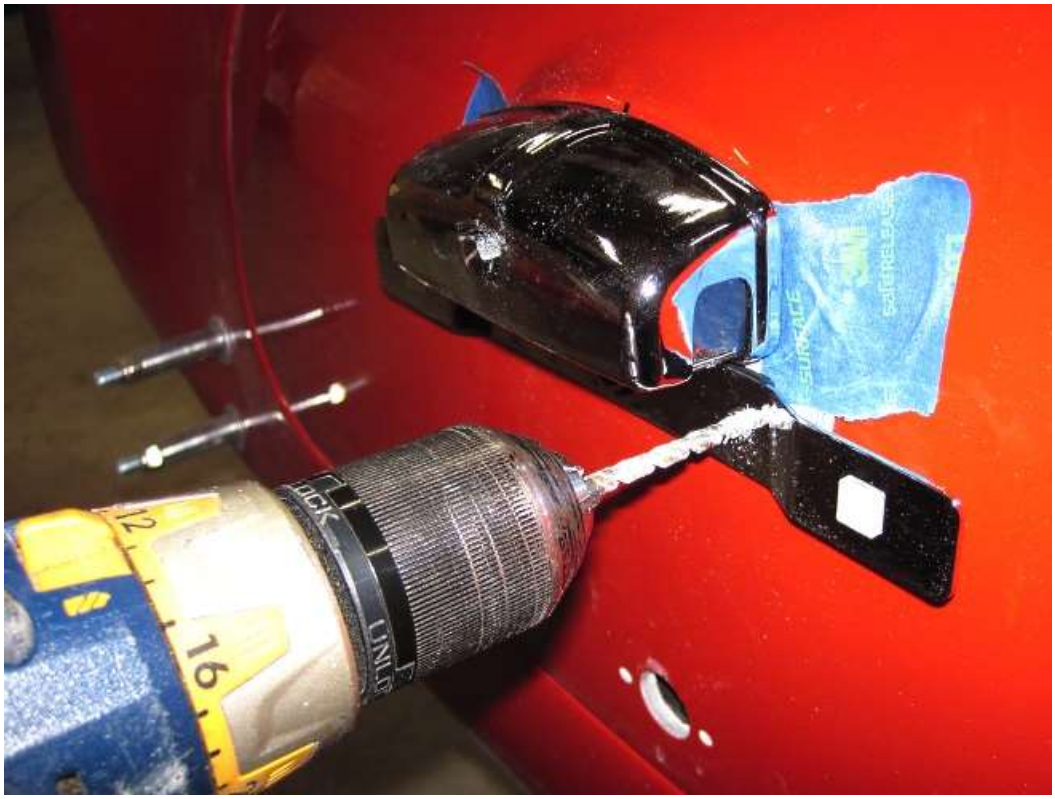


Align and tape the drill template in place.

Remove the license plate light cover and use it to double check the template location.



Drill the two mounting holes and the wire hole only.

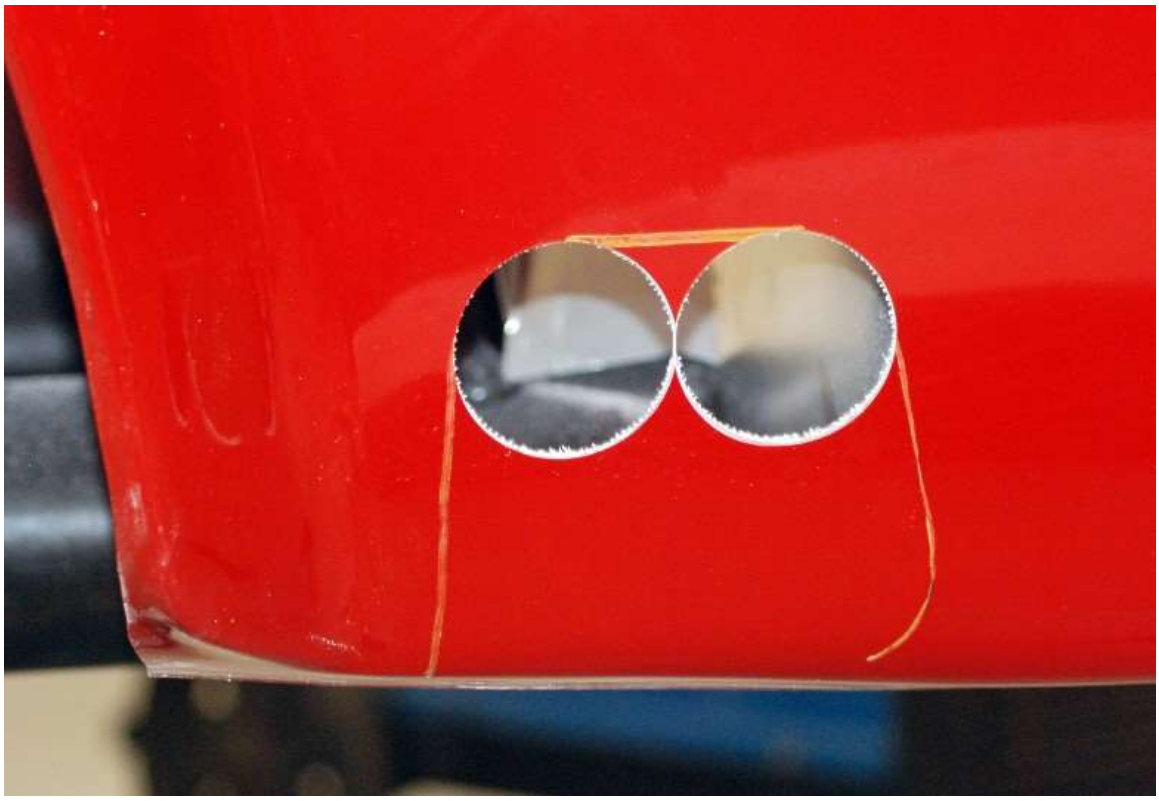


Push the light into the trunk and drill through the license plate mounting holes with a $^{3}/_{16}$" drill bit.

Side exhaust

🛠 Drill, 2½" hole saw, air saw or jig saw.

- Side exhaust template



The pattern for the standard exhaust cut out is pre-traced on the body. Using a 2½" hole saw cut the upper two corners of the pattern out.

Using a jig saw cut the remaining straight sections and radius on the lower rear corner.

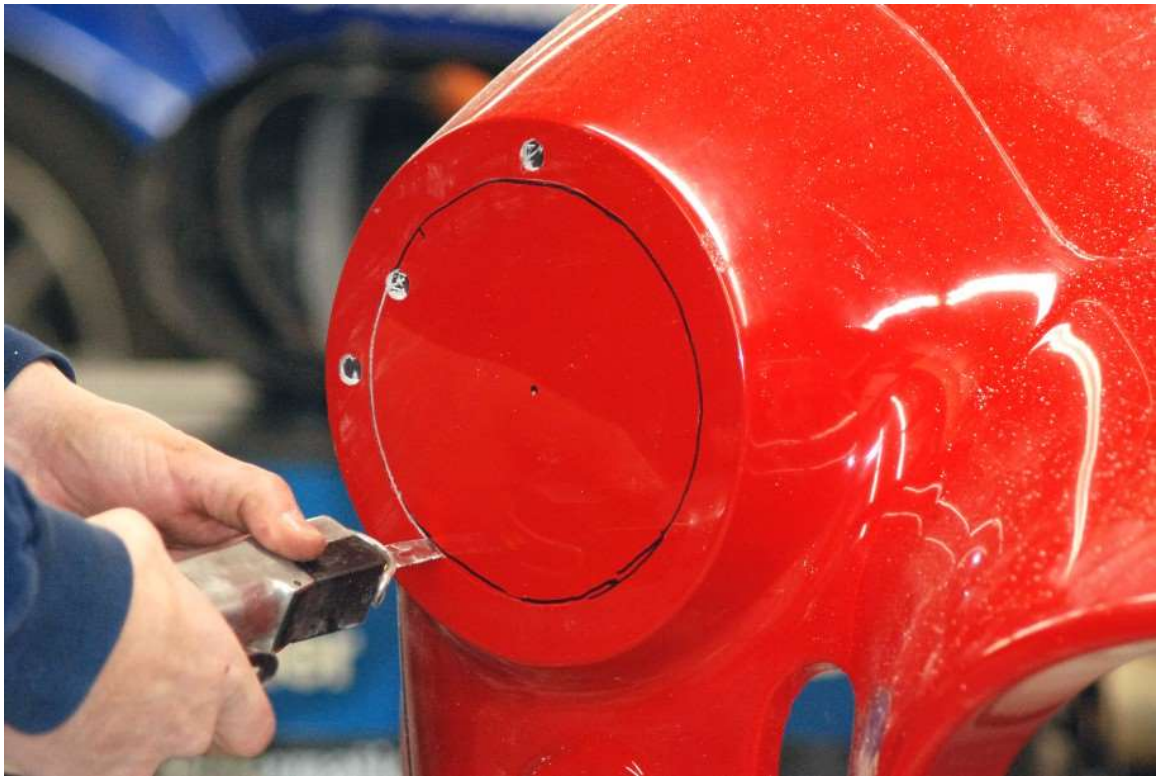
Headlights

🛠 Drill, 1/8", 1/4", 3/8" drill bit, razor knife, masking tape, air saw or jig saw, level.
🚘 Headlight template, headlight components,

Cut out the headlight templates from the back of the manual on the outermost diameter and tape them in the center of the fender with the line level with the ground.

Cut the center of the template out and trace the inner circle with a marker.

Drill the two smaller corner holes with a ¼" drill bit to mark their location. Follow this with a 3/8" drill bit.



Using a jig saw, cut the inner hole out of the body, use a larger drill bit to make a hole to start your cut.

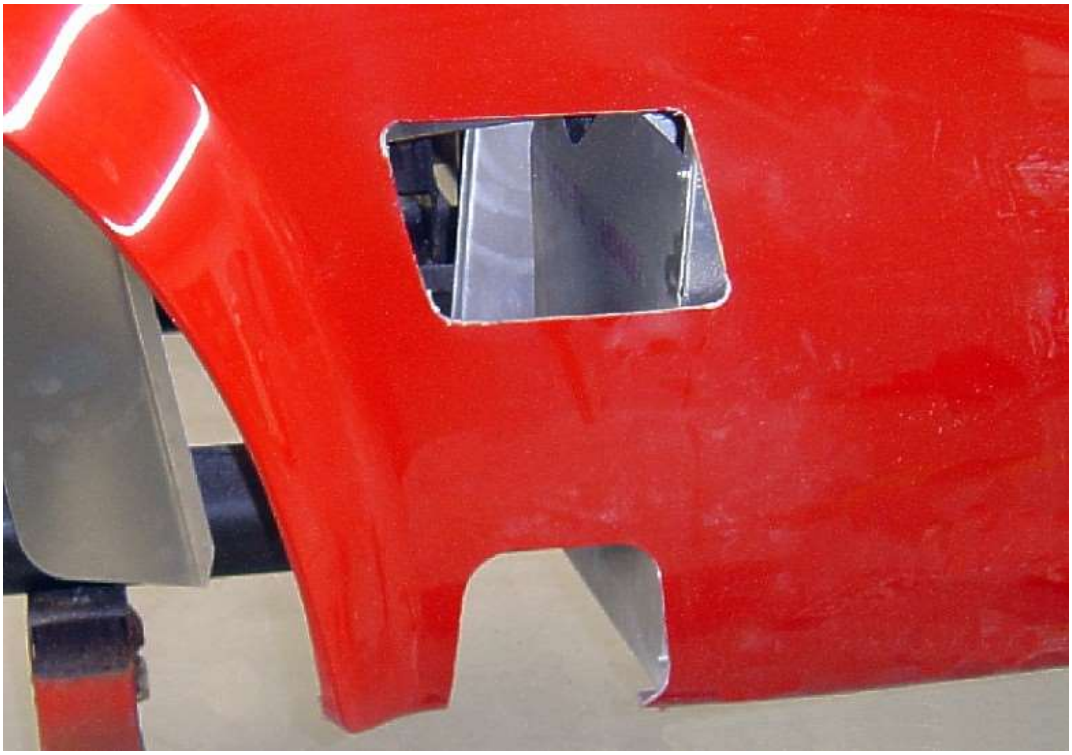
Test fit the light bucket and rubber gasket making sure that they sit flat and the bucket is centered on the fender. Mark and drill the four mounting screws for the headlight bucket using a 1/8" drill bit.

Side louver

🛠 Drill, 1¼" hole saw, jig saw or air saw, measuring tape, marker
🚘 Side louver template

Use the template and measurements in the picture below to locate the template on the body.

Use a 1¼" hole saw to cut the corners on the traced opening for the side louver.



Connect the flush surfaces of the holes with a jig saw.

Roll bar

🛠 Drill, 1¾” hole saw, air saw or jig saw, file
🚘 1.50” driver side Rollbar.

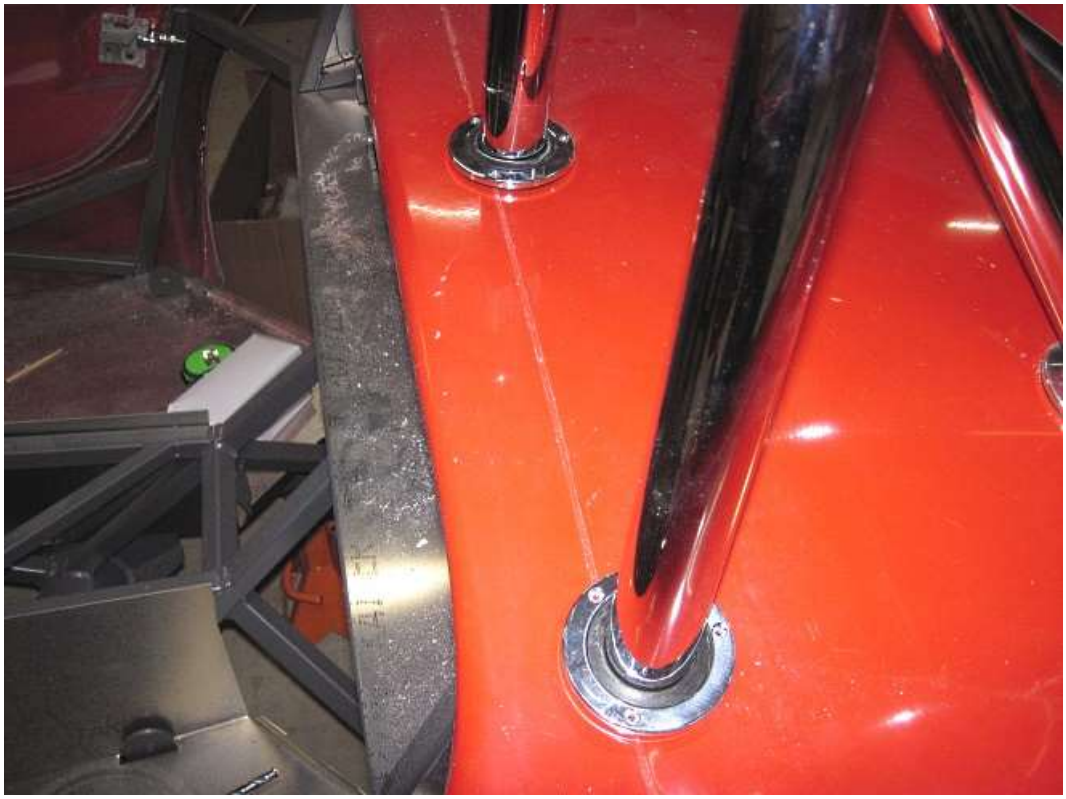
The roll bar holes are marked on the body and need to be cut out using a 1¾” holes saw. The front two holes are cut centering the saw in the marked circle and drilling vertically to match the angle the bar comes through the body.

To cut the rear roll bar leg, make 2 holes overlapping so that they form the right length. Use the same 1¾" hole saw centered in the front of the traced opening and with the drill leaning at a 45° angle toward the inner front leg. Stop the drill when it has cut through half of the hole.

The rear of the hole is then finished using the whole saw vertically.

Trim the remaining flash on the opening with a file or jig saw.

Put the rear rollbar leg through the body and onto the frame. If using rollbar grommets, put the rear ring and grommet on as well.



If using rollbar grommets, put the front rings and grommets onto the rollbar hoop then put the hoop through the body and on to the frame.

If necessary, use a plastic mallet to seat the rollbar hoop down and make sure the rear leg goes all the way up onto the hoop.

Rollbar drilling

🛠 1/8", 3/16", 5/16" drill bits, drill.

Step drill the top of the rear leg first using an 1/8" bit followed by a 3/16" then a 5/16" bit.

Insert the bolt through the top rollbar hole.

Repeat the step drilling through the rollbar for both front lower mounts. After drilling each hole, put the bolt in the hole so the rollbar stays in the correct location.

Drill the rear leg lower hole last making sure to drill through the frame mount.

Optional rollbar grommets

🛠 1/8" drill bit, drill

Locate the rear grommet so that it sits flat then drill the holes using an 1/8" drill bit.

Locate and drill the front grommet holes.

Remove the rollbar and drill any of the holes that were hard to reach

Final Prep

- 🛠 Sand paper
- 🤚 All of the exterior body accessories, Windshield and side 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.
- 🤚 Refer to appendix A for a drawing on how to make a wooden buck to hold the body. A body buck diagram is in the appendix. The dimensions do not have to be exact. A rough shape is all that is needed to hold the body.

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
- Hood Scoop
- Wheels Wells – Flange should be $^{3}/_{8}$" wide
- Side Vents
- Exhaust
- Brake Duct openings
- Main radiator opening
- Oil cooler opening
- Hood Opening
- Roll Bar cut outs

- Door openings
- Cockpit edges

The curled under side body edges are not as visible but just taking a little time here to get the lines straight and a small radius makes for a much nicer finish as well.
The headlight, taillight, fuel cap, turn signal, quick jack, and trunk openings all are covered and do not need the finish work of the other areas.
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. Our body shop has stated that any more than 40 hours of body work is unnecessary with the Mk IV body.
- 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.

Chapter 5

Final Assembly

Radiator Aluminum

🛠 Drill, ¼” Nut driver, ⅛”, 3/16” drill bits, rivet tool, floor jack, marker, ruler, silicone, caulk gun.
Secondary body fasteners, engine bay aluminum.
Use care when handling aluminum, the edges are sharp and can cut you.

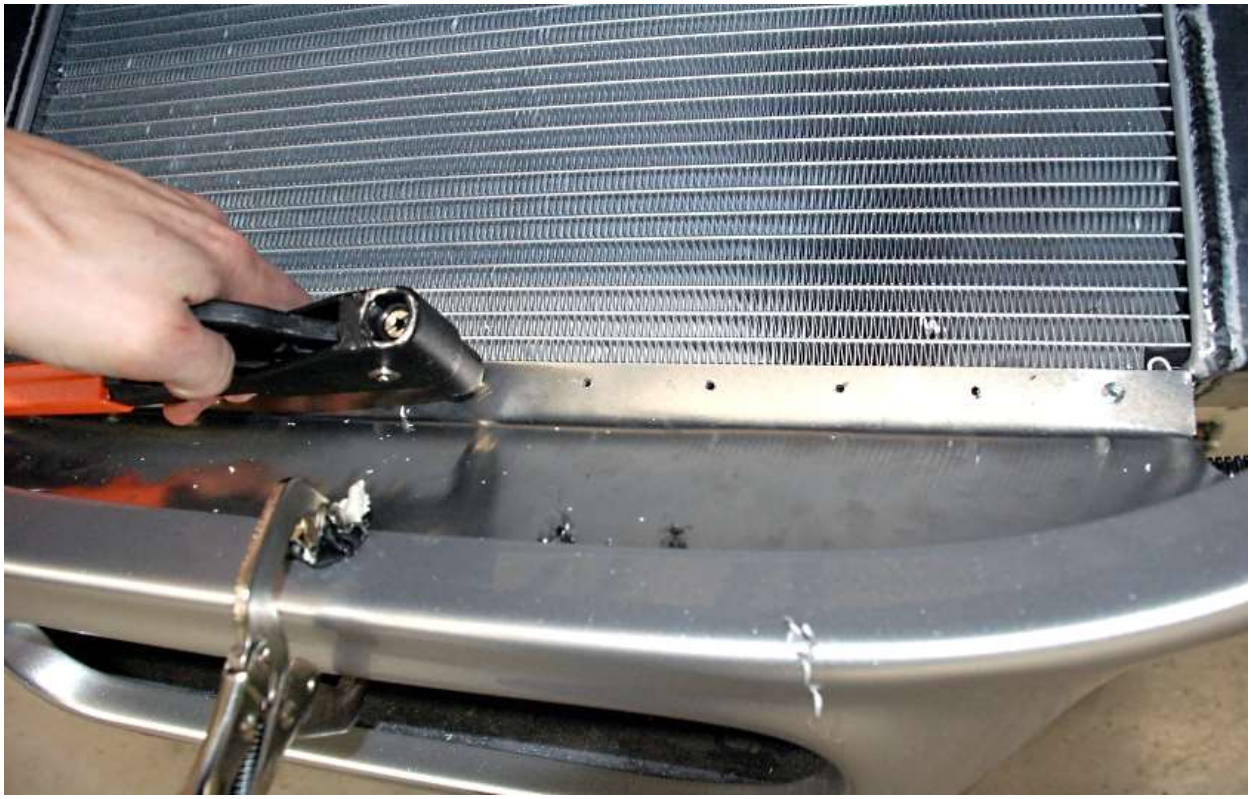
The radiator and its plumbing were installed before the body was mounted. The radiator is being held up at the bottom by a couple of zip ties through a quick jack bumper hole.

