FACTORY FIVE
RACING

Type 65 Coupe Assembly Manual

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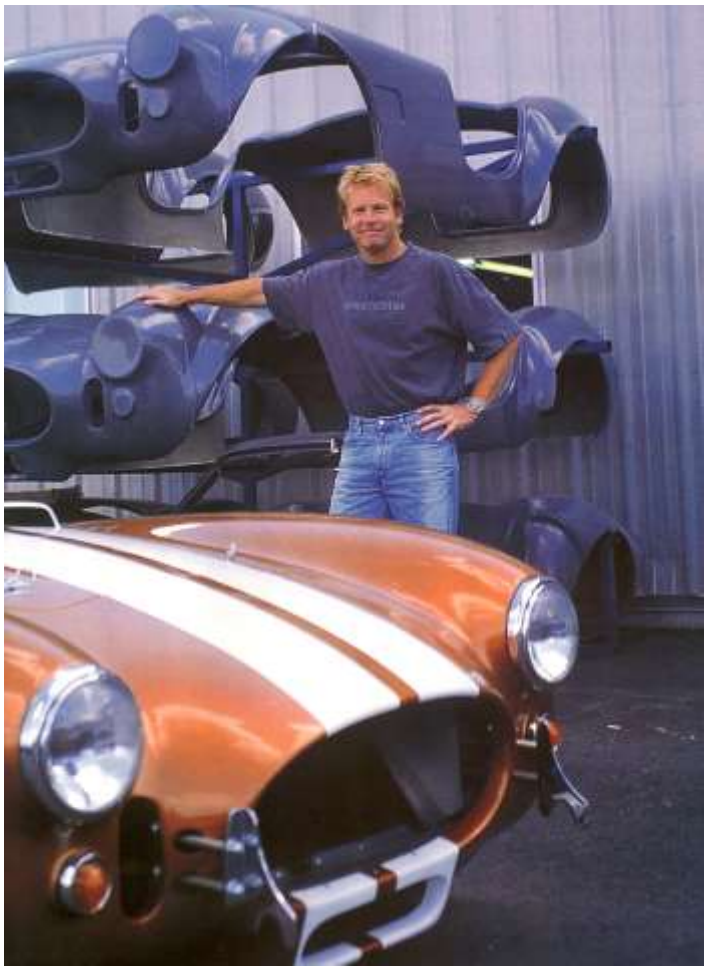
Chapter 1

General Information

Foreword



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

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

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

Carroll Smith

"Prepare to Win"

I can't think of anything more appropriate to say about the right way to approach the serious work of building your own car. Carroll passed away 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 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 is an internet discussion forum where you can vent your frustrations and complain about the idiots who designed this kit. We smile when reading these posts because we know that while the pregnant woman complains, the mother loves her children in an unreasonable and perhaps even undeserved way!

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

When the baby arrives and when your car is done, there will still be more work. With babies, it's up all night, diapers, and strange maternity contraptions that men don't speak of in the light of day… With the car it will be other challenges. Registration and licensing can be frustrating and laws vary from state to state. A wrench dropped from 25 feet away will inexplicably shoot sideways into any freshly painted surface and my favorite was my own engineers who felt the need to test out how long an 8.8" rear diff can run on a track without gear oil (answer, about three laps before deciding to stop moving).

There will be highs and there will be lows, but in the end, there are few parents who don't treasure their children more than life itself, and there are few Factory Five owners whose lives remain unchanged by the experience and the artwork they have crafted.

It's one of the greatest experiences in the world to raise children. It's also one of the most rewarding things I know to build your own car. Even today at car shows, open houses, and events wherever Factory Five cars are found, I smile to hear the inevitable first words every guy says to me… "Let me show you what I've done".

The cars that we build are more than cars. They are a reflection of us. The badge of honor that comes with having built your own car is a special one indeed. You will join a community of others who have earned their own… and THAT is the story of Factory Five Racing and that is what awaits you in this process.

David Smith
President

Safety Notice

Warning!

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

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

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

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

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

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

Ford and Chevrolet, GM and Cobra are registered trademarks.
Factory Five Racing, Inc. is not connected to the holders of these marks.

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.

There are differences between the base kit which uses Mustang suspension pieces and the complete kit which uses FFR spindles and other new parts. Please keep this in mind when assembling the kit.

Check out old and new build videos on our YouTube channel for additional help.

What you need for all kits

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.

*Call or check our parts catalog online for Coyote install instructions

Transmission: T5, Tremec TKO.

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

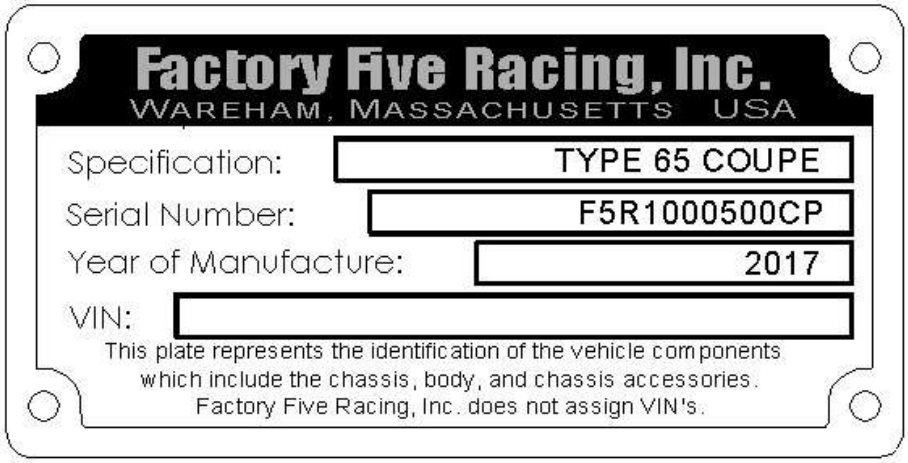
Paint: Most customers will send out the body and paint work to a professional body shop.

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

Battery: We recommend a group 34 or a 925 sized battery.

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 1.50”x 1.50” tube going across the car at the front of the cockpit. Above 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

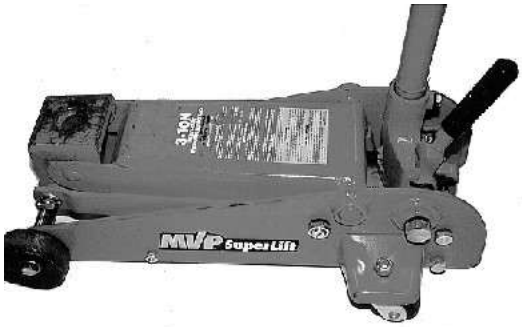
Part instructions for all Factory Five parts and options can be found online at:

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 ($^{3}/_{32}$", ⅛", $^{9}/_{64}$", $^{3}/_{16}$", $^{7}/_{32}$", $^{5}/_{16}$", $^{7}/_{16}$", ½")
Driver bit set
Caulk gun
24 oz. Plastic Dead Blow hammer
Razor knife
Wire stripper/crimping tool
⅞", 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, ⅜" 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, Type and quantity depends on engine and oil pan ~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
_____ 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 (for donor parts, pick a color)
_____ 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

Donor Parts and Prep

This chapter deals with the Mustang parts needed in addition to our kit. Many people choose to use parts from a single Mustang donor. If you are not going to use a donor car but choose to acquire parts separately, this section may still be useful. The complete list of parts required to build the FFR Coupe is included in the Appendix of this manual. For specifications on the different year cars, check out the "Mustang Specifications" Appendix.

The 5.0L Mustang

In 1987, the 5.0L Mustang started a modern muscle-car revolution. For slightly more than $10,000 the average Joe could pick up a brand new 225 hp car that weighed in just over 3000 lbs. (in LX trim). Since its introduction, virtually every enthusiast magazine has hailed the 5.0L Mustang as the best speed bargain of the decade. It had performance numbers of six seconds 0-60 and a quarter mile time in the 14's right off the showroom floor. This factory hot rod came with stainless tubular headers, a five-speed transmission, a big 8.8-inch ring and pinion, limited slip rear end, 11" front disc brakes and much more... all standard! The 5.0L Mustang literally created a multi-billion dollar aftermarket in less than five years because of the great bang for the buck that Ford was providing. From racetracks and drag strips all across the country to street racers in every town, the **5.0L Mustang has earned a faithful following for its high performance, reliability, and affordability.** Many who have owned or driven 5.0L Mustang's feel that the car is the rightful heir to the legacy of the original high performance 289 Mustangs of the 60's.

We saw the Mustang as more than just the functionally perfect donor car. It is truly the spiritual successor to the factory muscle Fords of the 60's. The 289 block that beat Ferrari in 1965 still beats strong in each donor-built Factory Five Coupe. The lightweight small block with Electronic fuel injection is one of the keys to our well-balanced replica. Our design bridges the gap between yesterday and today. Our kit delivers the precise handling of a racecar along with the mechanical reliability of a modern Mustang without compromising vintage period authentic looks.

We have found that the well-balanced fun street cars have 300 to 350 horsepower. To do this with a 5.0L means upgrading the following parts: heads/cam/intake/mass air/fuel injectors. The ultimate decision is the builder's preference.

Not using a donor

Many people will build this car without using a Mustang donor car. That is, they will want to use a combination of new and used parts from a variety of sources. Use your best judgment when buying new parts. Some of these parts, such as the pedal box and upper steering shaft do not get a lot of wear and are quite expensive when purchased new. These can be easily sourced from a salvage yard. An alternative would be the Factory Five Complete Coupe kit in which you are provided with all new parts except for Engine, Trans., wheels, tires, paint and fuel pump. Check out details on the website.

- Read the appendix carefully to determine what you'll need to get.
- Read the Performance parts section for ideas and places to get parts.

Donor Parts Selection Tips

87-93 Mustang

The following are a few tips we've picked up over the years when dealing with used parts. In addition to the parts that come with the kit, you have to provide the running gear and some other parts that can be taken directly off a 1987-1993 Mustang. This section deals with those donor parts. If you are getting parts from a different source, please refer to the last section in this chapter, "Not using a Donor". If you find that some parts of your donor are too rusted or not usable, Factory five does have all of the parts, except for engines and transmissions, available as modules (i.e. Fuel system, cooling system, spindles/brakes, etc.…).

Other Donor years

The Factory Five Coupe kit is designed to use parts from the 1987-1993 Mustang. You can use many of the same parts from earlier and later model Mustangs but there are some differences. For example, before 1987 the Mustang used smaller components such as 10" front brakes, 7.5" rear-ends, and the engines produced less horsepower. Likewise, the 1994-95 and the 1996-2004 models have many shared parts but there are some important differences. If you choose to use older or newer donor parts call the FFR tech department and ask about what specific parts you can use.

If you go to a salvage yard for parts, the donor parts list in the Appendix will help you check to see that you have procured all the required parts in order to avoid a return trip. Try to get everything you need before you pay and leave. We've found that the average parts yard doesn't exactly serve as a model of modern customer service philosophy. Ford made over a million Mustangs so the availability of complete running, non-crashed cars is also good.

Where to look

- Junkyards – If they do not have one, usually they go to auctions weekly and can get what you want.
- Newspaper classifieds, Craig's list
- www.ebaymotors.com – search for wrecked mustang
- Internet search - search for wrecked mustang
- The following is a list of companies that will take all the parts needed, palletize it and ship it to you.

USA East Coast				
Connecticut Mustang	Bridgeport, CT	203 384 0525	Bob	www.connecticutmustangllc.com
Menard's Auto	Chester NH	603 887 4049	Rick Menard	
Fox's Auto	Dover, PA	717 292 2537	Bill Fox	www.billfoxsautosales.com
USA Midwest				
Body Doctor	Holland, OH	800-845-0270	Greg LaPointe	www.lapointauto.com
USA South				
Mustang Parts Specialties	Statham, GA	800-236-1156	Greg or Ben	www.mpsautosalvage.com
USA West Coast				
Mustang Village	Fontana, CA	909 823 7915	Scott or Tom	www.mustang-village.com
Mustang Depot	Las Vegas, NV	702 281 4517		www.mustangdepot.com

Price

Whether you're buying a complete salvage yard car or a bunch of parts, it's important to remember which parts are worth money to the salvage yard and which ones are of little or no value. The drive train, body panels and interior are of the most value. The other pieces such as the steering shaft, pedal box, and other miscellaneous pieces usually are very inexpensive for the yard to include. When negotiating the price from the parts yard, you might get a better deal if you promise to let them have the parts you won't be utilizing. Look at the donor parts list again and you'll see that the glass, body panels, interior parts, and doors are not needed. We believe it is usually better to take the parts off yourself; you will inevitably do a more careful job. If you are using parts that are already taken off, you gain the advantage of being able to cherry pick the best of those that are available. It is not hard to buy a complete donor car from a salvage yard for less than $3,000.00.

Running Gear

In order to make a wise choice on running gear, there are several things to look for. First, make sure that the VIN numbers on the transmission and engine are present and match the numbers on the vehicle title (if available). If the numbers don't match, (let's say the transmission was replaced) make sure the parts yard records the new numbers on their bill of sale. In the unfortunate event that these components were stolen, you need to have documentation on the origin and sale price. Check the numbers twice. The VIN numbers are located on the back of the engine block, on a flat spot between the heads where the bell housing meets the block. Some solvent or WD-40 can usually clean this area off enough to see the numbers. The VIN numbers on the transmission are typically stamped on the side of the main transmission housing at the lower front edge of the passenger side, near the seam of the bell housing. Check these numbers against the codes listed in a Chilton's manual to find out the year of manufacture. Here are some tips to follow when checking out running gear.

- Examine the engine mounts. Some small splits in the rubber area of the mount are normal, but any serious splitting should be avoided. Aftermarket engine and transmission mounts are cheap and an excellent alternative to donor car ones.
- Check the steel sections of the engine mounts for damage since these are areas that can bend.
- Mileage is not the most important aspect of selecting a donor Mustang. The 5.0L drivetrain is one of the toughest things about these cars. It's obvious however, that the lower the mileage the higher the chances of avoiding additional expenses down the road.
- The rear end assembly should be free from oil leaks. Oil leaking out the sides of the 8.8" rear end near the brakes, or around the pinion snout (drive shaft connection area) is an indication that there may be more than 100K miles on the rear axle, or that it was abused. One way to check the rear end is to grab the rear wheel at the top and rock the car back and forth (by pushing and pulling in and out). This will give you an idea of free play in the axles. Some play (about 1mm) is OK. What you are looking for is a large amount of movement side to side within the housing. Avoid cars with bent axles (from rollovers or hard side hits). These are not too hard to fix but it's good to know up front when you're planning your budget. A quick way to verify mileage is by inspecting the drum brake shoes on the unit. The drum pulls straight out, off the axle. Rear shoes are never really replaced until about 60-100K miles unless there was severe duty (read abuse) placed on the car.

- The easiest way to avoid engine work is to buy a donor car with an engine that runs. Everyone will tell you it runs, but it's best to hear for yourself. Bring a battery with you since for some reason, that's usually the first thing that gets taken out. A battery also helps when some guy says, "Don't worry it runs great, but since I don't have the battery, you'll have to trust me." The Mustang is computer controlled and should run really well the first or second time it is turned over. If at all possible, put the car into the gear and drive it forward and backward. If you can't drive it, let it run for a moment, and then re-start it. Look for main bearing oil leaks (behind the harmonic balancer) or oil pan leaks. Leaks aren't common unless the car has high mileage. Valve cover gaskets commonly leak at around 50,000 miles and are easy to replace so don't sweat them.

- If the engine block has been painted, it is a good indication that the engine was re-manufactured since the block was never painted at the factory. Even brand new 5.0L blocks with relatively few miles on the odometer will have a surface dusting of corrosion.
- Since our kit can use the original drive shaft (that gets shortened), the quality and condition of the slip yolk (transmission end) and the rear flange is important. The slip yolk must be smooth and clean without scores or gouges that can cause premature wear and develop leaks down the road. We recommend using only yokes from manual transmission cars; the automatic cars have a weight that limits the universal joint movement.
- The front spindles should be clean, dry, and have decent rotors and calipers without much dirt or crud accumulation. There should be no deep grooves or huge flakes of rust inside the rotor contact area. If you do have rotors with lots of rust inside the cooling fins, you are usually looking at an older car part or it has been sitting for a while.

We've rarely seen serious problems with donor car parts. An occasional bent axle, bad steering rack, or mangled tie rod end are about all we've come across. Second gear seems to get the lion's share of abuse in the T5 transmission. The factory drivetrain is remarkably tough so try not to worry excessively about the donor parts; odds are they will work just fine.

Disassembly of a Mustang Donor for Parts

Ford Motor Company designs all of their cars for rapid and accurate assembly. These cars come apart quickly and easily if you remember to look at it from the assembly point of view. The rear vertical shock, for example, is not as much an individual part as it is a part of the entire rear end assembly. The engine and transmission are actually dropped in and fastened at four points (2 engine mounts, 1 transmission mount, and the drive shaft). Think of this job as a reverse assembly line and it will go faster. If you are getting ready to disassemble a Mustang, please refer to the "donor parts list" Appendix. A Chilton's repair manual has quite good step-by-step disassembly instructions for each assembly. We have tried to be helpful here but a Chilton's manual or any other quality manual will make it that much easier. Many manuals licensed by Ford use excellent Ford drawings, schematics and diagrams.

When in doubt, don't throw it out. That one little OEM bolt could save you a trip to the auto parts store.

Radiator/Cooling System

✋ Metric sockets, extensions, large pliers, and waste container/bucket.

- Mustang radiator and fan shroud w/overflow reservoir. Refer to Appendix B.
- Try to avoid spilling used coolant.
- Take care when handling the Mustang radiator.
- When removing the A/C system make sure that an authorized service center evacuates the Freon in your A/C system. Dispose of hazardous waste correctly.
- If your car was in a front collision and the radiator shroud and reservoir were damaged and you would like to use them, the Ford part number for the shroud is E6ZZ-8146-A and the reservoir part number is F2ZZ-8A080-B.

Place a bucket under the radiator drain petcock on the lower passenger side of the radiator
Loosen the radiator drain petcock with pliers.
Collect all of the used coolant and dispose of the coolant properly (local garage or parts store).
Loosen and remove the upper radiator hose clamp at engine block. There may be residual fluid in hoses so try to avoid spilling.
Loosen and remove the upper and lower hose clamps at the radiator.
Remove the upper radiator hose.
Use duct tape or zip ties to secure the lower radiator hose up to the power steering pump area so that it will not spill fluid as the engine is removed later.
Remove the fan clutch from the water pump shaft so that it is sitting in the fan shroud.
Loosen the bolts on the brackets at the top of radiator.
Lift the radiator, shroud and the fan up and out of the engine bay. Discard the 1987-1993 fan. Keep the shroud. You will not need the 1987-1993 Mustang fan since a 16" electric fan is included in the kit.
If the car was fitted with A/C, remove the condenser at this time.

- If you started with a good running car that has the A/C system intact it's your environmental responsibility to have the Freon removed and disposed of safely. Do not release this into the ozone.

Store the radiator, fan shroud and overflow reservoir in a safe place.

87-93 Steering Rack

- ⅝", 11/16" wrenches, needle nose pliers, hammer
- Mustang steering rack assembly, rubber mounting bushings.

Remove the U-joint bolt from the steering column sleeve.
Remove the lower steering shaft by taking off the two bolts at the flexible collar in the area where the splined steering rack shaft begins.
Remove the steering rack outer tie rod nuts and cotter pins. If the tie rod will not come out of the spindles easily, use a hammer but be careful not to damage the threads.

- Never heat or lubricate the tie rod end to make removal easier.

Remove the two bolts that secure the steering rack to the frame and lower the rack out of the car.

Mustang steering rack with lines removed with rubber bushings and fasteners.

Engine Bay Sensors and Electrical Connections

🛠 Socket set, combination wrenches, Phillips head screwdriver, slip joint pliers, tape, marker, and bucket.

🚗 Mustang coil, EGR assembly, vacuum lines, starter solenoid, mass air meter, and throttle cable.

✋ Remember to identify both ends of every connector disassembled. The easy way to do this is to tape and number each side of the connector the same. The connectors will only work if they're mated to the other similar shaped connector. Each connector is different in the car.

Disconnect and remove the battery.
At the starter solenoid and coil, disconnect the wires, labeling which wires connect to which screw.
Disconnect the connectors from the headlights and engine harnesses.
Disconnect and remove the coil from the engine compartment wall.
Disconnect and remove the starter solenoid from the same area.
Disconnect and remove the Barometric Air Pressure sensor from the firewall behind the engine.
Disconnect and remove the mass air sensor. Store it with the computer.
Disconnect the throttle cable from the throttle body on the engine.
Cut the heater core hoses from the firewall on the passenger's side making sure to leave the bends intact on the larger hose so it can be used to complete the coolant circuit loop.

✋ Napa sells a replacement heater hose loop, part number #10743. This part is designed to loop the heater hose circuit perfectly and it works better than the stock hose, which has two different inner diameters. Connect the two hard black heater tubes on the engine with the one larger diameter tube with a bend. Do not kink the hose.

Remove the power steering lines from the pump, catching the fluid in a bucket.
Remove the braided ground strap from the rear driver's side of the engine.
Follow the fuel lines off the engine and cut the lines 4" after they turn into the hard-plastic line.
Remove and discard the front driver's side plastic wheel well using a 7mm socket to loosen it from the body.
Disconnect and remove the horns. They are located just forward of the wheel well on the driver's side (accessed from the wheel well). Label and mark the connectors with tape.

Interior

🛠 Socket set
🚗 None.

Remove the seats from the car.
Remove the center consul cover the handle.
Remove the carpet from the car.

Computer

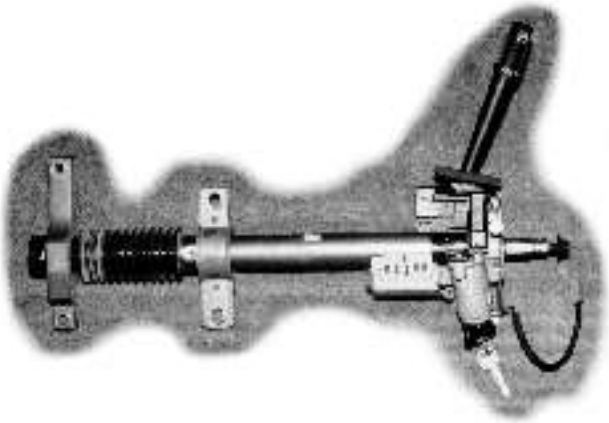
🛠 Socket set.
🚗 Mustang Computer and OEM plastic cradle.
✋ If you are going to run the car with a Carburetor you can disregard the EFI wiring harness part in this section.
✋ We recommend the use of a fuel inertia cut off switch in your car if using an electric fuel pump.

EEC-IV computer and cradle.

Remove the kick panel in the passenger footbox.
Disconnect the ground strap in the footbox next to the computer.
Remove the computer and its plastic holder from the passenger footbox area.

Turn Signal and Ignition Switches

🛠 Socket set, extension, Phillips head screwdrivers, needle nose pliers, T-15 Torx screwdriver
🚗 Turn signal and ignition switches



87-93 Steering column (with ignition, turn signal stalk)

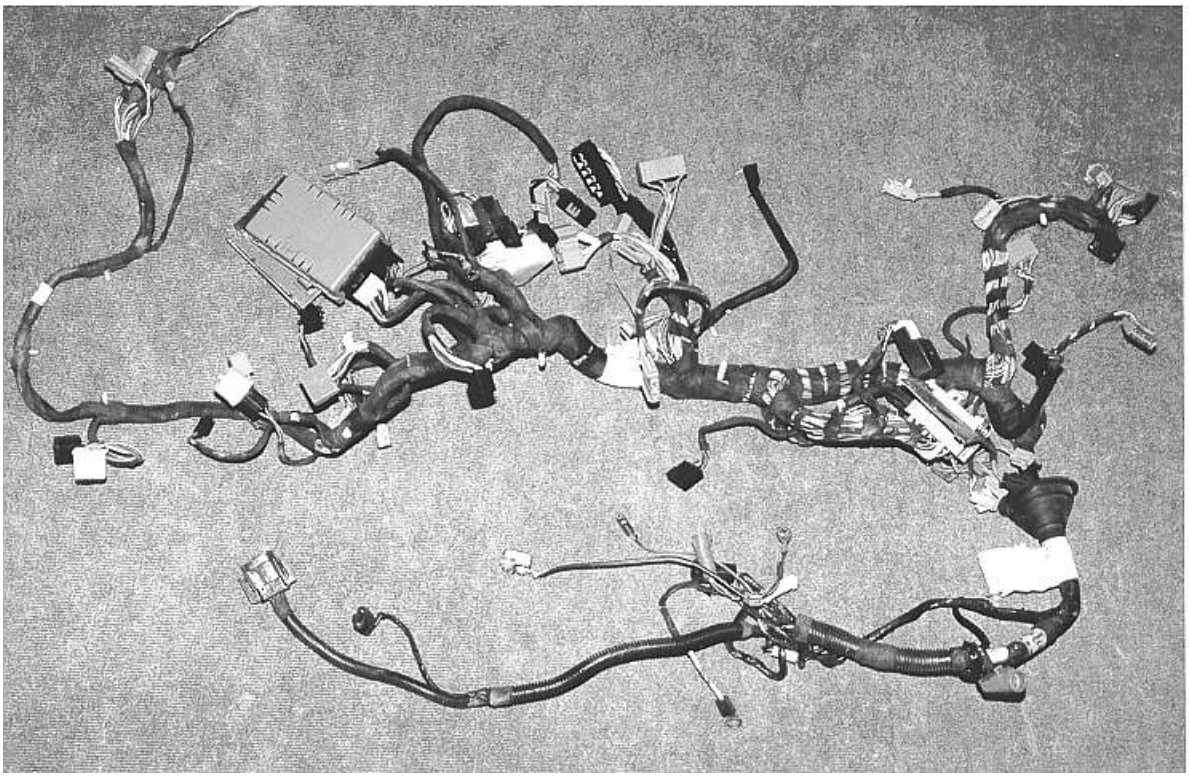
Remove the steering column mounts located under the dash above the driver floor. Allow the column to fall down.
Remove the wiring connectors have from the turn signal and ignition switches.
Remove the turn signal stalk

Dash Wiring Harness

- Socket set, extension, regular, Torx and Phillips head screwdrivers, needle nose pliers, hammer, and marker tape.
- Dash wiring harnesses
- The wiring comes out in stages. Keep the sub-assemblies together as they are removed. Remember to identify both ends of every connector that you disassemble. The easy way to do this is to tape and number each side of the connector the same or use colored zip ties. The connectors will only work if they're mated to the other similar shaped connector. Almost every connector is different in the car, so cross wiring is rare. Labeling will help speed up the job later.

Remove the dash from the car.
Remove the wiring harness and all of the "black boxes" hooked into it from the dash. Mark all of the connectors to prevent any confusion later.
Disconnect the connectors from the headlights and engine harnesses marking each connector with what it connects to.

- The headlight dimmer switch should be kept if dash lights are wanted otherwise the switch will have to be bypassed.



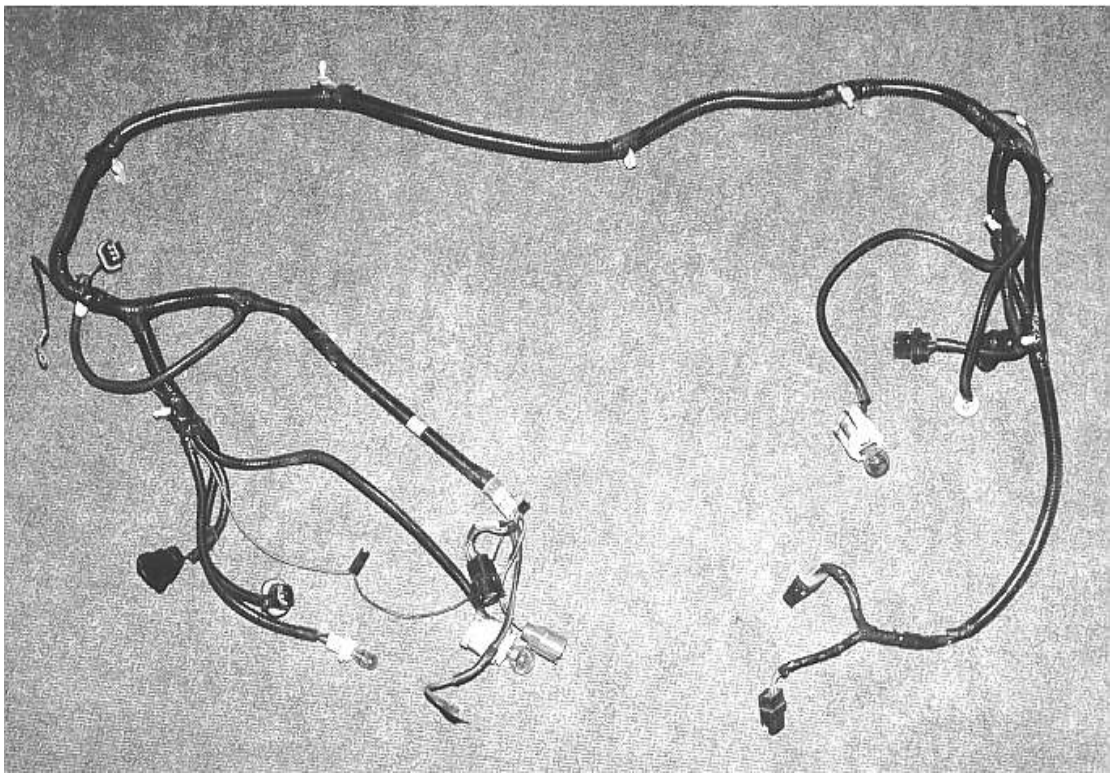
87-93 Dash harness with air bag and fuse panel attachments.

Front Wiring Harness

🛠 Socket set, extension, regular, Phillips head screwdrivers, needle nose pliers, hammer, and marker tape.

🚗 Front wiring harnesses.

Pull the rubber grommet out of the firewall into the engine bay.
Remove the front light harness from the engine bay wall working from the starter solenoid area to the alternator. Unscrew any ground wires and mark the connectors (Especially the headlight and turn signal lights) as you go.



87-93 Front wiring harness with hookups for headlights, alternator, and horn.

Speedometer sending unit

🛠 Socket set, duct tape.
🚗 Speedometer sending unit.

Remove the wiring harness plug from the sending unit.
Remove the speedometer sending unit bolt using an 11mm socket.
Pull the sending unit straight out.
Replace the screw in the transmission once the sending unit is removed.
Cover the speedometer drive hole with duct tape to prevent dust and dirt from entering.

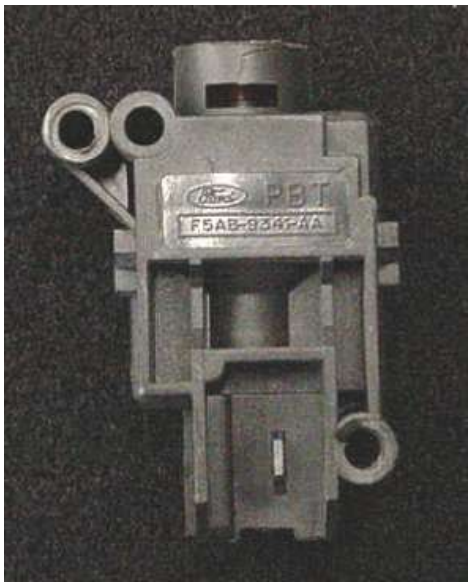
Shifter and Shifter handle

🛠 Socket set, Phillips head screwdriver.
🚗 Shifter
✋ The kit comes with new bolts for the shifter handle so you don't need the OEM bolts. Save them anyway according to rule #85 of the car guys' handbook which states "save any and all fasteners in rusty coffee cans". This, of course, makes finding and using such fasteners in the future all but impossible but it makes us feel good.

Remove the shifter knob from the handle.
Unscrew the plastic console that retains the boot.
Remove the shifter boot and unbolt the rubber boot below it.
Unbolt and remove the shifter and handle from the cockpit.
Duct tape over the handle hole and shaft opening.

Fuel Inertia cut-off switch

- Socket set, nut driver, Phillips head screwdriver, wire cutters to cut plastic fasteners, marker pen, and tape.
- Fuel inertia cut-off switch.
- It is recommended that a fuel inertia cut-off switch be used in the car.



Inertia cut-off switch.

From inside the trunk, unscrew and remove the panel covering the driver side taillight.
The inertia cut-off switch is a small black box (about 2”x 3”) with either a red or white button on top.
Unscrew the inertia switch from the body.

Rear and Transmission Wiring Harnesses

- Socket set, nut driver, Phillips head screwdriver, wire cutters to cut plastic fasteners, marker pen, and tape.
- Donor car rear wiring harness.
- Whenever you handle a wiring harness make sure to avoid cutting any leads. Ford uses multiple grounds in circuits and cutting any line may interrupt a circuit. Keep any/all seemingly useless leads intact and handle harness with care. If you decide to cut your harness down (remove all non-essential wires) follow a wiring schematic.

Remove bulb bases from the rear light housings if they are still on your donor. Use tape and a marker to label the wires.
Remove the rubber body plug from the fuel harness exit point in the base of the trunk area and unplug the connector.
Follow the rear harness toward the front of the car pulling it away from the wall of the car as you go. It is helpful to remove the panels that cover the harness as it goes into the cockpit. This makes pulling the wire assembly through easier.
The rear harness ends at the front driver’s side of the cockpit.
The transmission harness must be removed along with the rubber plug. This runs along the driver’s side of the transmission tunnel.
Store the rear harness and transmission harness.

Exhaust

🛠 Wrenches, $^{11}/_{16}$" socket, socket extension, ratchet, adjustable wrench, hack saw.
🚗 O_2 Sensors.
✋ Handle the Mustang Catalytic Converters with care since the honeycomb inside breaks easily. Some parts yards will want these, since they get a recycling credit for each. They are not used.

Remove the rear exhaust from the H-pipe in the middle area of the car with four bolts.

✋ The H-Pipe is mounted to the headers using four nuts, and is mounted to the transmission cross-member with sliding ⅝" pins inside rubber sleeves.

Cut the air tube connected to the H-pipe.
Disconnect the O_2 sensors from the engine harness.
Remove the nuts connecting to the headers so that the H-pipe can be moved rearward sliding the pins out of the transmission cross-member sleeves.
Lower the H-pipe assembly and remove.
Remove the O_2 sensors from the H-pipe with an adjustable wrench. Do not touch the ends.

Engine Removal

🛠 Engine hoist, socket set, wrenches, floor jack, used tire or engine stand, rags, chain, duct tape, friends.
🚗 Mustang engine/transmission assembly, engine mounts, transmission mount, OEM fasteners.
✋ Make sure to use an engine hoist that has sufficient load capacity for the job. Use extreme caution when moving engine assembly. Work on a clear and level surface.

Remove the two large nuts that hold the engine mounts to the frame of the car. The driver's side bolt-hole is notched for ease of removal. The passenger's side engine mount has a single bolt hole.
Disconnect the drive shaft from the rear end pinion Using a 12-point 12mm wrench or socket.
Remove the drive shaft carefully. Do not damage the front snout. Thread the bolts back into the rear end so you do not lose them.
Drain the transmission fluid. This can be done on the passenger side of the transmission through the plug with the square socket on it. Use a ⅜" ratchet handle to undo it.
Tape over the rear of the transmission so that it doesn't leak or drip fluid.
Undo the transmission mount from the cross-member.
Loosen the cross-member attachment bolts.
Place a bucket under the radiator drain petcock on the lower passenger side of the radiator
Loosen the radiator drain petcock with pliers.
Collect all of the used coolant and dispose of the coolant properly (local garage or parts store).
Loosen and remove the radiator hose clamps and hoses at the engine block. There may be residual fluid in hoses so try to avoid spilling.
Use duct tape or zip ties to secure the lower radiator hose up to the power steering pump area so that it will not spill fluid as the engine is removed later.

✋ Get help with the next few steps, as the parts involved are heavy!

Attach an engine hoist to the engine lift points at the driver's front and passenger's rear areas of the engine. One easy way to do this is with a chain and bolt on the other side of the hole. An alternative to this is to wrap chains through the back of the engine mounts and bolt the chain together for lifting. This will give you a balanced lift point.
Take up the slack on the chain slowly. Check to make sure that no hoses or wires remain connected to the engine.

Remove the bolts from the transmission cross-member and remove the cross-member.
Check again to make sure that all wires and straps are removed.
Lift the engine off the engine mounts and guide it out of the engine bay. Guide the rear of the transmission out of the transmission tunnel carefully.
Set the engine/transmission assembly on an old tire with no rim or on engine stands to avoid damaging the oil pan.

There is an exhaust H-pipe tube holder plate sandwiched between the transmission mount and the transmission that must be removed. All you need is the transmission mount with the two bolts sticking down.

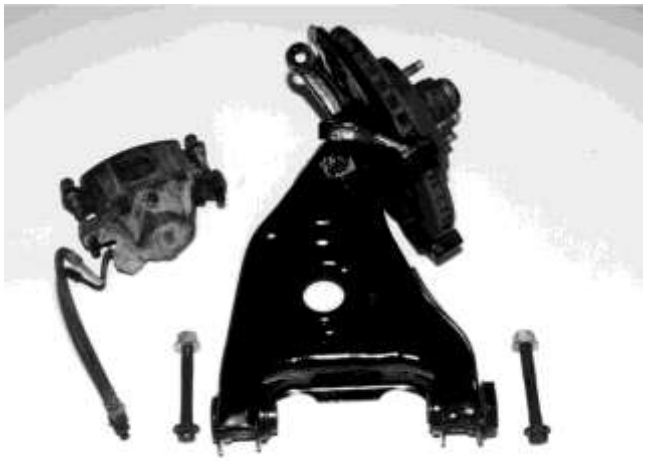
Front Suspension

🛠 Spring compression tool, socket set, wrenches, breaker bar, tubing cutter, floor jack, tire iron, jack stands, chain, needle nose pliers, rags, ball joint removal tool or plastic dead blow hammer.

🚗 Front lower control arms.

✋ The front springs are compressed in their fitted positions even when the suspension pieces are lowered in their mounts! These springs will cause serious injury or death if you are not extremely careful.

Loosen the lug nuts on the front wheels.
Raise the front of the car up with a floor jack and support it with jack stands.
Remove the front wheels.
Disconnect the front sway bar and remove the mounts from the control arms.
Follow the flexible brake line from the front brakes to the mounting bracket on the body, unscrew or cut the steel brake line 4" after the bracket.
Remove the bracket clips from the brake line body mounts keeping them to use later.
Pull the brake line through the bracket. Put a rag or duct tape over the end to prevent brake fluid from dropping on the floor.
Put a jack underneath the ball joint on the lower control arm.



Lower A-arm w/bolts, brake caliper, spindle and brake rotor.

Use a spring compression tool to remove the front springs or chain the spring to the chassis.
Remove the three bolts that retain the struts to the top mounting plate.
Slowly lower the Jack and the strut assembly will come out of the body mount (sometimes violently) and allow the lower control arm to go down.

Remove the springs with extreme caution!
Unchain the spring once it is removed from the car.
Uncompress the spring compression tool slowly.
Remove the cotter pin and castle nut from the lower control arm.
Use a ball joint separation tool or dead blow hammer the ball joint through the spindle.
Remove the spindle from the car.
Remove the large bolts and nuts from the lower control arm mounts. These bolts and nuts should not be heated, get a big wrench and breaker bar to remove them.
Remove the lower control arm from the car.

Fuel Tank

- Socket set, wrenches, small flat head screwdrivers, floor jack, jack stands, fuel line disconnect tool, goggles with side splash protection, plastic dead blow hammer.
- Fuel tank with lower plastic cover, mounting straps, fuel cap, fuel filter, evaporative canister, and vapor line.
- Extreme caution should be used when handling and storing used fuel tanks. Make sure to close off openings. Use the factory cap and seal off open fuel line ends. Keep the tank level. Avoid dropping the fuel tank as the baffles and fuel pump inside are subject to damage. For more information, refer to a Chilton's or other repair manual for fuel system assemblies.

Loosen the rear wheel lug nuts.
Raise the rear of the car and place on jack stands.
Open the gas cap to relieve any pressure built up in the tank.
Remove the screws that hold the upper fuel cap and flange to the body of the car.
Remove the set screw and metal ring collar retainer from the fuel neck where it meets the tank.
Remove the fuel neck from the upper fuel fill area and slide the lower fuel tube out of the rubber grommet on the side of the tank.
The fuel tank is held in place with two straps that go under the tank and bolt to the body in front.
Place a floor jack under fuel tank and loosen the strap bolts.
Remove the bolts and lower tank enough to reach the high-pressure fuel lines and return lines located on the top of the tank, on the passenger's side.
Use a fuel line disconnect tool or two small screwdrivers to remove the fuel line from the smaller low-pressure return line on the fuel pump.
Disconnect the fuel line at the fuel filter by removing the small white clip with a regular head screwdriver.
Pull the fuel vapor hose off the plastic fitting on top of the gas tank.
With the help of a friend, drop the gas tank and store on a level surface.
Re-insert the fuel neck into the tank with the ring collar and screw that retain the fuel neck to the side of the tank.
Remove the rear strap retainer by removing a pin that is contained inside a sheet metal box mount. Use a small screwdriver or pushing tool to push on the pin from the side as you push upwards to align it to the exit hole. The pin is a very loose fit and you will see that this is not very difficult.
Remove the fuel vapor line going to the front of the car if you plan to use it.

Rear End

- Drill, ¼" drill bit, socket set, wrenches, duct tape, tire iron, floor jack, and jack stands.
- 8.8" rear-end assembly, complete with quad shocks and springs. Rear brake assembly w/lines, OEM fasteners, Quad shock fame brackets.

- The rear end assembly weighs 225 lbs. Use caution when removing this assembly. Use extreme caution when removing any compressed coil spring. Make sure not to damage, dent or crimp the brake lines mounted to the rear end.
- If using an independent rear suspension, you will still need to remove the quad shocks but you do not need the frame brackets.

Remove the rear wheels.
Remove the flexible brake line from the body-mounted bracket.
Put a jack on the flat part of the middle of the rear axle.
In the trunk/hatch area of the car, undo the nuts on the top of the vertical shocks.
On the axle, undo the bolt that secures the quad shock using a 15mm socket. Move the shock out of the bracket and replace the bolt so that it will not get lost.
Lower the jack slowly with the rear end so that they come down together.
When the rear end has dropped down low enough, you can easily remove the coil springs and upper rubber spring mount. Save the rubber bushings above and below the springs.
Remove the bolts and nuts from the lower rear Mustang control arm, where the arms are mounted to the body/chassis.
Remove the bolts and nuts from the upper Mustang control arm, where the arms are mounted to the body/chassis.
All of the arms should remain attached to the rear end assembly. Once off, place the bolts back into the arms and attach nuts so they do not get lost.
Remove the rear end from under the car.
Remove the brackets that secure the quad shocks to the frame.
Use a drill with a ¼" bit to drill out the rivets on the brake bracket, which retain it to the body above the differential. Keep this bracket for use later.

Fuel filter and connectors

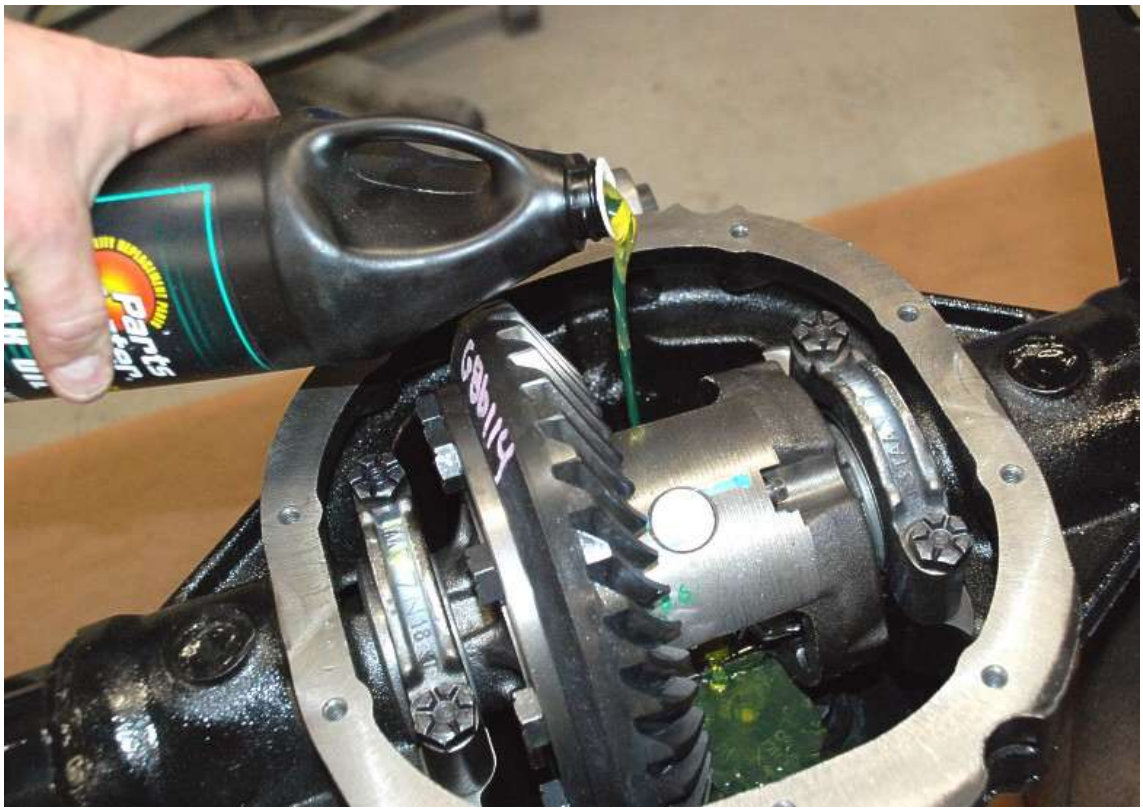
- Socket set, small flat head screwdriver, tin snips or razor knife.
- Rear fuel lines and fuel filter mount.

Remove the fuel filter and fuel filter mount from the frame.
Disconnect the rear fuel line going from the tank to the filter and store.
Cut the plastic return line hose going to the tank 4" from the tank and store.

Donor Part Preparation

Solid Axle

- ¾" sockets, ¾" wrench, ½" drill bit, drill, floor jack, jack stands, Torque Wrench
- 8.8" Rear axle assembly, Solid axle adapters/hardware Box, Mustang lower control arms.
- Use caution when working with the rear end assembly, it weighs 225 lbs.



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

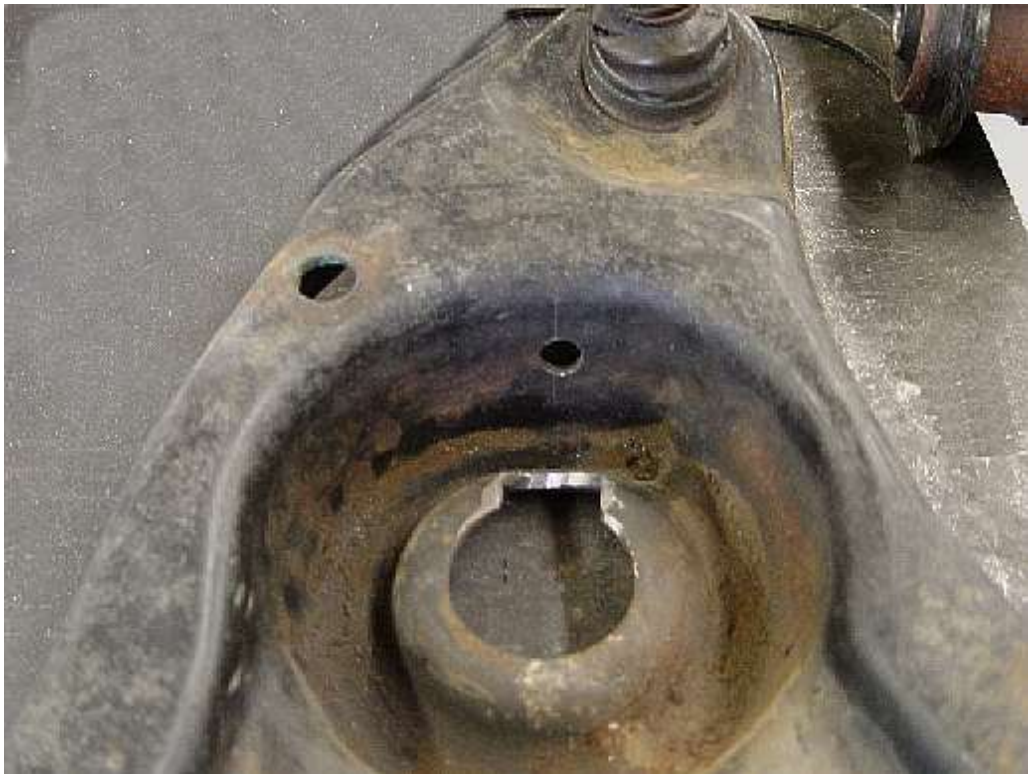
If using a used rear axle, remove the lower shock mounts and the anti-vibration weight under the pinion.

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

✋ The lower shock mount brackets will get used on the front lower control arms to mount the front shocks

Front Lower Control Arms

🛠 Hack saw, file grinder



Remove the area, near the center of the spring mount to prevent damage to the coil-over unit thru any contact whatsoever.

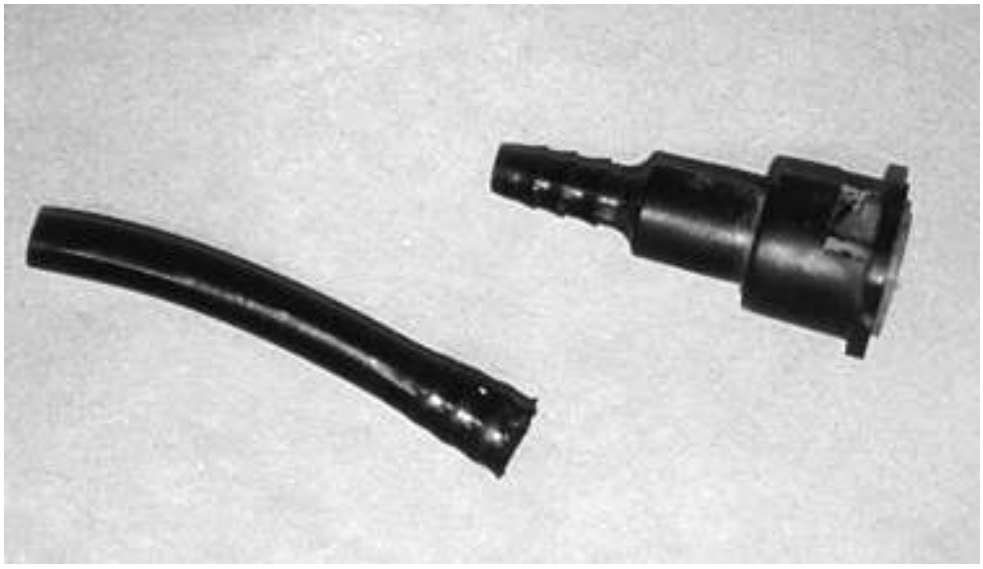
Attach the rear shock mount to the control arm through the hole in the spring seat with the small leg sticking up.

Check clearance with the new shock and the new mount. These parts must move freely without contacting the control arm surface.

Fuel Filter Fittings

🛠 Razor knife

🚗 Donor plastic fuel line fittings from fuel filter to body hard line and from return line from body hard line to fuel tank.



Carefully without damaging the plastic barb, cut the hard plastic off the plastic barbs.

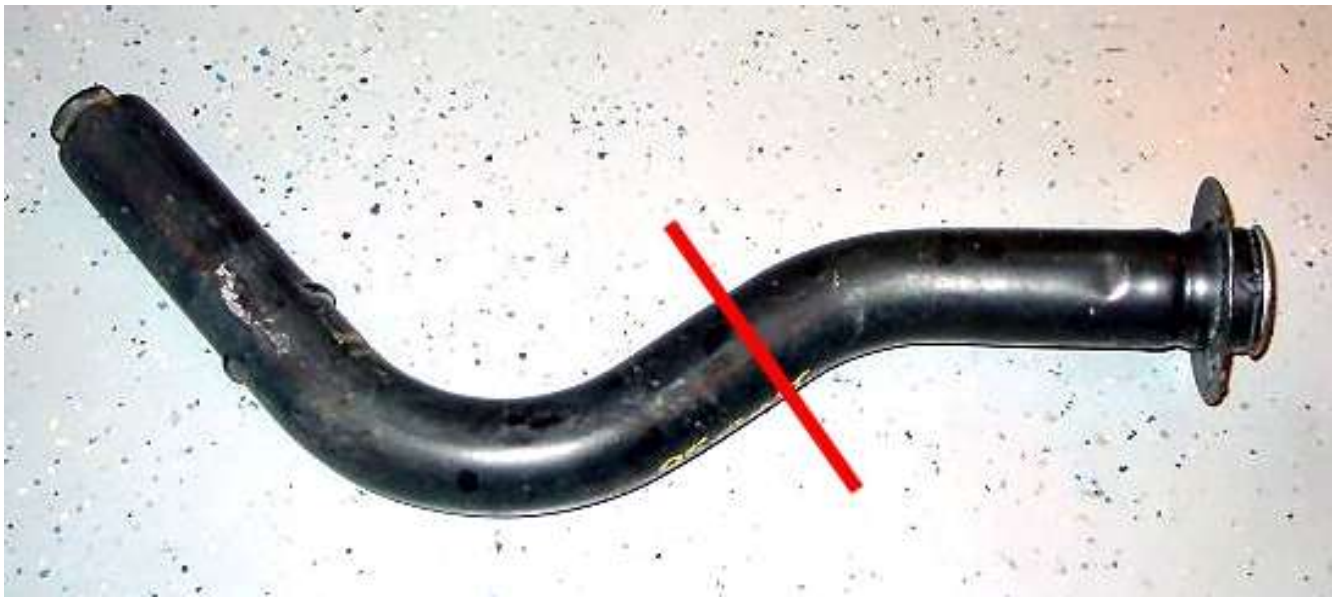
Fuel Tank

🛠 Pliers
🚗 Fuel Tank

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.

Fuel Filler Neck

🛠 Hack saw
🚗 Fuel Filler neck



Cut the Mustang steel fuel neck in the mid-section after the 90° bend. Leave enough straight tube, to attach a hose clamp to each side.

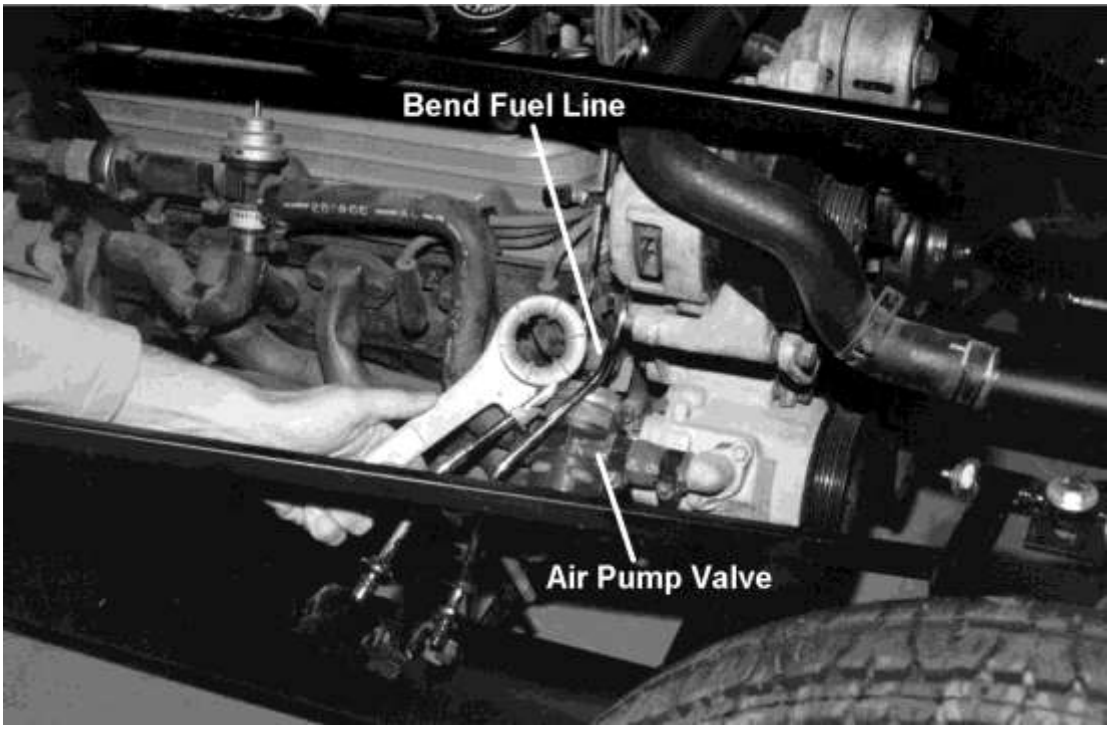
Remove the inner rubber hose.

Driveshaft

Shortening a driveshaft is not for the "Do-it-yourselfer". Take the driveshaft to a professional shop to have it shortened to the drawing. If you don't know of one, ask a local auto parts store or search the yellow pages. See appendix A for the driveshaft diagram to provide the shop with written instructions. Make sure your machine shop puts new U-joints on your shortened driveshaft and balances it (a pro does this anyway). You should expect to pay about $100.

Engine Preparation

🛠 $^{7}/_{16}$", ½" sockets, tube bender, ratchet



Bend the fuel lines away from the engine block just at the point where they are held in place by the retaining clips. This is so that the fuel does not travel near the hot header. Don't make tight bends here or it will affect your fuel flow.

If you are using a Lakewood bell housing, trim the area around the starter so that is flush with the inspection cover.
If you are not running emissions equipment, the only engine controls that need vacuum are the PCV valve in the valve cover and the fuel pressure regulator. The EGR can be left unhooked. Make sure to close off any extra vacuum ports.
If you are not running emissions equipment, the hoses, mounts and solenoids can be removed.
Install the headers using the header originally for the left side on the right side of the engine, and the right header on the left side of the engine. Thread all of the bolts on the headers before tightening any of them, to make installation easier.

Alternate Drive Pulley Preparation

- Cordless drill, ½" drill bit, needle nose pliers
- Alternate drive pulley template
- On 87-93 EFI cars, the pulley and fan belt supplied replace the A/C compressor and power steering pump.
- If you are planning on using under drive pulleys, do not use the template.
- If you are planning on running power steering the alternate pulley is not needed. You will however need the power steering mounting brackets for a non-A/C car.

Remove the A/C and power steering pump. Use the alternate drive pulley template to prepare the bracket for the pulley.
Use the template in appendix A to drill into the original Mustang A/C bracket. If you are choosing to run either A/C or power steering, you do not need to use this alternate drive pulley assembly.
If you really want power steering on the car use the non-A/C power steering brackets from Ford to move the power steering unit up out of the way of the steering shaft.

Steering Rack

🛠 $^{11}/_{16}$" and ⅝" wrenches, ruler, hack saw, marker.

Remove the outer tie rods.
Remove the inner tie rods.
Cut 1.75" off the end of the inner tie rods.

✋ If you are planning on running power steering the next steps are not needed.

Remove the hydraulic lines. Drain all fluid by turning it, lock to lock, upside down over a collection pan. Dispose of the fluid properly. The rack is greased on the gears at the ends.
The Mustang power rack is converted to a manual rack by removing the hydraulic lines from it and draining the fluid. You can leave the holes open without concern since the hydraulic cylinder is no longer used, however, for cosmetic reasons you may want to close them off. You can use a ½" Non-threaded hole plug. Keep in mind, this must not be airtight! Air must be allowed to move in and out of the holes. If you use a hole-plug, drill a small air release hole in the center.

Cleaning and Detailing

✋ Before you start assembling your car, cleaning is the best way to assess what needs to be done to the donor parts. Based on your close-up inspection you may choose to re-build or replace some of the parts that you have just removed. Areas to inspect include transmission tail shaft side to side free play, pinion oil seal on the rear end, valve cover gaskets, distributor cap for excessive build-up deposits, and clutch wear.

✋ When using engine degreaser, collect the waste solvents and dispose of properly.

- Steam clean or use a strong detergent such as Gunk™ engine cleaner.
- If the parts are really dirty, you can take the parts and assemblies to a do-it-yourself car wash. They usually have an engine degreaser as an option and most places run very high-water temperature that helps loosen debris and grease. If doing this, tape over the engine intake holes, engine wiring connectors, and coolant openings. Let the parts dry completely before removing the tape.

✋ Be sure to clean the bay after you clean your stuff.

- A wire wheel on a drill can bring even the most oxidized aluminum up to a nice finish. Be sure to wear gloves and safety goggles. This can be done on the bell housing, transmission, alternator, valve covers, steering rack, engine intake, water-pump, and engine accessory brackets.
- Apply clear coat paint on aluminum parts so the parts will not oxidize.
- Wire brush and paint control arms and the rear end. Avoid rubber bushings and quad-shock travel shafts (shiny areas). When repainting parts, a consistent color scheme works best and looks the nicest.
- Wait until the wiring harness is installed and the car is running before you cover the harness up with a nice wrapping of electrical tape. If it's dirty, wipe it off gently with a moist (not wet) rag.
- Use common sense when cleaning these parts; don't use a wire wheel on a drill close to any wires or lines. Keep solvents away from rubber lines/hoses.

- After cleaning the engine, replace the spark plugs. When removing the plugs, look for oil on them or if they look burned. If you have any doubts, ask a mechanic or a good auto parts store what the condition of the spark plug reveals about the engine's performance. When replacing the spark plugs, make sure you gap them before installing them.

Chapter

3

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.

Fastener Pack

The Coupe kit packages all the fasteners together in one box. The assembly manual will tell you which fasteners to use in which location. There is a list of the fasteners in the appendix. There are also full-size fastener diagrams for both Metric and standard fasteners in the appendix.

Kit Parts Prep

There are a number of parts in the kit and options 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:

60351/52	DOOR FRAMES	EA	2.00
60347/48	DOOR HINGE ARM	EA	2.00
13565	HINGE ADJUSTER BRACKET	EA	2.00
15176	E-BRAKE LOWER HANDLE ASSEMBLY	EA	1.00
14788	WILWOOD BRAKE LIGHT SWITCH MOUNT	EA	1.00
13551	EXHAUST FRAME MOUNT ASSEMBLY	EA	2.00
60391	NOSE HINGE BRACKET ASSEMBLY	EA	2.00
60525	LEFT SIDE HATCH HINGE MOUNT	EA	1.00
60526	RIGHT SIDE HATCH HINGE MOUNT	EA	1.00
15224	REAR HATCH HINGE ARM FRAME SIDE	EA	2.00
15252	REAR HATCH HINGE ARM HATCH SIDE, DRIVER	EA	1.00
15253	REAR HATCH HINGE ARM HATCH SIDE, PASS	EA	1.00
60412	BODY REAR MOUNT PLATE, LEFT	EA	1.00
60413	BODY REAR MOUNT PLATE, RIGHT	EA	1.00
60320	RIGHT COUPE SIDE EXHAUST	EA	1.00
60321	LEFT COUPE SIDE EXHAUST	EA	1.00
60335	RADIATOR TOP MOUNTING BRACKET	EA	1.00
60399	TRANSMISSION MOUNT PLATE	EA	1.00

Headliner and Optional Carpet

- Razor Knife
- Interior Trim/Carpet Box

If you have the space, unpack your headliner and carpet material. 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.

Body Removal

🛠 $^{5}/_{16}$" socket, Ratchet, gloves, 2 friends.
✋ Be careful of the raw fiberglass edges, they can splinter into your skin

Remove the duct tape from the kit.
Remove the nose and rear hatch.

Unscrew the body in the door openings using a $^{5}/_{16}$" socket and ratchet or $^{5}/_{16}$" nut driver.

Lift in the exhaust recess and the rear wheel well. Carefully pull the front sides of the body out and up around the door hinge mounts while at the same time lifting the rear of the body.

Rotate the back of the body down and the front up once the back is clear of the frame.

Remove the body by walking towards the rear of the frame.

The body can be stored on the ground outside.

Area set-up

🛠 Jack stands, garage

Use jack-stands to position your frame in your workspace with plenty of room to move and walk around the whole frame.

Aluminum Prep and removal

🛠 ¼” nut driver, black or blue marker.

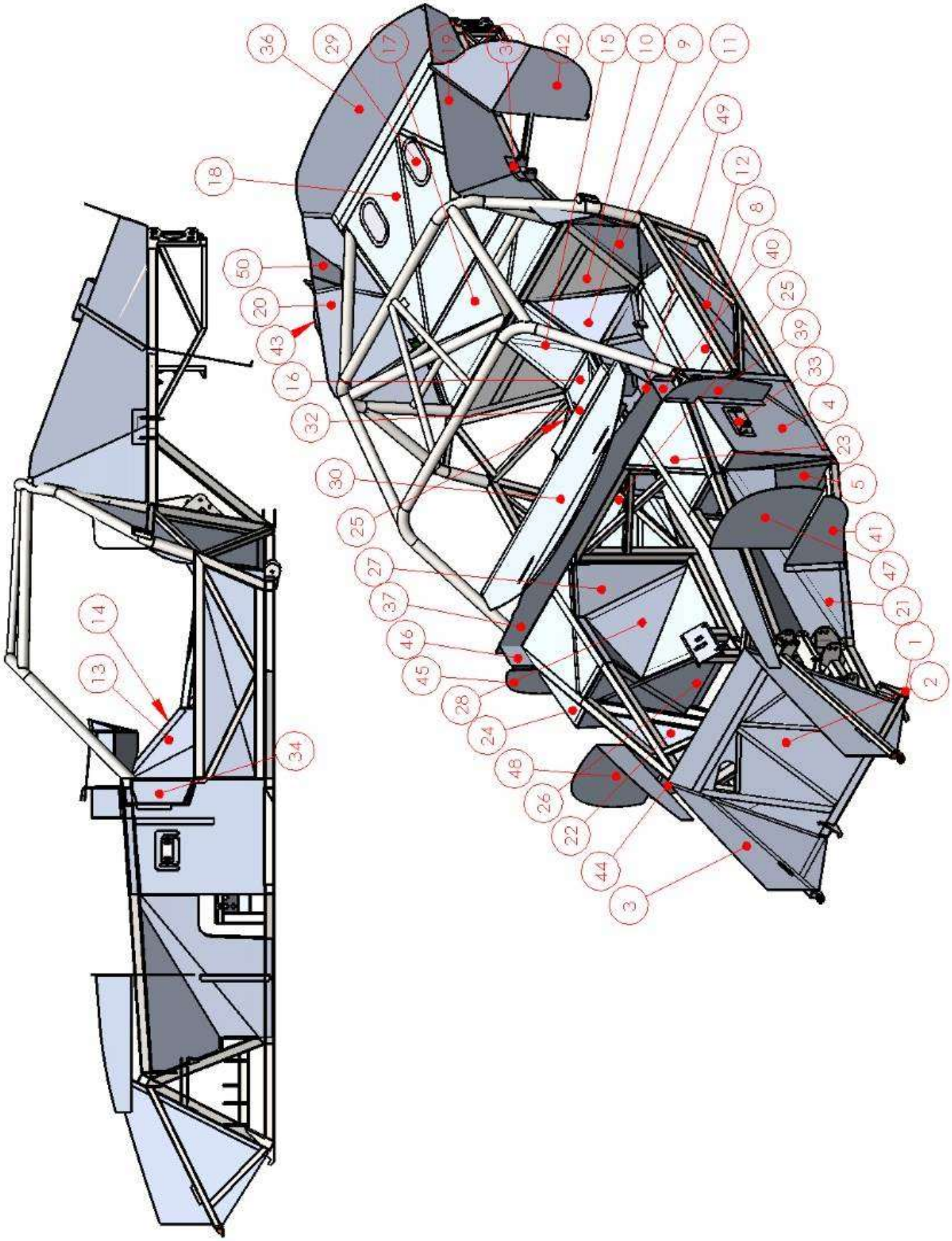
✋ Do one panel at a time. Be careful of the sharp aluminum edges, they can cut you.

Using a marker trace along each tube on the aluminum panels where they contact the chassis. If you see a spot where a drill or rivet cannot be installed due to lack of space or interference then make a small note not to drill in that area. 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 the aluminum positioning later during build-up.

Aluminum panel diagram



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	COUPE FRAME	COUPE FRAME	1
2	60195	RADIATOR DUCT BACK	1
3	60196	RADIATOR DUCT SIDE	2
4	60125	60149 - FOOTBOX OUTSIDE WALL, LEFT	1
5	60501	LEFT FOOTBOX FRONT	1
6	60132	LEFT FOOTBOX INSIDE LOWER WALL	1
7	60139	FOOTBOX INSIDE UPPER WALL, LEFT	1
8	60128	60167 - COCKPIT FLOOR, LEFT	1
9	60129	60159 -COCKPIT REAR INSIDE CORNER, LEFT	1
10	60130	COCKPIT REAR WALL	1
11	60131	60275 - COCKPIT REAR OUTSIDE CORNER, LEFT	1
12	60133	60164 - COCKPIT UNDER DOOR, LEFT	1
13	60134	60161 - COCKPIT TRANS SIDE, LEFT	1
14	60135	TRANSMISSION TUNNEL TOP FRONT	1
15	60136	DRIVESHAFT COVER	1
16	60137	TRANSMISSION TUNEL TOP REAR	1
17	60138	FRONT HATCH FLOOR	1
18	60122	HATCH FLOOR	1
19	60123	60277 - HATCH SIDE, LEFT	1
20	60123	60278 - HATCH SIDE, RIGHT	1
21	60142	60279 - FRNT WHEEL REAR INSIDE SPLASH, LFT	1
22	60142	60280 - FRNT WHEEL REAR INSIDE SPLASH, RT	1
23	60143	FOOTBOX TOP	2
24	60125	60150 - FOOTBOX OUTSIDE WALL, RIGHT	1
25	60128	60168 - COCKPIT FLOOR, RIGHT	1
26	60502	RIGHT FOOTBOX FRONT	1
27	60148	FOOTBOX INSIDE UPPER WALL, RIGHT	1
28	60146	FOOTBOX INSIDE LOWER WALL, RIGHT	1
29	12959	BLOCK OFF PLATE	2
30	60314	DASH	1
31	60315	PLATINUM GAUGE PANEL	1
32	60316	GAUGE VISOR	1
33	60273	FOOTBOX OUTSIDE NOSE MOUNT COVER	2
34	60274	60512 - LFT DOOR HINGE INSIDE COVER	1
35	60274	60513 - RT DOOR HINGE INSIDE COVER	1
36	60295	REAR HATCH REAR WALL	1
37	60296	FIREWALL	1
38	60297	REAR SHOCK TOWER COVER	1
39	60298	60441 - FIREWALL EXTENSION, LEFT	1
40	60542	60543 - LEFT INNER FIREWALL EXT.	1
41	60299	60439 - FRNT WHEEL REAR LWR SPLASH, LEFT	1
42	60300	60437 - REAR SPLASH GUARD, LEFT	1
43	60300	60438 - REAR SPLASH GUARD, RIGHT	1
44	60299	60440 - FRNT WHEEL REAR LWR SPLASH, RT	1
45	60298	60442 - FIREWALL EXTENSION, RIGHT	1
46	60542	60544 - RIGHT INNER FIREWALL EXT.	1
47	60301	60443 - LEFT UPPER ENGINE BAY SPLASH GRD	1
48	60301	60444 - RIGHT UPPER ENGINE BAY SPLASH GRD	1
49	60394	60395 - DASH SIDE, LEFT	1
50	60447	FUEL NECK COVER	1

Chapter 4

Chassis Assembly

Steering Rack

🛠 Needle Nose Pliers, ¾” wrench, ¾” socket, Ratchet
🚘 Steering Rack Assembly, Steering System Hardware (Box 1)

Unpack the Steering System Hardware.

Stock Mustang power steering rack prep

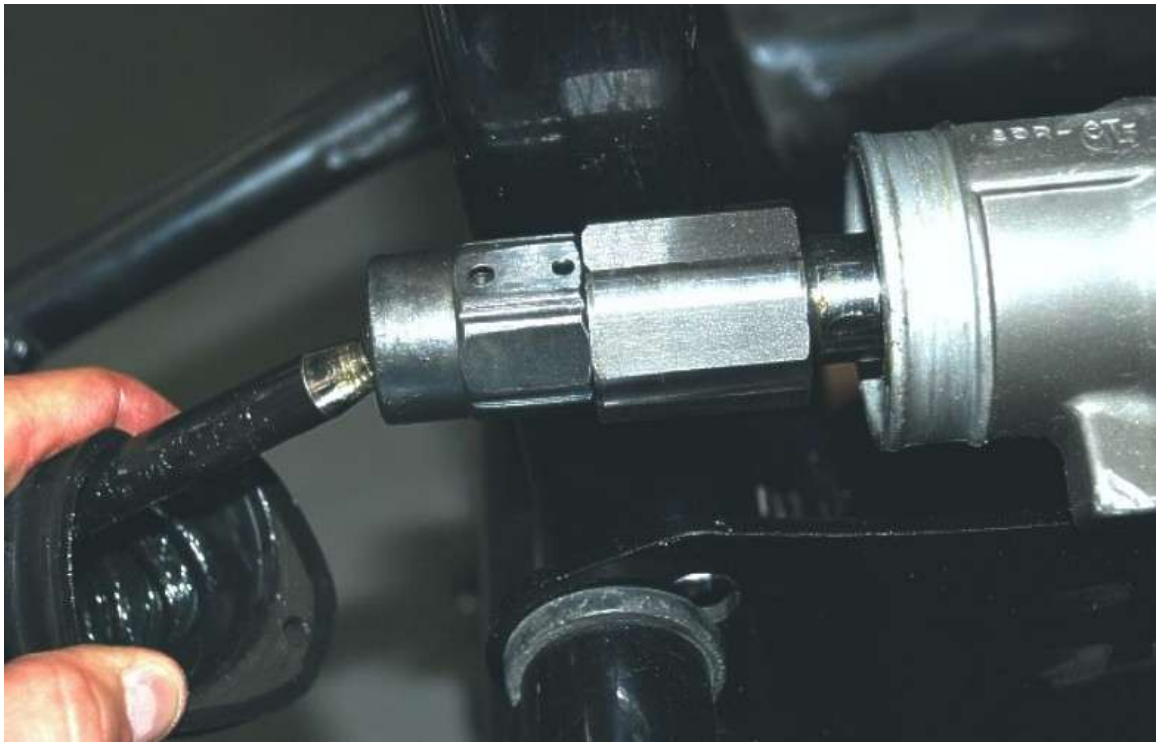
Push the bushing sleeves (Box 1) into the stock mustang rack bushings.

Steering rack extensions

✋ 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 optional FFR power steering rack.
✋ If using the power rack and you have not already done this in the donor prep stage, cut 1.75” off the end of the inner tie rod.

Pull back the rubber boot on the inner tie rod and remove the inner tie rod from the steering rack.

Put a dot of thread lock on the threads of the steering rack. Attach the steering rack extension to the steering rack using a 1.50” wrench and tighten.



Put a dot of thread lock on the threads of the steering rack extension and attach the Mustang inner tie rods to the steering rack.

Push the boot back onto the steering rack body and attach with zip ties.

MANUAL OR OPTIONAL POWER STEERING RACK PREP

✋ Factory Five Manual and power racks are installed in a similar way.