Use a floor jack under the radiator to hold it in place.
Cut and remove the zip ties.
Mark the radiator floor piece for either screws or, rivets for a cleaner look (attach every 2” if using rivets).

Pass the radiator floor piece through the nose.

Position the radiator floor aluminum so that it goes under the body lip and goes across to the bottom of the radiator. Clamp the floor piece to the nose.

Attach the radiator floor piece to the bottom of the radiator with a couple of self-tapping screws on the marks or use a couple of clamps.



Drill, silicone and rivet the radiator floor aluminum to the bottom radiator lip.

Silicone and rivet the aluminum to the nose lip using three $^{3}/_{16}$" rivets.

Pass the radiator sidepieces through the nose and put them on their respective sides.

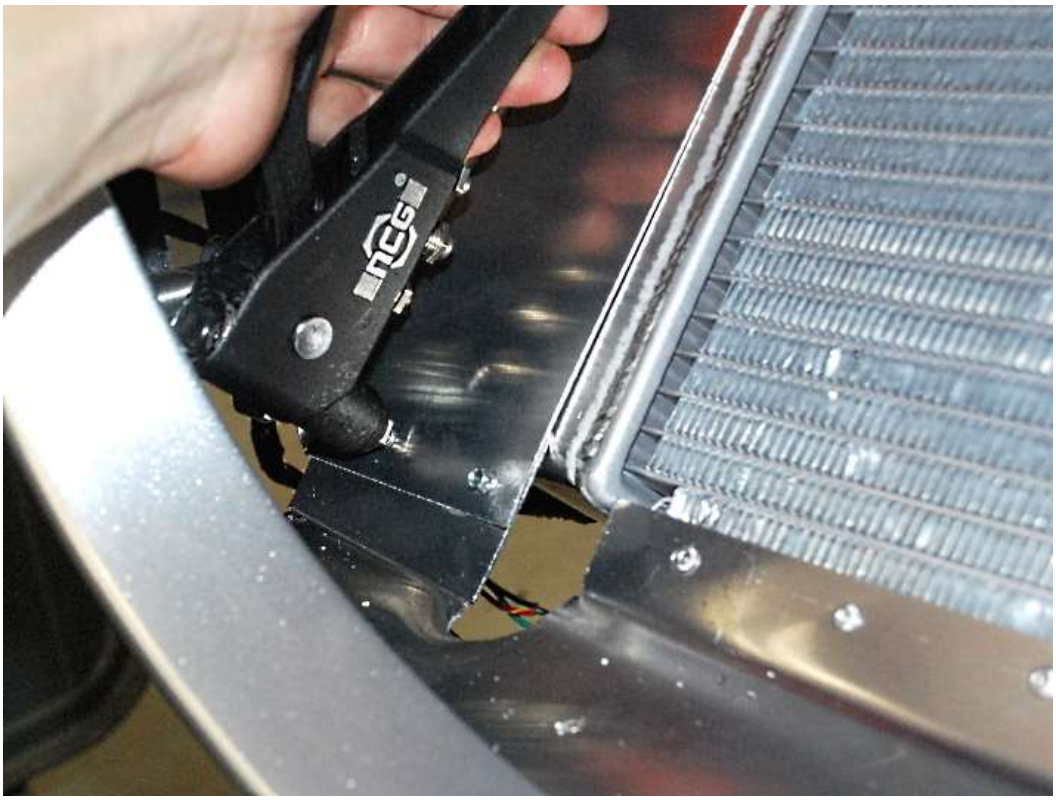
- Trimming aluminum may be necessary if you use the press-on rubber bulb seal weather-stripping.

Line up the edge of the radiator fins with the edge of the side aluminum and attach the piece to the ¾" tube using a self-tapping screw.

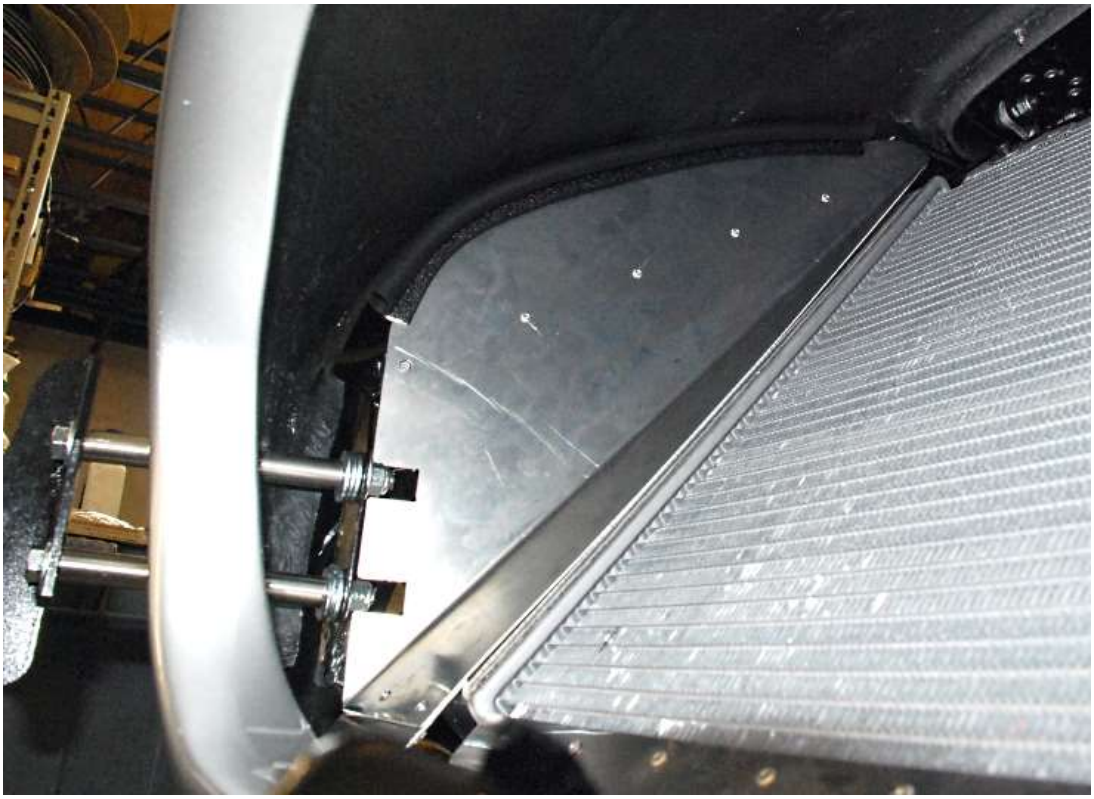
From the backside of the panel, mark the location of the ¾" tube.

- If using the press on bulb weatherstrip, make sure there is ⅜"-½" of gap between the edge of the panel and the body.

Remove the side panel then measure, mark, drill rivet locations where the ¾" tube is located and press on the bulb weatherstrip.



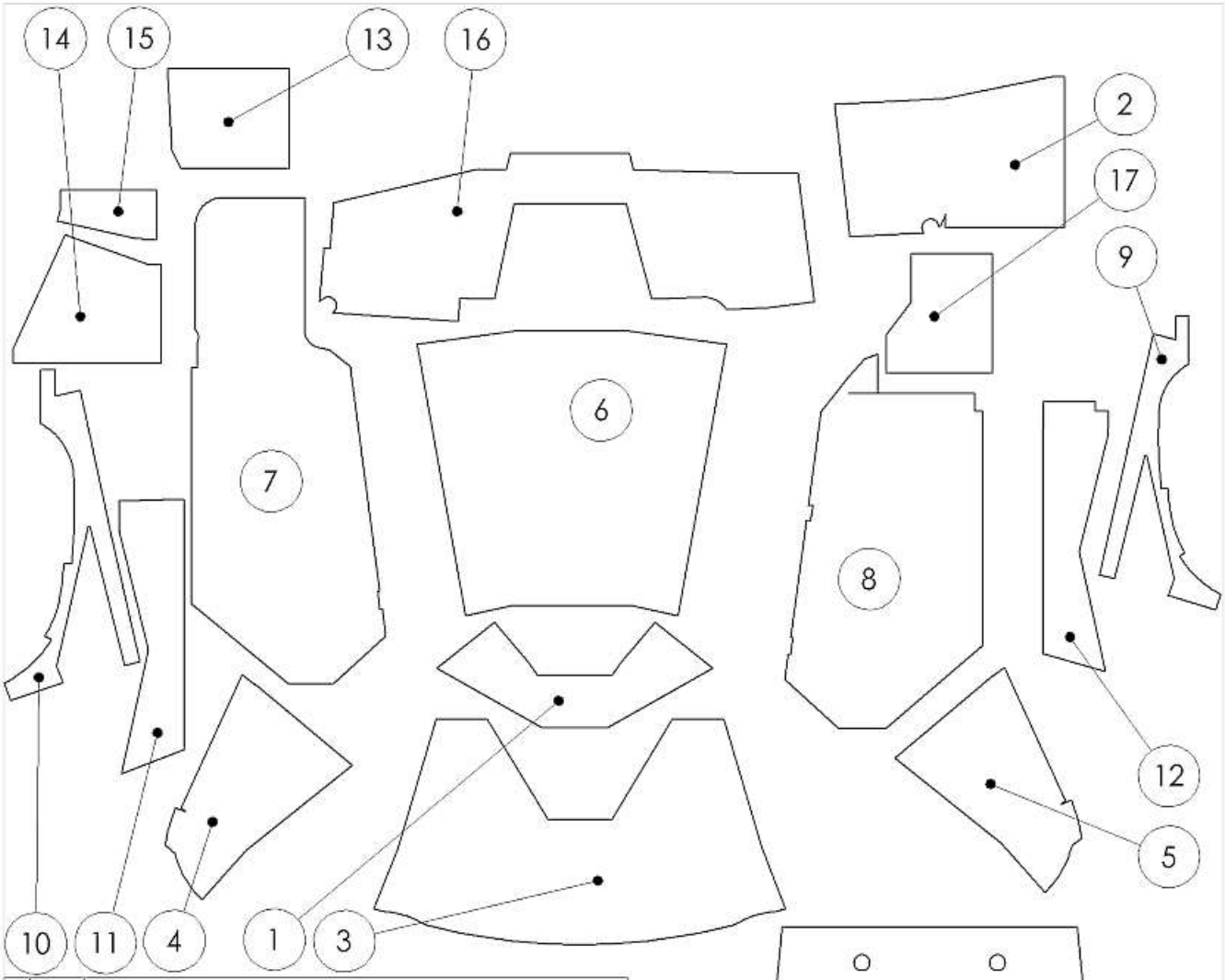
Reinsert the side panel then silicone and rivet the panel to the ¾” tube and the radiator floor aluminum.



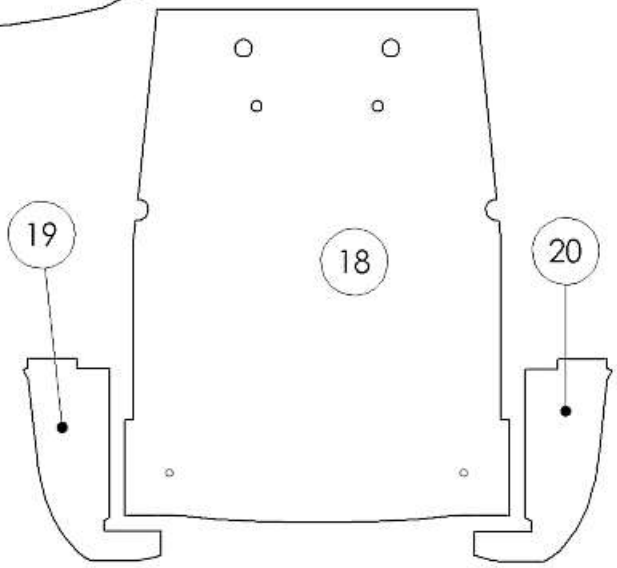
Repeat this procedure for the driver side panel.

Carpet

- Razor knife, silicone, caulking gun, spray glue, brake cleaner or acetone.
- Interior trim/carpet
- The adhesive used to hold the carpet down is the same as we used on the dash pad. 3M® Super77™ or Super90™ work best.



1	15051	U-JOINT COVER CARPET
2	15053	RIGHT SIDE OUTSIDE/FRONT FOOTBOX WALL CARPET
3	15054	COCKPIT REAR WALL BEHIND SEATS CARPET
4	15055	REAR WALL OUTER 1/4 LEFT SIDE CARPET
5	15056	REAR WALL OUTER 1/4 RIGHT SIDE CARPET
6	15057	TRANSMISSION TUNNEL TOP/WALLS CARPET
7	15058	COCKPIT FLOOR LEFT SIDE CARPET
8	15059	COCKPIT FLOOR RIGHT SIDE CARPET
9	15060	UNDER DOOR TOP RIGHT SIDE CARPET
10	15061	UNDER DOOR TOP LEFT SIDE CARPET
11	15062	UNDER DOOR LEFT SIDE CARPET
12	15063	UNDER DOOR RIGHT SIDE CARPET
13	16731	LEFT FOOTBOX FRONT CARPET
14	16732	LEFT FOOTBOX OUTSIDE REAR CARPET
15	16733	LEFT FOOTBOX OUTSIDE FRONT CARPET
16	15066	LEFT INSIDE/MIDDLE/RIGHT INSIDE FOOTBOX WALL CARPET
17	15067	RIGHT SIDE, FOOTBOX FLOOR CARPET
18	16672	TRUNK CARPET
19	16685	LEFT TRUNK SIDE CARPET
20	16686	RIGHT TRUNK SIDE CARPET



MK 4 ROADSTER

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

MATERIAL: CARPET

FINISH:

USED ON

APPLICATION

PRINTED: 9/19/2019

Factory Five Racing, Inc.

MK 4 ROADSTER CARPET SET

	NAME	DATE
DRAWN	JI	1/15/10

COMMENTS:

SIZE A | DWG. NO. 15049 | REV. G

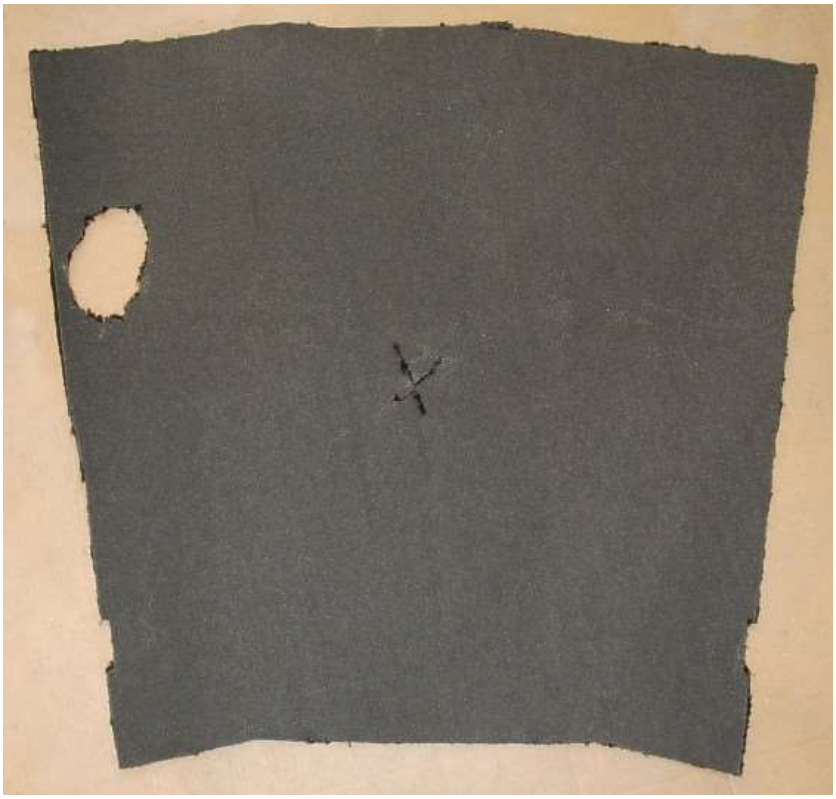
SCALE:1:18 | WEIGHT: | SHEET 1 OF 1

Wipe down the bare aluminum with acetone or brake cleaner for good adhesion.

Double check the aluminum edges and corners for any areas that look like they are not sealed. Run a small bead of silicone in these corners, seams and around the slots where the seat harness mounts poke through.

Start with the large rear cockpit wall of carpet. Position it before gluing so you understand where it will go then, apply the adhesive and glue it into position.

The cockpit rear corners go on next. Be very careful spraying the adhesive once some carpet is mounted. Guard the carpet with masking tape or cardboard.



Test fit the rear and main tunnel covers. While you are fitting cut the handle opening for the e-brake and shifter.

Glues down the tunnel top.

The tunnel rear section is slightly oversized to make sure it can cover small variances in the way the other pieces lay down. Trim it for a perfect fit then glue it in place.

Fit and glue the right outside footbox wall carpet section. The carpet tucks in behind the footbox protection tube. Taping off the tube helps prevent getting the adhesive on it.

Fit and glue the left side footbox outer carpet section. This piece also tucks behind the footbox tubing.

Fit and glue the tunnel/firewall section of carpet.

Fit and glue the lower floor sections.

Fit and glue the under-door piece.

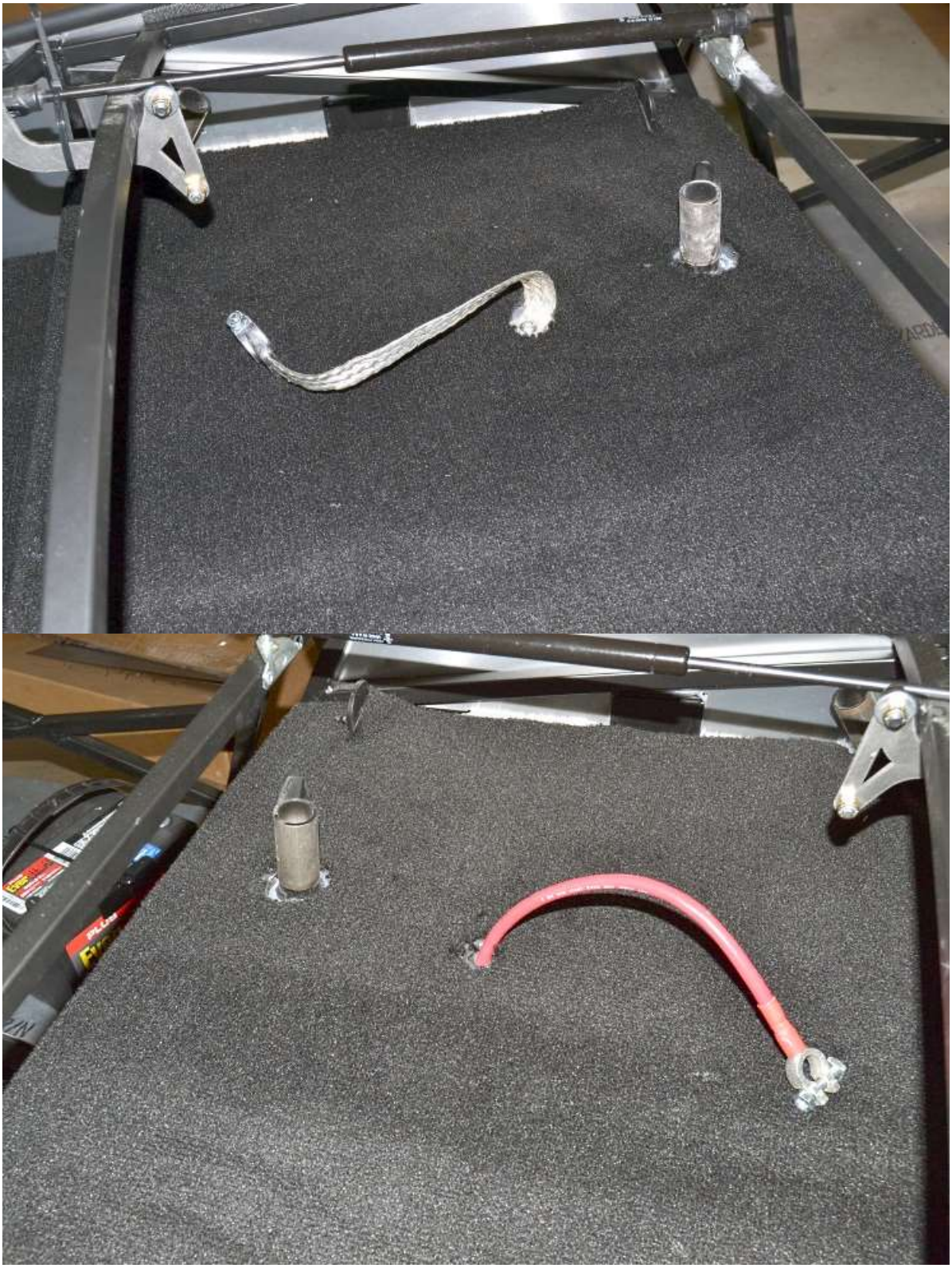
Install the under door top piece along with the push on weatherstrip.