Unpack the steering rack assembly.

If the power rack has rubber bushings and sleeves in it, remove all of these.

Push the bushings and sleeves (Box 1) into the mounting bosses on the rack.

Screw the grease nipple into the outer tie rod end.

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

Steering rack install

🛠 ¾” wrench, ¾” socket, ratchet.

Lower the rack into the chassis right side first. Allow the rack to drop far enough into the opening to swing the other side down into its mounting bracket.

Locate the rack between the mounting brackets.

Locate the ½” x 4” grade 8 bolts, washers and locknuts.

✋ There are two sets of mounting holes, **lower** for standard street car ride height. **Top** for race car.

For standard street car ride height use the **lower** set of holes to mount the steering rack.

Use a ¾” wrench and ratchet to fully tighten the steering rack.

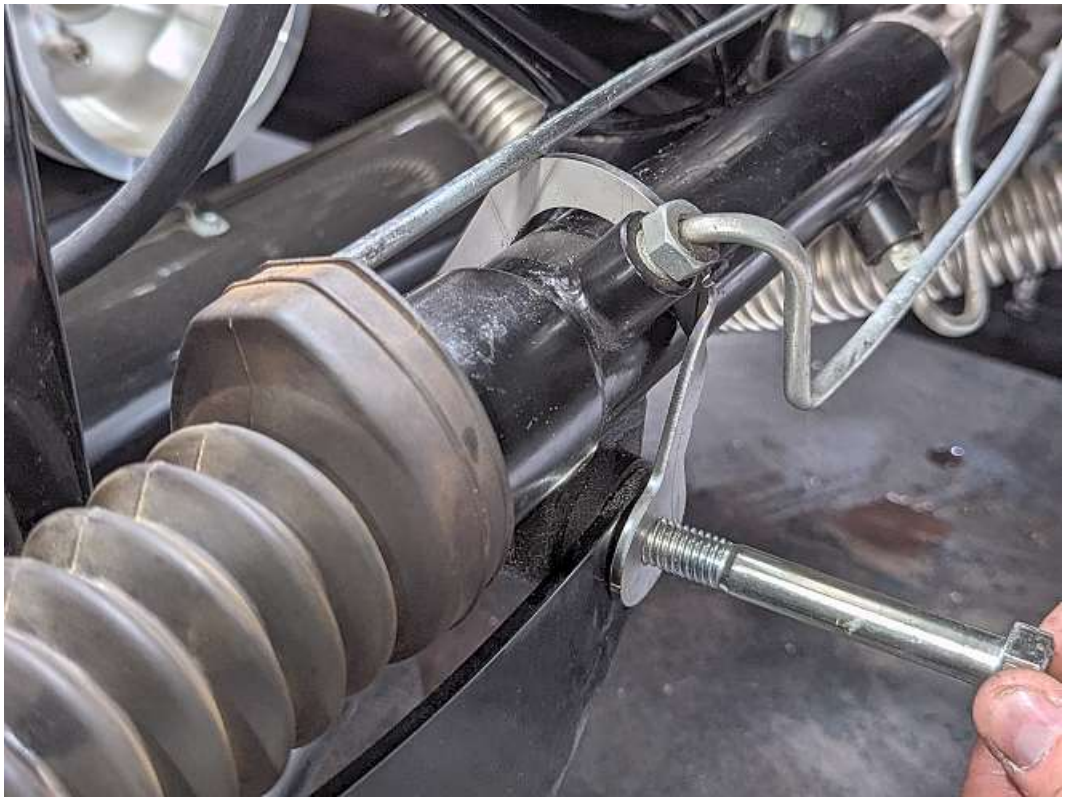
FFR Power steering Rack

Locate the included support safety bracket.

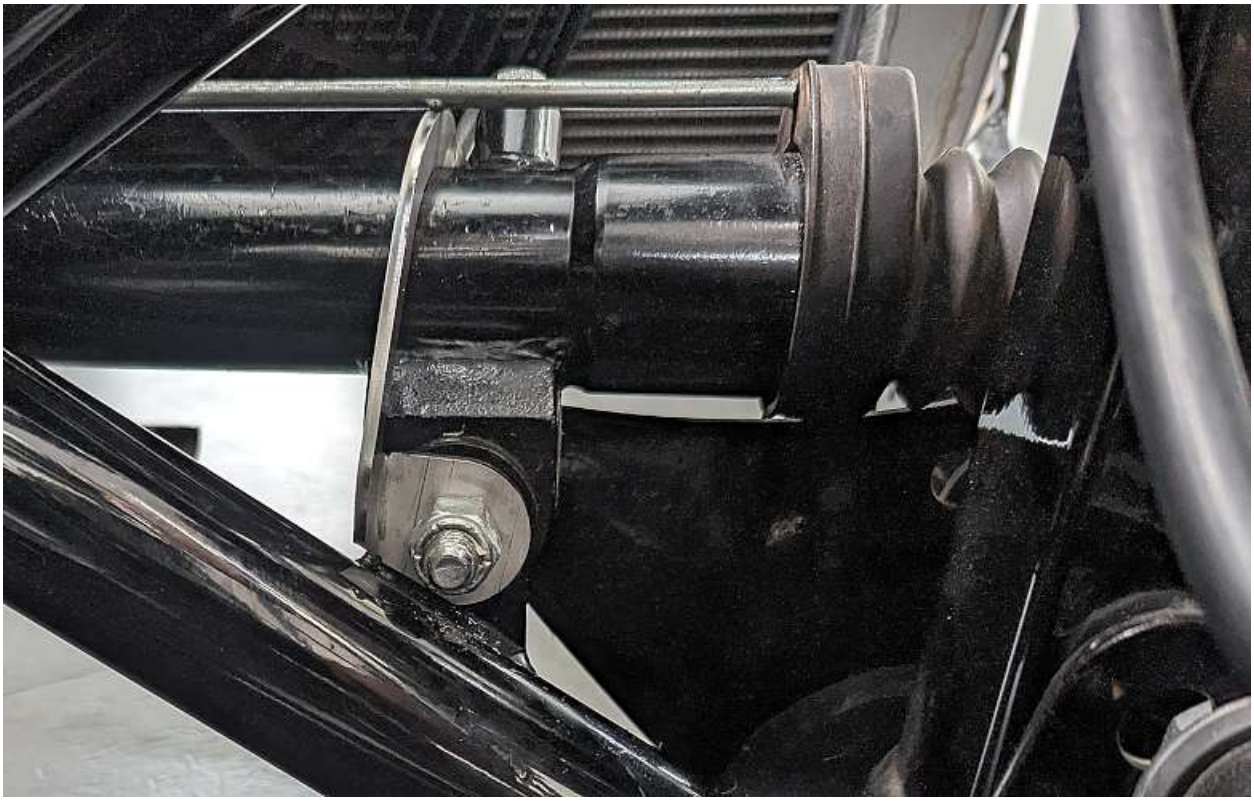
From the back side of the rack, slide the bracket under the bellows cross tube and to the left side of the hydraulic line connection.

As the bracket goes forward, rotate it to go under the hydraulic line.

Line up the bracket mounting hole with the frame bolt hole.



Remove the washer from the bolt then insert it through the bracket and frame.



Tighten the locknut on the bolt.

Use a ¾” wrench and ratchet to fully tighten the steering rack.

Front Suspension

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.

✋ There are two sets of mounting holes, **lower** for standard street car ride height. **Top** for race car.

Position the control arms one at a time so the lower set of holes line up with the control arm bushing sleeves and insert the front mounting bolt.

The rear bushing mount on the chassis is wider, use one of the large washers as a shim to take up the extra space on the backside of the rear bushing. attach the nuts and tighten the lower arms.

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

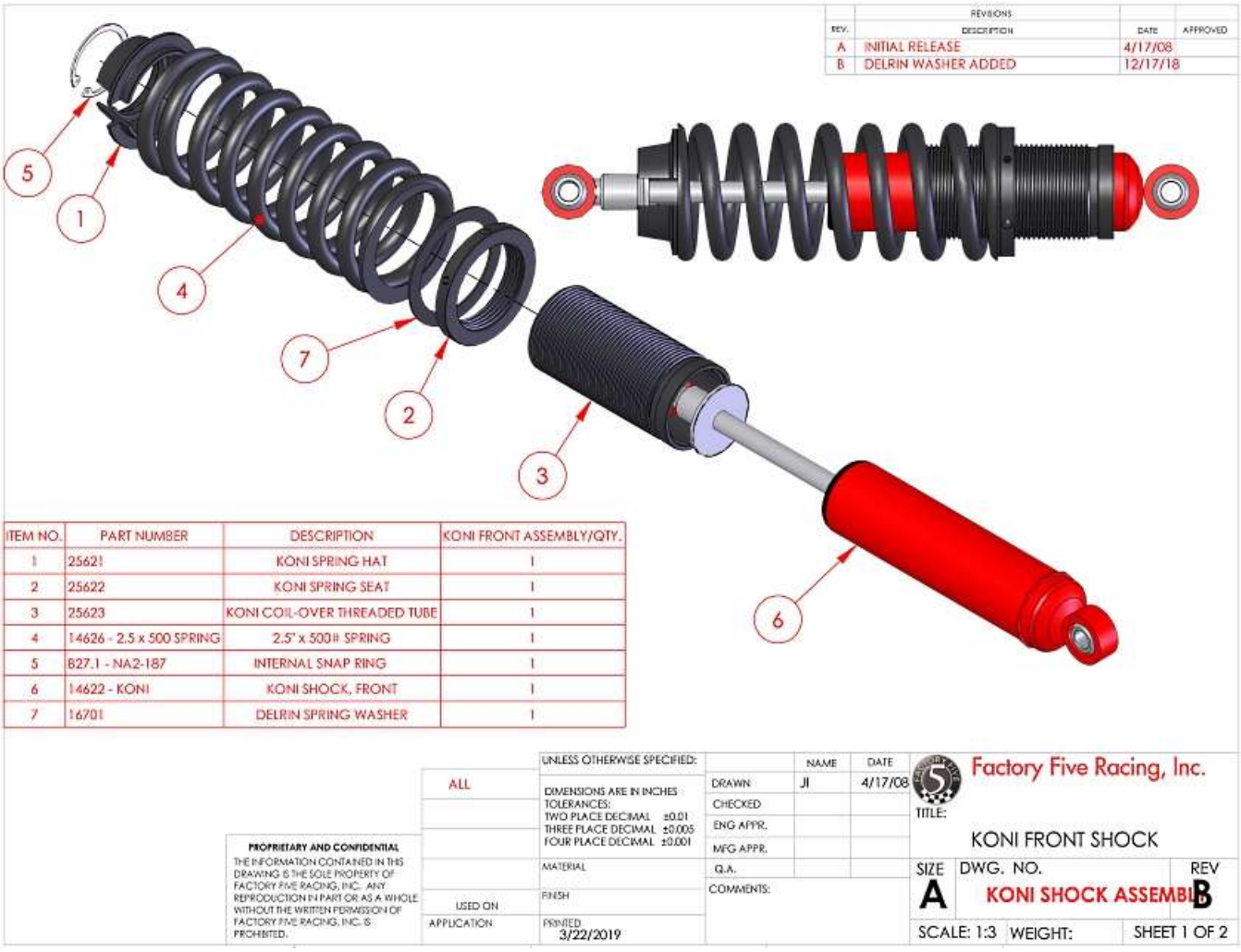
Front Coil-Over Shocks

Coil-over Assembly

- Snap ring pliers, chassis or lithium grease.
- Front shock set
- 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/IRS shock extended measurement is 15.15" center to center. They are 2.50" shorter than the solid axle rear shocks

Unpack the front shocks, coil-over kit 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.

Front shock installation

- If using the silver double adjustable shocks, these must be mounted with the body of the shock down in the top hole location for both street and race cars.
- For the stock red Koni shocks, there are two sets of mounting holes, **lower** for standard street car ride height. **Top** for race car.
- ¾" wrench, ¾" socket, Ratchet, Torque wrench
- Front shock set, IFS Components, fasteners, (2) 3.25"x ½" bolts, (2) 2.75"x ½" bolts, (4) ½"-13 locknuts and washers

Locate the coil-over mounting hardware in the kit. (2) 3.25”x ½” bolts, (2) 2.75”x ½” bolts, (4) ½”-13 locknuts and washers.

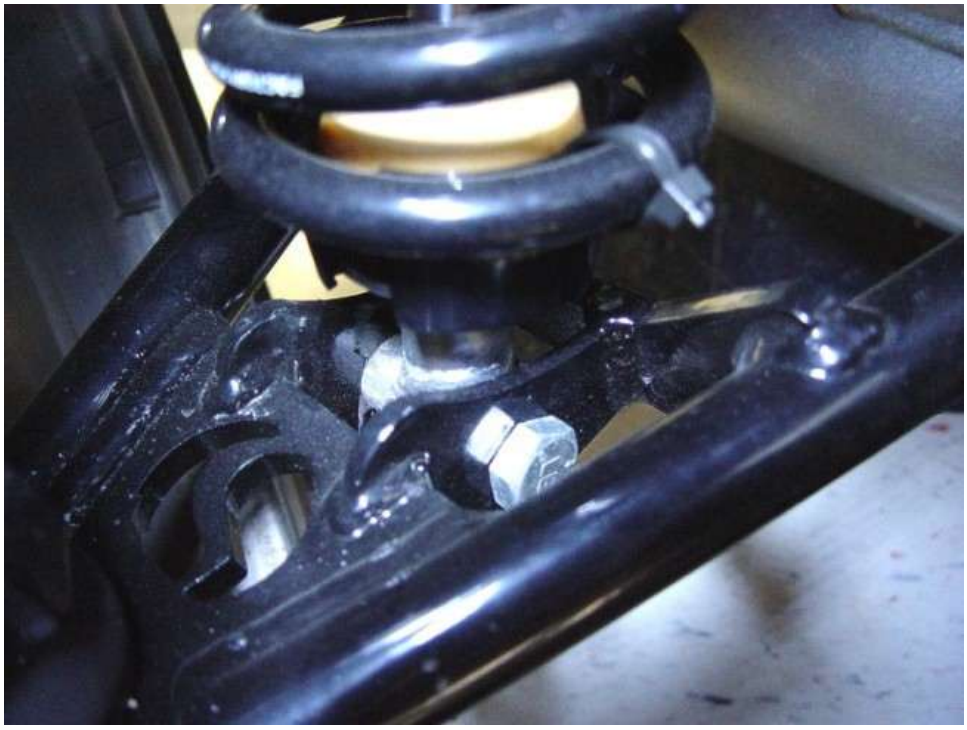
At the upper shock location using the longer 3.25” bolt and a washer thread it through the lower mounting hole in the frame and install one of the four longer (0.675”) spacers on it.

- If using the silver double adjustable shocks, these must be mounted with the body of the shock down in the top hole location for both street and race cars.
- For the stock red Koni shocks, there are two sets of mounting holes, **lower** for standard street car ride height. **Top** for race car.

Fasten the shock to the top mount with the ½"x 3.25" bolts and 0.675" spacers provided.

Use the 0.40” spacers and (2) ½”x 2.75” for the lower mounts.

The coil-over should now be holding the arm in place as shown.



Run zip ties through the holes in the spring hat and around the spring to prevent the spring from becoming unseated.

Torque the upper and lower mounting bolts for the coil-overs to **40 ft-lbs** and repeat for the other side of the frame.

Front upper control arm

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

Unpack the upper control arm assembly.

Start threading the upper ball joints into the control arms so that the balljoint angles out on the bottom. The arms are the same side to side so they will not appear symmetrical.

Use a little red Loctite on the balljoint threads.

If you do not have a balljoint socket, clamp the balljoint in a vice and use the arm itself for leverage to tighten.

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

Unpack the upper control arm mounting hardware. (4) ½”-20 x 1.75” flange head bolts and mechanical locknuts for Base and Complete kits. (4) ½”-13 x 2.75” bolts for R-Coupe

Remove one of the inner bolts from the upper control arms and wrap the cross shaft of the arm around behind the coil-over.

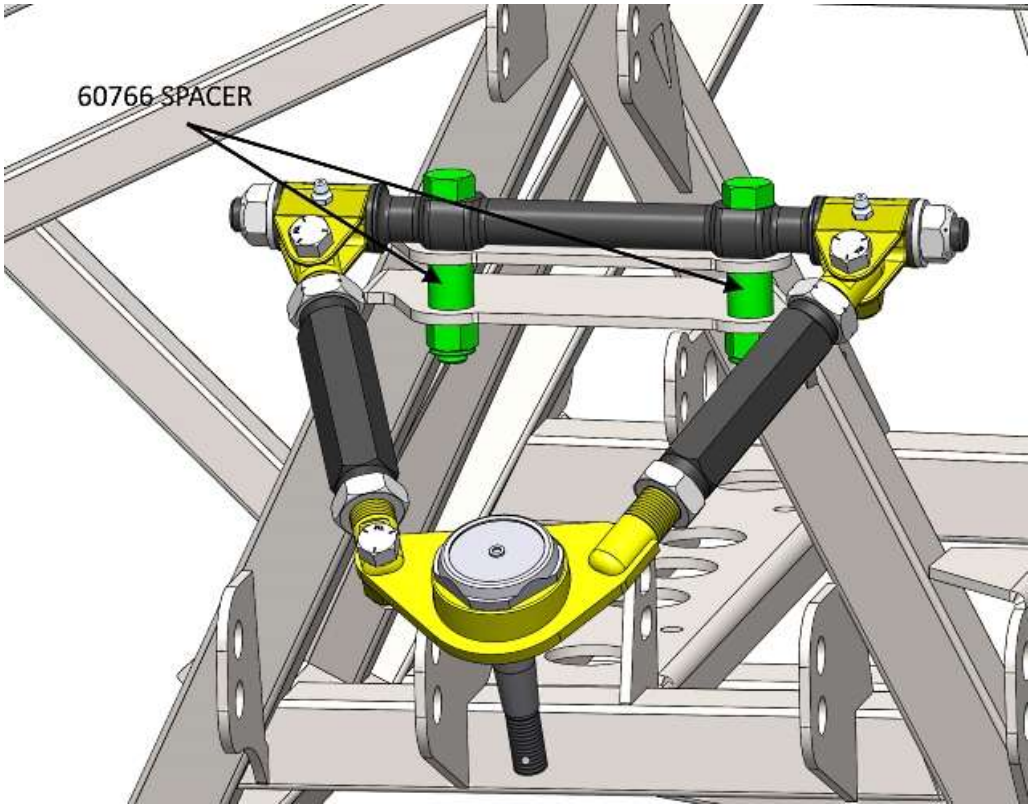
Base and complete kit upper arm location

Slide the cross shaft in **between** the two mounting flanges and thread the mounting bolts into place with the nuts on finger tight.

Replace the bolt removed to get the arm in place, flip over any remaining bolts that thread in from the bottom up so all the bolt heads are on top.

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

R model upper arm location



Set the cross shaft on top of the two mounting flanges, place the 0.84” spacers between the flanges then attach the arm using the ½” x 2.75” bolts.

Replace the bolt removed to get the arm in place, flip over any remaining bolts that thread in from the bottom up so all the bolt heads are on top and torque the two bolts that hold the arm to the frame to **108-115Nm (80-85 lbft).**

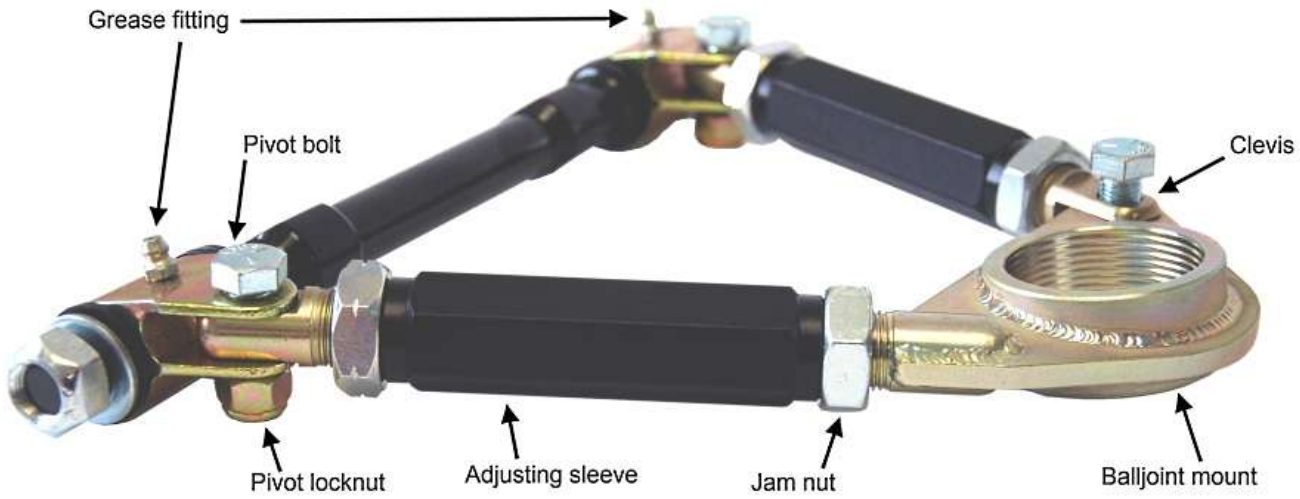
Pivot endplay

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 control arm should just drop slowly under its own weight when you hold it out straight and let it go.

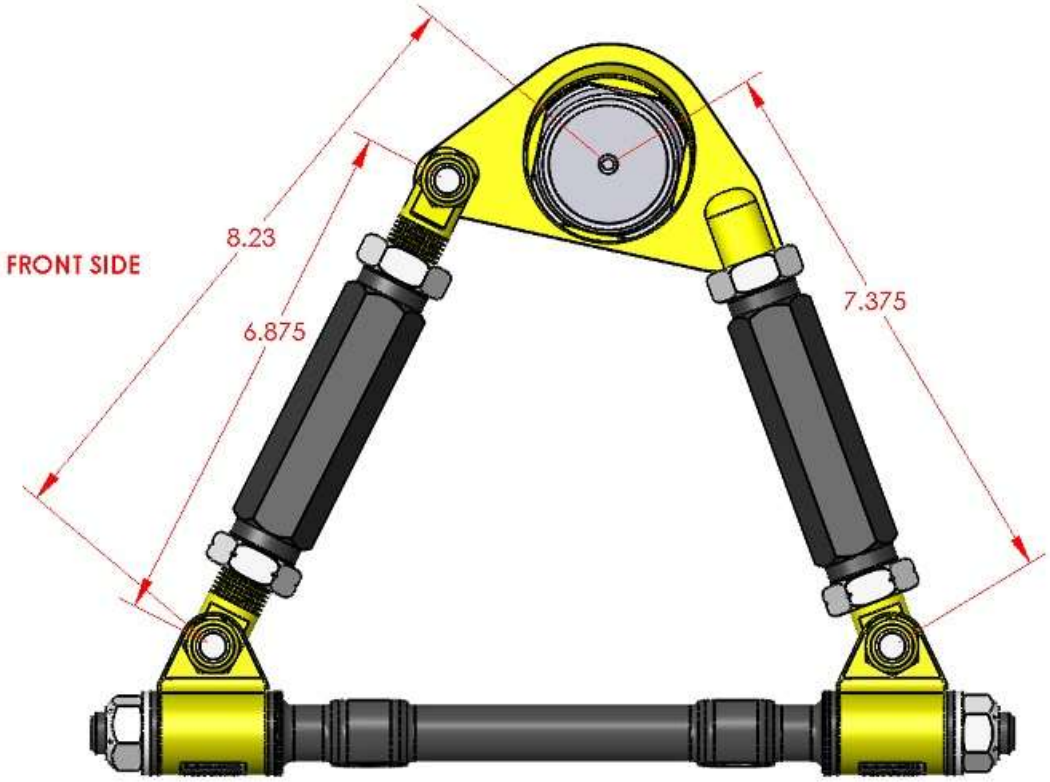
✋ The pivots may be a little stiff at first but once on the car they will loosen slightly.

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 tubes 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 lbft**.

Grease both ends using chassis grease frequently to insure smooth, trouble free operation.

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

Spindles

- $^{13}/_{16}$” socket, Torque wrench, Needle Nose Pliers, Rubber Mallet
- Spindle Assembly, (4) M12-1.75 x 50mm grade 10.9 bolts, (4) Flanged nylon locknuts.

Unpack and lay out the hardware for the spindles 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 Coupe uses these as Front steer so they are mounted opposite, The DSS spindle is mounted on the right side and the PSS spindle is mounted on the left side.

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

Place the 15803 countersunk spacer under the castle nut to ensure that the cotter pin is at the correct height. There is a small taper on the inside edge of the spacer that should face down toward the spindle.

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 ft-lbs** 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.

Use (4) M12-1.75 x 50mm grade 10.9 bolts and (4) Flanged nylon locknuts to bolt the steering arms to the spindles so the tie rod end will mount from the bottom (the taper on the hole will open out toward the bottom) and the kink in the arm angles the arm outward toward the rotor. Torque to **60 ft-lbs**.

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 ft-lbs)**.

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

Front Suspension Torque Specs Chart

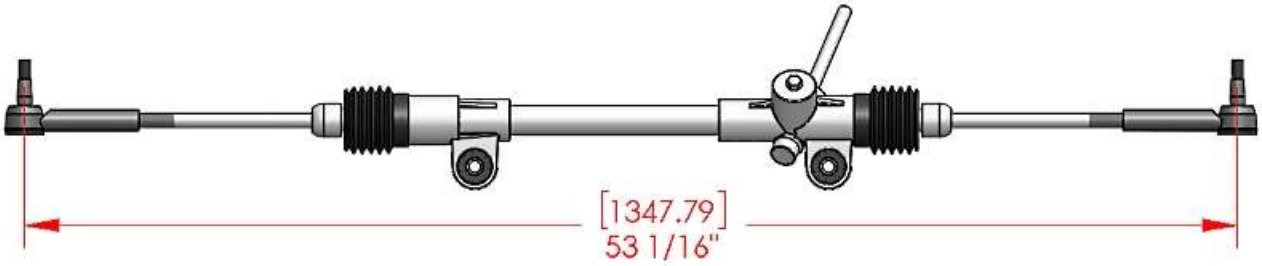
Item	Nm	Lbft
Front lower control arm to frame	135-162	100-110
Front lower ball joint to spindle	108-122	80-90
Upper A-arm to frame	108-115	80-85
Upper A-arm pivot bolts	73	54
Upper ball joint to Spindle	95-108	70-80
Spindle hub nut	305-338	225-250
Spindle steering arm to Spindle	81	60

Steering Tie Rod Ends

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.

Attach the tie rod to the spindle, torque the nut to **25 ft-lbs**. 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)**.

Front Brakes

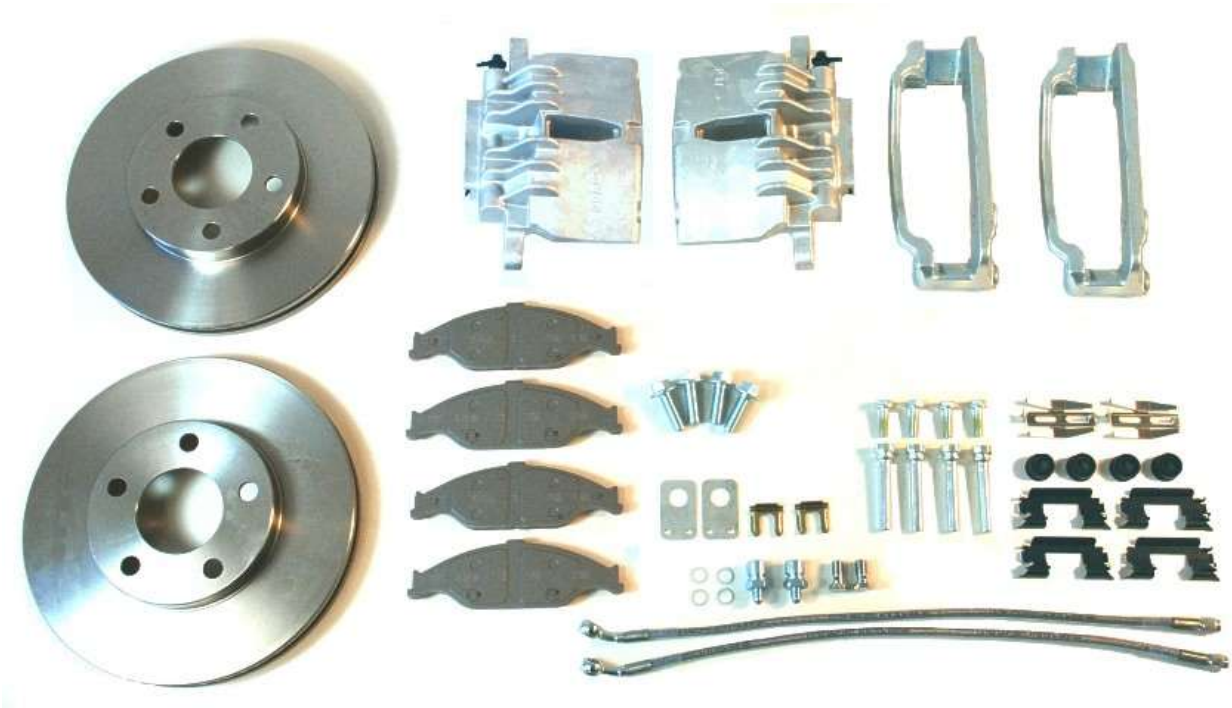
🛠 Sockets, Ratchet, Torque wrench, chassis grease, rags, brake cleaner,
🚗 Mustang front brake calipers and rotors
✋ Make sure that your brake pads and rotors are in good condition.

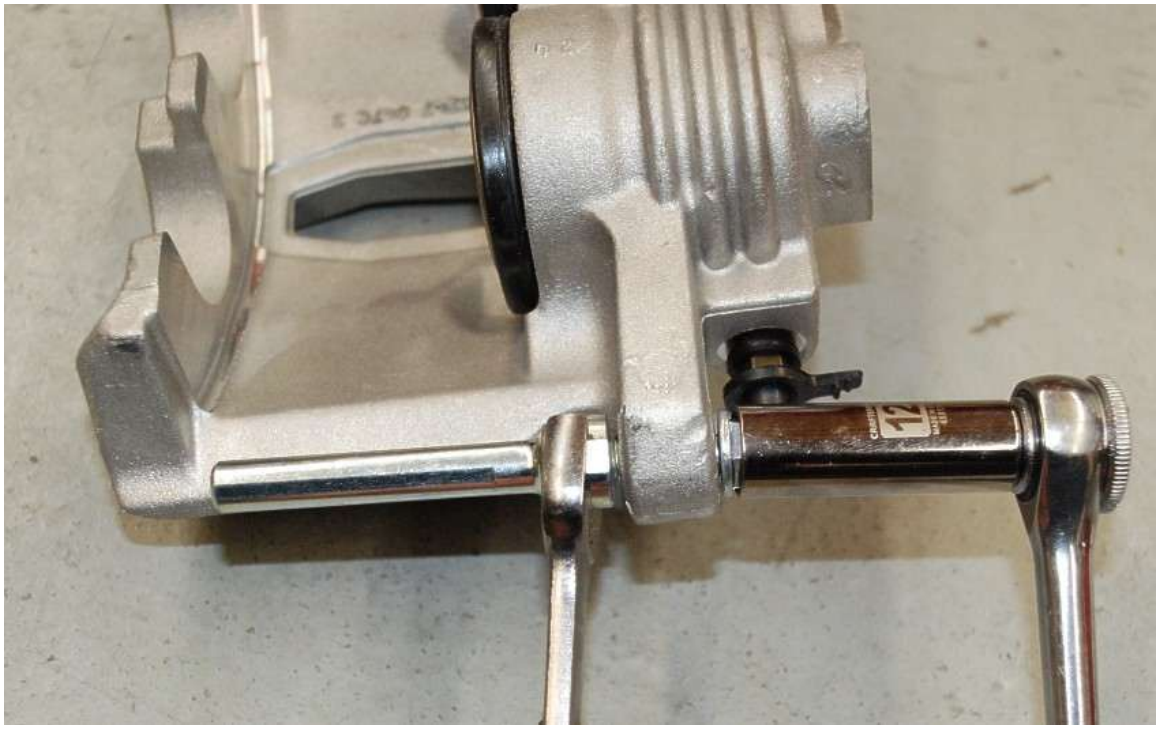
Donor Front Brakes

Make sure that the hub bearings are greased correctly and adequately.
Push the rotor onto the spindle.
Push the outer bearing on then the flat washer, and adjusting nut.
Adjust the bearing play.
Attach the nut lock and insert a cotter pin.
Using a large socket or a flat head screwdriver and rubber mallet, hit the dust cap onto the rotor.
Clean the rotor with brake cleaner.
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 **61-88Nm (45-65 lb-ft)**.

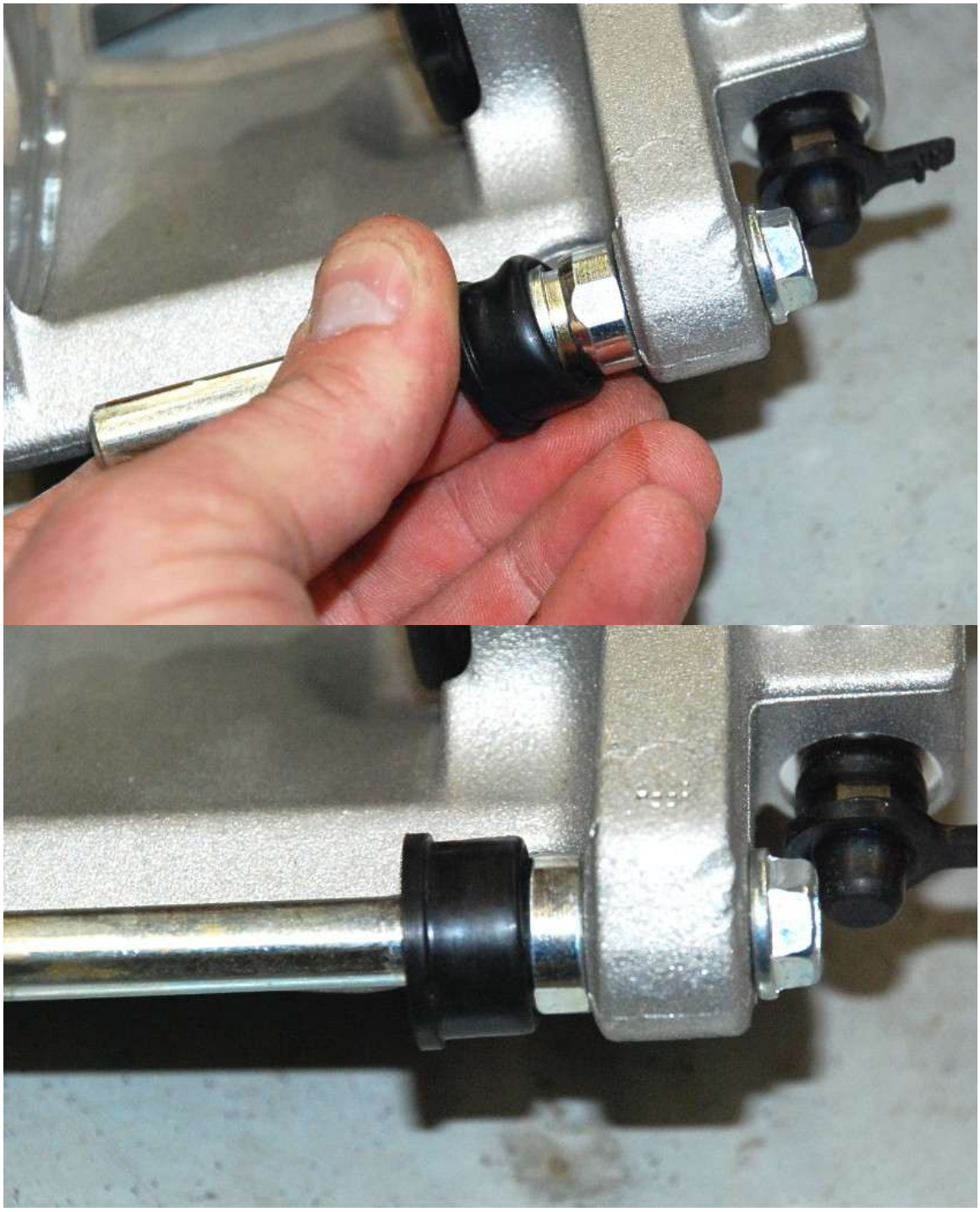
Complete kit Front Brakes

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



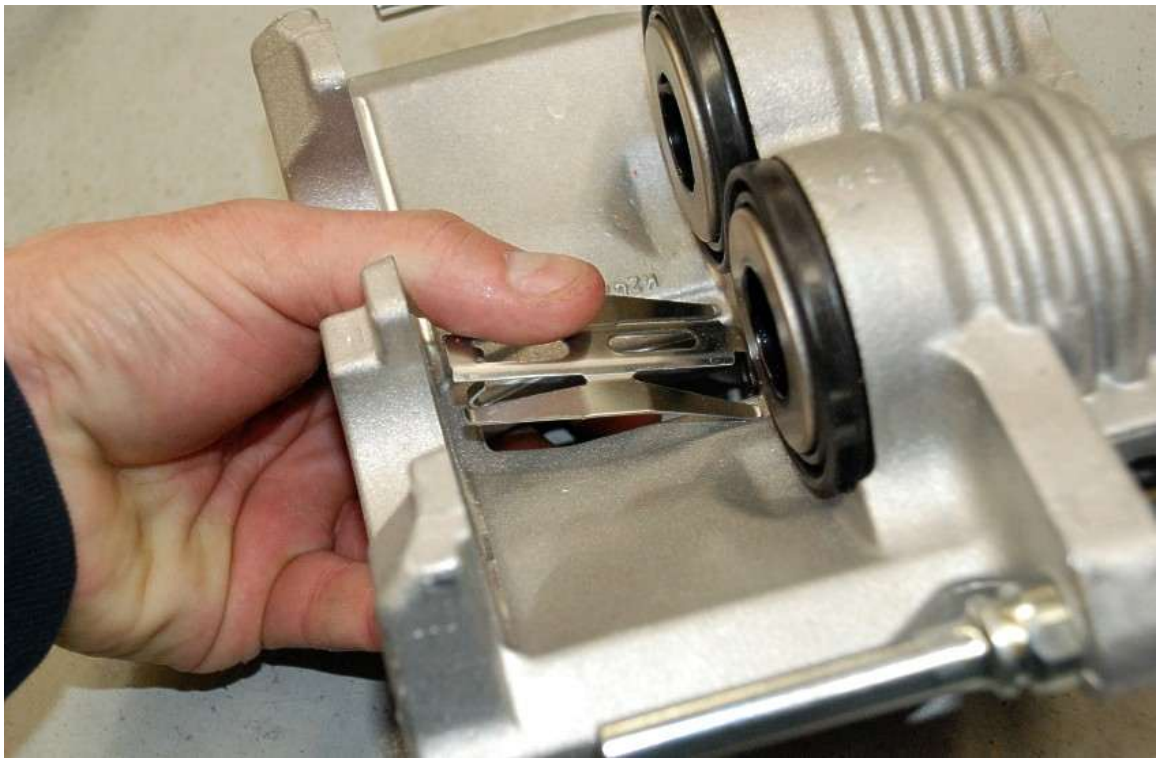


Install the caliper slider pins on the caliper using the supplied bolts and a 16mm wrench and 12mm socket. Torque to **23-26 lb-ft**.



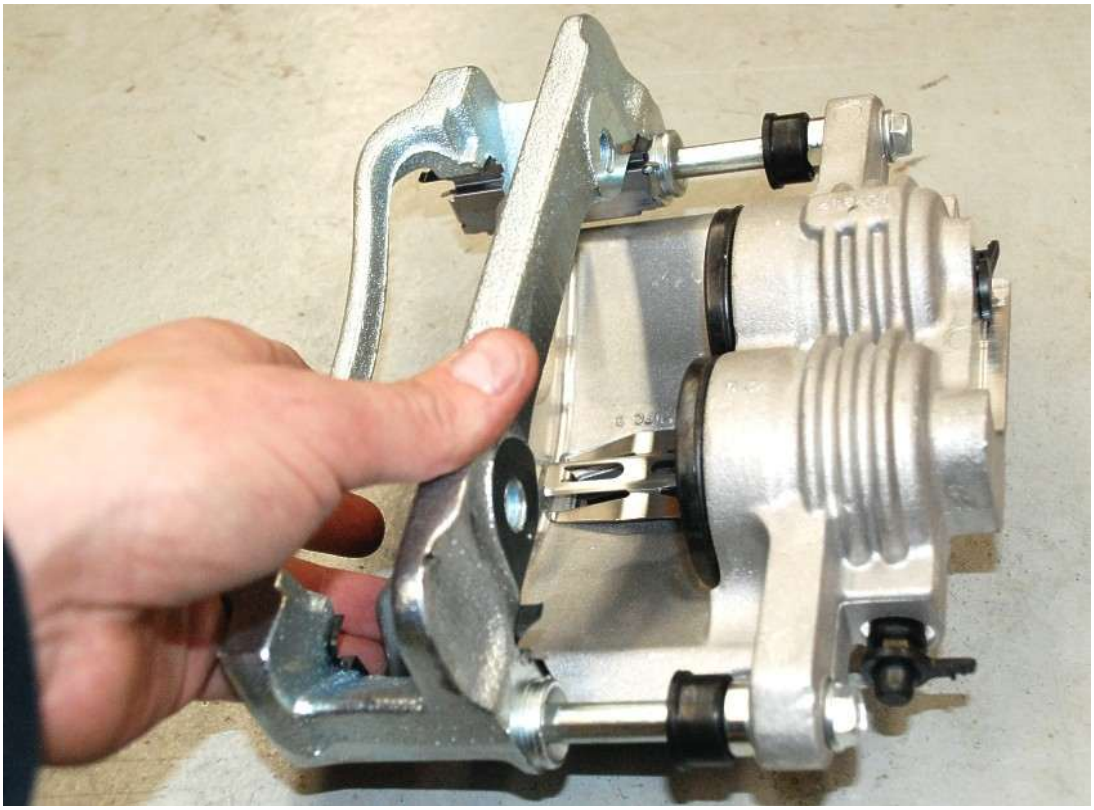
Install the slider grease boots on the slider pins.

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.

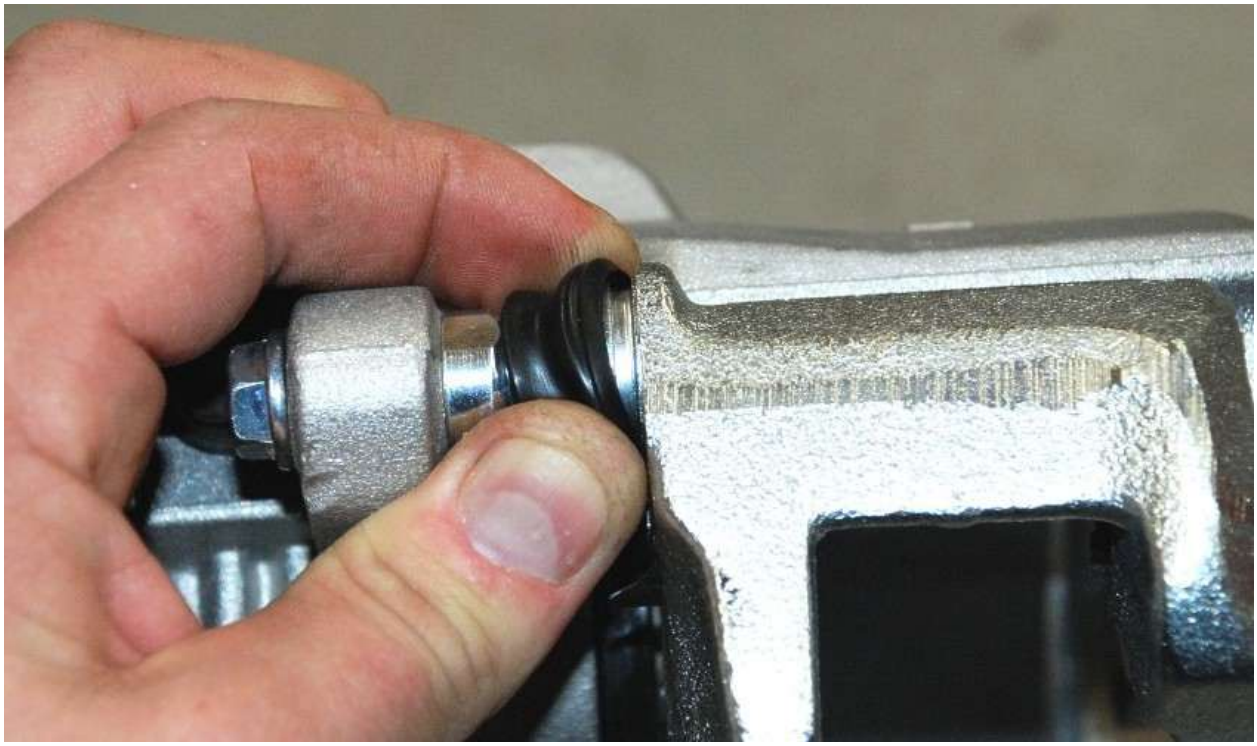


The two clips that are left go in the center of the caliper with the tab sticking up through the center hole. Insert the clip from the inside of the caliper through the large center hole with the larger tab on the side facing the pistons then press down on the outer part of the clip so the small clip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

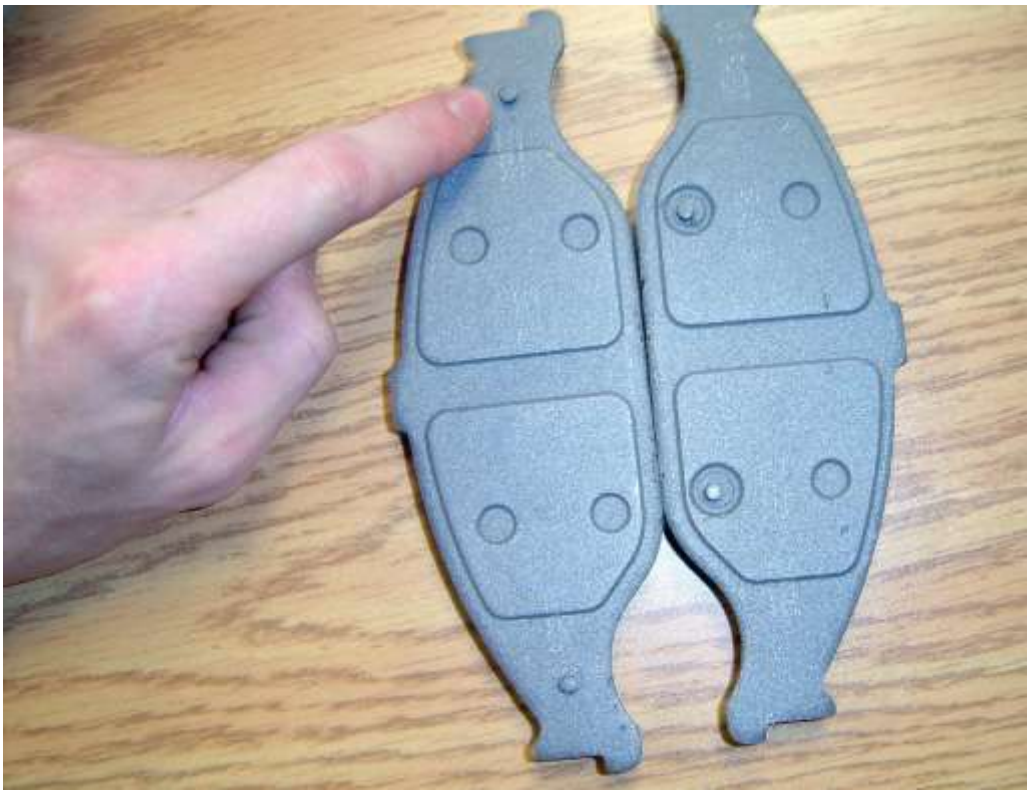
Grease the slide pins using the supplied grease.



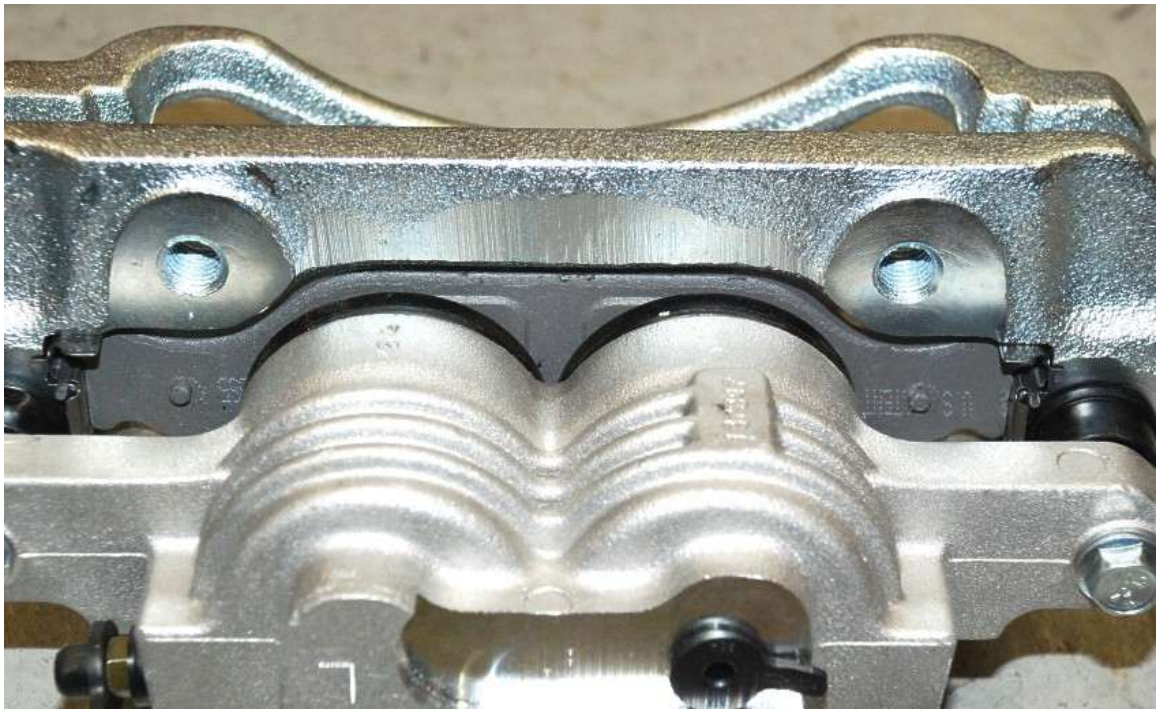
Slide the caliper hanger onto the caliper.



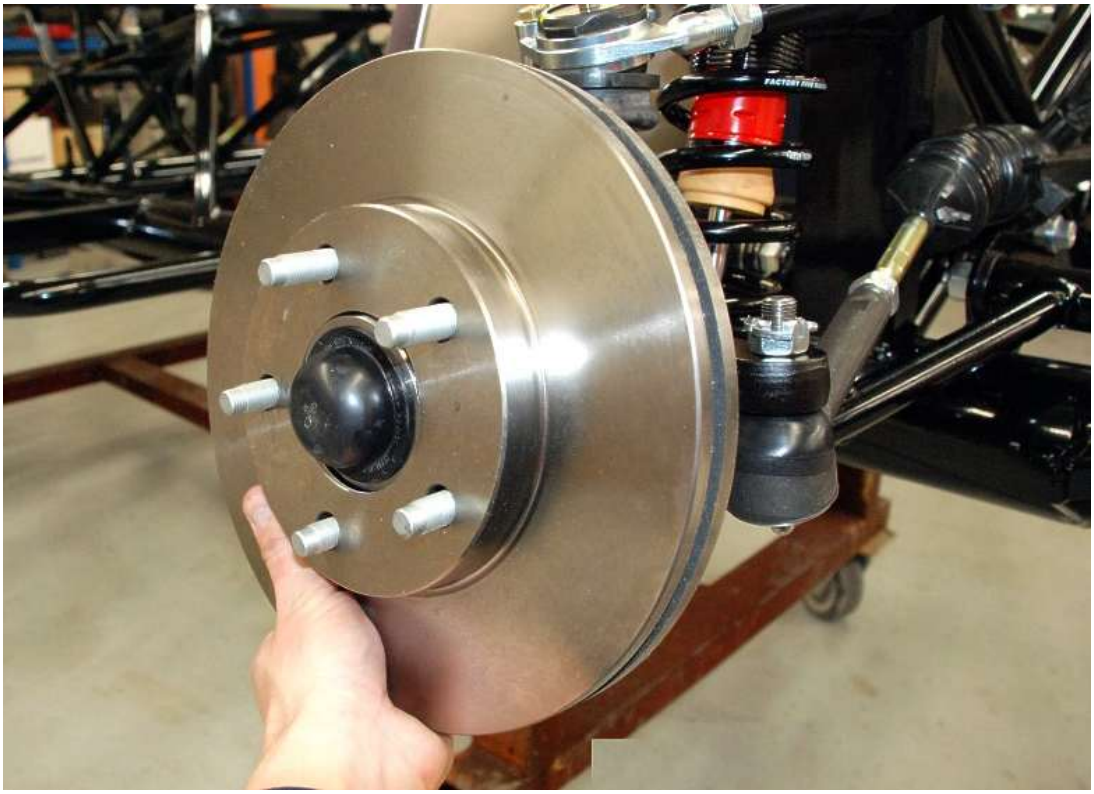
Push the rubber boots over the lip on the caliper bracket to seal the slider bolts correctly.



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.

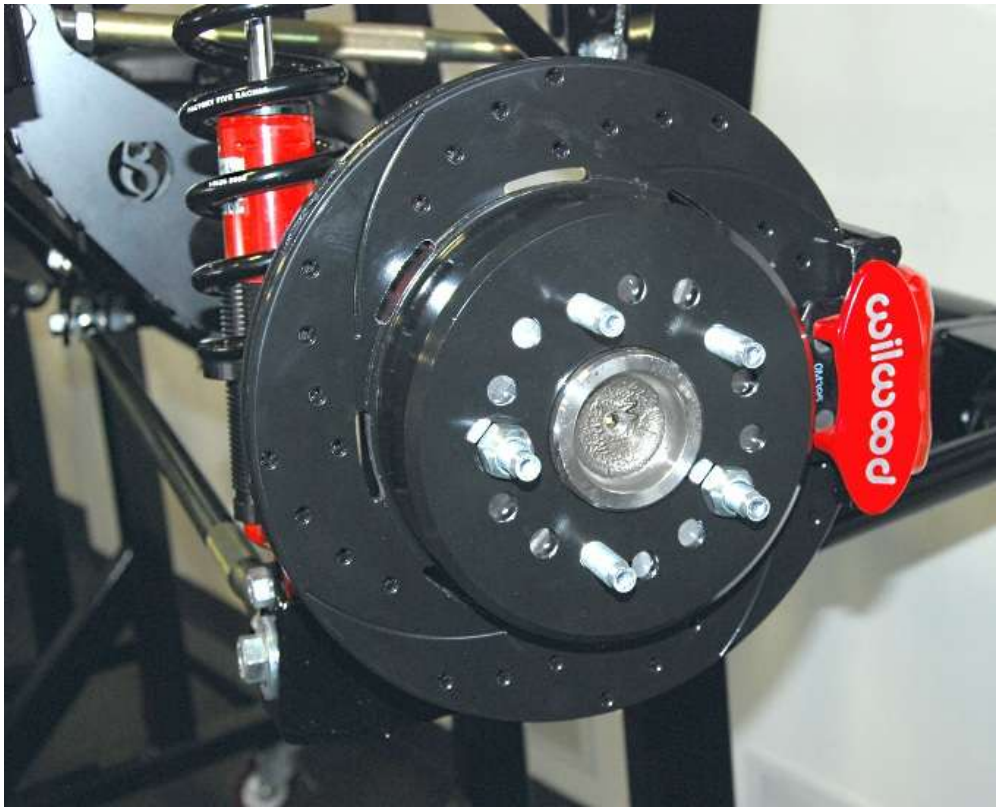
Torque the caliper mounting bolts to **130Nm (95 lb-ft)**.

Solid Axle Rear Suspension

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

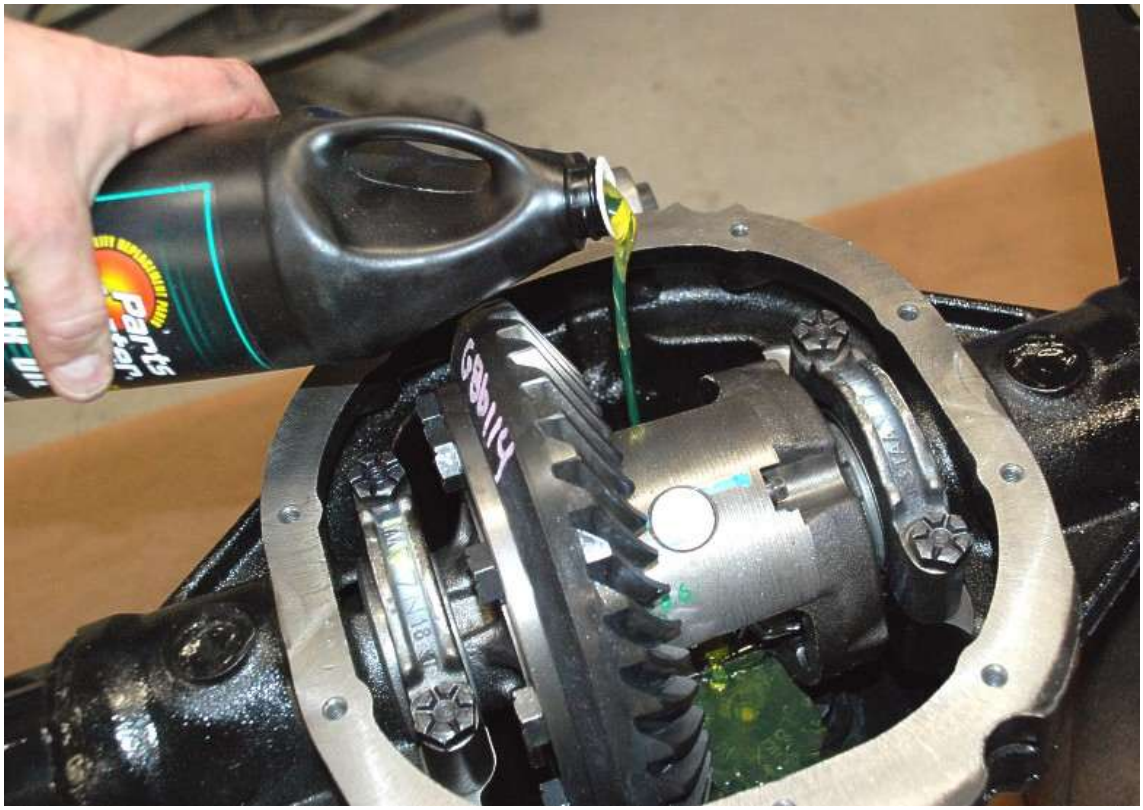
Solid Axle Preparation

- 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. (4) ½”x 1.25” bolts, ½”-13 Nylon locknuts, (2) ½”-20 x 3” grade 8 bolt, ½”-20 mechanical locknuts
- Use caution when working with the rear end assembly, it weighs 225 lbs.
- Two bolts for the lower control arms are included in the kit with the Traction Lok Brackets. The other two bolts are included with the optional control arms.



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

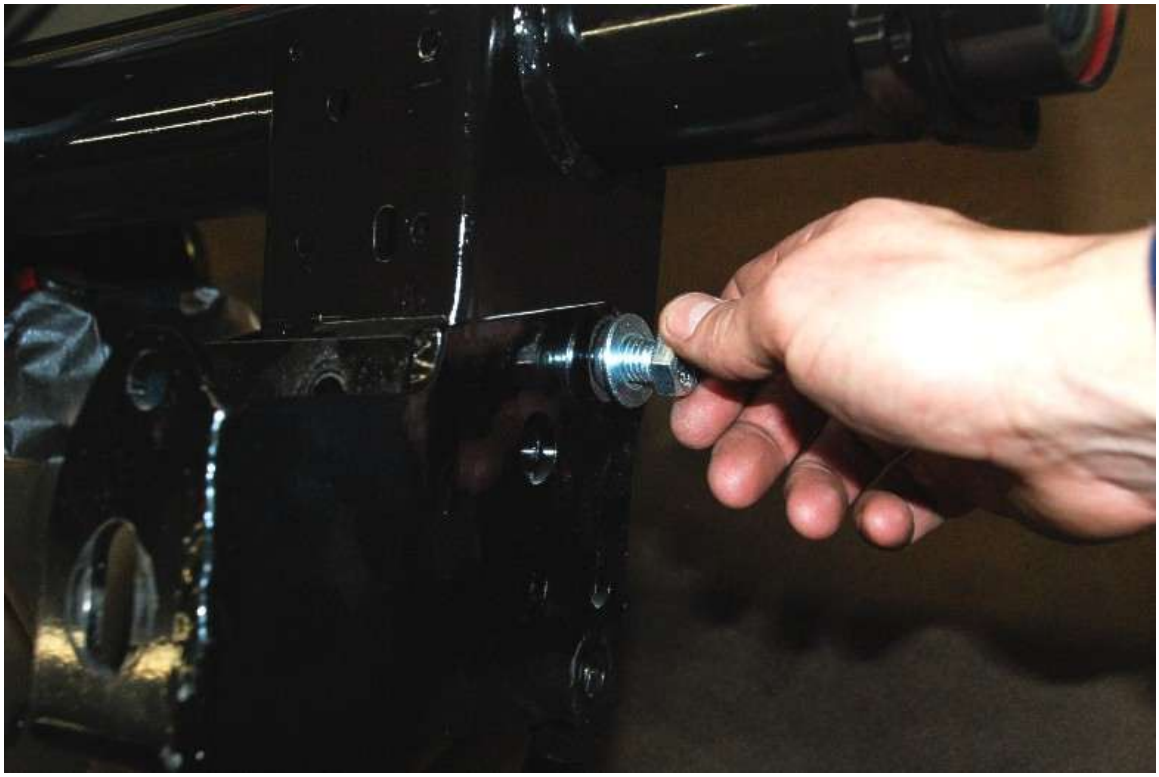
- Check out the Appendix for the optional FFR brake install or www.factoryfiveparts.com for Wilwood brake options.



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.

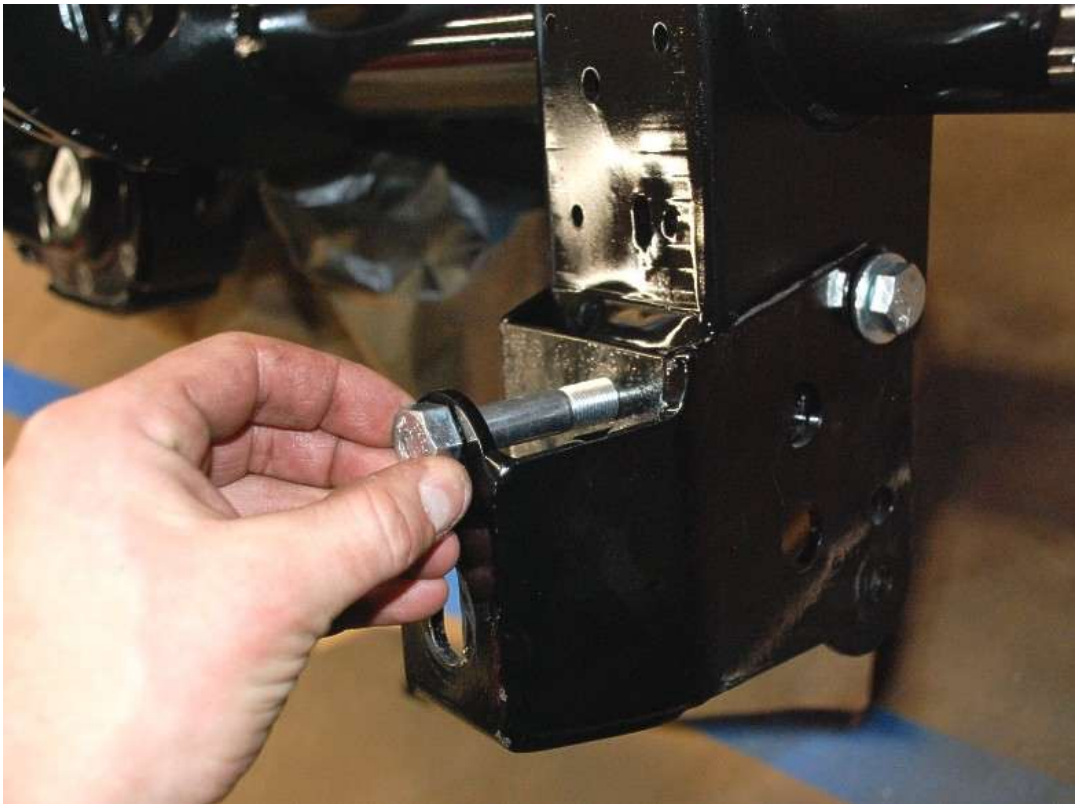
Drill the lower control arm mount holes with a ½” drill bit.



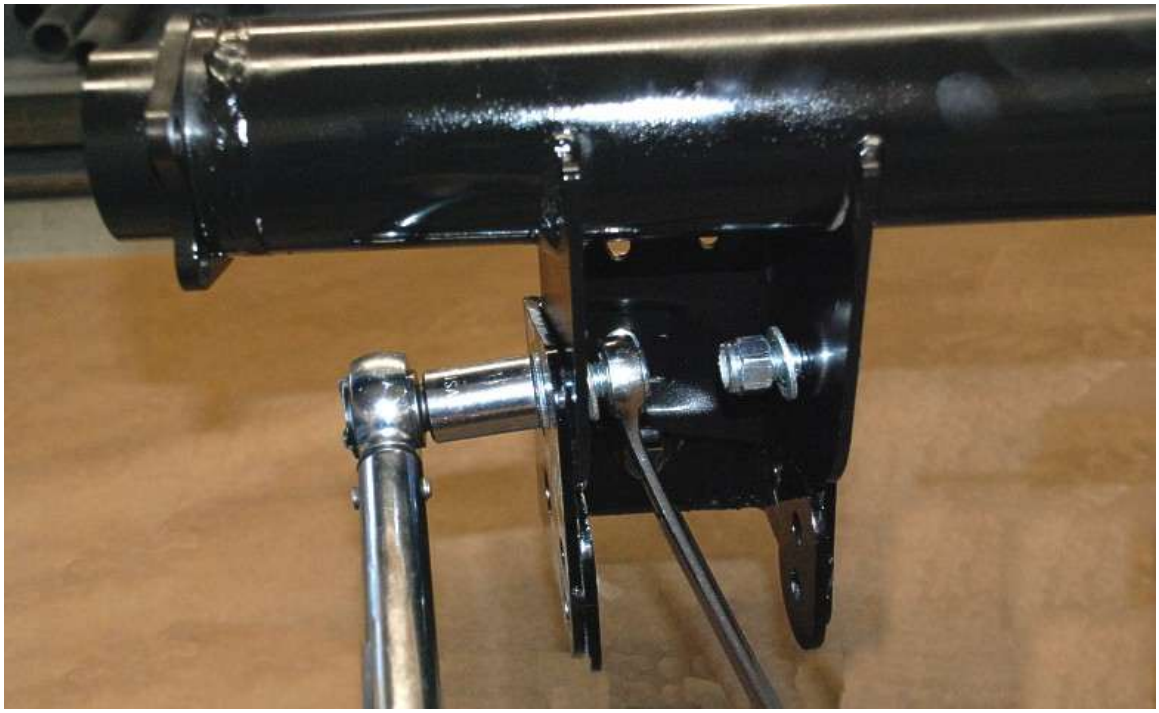
Position the Traction Lok brackets on the rear end with the (2) ½”x 1.25” bolts on the sides.

Axle Bracket left side

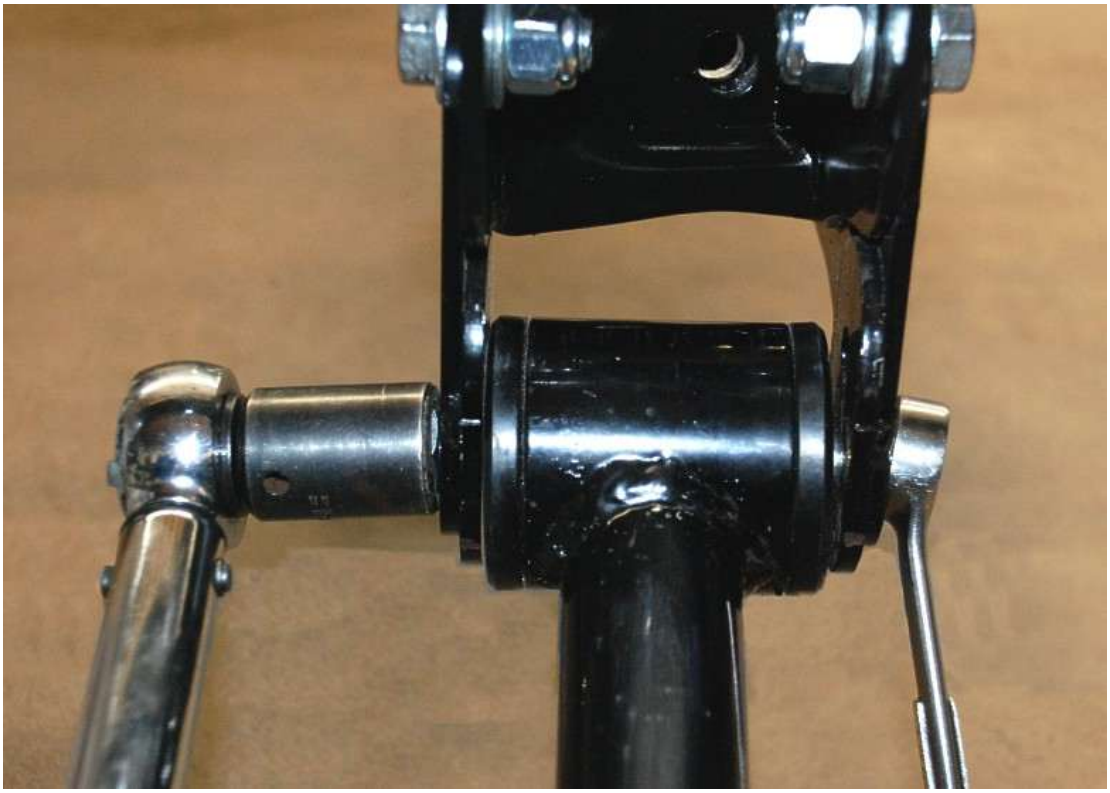
Axle Bracket right side



Temporarily put the lower shock bolt (½”-20 x 3” grade 8 bolt) through the traction lock bracket and stock shock hole on the axle.



Tighten the two short bolts. Torque to 75-95 Nm (**55-70 lbft**).



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.

4 Link Rear Suspension

🛠 18mm sockets, ratchet, 15mm wrench

Mustang upper control arms and hardware.

Attach the Mustang upper rear control arms loosely to the rear end using the Mustang hardware.

Skip the 3 Link section and continue on with the **rear axle installation** section.

Optional 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

3-Link Fasteners

The 3-link kit packages all the fasteners together in one box.

17156	**3-LINK DELUXE FASTENERS**	1.00	EA
13976	1/2" WASHER	20.00	EA
10834	1/2"-13 NYLON LOCK NUT	11.00	EA
10833	1/2"-13 x 1.25" BOLT	8.00	EA
12385	1/2"-13 x 2.50" BOLT	1.00	EA
12332	1/2"-13 x 4" BOLT	2.00	EA
12218	1/2"-20 MECH LOCK NUT	6.00	EA
12217	1/2"-20 x 3" BOLT	6.00	EA
12380	3/4" JAM NUT, RH THREAD	1.00	EA
13166	3/4"-16 LFT HAND JAM NUT	2.00	EA
13977	3/8" WASHER	6.00	EA
13964	3/8"-16 NYLON LOCK NUT	4.00	EA
10520	3/8"-16 x 1" SOCKET HEAD	2.00	EA
60387	3/8"-16 x 2" SOCKET HEAD	2.00	EA
12387	5/8" WASHER	4.00	EA
15216	5/8"-11 MECH LOCK-NUT	4.00	EA
12382	5/8"-11 x 3" BOLT	4.00	EA
13212	5/8"-11 x 3.50" BOLT	1.00	EA
13751	M12 GRADE 10.9 LOCKNUT	2.00	EA
13706	M12 x 110MM BOLT	2.00	EA

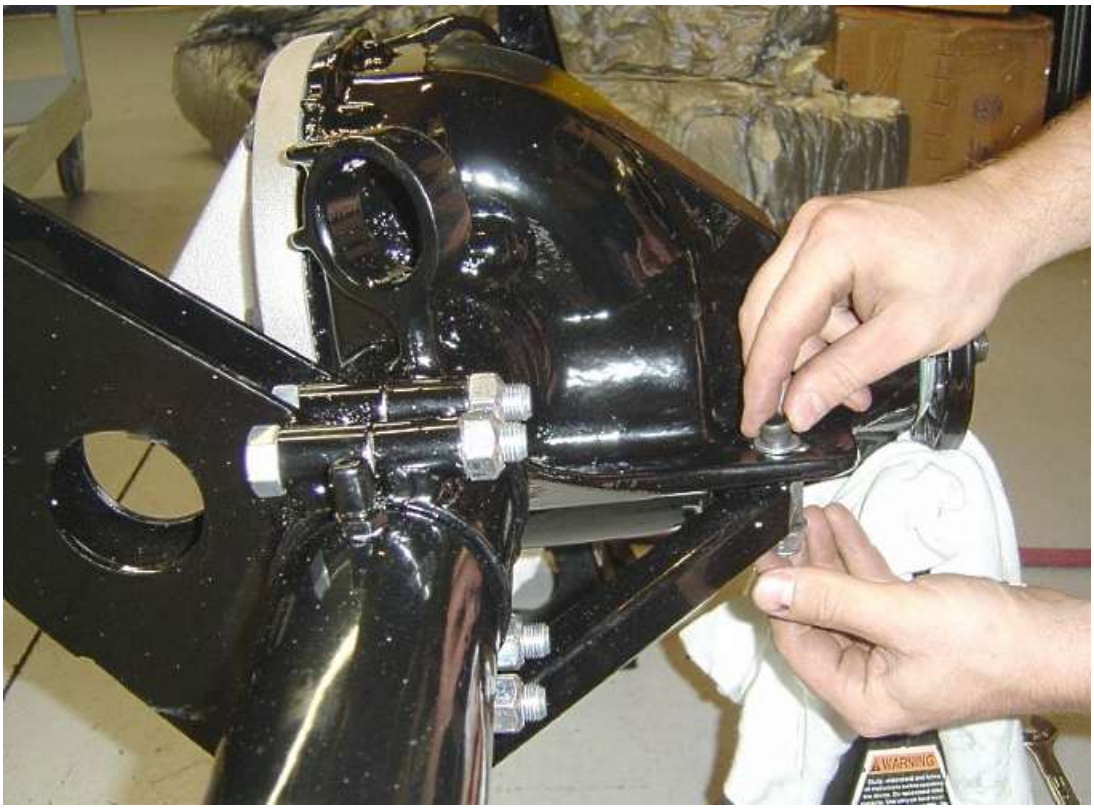
Upper Link Axle Mount

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.

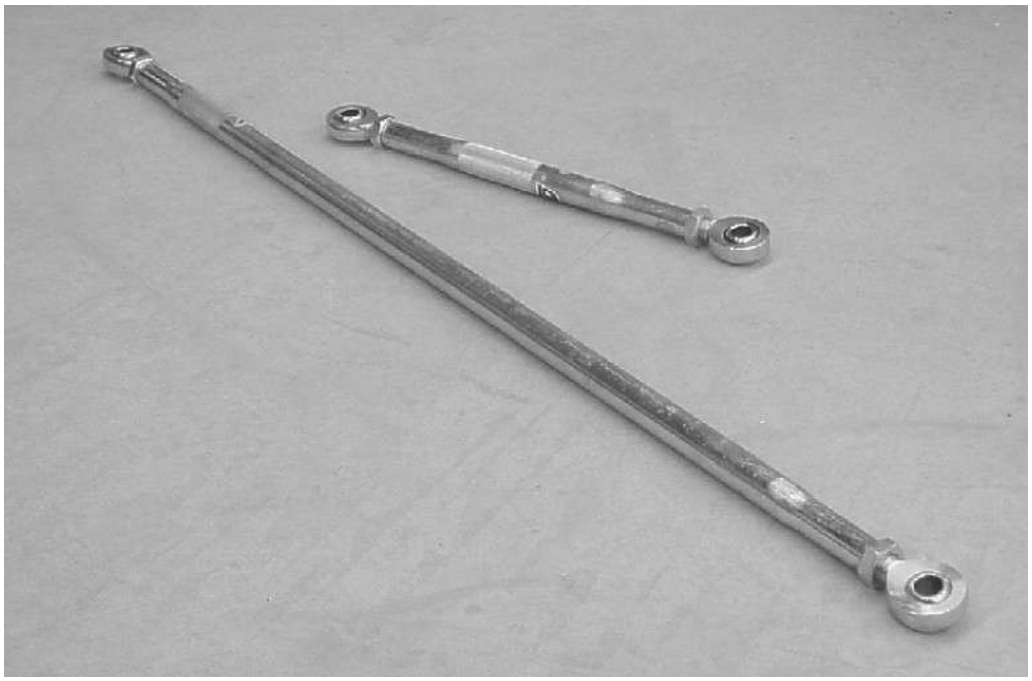
Attach the upper link bracket onto the axle using the fine hardware (FFR# 12217 & 12218).

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 swedged 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 Coil-Over Shock Assembly

- Snap ring pliers, 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.

Rear Axle installation

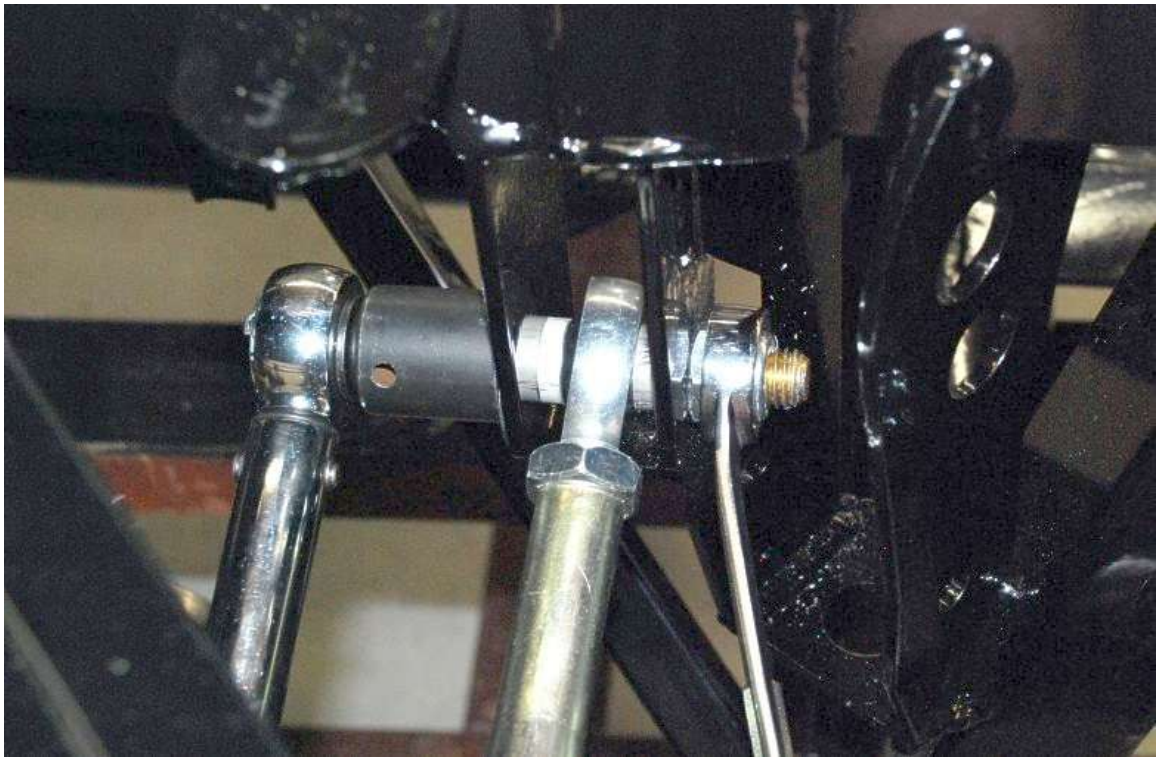
- Solid axle shock mounting components
- ¾” wrench, ¾” socket, ratchet, torque wrench, floor jack.
- Have someone help with this step, the rear axle is very heavy and mistakes can result in serious injury.

Use a floor jack to position the rear axle assembly under the frame. 3-link shown.

- Make sure that the rear jack stands are positioned under the frame 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 one 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 using the OEM bolts or bolts supplied with the lower control arms



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

- If using the silver double adjustable shocks, these must be mounted with the body of the shock down in the top hole location for both street and race cars.
- For the stock red Koni shocks, there are two sets of mounting holes, **lower** for standard street car ride height. **Top** for race car.

Attach the body end of the shock to the frame using the lower shock mount hole, two 1.09” spacers along with the ½” x 4.00” bolts and locknuts.

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

Right side

Left 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 to make sure that the spring is seated correctly on the shock.

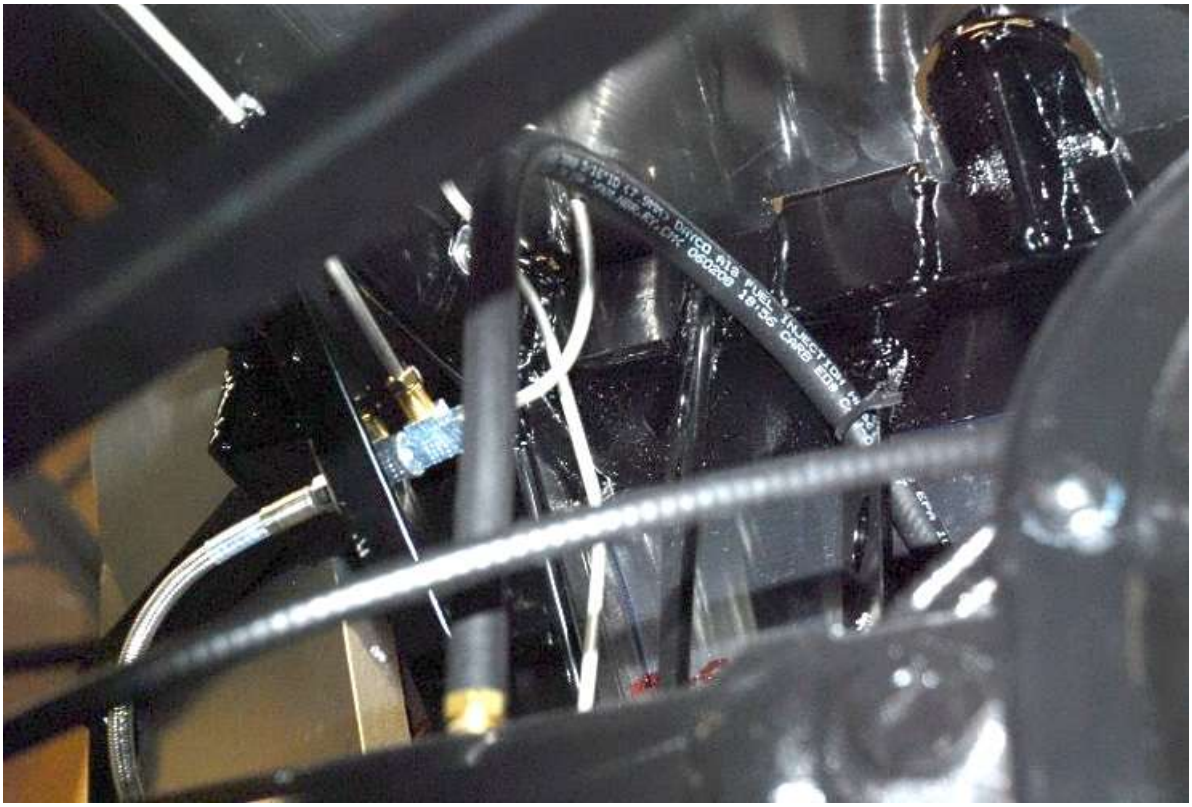
Run zip ties through the holes in the spring hat and around the spring to prevent the spring from becoming unseated.

4 link Rear Suspension Torque Specs Chart

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

For a 4-link car loosely mount all 4 arms and then lift axle until lower arms are flat to torque the mounting hardware.

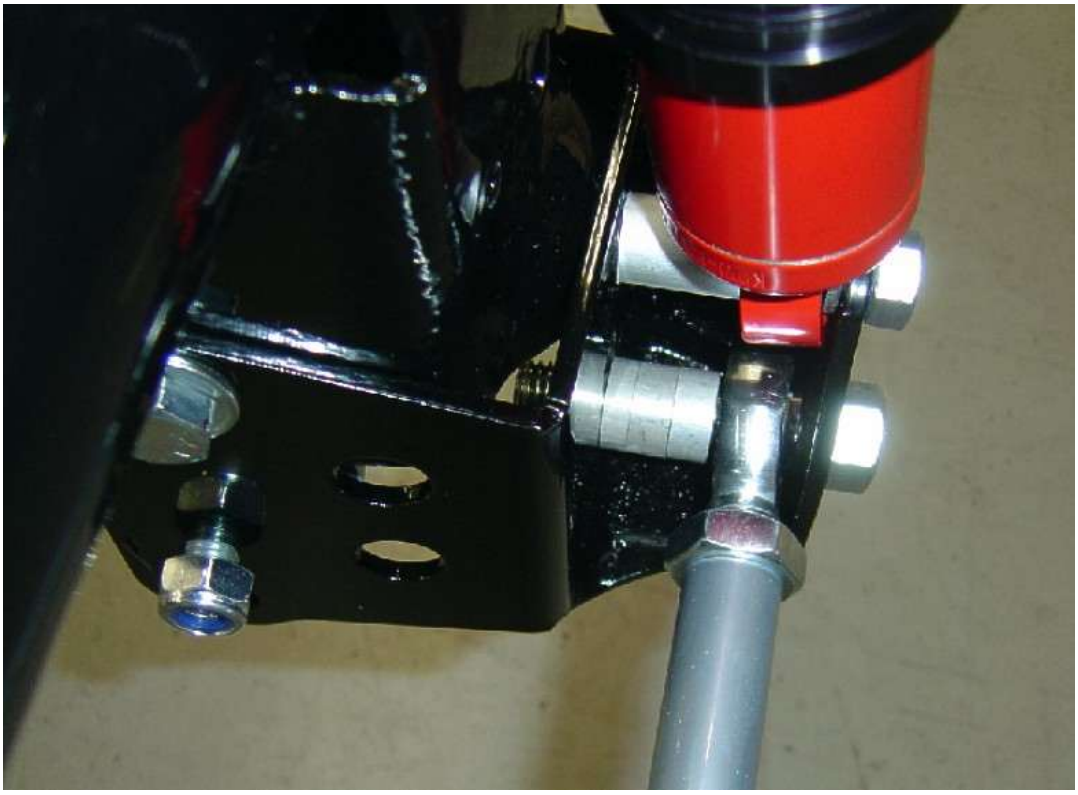
Solid axle vent



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.

✋ If running a 4 link, skip to the next section

Panhard Bar



The Panhard bar mounts to the car using the ⅝”x 3” bolts and spacers. Install the Panhard bar to the right-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.

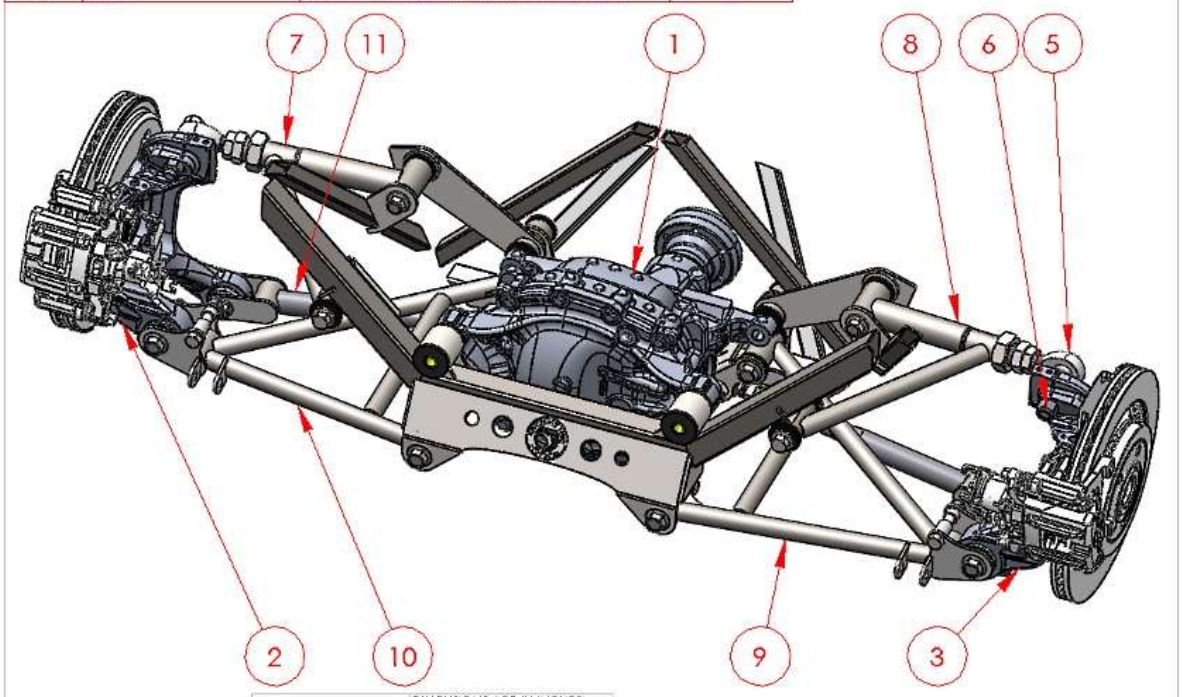
3 link Rear Suspension Torque Specs Chart

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

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:1:8 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 Eco boost	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

IRS Fasteners

The IRS kit packages all the fasteners together in one box.

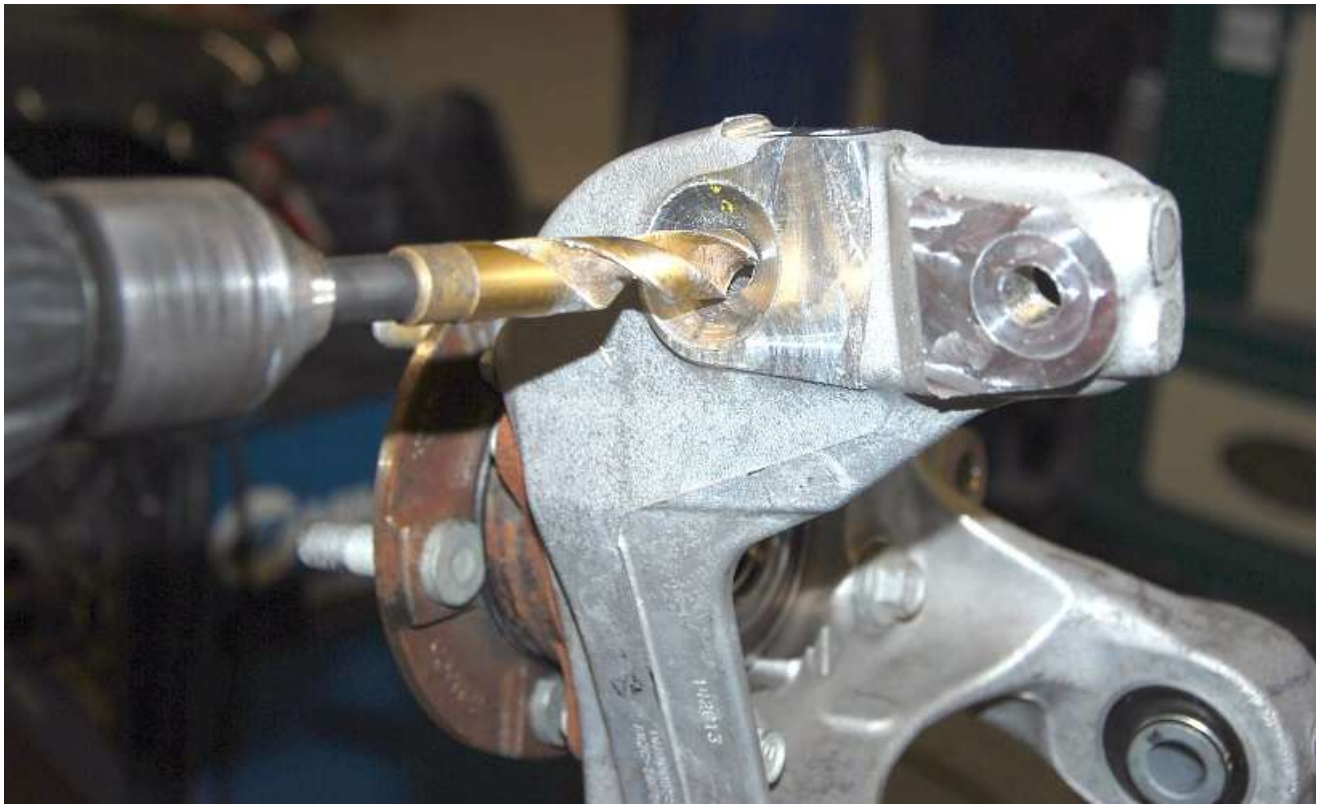
17157	**IRS FASTENERS**	1.00	EA
10834	1/2"-13 NYLON LOCK NUT	4.00	EA
12386	1/2"-13 x 3.25" BOLT	2.00	EA
12332	1/2"-13 x 4" BOLT	2.00	EA
13166	3/4"-16 LFT HAND JAM NUT	2.00	EA
12387	5/8" WASHER	2.00	EA
15216	5/8"-11 MECH LOCK-NUT	4.00	EA
15937	5/8"-11 x 2.25" BOLT	2.00	EA
16242	5/8"-11 x 4.25" BOLT	2.00	EA
16040	M10 x 20MM SOCKET HEAD	4.00	EA
15961	M10 x 25MM SOCKET HEAD	10.00	EA
14759	M14-2.0 FLANGED LOCK NUT	2.00	EA
15962	M14-2.0 x 100MM FLNG HEAD	2.00	EA
15936	M14-2.0 x 80MM FLNG HEAD	2.00	EA
14925	M16-2.0 x 110MM FLNG HEAD	8.00	EA
15963	M16-2.0 x 130MM FLNG HEAD	2.00	EA
15909	M16-2.0 x 90MM FLNG HEAD	2.00	EA
14515	M16-2.0MM FLANGED LOCK NUT	12.00	EA

Parts preparation

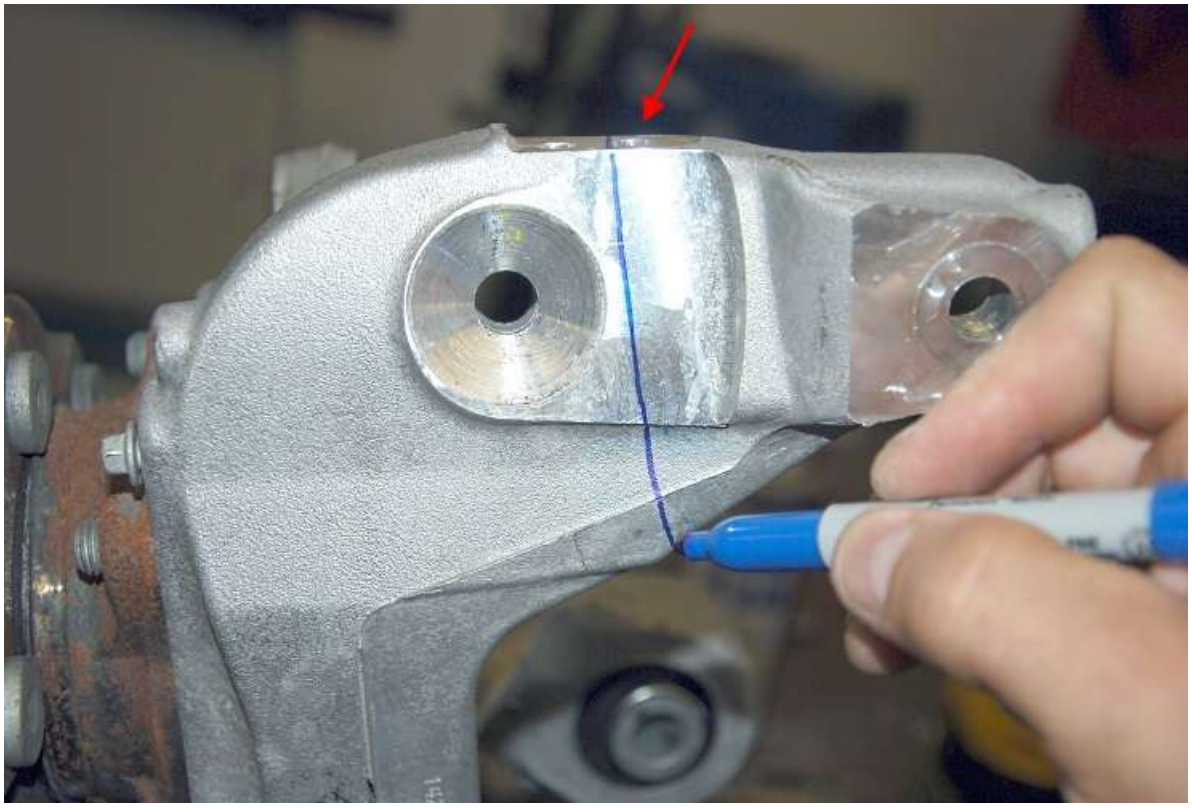
Spindles

$^5/_8$" drill bit, drill, saw, marker

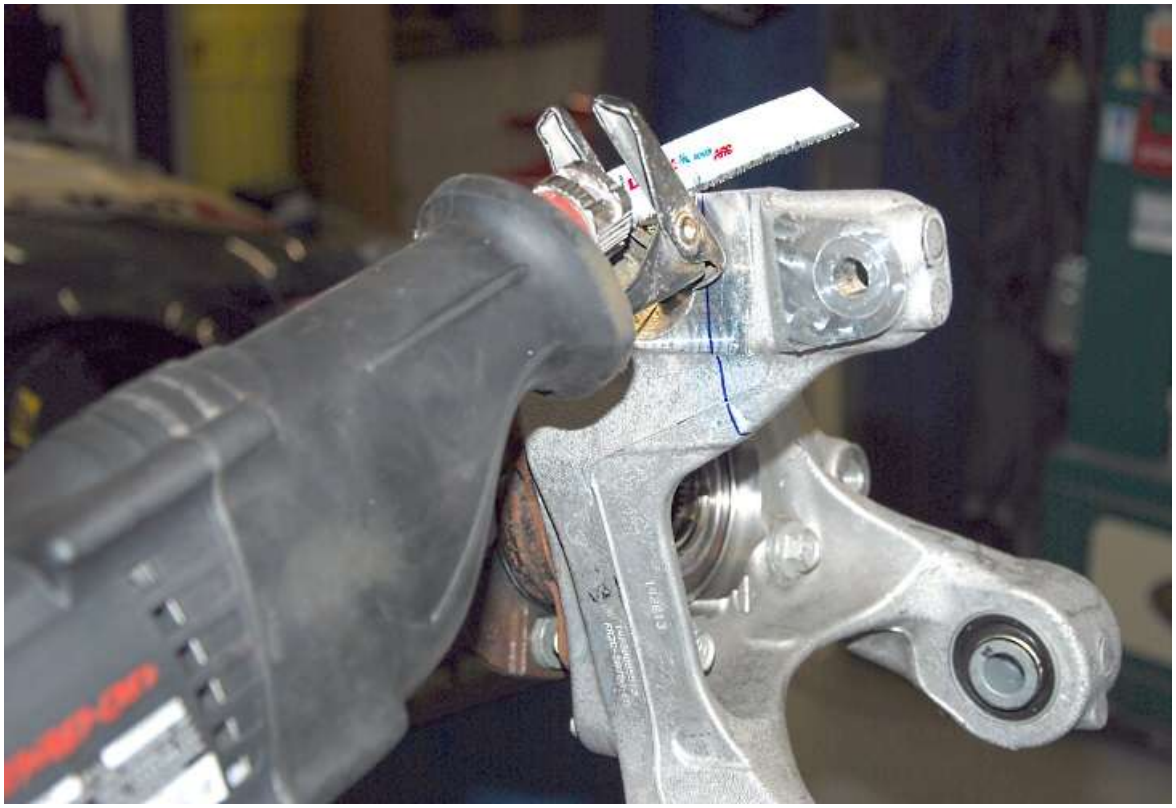
Remove the brake calipers from the spindle if they are mounted. They will be reinstalled after the spindle is put on the car.



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.

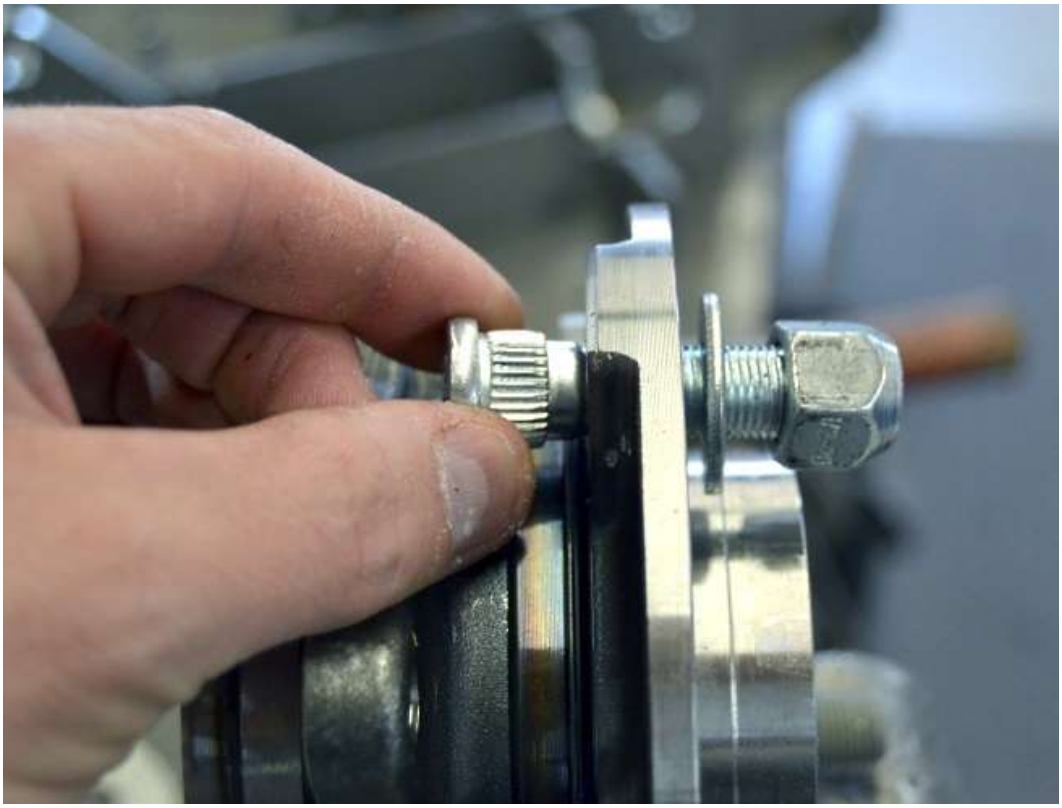


Use a saw to cut the ear off the spindle. If using a Sawzall or similar, use a wood blade; a 14tpi blade or finer will just get gummed up with the aluminum.

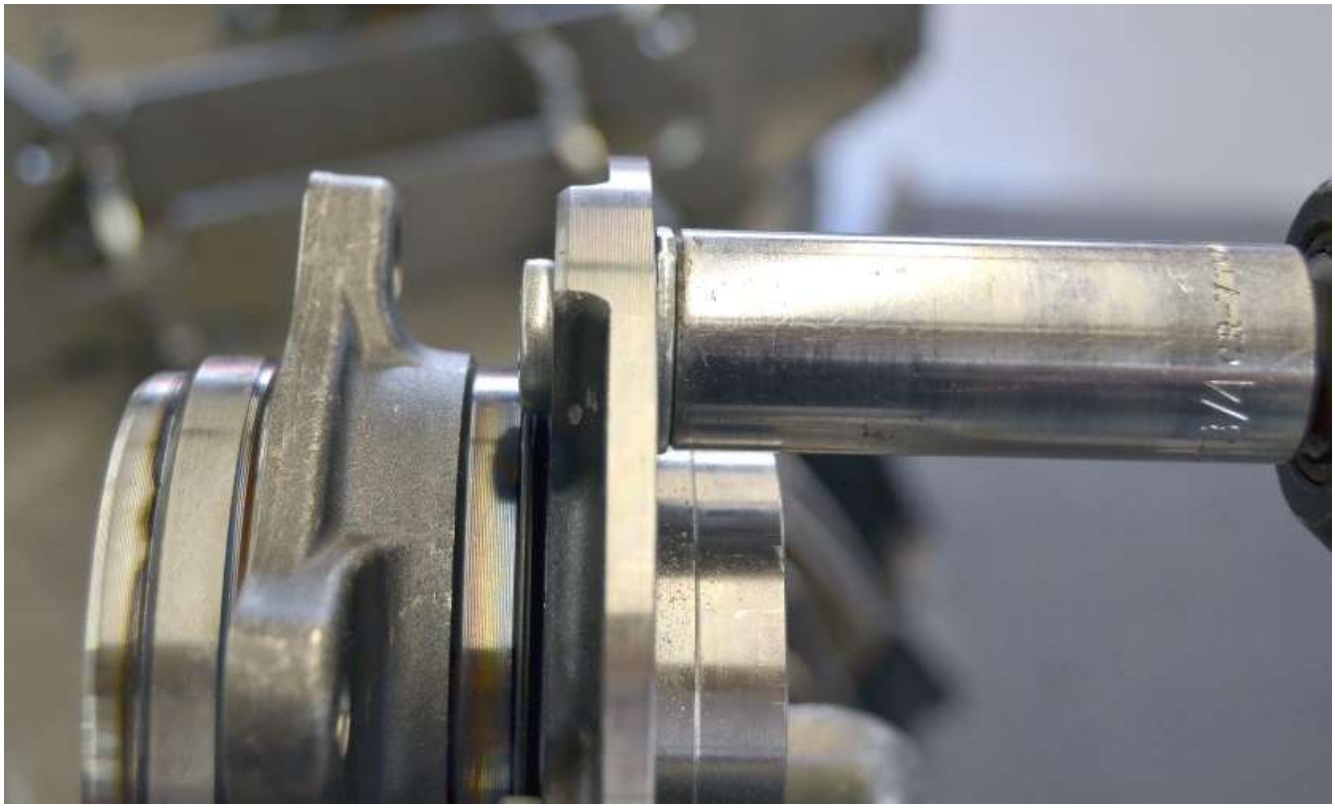
Hubs

🛠 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)**.

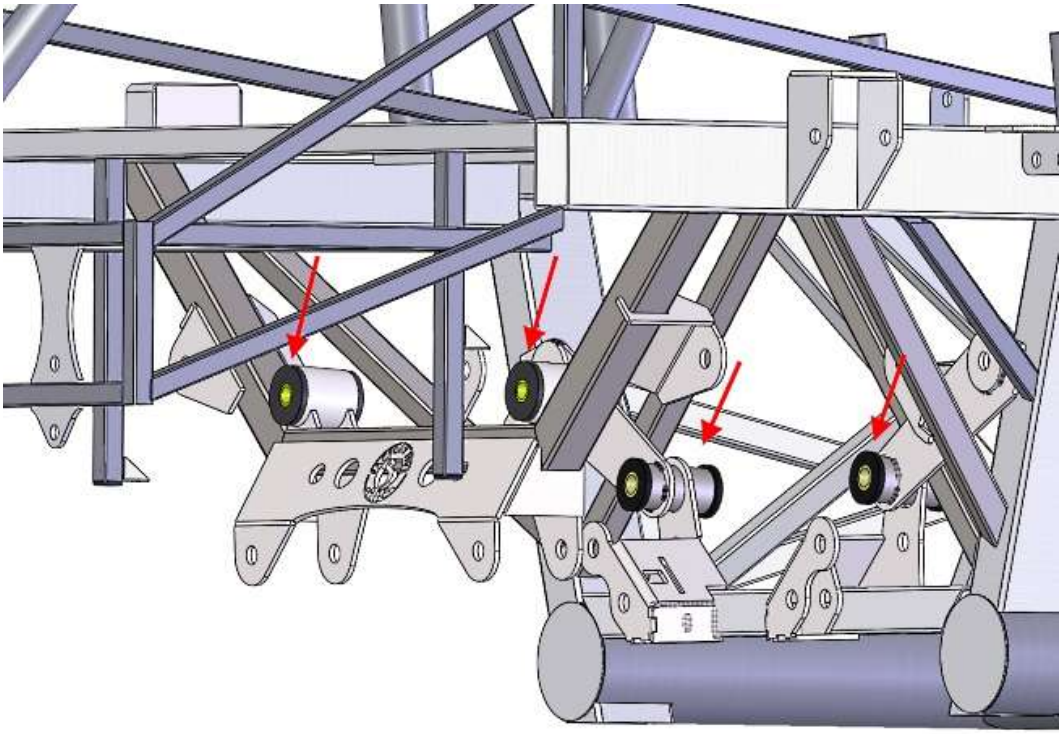
Center section

🛠 $^{5}/_{8}$" drill bit, drill.

Use a $^{5}/_{8}$" drill bit to chase the front mount holes on the center section.

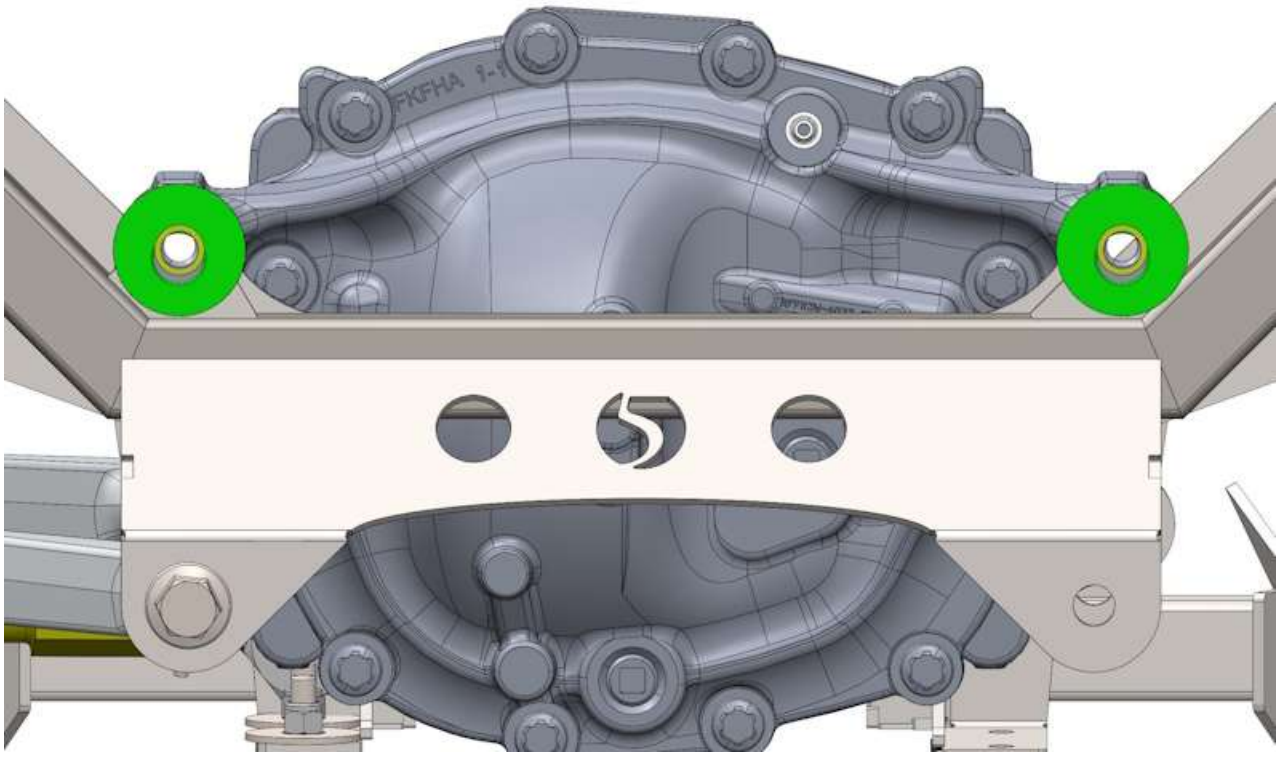
Frame

🛠 Rubber/plastic mallet
🚘 Differential mounting components



Bushing locations.

✋ The rear differential bushings have offset center holes. This is to help install the Diff. Start with the holes centered at the bottom and rotate as needed.

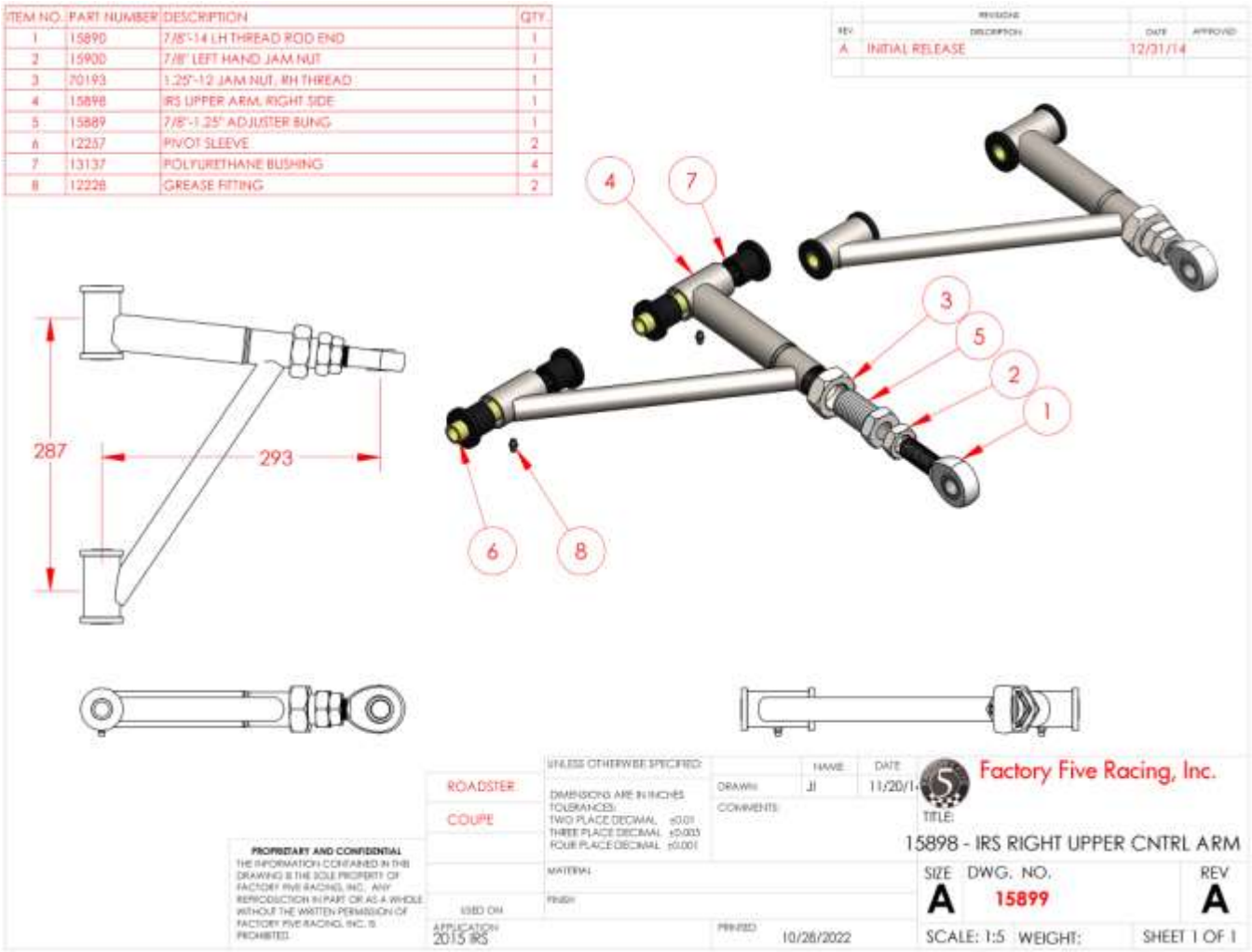


Use a plastic mallet to install the rear differential bushings marked 01P01417 and the shorter (2.40”) sleeves where the rear of the center section will mount.

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



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

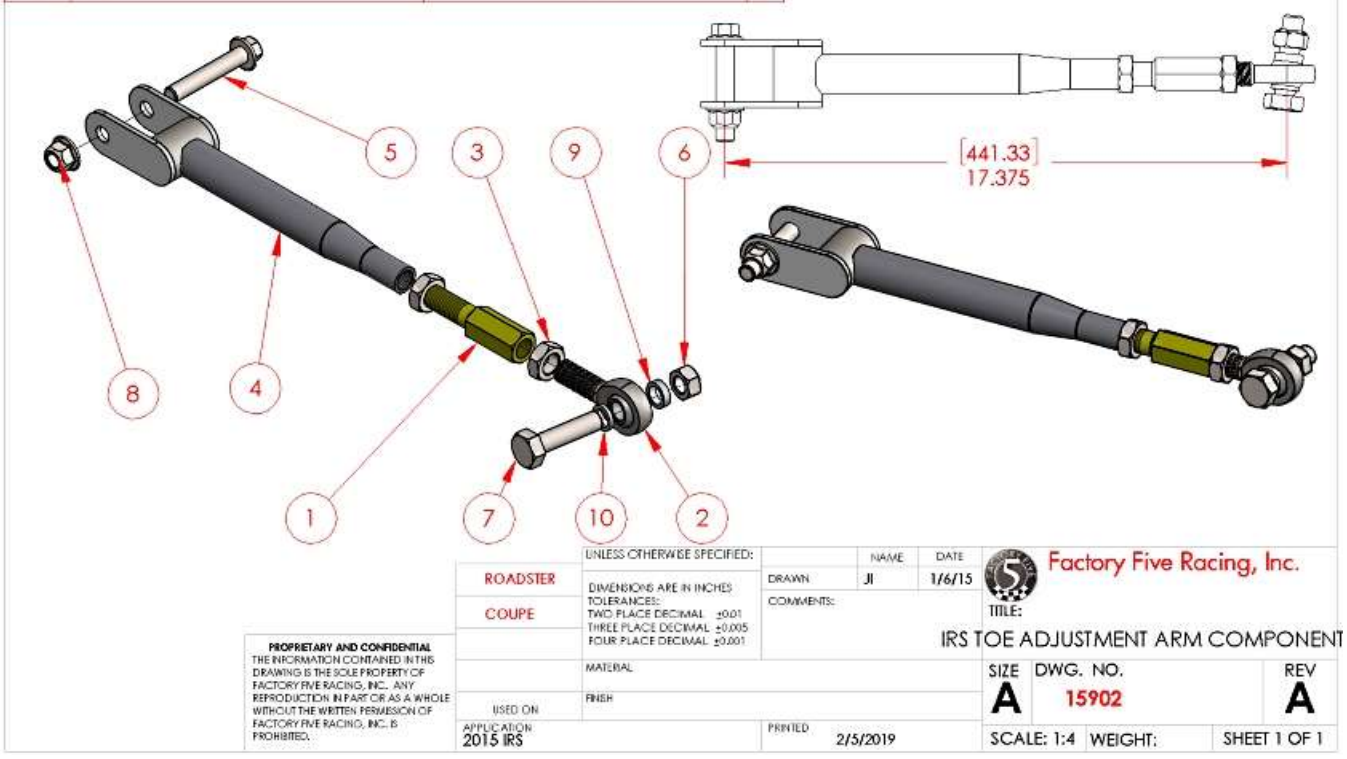
🛠 Grease gun

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	HJNUT0.7500-16-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	HNUT0.6250-11-D-N	15936	1
7	HHBOLT0.6250-11x2.5x1.25-N	15216	1
8	AM-M14-N		1
9	33240	14759 0.25" SPACER	1
10	15908	0.25" SPACER	1

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



ROADSTER
COUPE

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

	NAME	DATE
DRAWN	JI	1/6/15

COMMENTS:

Factory Five Racing, Inc.

TITLE: IRS TOE ADJUSTMENT ARM COMPONENT

MATERIAL
FINISH
USED ON
APPLICATION 2015 IRS
PRINTED 2/5/2019

SIZE	DWG. NO.	REV
A	15902	A

SCALE: 1:4 WEIGHT: SHEET 1 OF 1

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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.

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

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

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

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

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

Toe Adjustment arms

IRS Toe adjustment arm components

$^{13}/_{16}$" socket, $^{15}/_{16}$" wrench, torque wrench.

If using the sway bar option, pass the bolt through the frame mount bracket when installing the toe arms.

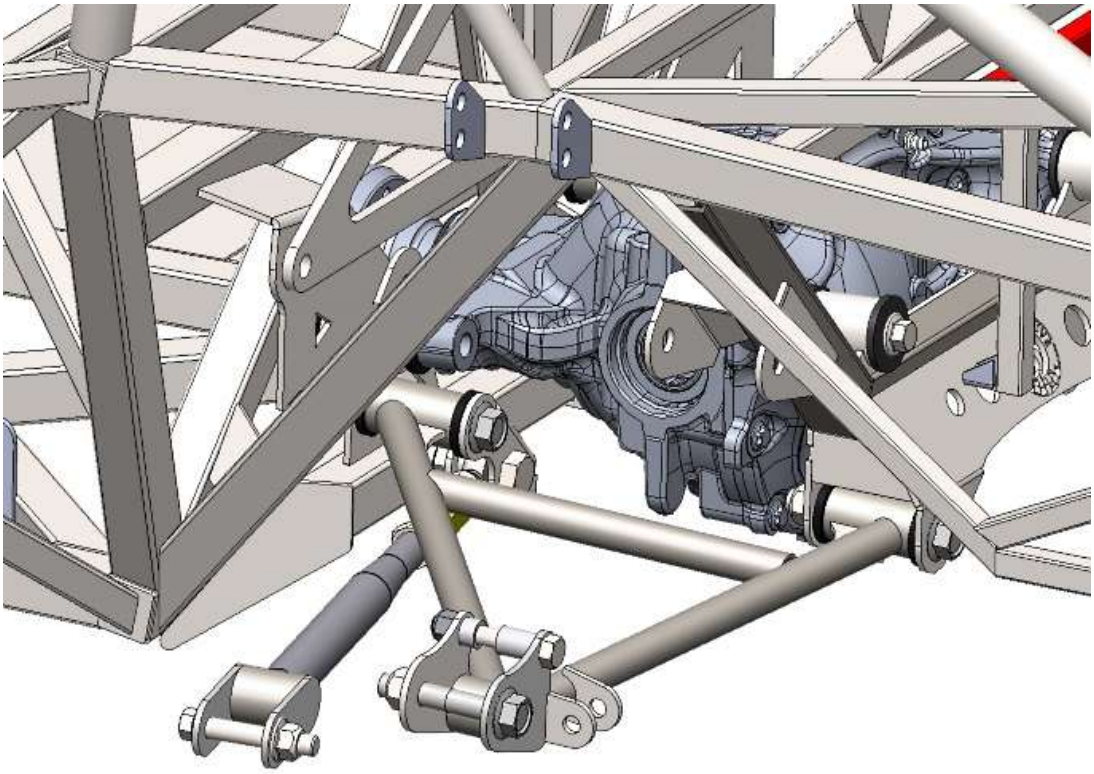
Attach the toe arms to the frame below the front lower arm mount using the $^{1}/_{8}$" thick spacer in the back and the ¼" spacer on the front side of the rod end. Use the $^{5}/_{8}$" x 2.25" bolts to attach them to the frame.

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

Lower control arms

IRS lower control arm components

$^{13}/_{16}$" socket, $^{15}/_{16}$" wrench, torque wrench.

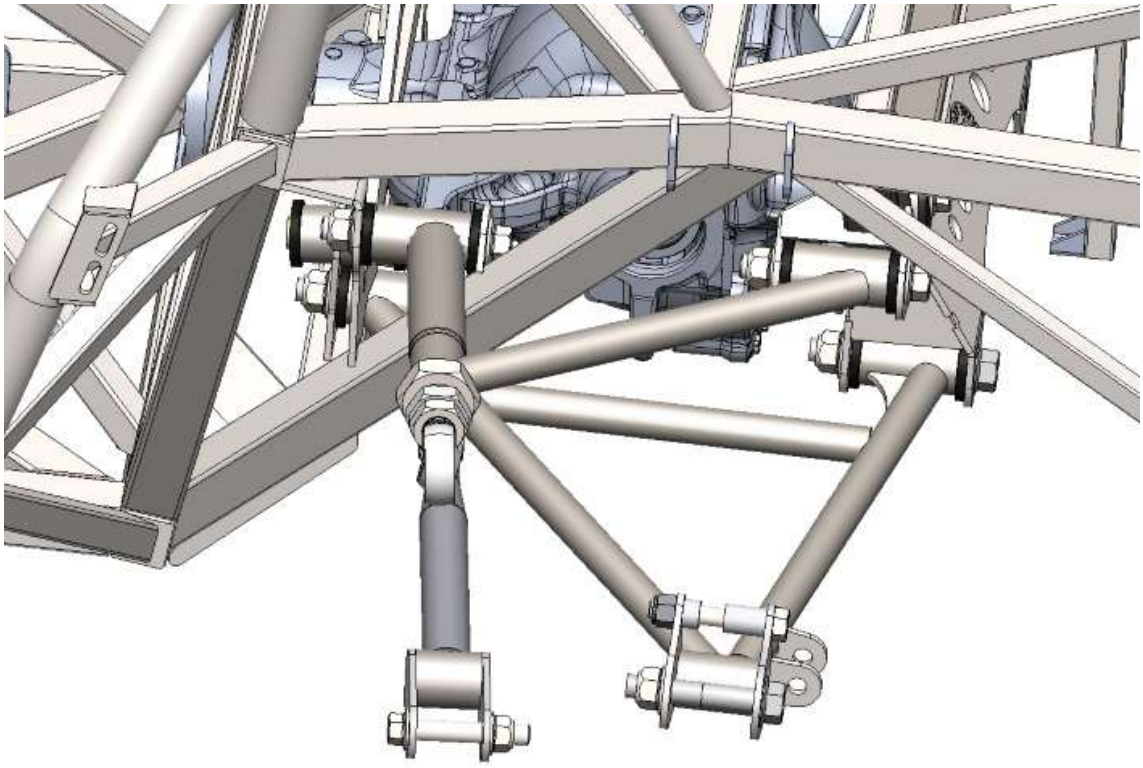


Attach the control arms to the frame with the shock mount towards the rear and spindle brackets up. Use the longer M16 x 110mm (~$4^{5}/_{16}$") bolts.

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.

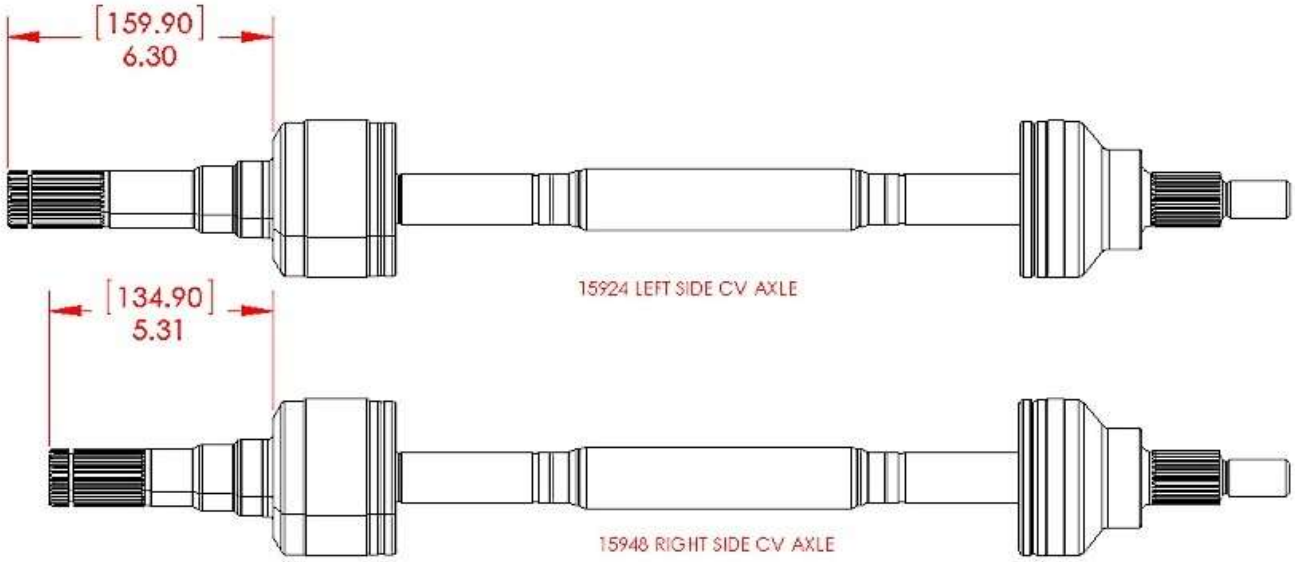


Pass the upper control arm thick tube through the triangular area as shown in between the frame mounts. Use the longer M16 x 110mm (~$4^{5}/_{16}$") bolts.

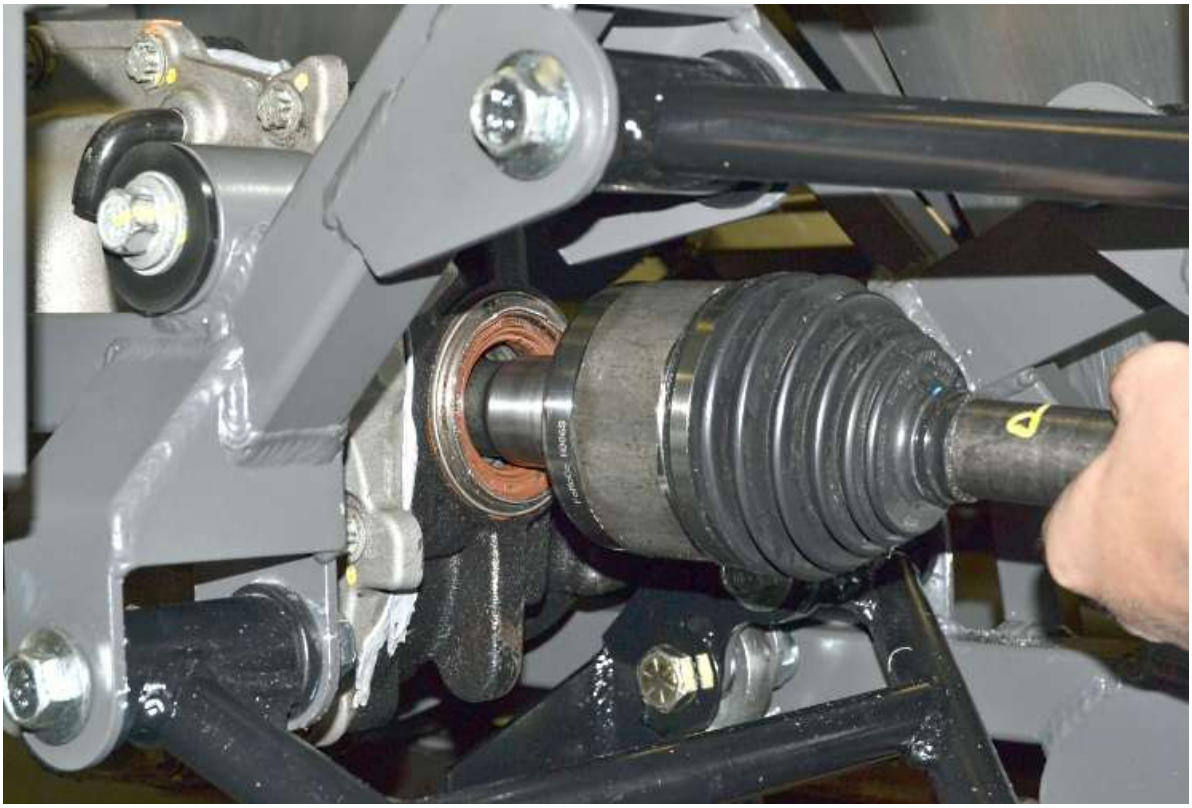
Hold the arm horizontal and torque the bolts to **135Nm (100 lb-ft)**.

CV Axle

- CV Axles, spindles

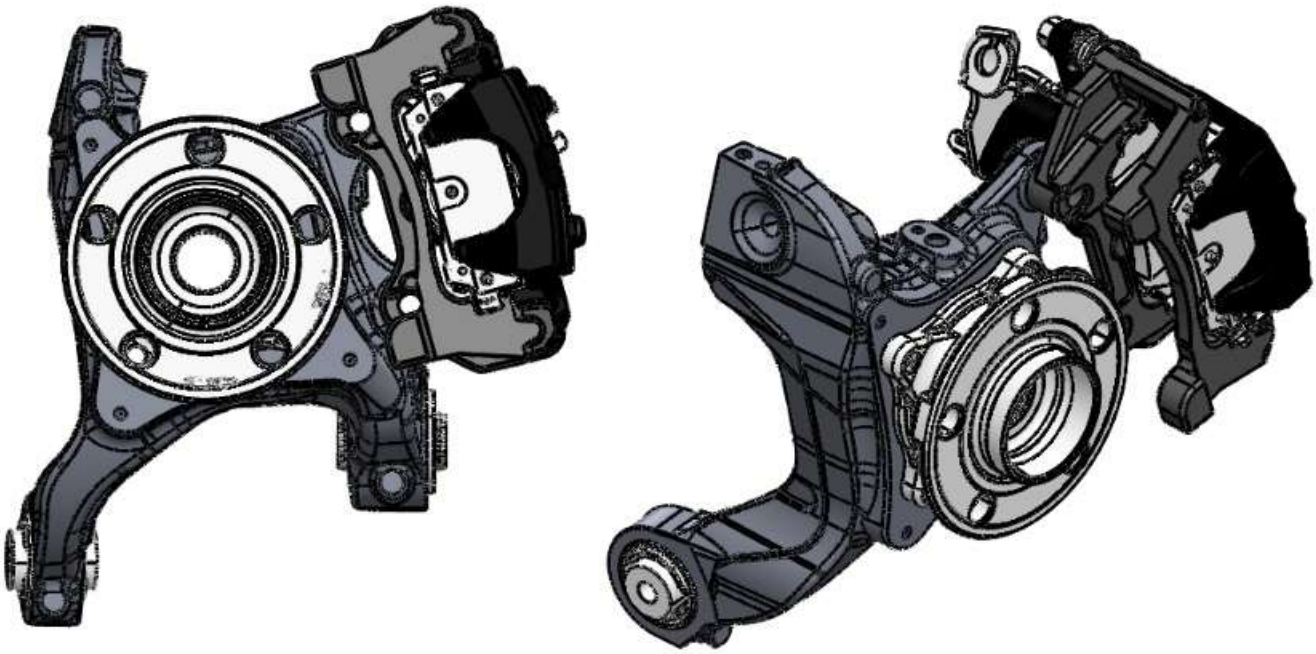


The inside CV joint is different for each side of the car, make sure to use the correct one when installing.



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.

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

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 bolts until after the other arms 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)

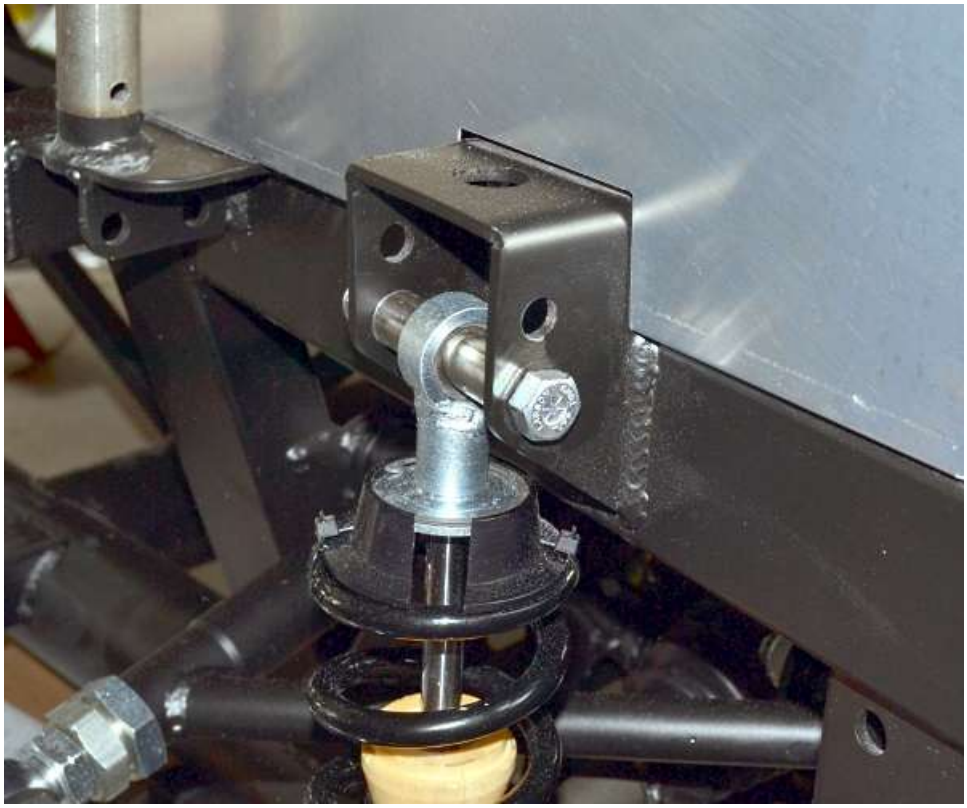
The coil-over hats have a snap ring which holds it in place. Remove this snap ring to assemble the coil over shock.

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 both street and race cars.
- For the stock red Koni shocks, there are two sets of mounting holes, **lower** for standard street car ride height. **Top** for race car.



Attach the rod end of the shock to the upper shock mount 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.

- The e-brake cables are mounted later with the e-brake handle.

CV axle Nut

- 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: $^1/_8$" 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	100	135	
CENTER SECTION TO FRAME REAR	100	135	
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 $1^{5}/_{8}$" 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.

Fuel System

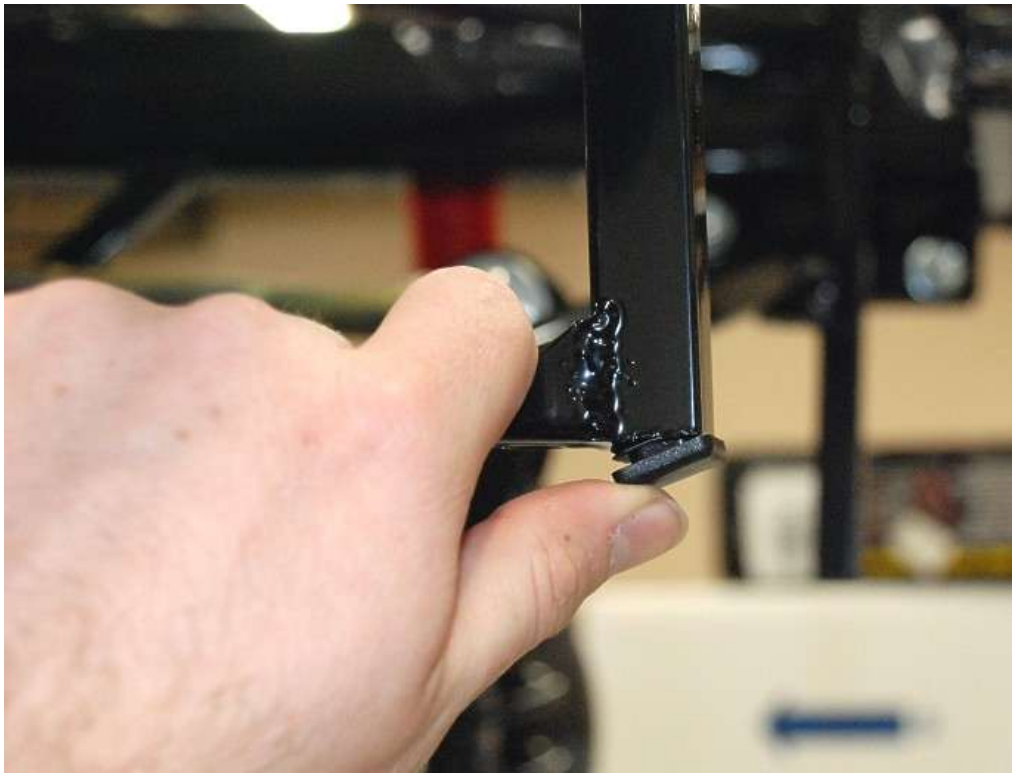
Insulated clip hardware, Fuel line components, ¼", $^{5}/_{16}$" fuel lines, OEM fuel tank components.
The pictures show the install of the complete kit fuel system, the OEM set-up is similar.

Frame prep

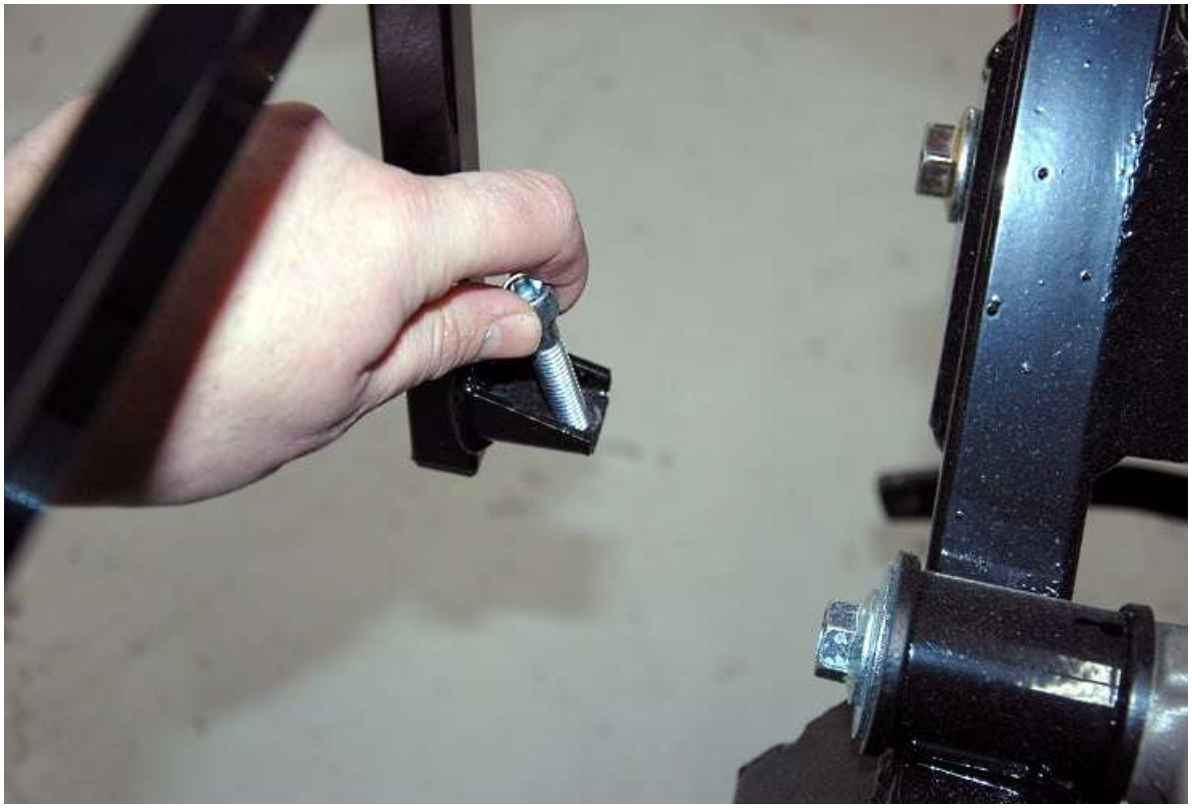
Secondary body fasteners, fuel tank straps, (4) $^{3}/_{8}$" x 2.25" bolts and Flanged Nylon locknuts

Unpack the fuel strap fasteners. (4) $^{3}/_{8}$" x 2.25" bolts and Flanged Nylon locknuts.

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 right side. Do not tighten the nuts

Fuel filler neck

🛠 Marker, tape measure, saw, razor knife

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

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

Use a ruler or wall and a tape measure to measure 6.50” and 8.50” up from the bottom edge of the filler tube and mark the tube.

Cut the filler tube on the two places marked.

Fuel Pick-up

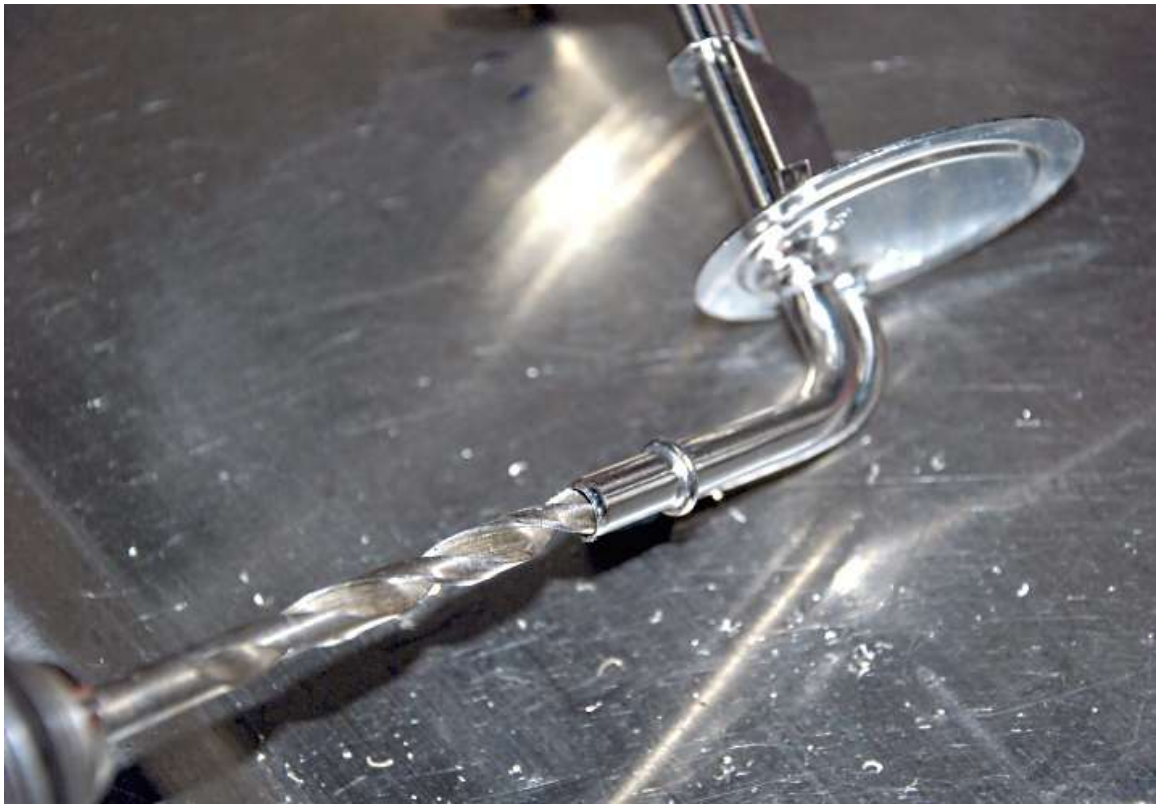
This install shows the set-up for a pick-up with an inline fuel pump. See www.factoryfiveparts.com/instructions for in-tank fuel pump set-up.

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, $^{1}/_{8}$", $^{5}/_{32}$", ¼", $^{9}/_{32}$" 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

✋ Use the O-ring included with the kit not the square profiled O-ring sent with the pick-up

Set the rubber O-ring 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

✋ Use the O-ring included with the kit not the square profiled O-ring sent with the 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 Tank Vent

🛠 ¼”, $^{5}/_{16}$” sockets, ratchet, $^{7}/_{8}$” wrench, razor knife, vise.

Screw the vent into the plastic bushing and tighten.

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

Push the vent into the grommet. A little oil or WD40 on the rubber gasket helps.

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

Put masking tape over the end of the tube so that nothing drops into the tank.

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.

Remove the filler neck tube.

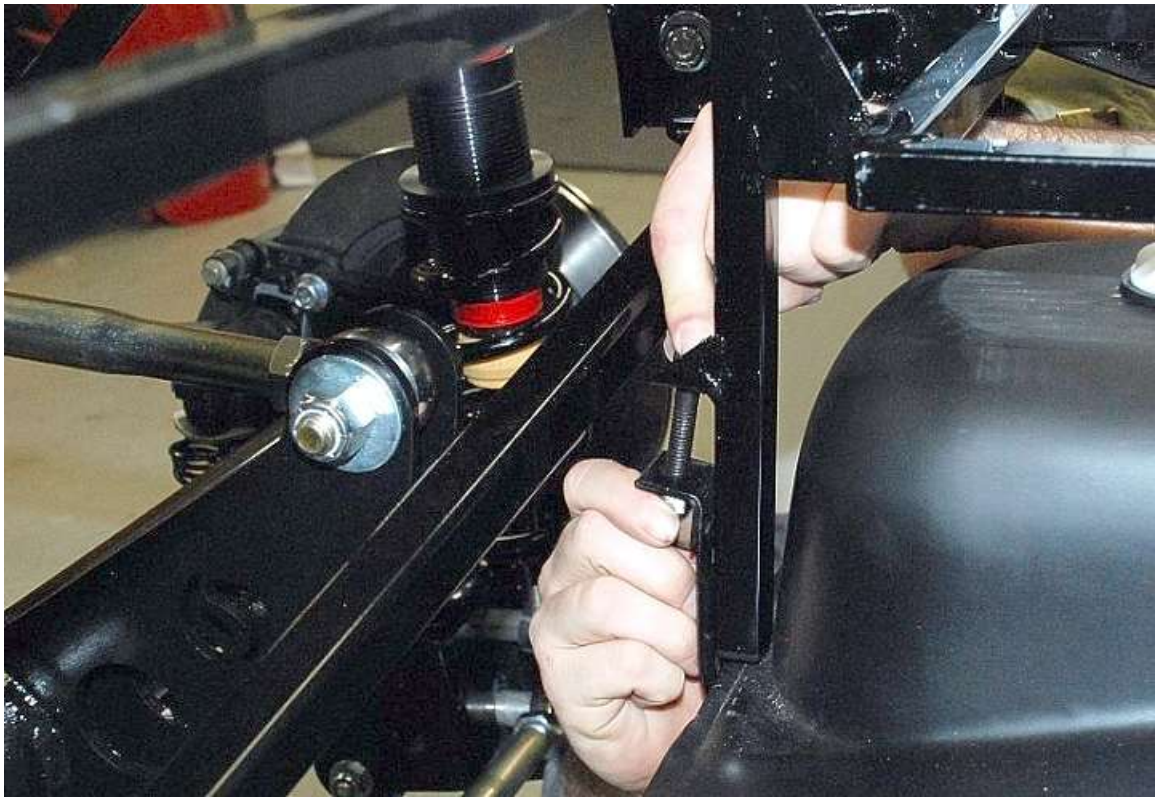
Fuel Tank install

🛠 $^{9}/_{16}$” wrench, $^{9}/_{16}$” deep socket, ratchet.