The floors are next. They may also need a slight trim for the best fit. Glue them down and vacuum the carpet prior to the seats going in.

Install the trunk last, tape the aluminum side walls, fuel strap and rollbar mounts so they do not get spray glued.
Remove the battery.

Start at the back of the frame poke the right-side fuel tank strap mount through the hole.

Line up the notches with the ¾” tubes and work forward.



Pull the battery cables through the holes.

Pull the license plate wires up next to the right side rear rollbar leg.

Seats Harness lap belt

🛠 ¾” wrench, ¾” socket, ½” drill bit, drill, ratchet
🚘 Seat Harness/Fasteners

Unpack the seat harnesses and hardware.

Drill through the inner lap belt mount into the tunnel with a ½ in. bit.

Bolt the lap harness in position with the inner most nut inside the transmission tunnel.

Emergency Brake Boot

🛠 $_1/_8$" drill bit, drill, Philips head screwdriver
Interior Trim/Carpet

Unpack the e-brake boot and a few of trim screws.

Fit the boot over the handle and check the handle actuation. When you are in a position where the boot clears the handle movement drill through the material into the tunnel and screw it into place.

Seat Final Install

Drill back up through your seat mounting holes to put holes through the carpet and re-mount the seats.

Seat Harness Shoulder Belts

🛠 Razor knife, ¾” wrench, ¾” socket, ½” drill bit, drill, ratchet
🚘 Seat Harness/Fasteners, Misc. electrical components

Use some of the serrated grommeting from the electrical assembly to cover the edge where the harness passes through.

Cut the carpet with a single slit to allow the harness to pass through.

Remove the mounting tab and slider from the harness.

Slide the harness through the rear wall from the front. The shoulder harnesses are side specific so make sure you have the sides correct.

Replace the slider and mounting tab and bolt the tab to the chassis.

Adjust the harnesses to where they fit you comfortably.

Shifter Handle and Boot

🛠 ½" wrench, 1/8" drill bit, drill, Philips head screwdriver, marker, thread lock

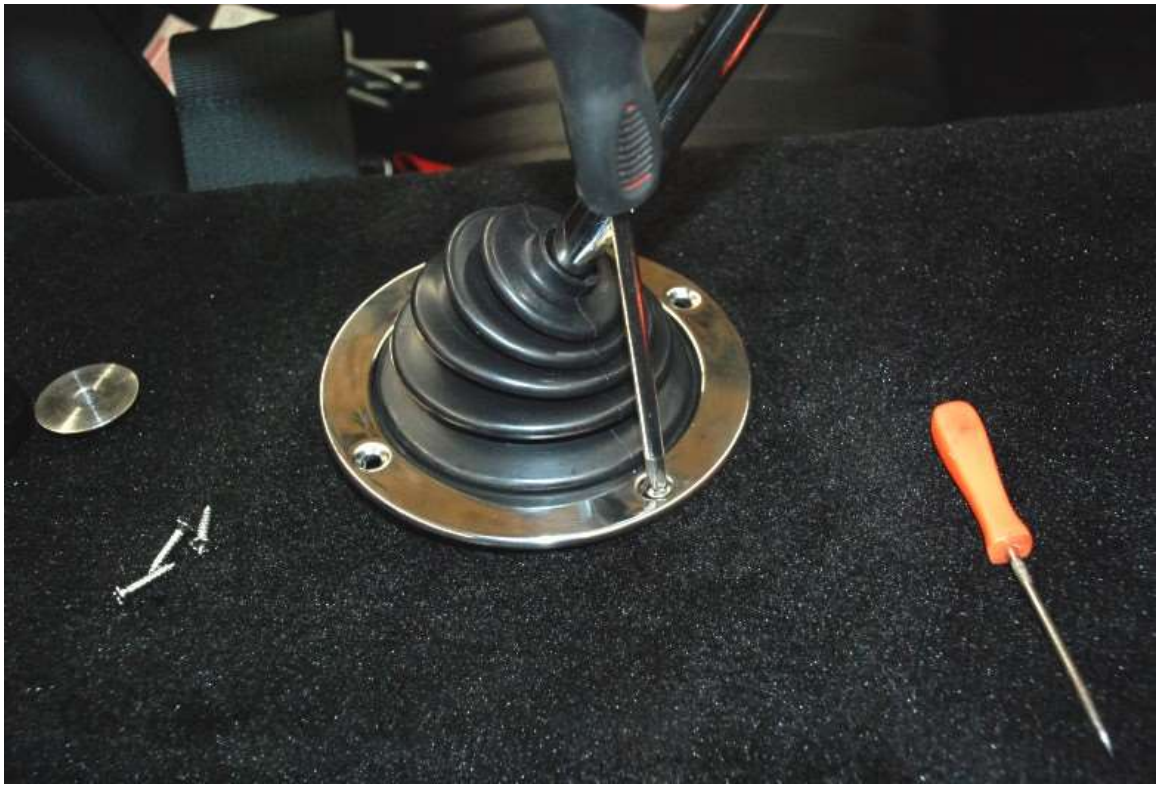
- Shifter handle components

Unpack the shift handle and bolt it to the transmission. These bolts have a tendency to rattle loose so use a little thread locker.

Push the boot and trim rind down over the handle so it sits flush on the tunnel.

Using a silver marker or white paint marker, mark your screw holes on the tunnel.

Remove the boot and drill $_1/_8$" holes in the spots you marked.



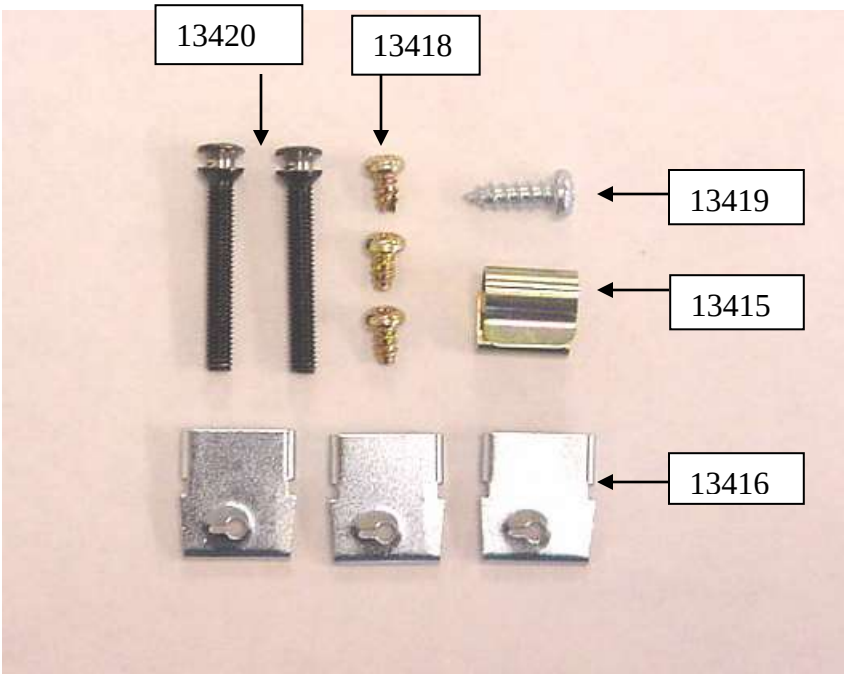
Re-install the boot and screw down to the tunnel with the countersunk screws. A small screwdriver can help to locate the holes.

Screw the two-piece knob onto the shift handle and tighten so the shift pattern is in the correct orientation.

Headlights

🛠 Philips head screwdriver
🚘 Headlight components

Unpack the headlight mounting assembly.



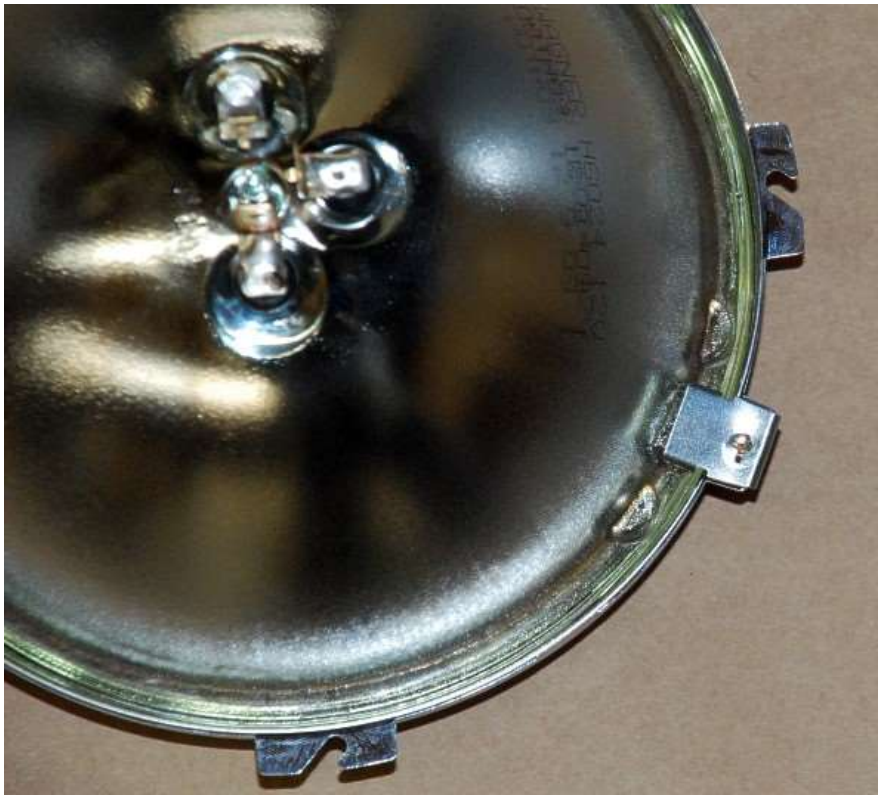
Headlight fasteners.

Screw the adjuster screws about halfway into the buckets.

Push the grommet into the side of the bucket.

Run the light plug harness through from the inside

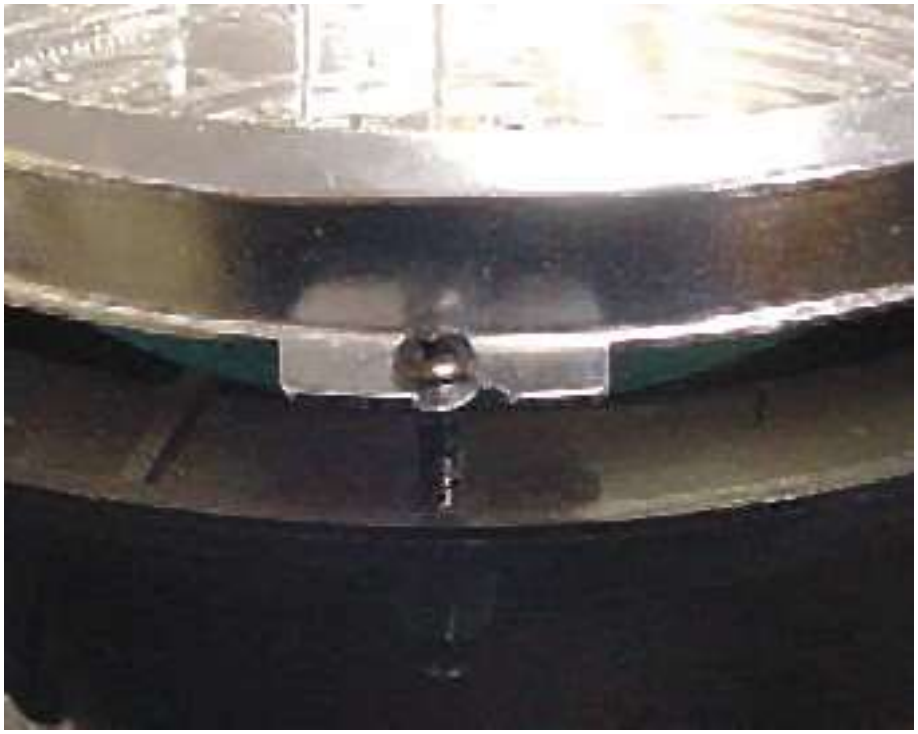
Line up the headlight with the bucket to get the proper orientation. The bottom of the bucket is the only screw boss that comes in from the side and the writing on the headlight should be right side up.



Screw the mounting flange onto the light with the 3 small tabs and small screws. The tabs are bent to fit around the bosses on the light.

Put the gasket on the bucket with the adjuster bosses poking through the 2 larger holes.

Screw the bucket to the body using the screw that came in the mounting assembly.



Plug the light into the connector and mount the bulb to the bucket. The slotted parts of the mounting flange go onto the adjusting screws between the screw head and flange.

Push the spring clip onto the boss near the bottom of the bucket.

Mount the trim ring hooking it over the bucket on the top and screwing it into the bottom using the countersunk screw.

Turn Signals

- 🛠 $^{5}/_{16}$" deep socket, ratchet
- 🚘 Amber front turn signal lights

Mount the turn signals to the body being careful not to over tighten the locknuts.

Tail lights

🛠 $^{5}/_{16}$" deep socket, ratchet
🚘 Red rear lights

Mount the taillights, also being careful with the mounting hardware.

Gas Cap

- 🛠 Philips head screwdriver
- 🚘 Aston Lemans Cap

Unpack the fuel cap and mounting hardware.

Put the gasket on the bottom surface of the cap.

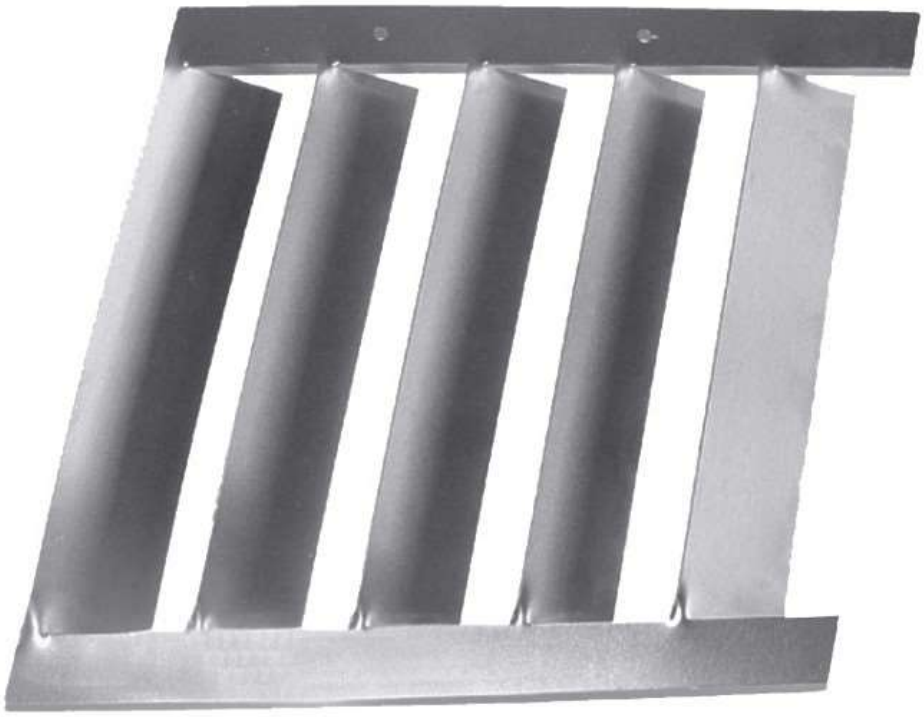
Set the cap on the body and screw in using 5 of the countersunk screws. Leave the inside most forward hole open.

The one remaining cap fastener is a longer screw and nut used for the ground strap, screw it in from the top then put the ground strap washer and nut on from underneath.

Side Louvers

🛠 Silicone, caulking gun, duct tape
🚘 Side Louvers

Unpack the side louvers.



Holding the top and bottom flanges, bend the fins in so they are roughly at a 45° angle.

Hold them up to the body to see how they fit. They are designed to allow air to exit the engine bay so the flanges point from the rear edge in.

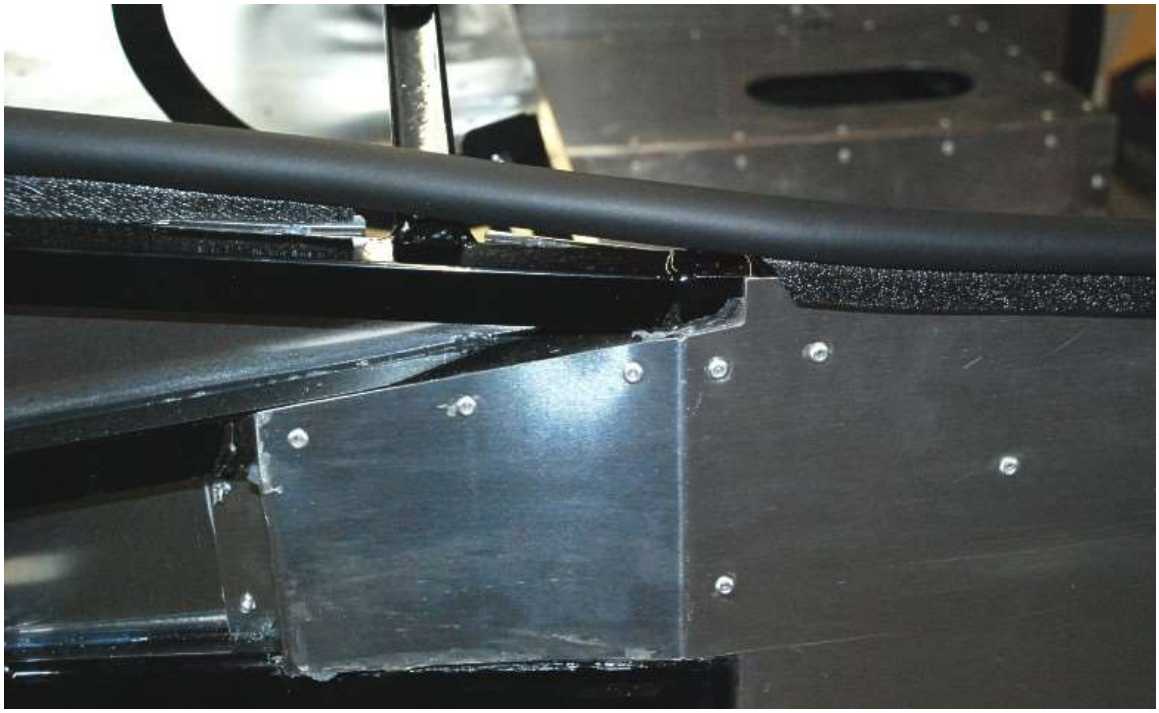
Apply silicone down the top and bottom flange on the side facing the body.

Line up the louvers and tape them in place to hold them until the silicone dries.

Weatherstripping

- Razor knife, tin snips
- Secondary body fasteners

If you haven't already run the bulb seal up the sides and rear of the trunk and bolt the trunk hinges back in place and tighten.



Cut out a section of the C channel where the hoop comes across to allow one piece to run the whole way.

If you removed any of the other weatherstrip on the firewall or hood support tubes replace it now.

When you are ready to mount the body, unpack the expanding foam and run a small section up the outside of each footbox just forward of the door hinge.

Final Body Mounting

Fit the body back on the chassis. Be very careful with the sides and slowly work it down into position. Pull the sides out around the chassis and make sure the body covers the rear cockpit wall and top of the dash without pulling the material off either.

Quick Jack Mounting

Re-mount the body in the rear with the quick jacks.