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.

With the help of a friend or using a jack in the center of the tank, raise the tank up into place on the chassis.



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

Fuel filler neck

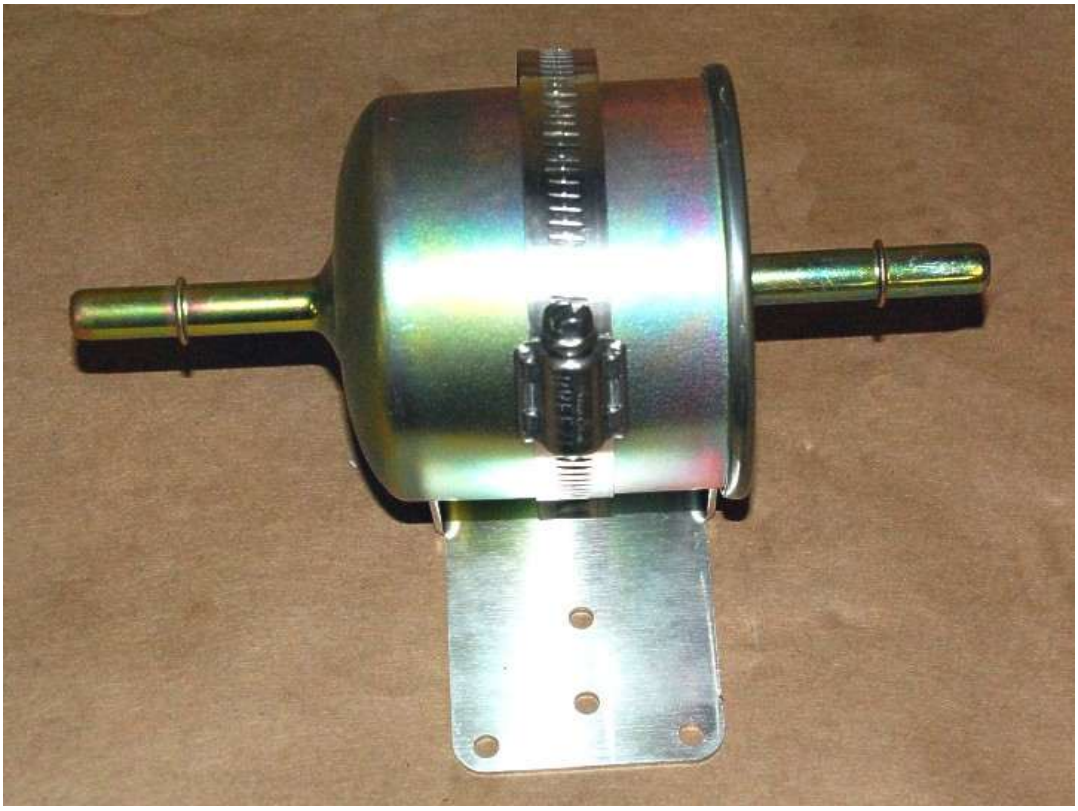
Insert the fuel filler neck into the fuel tank.

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

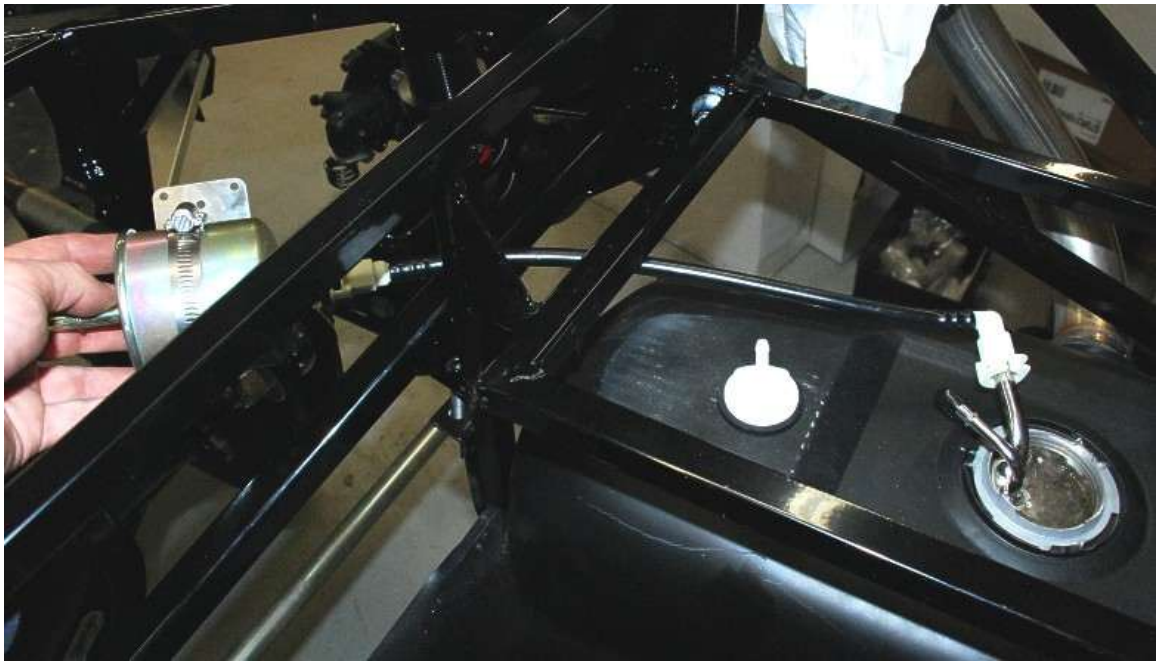
Fuel filter

Unpack the fuel filter and mounting hardware.

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



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



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.

Line the filter up to the chassis tube, the back of the bracket should be no more than 9 inches behind the rear shock mount tab to leave room for the splash panel. Hold up the bracket and mark the holes, then drill and rivet the bracket on using $^{3}/_{16}$" rivets. Aftermarket filter shown.

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 are 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.
- Which side you run down may depend on where you are hooking up to your fuel rail, carburetor, or pressure regulator. These pictures show a crate engine Coyote which has the fuel rail connection on the left side of the engine.

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 to the middle of the frame then down the transmission tunnel.

Run the hard line up to the front of the transmission tunnel.

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

Connect the return line to the fuel tank.

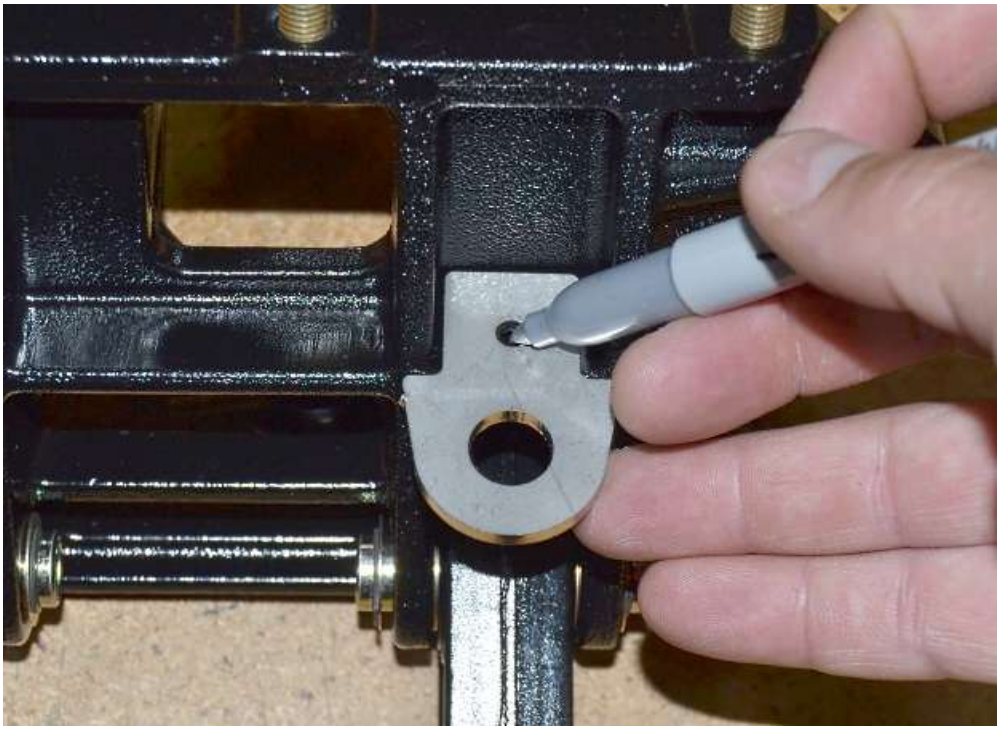
Vent hose

Attach a 25” section of $^{5}/_{16}$” fuel line and fuel line clamp onto the vent then run the vent hose down to the tube near the vent and attach it to the tube using a zip tie.

Pedal Box

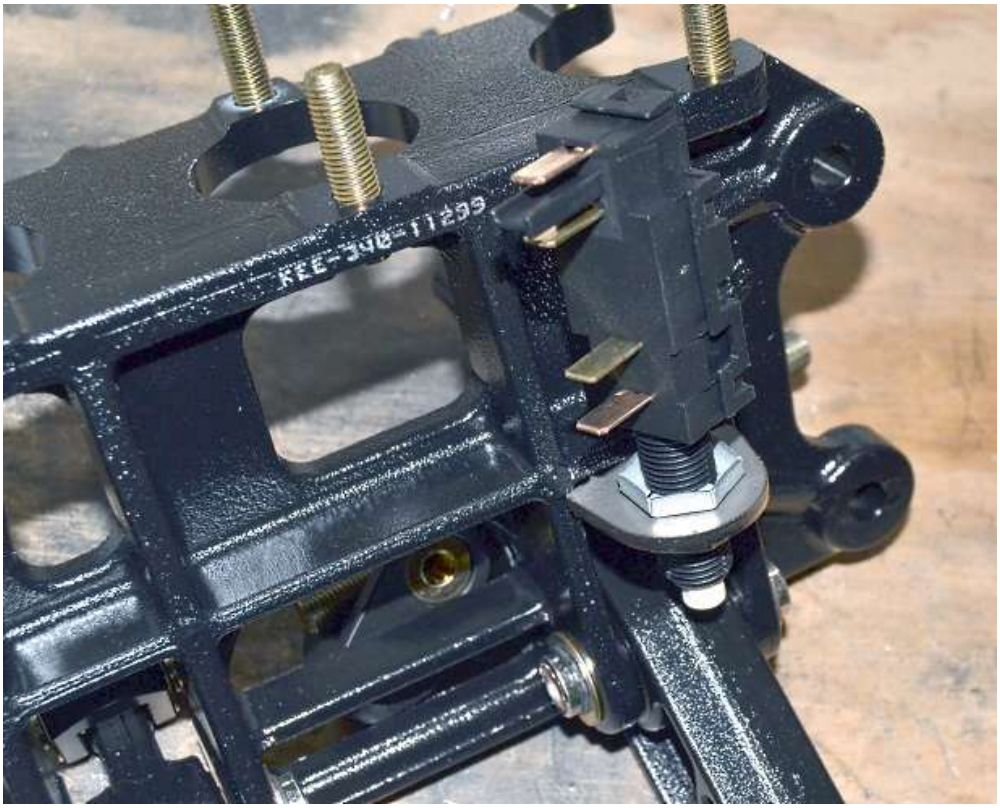
- 🛠 $^{7}/_{16}$", ½" sockets, ratchet, ¼", ⅜", $^{7}/_{16}$", ½" wrenches, $^{3}/_{16}$", ¼" drill bits, drill, Philips head screwdriver, $^{3}/_{16}$" Hex Key, snap ring pliers
- Pedal Components, pedal box hardware.
- This pedal box is set-up to use either a hydraulic clutch or a cable clutch. The parts and instructions required for a cable clutch installation are included below.
- Unpack the pedal box assembly. Now is a good time to paint all of the bare steel brackets.
- 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.

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.

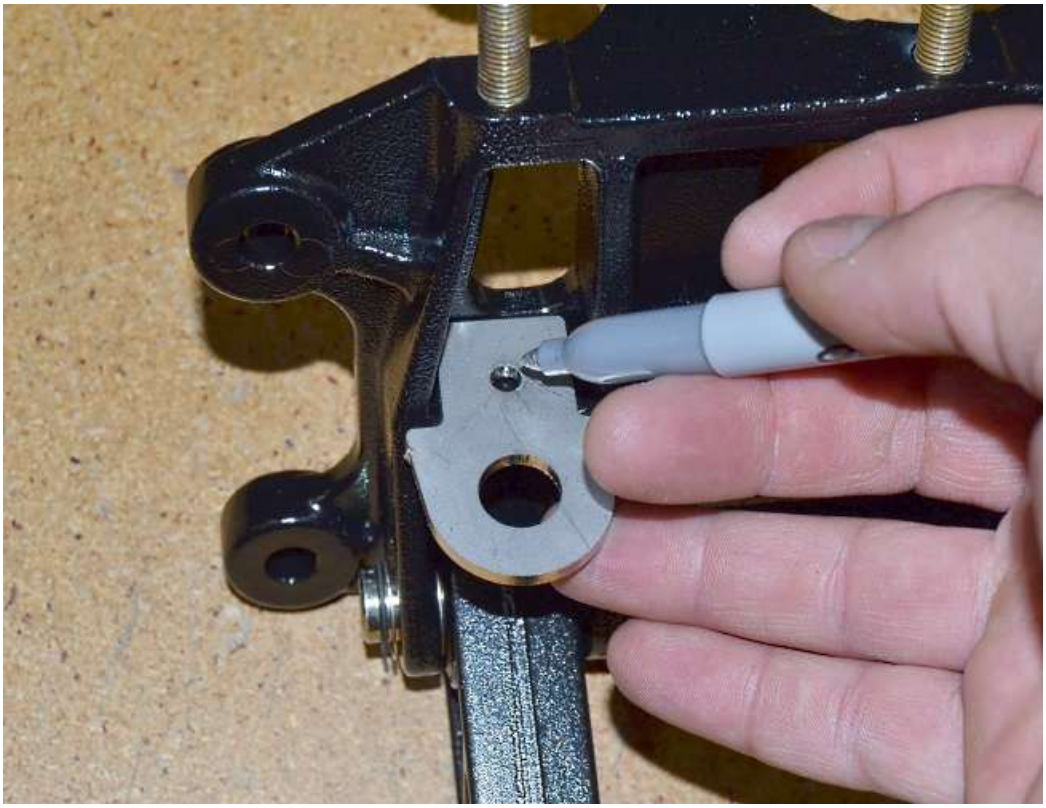
Attach the switch mount to the pedal box using the black #10 screw and locknut.



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.



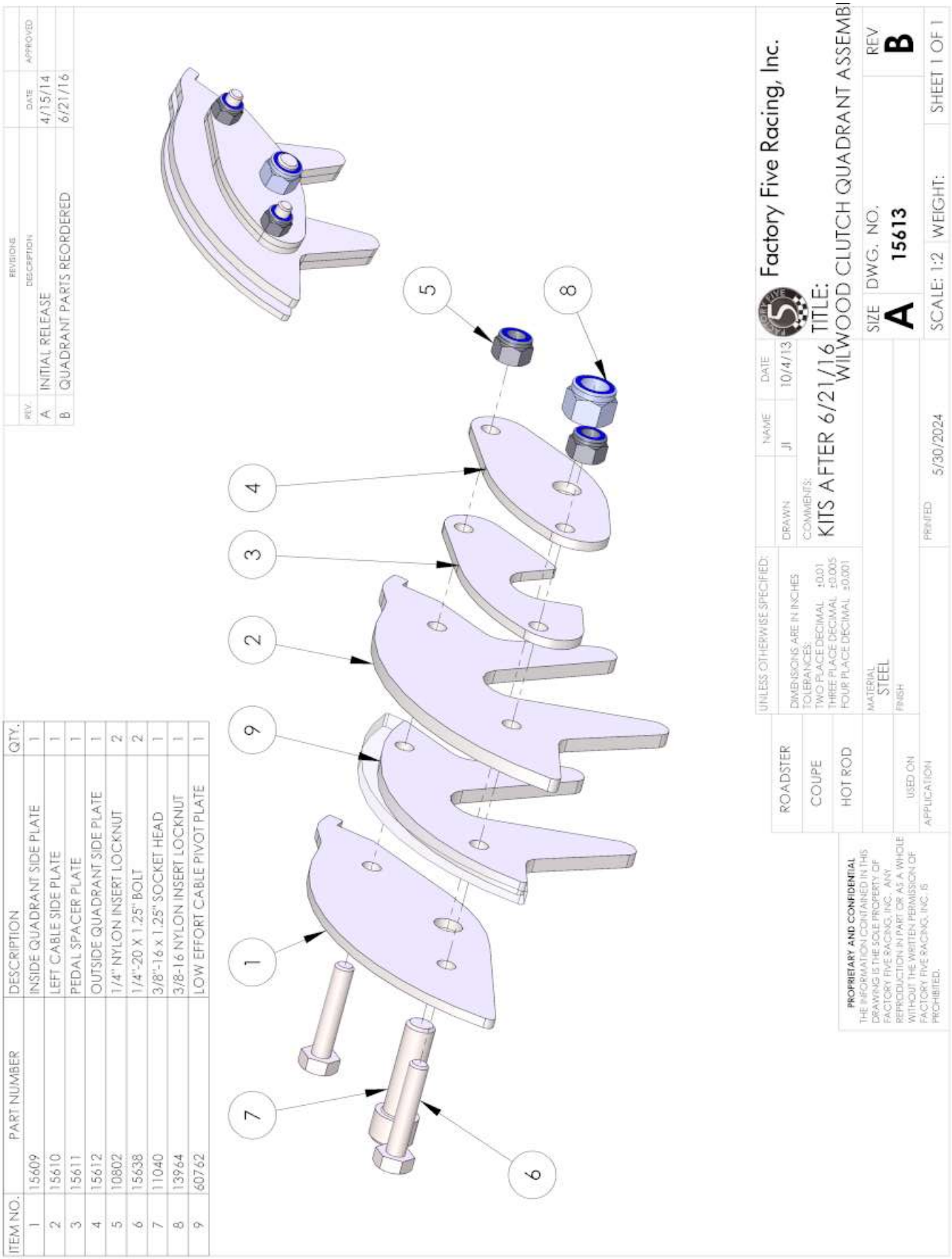
Place the switch mount between the clutch pedal mount tabs on the side closest to the clutch pedal pivot holes and drill a $^{3}/_{16}$" hole through the switch mount hole and the pedal box.

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.

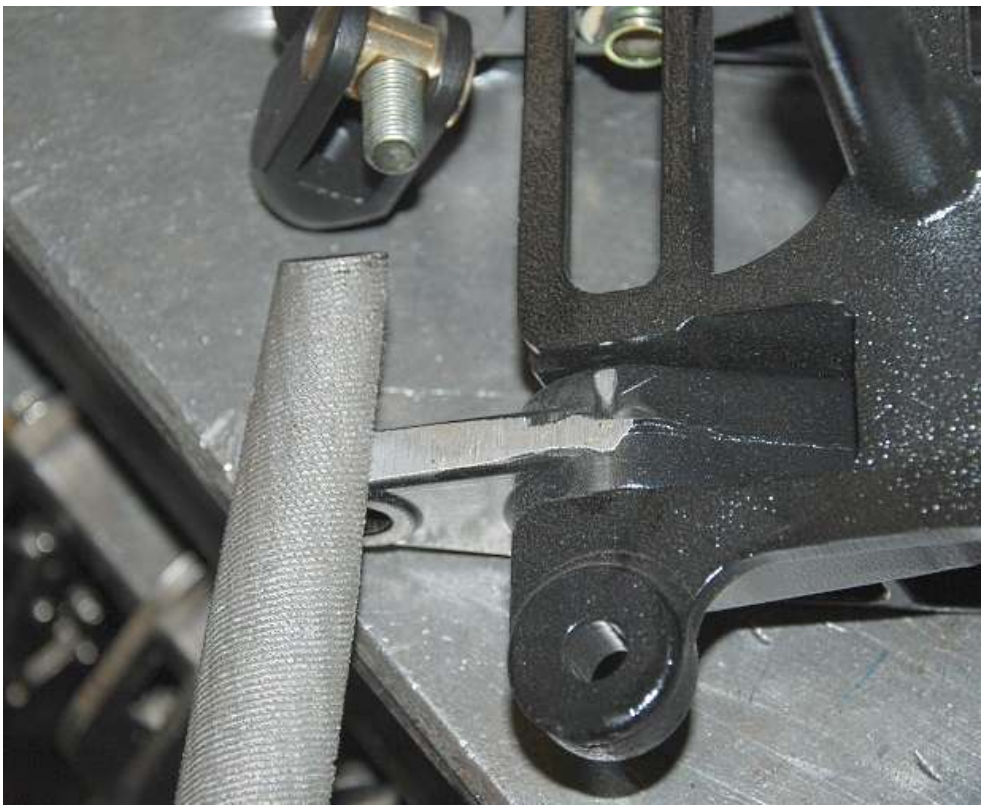
Clutch Cable Quadrant

🛠 $^{3}/_{16}$", $^{5}/_{16}$" hex keys, ½", $^{9}/_{16}$" wrenches, ½" socket, ratchet, file, external snap ring pliers.



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

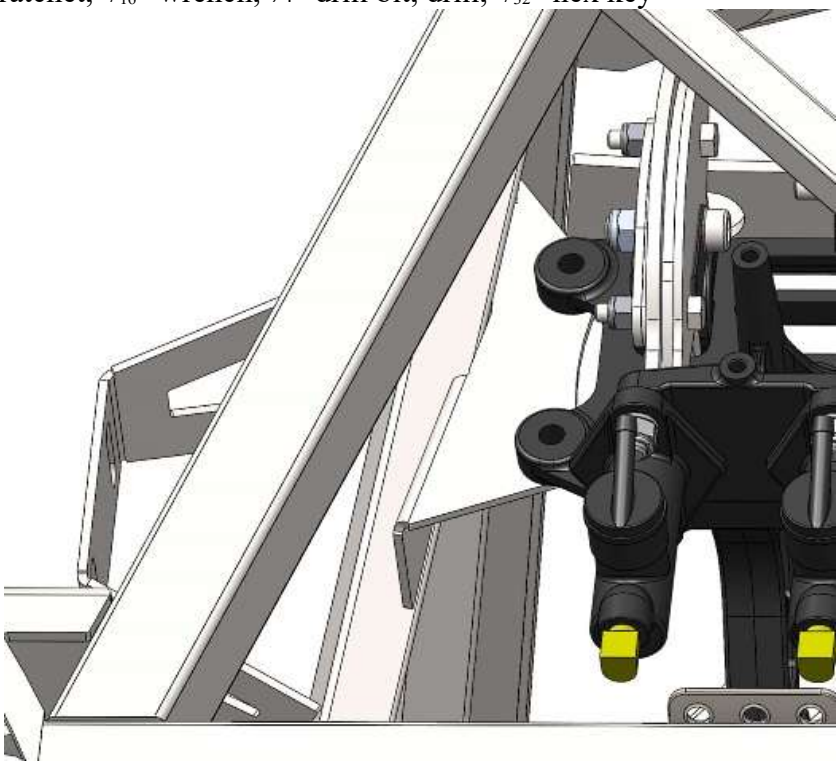
Use snap ring pliers to remove the clevis at the top of the clutch pedal.



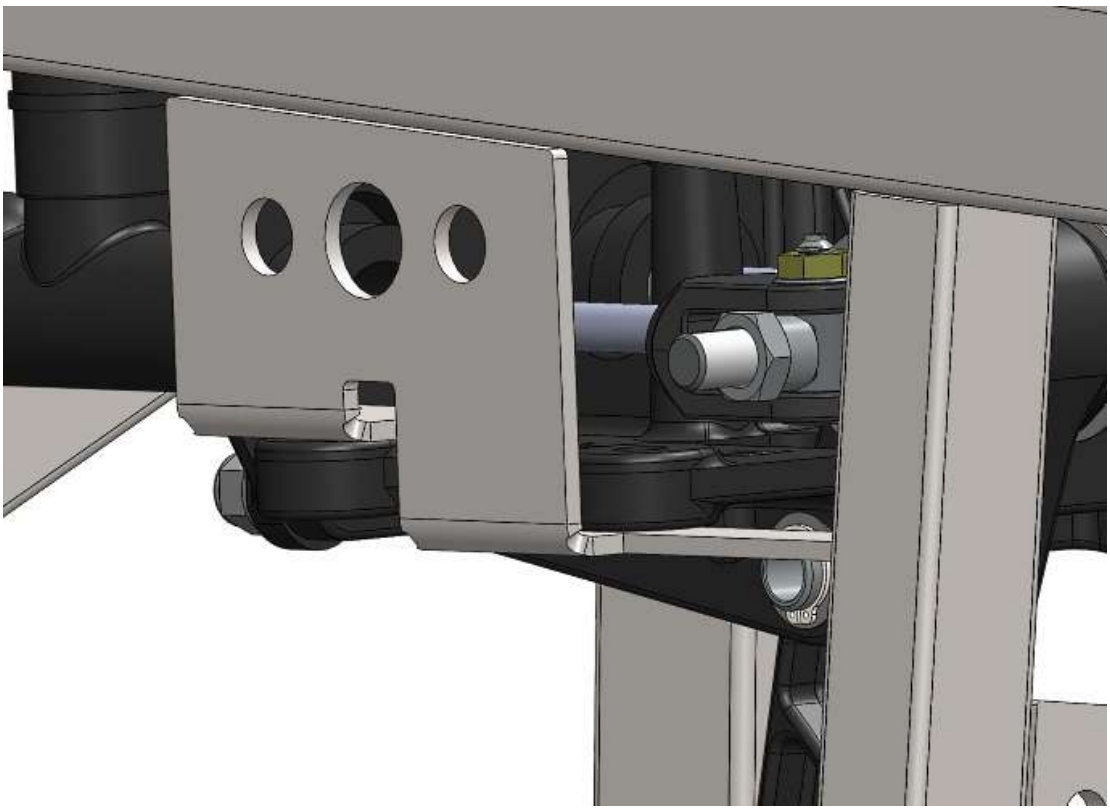
If necessary, use a file to remove the forging centerline so the $^{3}/_{8}$" bolt can go through the clutch pedal hole.

Frame Installation

🛠 $^{7}/_{16}$" socket, ratchet, $^{7}/_{16}$" wrench, ¼" drill bit, drill, $^{5}/_{32}$" hex key

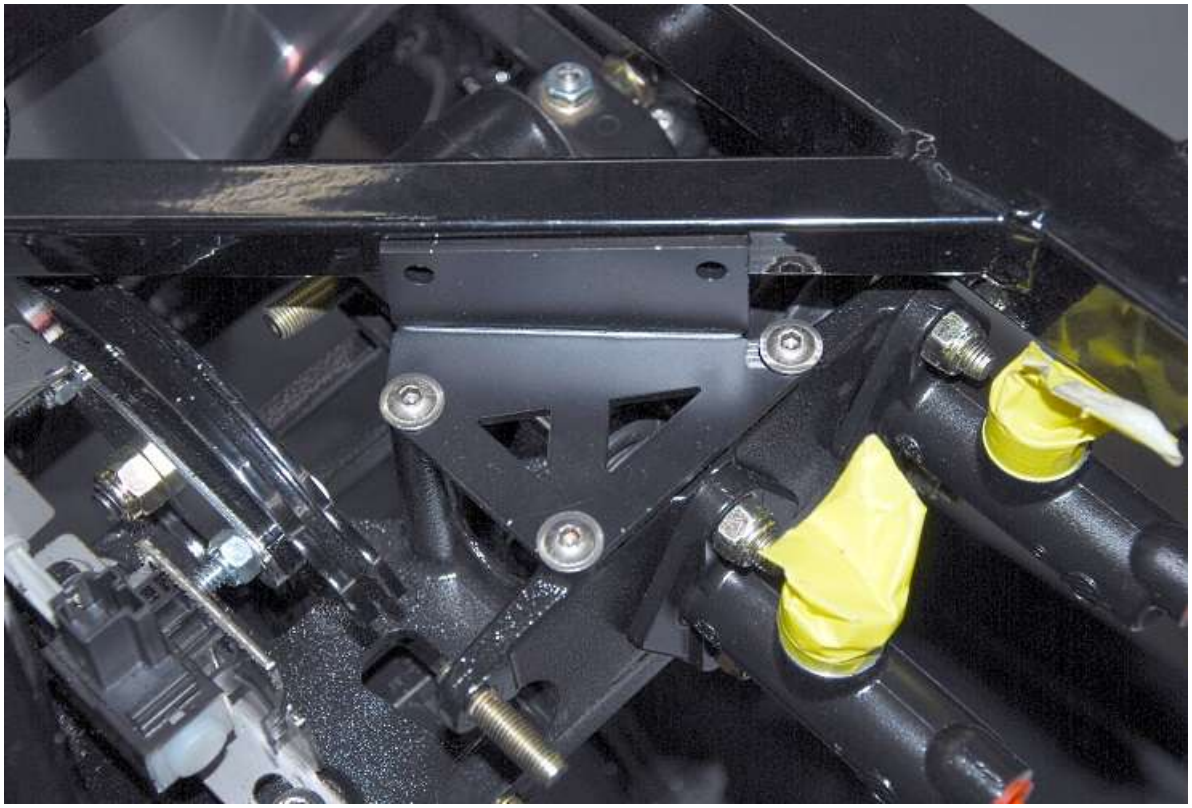


Pedalbox left side mount.



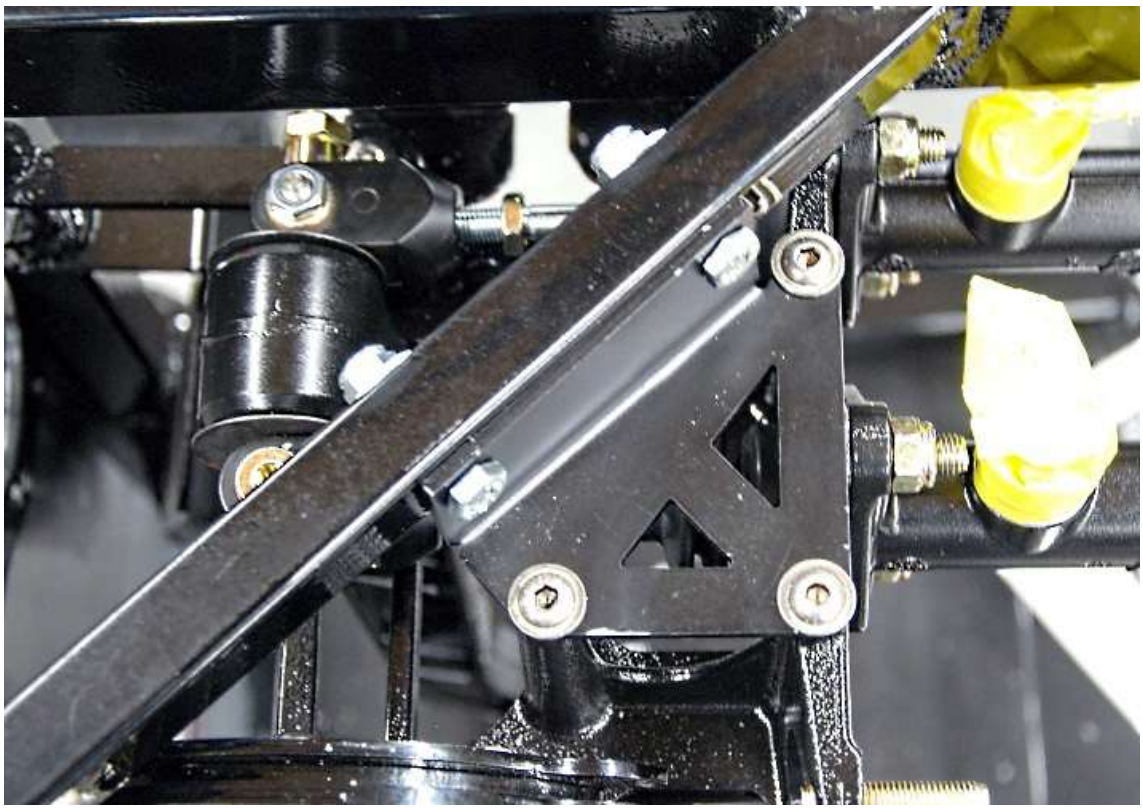
Place the pedal box assembly in the driver's footbox. Make sure that the left side of the pedalbox sits on top of the frame mount and the right side goes on top of the front mount and under the rear mount as shown above.

Attach the Wilwood pedals to the mounting brackets using four $^{5}/_{16}$" Button head screws, locknuts, $^{3}/_{16}$" hex key and ½" wrench.



Attach the 60193 pedalbox top mount to the top of the pedalbox using the stainless ¼" x 0.50" flange head screws and a $^{5}/_{32}$" hex key.

Drill through the 1” frame tube through the bracket mounting holes using a ¼” drill bit.



Attach the pedalbox mount to the tube using the ¼” x 1.25” bolts and nuts along with a $^{7}/_{16}$” socket, ratchet and wrench.

Master Cylinders

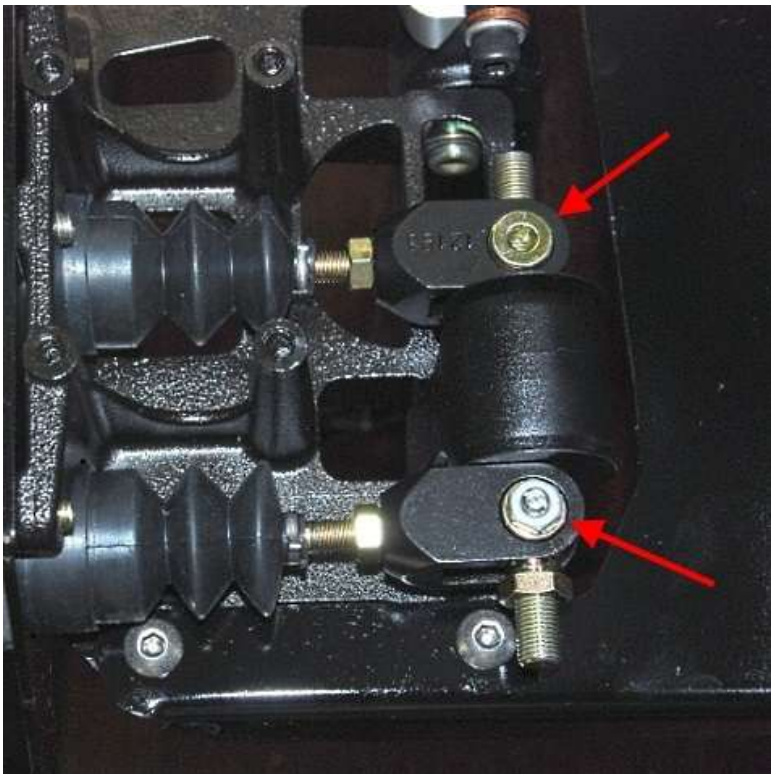
🛠 6mm socket, ½” deep socket, ratchet, ½” wrench, saw
🚗 Master cylinders

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.

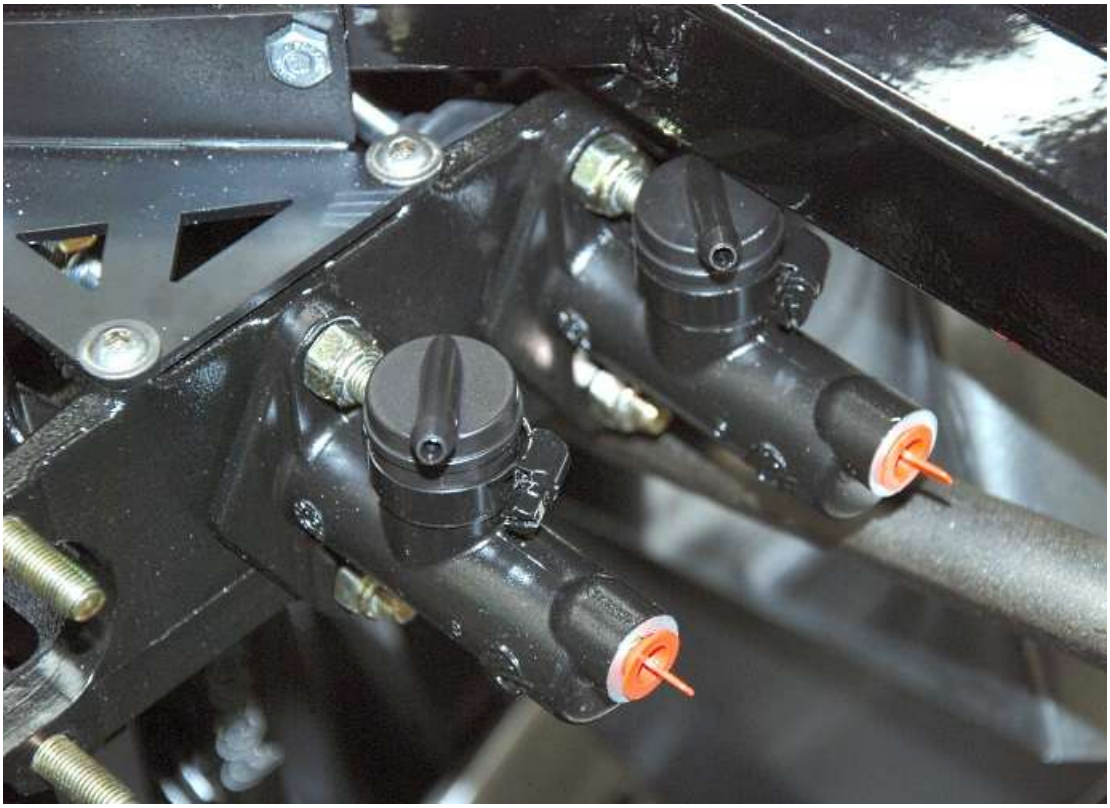
Put one of the ¾” master cylinders onto the brake left master cylinder mount location and turn the threaded shaft into the threaded mount on the brake pedal. As a starting point, thread the shaft in until you can see it is flush on the other side of the mount.

Repeat this for the master cylinder in the right master cylinder mount location for the rear brakes.



✋ 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.

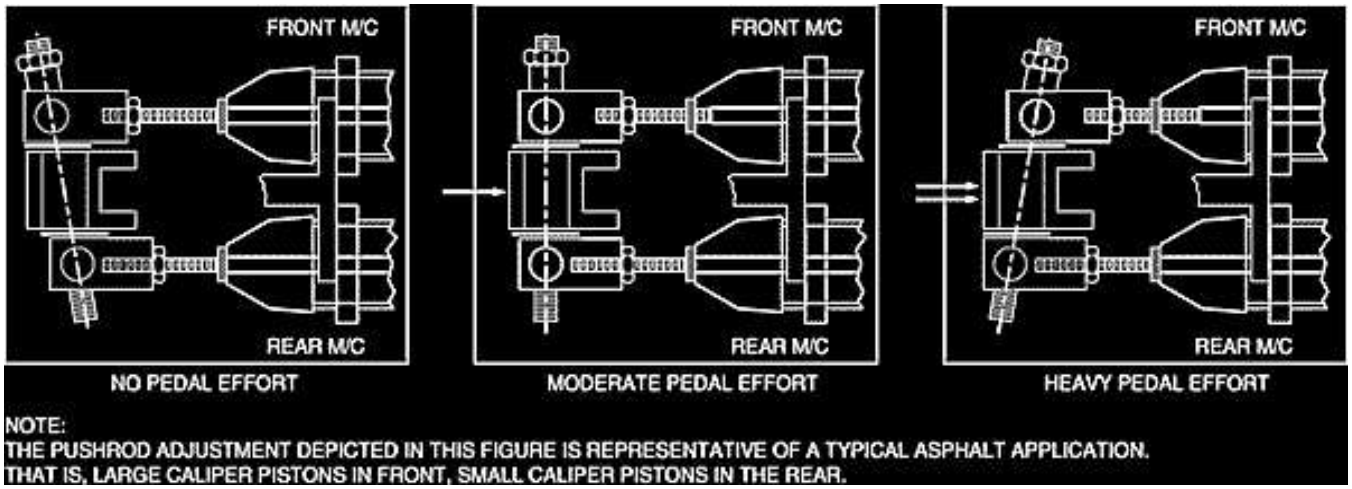


Put the plastic angled inlet adapter with hose clamp on the master cylinders. Use a 6mm socket and ratchet to tighten the hose clamp.

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

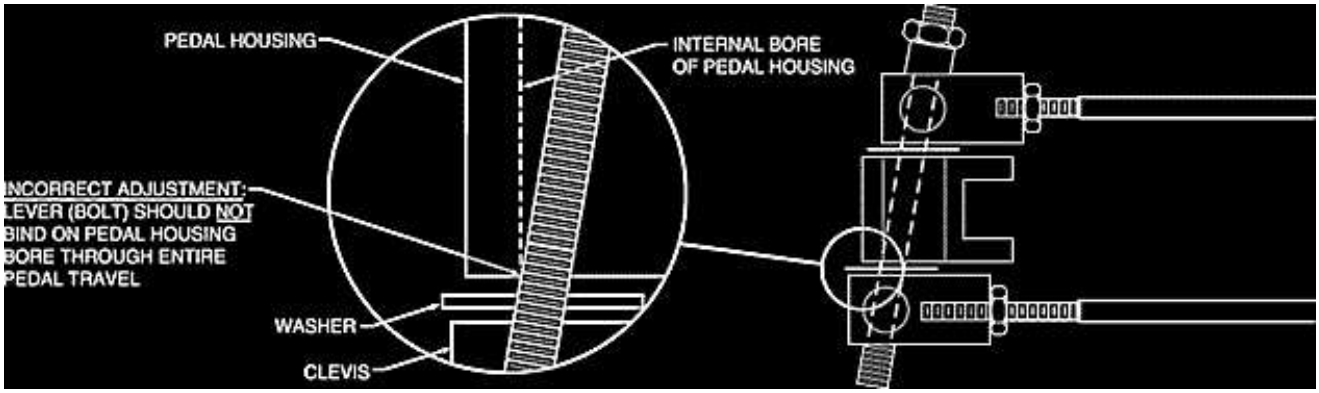
Balance Bar adjustment

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.



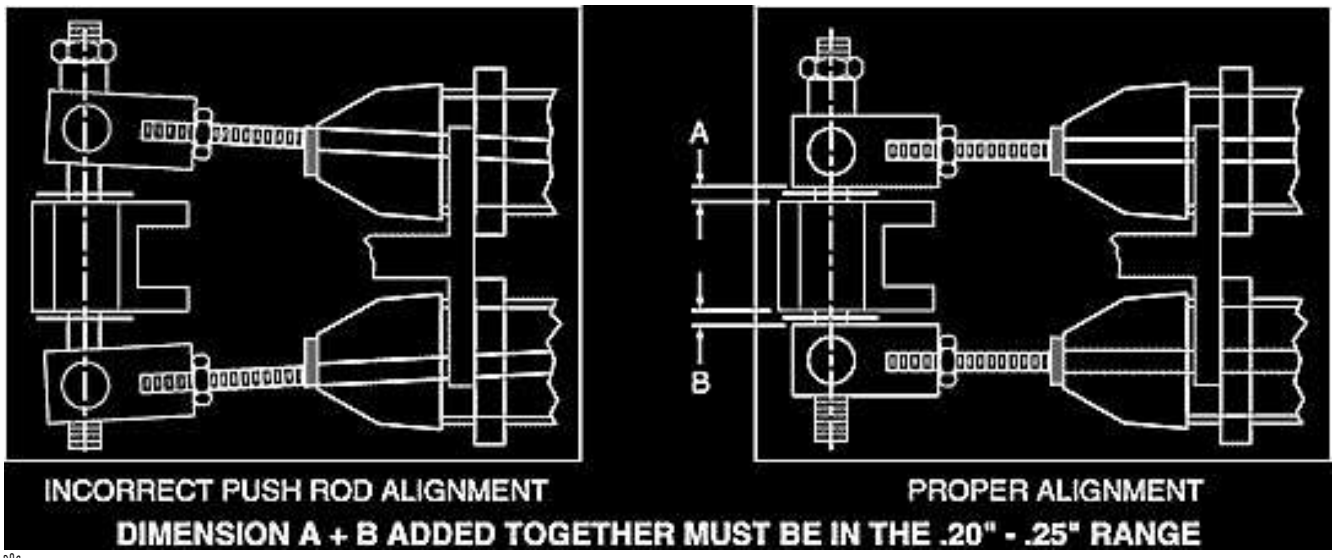
Sometimes this will lead to a “cocked” balance bar when the pedal is in the relaxed position, “no pedal effort”. This is acceptable as long as each master cylinder pushrod is completely free of pressure when the pedal is relaxed.

✋ 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 interference.

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.

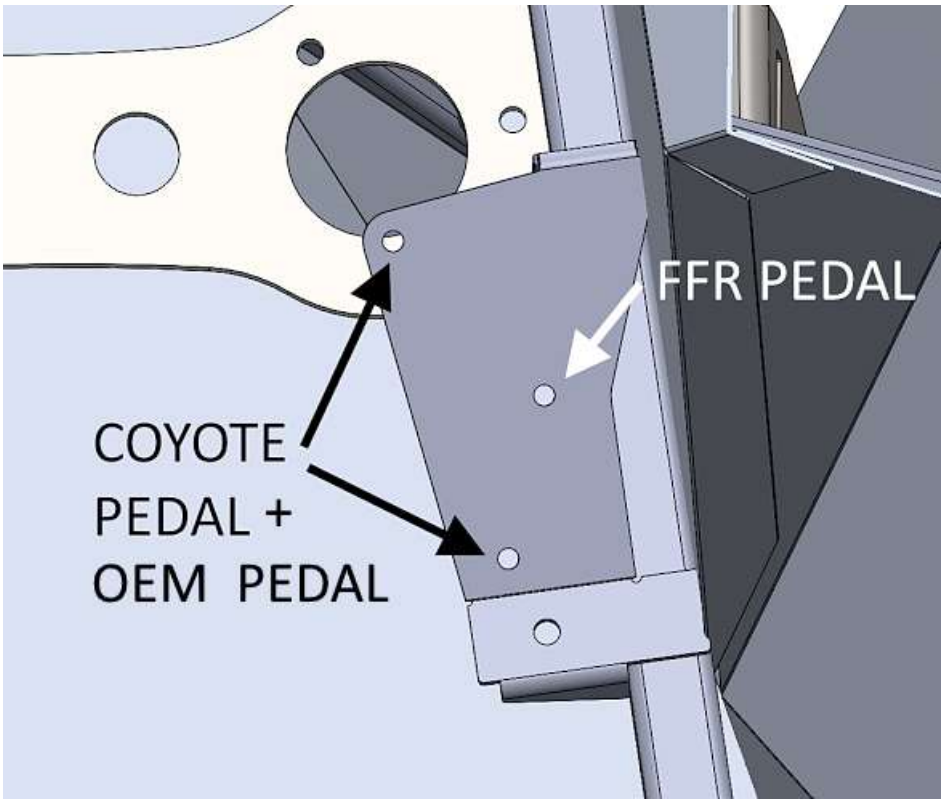


✋ Make sure that the master cylinder pushrods remain true in relationship to the cylinder during entire pedal travel; pushrods should not be pushing master cylinder pistons at an angle.

Warning – If the Master cylinder pushrods are not straight, it will cause side loads on the master cylinder which will lead to a master cylinder failure.

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



There are two pedal locations provided on the frame that will do three different pedals.

OEM Mustang

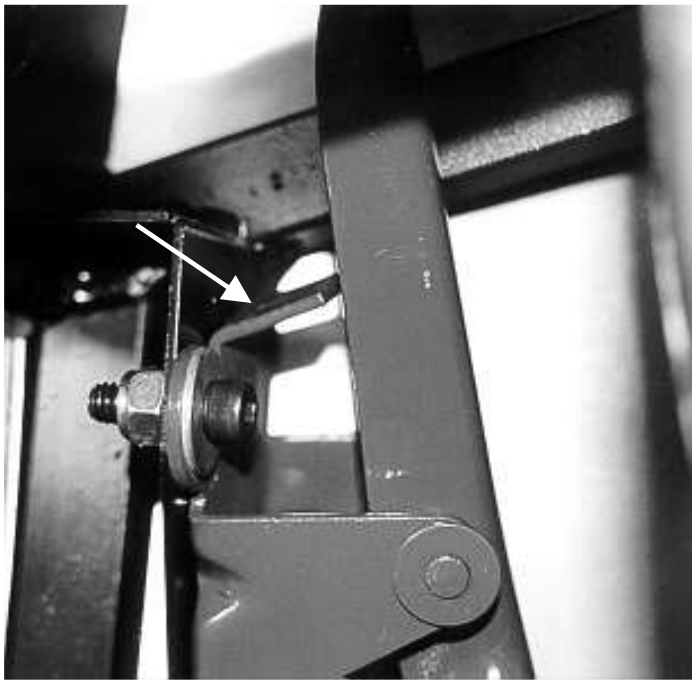
🛠 $^{7}/_{16}$" wrench, $^{7}/_{16}$" socket, ratchet, pliers, marker
✋ OEM accelerator pedal, accelerator cable components (Box 7)

Hold the accelerator pedal up to the mount on the front of the foot box. The higher you can mount the pedal the better the pedal will be positioned on your foot. Make sure there is still room at the top of the accelerator pedal on the front of the footbox for the accelerator cable to come through. Attach the accelerator pedal to the mount using the ¼"x ¾" hex head bolts and lock nuts.

Cut the accelerator pedal capture in the corner using a pair of wire cutters.

Slip the accelerator cable through the cut so that the ball will sit in the recess.

Push the capture into the end of the throttle pedal.



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

Complete kit Accelerator Pedal

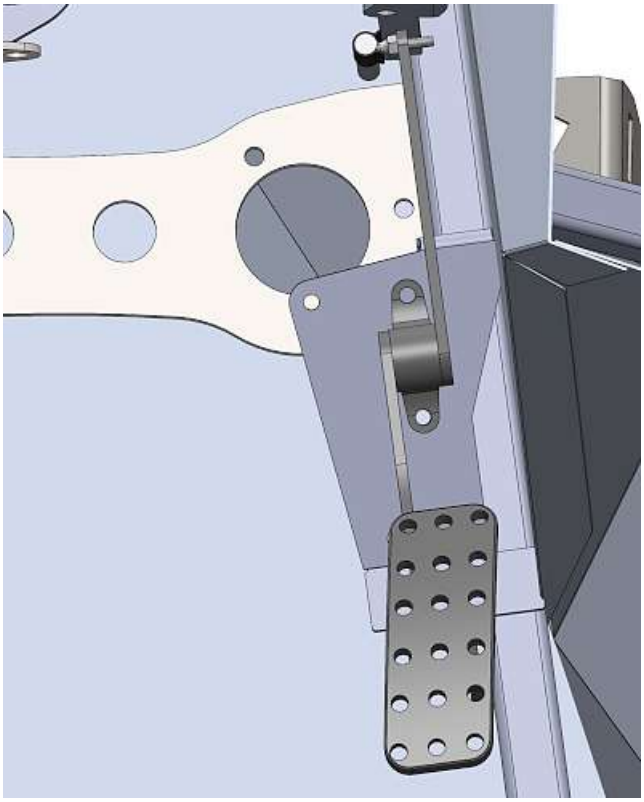
- $^{5}/_{64}$" hex key, ⅜", $^{7}/_{16}$", ½" wrenches, wire cutter, ¼" drill bit, drill, marker, masking tape.
- Accelerator cable components (Box 7), accelerator pedal components (Box 18), pedal box hardware (Box 18).
- The Accelerator cable is designed to be used with all types of engines, carbureted 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 or other throttle by wire engine, skip this section and see Coyote or LS install instructions.

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

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

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

✋ This will allow the cable to come out of the firewall straight and not rub on the side of the cable sheath too much.



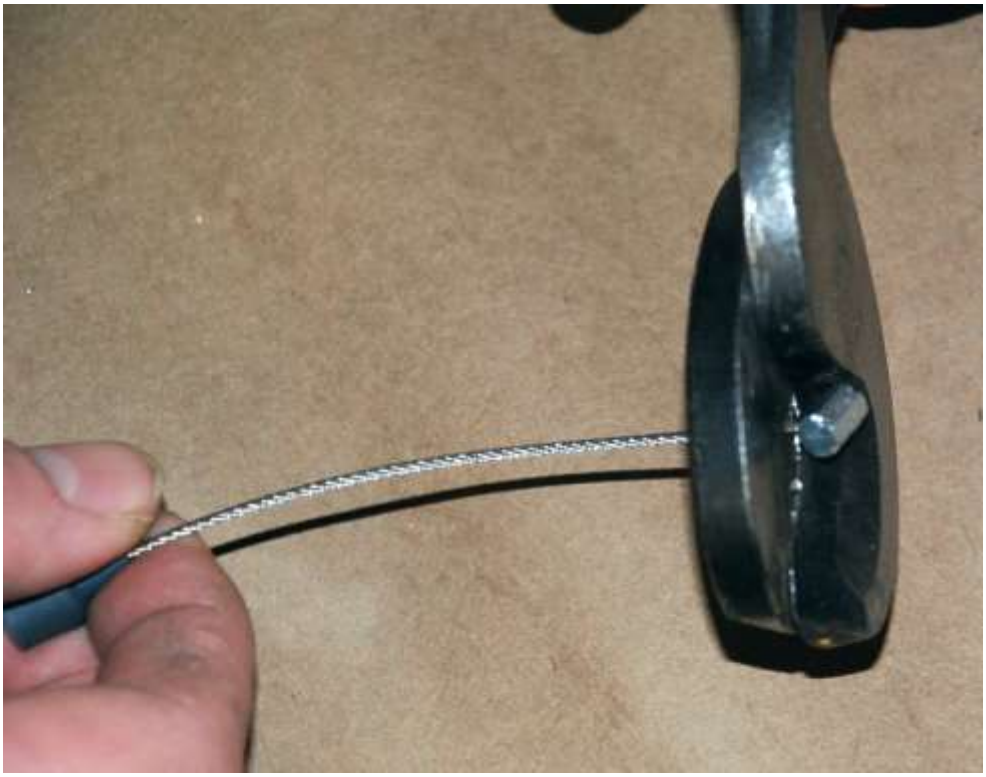
Use one ¼”x ¾” socket head screw and ¼” locknut from the pedal box hardware in the bottom hole to locate the pedal up and down.

The upper pedal hole will need to get drilled depending on the location desired. Position the accelerator pedal so that the pedal pad is at a comfortable height on your foot and there is still room at the top of the accelerator pedal on the front of the footbox for the accelerator cable to come through.
Mark the accelerator pedal mount hole then drill the plate using a ¼” drill bit.

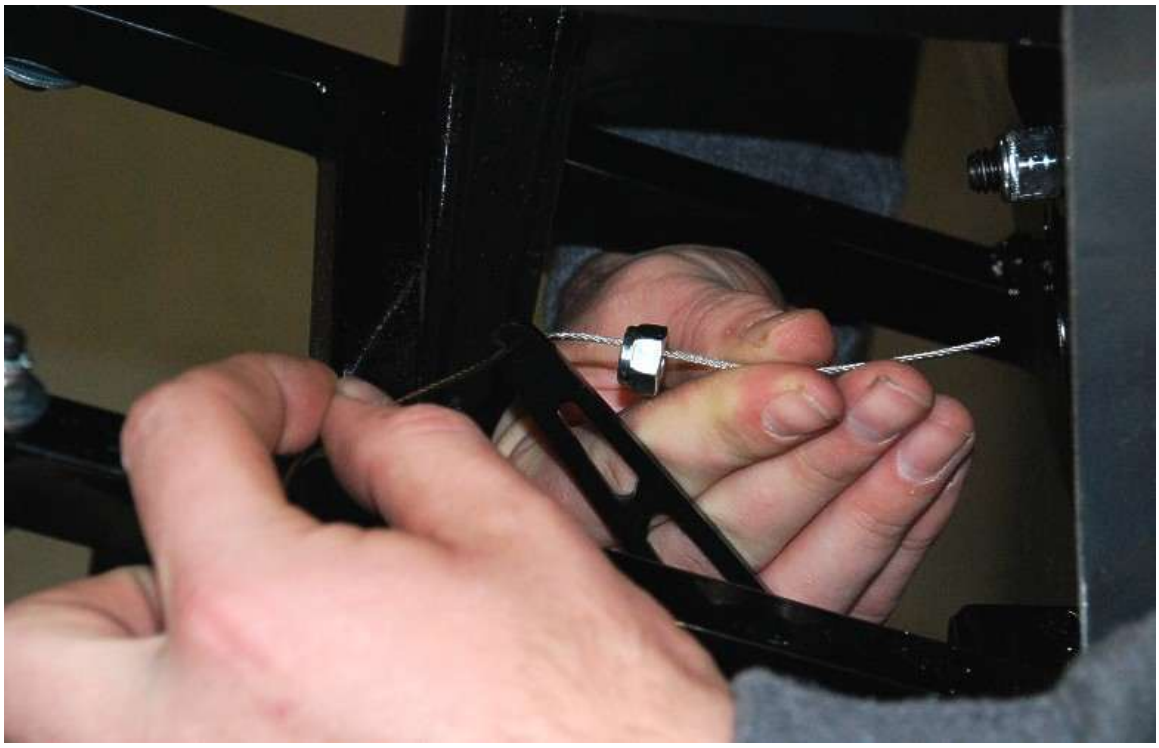
Bolt the top of the pedal to the mount plate using a ¼”x ¾” screw and locknut.

Rotate the pedal so the top of the pedal where the accelerator cable will attach is 1.50” away from the front of the footbox and mark the front of the footbox directly in front of the ball stud.

✋ If running a 4.6L engine, do not do the next steps, the cable is designed for the pedal.



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.

Bend the top part of the pedal sideways so that the ball stud retainer lines up with the accelerator cable.

The remainder of the install will get done after the engine install.

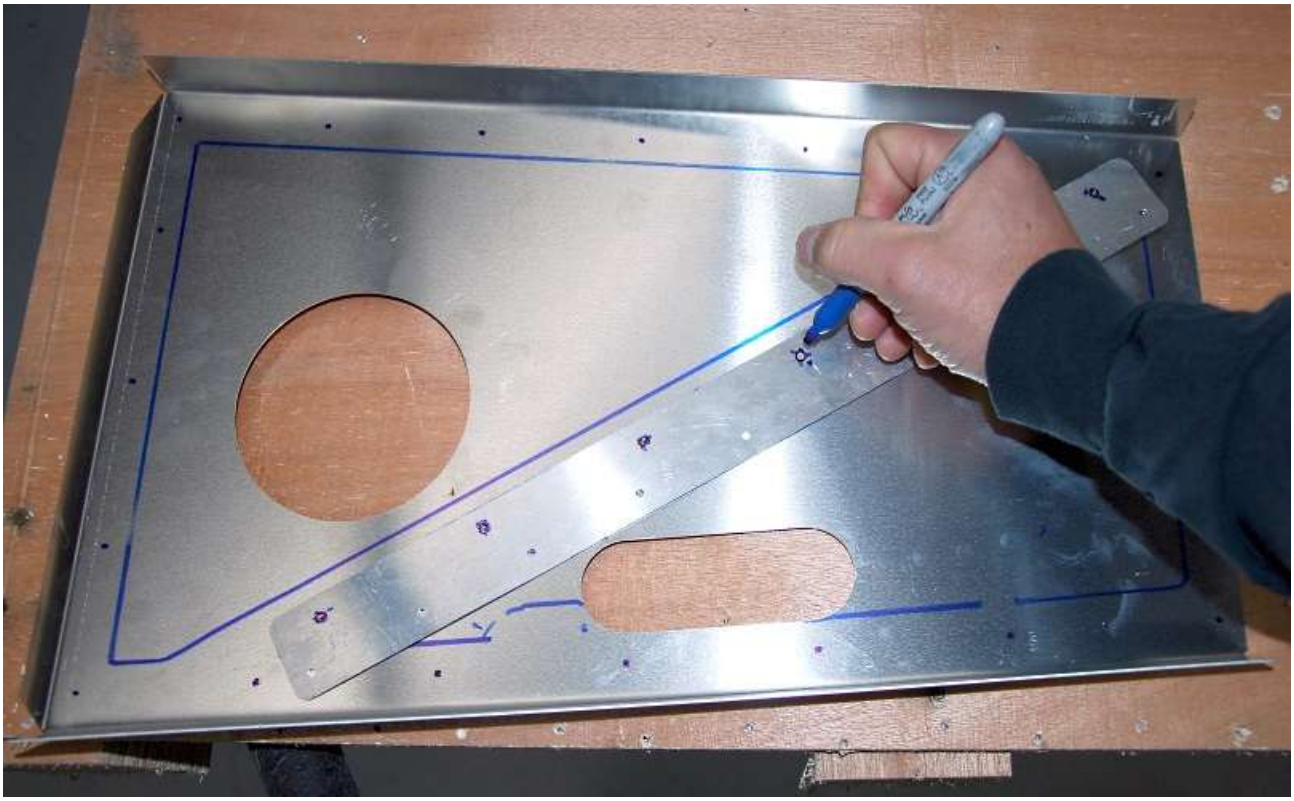
Cockpit aluminum

Rivet Spacing Tool

Packaged Aluminum

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

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



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

Drill the rivet locations using a 1/8" drill bit.

Right footbox aluminum

🛠 ¼" nut driver, drill, 1/8" drill bit, rivet tool.
🚘 Secondary body fasteners, kit aluminum.

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

Locate and hold the right footbox aluminum panels (inside, front and outside) using the kit # 8 screws originally holding the aluminum to the frame.

Drill through the rivet holes in the footbox front aluminum into the frame tubes using a $^1/_8$" drill bit.

Rivet the panel to the frame.

Drill and rivet the inside footbox aluminum panels.

Run a bead of silicone along the inside bottom of the footbox.

Silicone. drill and rivet the outside footbox aluminum panel.

Silicone, drill and rivet the right door hinge inside cover to the frame.

Left footbox aluminum

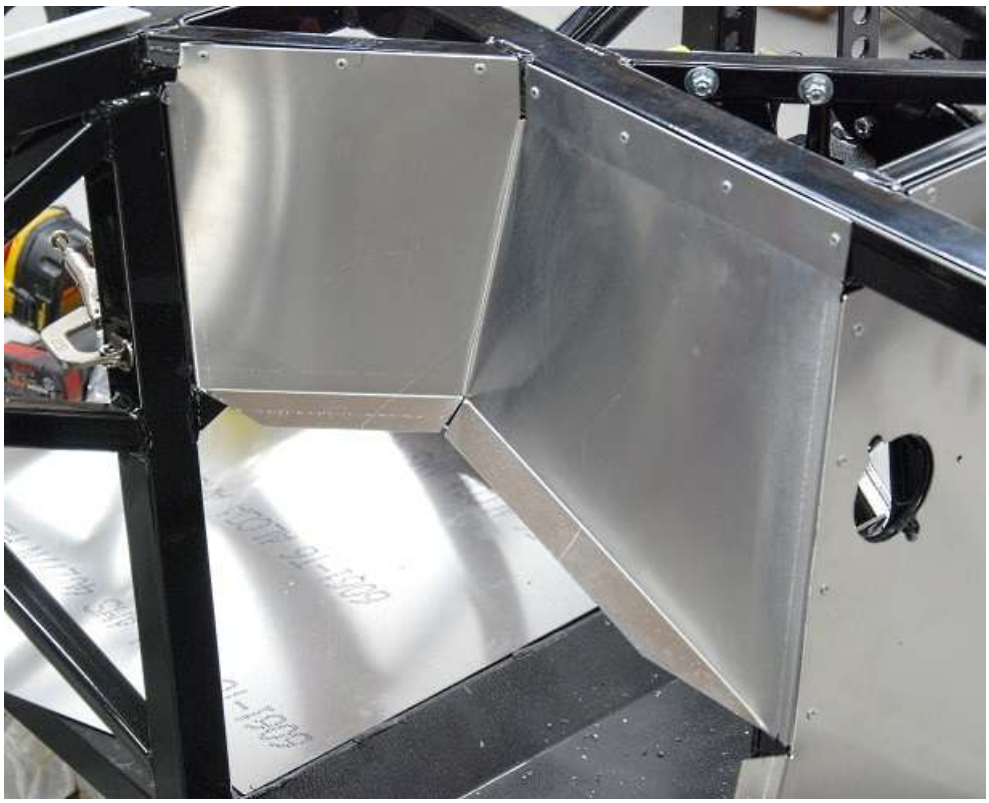
🛠 ¼” nut driver, drill, 1/8” drill bit, rivet tool.

Secondary body fasteners, kit aluminum.

Do not rivet the panels together until everything fits together in the correct location.

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

Locate and hold the left footbox front aluminum panel using the kit # 8 screws originally holding the aluminum to the frame.



Locate and hold the left footbox inside top aluminum panel using the kit # 8 screws.

Locate and hold the left footbox inside bottom aluminum panel using the kit # 8 screws.

Drill through the rivet holes in the aluminum into the frame tubes using a $^{1}/_{8}$" drill bit.

Rivet the panels to the frame.

Do not attach the outside panel yet.

Cockpit rear wall

🛠 Drill, ⅛” drill bit, rivet tool, Silicone, caulking gun, #8 self-tapping screws, ¼” 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.

Silicone the rear cockpit wall frame tubes.

Use the #8 screws to hole the panel in place then drill and rivet the cockpit rear wall to the frame.

Cockpit floors

Silicone the tubes under the main floor areas.

Set the floors in place.

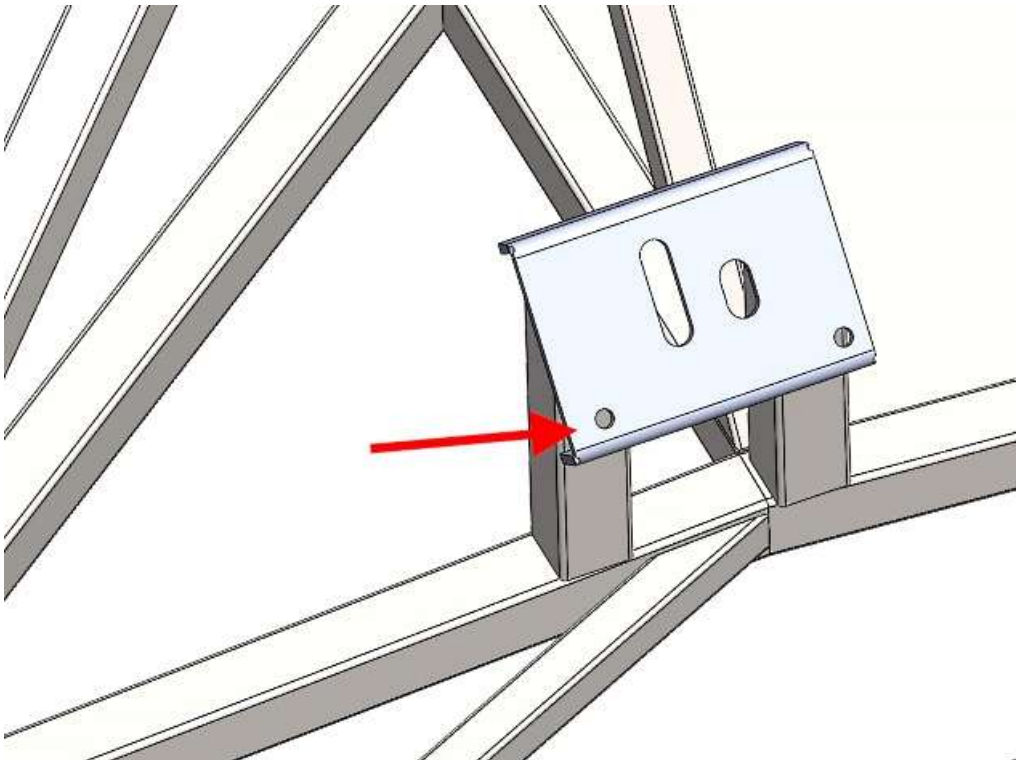
Use the #8 screws to hole the panel in place then drill and rivet the floors in place.

Riveted floors.

Drivetrain Install

If installing a Coyote engine, check our parts catalog www.factoryfiveparts.com/instructions/ for install instructions.

Frame prep



On the right engine mount sand or grand any coating away around one of the holes shown above for the engine ground strap.

Transmission prep

13mm, ¾” sockets, ratchet

Remove the shifter handle for easier install using a 13mm socket and ratchet.

Put masking tape over the hole.

If not already attached, attach the transmission mount to the transmission using a ¾" socket and ratchet. 6speed Magnum shown.

Engine Prep

🛠 Engine hoist, chain, ¾”, 15/16” sockets, ratchet, extension
🚗 Engine, Engine mounts, engine ground strap.
✋ The easiest method to install the drivetrain is with the engine and transmission already bolted together and lowered in as a unit. Also remove anything that will make your job easier (shifter assembly, headers, power steering pump, etc…).
✋ If using a 4.6L or Coyote engine, a shallow oil pan is required.

If using a 4.6L or Coyote engine remove the stock oil pan and install a shallow oil pan.

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

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

Tighten all of the engine mount bolts.

87-95 Oil Filter Relocator

🛠 ⅞” wrench, razor knife, Teflon tape, chassis grease, ⅜” hex key

🚘 Oil filter relocating kit, oil, oil filter.

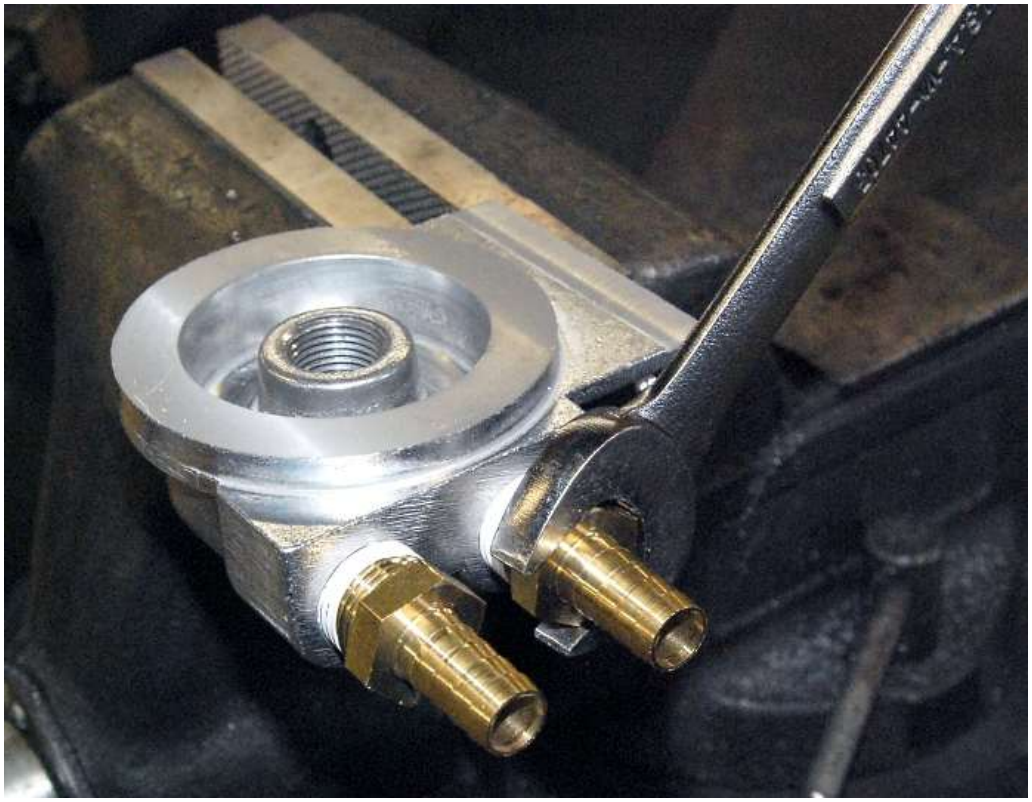
✋ This is needed only if running shorty headers and J-pipes on a 302 or 351 engine.

✋ **Max torque** for the fittings on the relocate kit is **28 lb-ft**.

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.



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.

✋ Mount the oil filter relocator on the frame after the engine has been installed.

Engine/Transmission Installation

🛠 Engine hoist, chain, 2-3 friends, 13/16" socket, ratchet and extension.

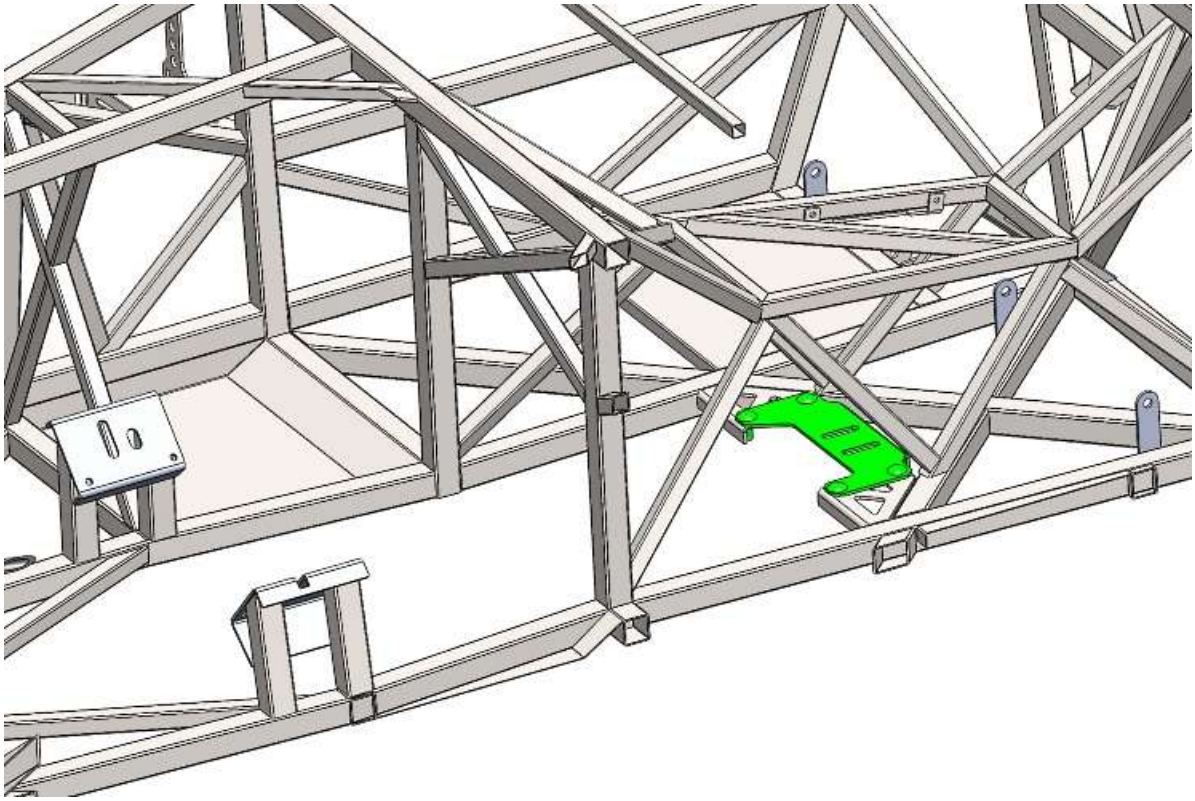
Attach engine hoist chain to the engine.

Lower the engine and transmission into place. The more hands you have to help the better. Go very slowly.

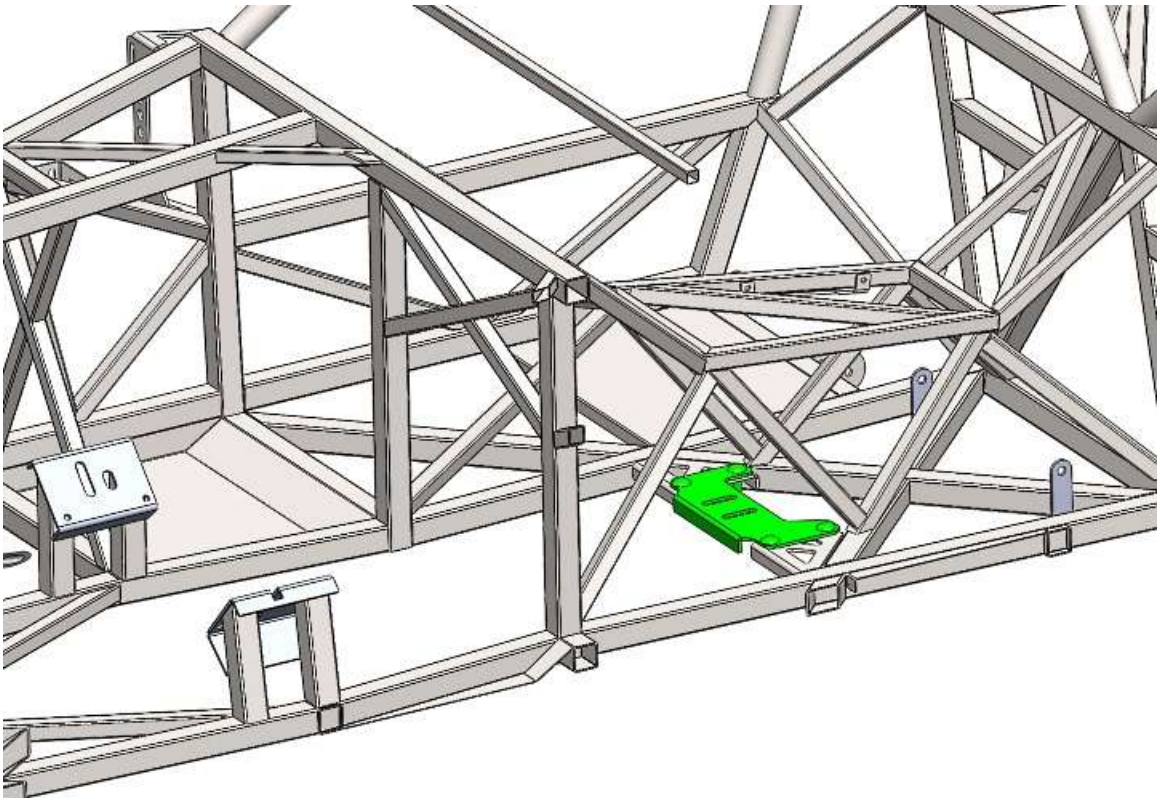
Install the engine mount to chassis nuts and tighten using a $^{13}/_{16}$" socket, extension and ratchet. Make sure the alignment pins on the mounts are in the holes on the chassis pads.

Transmission Mount

🛠 $^{5}/_{8}$", ¾" sockets, ratchet, floor jack
🚘 Transmission mount/hardware



Use this transmission mount orientation for 302/351 with TKO applications and all 6-speed applications.



Use this transmission mount orientation for the Coyote with TKO application

Jack the transmission up and place the transmission mount on top of the frame mount in the correct orientation.

From the top pass the carriage bolts through the transmission mount plate and frame mount and hand tighten the locknuts on.
Attach the transmission mount plate to the transmission mount using a $^{5}/_{8}$" socket and ratchet.
Tighten the carriage bolts using a ¾" socket and ratchet.

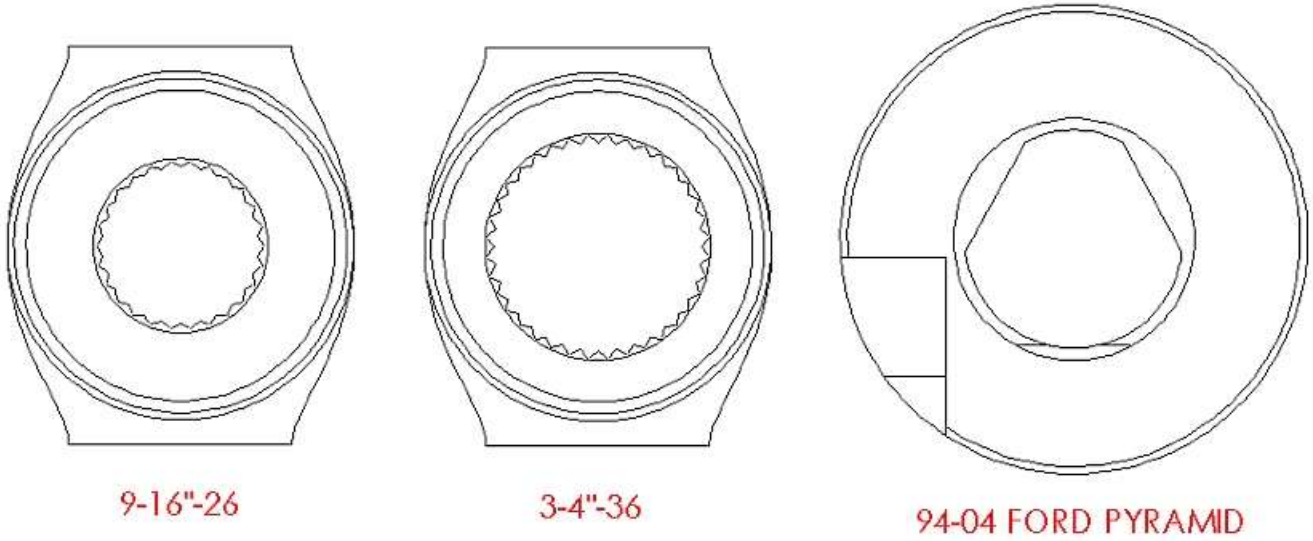
Engine ground

🛠 $^{3}/_{16}$" hex key, ½" socket, ratchet.
🚗 Electrical completion parts (complete kit)

Attach the ground strap to the frame using a $^{5}/_{16}$" x 1" stainless button head screw, locknut, $^{3}/_{16}$" hex key, ½" socket and ratchet (complete kit only).

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 underside of the chassis mount with the set screw toward the rear of the car using the 60103 spacers, the $^{5}/_{16}$" x 1.50" stainless button head screws, locknuts, $^{3}/_{16}$" hex key and ½" wrench. Do not tighten the locknut all the way until all of the steering parts have been installed.

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. Do not tighten the locknut all the way until all of the steering parts have been installed.

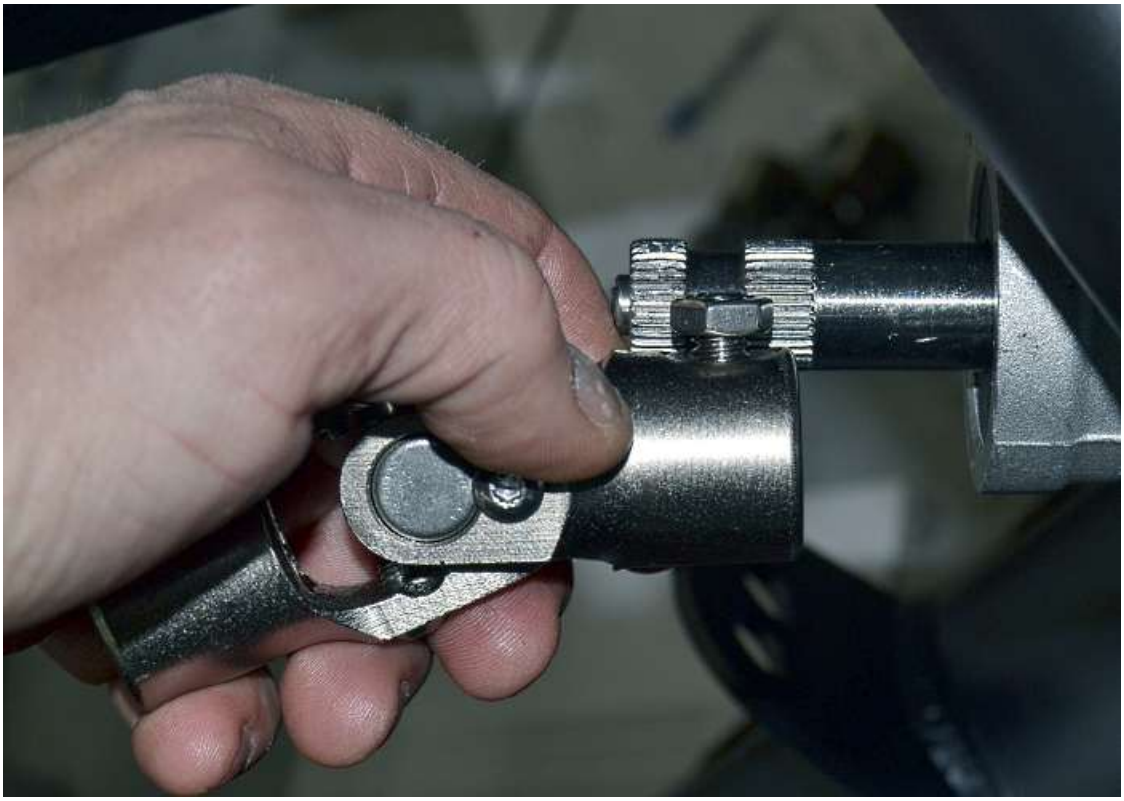
Manual steering

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.

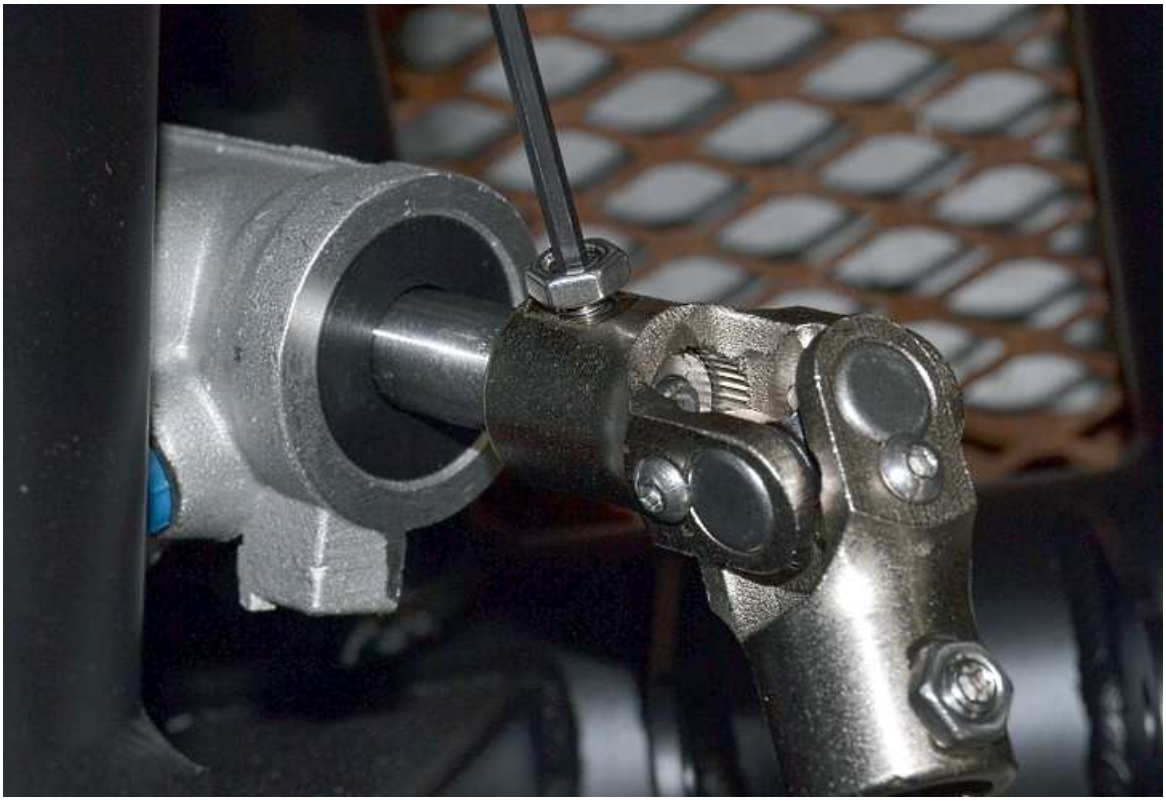
If necessary, use a plastic mallet to get the joint onto the spline, it is tight.

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.



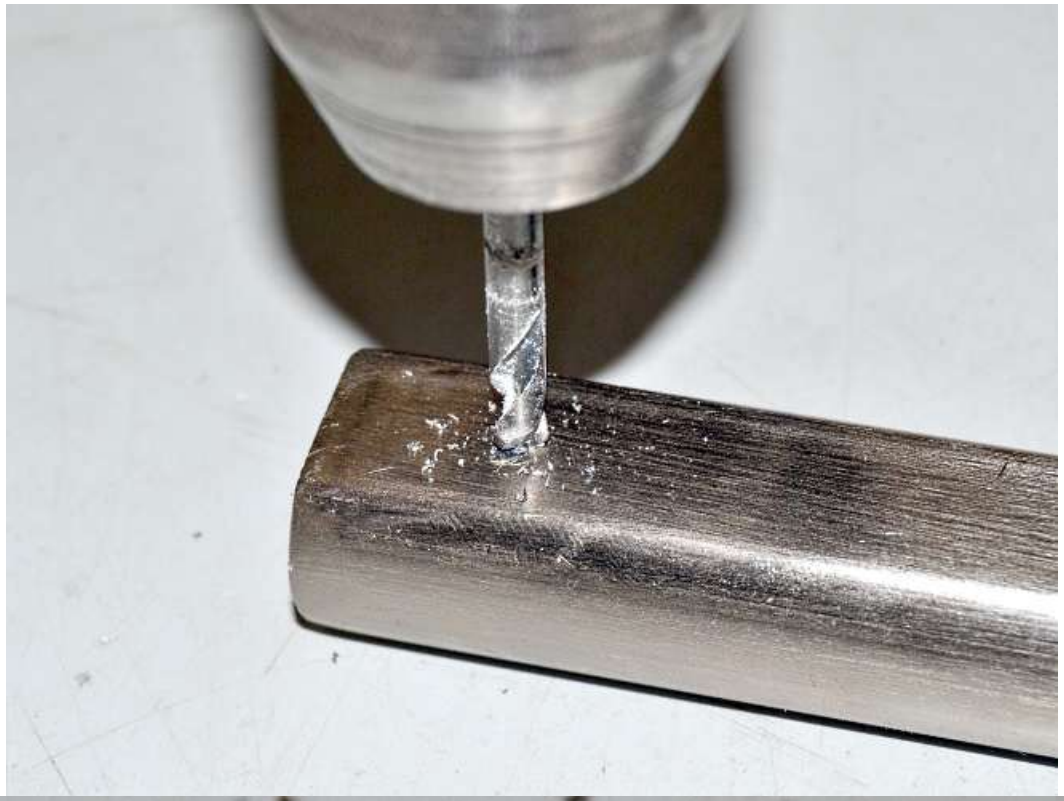
Push the shaft into the steering joint so that the set screw will go into the recessed area on the input shaft then tighten the set screw and jam nut using a $^{5}/_{32}$" Hex key and ½" wrench.

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.

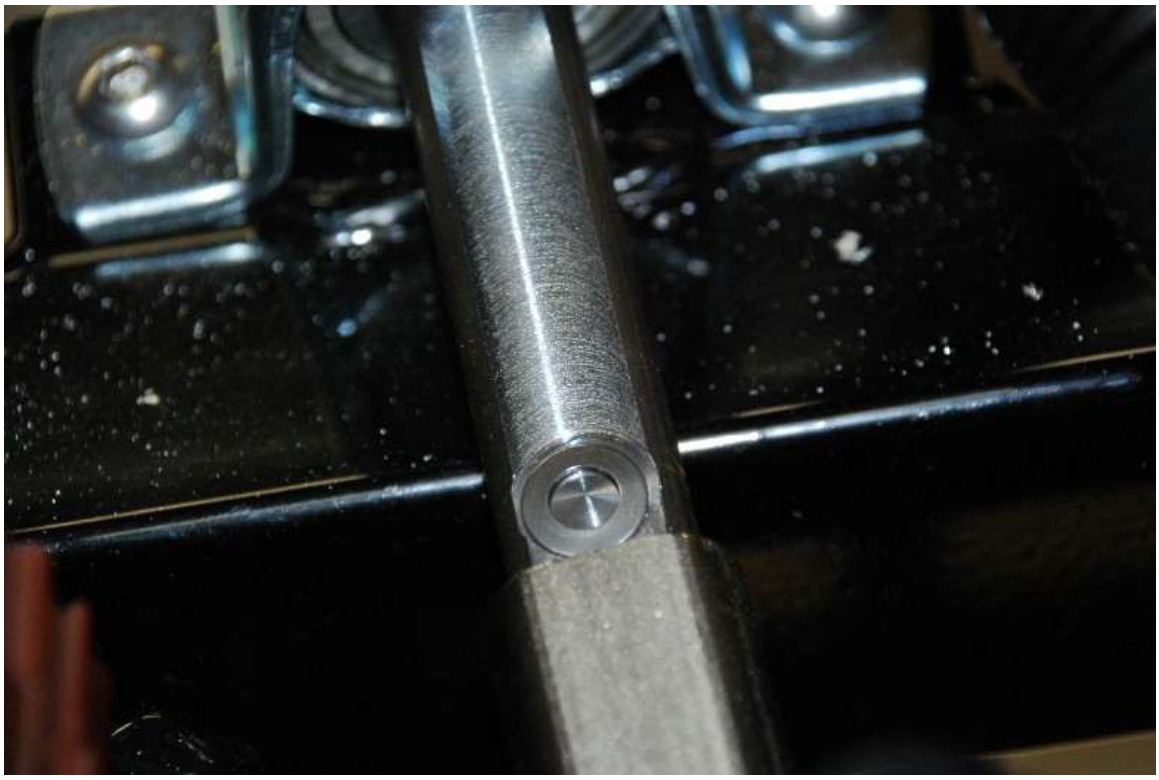
Insert the lower shaft into the steering rack joint.
Slide the 1"DD tube through the footbox bearing into the upper u-joint so the set screw on the 1"DD tube goes into the recess made earlier.

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.



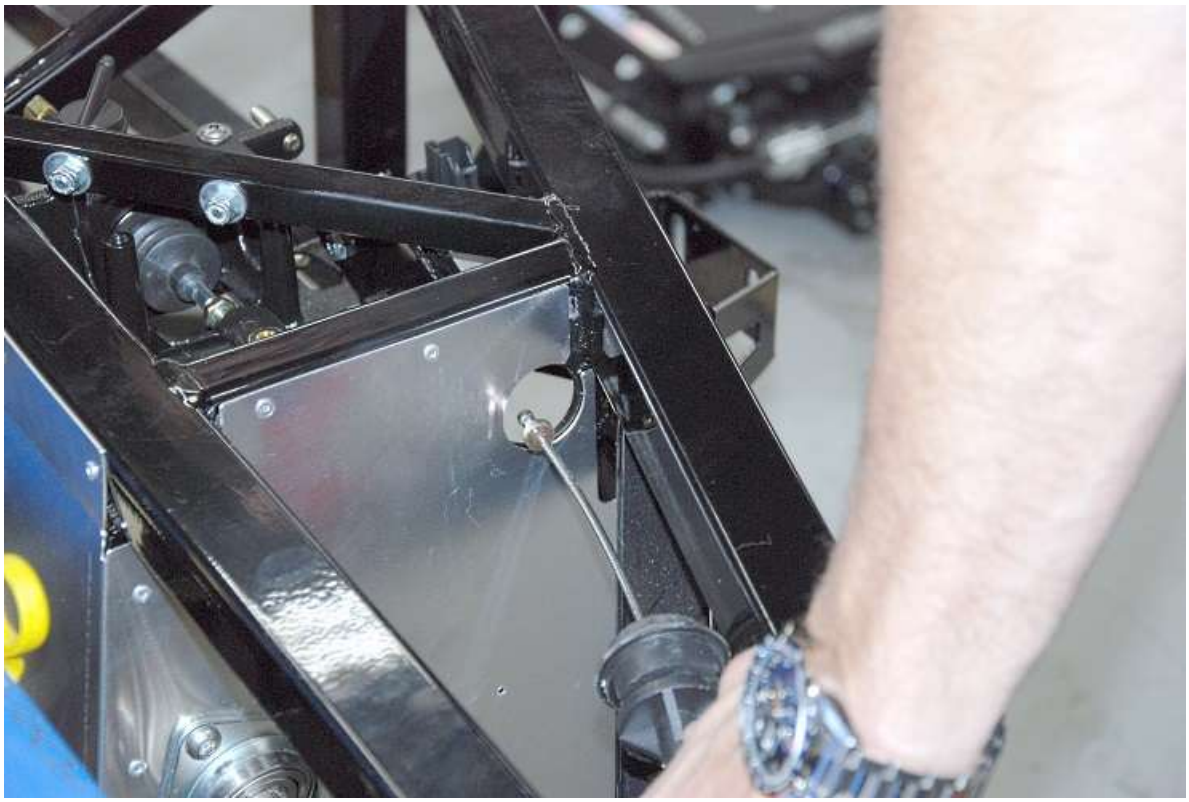
Turn the steering shaft so the recessed bosses for the spring washers are facing up and set the washers in place. Then tap the upper shaft down until the upper clip just disappears into the lower shaft.

Tighten the upper and lower bearings.

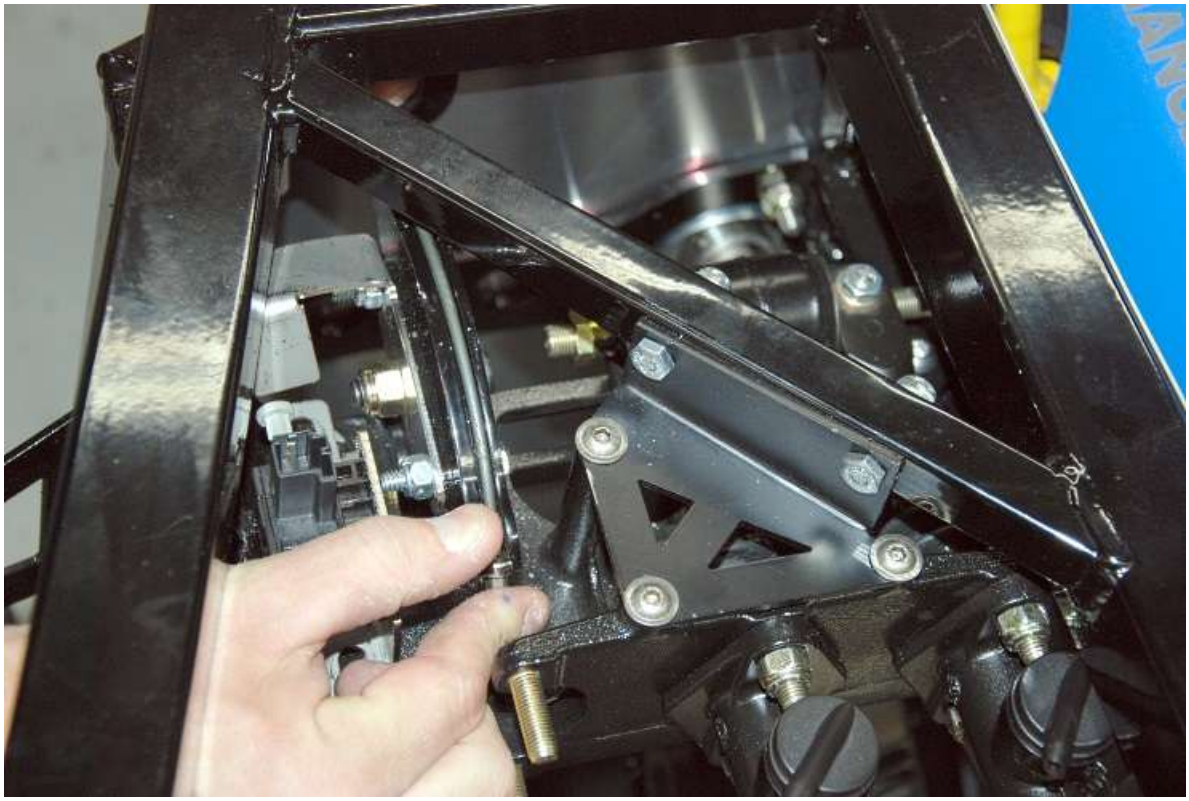
On the lower shaft make sure the shaft does not go into the lower joint and is no more than flush on the inside.

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

Clutch Cable



Slide the clutch cable boss through the front of the driver footbox.



Hook the clutch cable over the quadrant.

Attach the clutch cable to the front of the footbox using the small #8 screw provided and ¼" wrench.

Route the clutch cable down to the bellhousing. 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.

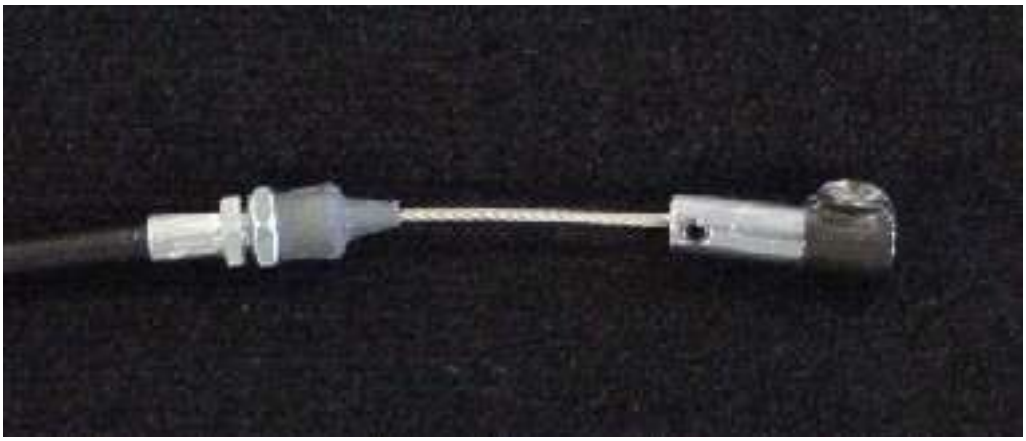
Using zip ties or insulated clips tie the cable safely away from the headers and the moving steering components.

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.
- If running a 4.6L engine, do not do the first 2 steps.

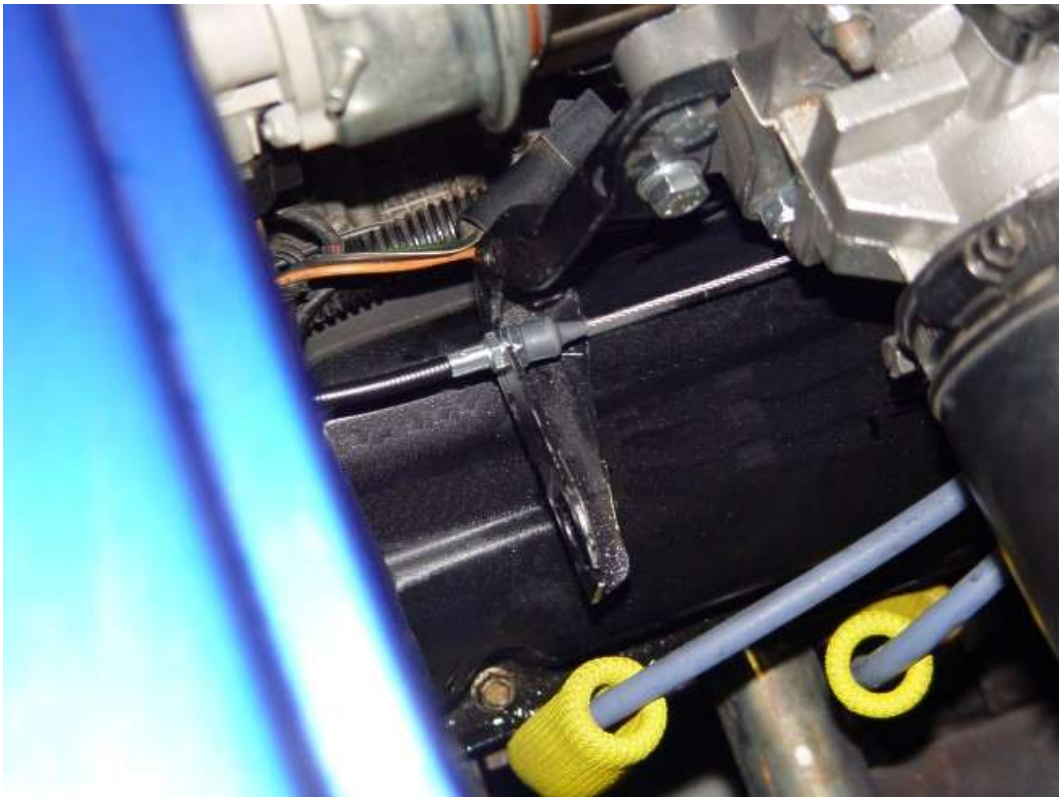
Cut the barrel fitting off the end of the cable.



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.

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.

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.

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.

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

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

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

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

Brake System

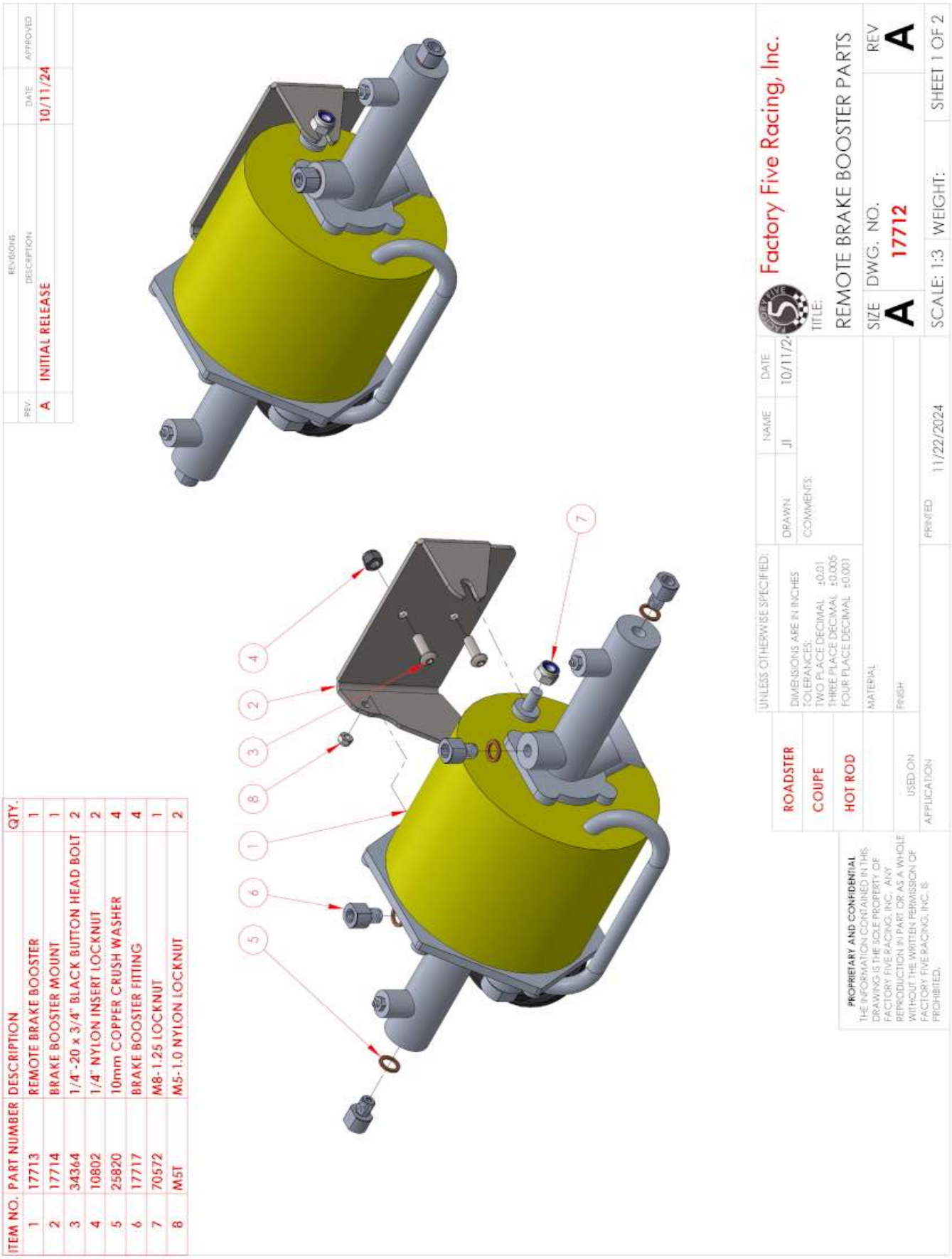
Tube bender, $^{3}/_{16}$", ¼", ½" drill bits, drill, $^{7}/_{16}$", ½", $^{11}/_{16}$", ¾" wrenches, 7mm socket, ratchet, rivet gun, marker, tape measure, razor knife, brake fluid, channellock pliers.

Pedal Components, Insulated clip hardware, Brake line components, $^{3}/_{16}$" brake lines, Front caliper/rotor assembly

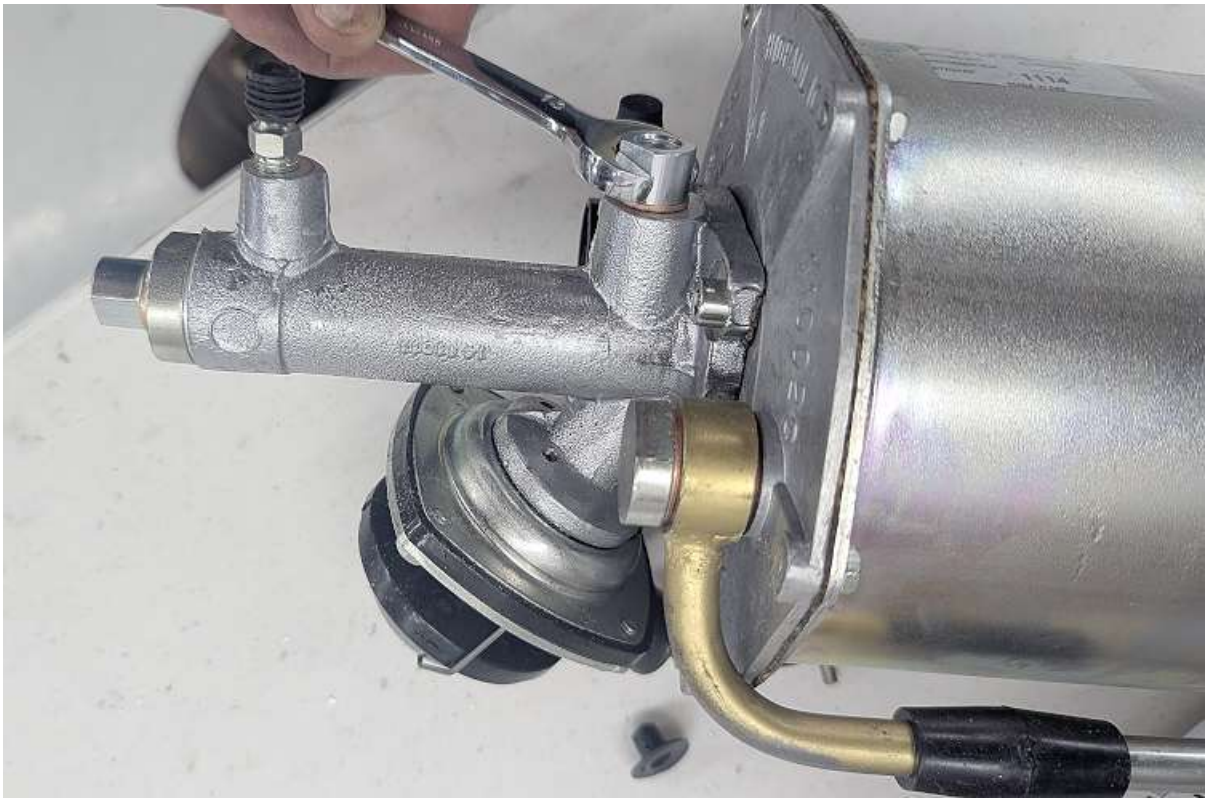
Brake Booster (Optional)

Remote Brake Booster parts (Box 33)

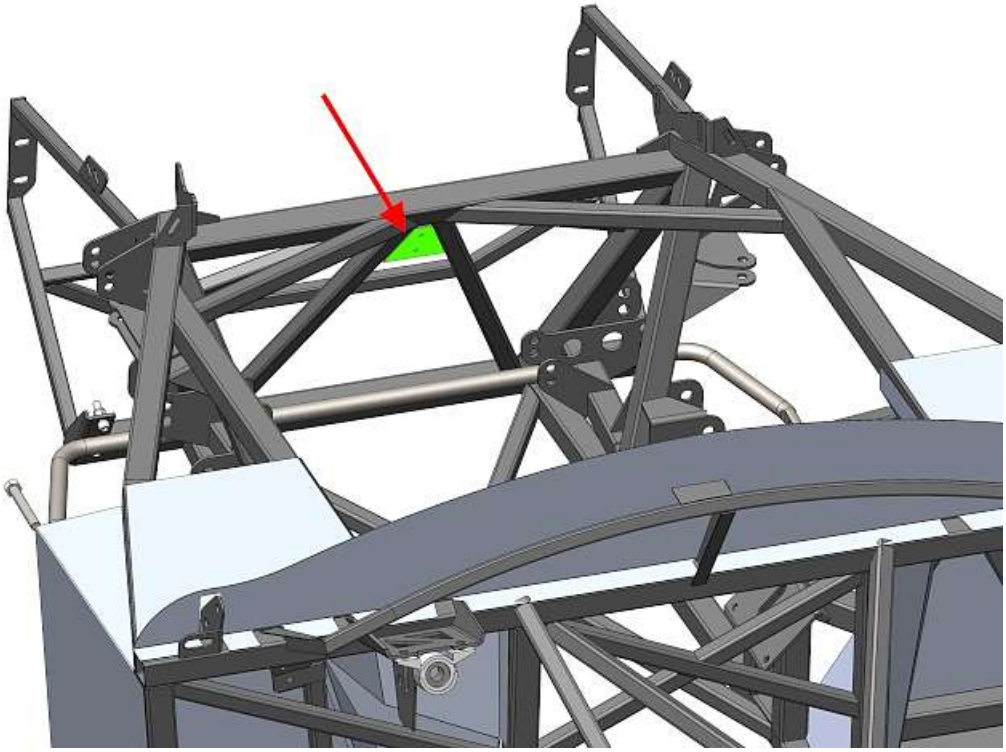
$^{7}/_{16}$" socket, ratchet, 8mm, 13mm wrenches, $^{5}/_{32}$" hex key.



Locate the remote brake booster parts.



Attach the booster fittings to the booster using the copper crush washers.



Locate the front frame mounting location for the booster.

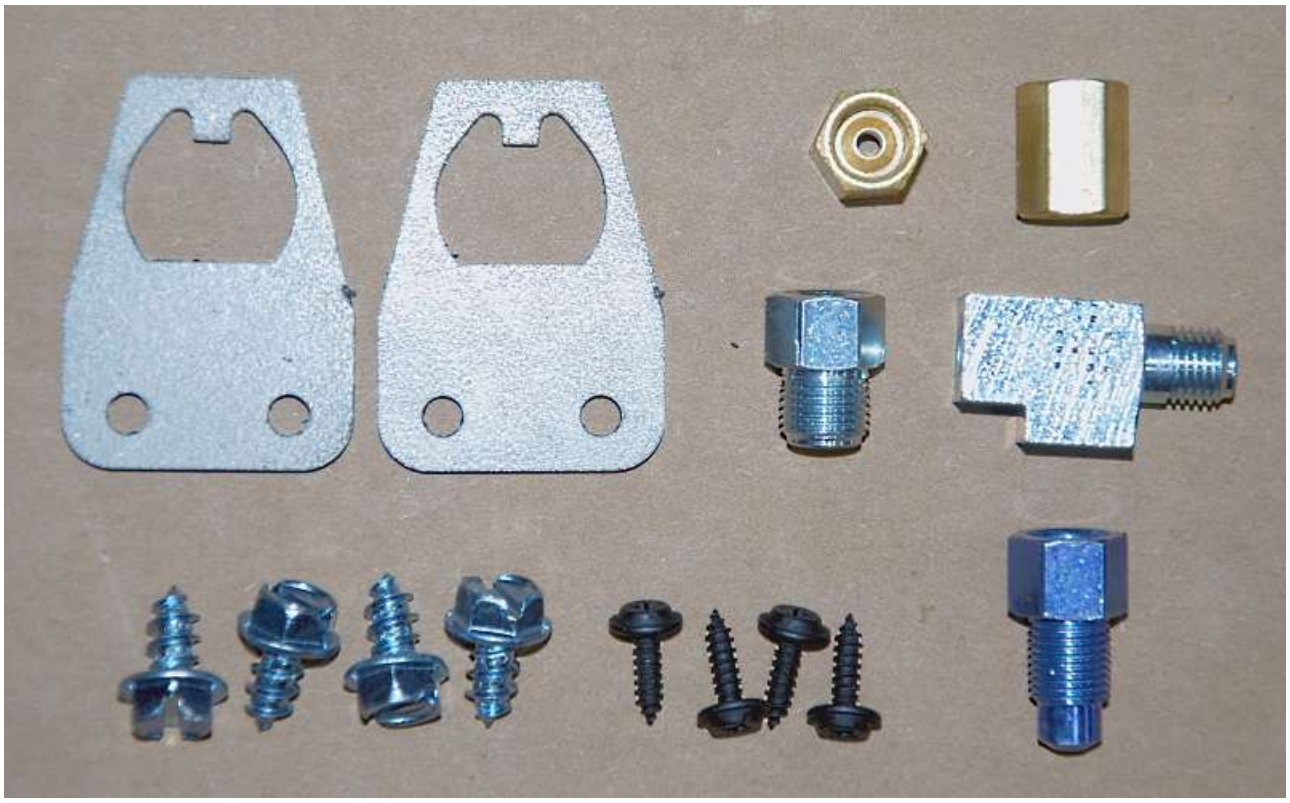
Attach the booster mount to the frame using the ¼" button head screws, $^{5}/_{16}$" wrench and $^{5}/_{32}$" hex key. Note the orientation of the bracket.

Insert the left side small studs through the bracket and attach the brake booster using the small metric locknuts and 8mm wrench.

Attach the right side using the larger locknut in the slot and a 13mm wrench.

Mounted booster.

Attach the 8” brake line to the left side end fitting on the booster. This will get shaped when the front flexible brake line mount is mounted.



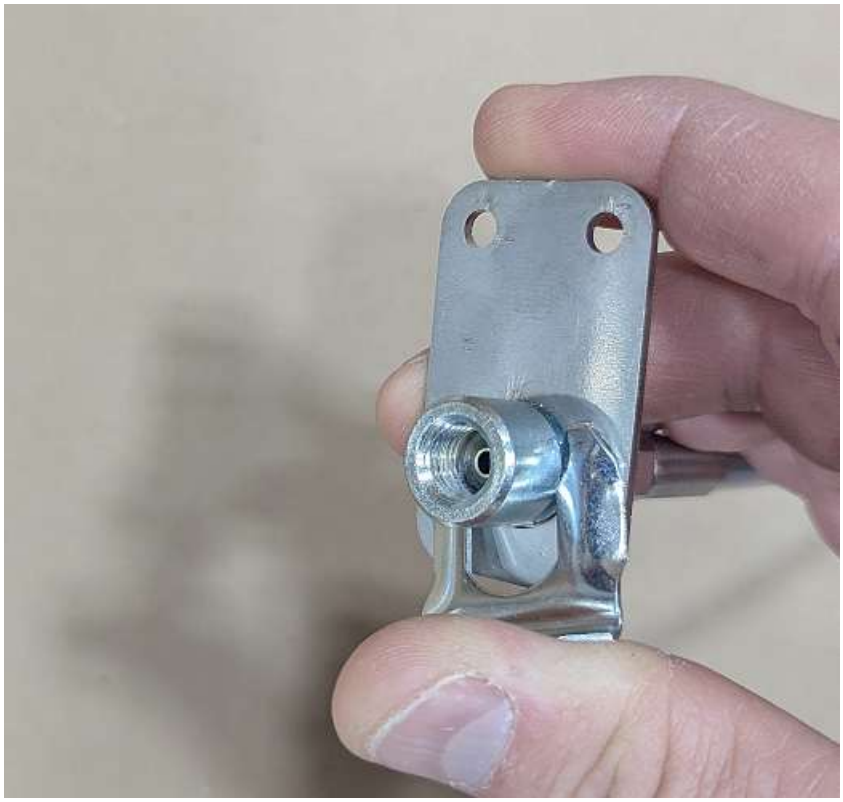
Unpack the hardware from the brake line components.

Front flexible brake lines

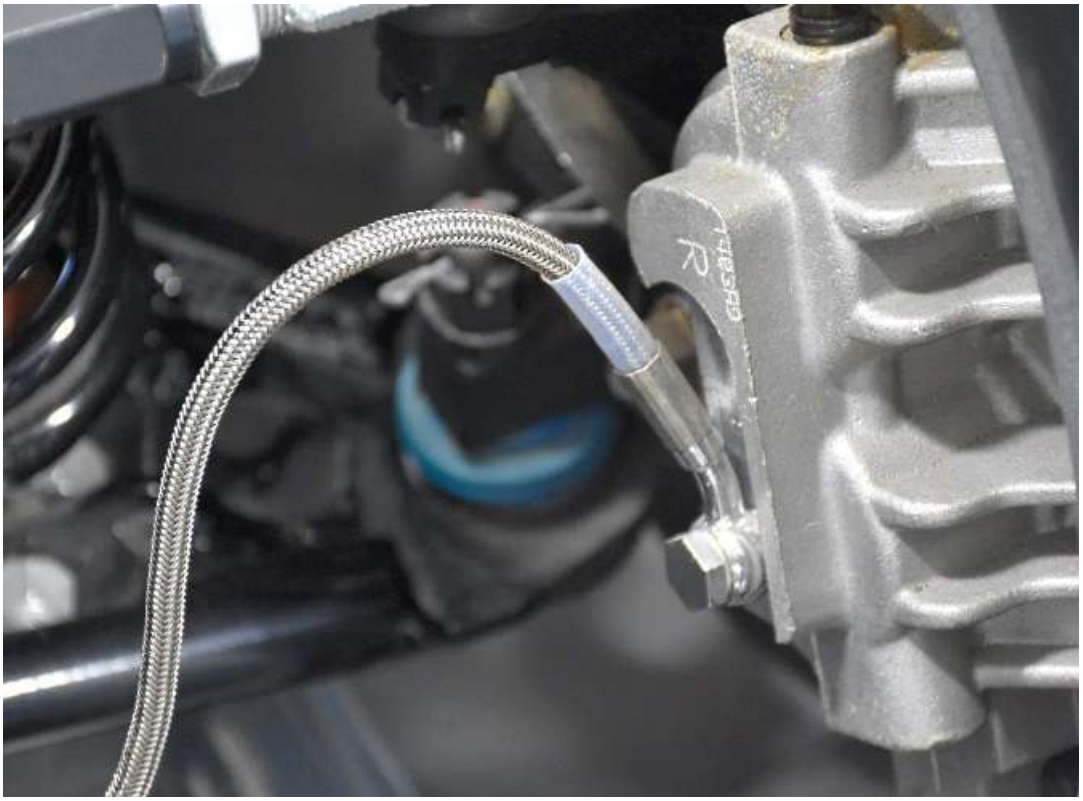
The upper left laser cut pieces and the brake line adapter parts in the picture above are for the stock Mustang flexible brake lines. The small black screws are for the e-brake boot

If building the complete kit, unpack the remaining hardware from the front brake assembly. The stainless laser cut mounts with the circles on are for the Complete kit or Wilwood brake braided lines.

If necessary, attach the brake line adapter to the flexible AN brake line. Tighten using $^{7}/_{16}$" and ¾" wrenches.



Push the brake line adapter through the laser cut bracket from the outside in and install the clip that holds it in place.



Attach the front flex line to the caliper making sure there is a crush-washer on either side of the fitting. Hand tight these for now.

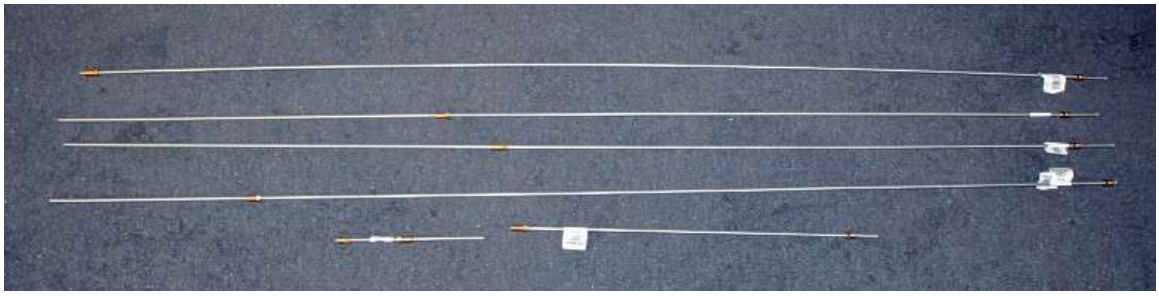
Repeat these steps for both front lines.

Clamp the stainless bracket to the 1.50” tube above the front lower control arm rear mount. Make sure that when the steering is turned all the way in both directions that the brake line is not tight. If necessary, move the location of the frame bracket.

If the Brake booster is being used, bend the 8” brake line on the booster and connect it to the side fitting on the brake line “T”. Make sure that when the steering is turned all the way in both directions that the brake line is not tight.

Drill and rivet the bracket in place using two $^{3}/_{16}$" rivets.

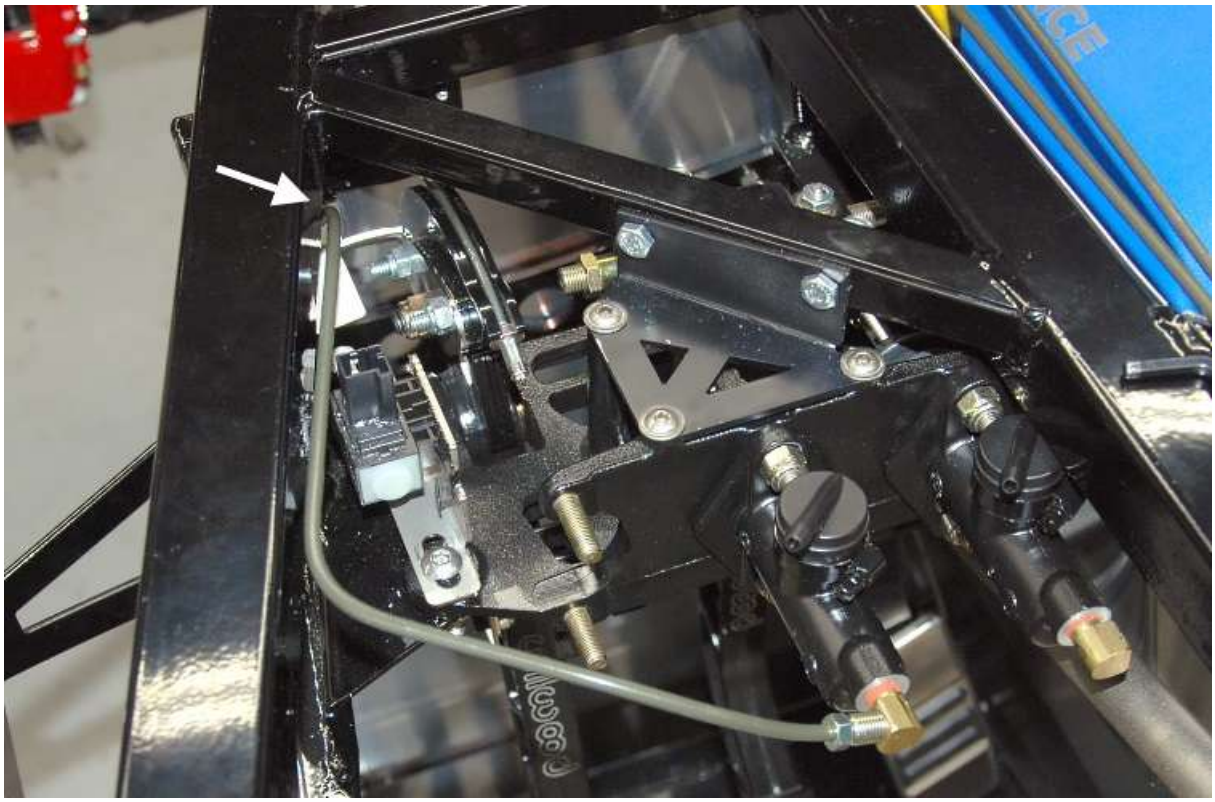
Hard Brake lines



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.

- There are many different paths the brake lines can be run and the following is just one example. Most importantly when choosing a routing path is to keep away from heat or moving parts and ensure there is room for the flex lines to not be pulled tight under the full range of wheel travel including lock to lock steering travel.
- The left master cylinder is used for front and the right master cylinder is used for the rear brakes.

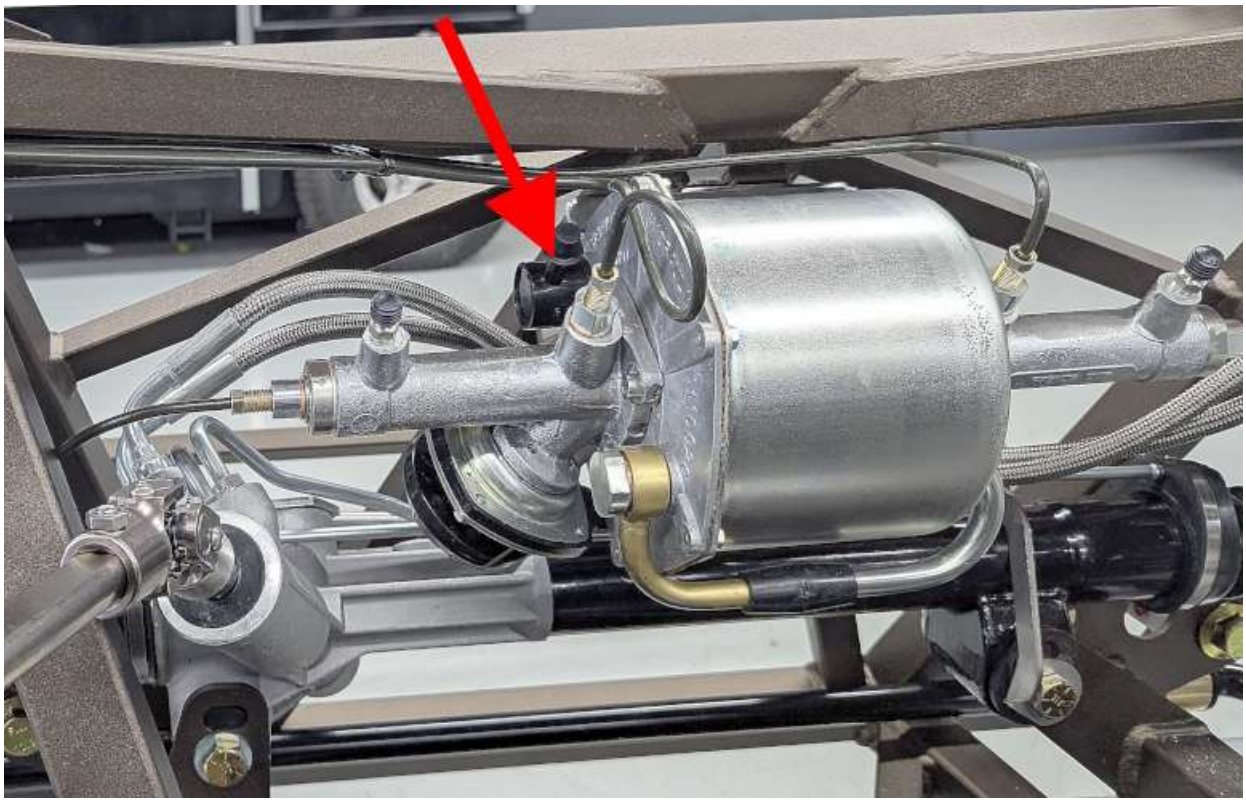
Left front



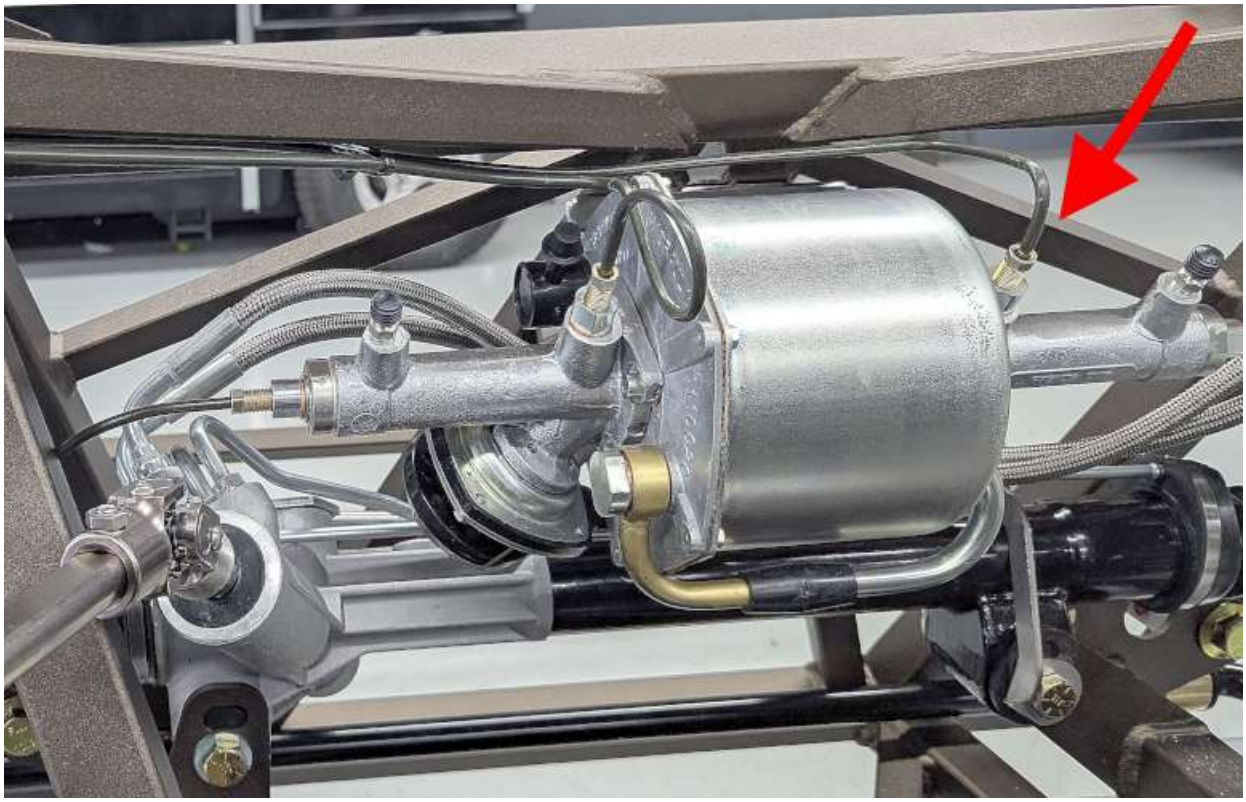
Run one of the 60" brake lines from the left (¾") master cylinder to the 1.50" tube to the left of the pedalbox and out the front of the pedalbox below the tube as shown.

Brake booster line routing

Run the front and rear brake lines forward under the top 1.50” tube. Run the lines across under the 1” tube to the booster.



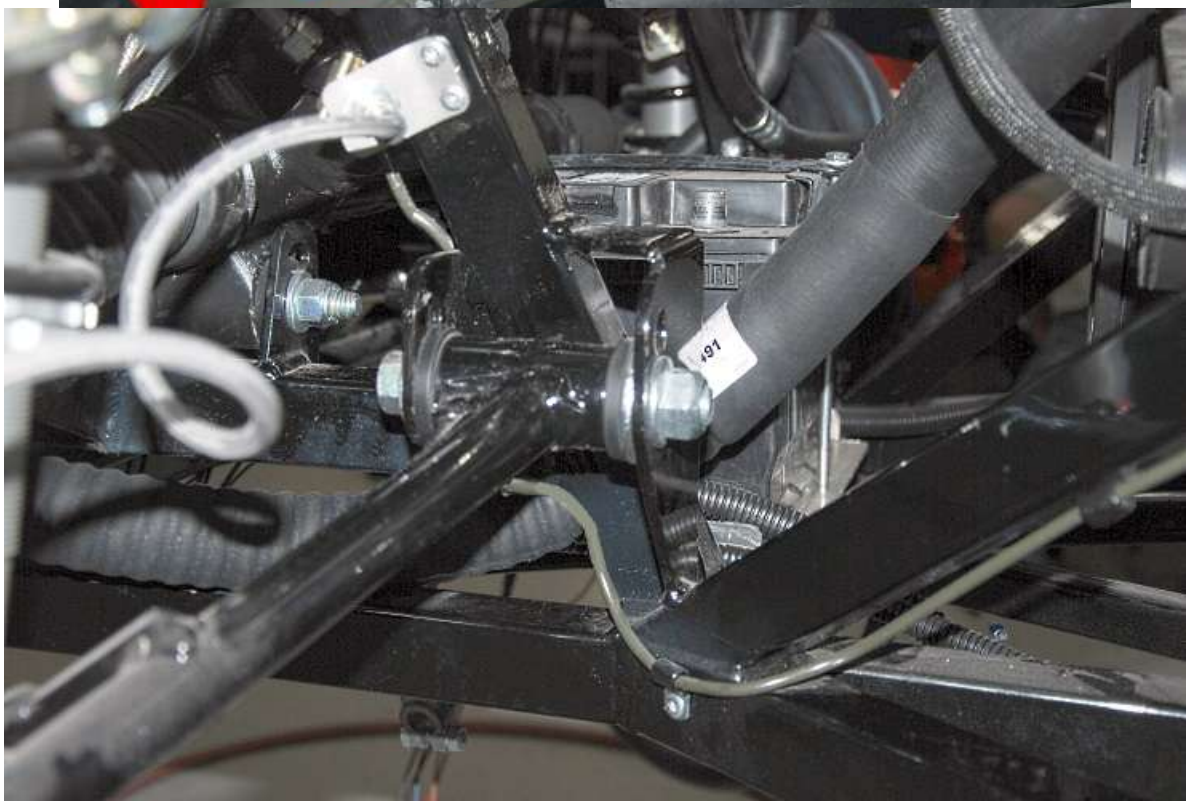
Attach the front brake line to the left side of the booster next to the large part of the booster.



Attach the rear brake line to the right side of the booster next to the large part of the booster.

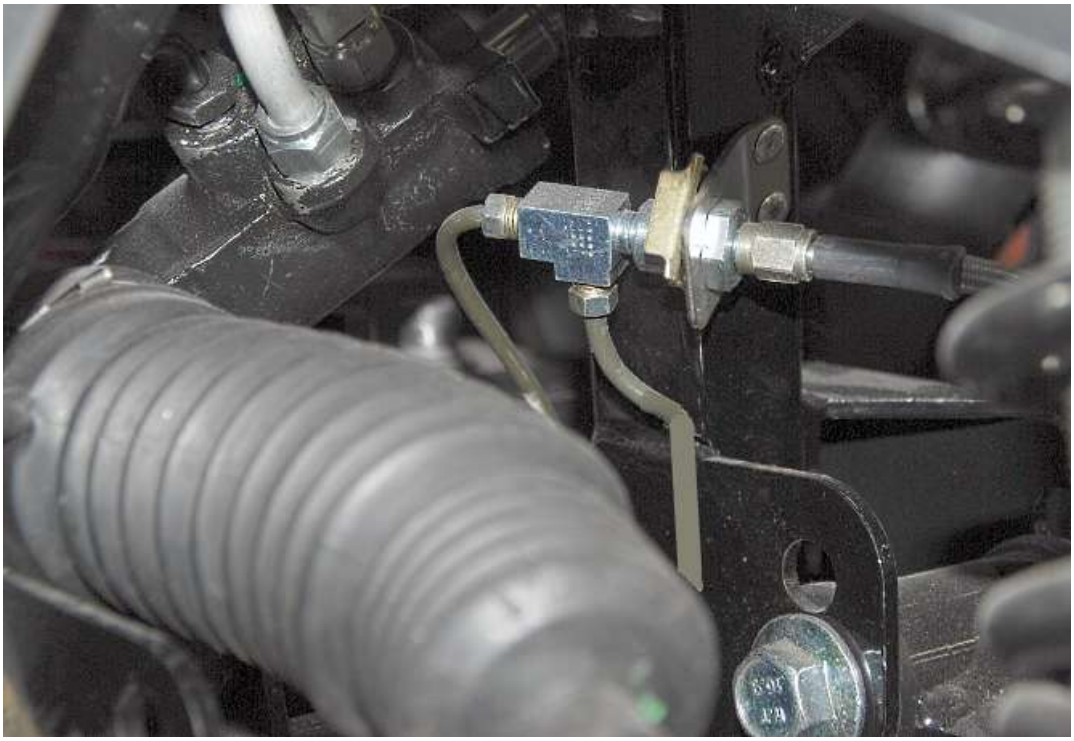
Standard brake line routing

✋ Keep the brake line as far away from the headers as possible or make a heat shield to protect them so the brake fluid does not overheat.



Run the brake line down the 1.50” tube to the bottom frame tube then up the front side of the angled rear suspension tube.

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



Connect the brake line "T" adapter to the end of the brake line using a ¾" and ½" wrenches.

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

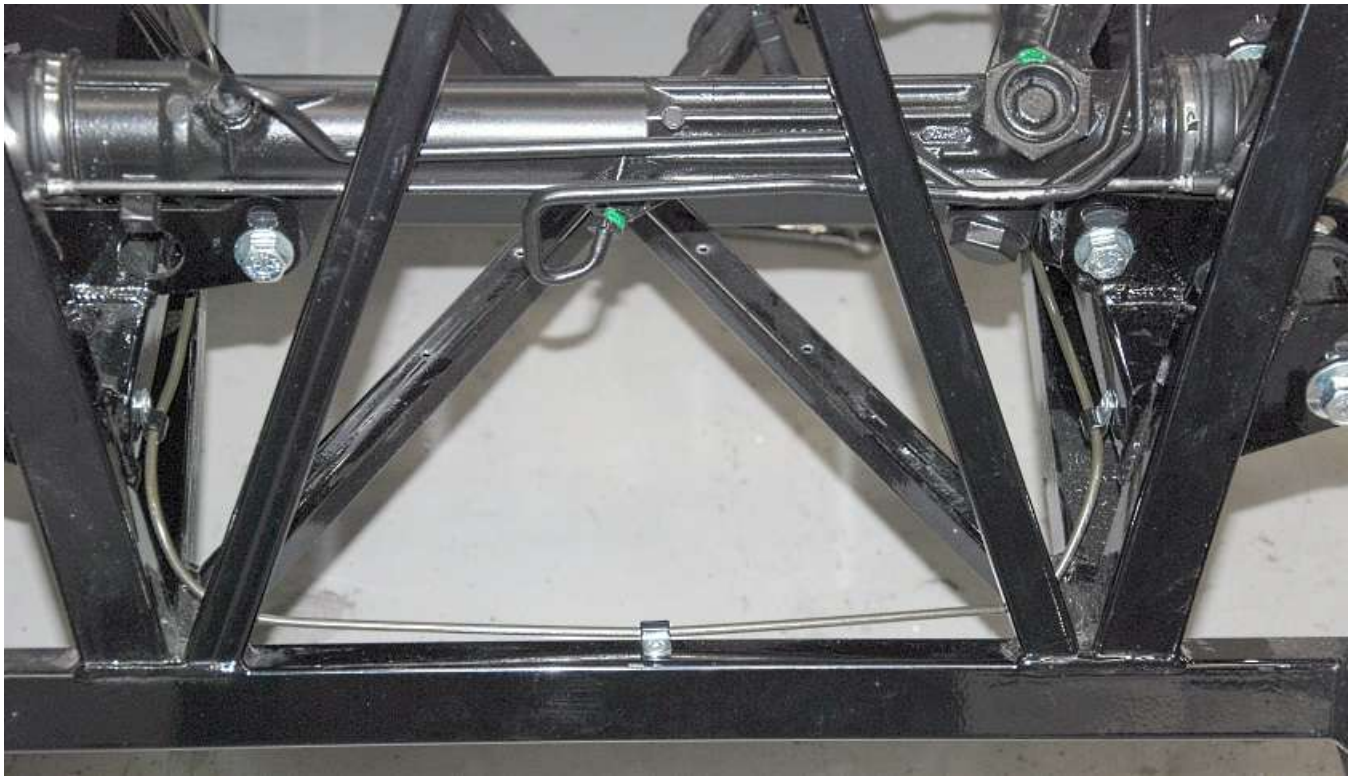
Left flexible brake line

The laser cut flexible brake line brackets attach to the rear angled chassis tube on the left front suspension. Drill and rivet these in place using two $^{3}/_{16}$" rivets.

Attach the flexible line to the open end on the fitting using $^{7}/_{16}$" and ¾" wrenches.

Front right

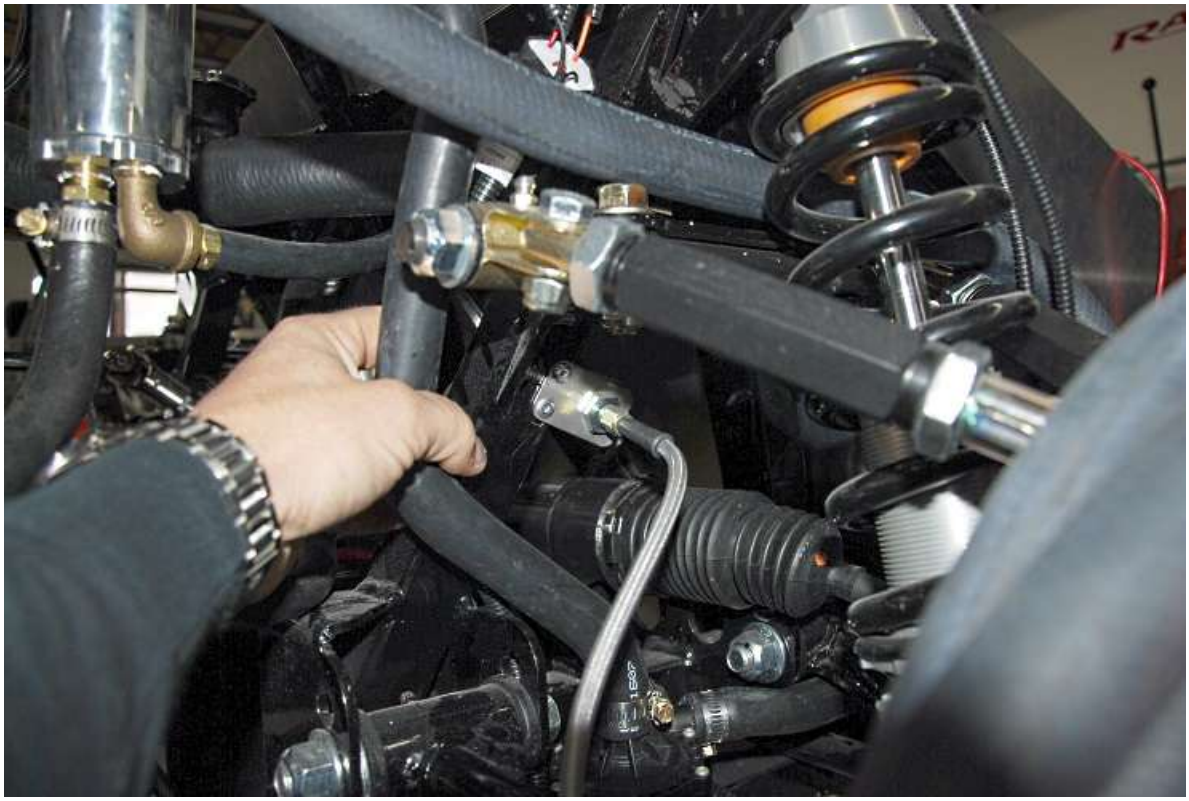
✋ Attach the flexible brake line to the caliper and make sure that when the steering is turned all the way in both directions that the brake line is not tight. If necessary, move the location of the frame bracket.