Re-mount the nose with the front quick jacks.

Hood mounting

Rivet the scoop back in position on the hood.

Re-install the hood latch plates and replace the bumpers you used before on the body to line up the hood.

Re-Install the hood and latches.

Rollbar mounting

- A popular option are the Roll bar grommets. If installing them, do it now.

Re-mount the roll bar through the body. Make sure that the rear leg is in the correct orientation so that your holes will line up.

Door and Latch mount

Reattach the doors and latches.

Once you are happy with the door fit install the covers on the door latches.

Interior Rearview Mirror

🛠 Philips head screwdriver, drill, 1/16", 1/8", 3/16" drill bits, marker, measuring tape
🚘 Rearview mirrors/fasteners

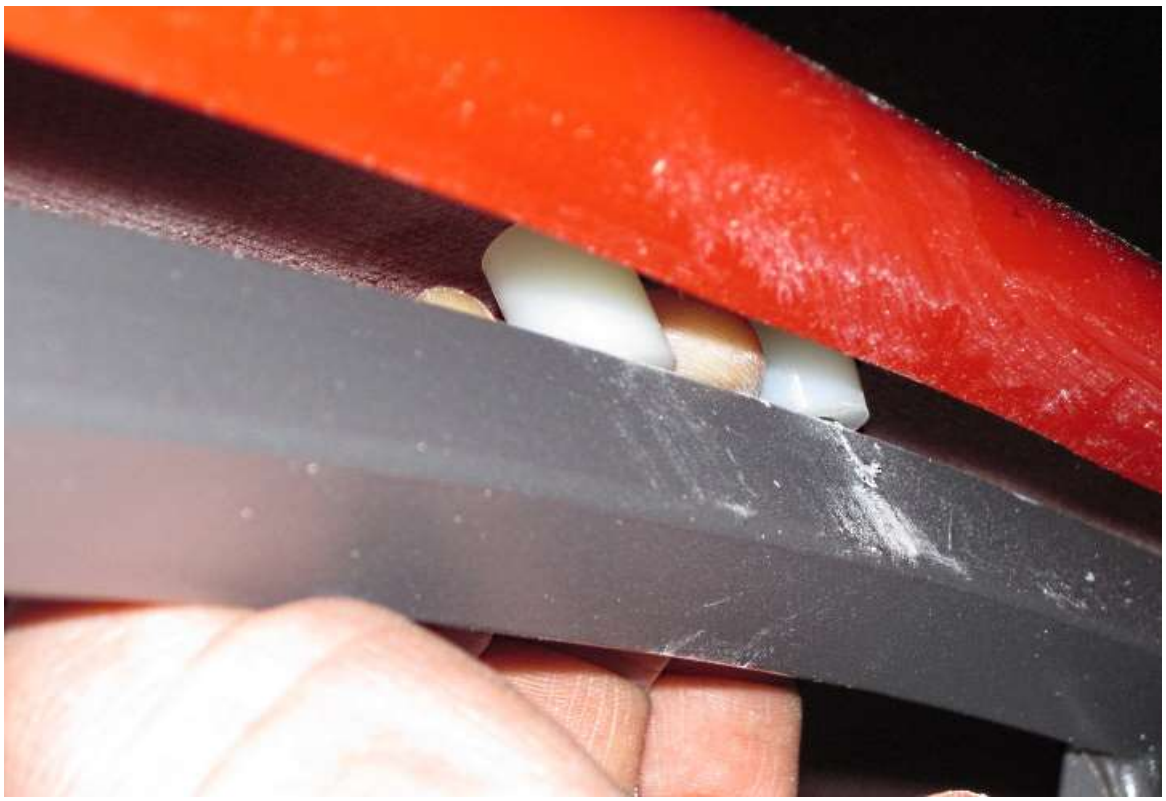
Use a tape measure to find the center of the body by measuring between the inside front door corner areas and mark this on the body.

Use a tape measure to measure in from the body lip to roughly the center of the dash tube.

On top of the boy measure in and mark the body for the center tube location.

Line up the rearview mirror with the center mark and mark the holes in the body.

Use a 1/16" drill bit and slowly (so the bit doesn't walk off the tube) drill through the body into the tube at the mirror hole locations.
Follow this with a 1/8" drill bit into the tube.
Use the 3/16" drill bit next but **only** drill through the body.



Put the plastic spacers between the dash tube and the body so the screws can go through them.

Put the mirror screws through the mirror, body and spacers and screw them into the dash tube.

Windshield Mounting

Re-position the windshield.

Make sure that the windshield does not hit the body on any side, if necessary, file the hole bigger.

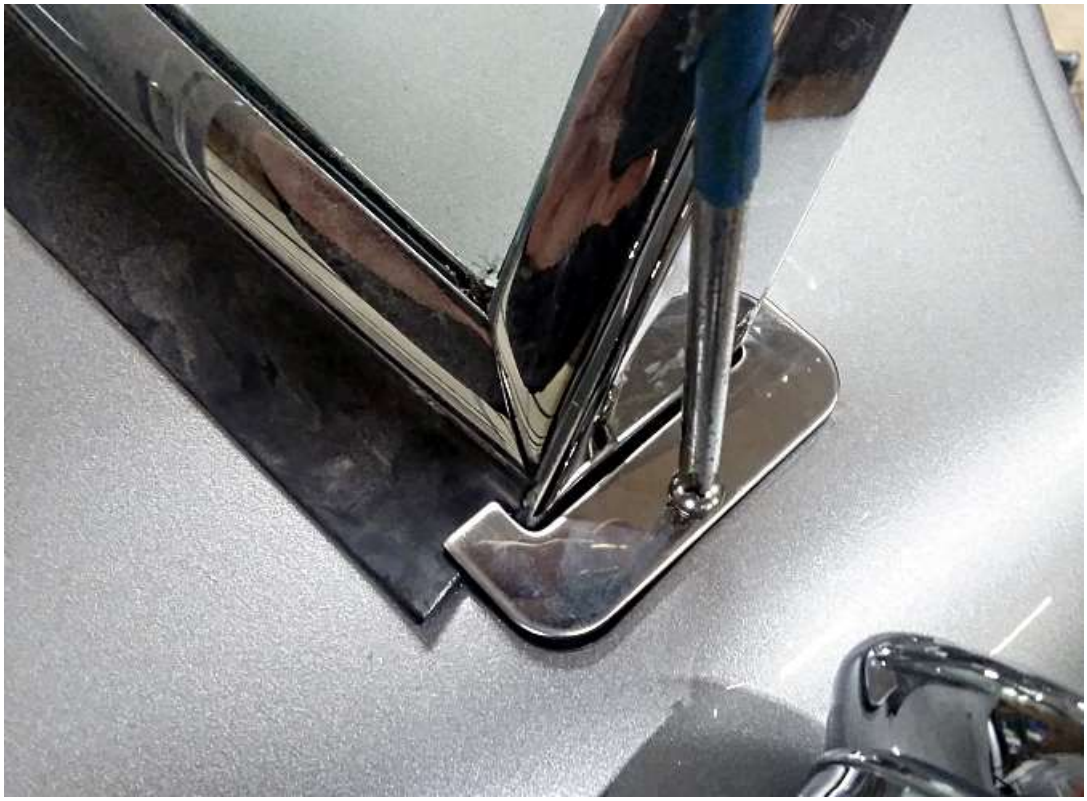
Put the rubber base plate gasket around the side bar and make sure the rubber does not go up onto the windshield bottom wipe. Trim the base plate gasket if necessary.

From the top, slide the base plate down to the body.

Make sure the base plate sits flat on the gasket, if it hits the side bar on the ends, file and angle on the end of the base plate.

Use a 3/32" drill bit through the base plate holes for the mounting screws.

Remove the base plate and silicone in the slot around the windshield.



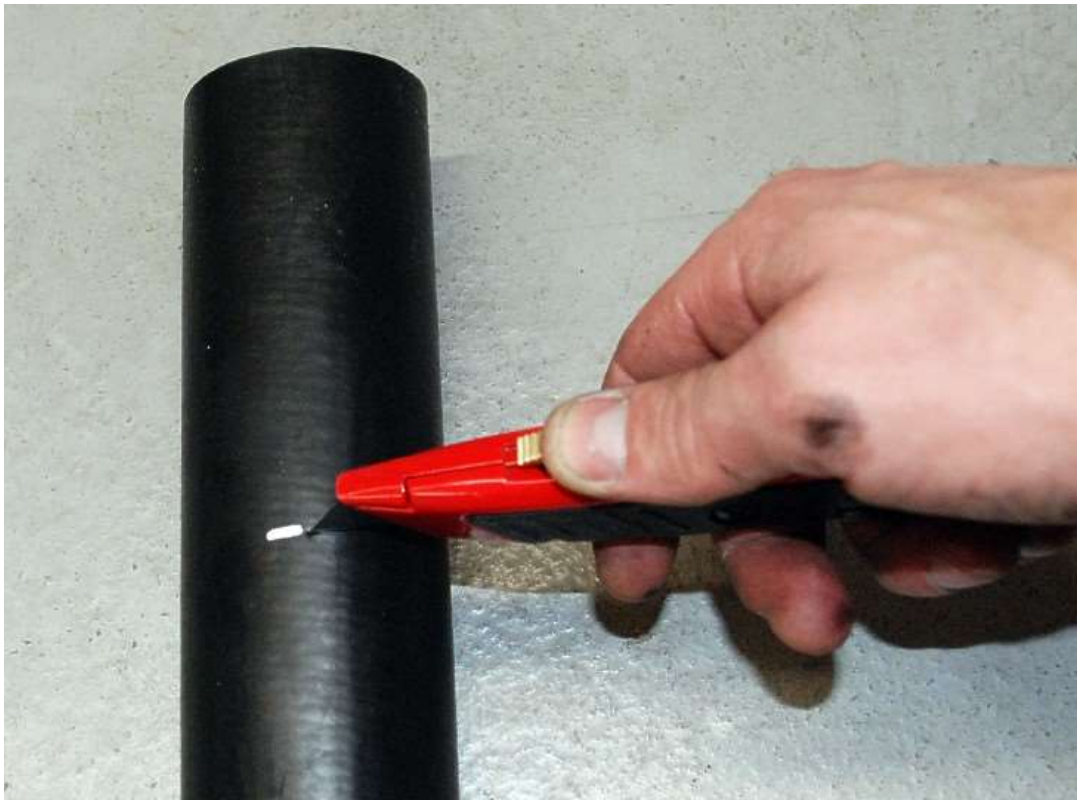
Remount and screw the base plate to the body.

Fuel Filler Neck

🛠 Razor knife, ⅜” socket, ratchet, 3/16” drill bit, drill
🚘 Aston Lemans Cap components

Ground the fuel filler strap to the chassis using the screw that came in the cap hardware.

This wire prevents any static charge build-up and must be used.



Unpack the fuel filler neck hose and cut a 5” long section out of one end.

Install the hose between the filler neck and gas cap with the clamps that came in the cap hardware.

Screw the plastic gas cap into the Aston Lemans style cap.

Fuel tank access covers

🛠 $^1/_8$" drill bit, drill, rivet gun, silicone, caulking gun

🚗 Secondary body fasteners, packaged aluminum

Silicone and install the patch panels in the trunk that cover the fuel sender and pickup access holes.

Final Trunk Mounting

- Tin snips, 3/16" hex key
- Secondary body fasteners

Push the side mount weatherstrip on the trunk opening starting at the bottom next to the latch pin hole and working all the way around just leaving a small gap for the head of the latch pin bolt.

Re-mount the license plate light and trunk handle.

Re-mount the trunk to the hinges and re install the latch pin.

Side Mirror

- 🛠 $^{5}/_{16}$" wrench
- 🚘 Rearview mirrors/fasteners.
- ✋ Only a driver side mirror is included with the kit. A passenger side one is available if desired.

Put the gasket on the bottom of the mirror so the holes line up with the threaded hole locations.

From the underside of the body, use a $^{5}/_{16}$" socket to attach the mirror to the body.

Light wiring

🛠 Wire strippers, wire crimpers, chassis harness instructions

- Headlight components, amber front turn signal lights, rear lights, license plate light, electrical system completion components

Wire in the headlights to the chassis harness. On the headlight, there are three wires, black is ground, white is high beam and the red is low beam.

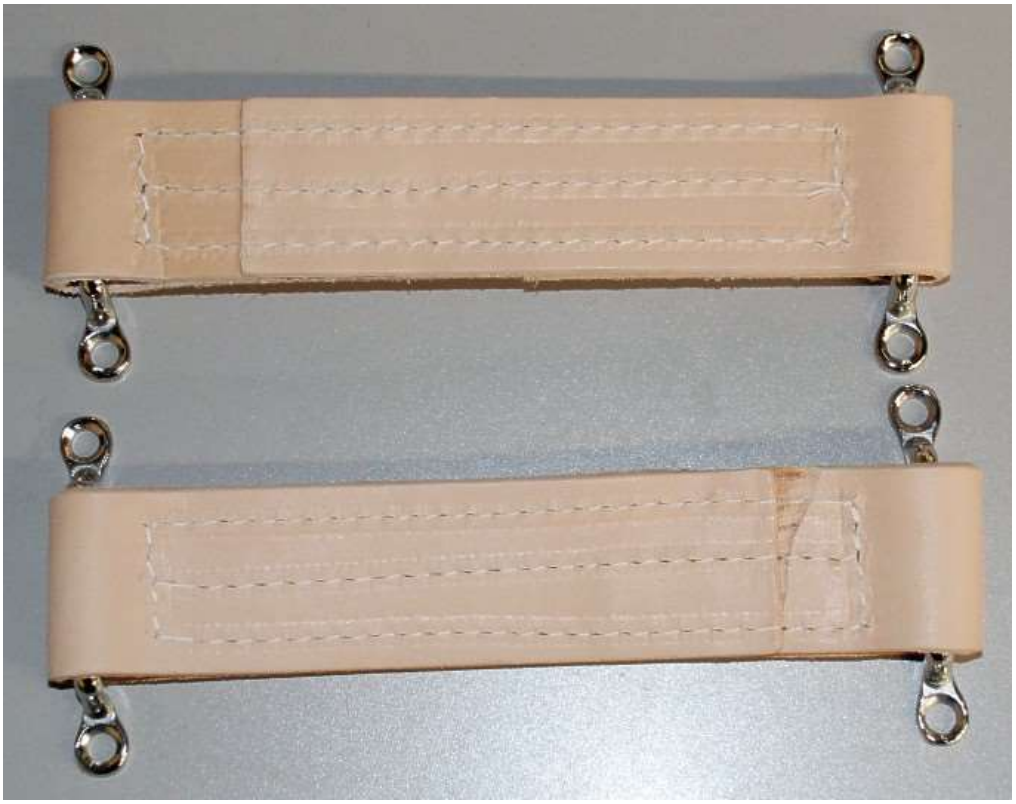
Wire the turn signals up to the chassis harness. On the light, the red wire is the dim light and the green wire is the bright light and the brass ring is the ground.

Wire the taillights according to the wiring harness instructions. We normally run the upper lights in the rear for brakes and the lower for turn signals.

Wire the license plate light.

Check straps

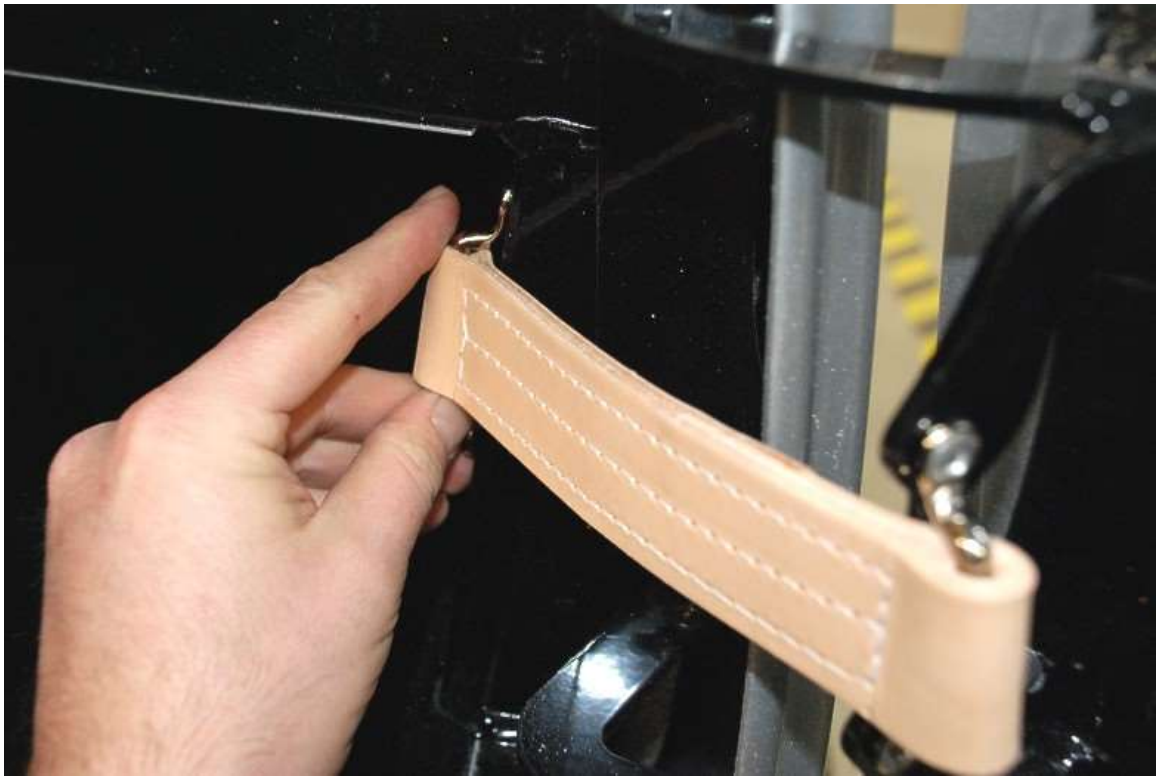
- $^{3}/_{16}$" drill bit, drill, rivet tool, marker
- Secondary body fasteners, door components



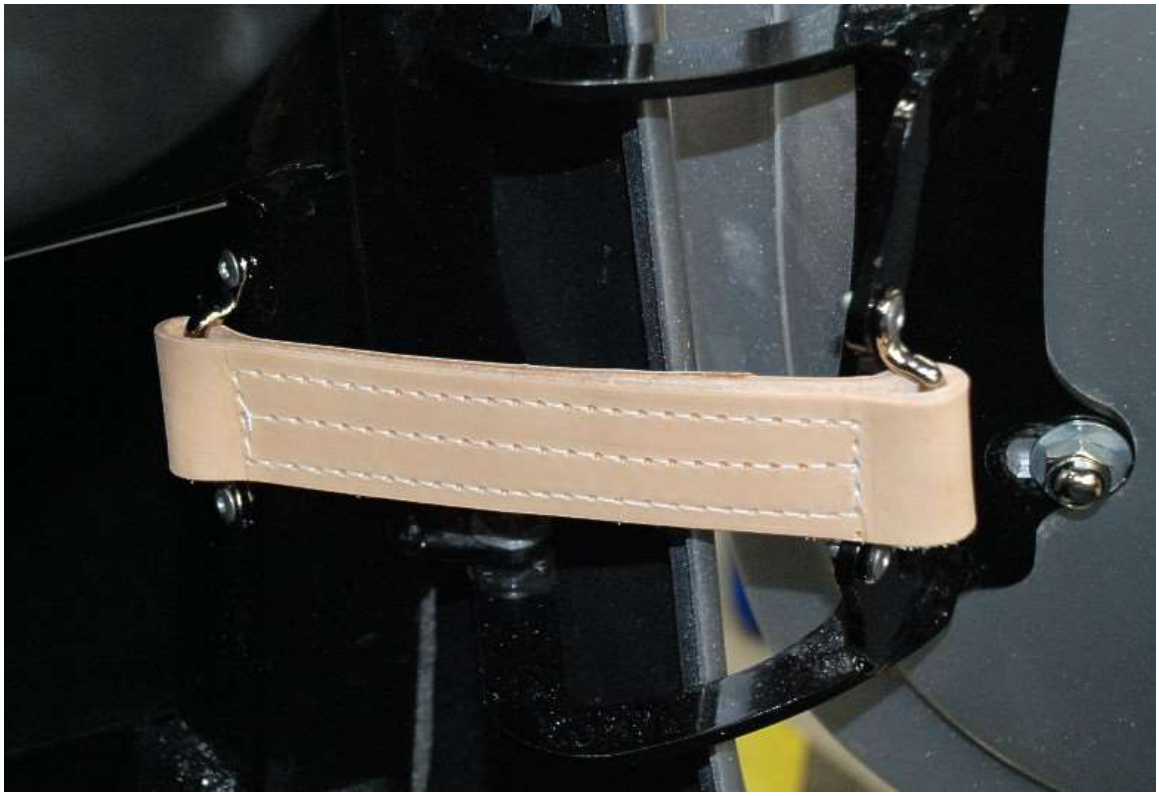
Unpack the door check-straps.