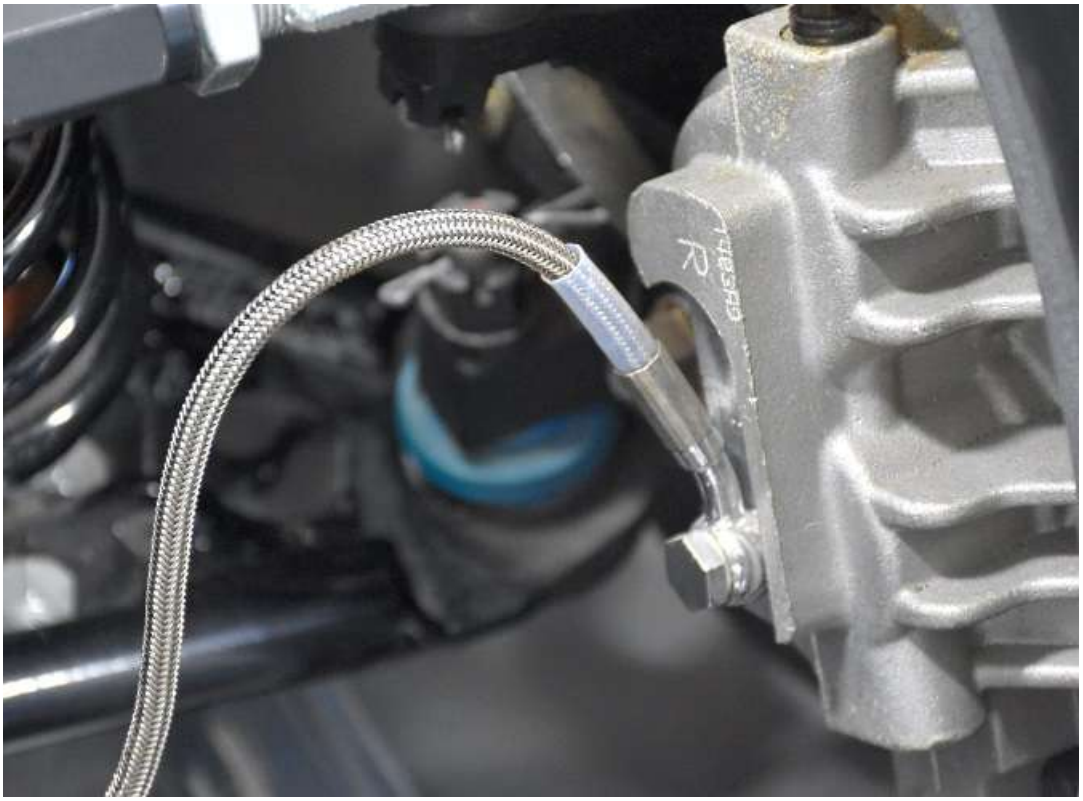
From the “T” fitting run a 60” brake line down the 1.50” tube, forward to the front of the frame and over to the right side of the frame.

Run along the 1.50” tube behind the lower control arm and up the rear angled 1.50” tube.

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



Like the left side, push the flexible brake line through the bracket from the outside in, rivet the bracket in place and screw the flexible line onto the brake line fitting and tighten.

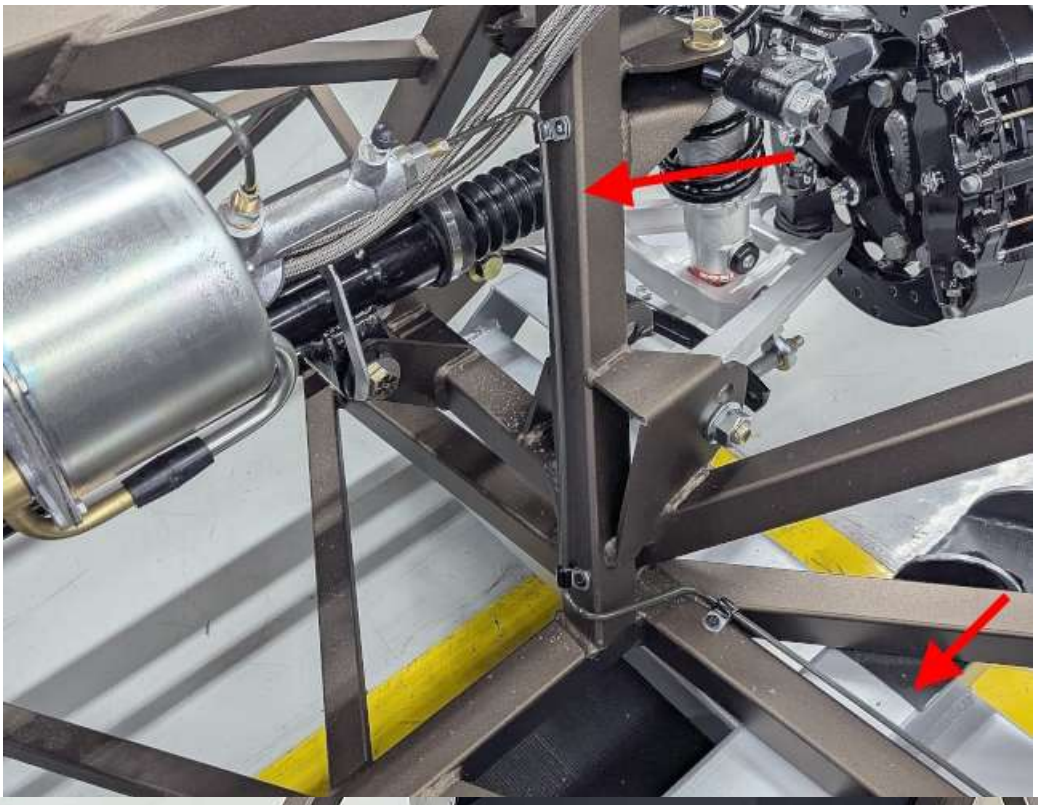


Attach the front flex lines to the caliper making sure there is a crush-washer on either side of the fitting.

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

Rear brake line

Rear brake line (Brake Booster)



From the end of the Booster run a 60” brake line down the right side of the chassis.

Rear brake line standard routing

From the right (Rear brakes) master cylinder run a 60” brake line towards the center of the car then to the rear of the inside footbox panel.

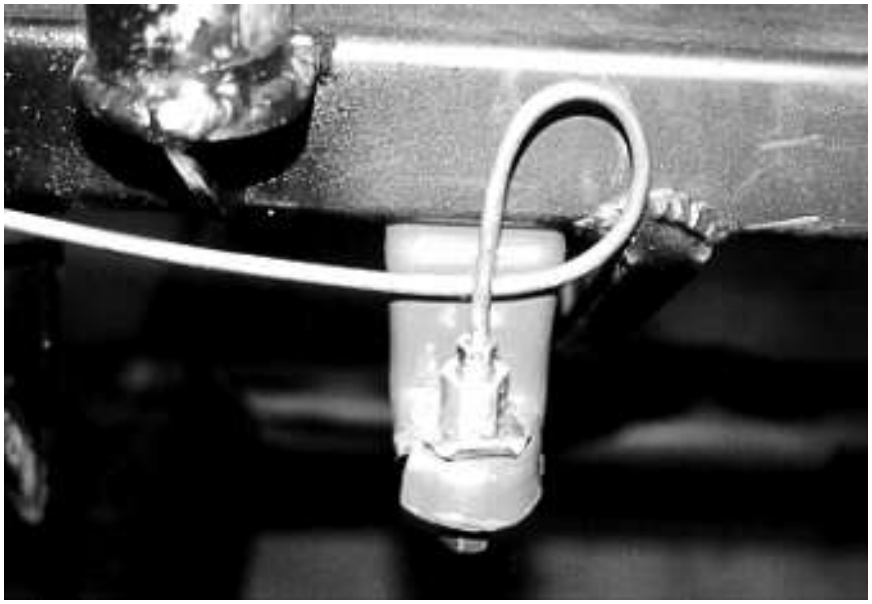
At the back of the inside footbox, run down the 1” transmission tunnel tubes to the bottom 1.50” tube then to the back of the transmission tunnel.

Stock solid axle rear brakes

- At this point your routing will depend on your rear brakes. 87-95 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.
- Attach the flexible brake line to the caliper and make sure that when the steering is turned all the way in both directions that the brake line is not tight. If necessary, move the location of the frame bracket.

If using the 87-95 Mustang mount connect a 20" brake line using a brake line union and run the brake line straight up and towards the middle of the frame. If necessary, use another brake union and one of the 8" brake lines to get the brake line to the top middle near the axle where the brake hose will reach.

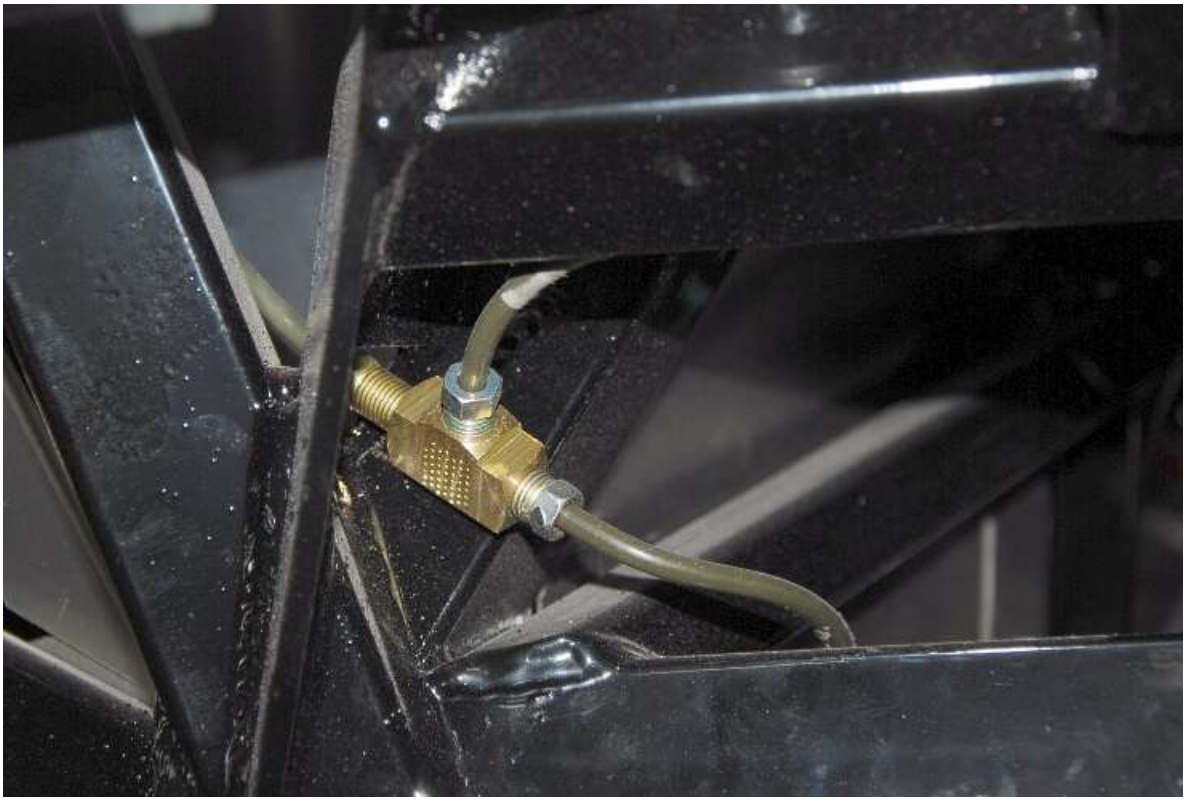
Drill two holes for the Mustang brake bracket on the underside of the 1.50"x 1.50" frame member and mount the Mustang bracket.



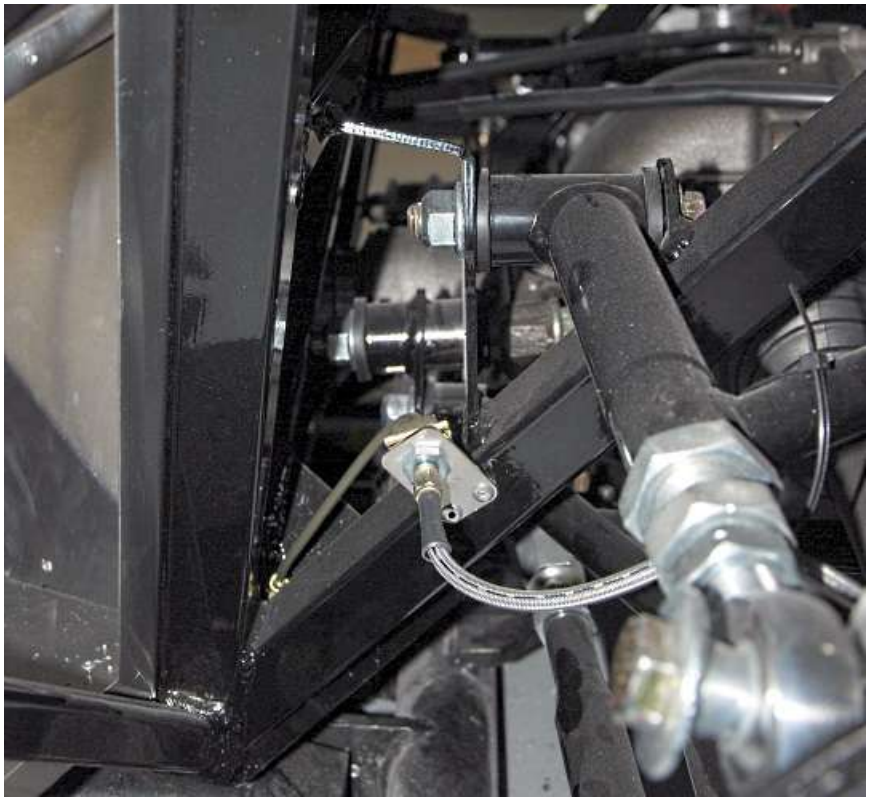
Attach the brake line to the Mustang mount.

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

IRS brakes



At the back of the tunnel connect the 3-way female “T” adapter and an 8” brake line up the left rear tube. Off the other leg of the “T” run the 20” brake line across the 1.50” tube that goes across the frame at the back of the tunnel.

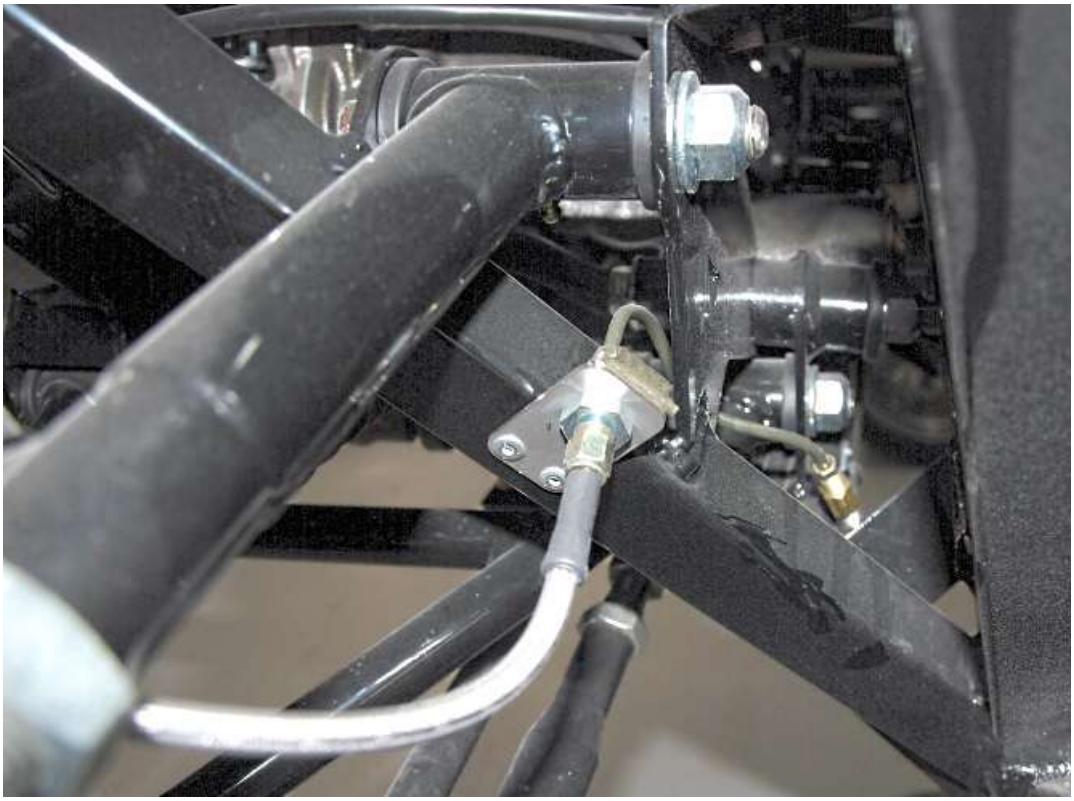


Push the flexible brake line through the bracket from the outside in, screw the flexible line onto the brake line fitting, tighten by hand.

Use channel lock pliers to install the clip that holds the flexible brake line in place.

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

Locate, drill and rivet the bracket of the frame using two $^{3}/_{16}$" rivets.



At the end of the 20” line use a brake line union and an 8” brake line up the right side of the frame.

Like the left side, push the flexible brake line through the bracket from the outside in, screw the flexible line onto the brake line fitting and tighten.

Use channel lock pliers to install the clip that holds the flexible brake line in place.

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

Drill and rivet the bracket of the frame using two $^{3}/_{16}$” rivets.

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

✋ Make sure that your flex lines will not interfere with anything in the suspension, wheels during travel.

Tighten the banjo bolts on the calipers

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 reservoir

🛠 5mm Hex key, $^{7}/_{16}$" wrench, ¼" drill bit, drill.

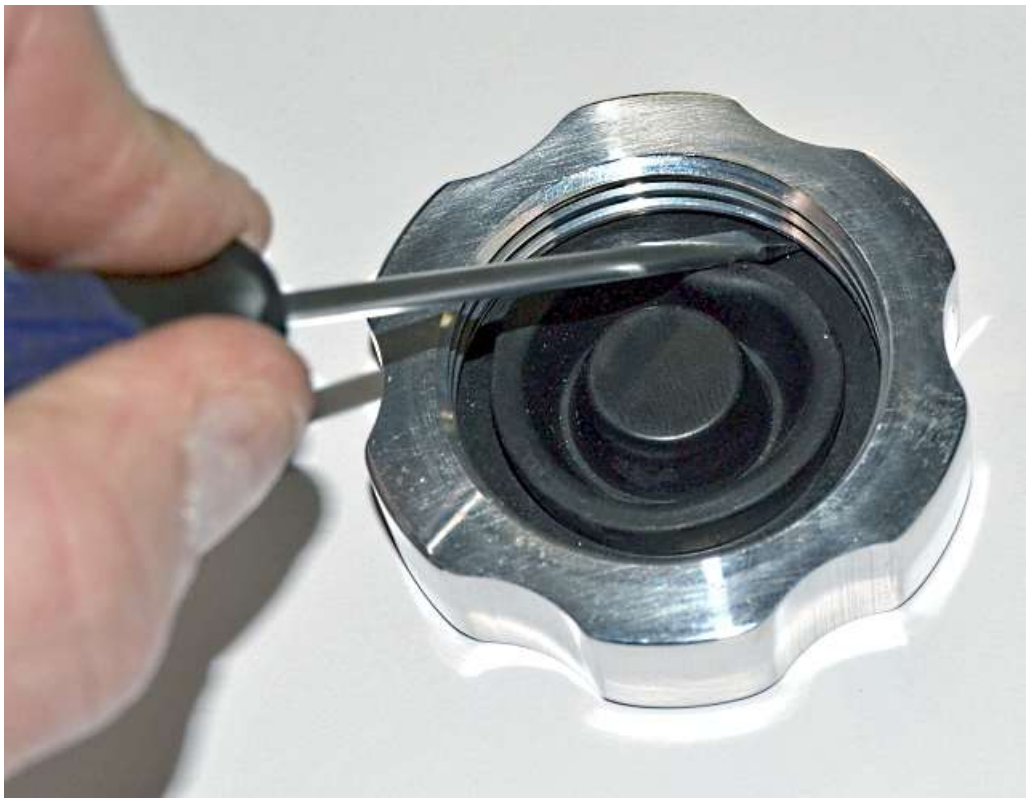
✋ There are two ways to plumb the brake fluid reservoirs. One way is to use two reservoirs, one for each master cylinder. The other way is only use one reservoir and put a "Y" in the line to go to the two reservoirs.

✋ 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.

Decide where to mount the brake reservoir, it can go behind the engine (depending on the engine being used) or mount to the front of the footbox. Keep the reservoir high enough so that the lid is higher than master cylinder. This picture shows a coyote engine with placement on the firewall behind the engine.

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.

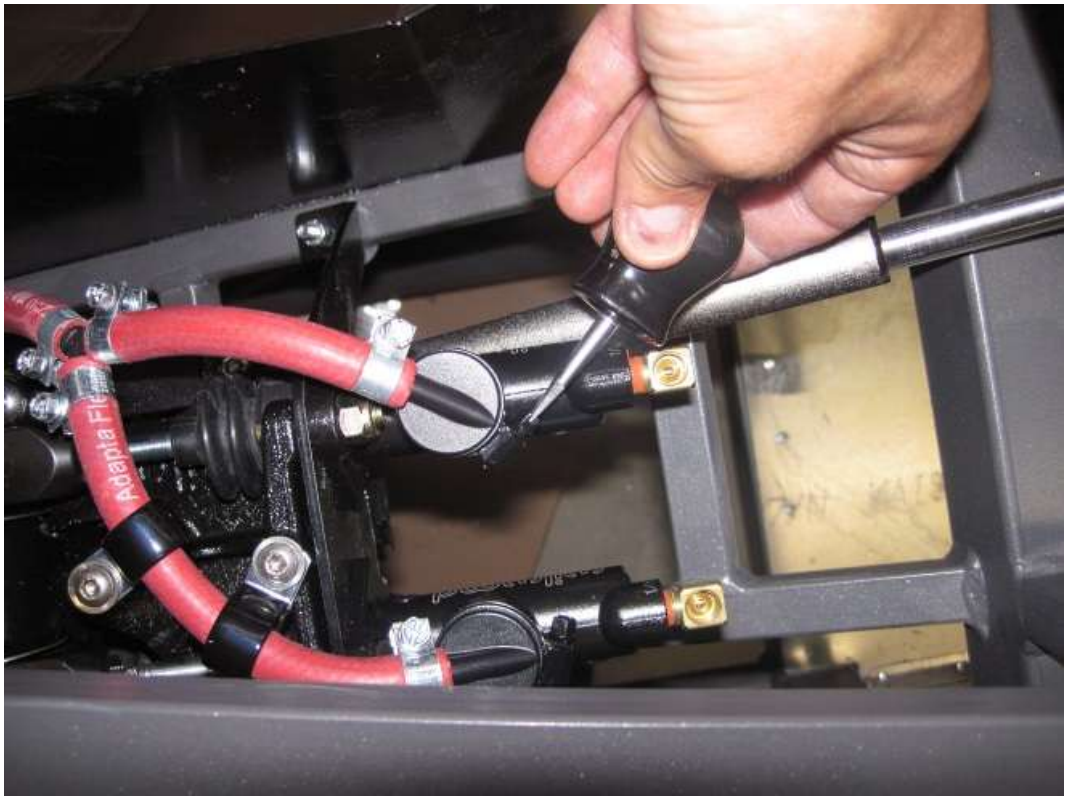
Insert the bulkhead fitting and spin the nut on the backside of the panel. Tighten the fitting using $^{7}/_{16}$" and $^{11}/_{16}$" wrenches.

✋ 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.

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.

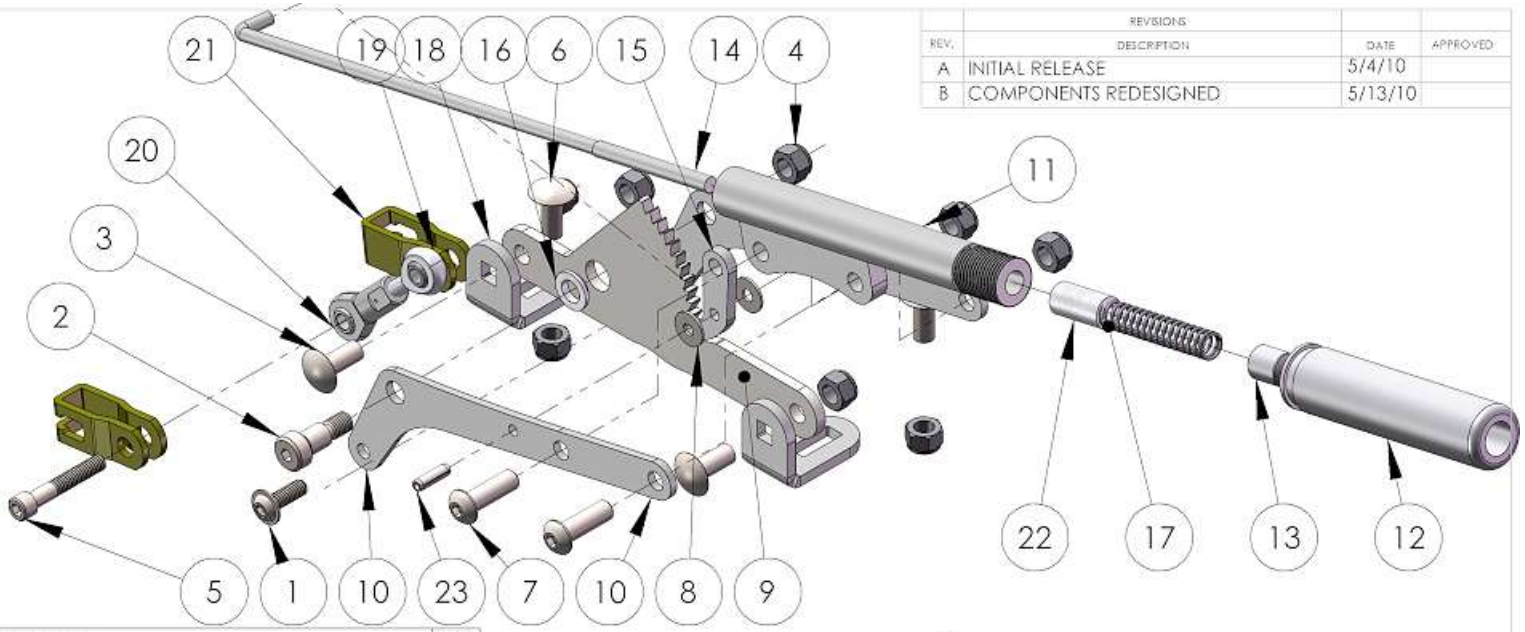
Emergency Brake

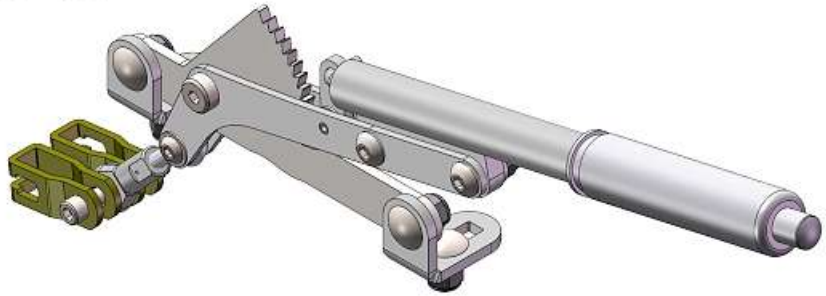
E-brake Handle

🛠 $^{5}/_{32}$”, $^{3}/_{16}$” 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	QTY.
1	25460	1/4"-20 x 3/4"	1
2	13325	0.50" SHOULDER BOLT	1
3	25562	5/16"x 3/4" CARRIAGE BOLT	4
4	13963	5/16-18 NYLON INSERT LOCKNUT	7
5	12336	1/4"-20 x 1.5" SOCKET HEAD	1
6	10802	1/4" NYLON INSERT LOCKNUT	2
7	11024	5/16"-18 x 1" BUTTON HEAD BOLT	2
8	10635	#10 WASHER	2
9	15167	FIXED GEAR	1
10	15168	HANDLE TO RATCHET MOUNT	2
11	15176	LOWER HANDLE ASSEMBLY	1
12	15173	HANDLE GRIP	1
13	15174	E-BRAKE BUTTON	1
14	15166	ANCHOR BOLT, 1/4-20 x 10", 4.25" THREAD LENGTH	1
15	15169	RATCHET TOOTH	1
16	15165	NYLON BUSHING	2
17	15179	2.625" 6.0#/in COMPRESSION SPRING	1
18	15170	MOUNT BRACKET	2
19	15177	1/4" MALE ROD END	1
20	15180	1/4" FEMALE ROD END	1
21	15181	E-BRAKE CABLE CLEVIS	2
22	15182	0.50" OD x 0.25"ID x 1" NYLON SPACER	1
23	15178	3/16" x 0.625" SPRING PIN	1

UNLESS OTHERWISE SPECIFIED:

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

	NAME	DATE
DRAWN	JI	4/26/10

COMMENTS:
8.12:1 LEVERAGE RATIO

MATERIAL

FINISH

PRINTED 6/22/2023

Factory Five Racing, Inc.

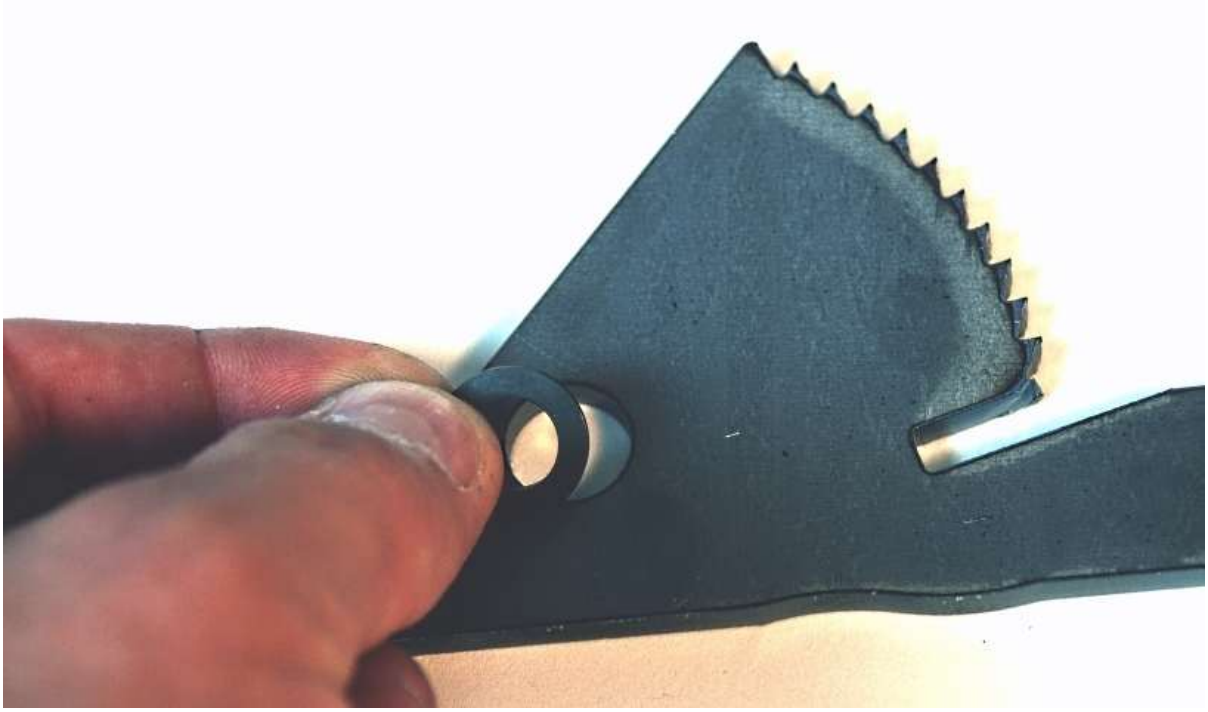
TITLE:
34648 - 35 TRUCK E-BRAKE HANDLE

SIZE A | DWG. NO. 15183 | REV A

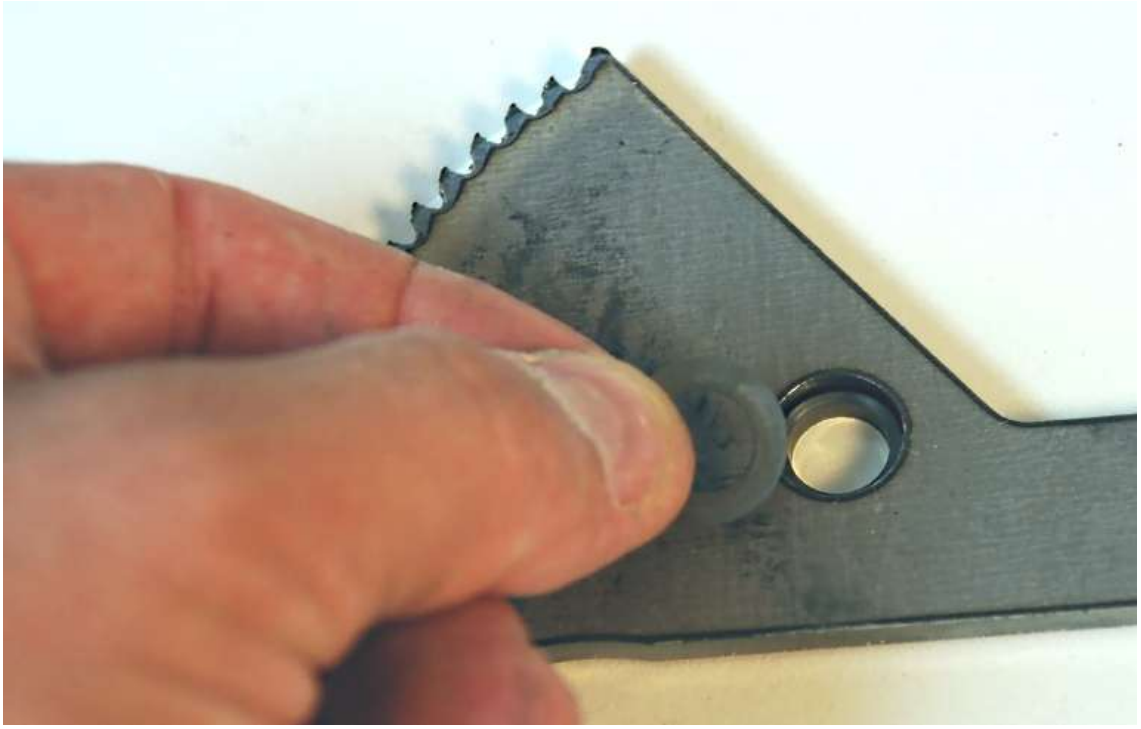
SCALE: 1:2.5 WEIGHT: SHEET 1 OF 4

www.factoryfive.com 508-291-3443

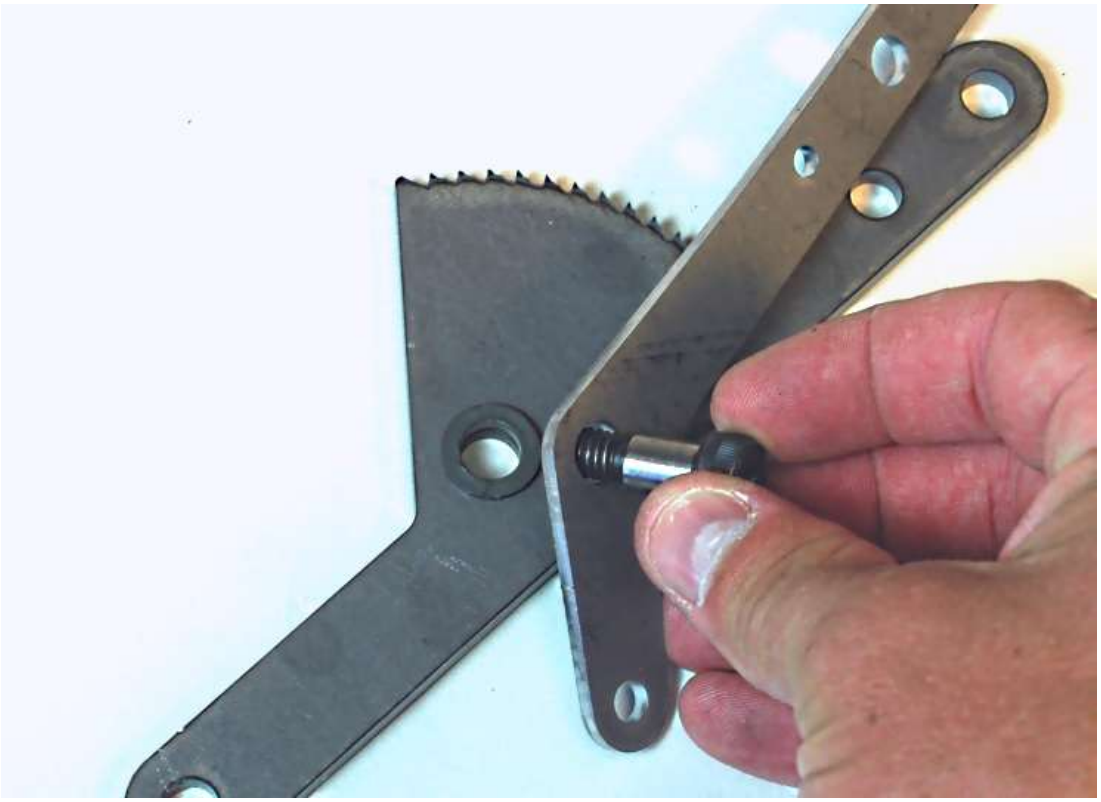
Unpack the emergency brake handle components. Some parts are not used for the Coupe application



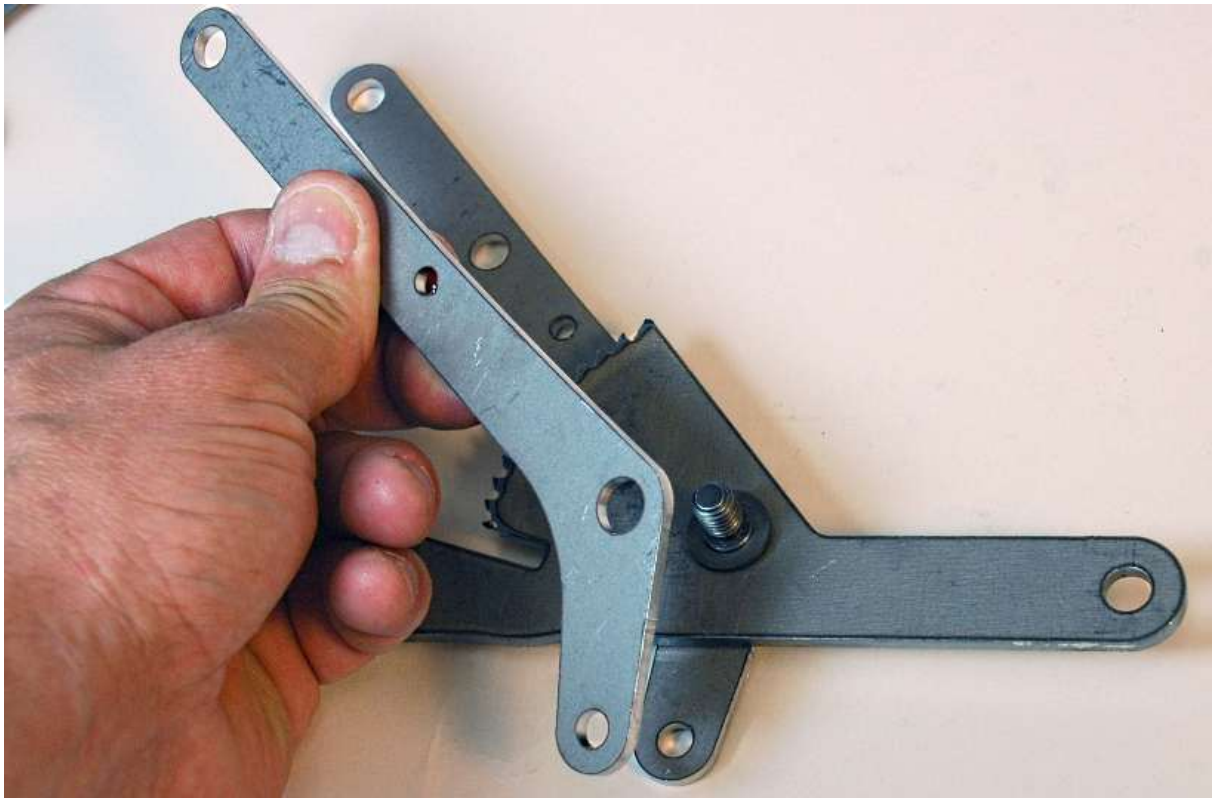
Push a nylon bushing into one side of the fixed gear.



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



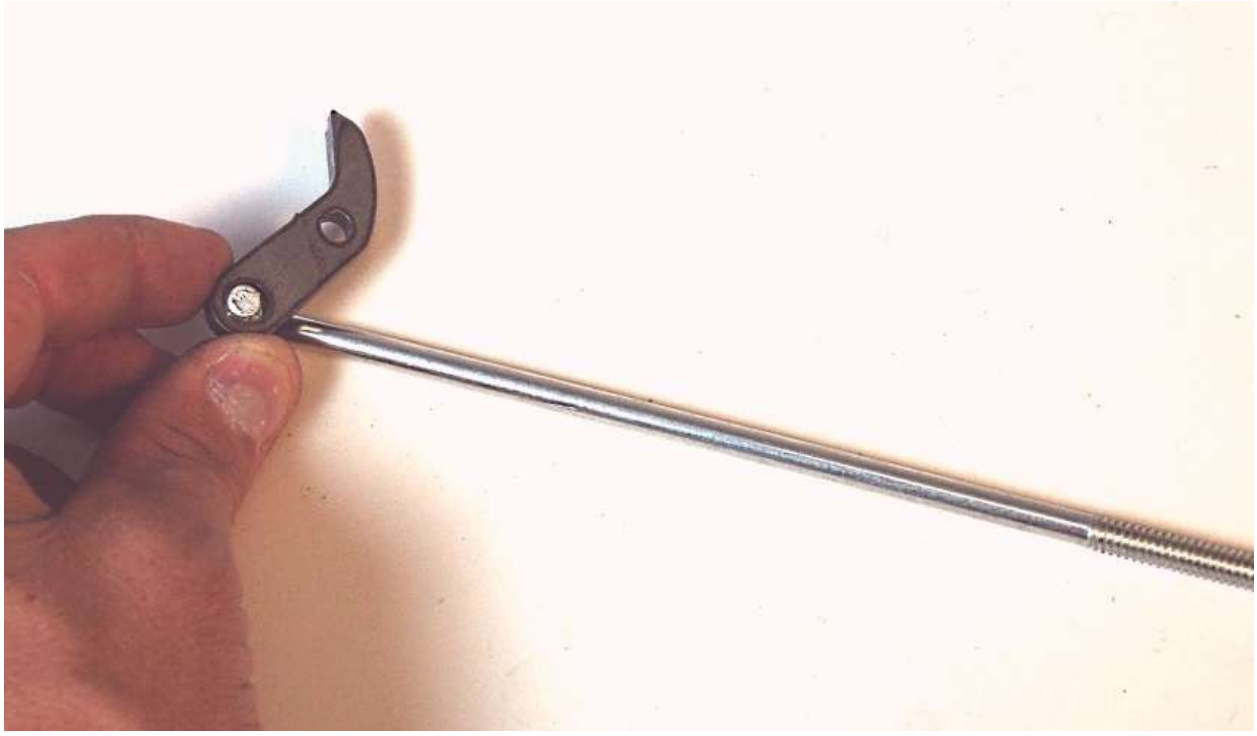
From the right side of one of the Handle to ratchet mounts, insert the shoulder bolt through the ratchet mount and then the fixed gear.



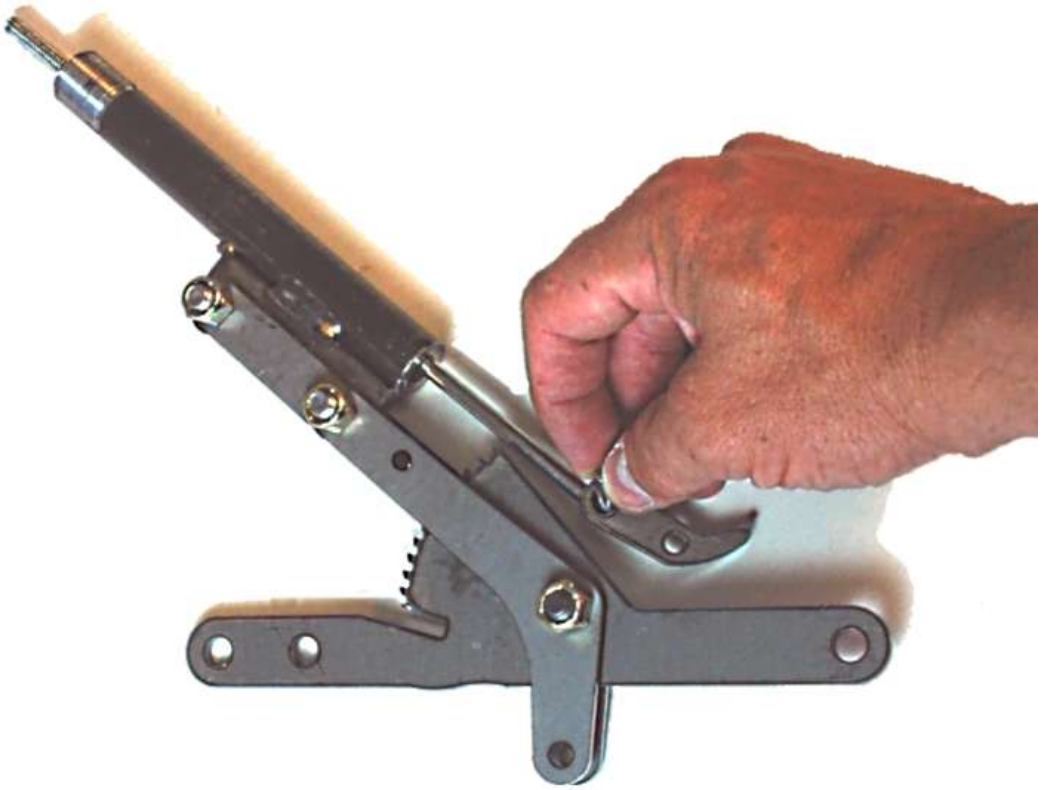
Put the other ratchet to handle mount on shoulder bolt from the other side of the fixed gear.

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.

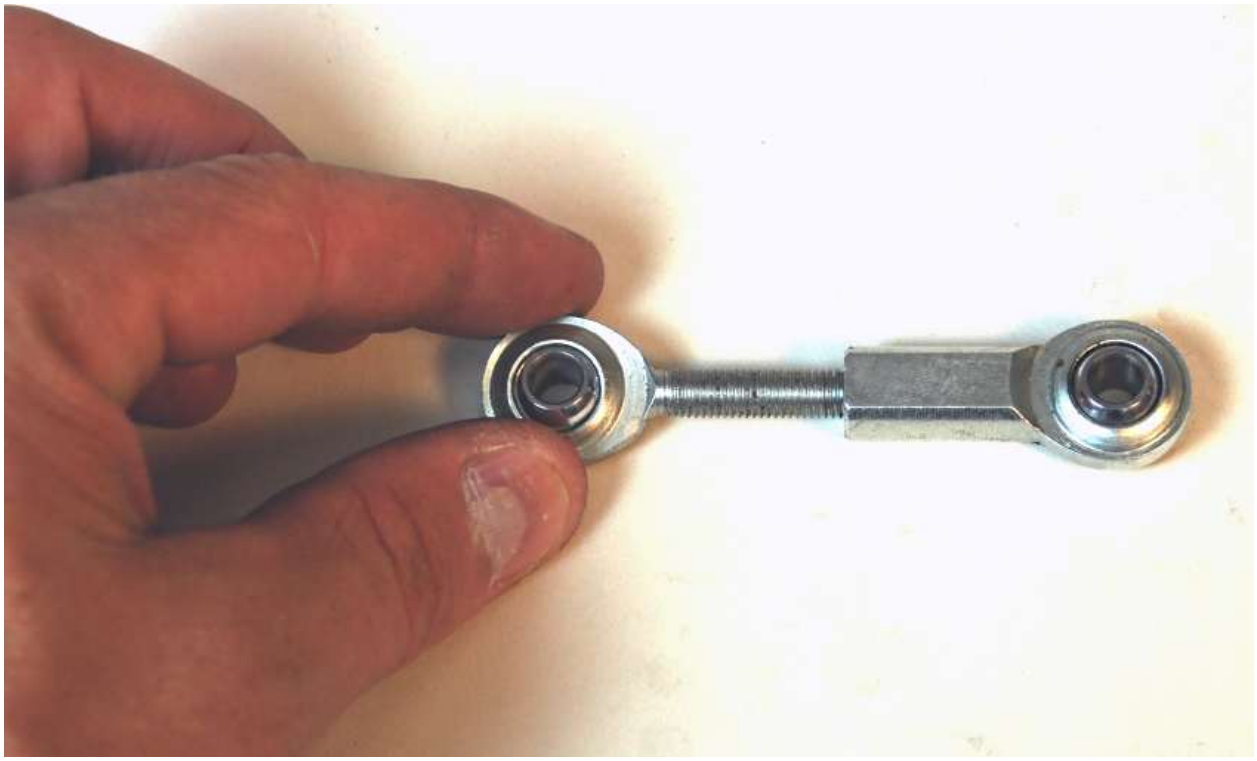
Slide the 1” nylon spacer onto the end of the anchor bolt.

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.

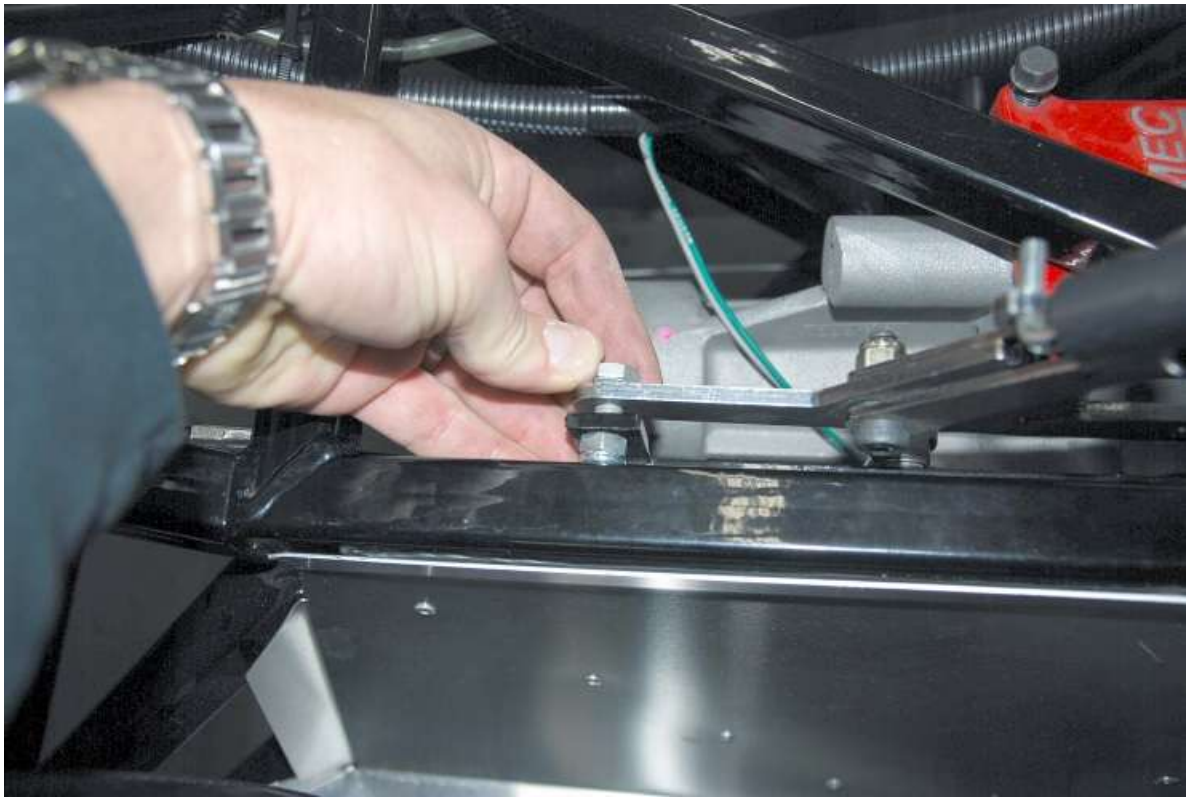
Screw the button onto the end of the anchor bolt.



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.

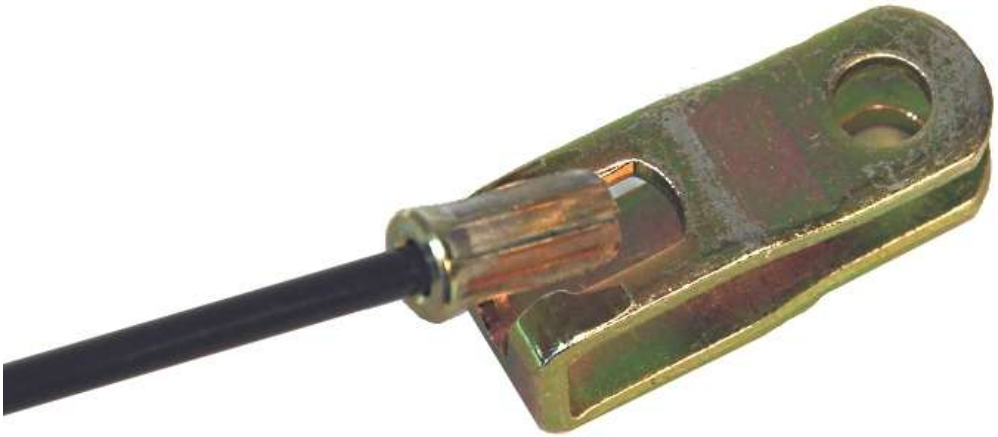
Slide the male rod end between the ratchet to handle mount plates and attach it using the ¼” flange head bolt and locknut.



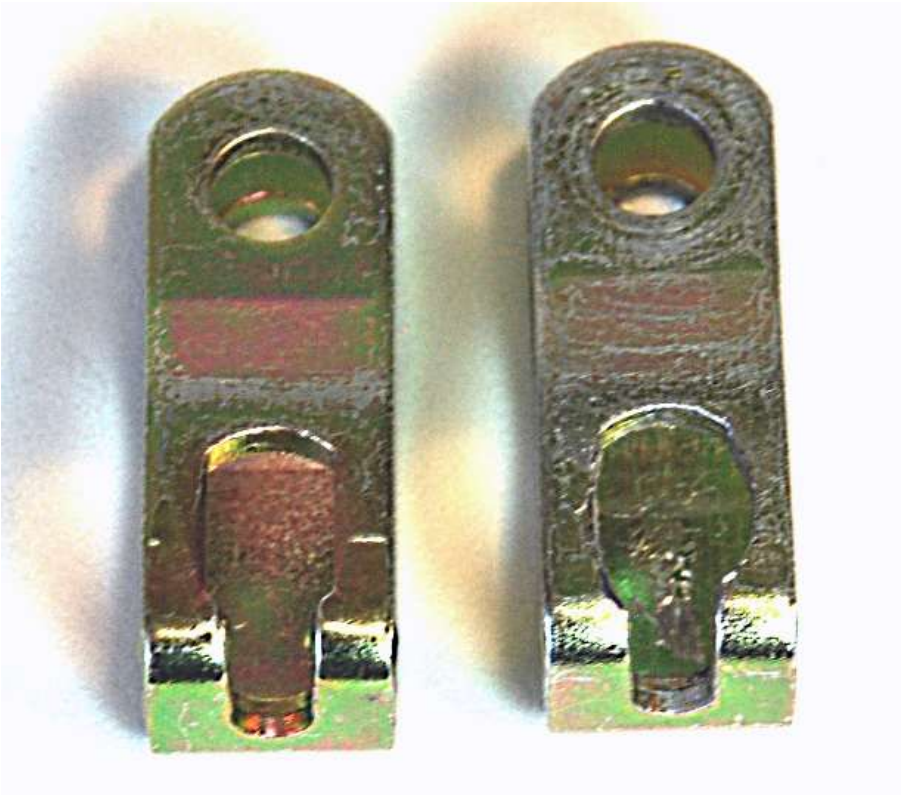
Attach the handle to the frame using the $^{5}/_{16}$”x 0.75” bolts.

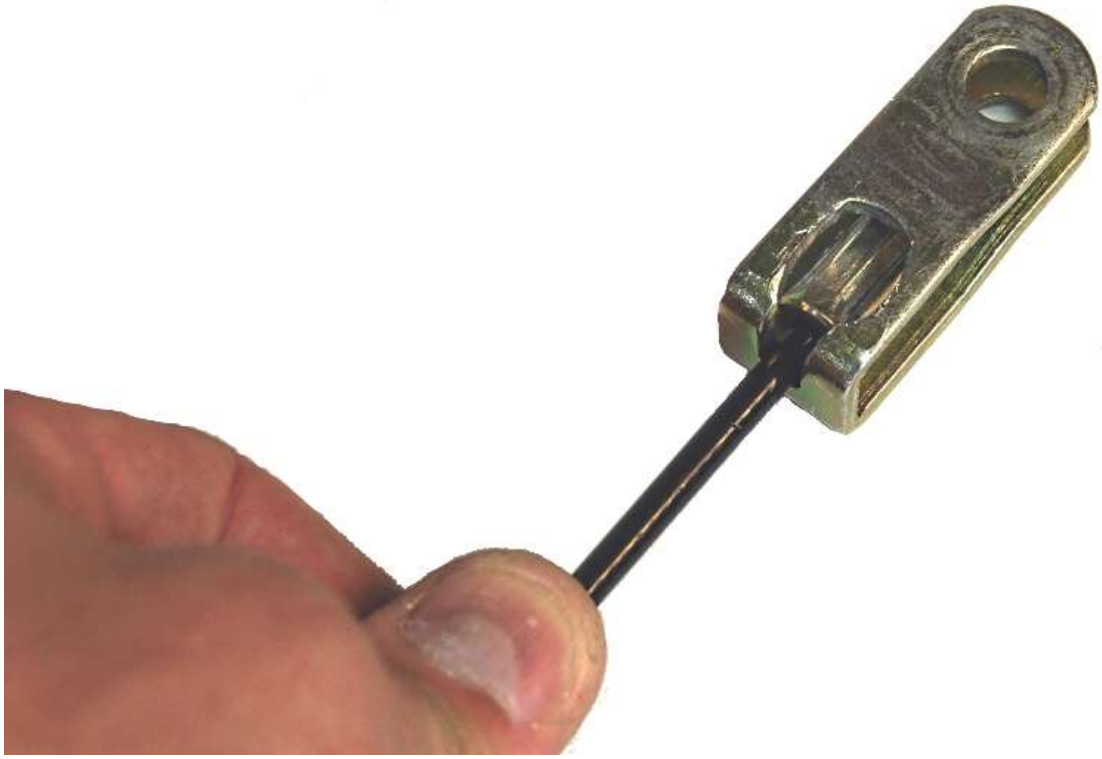
Cables

If there is a rubber washer on the end with the clip (frame end) of the cable shown, remove the rubber washer.



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.

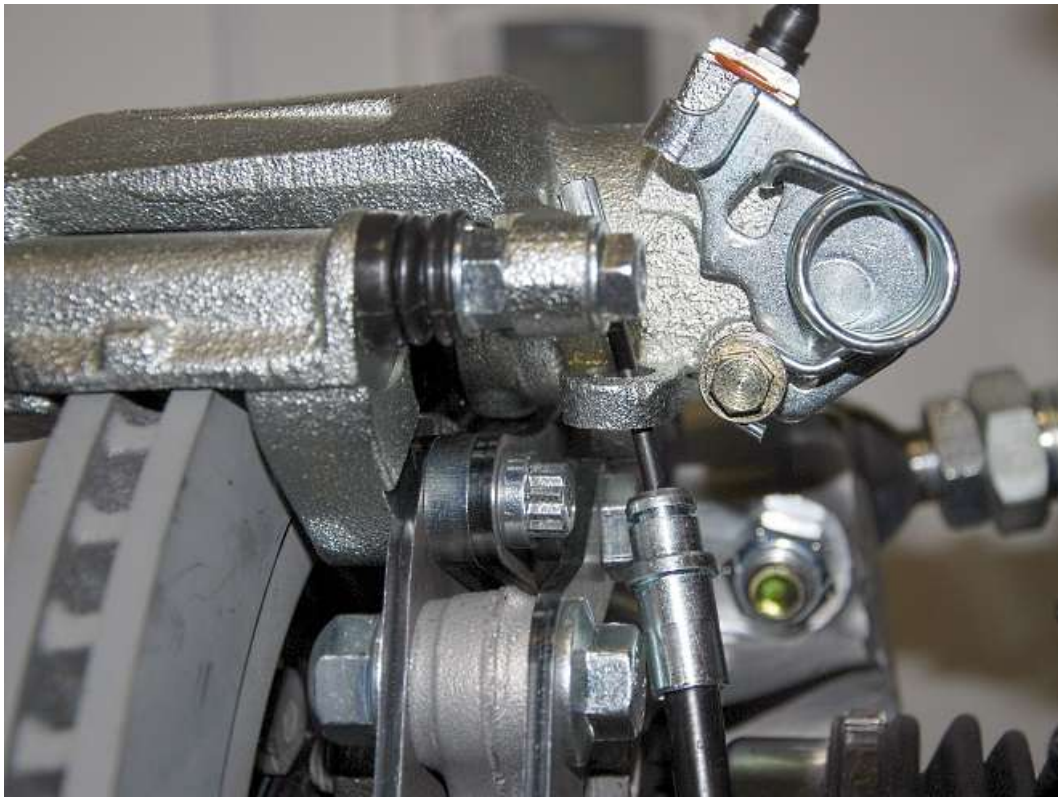
Push one of the cables through the bracket in the transmission tunnel until the sheath end clicks in place.

Push the second cable into the frame bracket.

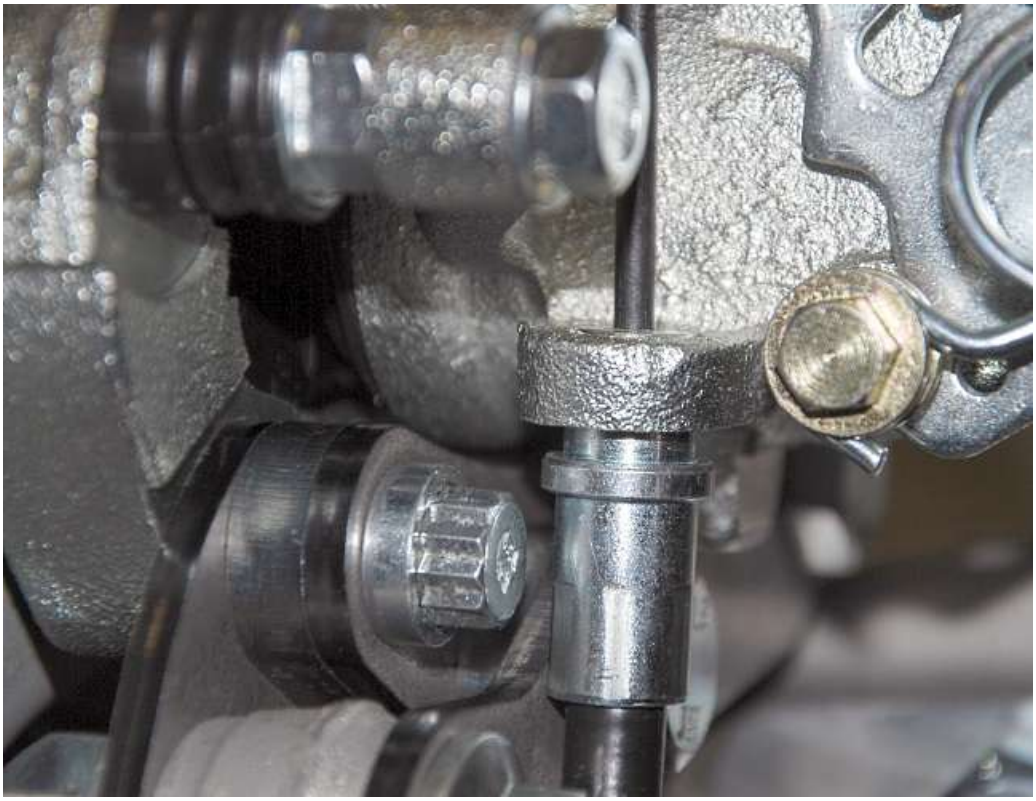
Solid Axle

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.

On the end of the Emergency brake cable sheath with no clip on, pull/push the cable so that 3” of cable sticks out of the sheath.

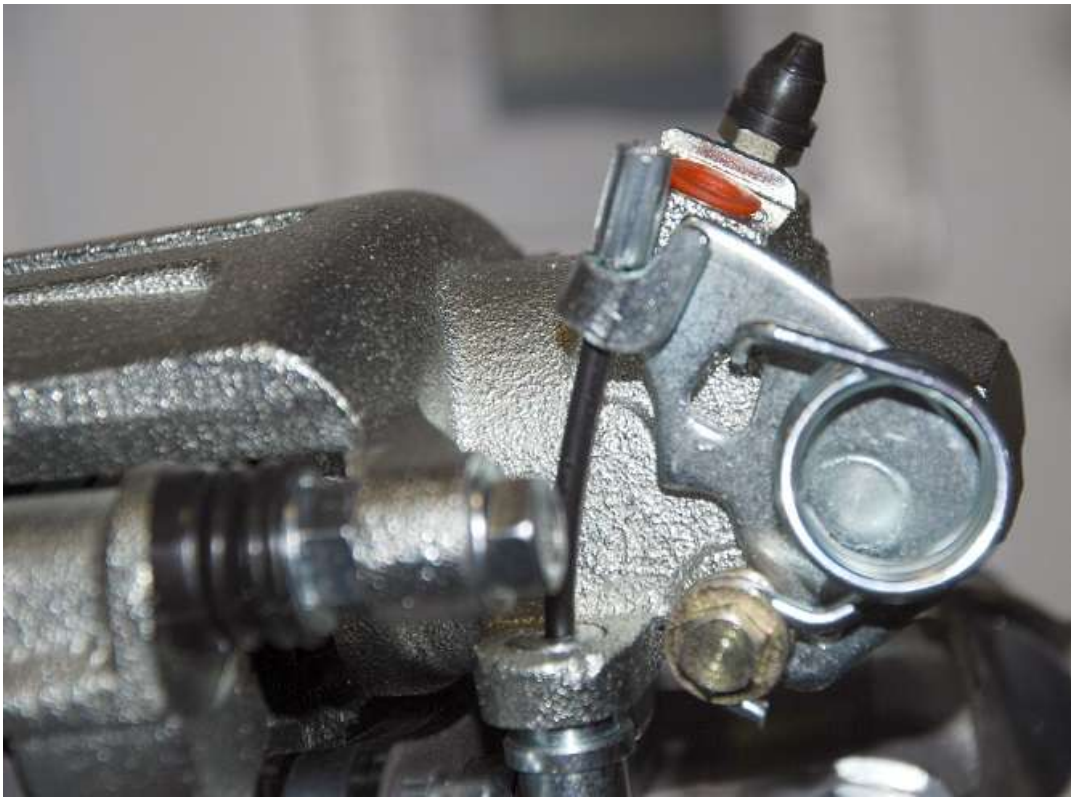


From the bottom, insert the cable through the hole in the brake caliper.



Push the end of the sheath into the hole. The end of the sheath may or may not bottom on the flange. It is normal for the sheath to look like the picture, the end is being held in place and cannot move.

Move the end of the cable around the spring bracket so it will be captured.



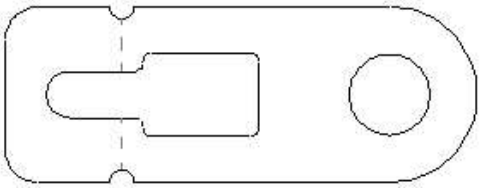
Push the cable so that the end of the cable sits on the spring bracket.

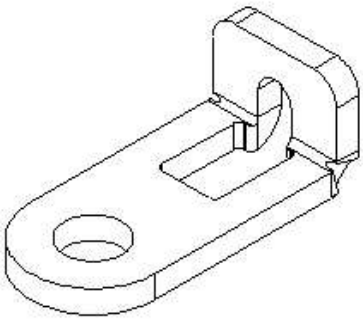
IRS

Route the cable back behind the shock and towards the middle of the car.

Route the cable up over the center section and to the bracket in the transmission tunnel.

Wilwood IRS E-brake adapter

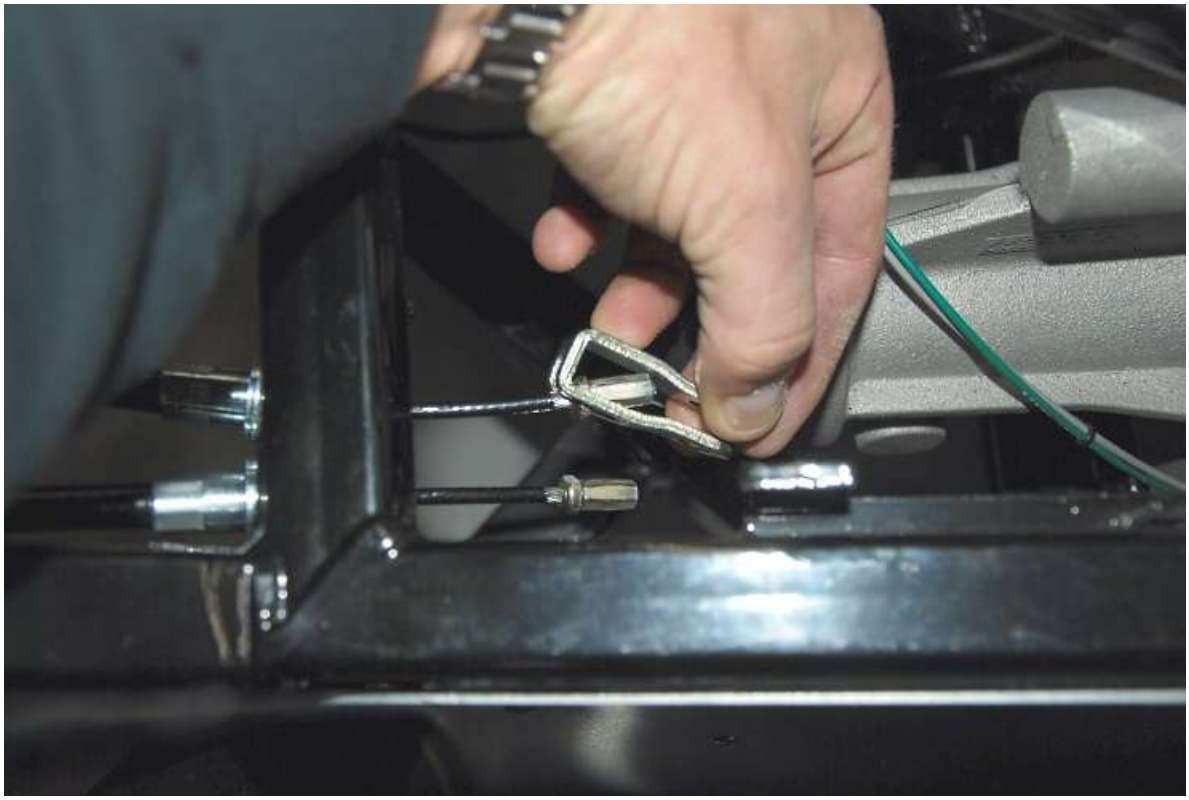




WILWOOD CALIPER E-BRAKE ADAPTER

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

Handle and Cable Adjustment

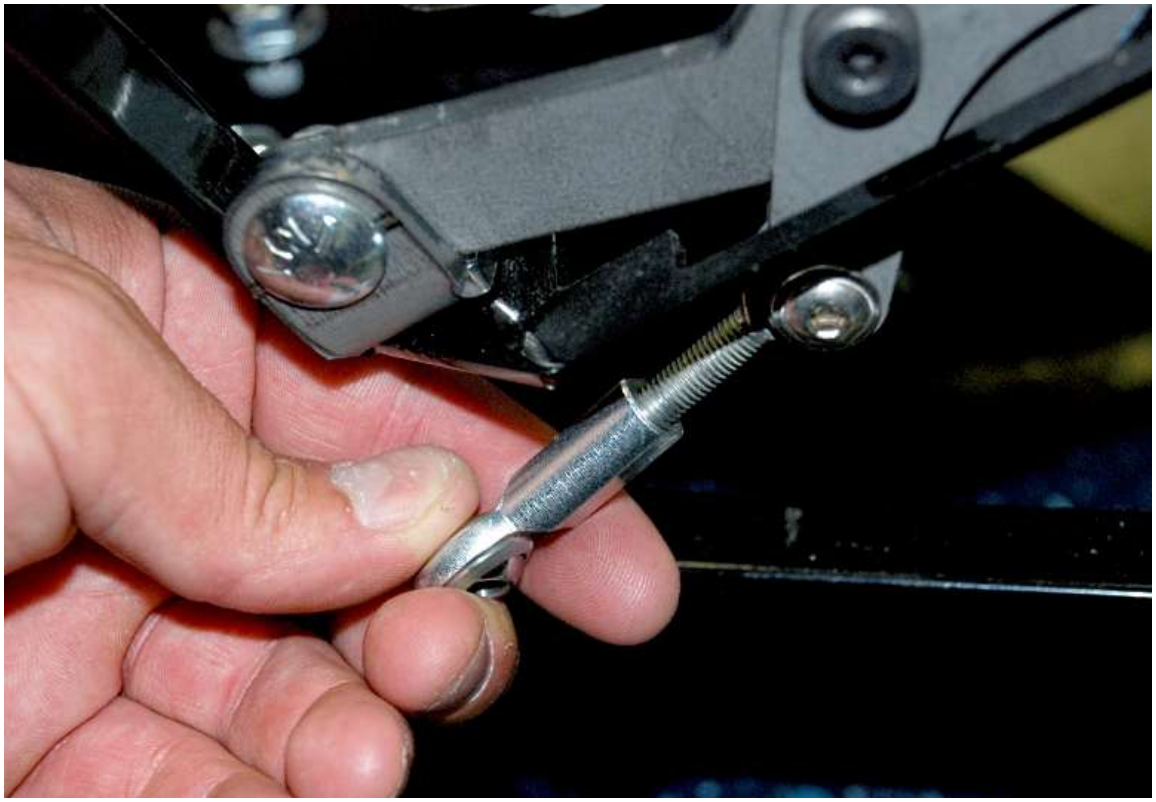


Put the clevis brackets onto the end of the cables.

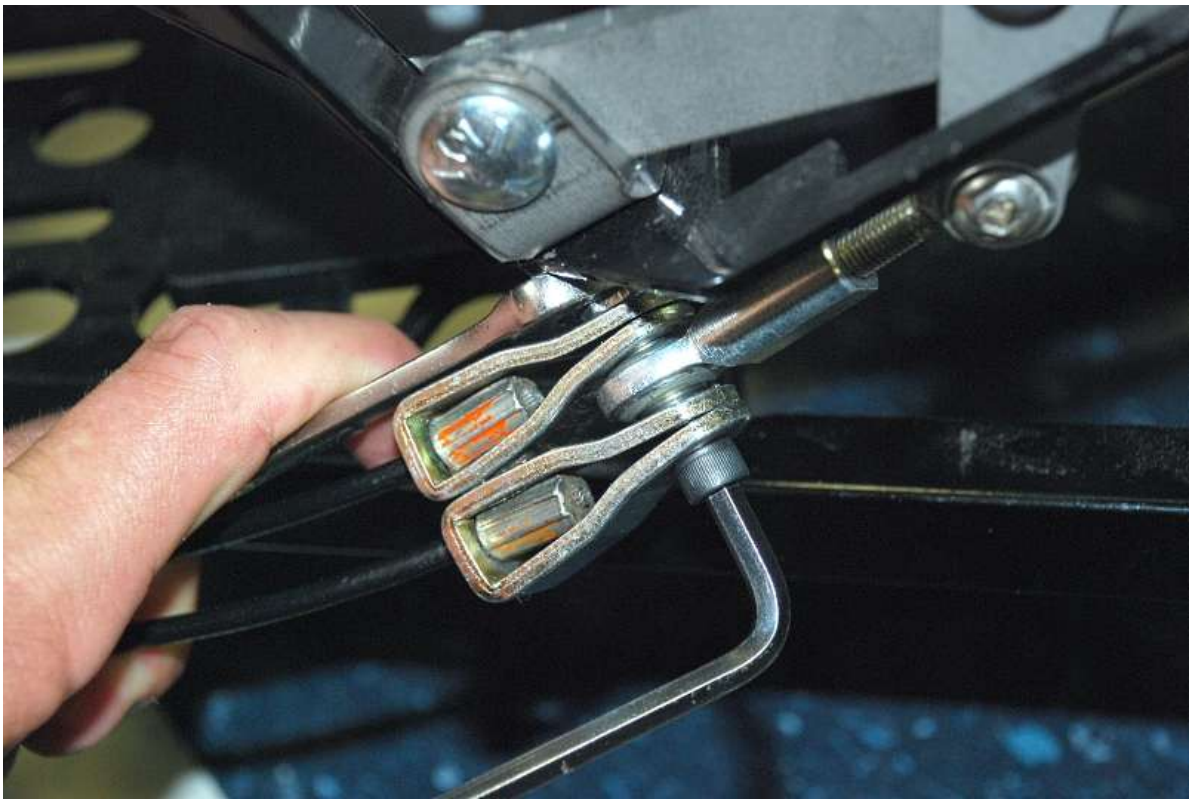
Squeeze the ends of the clevises with a pair of pliers.

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. Leave the locknut loose for now.

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.
✋ IRS only.

Apply the emergency brake.

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

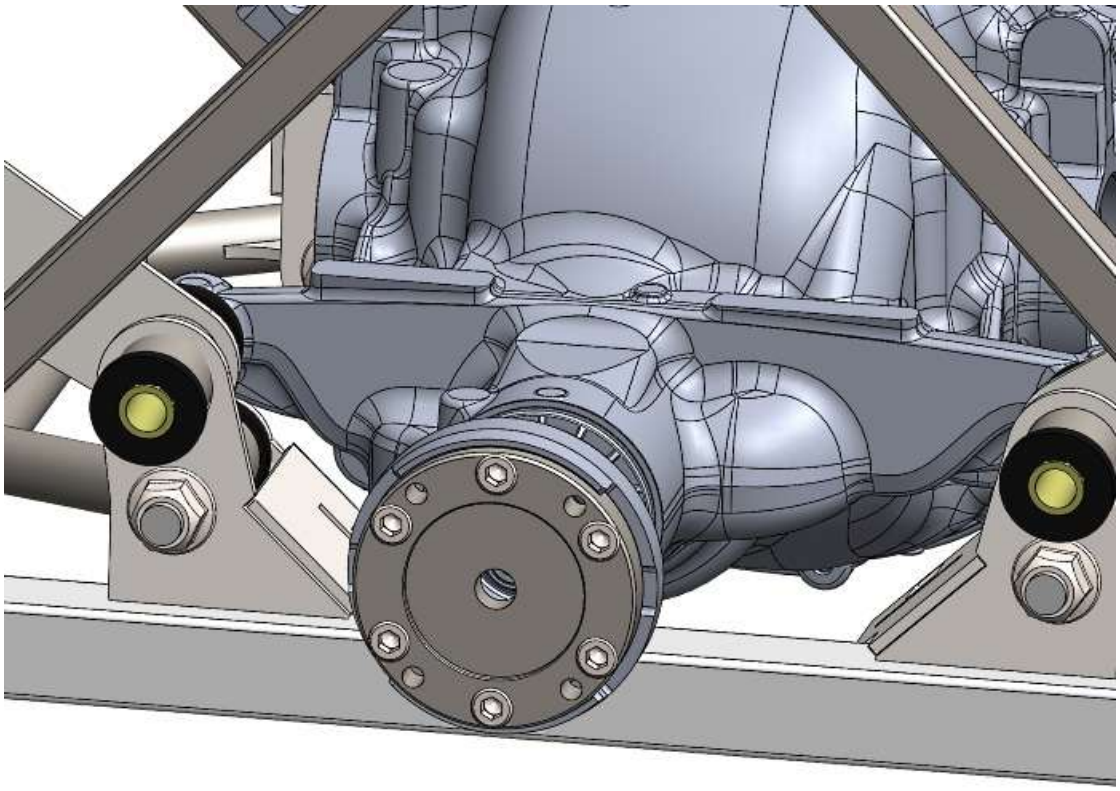
Use a torque wrench to torque to **133Nm (98 lb-ft) then rotate the nut an additional 45°**.

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 the emergency brake.

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)**.

Battery Mounting and Cable

🛠 Drill, $^{3}/_{16}$”, ¼”, $^{5}/_{16}$” drill bits, rivet gun, marker, $^{7}/_{16}$” deep socket, ratchet, ½” wrench, $^{3}/_{16}$” hex key.

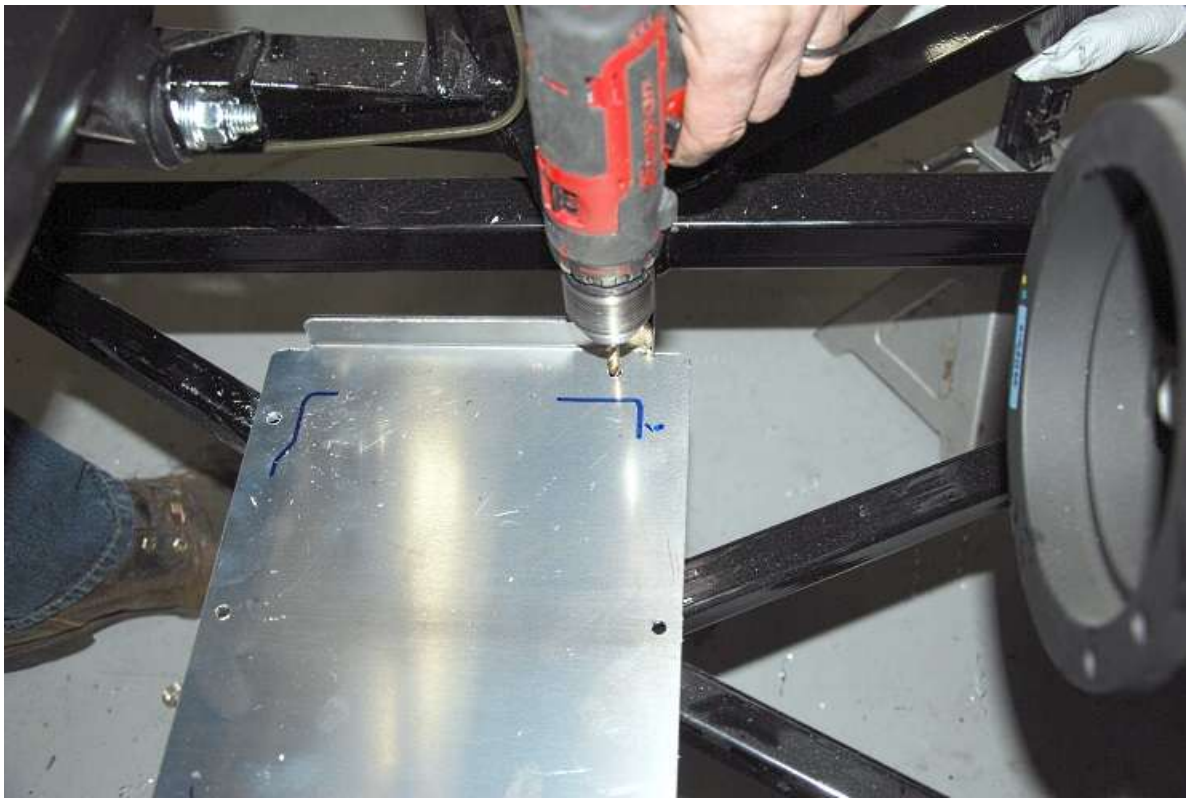
🚗 Secondary Body fasteners, Battery/Tray components, Insulated clip hardware, misc. electrical components, battery, electrical system completion components (complete kit only)

Battery Tray

Unpack the Battery/Tray components.

Position the battery on the battery tray front of the engine as shown above. It is centered side to side.

Mark the corners of the battery on the tray.



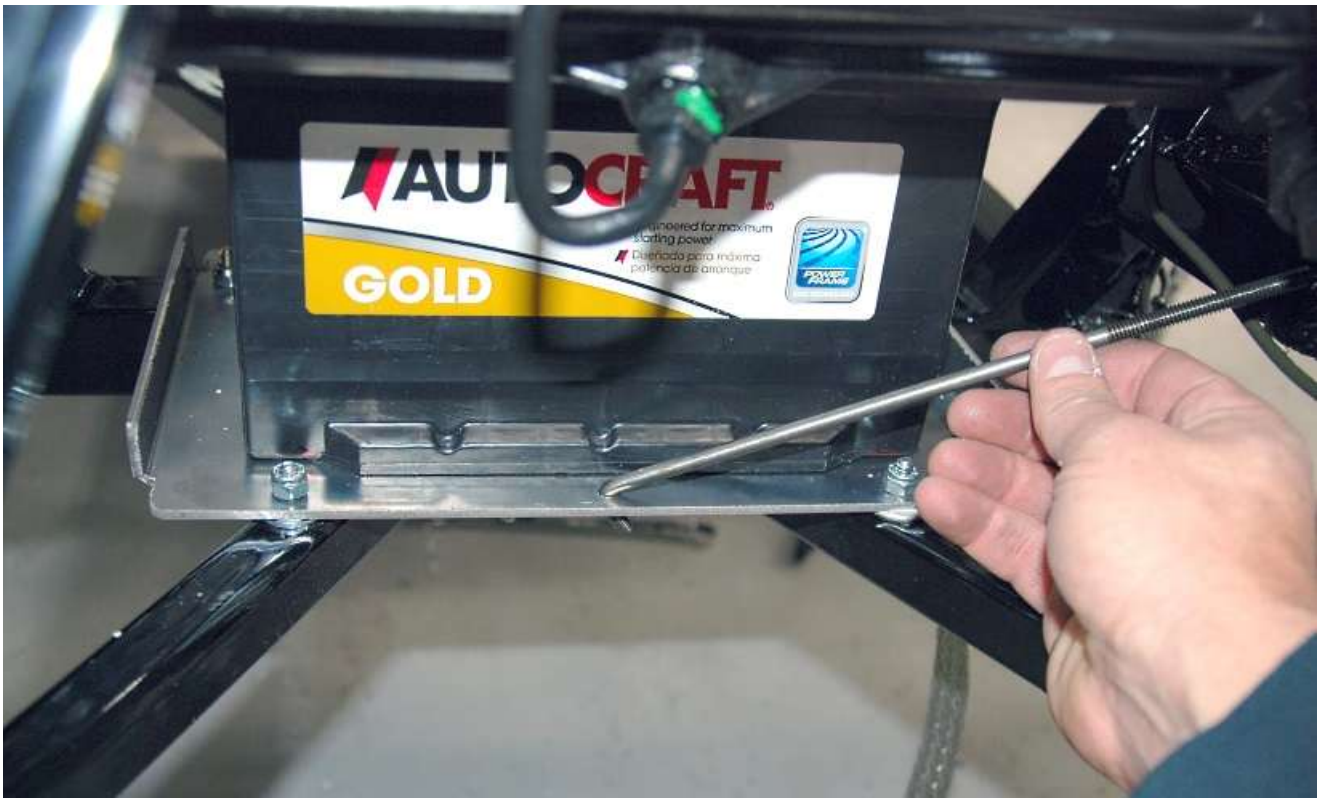
Drill (4) ¼” holes through the tray and 1” tubes in the front and the 1.50” cross tube so that the holes are outside where the battery will sit.

Remove the battery tray and on the 1” tube that is on the side of the negative post, remove any coating for the ground cable to connect.

Use one or two of the ¼” washers between the battery tray and the frame on the side of the positive post, and the ground cable on the negative side.

Use the ¼" x 2.25" bolts through the 1.50" tube and the ¼" x 1.75" bolts through the 1" tubes. Bolt from the bottom up using a $^{7}/_{16}$" wrench, socket and ratchet.

Place the battery on the tray with the crossbar hold-down.

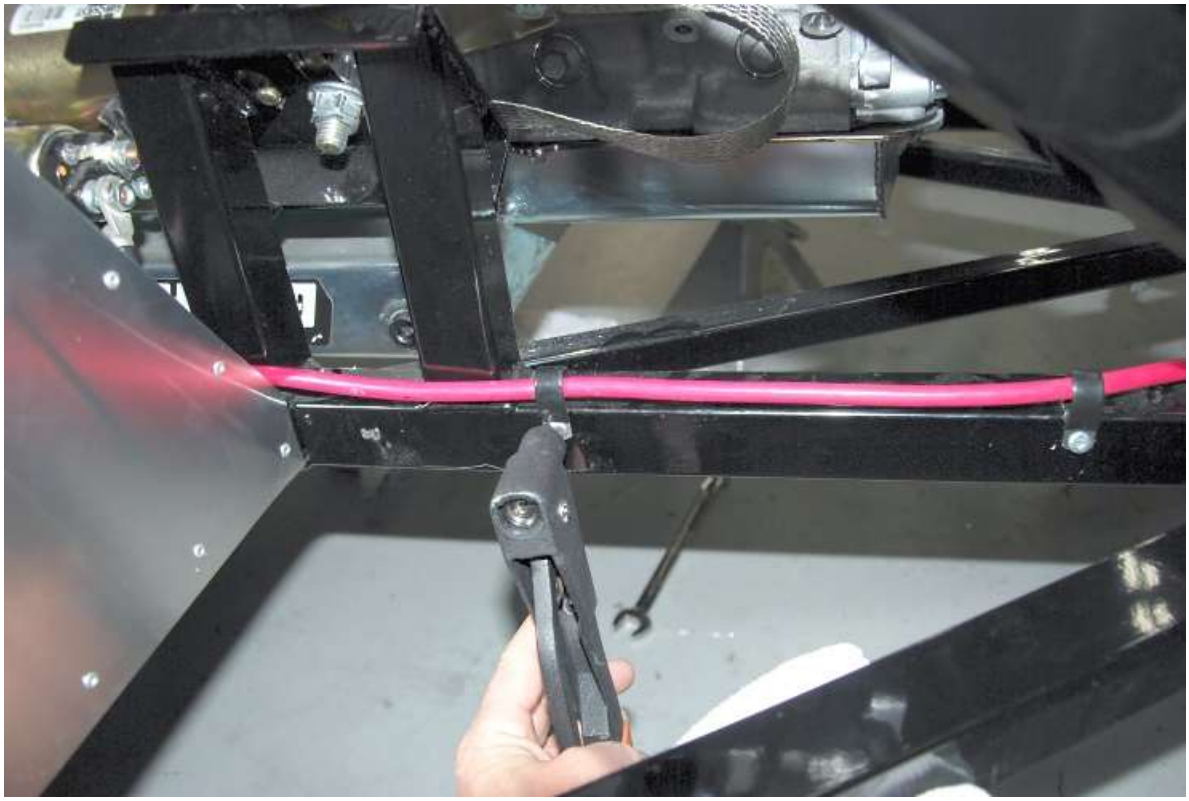


Insert the J bolts through the battery tray and up through the hold-down.

Bolt the hold-down to the tray using the ¼" washers, locknuts, $^{7}/_{16}$" deep socket and a ratchet.

Battery cable

Attach the positive battery cable to the battery.



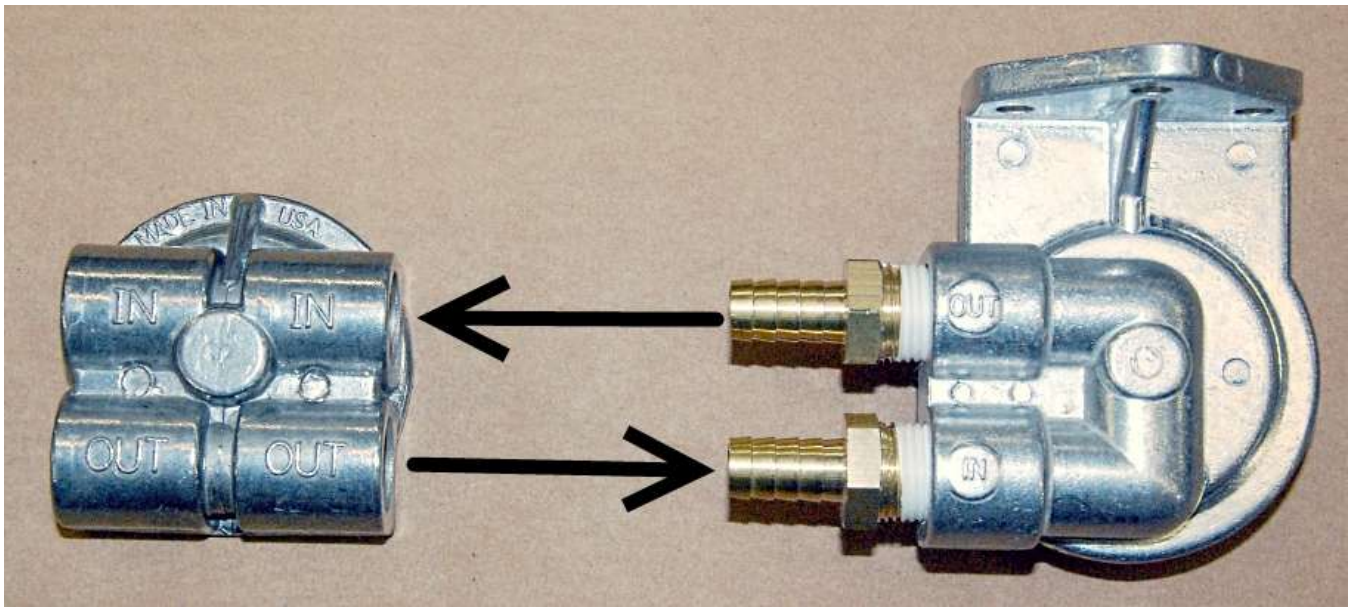
Run the battery cable down the right 1.50” tube to the starter attaching it to the frame using the $^{5}/_{8}$” clamps and $^{3}/_{16}$” rivets.

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

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

Oil Filter Relocator

🛠 Razor knife, flathead screwdriver
🚗 Oil filter relocating kit, oil, oil filter
✋ This is needed for pushrod 302/351 engines running shorty headers and J pipes 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.

Locate and attach the relocator to the chassis where the hoses will reach and will not get burned by the exhaust or hit by the steering shaft.

Aluminum panels

🚗 Firewall, packaged aluminum, rivets

Firewall

🛠 Silicone, drill, 1/8" drill bit, rivet tool

The finished firewall will sit with the windshield support flange facing toward the front of the car.

Run a bead of silicone down the top of the frame tube the firewall sits on top of and lower it into place. The bottom flange faces toward the rear of the car and the top windshield flange faces forward.

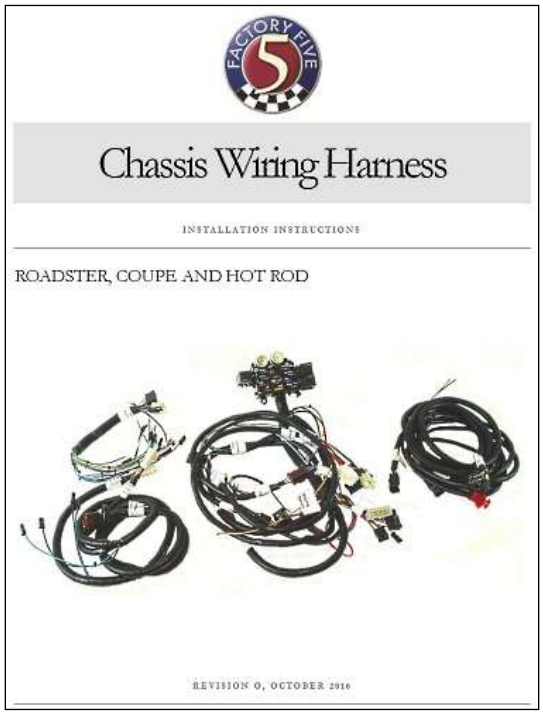
Drill and rivet the firewall to the frame so that the firewall is flush with the front of the tube. (upper flange not shown)

Trans tunnel top front

Position the Trans tunnel top front aluminum panel, it can be used to pass wires through. Once the wiring is done, rivet in place.

Wiring harness

Complete Kit Chassis wiring harness

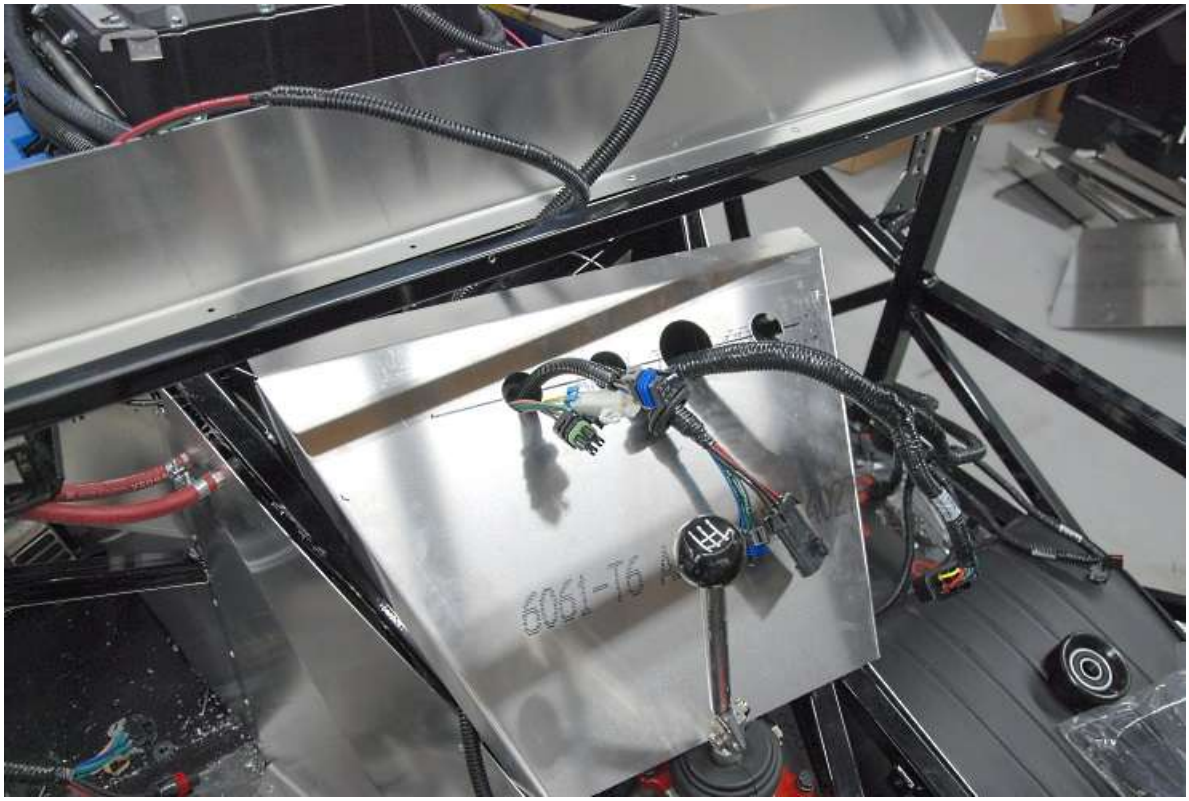

Chassis Wiring Harness

INSTALLATION INSTRUCTIONS

ROADSTER, COUPE AND HOT ROD

REVISION 0, OCTOBER 2016

The chassis wiring harness controls everything for the car except the engine. Use the instructions included with it to connect parts to the harness.



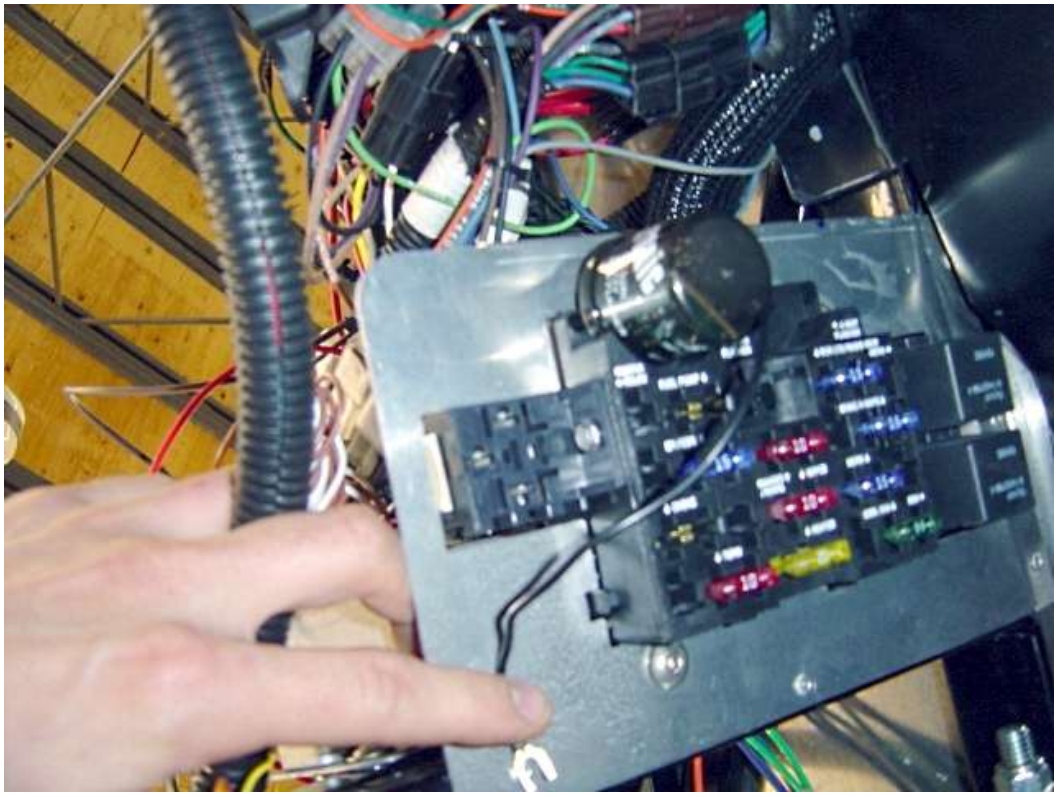
Route the front and rear harness through the transmission tunnel top front panel.

Attach the ground cable to the battery.

LED Flashers

- Misc. Electrical Components

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

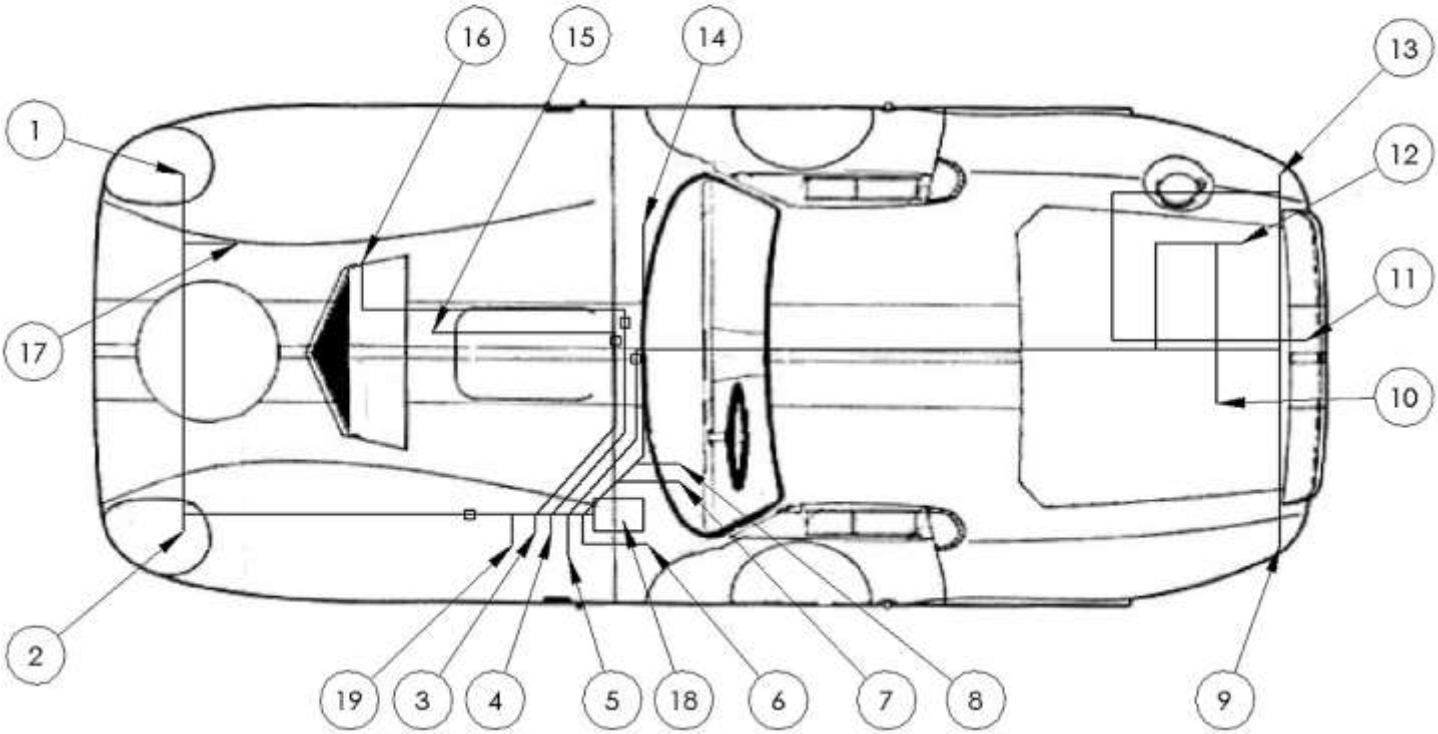


Make sure to ground the flashers.

1987-1993 Mustang Donor Harness

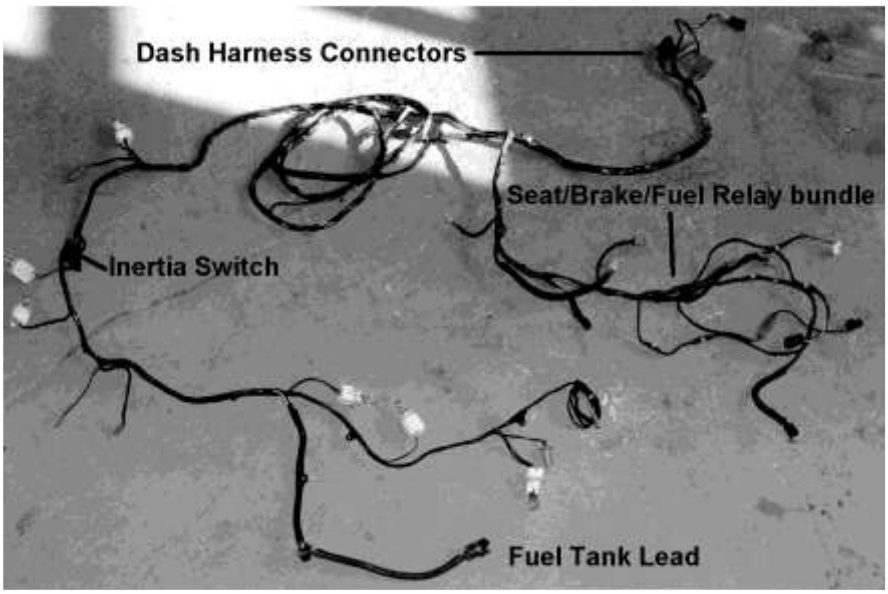
- ⅜" socket, regular head screwdriver, slip joint pliers, ⅛", $^{3}/_{16}$" drill bits, drill, #8 nut driver, electrical tape, wire cutters.
- Misc. electrical components, wiring harness mounting hardware, insulated clip hardware
- If during this section, you decide to cut your harness, wait until after the car has been started then remove sections one at a time, starting the car after each cut to make sure it runs. Helm electrical manuals for the model year you are using are invaluable. They cost between $30-$55 ea. but are well worth the money. www.helminc.com
- If you did not take the harness out of the car yourself, when connecting the plugs together, check the wire colors going into and out of the plugs to make sure that they line up and are the same color. The only plug that may not be the same color is the fuel tank harness. All other plugs that go together should be matching in color and shape or they will not connect. Different color plugs mean you may have a different year harness than the rest of the harness that you have and could cause complications later when trying to start the car.
- If you decide not to use the Mustang chassis harness because there are so many extra wires, the Factory Five chassis harness is a good alternative, it comes pre-loomed and labeled. It can also be used in combination with the Mustang engine harness if running fuel injection.
- There are three ways to wire an EFI engine. One is to use the entire Mustang harness and transplant it. Another way is to use an aftermarket engine harness from the Mustang and splice the power leads into an aftermarket chassis harness such as the FFR chassis harness using Chilton's or Ford wiring diagrams. The third way is to use an aftermarket chassis harness and an aftermarket standalone engine harness (www.factoryfiveparts.com).

1	Passenger headlight/turn signal	10	Fuel level plug
2	Driver headlight/turn signal	11	License plate light
3	Brake Switch	12	Fuel pump plug
4	Clutch safety wires	13	Passenger tail lights
5	Inertia Switch	14	Radio/Heater/Wiper wires
6	Headlight Switch	15	Gauge sending unit wires
7	Ignition Switch	16	Alternator plug
8	Dash/Gauge plugs	17	Electric fan plug
9	Driver Tail lights	18	Fuse panel
		19	EFI power/Coil wires



This is the harness layout using the stock Mustang wiring harness **only**, not the optional complete kit chassis harness.

Rear Harness



Run rear harness from the driver foot box inside wall, along inside the transmission tunnel straight back to the rear of the frame. Use zip ties, insulated line clips, and the wire loom to hold the wires and battery cable.

At the rear of the frame, run the wires low on the frame so that they are accessible after the body is mounted to the frame. Run the brake light wires to the far corners of the frame.

Locate the inertia cut-off switch out of the way but still accessible in case it is tripped. Use the switch as a template and drill two holes in the trunk aluminum on the far corner of the left side then mount with the provided screws.

Run (2) wires (using the blue wire extensions in the misc. electrical components) from the left rear, side marker light, to the center to be used for the license plate light. Leave the wires in the center for now. Run the harness forward to the beginning of the left foot box, passing over the transmission harness section on the way.

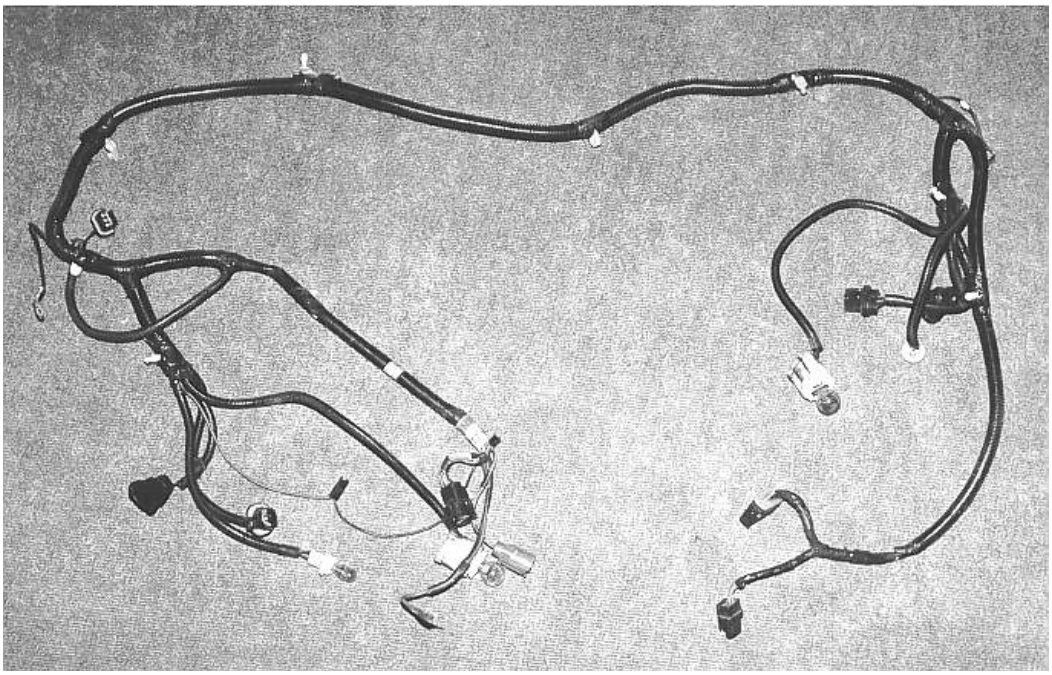
Cable ties can be used to secure the harness up to the hole by drilling two $^{3}/_{16}$" holes about a ¼" apart and passing a zip tie through it.

At the front of the tunnel, the rear harness goes up into the top foot box area where it meets the dash/engine main harness.

Transmission Harness

Run the harness up into the top of the foot box to its connector. Make sure that it does not get in the way of the steering shaft or accelerator pedal. Use the drilled holes and the zip tie trick to keep the harness in the corner along the floor.

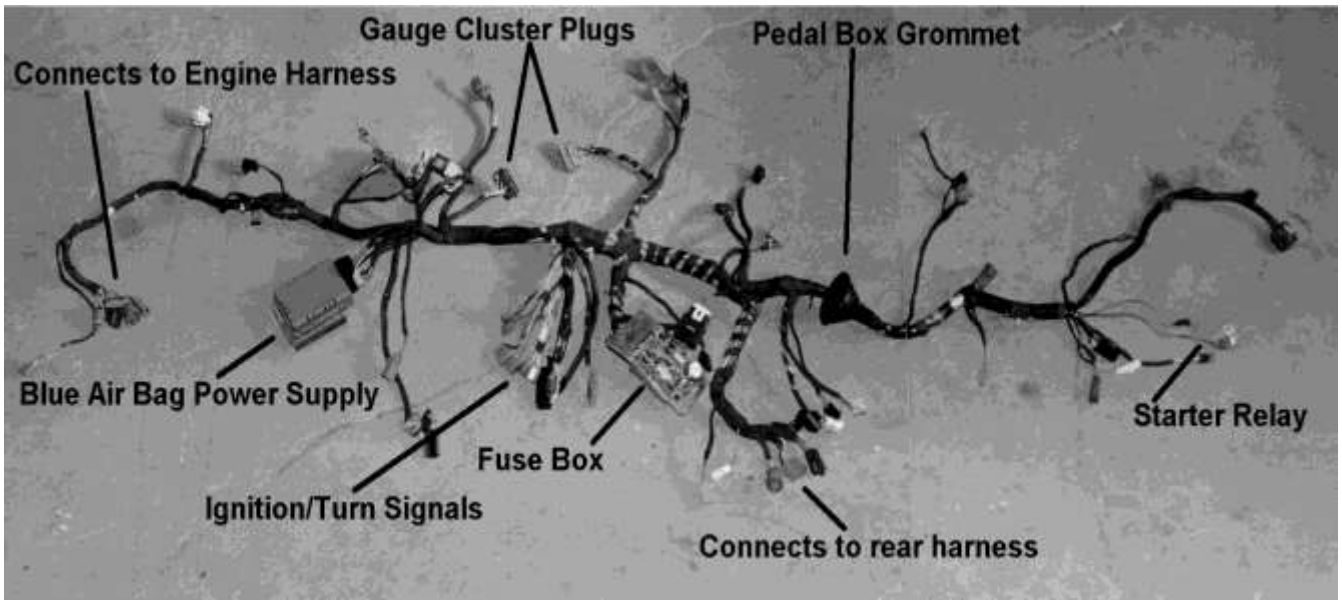
Headlight Harness



The headlight harness is started at the alternator and runs forward to the right headlight area, then goes under the radiator to the left side headlight area and then rearward to the coil and starter relay area. The Mustang is wider than the FFR Coupe in front and there is extra wiring between the headlights. By removing the tape from the harness under the radiator, overlapping the wires, re-taping and using the loom material provided, a cleaner looking harness can be made.

Attach the harness to the channel on the bottom of the radiator using zip ties.

Dash Harness



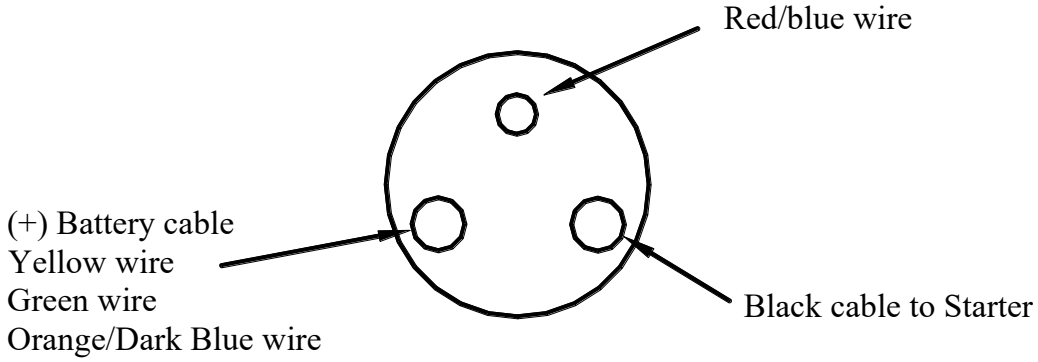
Dash harness

Lay out your wires to find the best location to drill a hole for the large grommet. The dash harness begins at the front of the left footbox and goes rearward.

Starter Solenoid

There are two different starters that were used and the wires are run differently for each.

- On older (large) starters, the cable runs from the starter to the empty post on the solenoid.
- On the newer starters the heavy starter wire connects to the same terminal as the body and the smaller 8-10 gauge wire runs to the empty terminal. The newer starters can be recognized by their smaller size and solenoid mounted on top.



Starter Solenoid Wiring

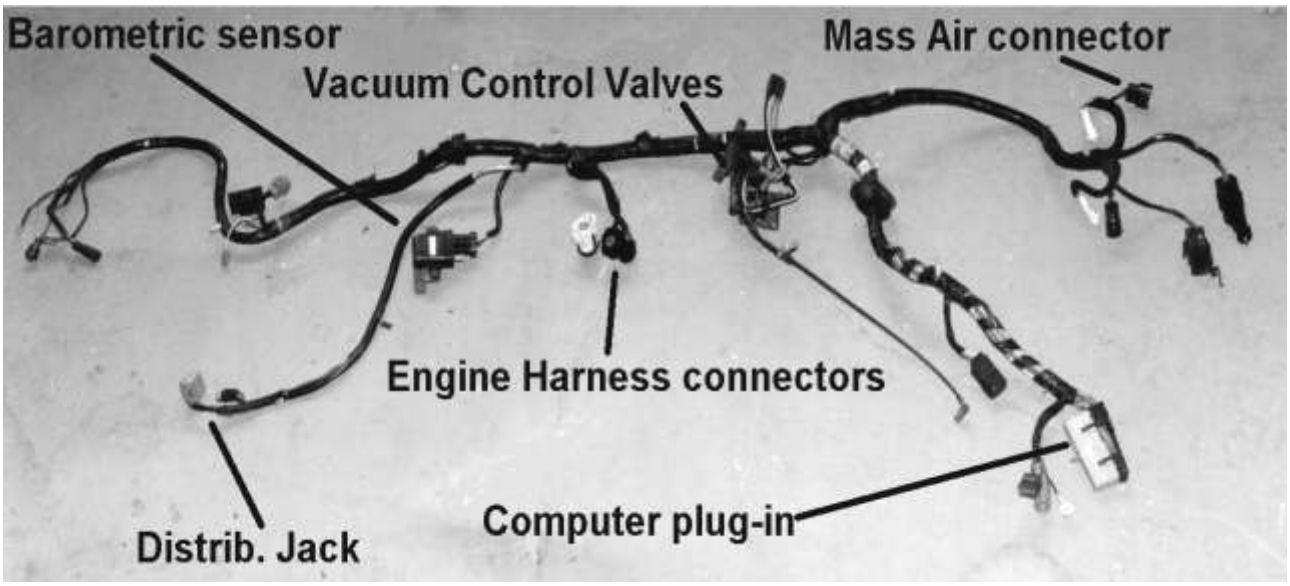
Old Starter

New Starter

When the wire harness is installed, mount the fuse panel to the 1.50” square tube going across the car in the left footbox.

Leave the headlight and hazard switches hanging for now.
Attach the harness across the 1.50” square tube, using the insulated line clips.

Engine Harness

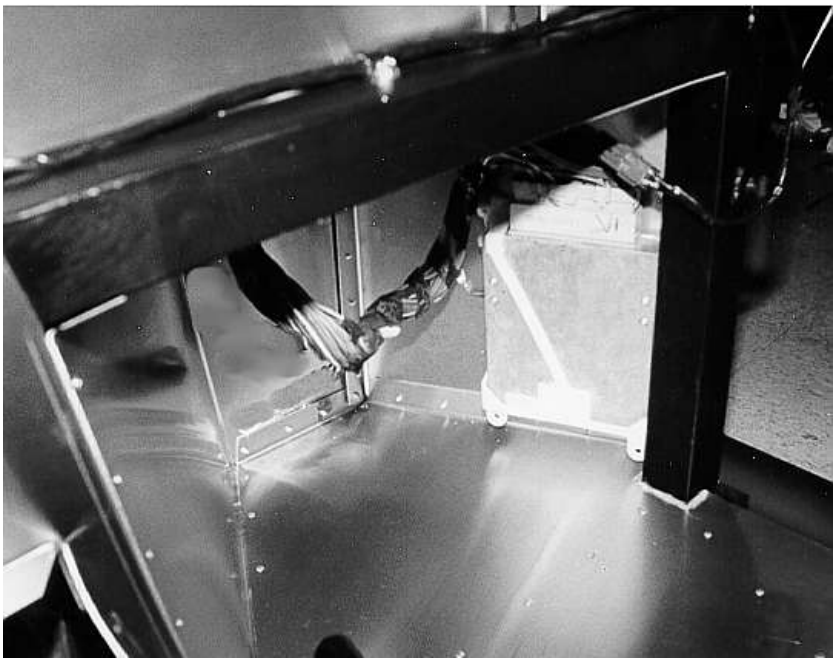


- ⅜" socket, regular head screwdriver, slip joint pliers, $^{3}/_{16}$" and ⅛" drill bits, drill, #6 nut driver, electrical tape, wire cutters.
- Mustang engine harness, engine harness assembly
- If you are running a carbureted engine you do not need this section.
- Make sure that the battery is not connected any time you are working with the computer.

The engine harness begins in the right foot box. In the footbox top, use a hole saw to cut two holes then connect the holes using tin snips to create the oval shaped computer plug grommet hole.

Push the computer plug through the hole from the engine bay side through the oval shaped hole on the passenger footbox top.

The computer can be mounted in a couple of places, to the underside of the top of the passenger foot box using the plastic bracket from the Mustang and the screws provided.



Alternatively, the computer can be mounted to the inside of the right footbox.

Use the drilled holes and cable tie trick to hold the extra harness to the top of the passenger foot box. The harness splits into two on top of the foot box. The short, smaller harness goes forward and connects to the mass air sensor and to the harness on the engine for the O_2 sensors and oil level sender. The other larger bundle goes along the firewall and contains the vacuum control lines for the EGR valve and engine, the connector to the distributor, the two large plugs for the fuel injectors, the power connectors to the dash harness by the master cylinder, and the coil plug.

✋ If you are running EFI without emissions equipment, the vacuum/electrical solenoids located on top of the foot box along with the vacuum reservoir on the firewall are not necessary. Plug the vacuum outlets on the intake remove the unused parts.

Use screws provided with kit to mount the vacuum controls and BAP (Barometric Air Pressure) sensor to the firewall.

✋ The BAP sensor is similar to a MAP sensor used on speed density cars except it does not get hooked up to vacuum; it is left open to the air.

Attach the computer connectors to the starter solenoid and the ground to the backside of the solenoid against the ¾" tubing. The ground looks like a female stereo jack (sort of). The other half of the connector is on the battery negative cable, so just cut the connector off and use the ring connector.

Computer ground near driver's foot box

Ignition and Turn signal stalk

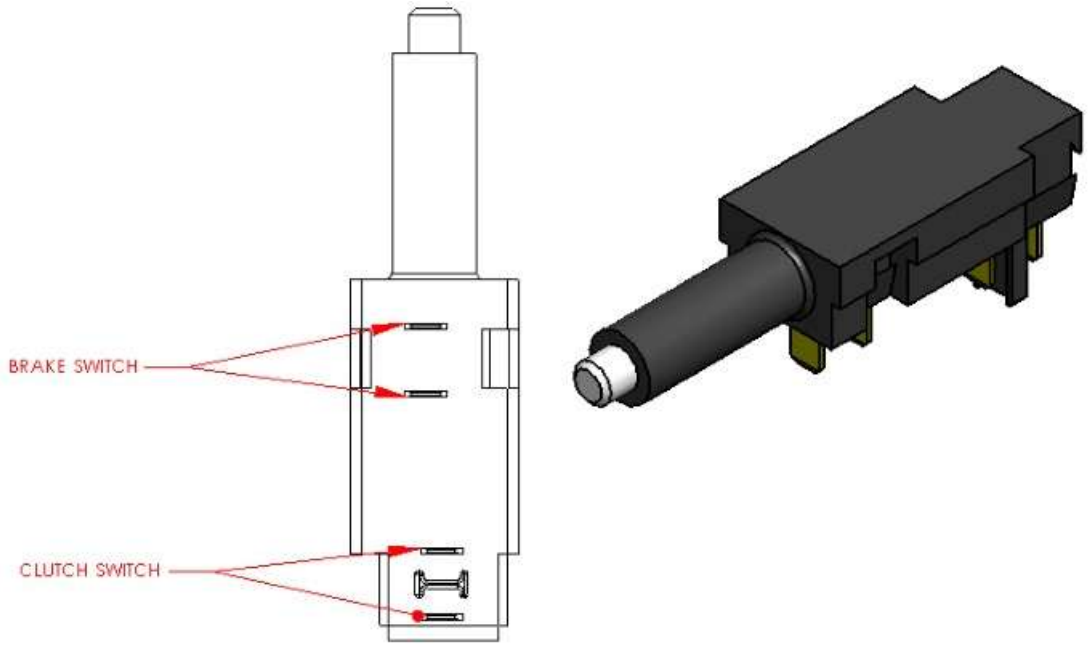
- Hack saw, $^{5}/_{16}$" socket, $^{9}/_{64}$" drill bits, drill.
- Misc. Electrical Components, Mustang ignition switch and turn signal stalk.
- The turn signal stalk can be cut shorter so that when it's mounted it will not protrude past the dash lip. If you want to cut the stalk length, do it after the dash is installed and you have sat in the car to see if it is needed. Cut half of the length first. Do not worry about the pieces that fall out, they are for the Mustang wipers and are not used. Re-use the end cap and epoxy glue it to the newly cut stalk to give it a nice finished look.

Sit in the car and mount the turn signal stalk with the stalk pointed towards the seat as high as possible on the 1.50" square tube going across the car so that your knee or leg does not hit it. Use two #10 x 1" screws and a $^{5}/_{16}$" socket and $^{9}/_{64}$" drill bit.
The ignition switch mounts near the turn signal stalk on the 1.50" tube. Mount the switch to the outside of the turn signal so that they do not hit each other when the turn signal is operated. Use two #14 x 1.50" screws and a $^{5}/_{16}$" socket and $^{9}/_{64}$" drill bit.

Brake light and Clutch switches

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

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



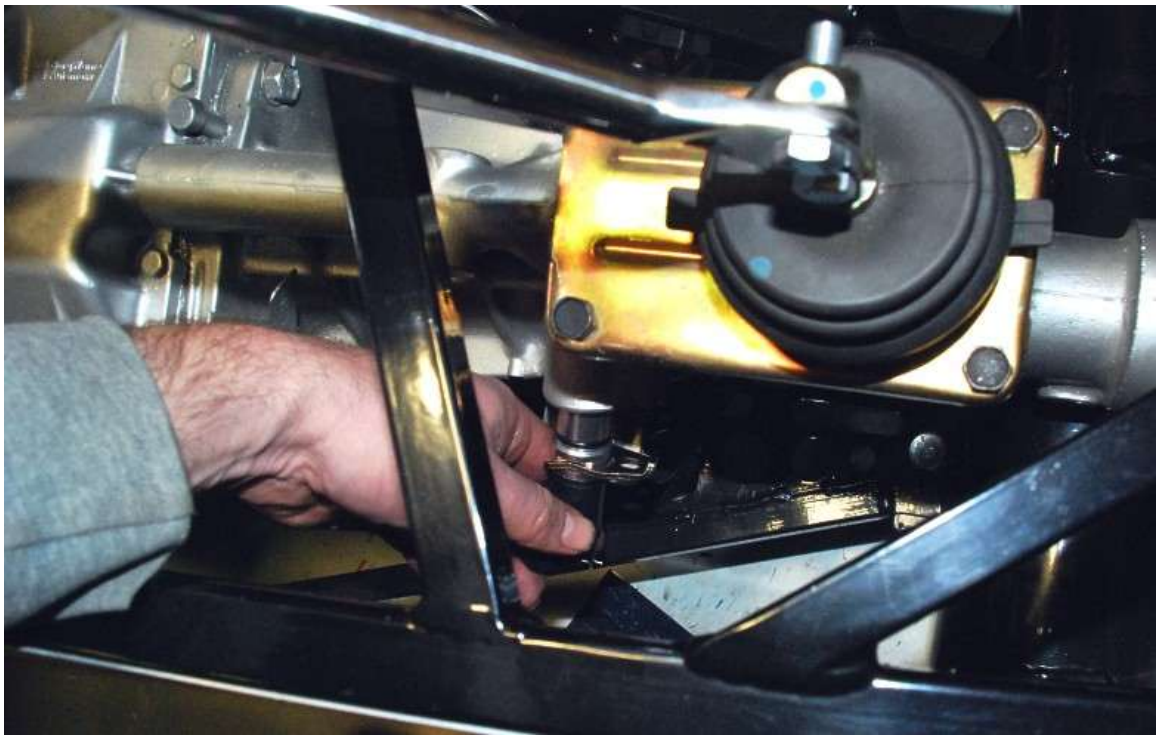
Cut the mustang plug in half using a pair of wire cutters or remove the female connectors from the housing and connect to the correct terminals on the switch.

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 (complete kit).

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.

Horns

🛠 14mm wrench, wire cutters, wire crimpers, $^{5}/_{32}$" hex key, drill, $^{3}/_{16}$" drill bit, $^{3}/_{8}$" socket, ratchet.

🚗 Electrical system components

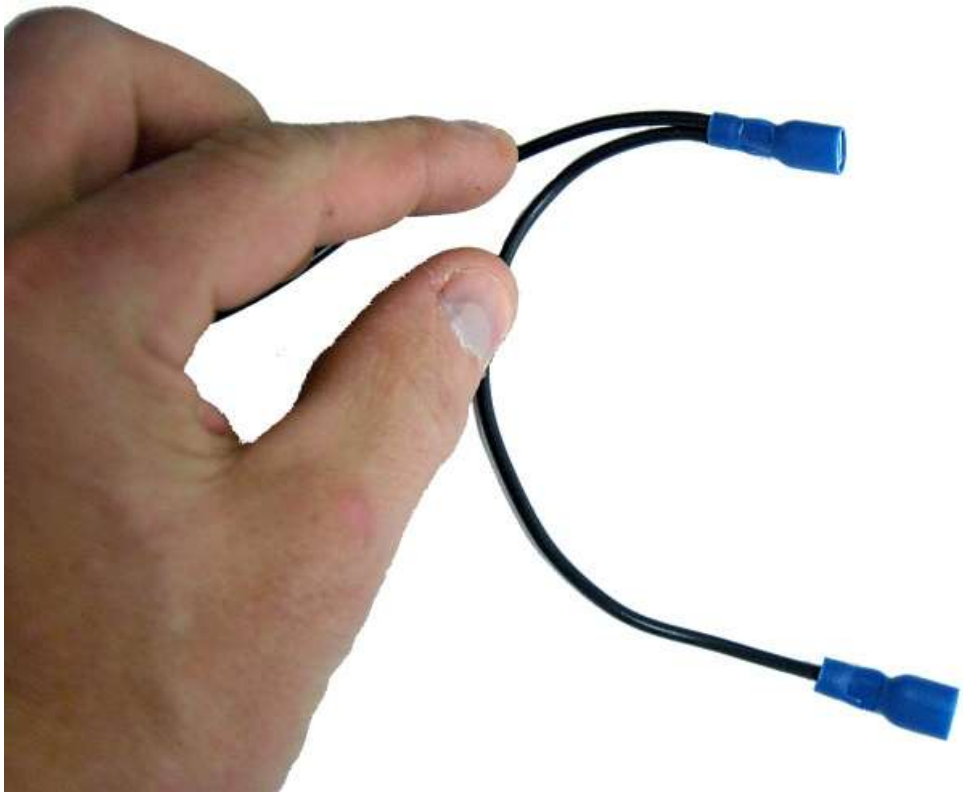
✋ Assembly shows complete kit parts, mount donor horn in similar location.

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

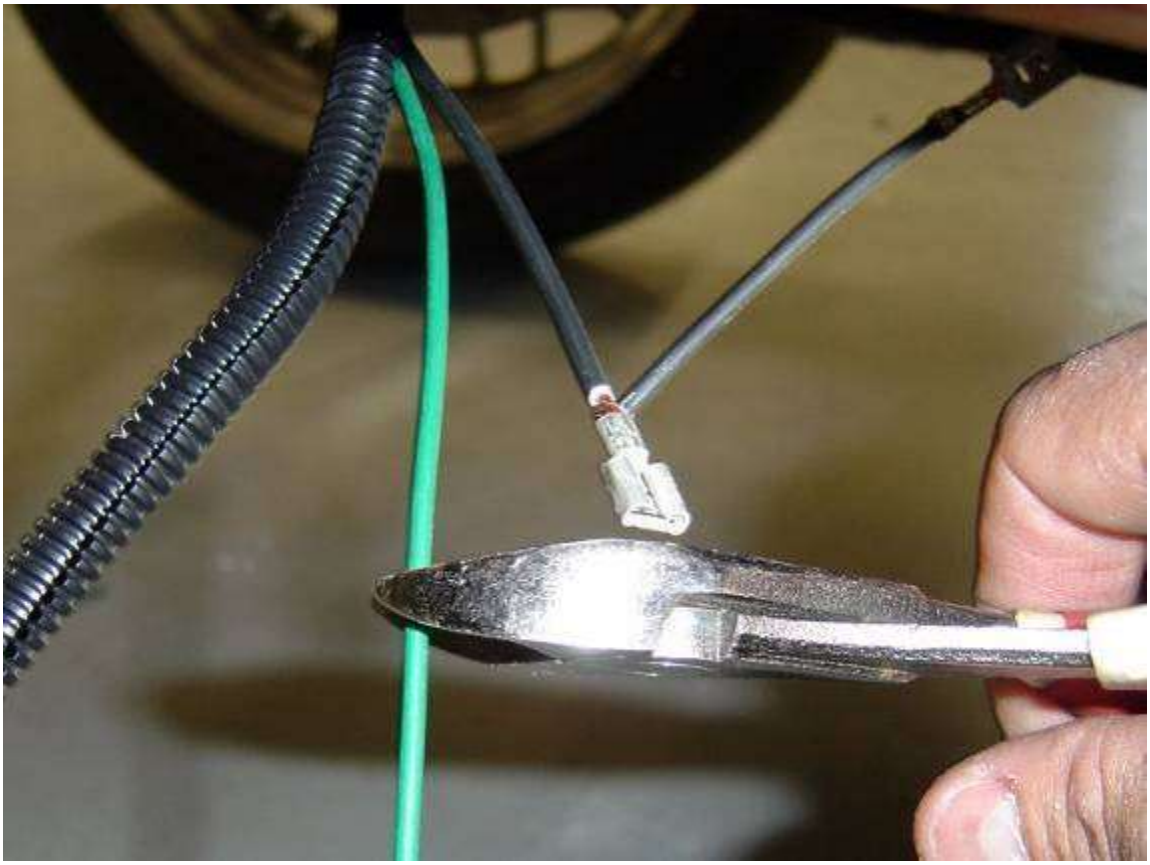
Mounting brackets on the horns

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

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.

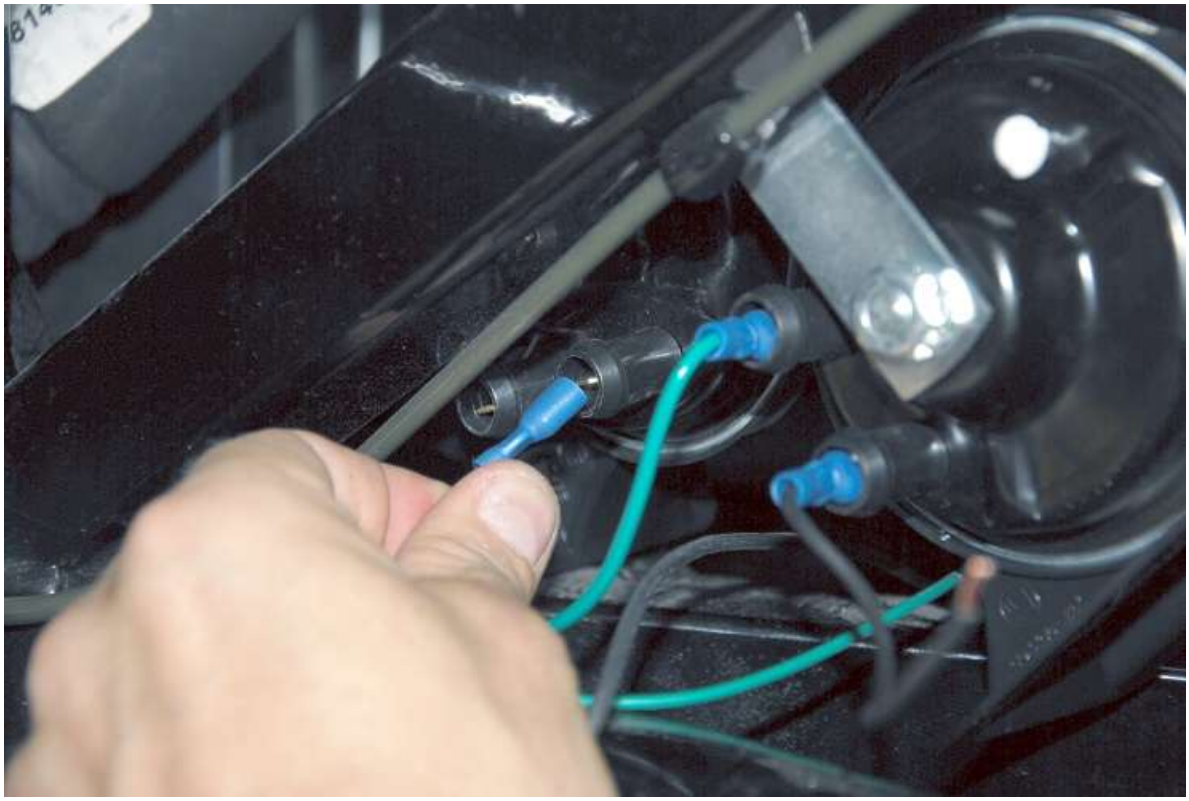


Twist the chassis harness ground wire and small wire ground together and insert them into one of the ¼” female connectors included then crimp the connector on.



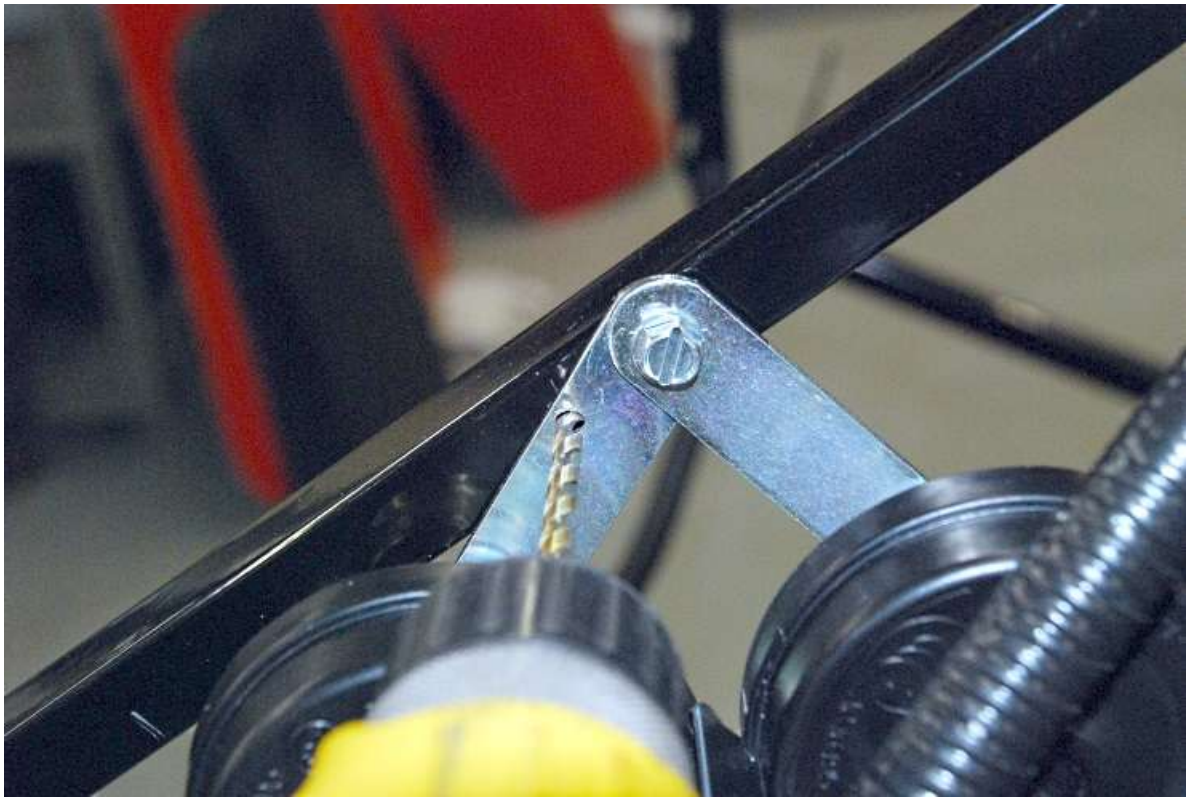
Cut the same 2” off the green horn power wire and strip the ends of both wires.

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.

Locate the horns on the frame so that the wires are not too tight. This picture shows the 1.50" tube coming down from the footbox and drill a $^{3}/_{16}$" mounting hole.



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

Attach the second #14 screw.

Fan Wiring

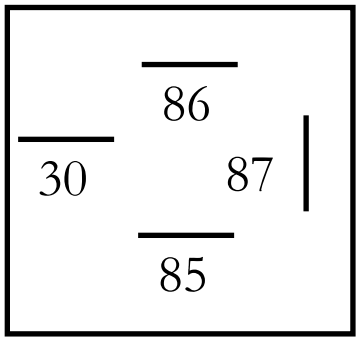
- Wire crimp tool
- Fan mounting components, dash electrical components
- There are a few ways to run the electric fan. The kit includes a relay, wiring, and a thermostat switch to get used with the relay to turn the fan on and off at 185°F. The alternative way is to use the relay with a dash mounted on/off switch or have the engine controls turn the fan on/off.

Dash mounted on/off switch

- Using this set-up, the driver must watch the water temperature gauge and manually turn the fan on when the water temperature gets to 212°F. The fan should only be needed while going less than 35mph or in traffic.
- This set-up will only power the fan with the ignition on. If you desire the fan to run with the key out which could drain your battery, power the fan directly from the battery or from an always hot fuse in the fuse panel.

Ground the black electric fan wire to the frame.
Connect the other electric fan wire to the #87 tab on the fan relay.
Ground the #85 tab to one of the 2-position dash toggle switches. The toggle will serve as your on-off switch.
Ground the other side of the dash switch to the frame.
Connect the #86 and #30 tabs to a +12V 30A fuse in the fuse panel.

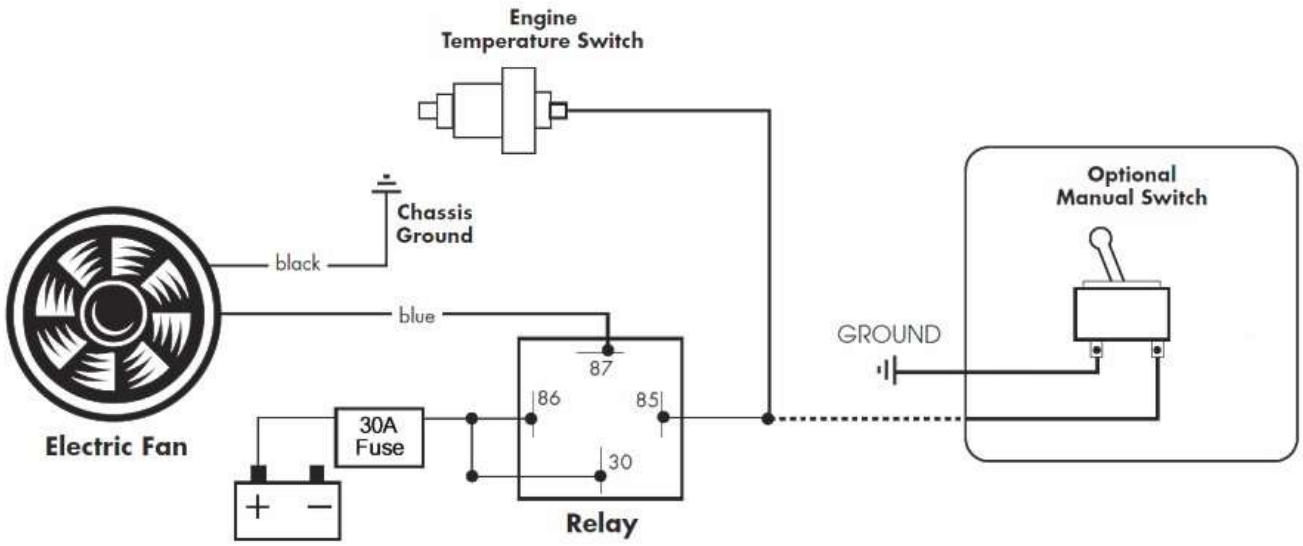
30 – +12V
85 – Ground
86 –+12V
87 – Fan



Thermostat switch

- Using this set-up, the fan will turn itself on and off when needed. If desired, an override switch can be installed as well to manually turn the fan on if desired.
- This set-up will only power the fan with the ignition on. If you desire the fan to run with the key out which could drain your battery, power the fan directly from the battery or from an always hot fuse in the fuse panel.

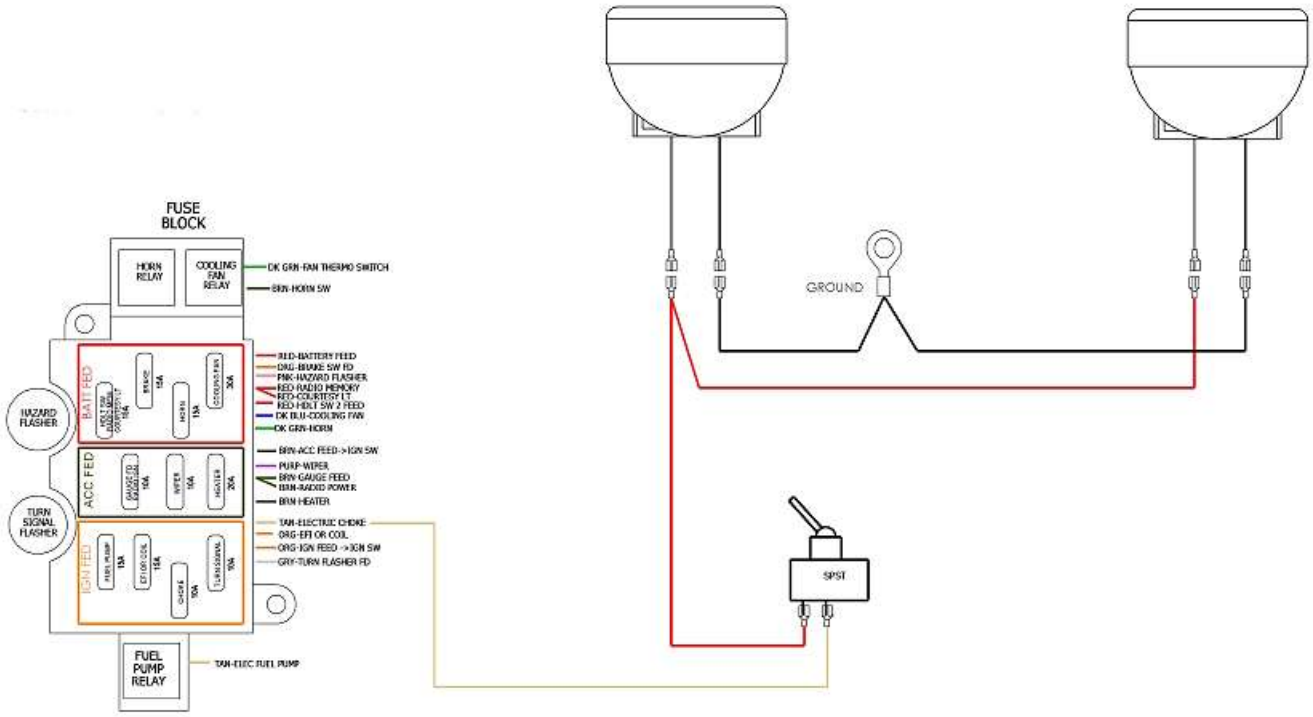
Locate a coolant access point in your engine block or cylinder head to install the thermostat switch and thread it in.