Rivet the check-strap to the door hinge using a $^{3}/_{16}$" rivet.

Open a door wide but not enough so that the door hits the body. The straps will stretch slightly over time so allow enough room for this by closing the door slightly from the maximum.



While holding the door open, pull the check strap tight and mark the location of the mount holes on the inside face of the 2”x 2” tube.



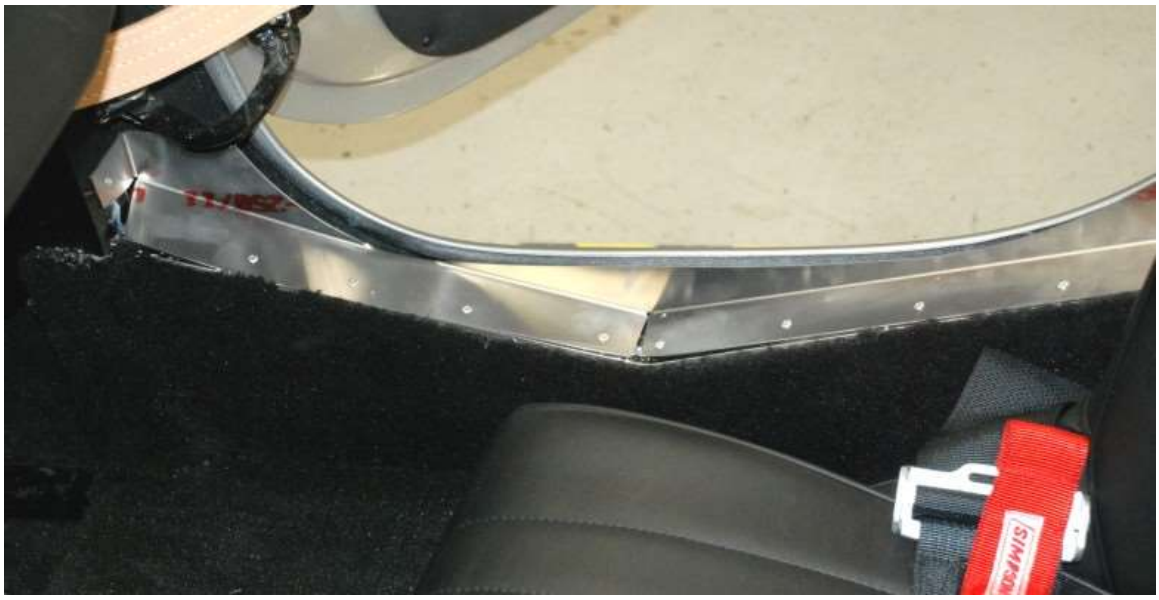
Drill $^{3}/_{16}$” holes at the marked locations and rivet the mount to the chassis.

Under door Aluminum

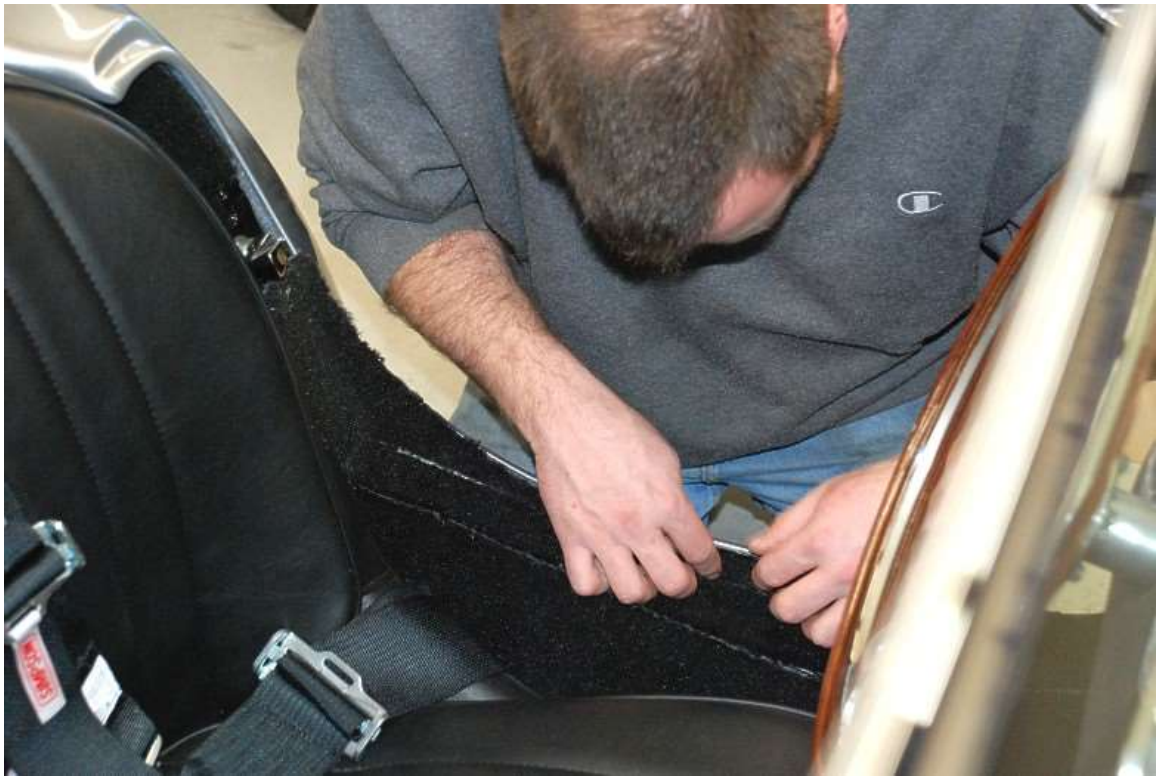
🛠 Drill, $^{1}/_{8}$” drill bit, rivet tool, silicone, caulking gun, spray glue, tin snips.

- Packaged aluminum, interior trim/carpet, secondary body fasteners

Unpack the under-door aluminum panels. They are shaped to fit around the bottom of the door with flanges to mount to the chassis.



Silicone and rivet the panels in place, it is ok if the flanges do not cover the full width of the chassis tubes. It is more important that the panel is lined up with the body under the door.



Test fit and then glue in the remaining carpet sections under the doors.

Cut a section of the large C channel weatherstrip to fit from the bottom of the door hinge to the door latch and push it in place over the body, aluminum and carpet to finish the edges off. The barb side goes towards the inside of the car.

Steering wheel center section

- WD40, 1/8" hex key
- Steering wheel/hardware, Factory Five Badge

Unwrap the steering wheel center section and push it into the steering wheel and boss, a little WD40 on the O-ring helps if it is tight.

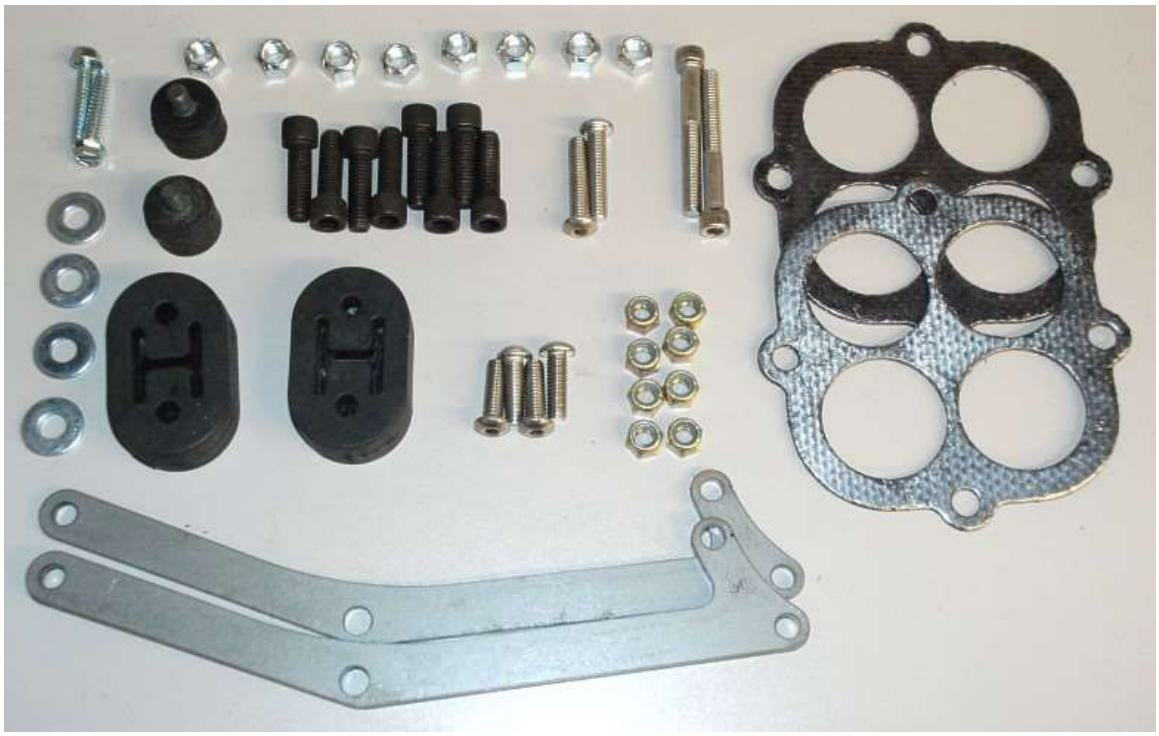
Peel the backing off the badge and stick it in the center section making sure you are aligned with the top of the steering wheel. If necessary, file any flashing off the bottom edge of the emblem so that it will fit.

With the steering wheel in the position that is most comfortable for you tighten the set screws on the collar of the upper steering bearing.

Side Exhaust

🛠 $^{3}/_{16}$”, $^{5}/_{16}$” Hex key, ⅜”, ½”, $^{9}/_{16}$” socket, ratchet, $^{9}/_{16}$” wrench, drill, $^{3}/_{16}$”, $^{5}/_{16}$” drill bits

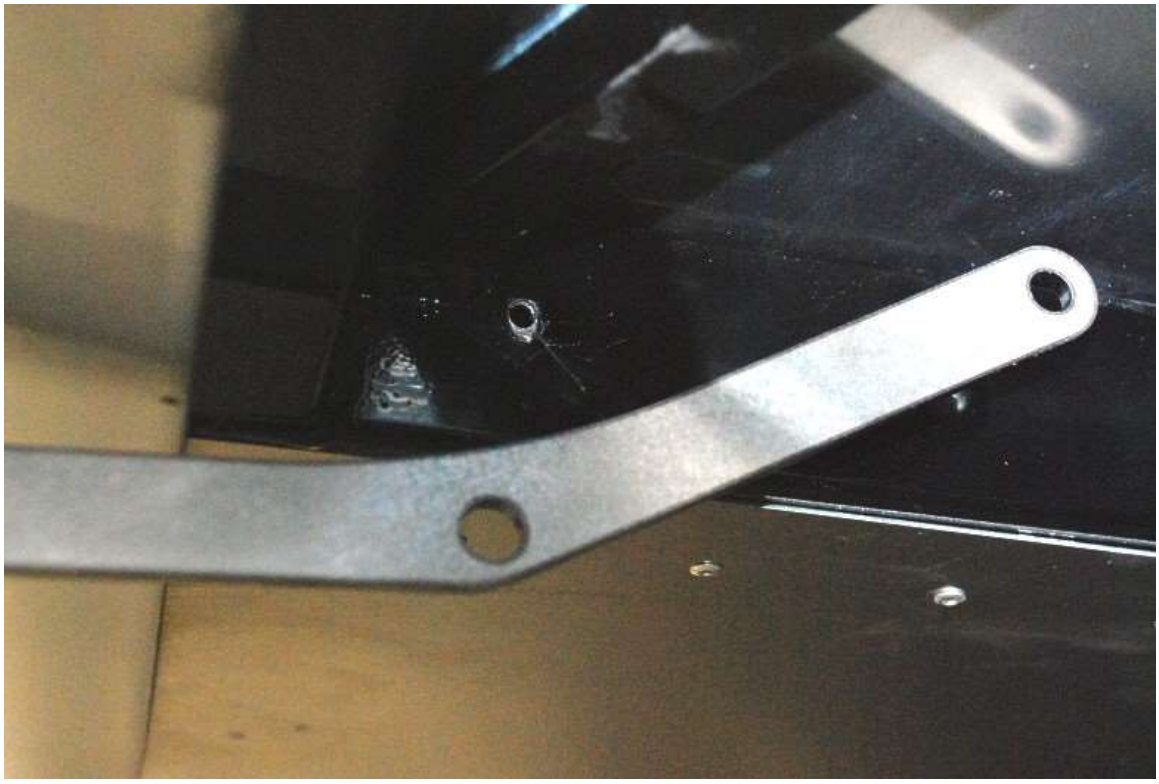
🚘 4 into 4 Side Exhaust



Unpack the hardware for mounting the side exhaust.

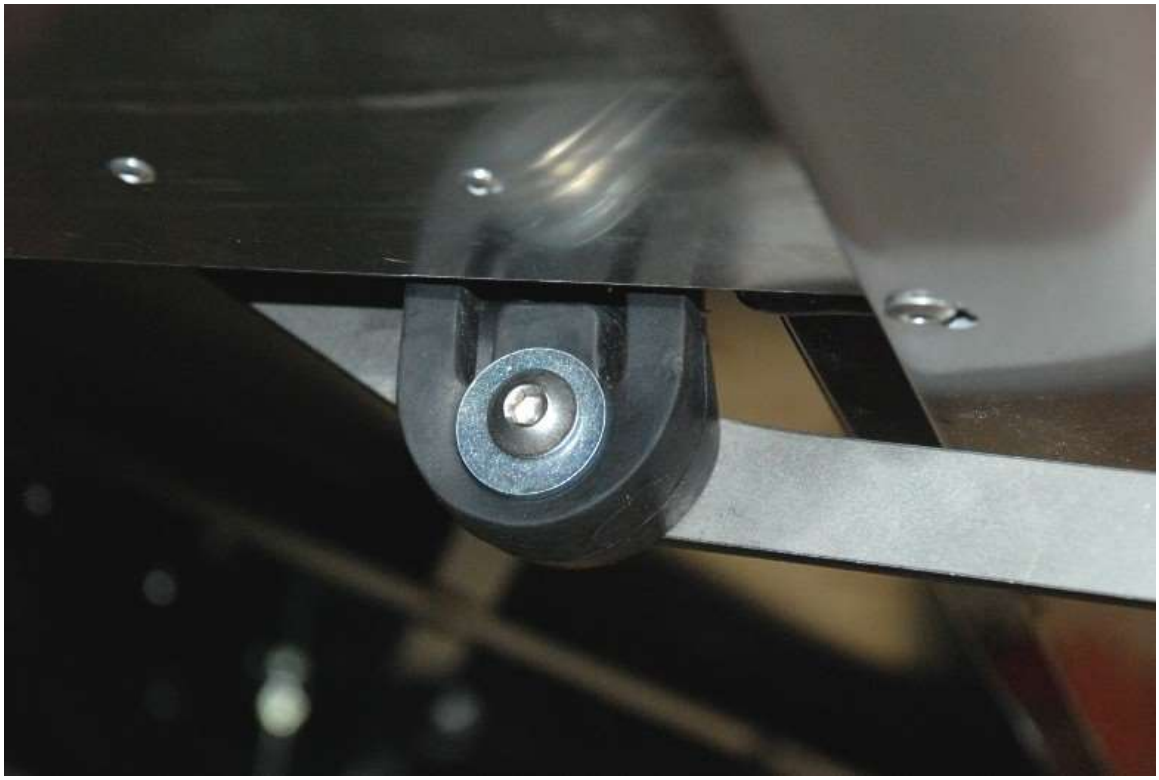
Bolt the mounting bracket to the pipe on the forward side of the bracket.

Bolt the pipe and gasket to the header or J-pipe flange with using the shorter ⅜" bolts and mechanical locknuts.



Drill a 3/16" hole in the 2"x 2" outrigger tube directly above the middle hole in the mounting bracket. You want this hole as high as you can get it while still being able to mount the rubber exhaust hanger. About ½" down from the aluminum floor.

Screw the rubber hanger onto the chassis with the sheet metal mounting screw using one of the washers between the rubber and the head of the screw.



Bolt the bottom section of the hanger to the side exhaust mounting bracket using the middle length $^{5}/_{16}$" button head bolt with a washer to keep the hanger in place.

Using the inner hole of the bracket as a guide, drill the 2"x 2" outrigger all the way through both of the tube walls and into the footbox area with a $^{5}/_{16}$" bit.

Insert the rubber standoff between the bracket and outrigger and put the nut on finger tight then run the long 5/16" bolt through from inside the footbox into the threads in the standoff.

Tighten the whole assembly together.

Aluminum Splash guards

🛠 1/8", 3/16" drill bit, drill, rivet gun, silicone, caulking gun, ¾" socket, ratchet, extension, marker

- Secondary body fasteners, packaged aluminum, front wheel and tire

Front Wheel

Put some of the press-on bulb seal around the outside edge of the aluminum front splash guards (they look like large elephant ears) where they will contact the body.

Hold the splashguards up against the rear bent lip of the engine bay “F” aluminum. Overlap the two lips.

Fit the splash guards in position. If needed, trim them to fit around the outside edge, the weatherstrip will cover the trimming.

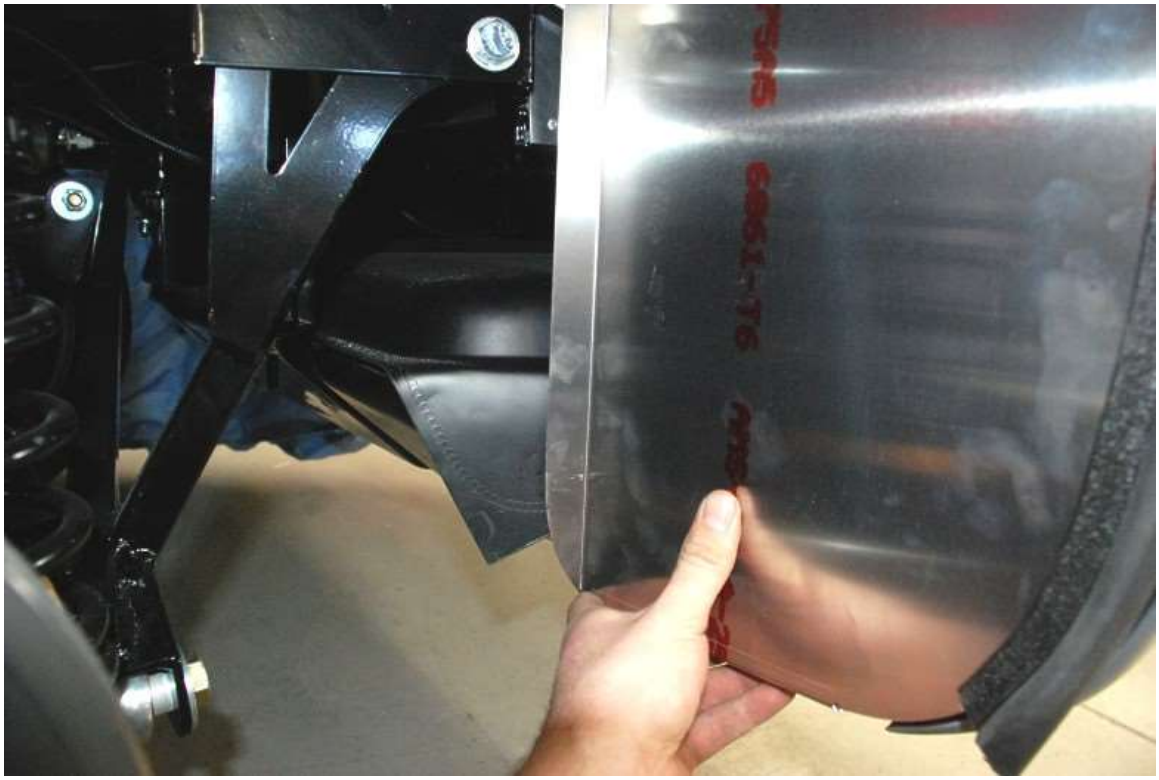
Put a wheel and tire on the car and check for aluminum clearance. If necessary, push the aluminum in and mark the inside of the body at the outer edge of the splashguards.
Remove the wheel.

Silicone and rivet the panels in place down the length of the flange.

Use one of the $^{3}/_{16}$" rivets to attach to the bottom of the fender just forward of the exhaust cut-out.

Rear Wheel

Push a piece of the bulb seal weather stripping around both rear splash guards where they will contact the body.



Fit the panels in place and trim the outside perimeter if needed. The small tab on the bottom faces towards the rear of the car and is on the bottom. The bent edge should be vertical and aligned with the trunk side pieces where they drop down, behind the quad shock mounts. It should sit on top of the ¾" vertical tube that is behind the trunk wall. You may also need to bend the flange of the gas tank down a little to get the panel in place.

Silicone and rivet the panels in place.

Bend the lower tab by hand to fit up flush with the body.

Use a long 1/8" rivet as low as possible to attach the tab to the lower fender.

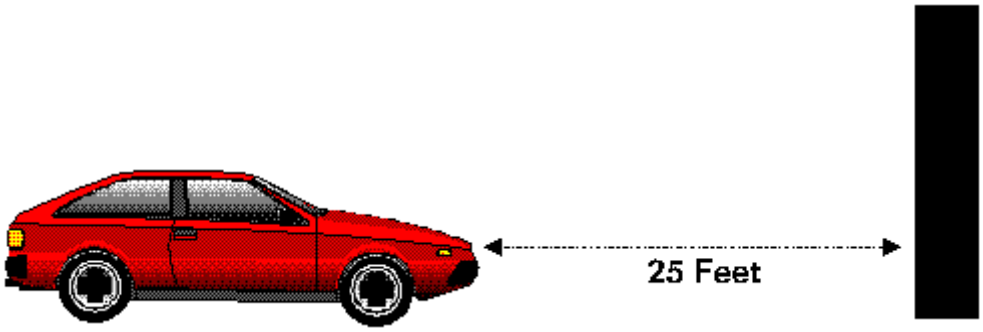
Finishing Touches

Review the Race car checklist in the appendix.

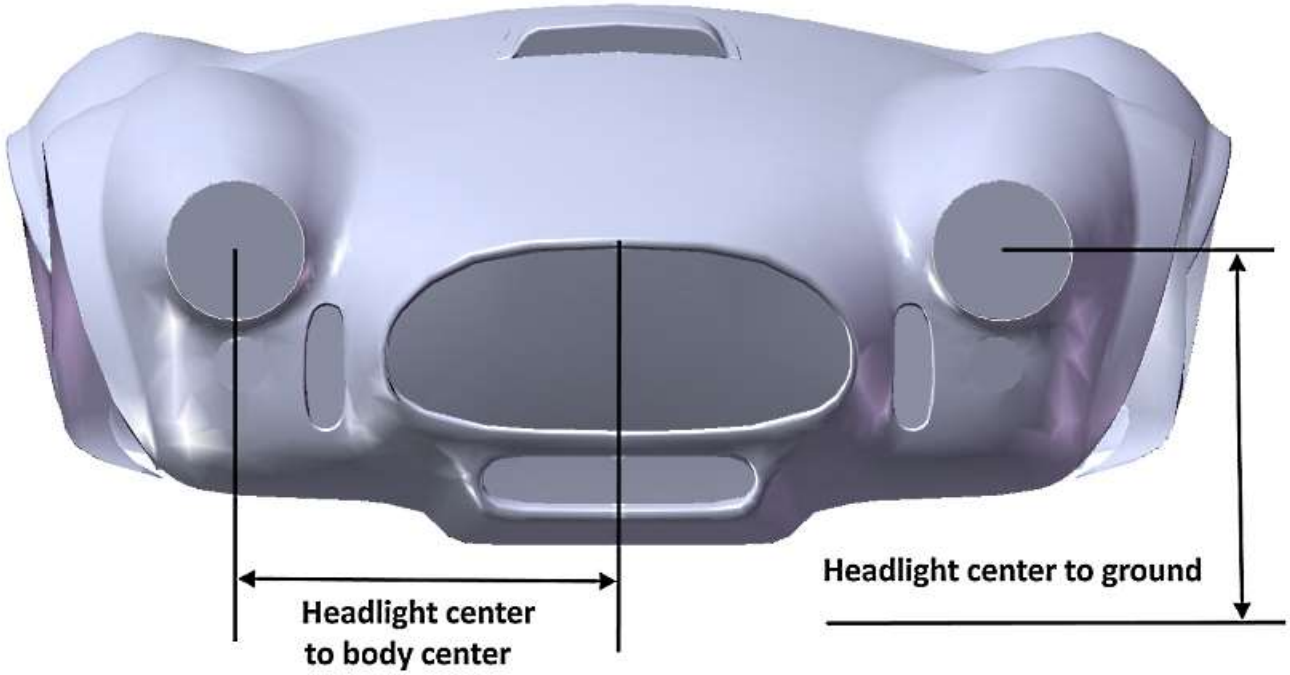
Headlight Alignment

- Masking tape, marker, tape measure
- Make sure that the car is at the correct ride height before the alignment procedure is done. Ride height should be 4½" at the front and 4½" at the back measured to the bottom of the 4" round tube with the normal number of people/weight in the car.
- It is important that the headlights are aimed properly in order for them 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.



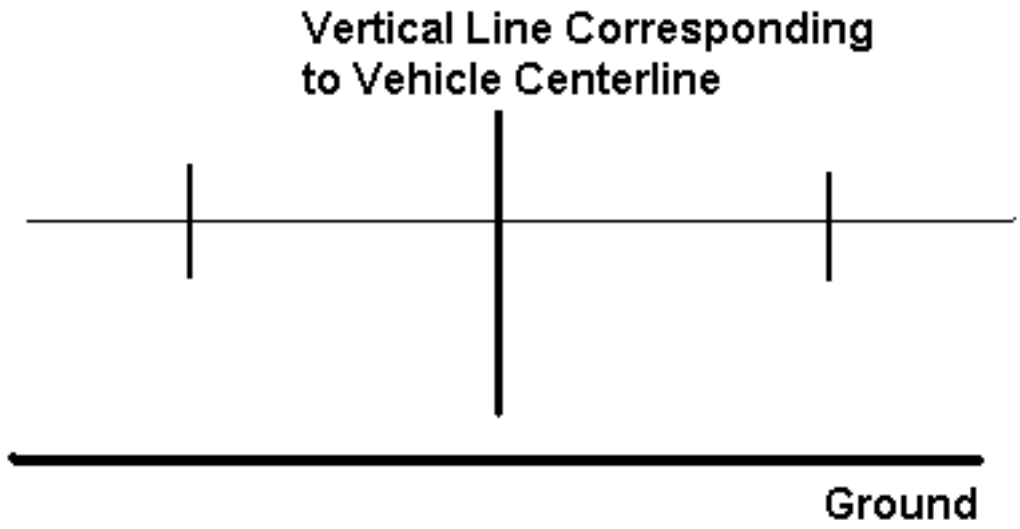
Pull the car straight back until the headlights are 25 feet from the wall.



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.

Alignment Specifications

Take your new car to an alignment shop and have the car aligned properly before hitting the track. A minor flaw in alignment can cause very "twitchy" handling. Avoid temptation and never drive a car without proper alignment.

Front

For a car using a manual steering rack or the power rack without power use the following specifications:

Caster: 3°
Camber: -0.5°
Total Toe: 1/16”

For a car using power steering car use the following specifications:

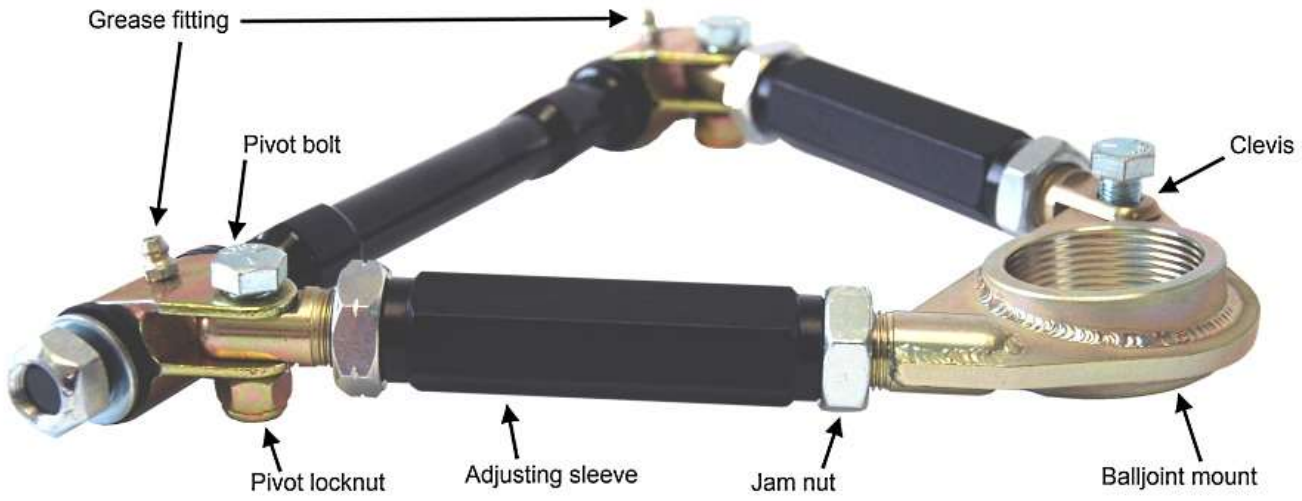
Caster: 7°
Camber: -0.5°
Total Toe: 1/16”

2015 IRS only

Camber: -0.5°to -0.75°
Total Toe: 1/8” Toe in

Adjusting the upper control Arm

✋ Use the diagram below for reference.



Slightly loosen the three pivot bolts using a ⅝” wrench and socket.
Loosen the jam nuts on both ends of each adjusting tubes using a 1⅛” wrench. Turn the adjusting tubes to lengthen or shorten the arm.
After you have adjusted the arm to the desired length, tighten down the jam nuts against the adjusting tubes, and then tighten each of the three pivot bolts. Torque the pivot bolts to 60 Lbft.
Grease both ends using chassis grease frequently to insure smooth, trouble free operation.

✋ There should never be more than 1” of thread showing past the tightened down jam nuts on either end of both adjusting tubes.

The Pivot Bolts must be loosened while the car is being aligned and retightened afterwards

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.

Optional Parts

Check out www.factoryfiveparts.com for the latest options available.

Instructions are available in the parts catalog at www.factoryfiveparts.com/instructions/

Chapter

6

Performance Reference Material and Technical Support

Maintenance

Check the items on the race car check sheet in the Appendix on a yearly basis or before track days depending on how hard the car is driven.

Wheels

- Only 7”-9” wheels are recommended for the front. If using a wheel wider than 7”, FFR front lower control arms are needed to prevent the wheels rubbing the control arms.

Below is a chart indicating the **REAR** wheel sizes and backspacing that are possible using the Mark IV kit:

Rear Wheel Backspace Equations

Max Tire width	87-93	94-98	99-04
275mm*	(Width/2)+1	(Width/2)+2	(Width/2)+2.75
315mm	(Width/2)+1.625	(Width/2)+2.5625	(Width/2)+3.25

*Can be used up to 10.50” wide wheel

	99-04	94-98	87-93	
OEM 17"x 8" FRONT/REAR	5.72	5.72	5.72	MAX TIRE WIDTH 245/45 R17
AFTERMARKET 17"x 9"	-	6.00	6.00	MAX TIRE WIDTH 275/40 R17
AFTERMARKET 17"x 10.5"	-	-	6.80	MAX TIRE WIDTH 315/35 R17

The max rim width for a 3-link is a 10.50”
If you have any questions please call the Tech department at 508-291-3443.

If a modern look is what you’re after, you may want to try the 17” Cobra-R or FR style wheels. If using the standard width 1987-93 rear, it is possible to use aftermarket 10.5” wide, 27mm offset wheels. If using a rear end that has been converted to 5-lug using the “Cobra” brake kit use two (4) 5.95” backspace wheels.

Left: FFR car using late model 17” Cobra-R rims. Right: Ford Racing Cobra R 17” wheels and 12” Cobra Brakes.

For a more vintage look, take a look at our Halibrand style wheels. Our online parts catalog: www.factoryfiveparts.com has more views of these wheels on cars.

Left: 17" FFR Halibrand style. Right 18" FFR Halibrand Style

1994-1998 REAR END

Use two (4) 9" wide, 5.95" backspace wheels in the front and the rear. If you would like a wider tire than this in the rear it is possible to use aftermarket 10.5" wide, 27mm offset wheels if the axles and caliper brackets are changed so that the rear is the same width as the 87-93 rear ends. See the table above for different width wheel backspacing.

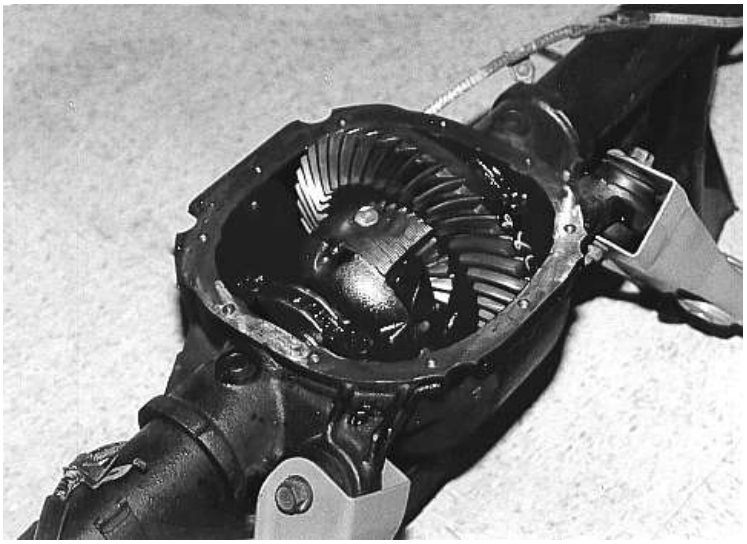
1999-2003 REAR END

Because of the width of this rear end, custom wheels are needed if 10" or wider wheels are wanted. Use two (2) 9" wide, 5.95" backspace wheels in the front. See the table above for different width wheel backspacing.

Performance Modifications

The following modifications and set-ups fall under the category of getting more horsepower from your engine and making your car perform better. You will find a hundred people a day that will tell you what you've got to have. We just want to start you out with the easy modifications that net large returns without large cash outlays or serious changes to the stock motor and drive train. Remember that a 2,100 lb. car stresses the parts less than a 3,100 lb. Mustang does, so all of the components will last longer and can take more abuse than they did on the Mustang. Check out www.factoryfive.com to see what we offer.

Gears



The Mustang 5.0 manual transmission car comes with either 2.73 or 3.08 rear end gear ratios from the factory. If you can get a rear from an automatic car it will have 3.27 gears. There is an ID tag on the rear differential. If you find that your rear end is missing its ID tag, there is a good chance that the rear end was modified. To find out what ratio is on the differential, mark the pinion and axle at a start point. Turn the axle exactly one rotation and count the number of rotations that the pinion makes compared to the reference mark. For example: 3 ½ turns is a 3.55 rear ratio, etc.… The other way to check the ratio out is to open the rear differential up and look on the ring gear. While the rear is open change the fluid. This never gets done enough on the car.

Changing the gear ratio is one of the least expensive ways to improve your car's performance and it is easiest to do before assembly, since the rear is out of the car. If you know you are going to change the gears get the 2.73 rear since these are the most readily available, the least expensive and the least abused. All of the gear ratios work well with our car but we've found that installing an aftermarket 3.55 ratio really wakes the motor up. If you change the rear end gears, don't forget to recalibrate your speedometer so that the speedometer reads correctly.

EFI Engines

- There are three things an engine needs; air, fuel and spark. If you allow more of each of these into the engine, it will make more power.

Throttle Body

Stock 87-93 Mustang size: 58mm
A 65mm throttle body work well up to 350hp. Ford Racing, BBK, Jegs, Summit Racing etc.… sell many other sizes.

Mass Air Meter

Stock 87-93 Mustang size: 55mm
In order to increase the flow of air above 5000 rpm, upgrade from the stock mass air sensor. Aftermarket 70 mm or 75 mm mass air units are an excellent choice and have proven effective. If the mass air meter is changed make sure it is calibrated for the injectors you are using or you will have to

change the injectors too. Pro-M or Ford Motorsport meters work the best. Usually the mass air meter is larger than the throttle body.

Fuel Injectors

Stock 87-93 Mustang size: 19lb/hr.
The stock injectors are good for exactly that, a stock engine. If upgrading parts, step up to 24 lb/hr injectors. They are good up to about 400hp. Make sure that you have the mass air sensor calibrated to the injectors you use.

Upper Intake

The next logical step for breathing is a more free flowing intake manifold. There are a number of intakes available from different companies (e.g. Edelbrock, Trick Flow). Ford also makes a good intake, the cast 1993 Cobra intake from Ford Racing.

Heads

The 5.0L Mustang aftermarket is full of aluminum and cast iron heads for the small block Ford. Our favorites are the **Edelbrock** Victor Jr. and the **Trick Flow** aluminum heads. These both flow very well, have stock exhaust port heights which allows the use of our headers and not only give you extra horsepower but also remove 50 lbs. in the process.

Cams

If you need to pass emissions testing, use a cam with a CARB number. We like the Ford E303 cam. We have used it with success in our racecars both naturally aspirated and in boosted applications. If building a more radical engine, match the cam to the combination.

Headers

Stock 1987-1995 Mustang: 1½" OD
We've found that the Mustang factory headers work well for the stock engine. If you want to go to an aftermarket set, the 1⅝" MAC shorty unequal length headers or Ford Racing 1⅝" unequal length headers fit as bolt on parts. They will reward you with an approximate 5-10 hp bump in the top end. All aftermarket headers use mandrel (smooth consistent bends) bent tubing. The stock ones are not and are restrictive on non-stock engines.

If using a 351W engine there are two options, use 351W engine swap headers from Ford Racing (M-9430-A58) or MAC (E358692) or if smog/catalytic converters are not necessary, use our full length 4 into 4 headers.

Timing

Most computer chips simply change the timing of the engine and slightly enrich the mixture. Using a timing light, advancing the base timing to 14° will do the same. Higher octane fuel will be needed.

Under-drive Pulleys

Yes. They work well on all cars.

Oil Cooler

Not really necessary on small blocks or cars that aren't raced heavily. They look nice when installed in the smaller opening below the radiator. For supercharged/turbocharged or big block track cars an oil cooler will help.
Factory Five offers an oil cooler with #10 Stainless Steel braided lines and mounting bracket.

High Horsepower Transmissions

The stock T-5 is good for the stock 302 engine. If the engine is going to have some work done to it then an upgrade to a heavy duty, Ford Performance "Z" T-5 is all that is needed. An additional change to a Tremec TKO 500 or 600 is needed if the engine that will be used has 300lbft of torque or more. One unique feature of the Tremec TKO is it allows the shifter to be relocated 8" forward of the normal shifter location if a vertical shifter is desired verses a forward angled shifter.

Steering Rack

The complete kit comes with an 18:1 manual steering rack. This is good for most driving situations. We have found that many prefer to use power steering. Factory Five has a power steering rack and pump for some applications available.

High Performance Manual Braking Systems

Factory Five offers some great Wilwood Brake packages that are designed to fit inside the Factory Five wheels. See www.factoryfiveparts.com for more information.
The braking systems recommended below are designed for those searching for higher performance braking capabilities. These are systems that have been used successfully by our customers and us. Each component below has been selected to optimize the capabilities of the system. If an attempt is made to utilize some of the specified components, but not all of them in correct combination, then braking abilities may not be satisfactory.

- Some of the setups may not clear some wheel sizes and designs.
- We highly recommend using Carbotech XP-8, Porterfield R-4, or Hawk Blue brake pads for the street. Though costly, you will find a significant difference in your cars ability to stop. If these pads are out of your price range, next in line would be Performance Friction Z-Compound pads.

Miscellaneous Brake Information

Carbotech Performance Brakes	877-899-5024 www.ctbrakes.com
Disc Brakes R' Us	888-558-5757 www.discbrakesrus.com
Mustang Part's Specialties, Inc.	770-867-2644 www.stangparts.com
Porterfield Enterprises Ltd.	800-537-6842www.porterfield-brakes.com
Hawk Brake, Inc.	800-542-0972 www.hawkbrake.com

Superchargers

Factory Five Racing customers have successfully installed Kenne Bell, Vortech, and Powerdyne superchargers in their cars. The key to any supercharger installation seems to be the side that the supercharger is hooked up on. Use the ones that mount on the passenger side. The drivers' side blowers may get in the way of the steering shaft if the blower is too big. Alternate brackets may be available from the manufacturer to remedy this situation.

Installed supercharger.

Seats

For the road racers/autocrossers that want more side support, Factory five offers a variety of different options. Check out www.factoryfiveparts.com

Helpful Reference Material

Must Reads

- www.thefactoryfiveforum.com - The largest discussion forum for Factory Five Racing kits. Also has many vendor links.

Helpful

- 5.0L Ford Dyno Tests. By Richard Holdener. www.cartechbooks.com
- Building 4.6/5.4L Ford Horsepower. By Richard Holdener. www.cartechbooks.com
- Engineer to Win. By Carroll Smith. www.motorbooks.com
- Prepare to Win. By Carroll Smith. www.motorbooks.com

Catalogs/Parts

- **Ford Performance Parts** - Catalog, current edition. Available at your local speed shop, an authorized Ford Racing distributor or www.performanceparts.ford.com
- **Tire Rack** - Tire and wheel source. 888-541-1777. www.tirerack.com
- **Jeg's Performance** - High performance products. 800-345-4545. www.jegs.com
- **Summit Racing** - High performance products. 800-230-3030. www.summitracing.com

Factory Five Aftermarket

- Check out the vendors section of www.thefactoryfiveforum.com

Tools

- **Craftsman Tools** - Sears brand "guaranteed forever" tools. 800-549-4505. www.craftsman.com
- **Husky Tools** – Home Depot "guaranteed forever" tools. www.homedepot.com
- **Eastwood** - Unique automotive tools. 800-345-1178. www.eastwoodco.com
- **Harbor Freight** - Discount tools. 800-423-2567. www.harborfreight.com
- **Northern Tools** - Discount tools and service products. 800-221-0516. www.northerntool.com
- **Paint over Rust 15** - Stops rust 800-4576715. www.por15.com

Insurance

- **Northeast Classic Auto Insurance** - Mike Smith. 800-866-6440. www.classiccarinsurance.com
- **Country Companies** - 800-950-5877. www.countryfinancial.com
- **Spinap** - Fred Benedict. Eastern US. 914-946-9300.

A Final Note about Completed Cars and Car Builders

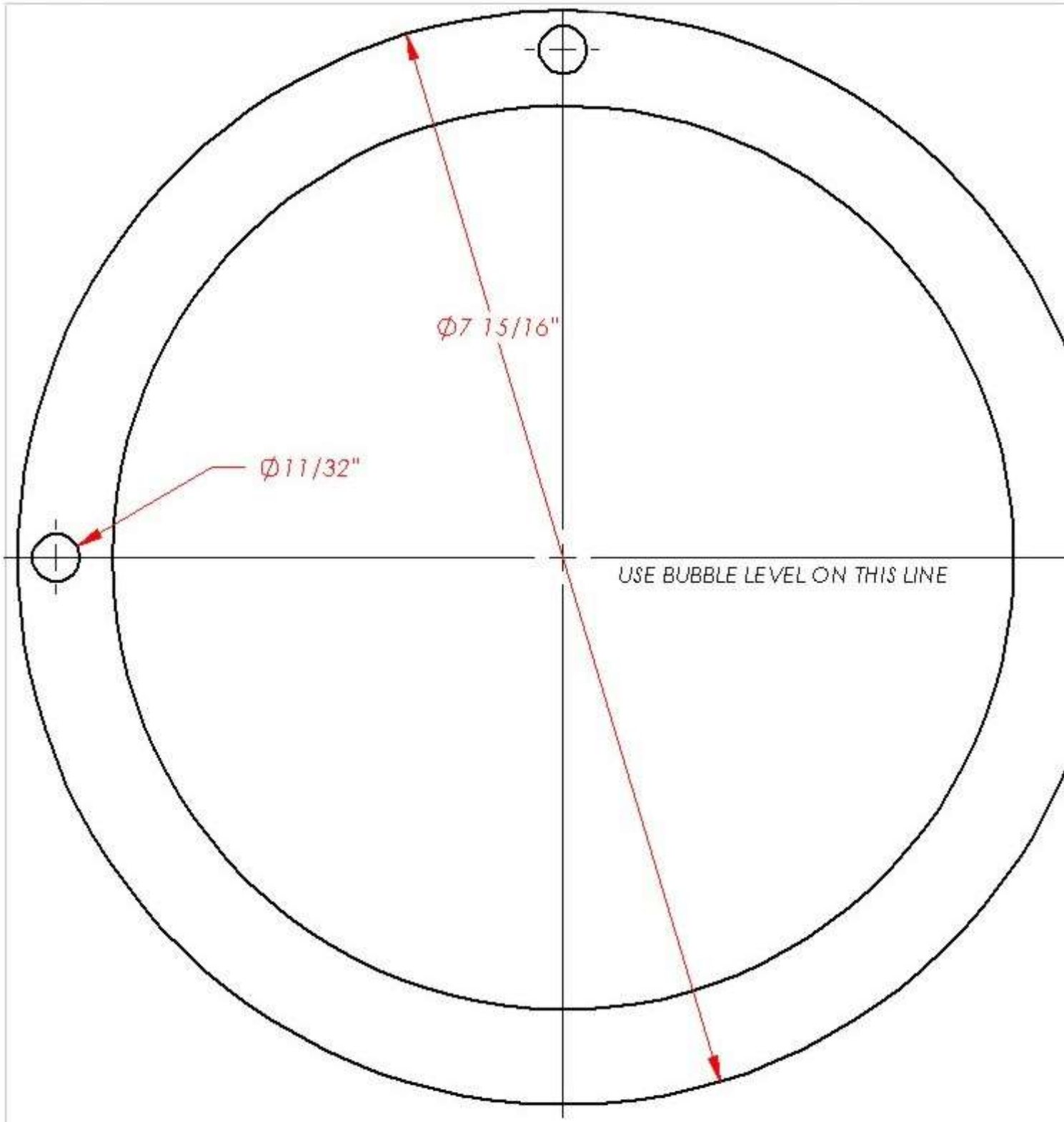
If you are reading this manual then you are at least contemplating the idea of building your own race car. Many component car companies offer services to those folks who find part or all of this too much to tackle. We don't.

If you are considering buying a completed vehicle from a third party (we do not and will not perform any vehicle assembly work for customers), keep the following in mind:

Factory Five Racing does not build or sell completed or partially completed vehicles. We are aware of a number of performance and hot rod shops that claim to specialize in building race cars and kit cars. We have over the years compiled a list of some of them, which includes parts yards, used parts suppliers, paint and body shops, hot rod assemblers, and race car shops.

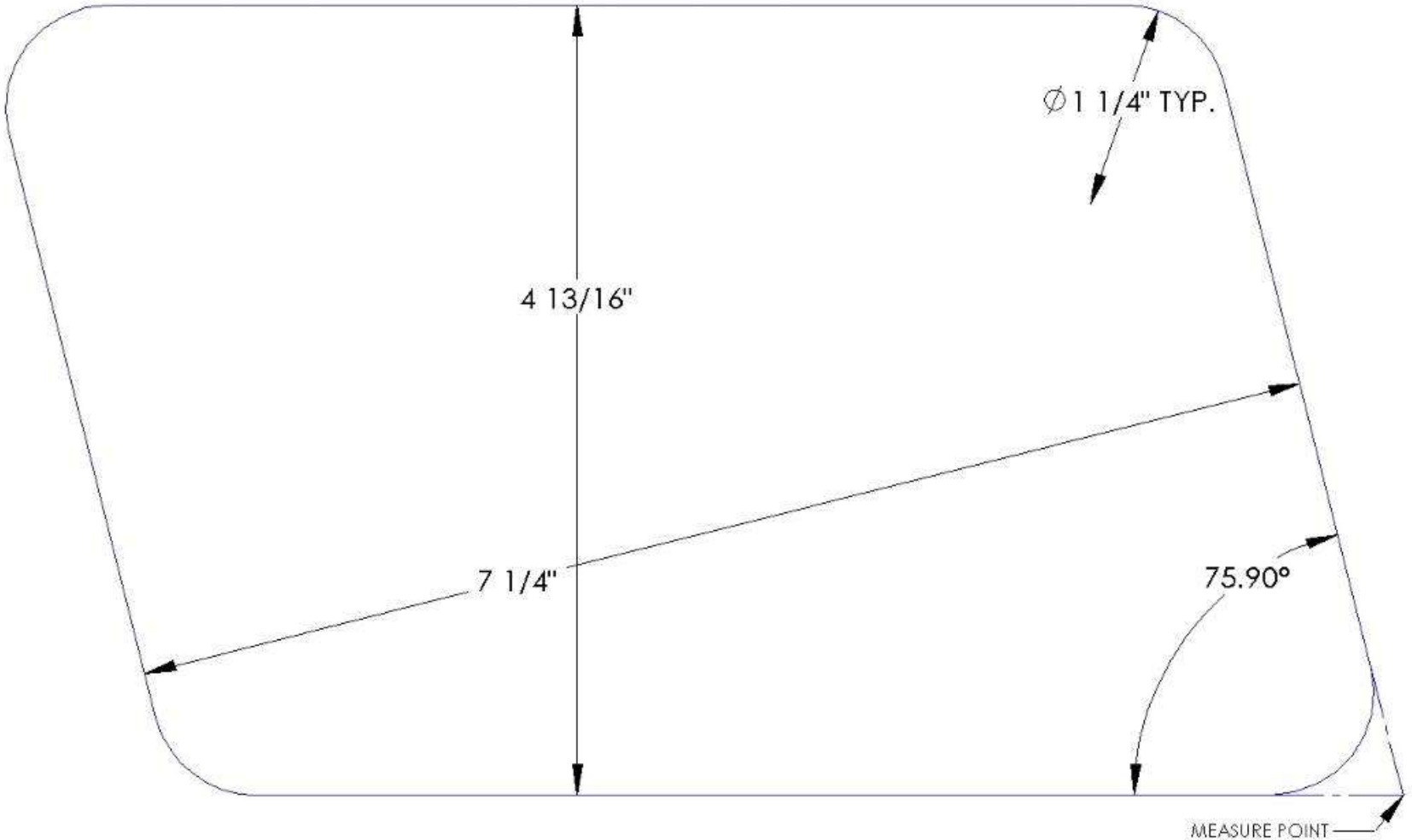
Please know that there is no connection between FFR and those outside shops. There are no authorized FFR dealerships, and we cannot recommend any of the particular businesses that are on our lists, nor do we warrantee their work. They are provided simply to help you identify businesses in your area that offer these types of services. You should research these carefully before choosing to purchase their products and/or services.

Appendix A – Templates



ROADSTER	DIMENSIONS ARE IN INCHES		NAME	DATE	Factory Five Racing, Inc.
SPEC CAR	TOLERANCES:	DRAWN	JI	12/14/09	
COUPE	TWO PLACE DECIMAL ±0.01	CHECKED			
	THREE PLACE DECIMAL ±0.005	ENG APPR.			
	FOUR PLACE DECIMAL ±0.0001	MFG APPR.			
	MATERIAL	Q.A.			HEADLIGHT TEMPLATE
USED ON	Finish	COMMENTS:			SIZE A DWG. NO. 11001 REV. C
APPLICATION	PRINTED 6/30/2010				SCALE: 1:1 WEIGHT: SHEET 1 OF 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	12/7/11	



ROADSTER

SPEC CAR

UNLESS OTHERWISE SPECIFIED:

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

MATERIAL

	NAME	DATE
DRAWN	JI	12/7/11

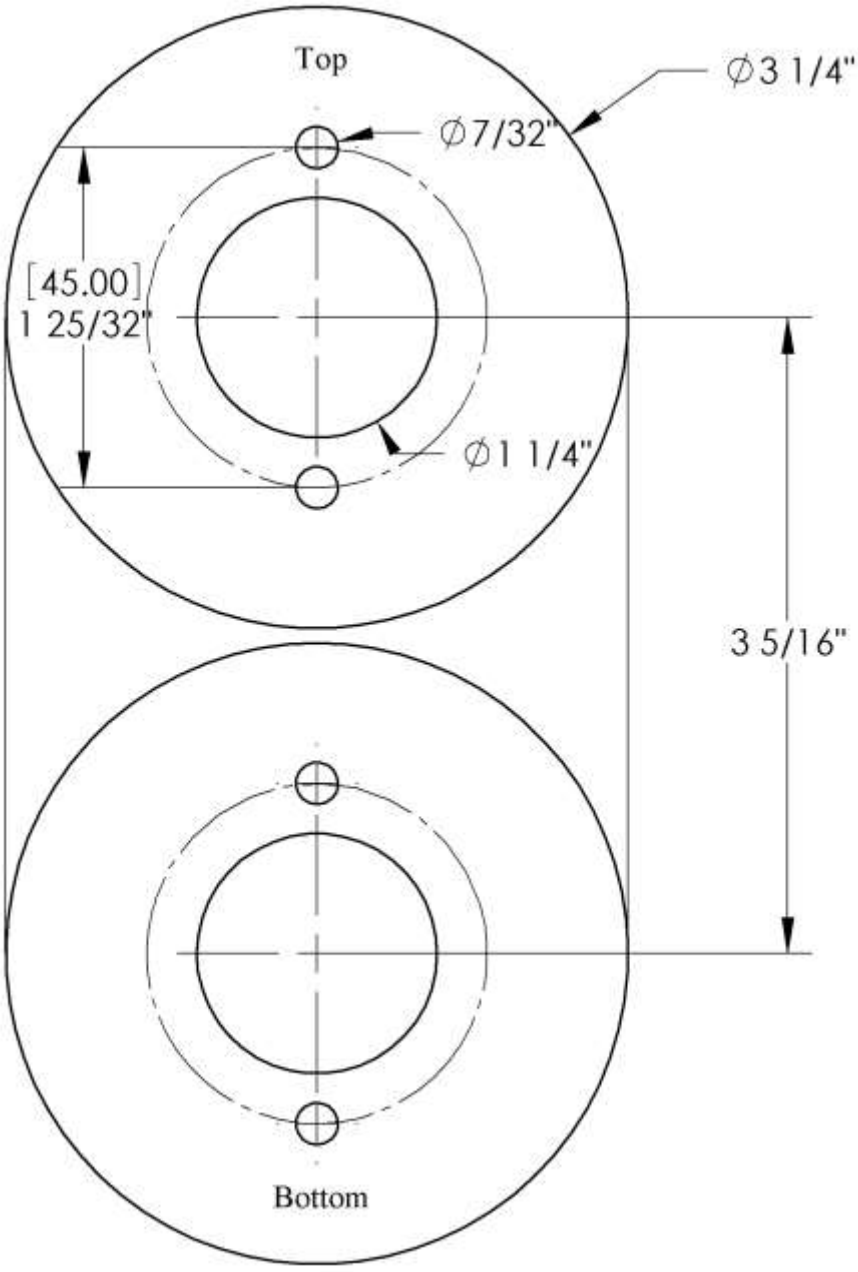
COMMENTS:

Factory Five Racing, Inc.

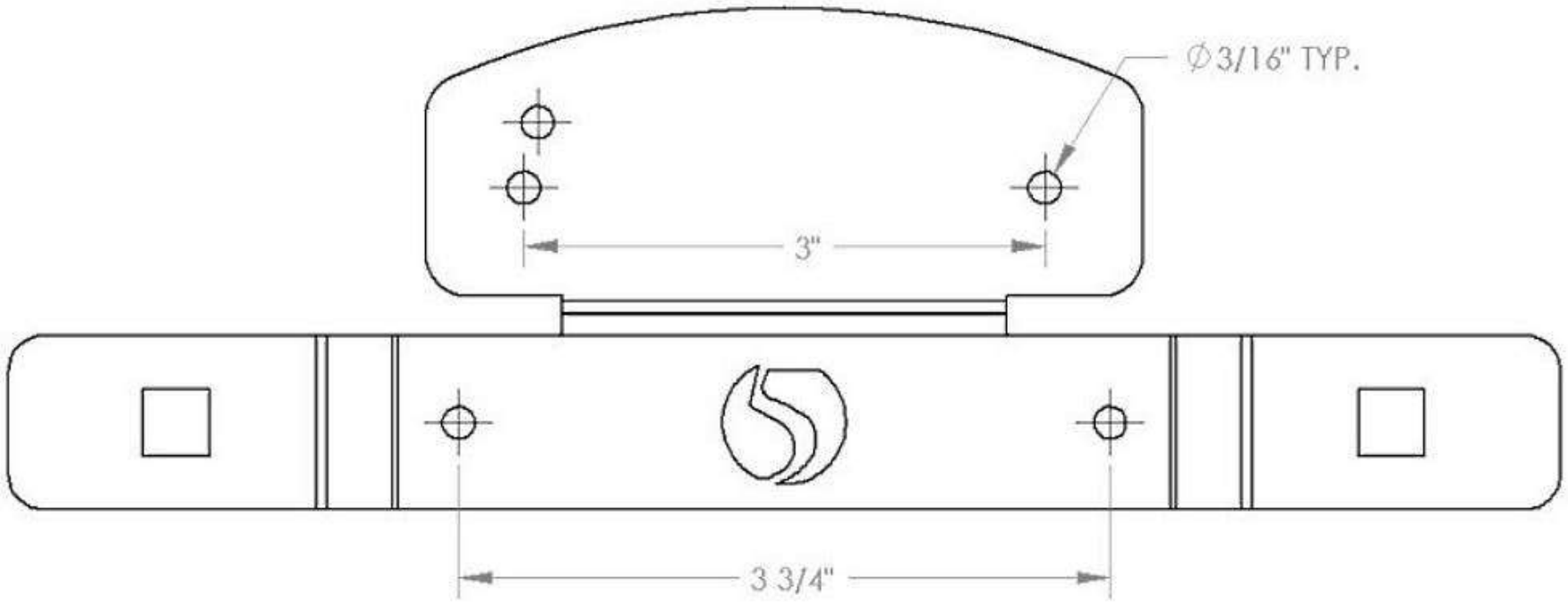
TITLE: **SIDE LOUVER TEMPLATE**

SIZE	DWG. NO.	REV
A	15464	A

www.factoryfive.com 508-291-3443

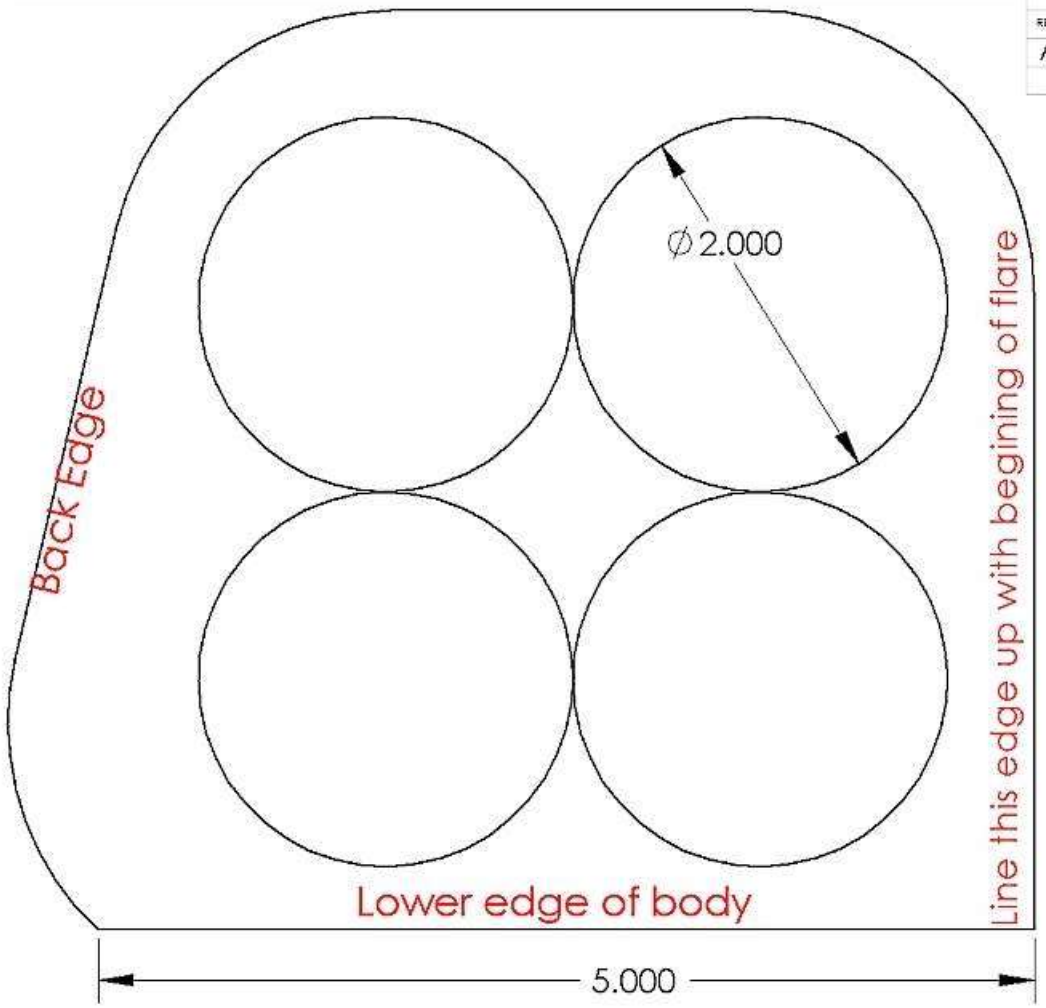

Top
Ø3 1/4"
Ø7/32"
[45.00]
1 25/32"
Ø1 1/4"
3 5/16"
Bottom

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
C	ONE PIECE DESIGN	12/16/04	



	UNLESS OTHERWISE SPECIFIED:		NAME	DATE	Factory Five Racing, Inc.
ROADSTER	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	D.R.	12/16/04	TITLE: LICENSE PLATE/LIGHT BRACKET
		CHECKED			
		ENG APPR.			
		MFG APPR.			
	MATERIAL: 16 GA STEEL	Q.A.			SIZE: A — DWG. NO.: 14097 — REV: C
USED ON	FINISH: CHROME	COMMENTS: MOUNT HOLE TEMPLATE			
APPLICATION	PRINTED: 3/29/2010				SCALE: 1:1 — WEIGHT: — SHEET 1 OF 1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	9/1995	



Note: This template is very tight, you can always cut more.

Cut outline and use on both sides

	NAME	DATE
DRAWN	D. SMITH	9/1995
CHECKED	FFR	
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

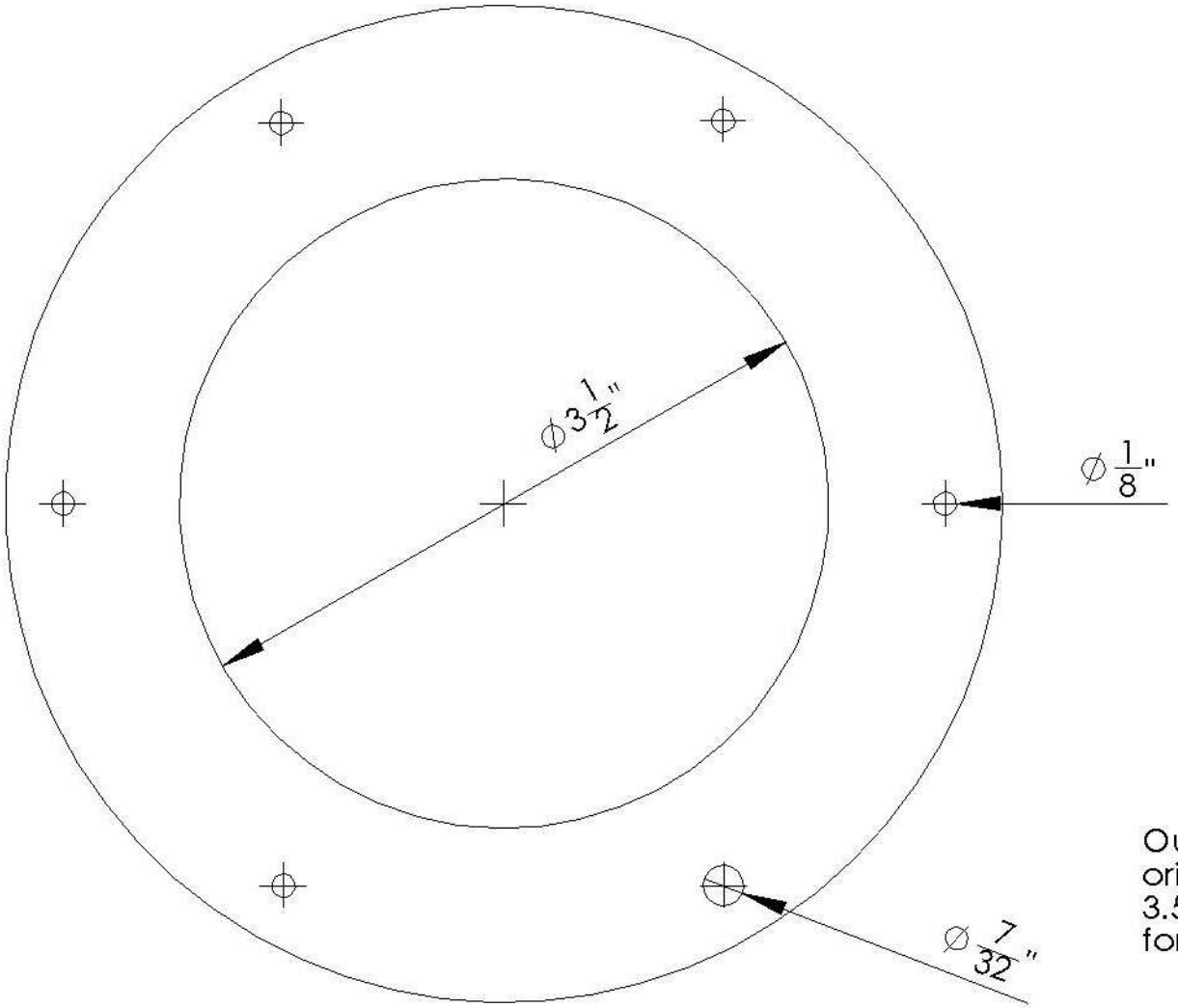
ROADSTER

SPEC CAR

Factory Five Racing, Inc.

Side Exhaust Cut-out Template

SIZE	DWG. NO.	REV
A	11004	A



Outside circle is shown for placement orientation only, do not cut. Use a 3.5" holesaw in center and 1/8" drill bit for all except one small hole.

www.factoryfive.com 508-291-3443

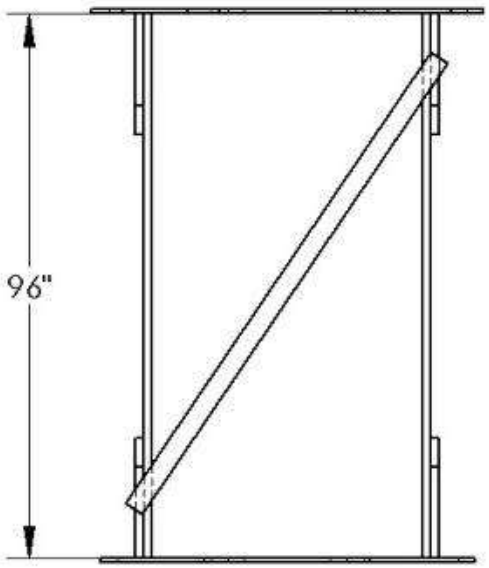
	UNLESS OTHERWISE SPECIFIED:		NAME	DATE
ROADSTER		DRAWN	JI	9/26/97
COUPE	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	CHECKED		
		ENG APPR.		
		MFG APPR.		
	MATERIAL	Q.A.		
USED ON	FINISH	COMMENTS:		

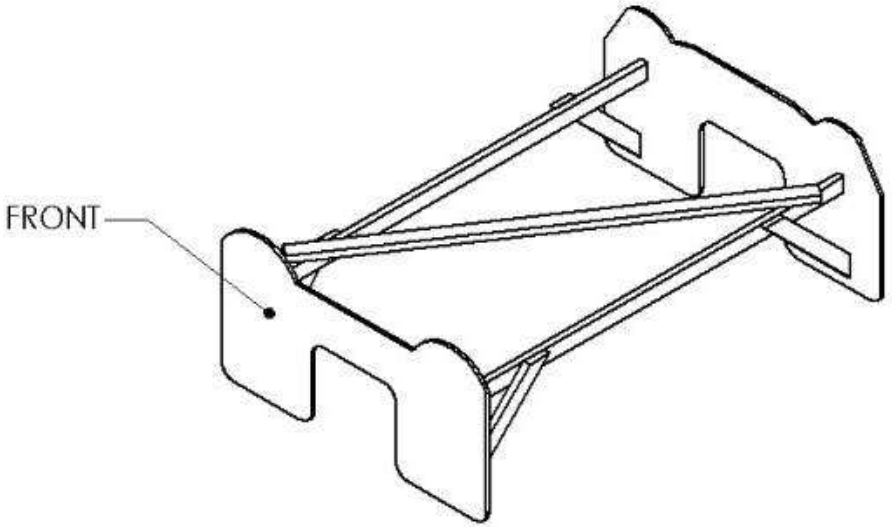
Factory Five Racing, Inc

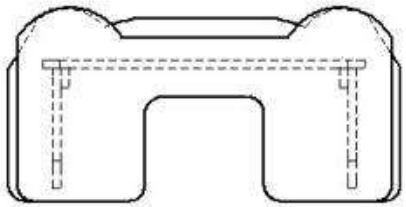
TITLE:
FUEL NECK FLANGE TEMPLAT

SIZE	DWG. NO.	RE
A	11009	E

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	1998	
B	REDRAWN	1/21/04	







	UNLESS OTHERWISE SPECIFIED:		NAME	DATE
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		CHECKED		
		ENG APPR.		
		MFG APPR.		
	MATERIAL	Q.A.		
USED ON	FINISH	COMMENTS:		
APPLICATION	PRINTED 3/29/2010			

Factory Five Racing, Inc.

TITLE: BODY BUCK

SIZE	DWG. NO.	REV
A	11190	B

SCALE: 1:30 WEIGHT: SHEET 1 OF 2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
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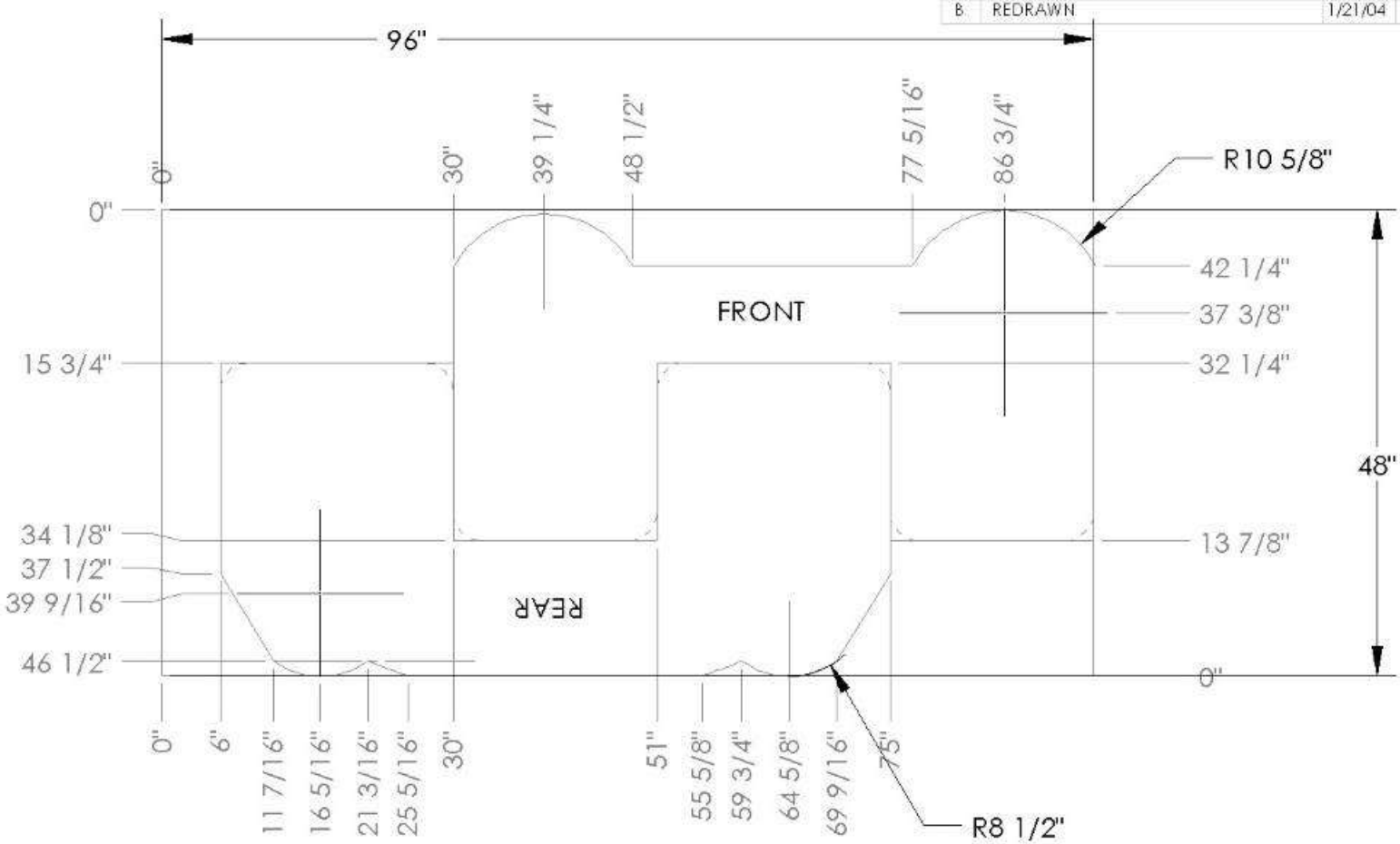
B	REDRAWN	1/21/04	



	UNLESS OTHERWISE SPECIFIED:		NAME	DATE
ROADSTER	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	DR	1/21/04
SPEC CAR		CHECKED		
		ENG APPR.		
		MFG APPR.		
	MATERIAL 3/4" PLYWOOD	Q.A.		
USED ON	FINISH	COMMENTS:		
APPLICATION	PRINTED 7/25/2017			

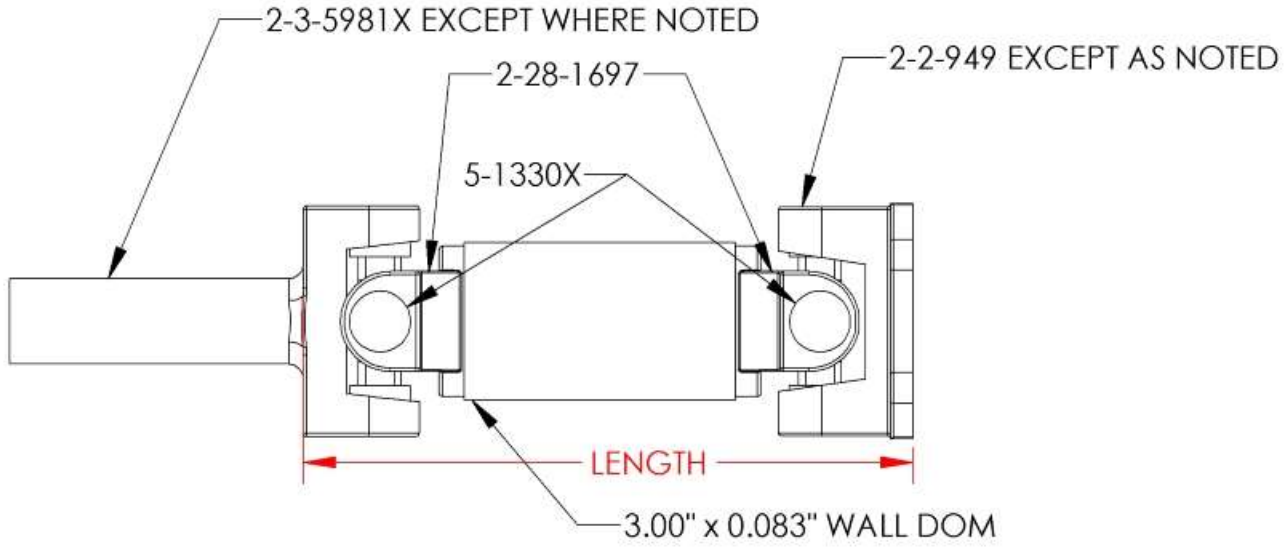
Factory Five Racing, Inc.

TITLE: BODY BUCK

SIZE	DWG. NO.	REV
A	11190	B

SCALE: 1:16 | WEIGHT: | SHEET 2 OF 3

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 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	33042	31	302/351/4.6L/COYOTE USING T-56 (NOT MAGNUM), 2-3-6041X YOKE	32.50
HOT ROD	33948	27	CHEVY 700R4/4L60/4L65E (EXCEPT CORVETTE), 2-3-12051X YOKE	34.00
HOT ROD	33465	28	302/351/4.6L/COYOTE T-5/AOD	34.25
HOT ROD	33466	31	302/351/4.6L/COYOTE TKO, 2-3-6041X YOKE	34.25
HOT ROD	33987	27	CHEVY 4L60/4L65E, 2-3-12051X YOKE	34.75
HOT ROD	33775	31	CHEVY TKO, 2-3-6041X YOKE	35.1875
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, 2-3-6041X YOKE, 2-2-489 FLG	8.375
ROADSTER	60175	31	4.6L/COYOTE w/2015 IRS, TKO, 2-3-6041X YOKE, 2-2-489 FLG	10.50
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 TKO/T-45/3650, BIG BLOCK TKO, 302/351 TKO COUPE, 2-3-6041X YOKE	13.50
35 TRUCK	34198	28	302/351/4.6L/COYOTE USING T-5/AOD, USE 2-2-489 FLG	38.50
35 TRUCK	34199	31	302/351/4.6L/COYOTE USING TKO, USE 2-3-6041X YOKE AND 2-2-489 FLG	38.50
35 TRUCK	34202	27	CHEVY USING 4L60/4L65E (1998+), USE 2-3-12051X YOKE AND 2-2-489 FLG	38.50
35 TRUCK	34200	27	CHEVY USING 700R4/4L60 (93-97 EXCEPT VETTE), USE 2-3-12051X YOKE AND 2-2-489 FLG	39.00
35 TRUCK	34201	31	CHEVY USING TREMEC TRANS. 2-3-6041X YOKE AND 2-2-489 FLG	39.4375



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 3/11/2019

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

Appendix B – Race car check sheet

CAR_____ **Date**_____

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

- Ride height ___
- 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 taped/tight ___
- Tire pressure set (recommend 22-25 psi) ___
- Lug nuts tight (90 lb-ft) ___

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 and undamaged ___

Cockpit

- Seat securely bolted ___
- Harnesses securely bolted ___
- Harnesses free from cuts or abrasions ___
- Pedals travel freely and bolts secure ___
- Throttle return springs hooked up ___
- Brake push rod secure and clip tight ___
- Interior wiring tight ___
- Shifter tight and free ___
- Mirrors tight and adjusted ___
- Windshield side bar screws tight ___
- Inspection/registration up to date ___

Electrical

- Battery charged ___

- Battery mount and connections secure ___
- Brake lights functioning ___
- All wires free and clear of moving or hot parts ___

Rear Suspension

- Ride height ___
- Shock mounting bolts tight ___
- Spring collars tight/taped ___
- Wheel bearings tight (IRS) ___
- Tire pressure set (recommend 22-25 psi) ___
- Lug nuts tight (90 lb-ft) ___

Transmission

- Clutch height/free play adjusted ___
- No leaks ___
- Driveshaft universal joints no bind or wear ___
- Output shaft snug no bind ___
- Drive shaft bolts tight ___
- Transmission mount bolts tight ___
- Bellhousing bolts tight ___
- Starter tight ___

Engine

- Oil level checked/changed/cap tight ___
- Water level checked including reservoir ___
- 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 ___

This list is not complete but a suggested list of items to check before driving. It is also a good idea to check these items on a yearly basis or sooner depending on how hard the car is driven

Appendix C – Torque Specifications

General Bolt torque specifications*

Thread	SAE English
	Zinc Plated
	Ft-Lb.
¼ -20	8
¼ -28	10
5/16 -18	17
5/16 -24	19
⅜ -16	30
⅜ -24	34
7/16 -14	48
7/16 -24	54
½ -13	75
½ -20	83
9/16 -12	100
9/16 -18	100
⅝ -11	100
⅝ -14	100

Thread	SAE Metric
	Zinc Plated
	Ft-Lb.
M8	18
M10	33
M12	61
M14	98
M16	120

ATTENTION: Use the following specs in order to torque Stainless Bolts.

3/16" 11 ft-lb (132 in-lb)
⅜" 16 ft-lb (192 in-lb)

*Use above specs unless otherwise noted in the assembly process.

Appendix D – Fluid Specifications

Engine

	Oil Type	Capacity
302	10W-30	5.0 qts.
4.6L/Coyote	5W-20	8.0 qts w/FFR pan

Transmission

Oil Type	T-5	TKO	T-56
Mercon/Dexron III Trans. Fluid	2.8 qts.	2.64 qts.	4.0 qts

8.8 Solid Rear Axle

Oil Type	Capacity	Friction Modifier
80W-90 Gear oil	1.875 qts.	4 oz.

2015 IRS

Fluid	Amount
Motorcraft 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)