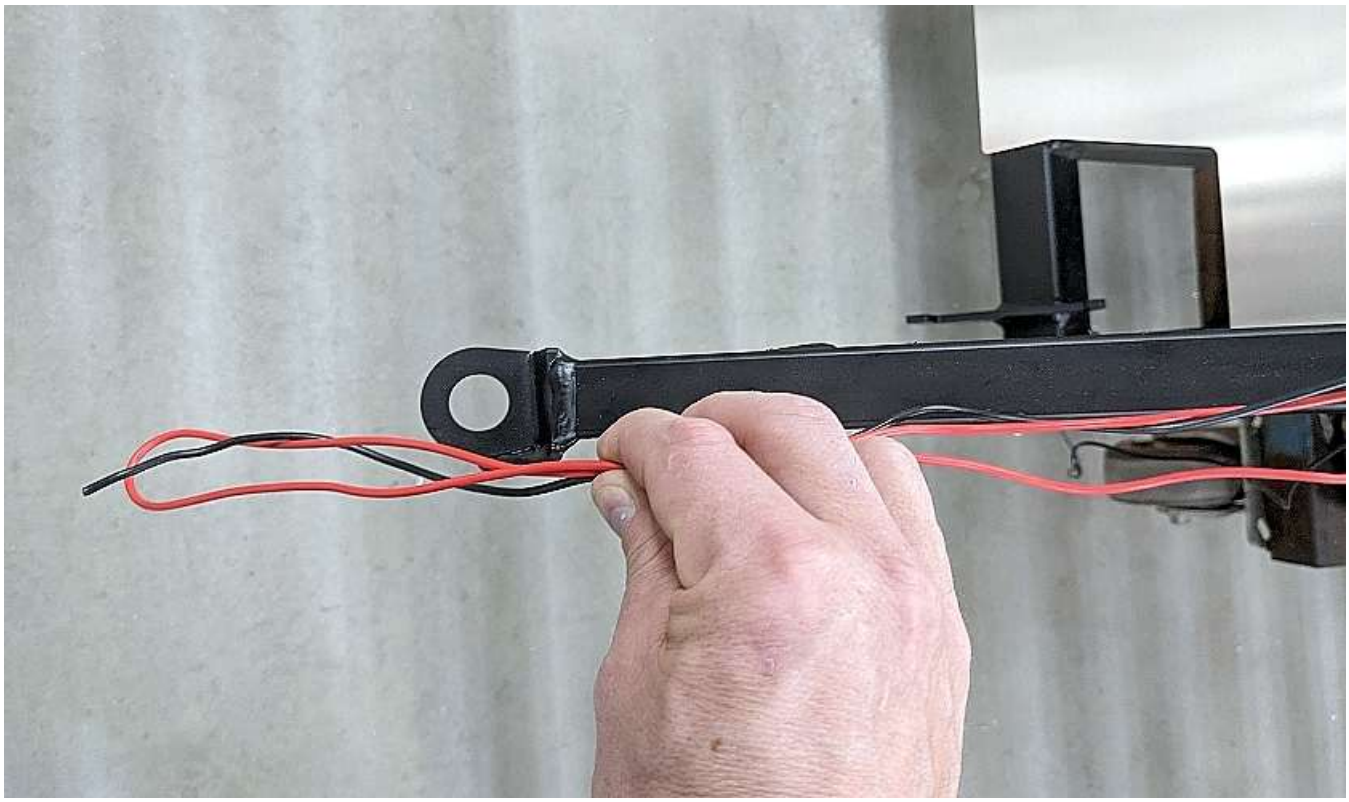
Ground the black electric fan wire to the frame.
Connect the other electric fan wire to the #87 tab on the fan relay.
Attach the #85 ground tab to the thermostat switch.
Connect the #86 and #30 tabs to a +12V 30A fuse in the fuse panel.

Driving/Fog lights

Driving light parts FFR 60824
Wire strippers, Wire crimpers, $^{3}/_{16}$" drill bit, $^{3}/_{8}$" socket, ratchet, drill, sand paper
Complete kit only, base kit uses the Mustang lights and wiring.



Engine bay



Leaving 2 feet at the center of the cockpit dash area, run the red wire with the chassis wiring harness down to the left front of the frame next to the nose hinge mount so that the wires extend 6” out from the frame.

✋ Do not cut the wire, leave a loop in the end for now.

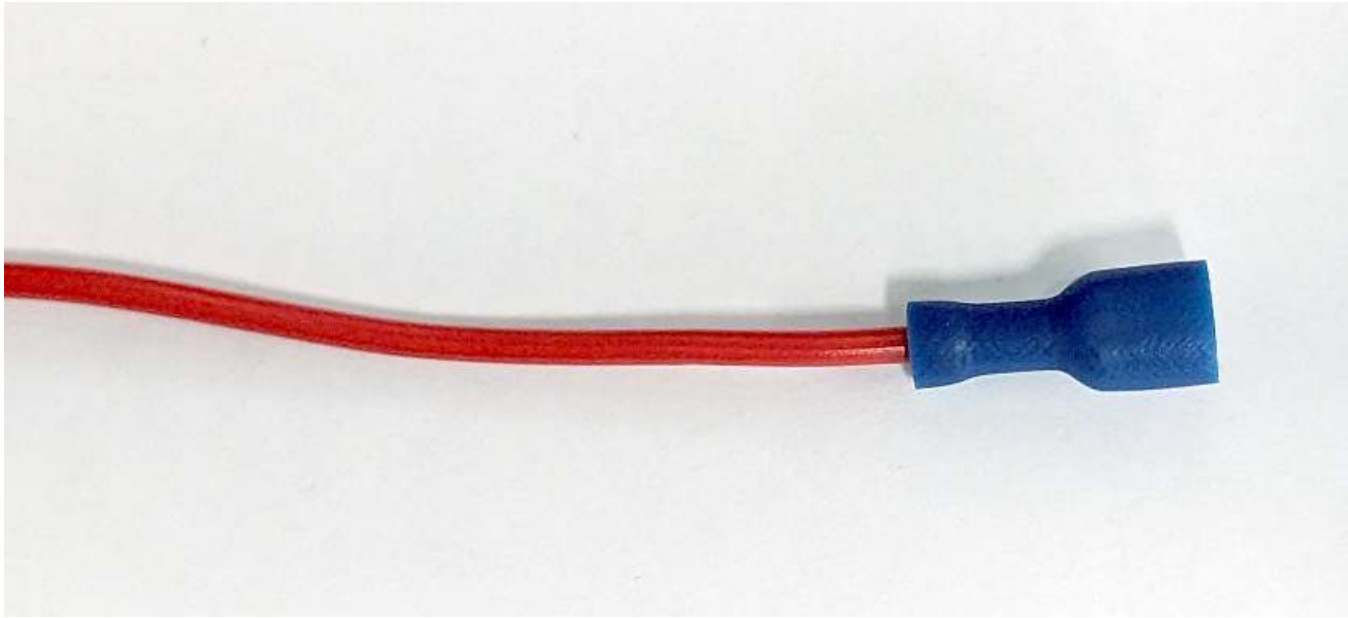
Add the black wire to the red wire.

From here run the wires across to the right-side headlight area so that it extends 6” out from the nose mount as well.

Between the left and right side of the frame, find a location to ground the black wire. Cut and connect the two ends of the black wires to the yellow ring terminal.

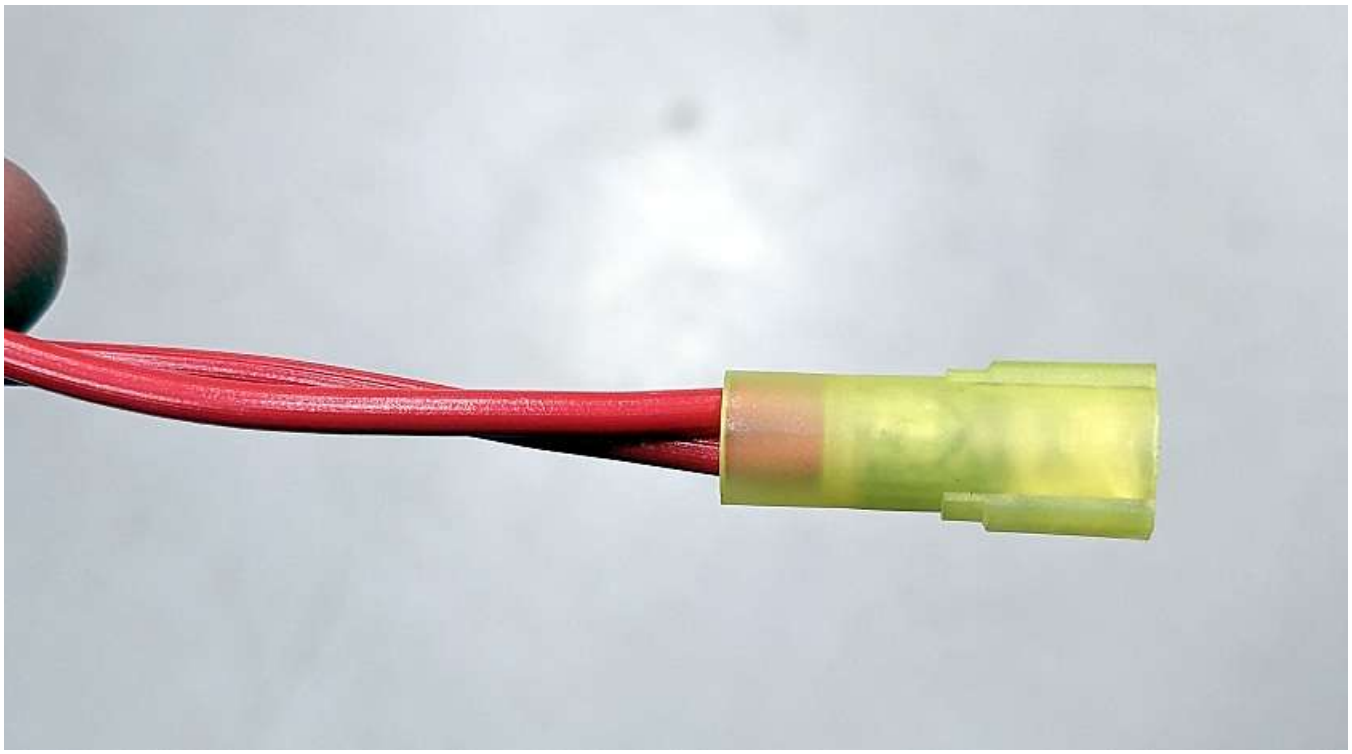
Drill a $^{3}/_{16}$” hole at the grounding location.

Sand the frame for the ring terminal then attach the ring terminal using the #14x ½” screw and $^{3}/_{8}$” socket.



Cut the right side red wire and add the ¼” female terminals to the end.

Keep the remaining red wire for wiring the switch later.



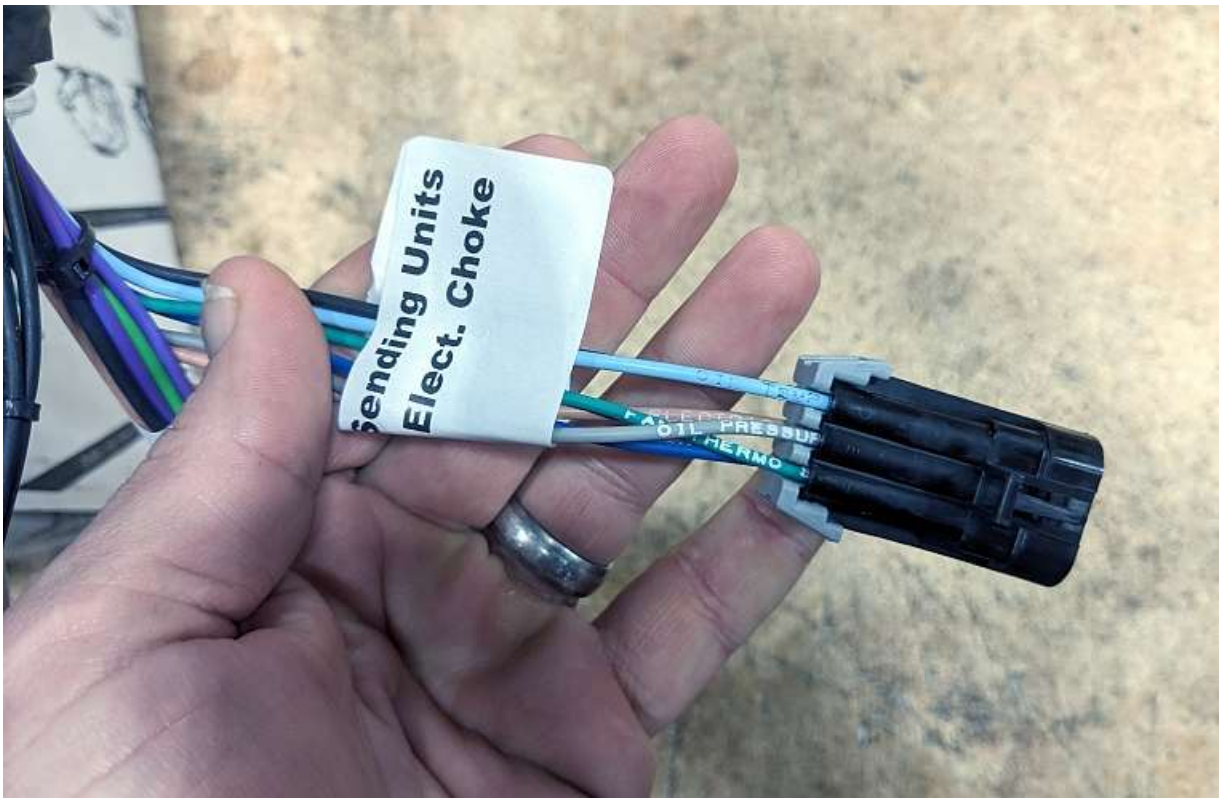
On the left side cut and twist the red wires together before inserting into the connector. Same with the black wires.

Inside cockpit

Dash electrical components

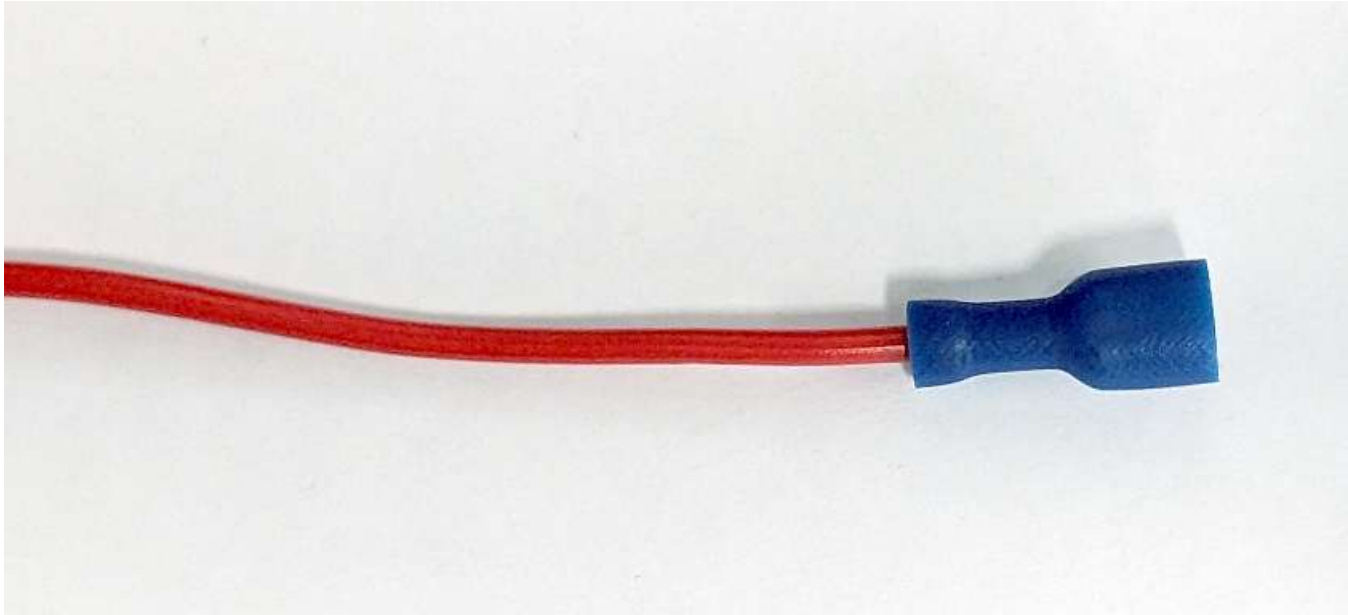
Wiring refers to the FFR chassis harness

✋ If using the A/C or Wiper option you may need to locate another 12v source.



Locate the tan electric choke wire in the sending unit plug near the middle of the dash area.

Cut the electric chock wire from this connector.
Attach the remaining piece of red wire using the blue butt connector.



Connect blue terminal connectors to both red wires in the cockpit area for the driving lights. These will connect to the dash switch in any orientation.

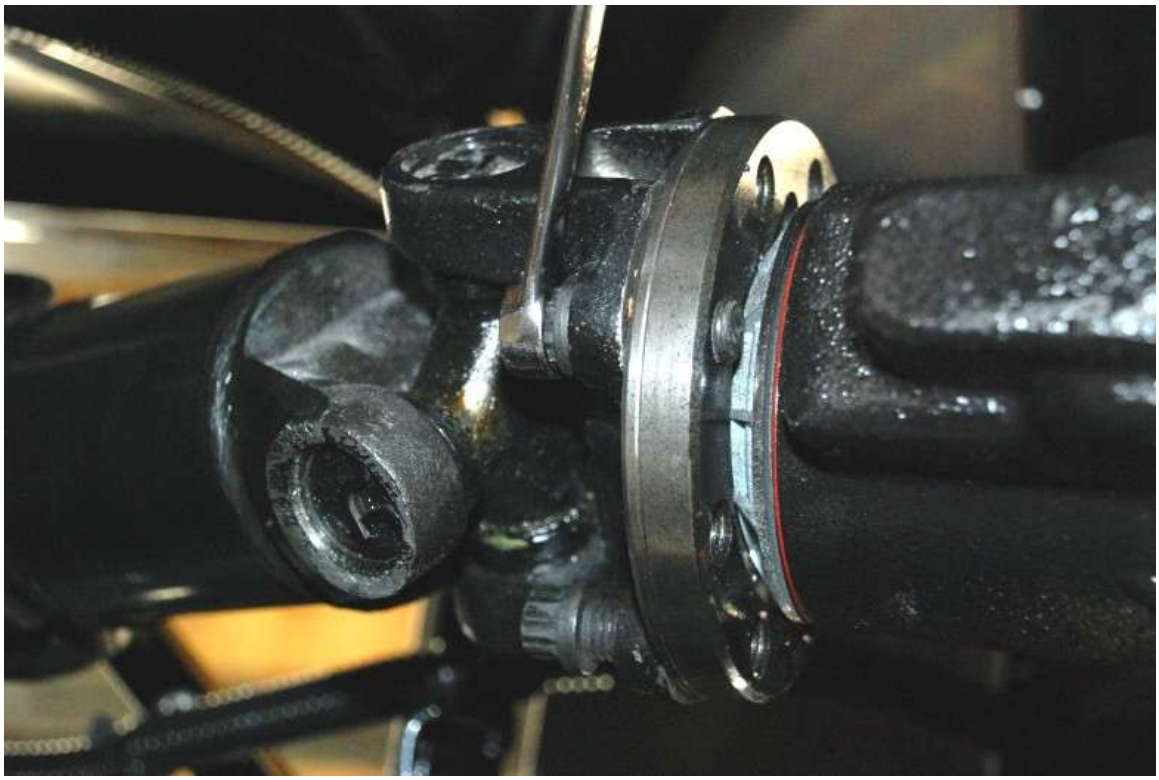
Driveshaft

🛠 14mm wrench, thread lock
🚗 Driveshaft
✋ Base kit - If not already done, the driveshaft should be shortened to the length specified in the appendix for the engine/transmission combination being used.

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 lock 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)**.

Bolt the rear flange to the driveshaft adapter and torque the bolts to **95Nm (70 lb-ft)**.

Cooling System

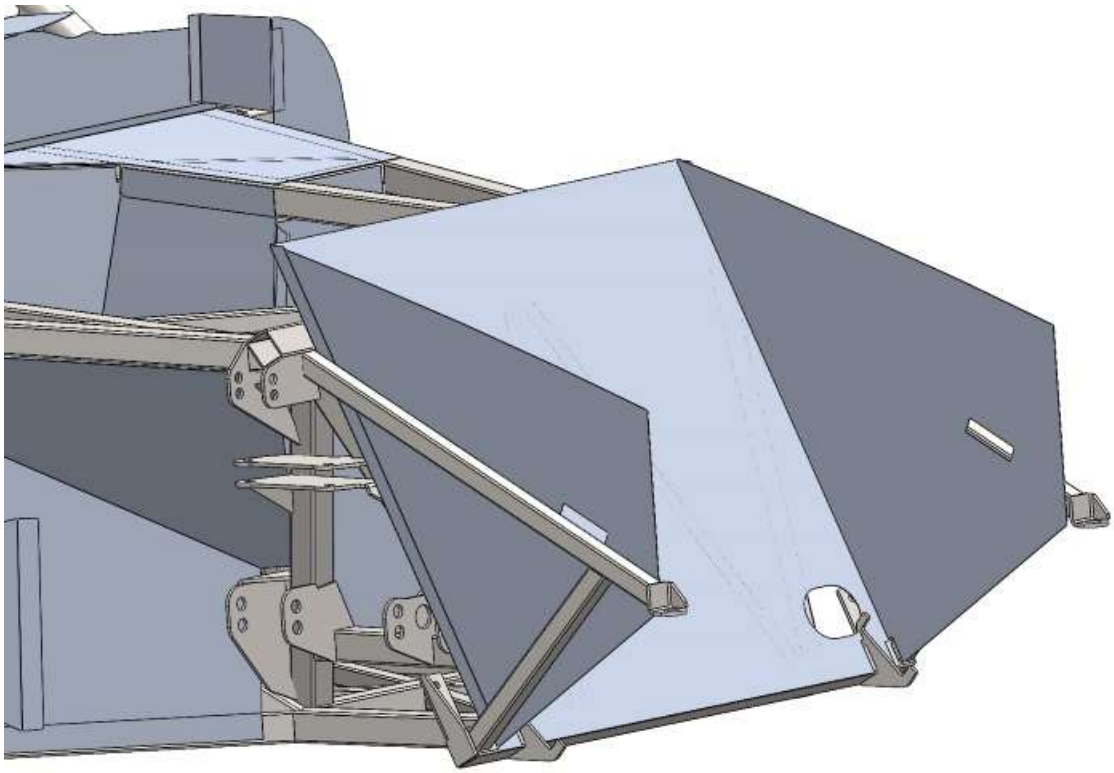
🛠 Marker, Hack saw, Insulated Clip hardware, Drill, ¼" drill bit, $^{3}/_{16}$" Hex key, $^{7}/_{16}$", ½" wrenches, ruler, flathead screwdriver, razor knife.

🚘 Fan mounting components, Radiator mount components, Stainless Radiator Hose kit, cooling system, insulated clip hardware, packaged aluminum

Unpack the roadster cooling system assembly.

Aluminum Duct

Silicone, drill and rivet the radiator duct back to the frame.



Silicone, drill and rivet the radiator duct sides to the duct back and the nose hinge support tubes.

Fan Mounting

🛠 $^{1}/_{8}$" hex key, $^{3}/_{8}$", $^{7}/_{16}$" sockets, $^{3}/_{16}$" drill bit, drill, ratchet.
🚗 Fan, Fan mount, fan mount strap, #10 x $^{5}/_{8}$" black button head screws, #10 locknuts

Unpack the fan mounting hardware.

Insert the fan mount 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.

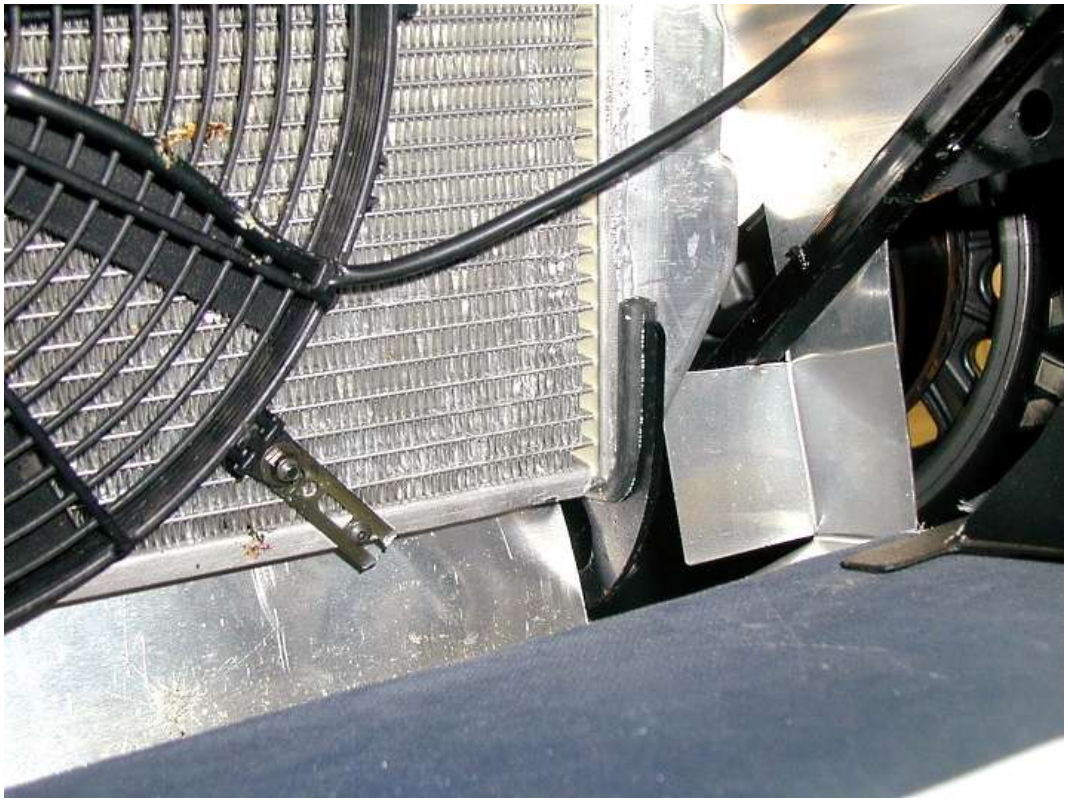
Place the fan on the radiator and rotate the mounts so that the smaller holes line up with the radiator flange then drill $^{3}/_{16}$" holes through radiator flange using the mounting strap holes as a guide.

Attach the radiator mounting strap to the radiator using the #10 x $^{5}/_{8}$" button head screws, nuts, $^{1}/_{8}$" hex key and $^{3}/_{8}$" socket.

Radiator Mounting

Use a razor knife and slit the 8.5” long sections of fuel line lengthwise.

Push the slit sections of fuel line onto the lower radiator frame mounts at the front of the frame and trim off any extra.



Slide the cut rubber tubing over the radiator mount and install the radiator from above the frame.

Attach some half-moon stick on weather stripping to the underside of the radiator top mount bracket. Position the top mount bracket so that the small tab sticking up is on the rearward side of the bracket.

Pass the mounting tabs through the holes in the side aluminum pieces.

Drill the holes to mount the radiator top mount bracket to the two 1” nose tubes on the chassis.

Attach the radiator top mount bracket to the frame using the $^{5}/_{16}$” x 1.5” button head screws, locknuts, washers, $^{7}/_{16}$” socket and ratchet.

Radiator Hoses

- 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.

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.

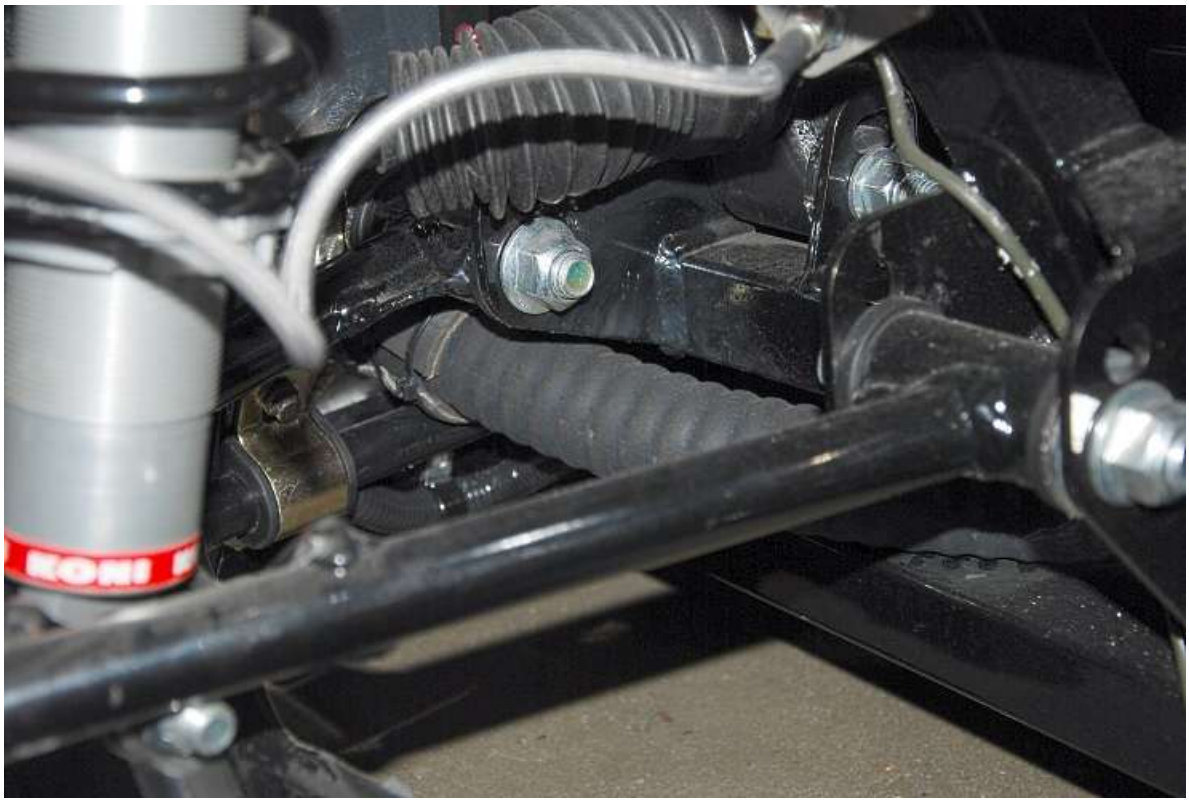
Then fit the larger adapters over them.

Upper radiator hose

Starting at the engine, attach the inline filler to the engine exit.
Attach stainless tube to the inline filler then route the tube under the angled frame tube and through the aluminum radiator duct hole to the upper radiator hose location.
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 hose to the radiator.



Run the tube under the lower control arm mount and attach the stainless hose to the end using an adapter then to the engine.

✋ 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

Unpack the overflow assembly.

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.

Attach the larger radiator hose to the inline filler.

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.

- 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.

Aluminum panels

🛠 Drill, 1/8" drill bit, Silicone, Caulking gun, Rivet gun

🚘 Roadster Secondary Body Fasteners Components, Packaged Aluminum, mounted aluminum

Trans tunnel sides aluminum

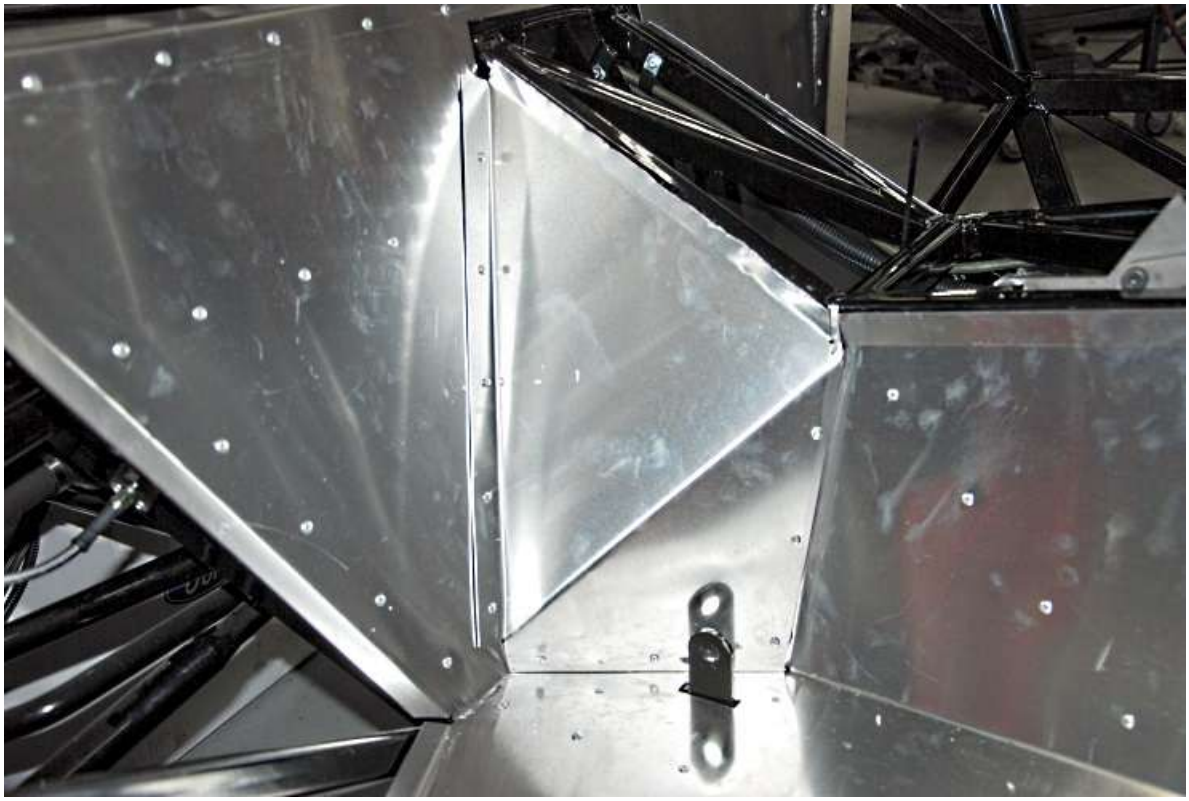
Drill and rivet the cockpit transmission side aluminum panels in place.

Transmission Tunnel Cover

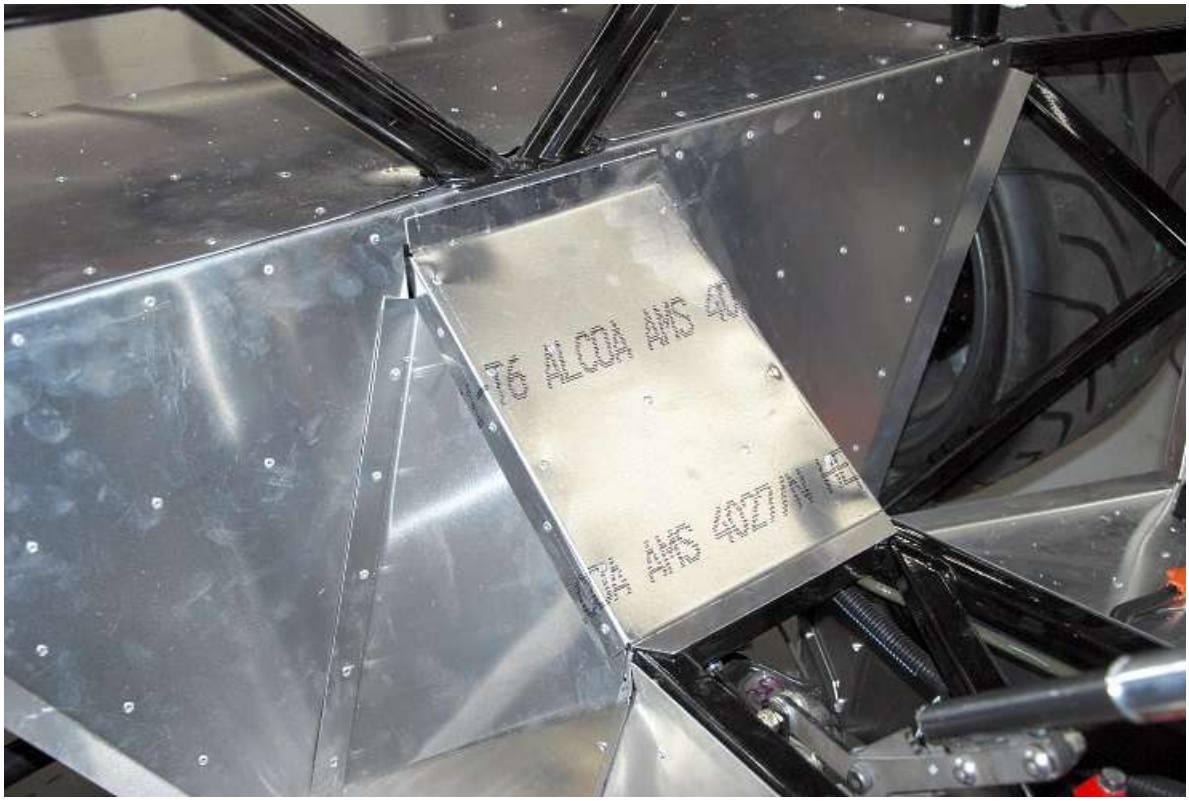
Silicone and install the transmission tunnel top.

Cockpit rear inside aluminum

🛠 ¼” nut driver, drill, 1/8” drill bit, rivet tool.
🚗 Secondary body fasteners, kit aluminum.



Silicone, drill and rivet the inside cockpit corner aluminum panels to the frame.



Silicone, drill and rivet the driveshaft cover aluminum panel to the frame.

Left outside footbox aluminum

🛠 ¼" nut driver, drill, 1/8" drill bit, rivet tool.

🚗 Secondary body fasteners, kit aluminum.

✋ Make sure all of the clutch/brake switches and any other pedal adjustments are done before install.

Silicone, drill and rivet the left footbox outside aluminum panel to the frame.

Left door hinge inside covers

Silicone, drill and rivet the left door hinge inside cover to the frame.

Hatch floor

🛠 1/8" drill bit, silicone, rivet gun, caulk gun.
🚗 Mounted Aluminum, Packaged Aluminum, secondary body fasteners

Start with the hatch floor front panel. Silicone and rivet in place. To install, put the right side in as far as possible.

“S” the panel so that the middle right side can clear the rollbar.

Bow the left side to get the left side to clear the rollbar.

Final panel installed.

Insert, silicone and rivet the rear panel in place.

Under door aluminum

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

- Packaged Aluminum, secondary body fasteners

Silicone drill and rivet in the under-door aluminum panels.

Exhaust

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.

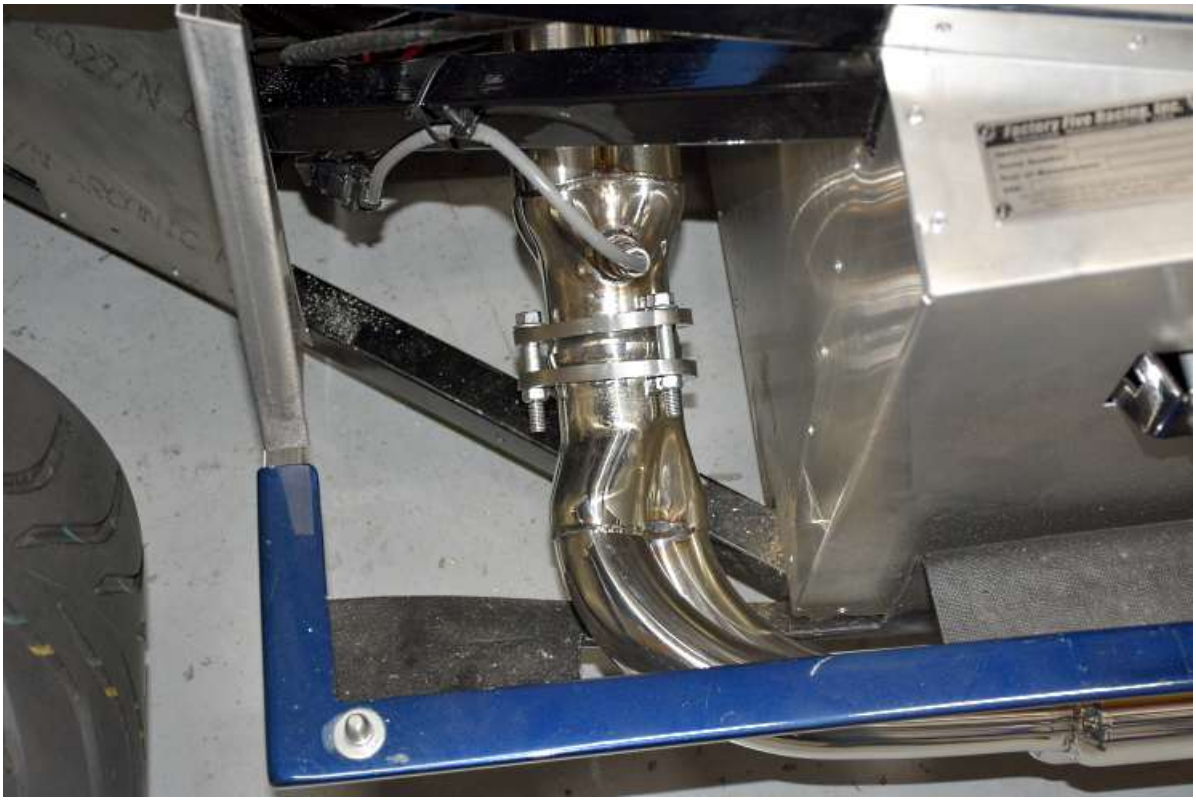
Mount the headers to the engine. If you are using full length headers they bolt in place with the gaskets and hardware provided. Thread locker is recommended.

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.

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

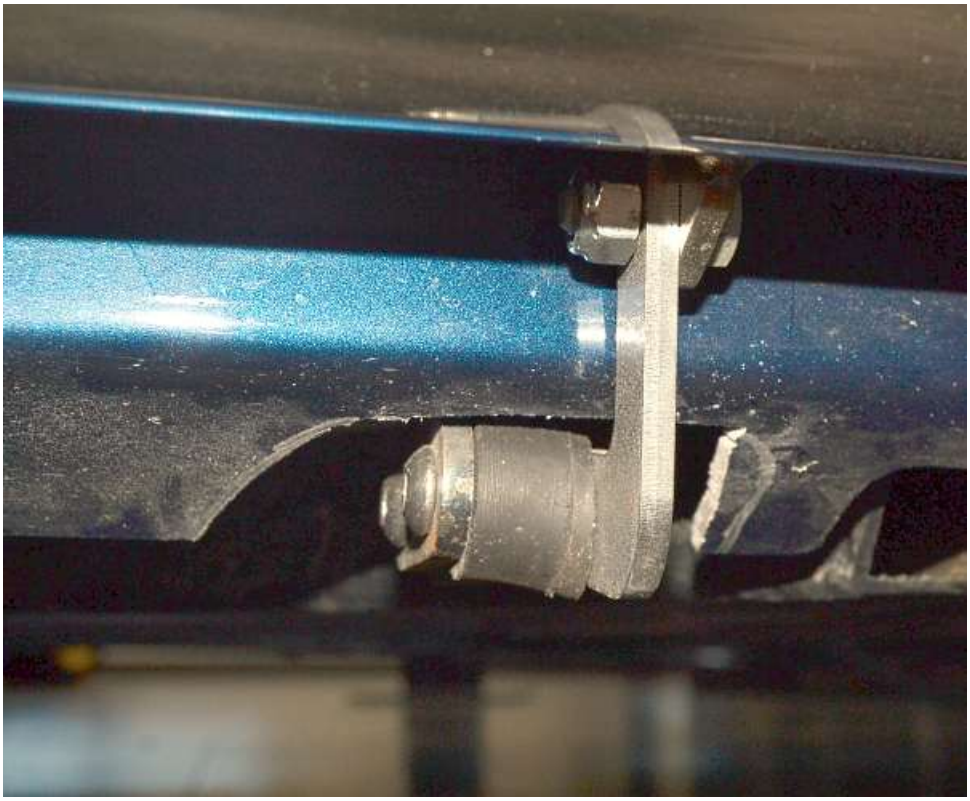
Side Exhaust

🛠 $^{3}/_{16}$", $^{5}/_{16}$" Hex key, ⅜", ½", $^{9}/_{16}$" socket, ratchet, $^{9}/_{16}$" wrench, drill, $^{3}/_{16}$", $^{5}/_{16}$" drill bits
🚘 Side Exhaust



Bolt the side exhaust to the header or J-pipe with using the ⅜” x 2.50” bolts and mechanical locknuts leaving the bolts loose enough so the pipe can rotate.

Assemble the side exhaust mount parts, right side shown.



Attach the frame mount to the rear side of the pipe mount tab and attach it to the underside of the 1.50” tubing using the #10 x 1” self-tapping screws. Right side shown.

Seats Harness

🛠 ¾” wrench, ¾” socket, ½” drill bit, drill, ratchet
🚘 Seat Harness/Fasteners

Unpack the seat harnesses and hardware.

Position the lap harnesses make sure to have the red release handle on the right side of the seat.

Bolt the lap harnesses to the frame. Inside mount (left), outside mount (right).

Remove the mounting tab from the harness.

Loop the harness over the roll bar crossbar.

- The shoulder harnesses are side specific so make sure you have the sides correct.

Follow the manufacturer's directions inside the seat harness boxes on how to loop the harness straps through the slider bracket.

Adjust the harnesses to where they fit you comfortably.

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.
Remove the seat cover if attached.
Drill the first hole for the seat mounting and install the bolt.

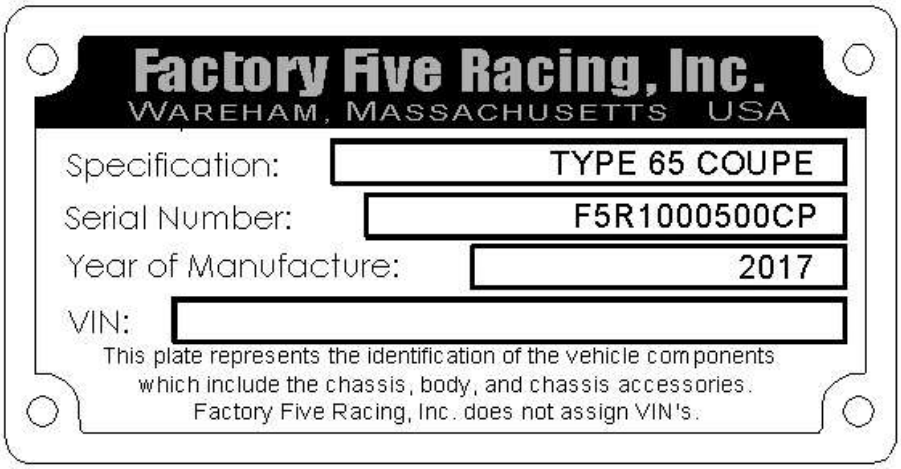
Drill the remaining holes for mounting the seats and install the bolts.

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

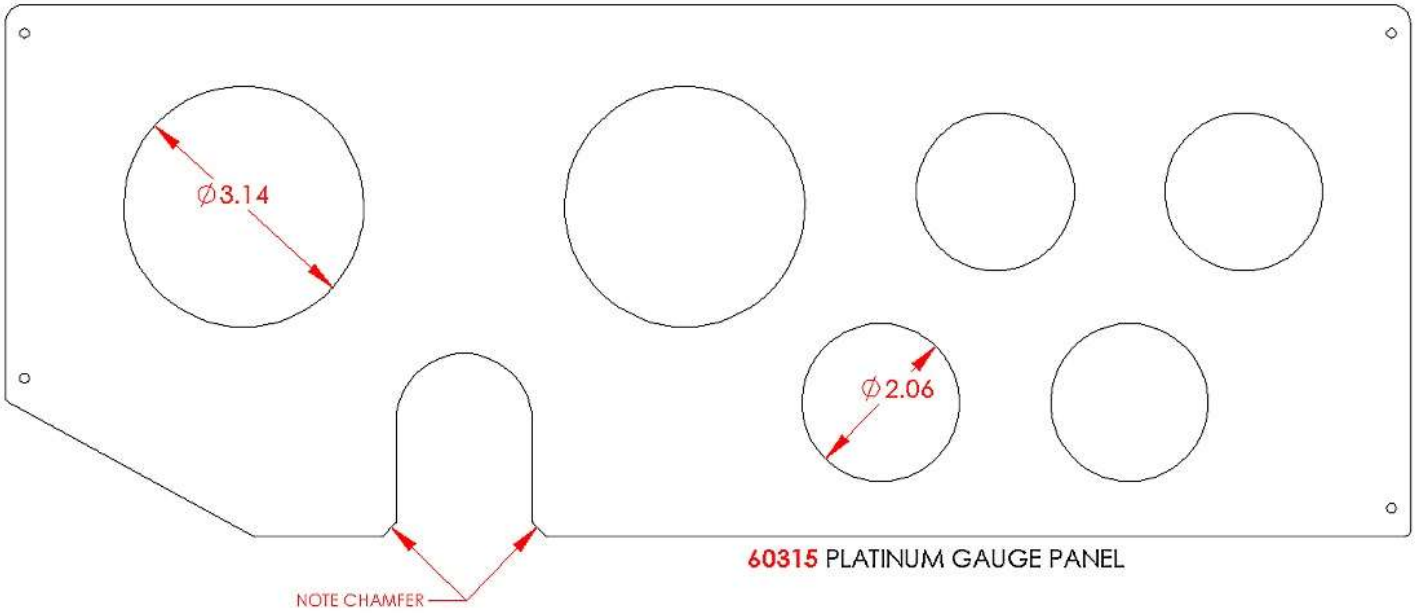
Gauges and Dash

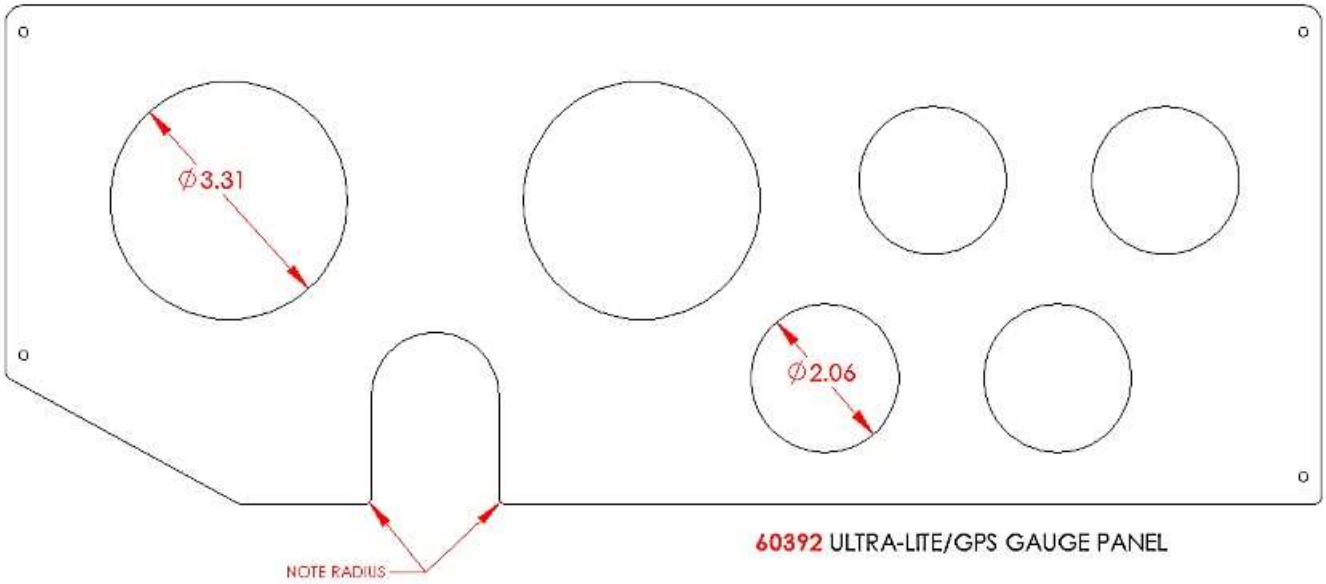
🛠 Tin snips, pliers, drill, $^{7}/_{64}$", $^{1}/_{8}$" drill bit, silicone, caulking gun, rivet gun, wire crimper, wire stripper, Philips screwdriver.

🚗 Gauge set, dash electrical components, cut dash, packaged aluminum, dash electrical components, electrical system completion components.

✋ If using the factory Five Coupe GPS gauges have built-in indicator lights so the large dash mounted ones included are not necessary.

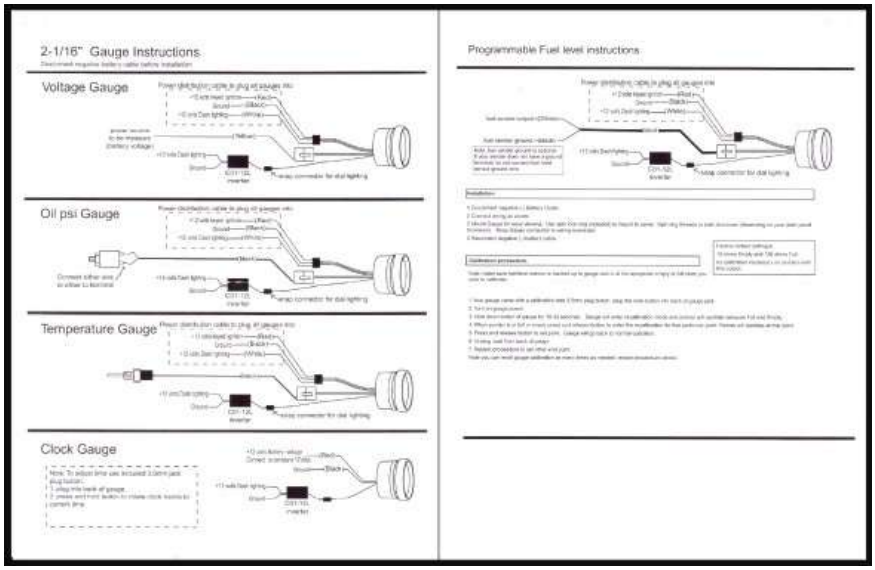
Unpack the dash and the gauges.



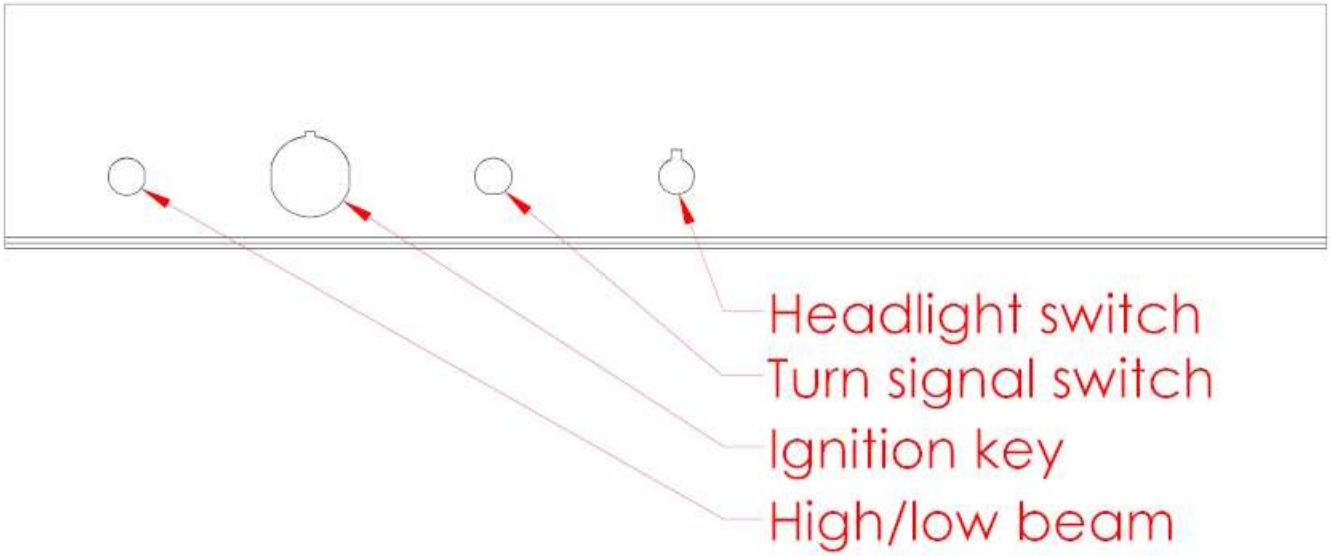


Depending on which gauges you are using you may need a different aluminum part for the correct gauge size. The standard gauges are the Platinum gauges.

Install the gauges in the gauge panel.



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



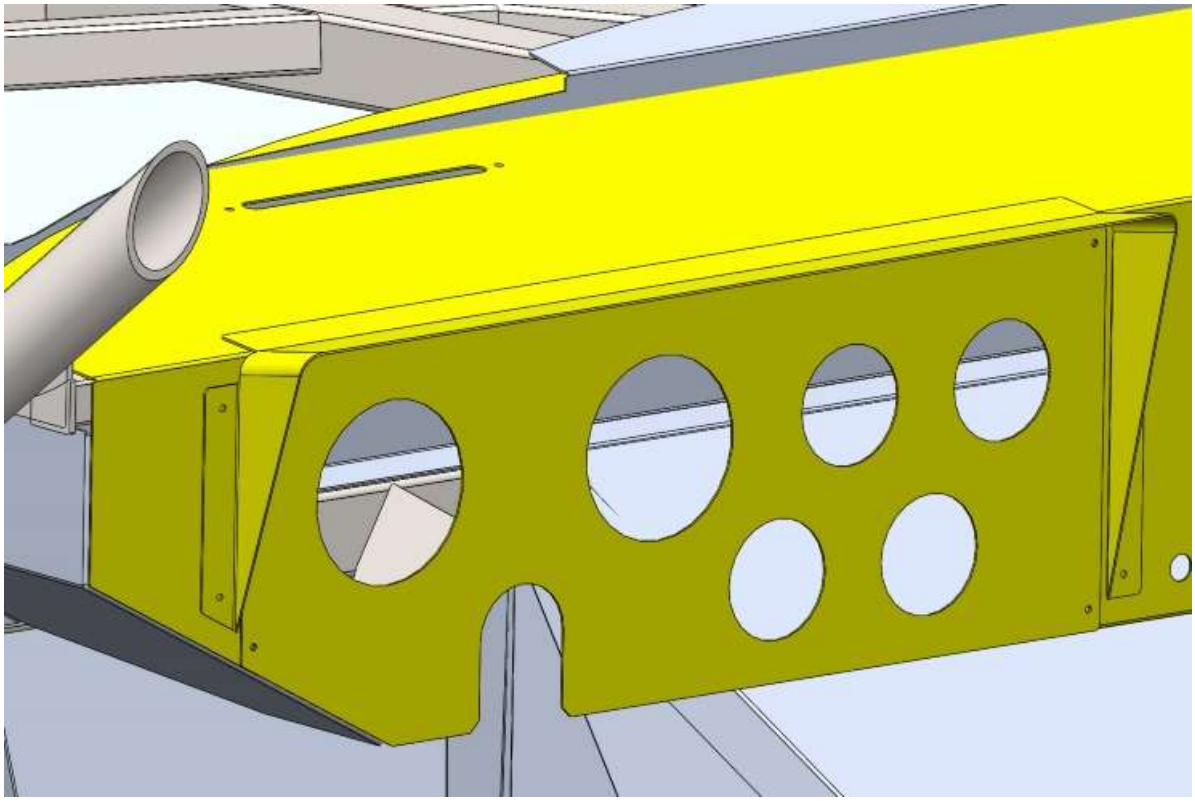
Install your switches in the dash. The horn button can be located where desired. Locate and drill a hole for your driving lights if used.

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

If being used, drill ½" holes and mount the turn signal and high beam indicators in the gauge panel. The red light can be used as a warning light for the engine controls if desired.

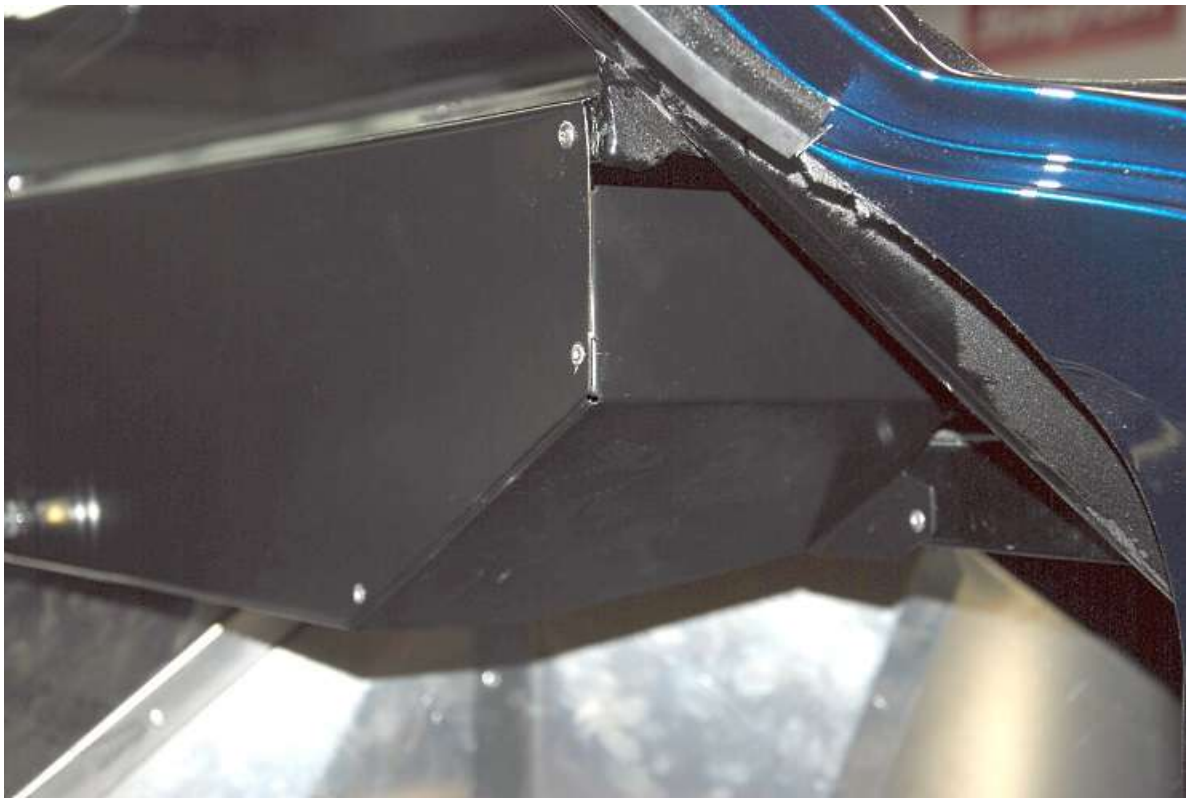
Push bulb weatherstrip on the front edge of the dash.

Attach the dash onto the chassis by drill four 4 $^{7}/_{64}$" holes, two of them through the top gauge panel holes and using the black #6 screws and a Philips screwdriver.



Attach the gauge visor to the dash using rivets.

Locate the dash side panels. Right side shown.



Attach the side panels to the ends of the dash and the frame using $^1/_8$" rivets.

Steering Wheel

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

🚘 Steering wheel, (6) M6-1.0 x 30mm screws, (6) M6 nylon locknuts, (1) $^{3}/_{8}$"x 1" socket head cap screw

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 using the $^{3}/_{8}$"x 1" socket head cap screw. Use thread-locker on this bolt.

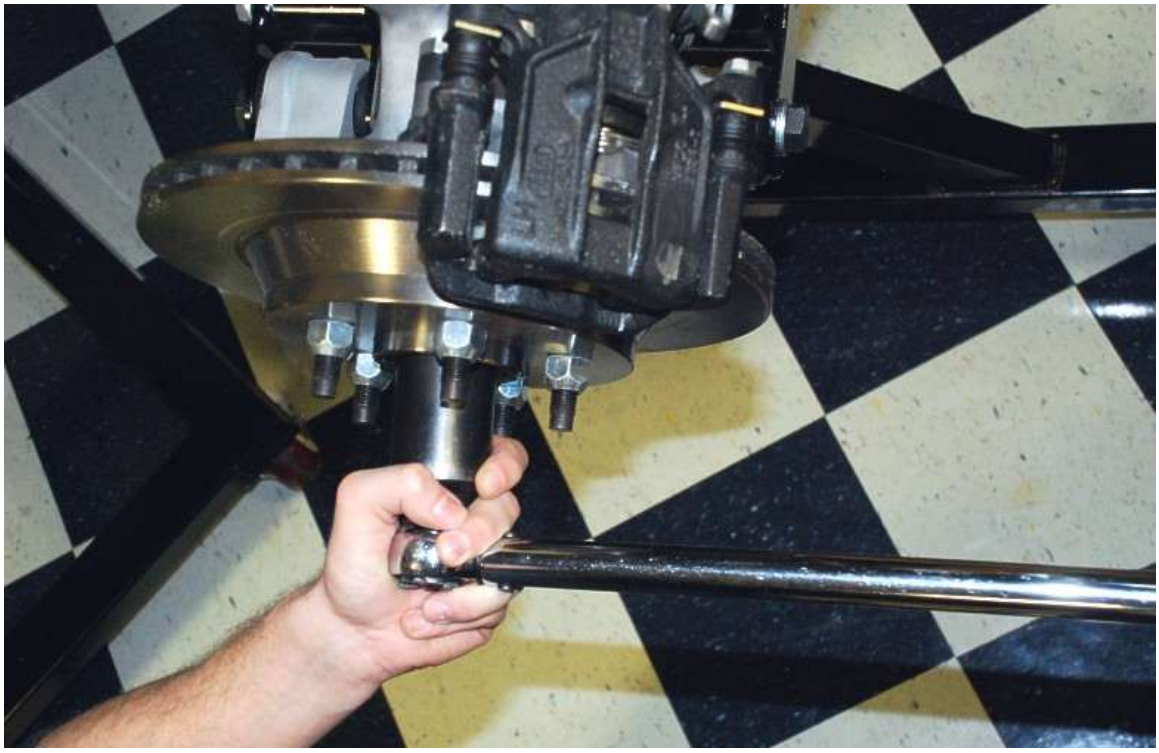
Rolling Chassis Check

Front Suspension

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.

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.

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.

Grease fittings

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.

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.

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 the firewall even if you are just test fitting the panels.

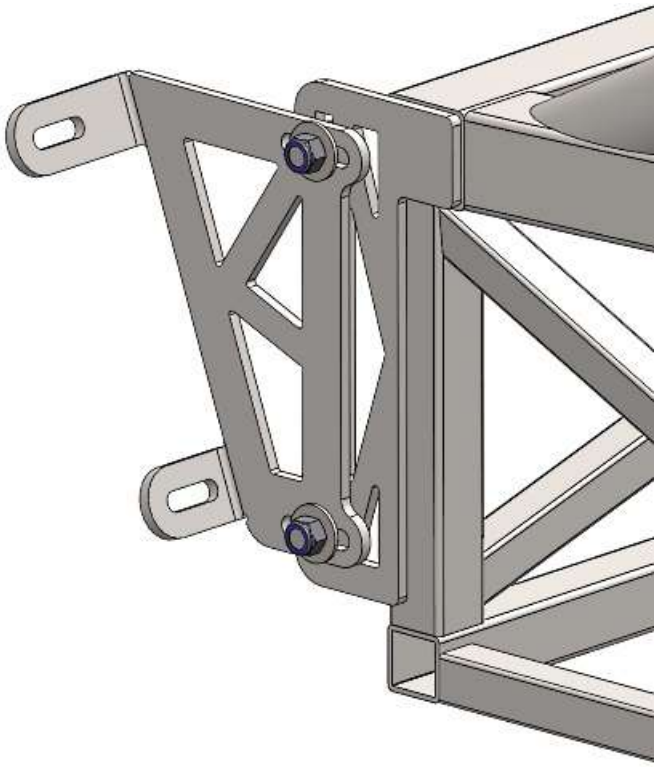
Locate the push-on bulb seal (part #10761) from the secondary body fasteners assembly.

Push weather strip goes across the top of the firewall on either side of the windshield support flange.

Push weatherstrip around the radiator aluminum.

Rear body mount

- Rear body mount components (mounted)
- ½” socket, ratchet



Attach the rear body mounts to the frame using the $^{5}/_{16}$” x ¾” carriage bolts, washers and locknuts using a ½” socket. Center them in the slots.

Body Mounting

- Gloves
- Body
- The body will be trial fit/adjusted along with the doors to ensure everything fits before the body and parts are painted. All of the trim accessories will also be trial fit/adjusted. Since the rear clip is one piece, get two people to help when you’re ready to position the body onto the frame. The body is delicate but can be pulled around the frame without any problems.
- If body cut outs were ordered, the side exhaust, side louver, headlight, taillight, turn signal, wiper, gas cap, and side mount holes are done at the factory. The body comes standard with the large nose hole cut.
- It is smart to have some help when doing this step. Much of the positioning is push and pull until all hole’s line up. The fiberglass edges can be very sharp. Wear gloves when lifting or holding the body.

Using three people, one on each side holding the door and side exhaust recess and one in the rear, move towards the frame from the rear with the back slightly lower than the front.

Pull the sides of the body out to clear the frame.

Watching the rear of the frame, move the body forward slowly lowering the front.

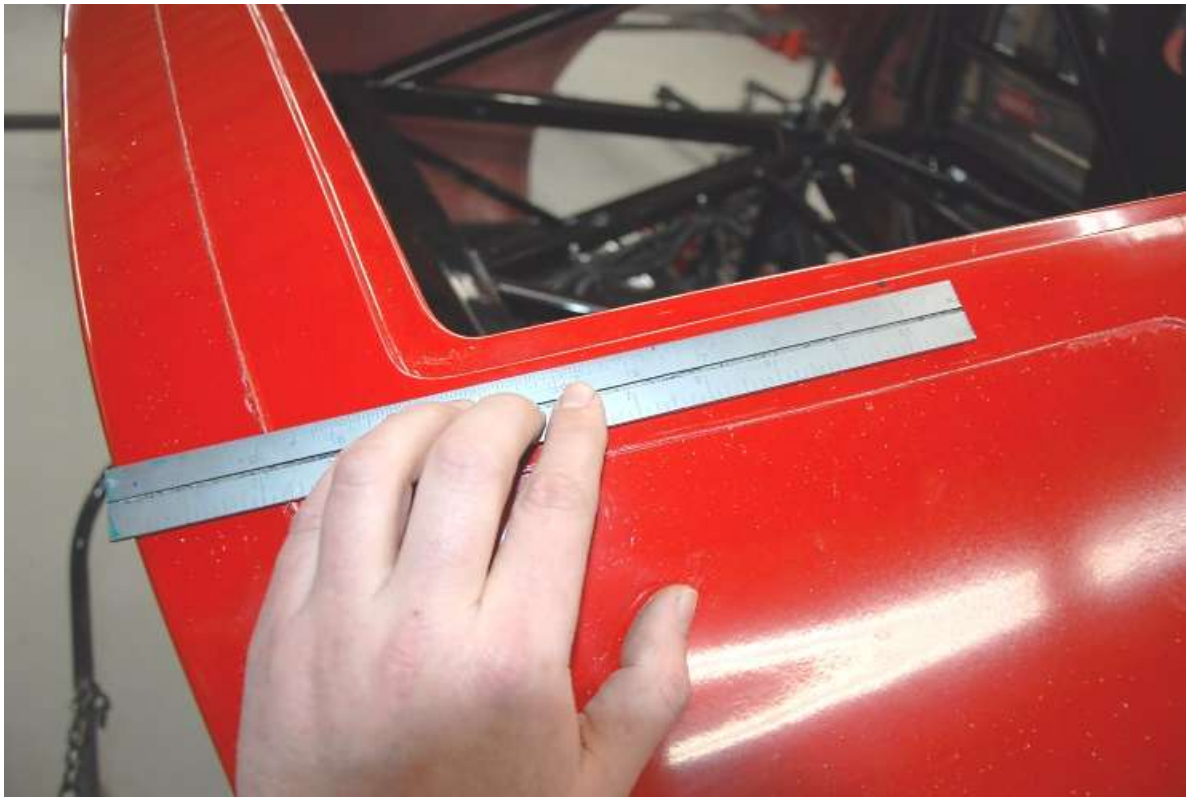
Watch the door hinge mounts.

Move forward until the rear hatch tubing is lined up with the lip on the body and put the body down in place.

Locating

🛠 Ruler, long level, marker, floor jack, tape measure

Once the body is sitting down on the frame inside the door area, adjust it forward or backwards so that there is a 0.25” gap between the body and frame at the front of the door area.



At the back of the body measure up 7” from the bottom corners of the hatch opening and mark the body.

Put a long level in the back of the hatch opening.

Use masking tape to hold the level at the 7” marks.

From the side of the hatch area, measure over 18” and mark the level. This should be the center of the opening.

At the center point marked on the level, use a floor jack to raise or lower the body so that the bottom of the level is 10.25” up from the frame.

In the rear wheel well area, measure horizontally from the frame shock mount over to the edge of the wheel well. This should be the same on both sides of the car.

Rear body mount

🛠 Drill, $^{5}/_{16}$" drill bit, ½" socket, ratchet, $^{5}/_{32}$" hex key, friend

🚘 (4) $^{5}/_{16}$" x 1" button head stainless screws, washers, and locknuts

Drill $^{5}/_{16}$" holes through the middle of the rear body mounting bracket slot and into the recessed rear part of the body.

Bolt the body to the bracket with the $^{5}/_{16}$" x 1" button head stainless screws, washers, and locknuts using a ½" socket, $^{5}/_{32}$" hex key and a friend.

Use a couple of the aluminum attachment screws through the bottom of the door opening into the tube.

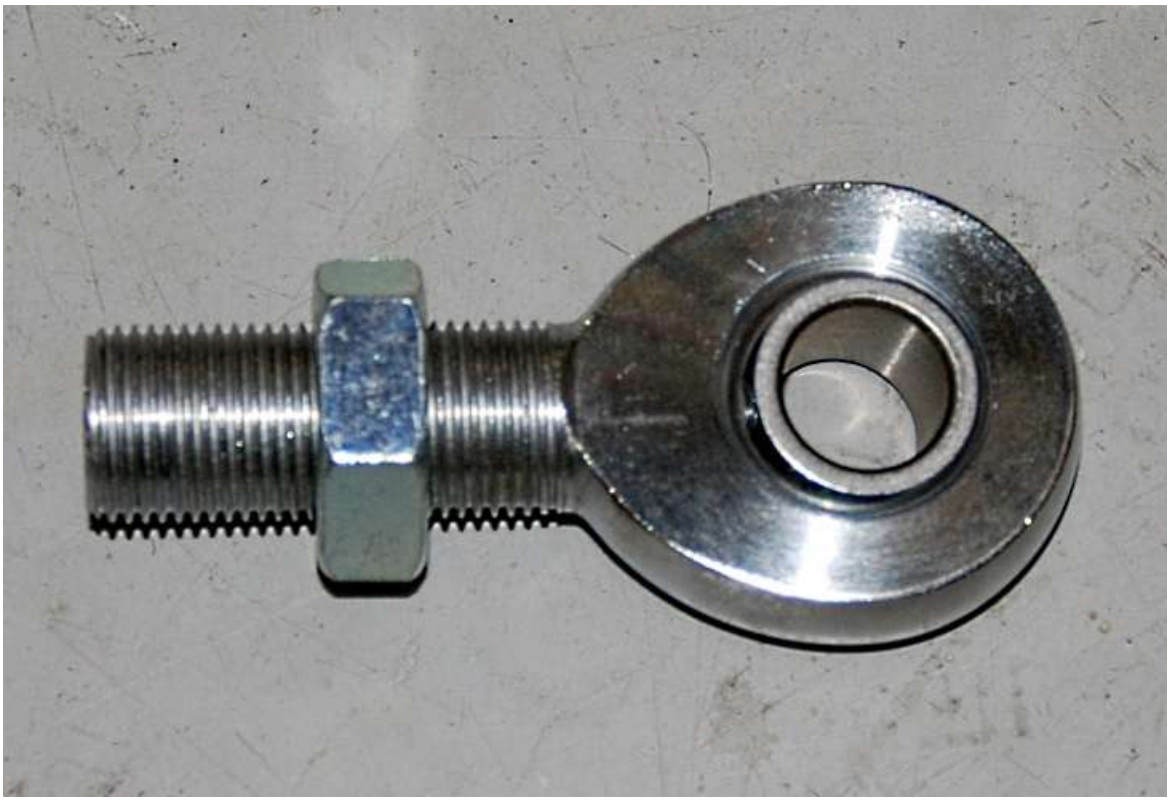
Side body cuts

Drill $^{5}/_{16}$" holes at the top side locations where the lower 1.50" frame tubes will hit the side of the body and cut the body for clearance.

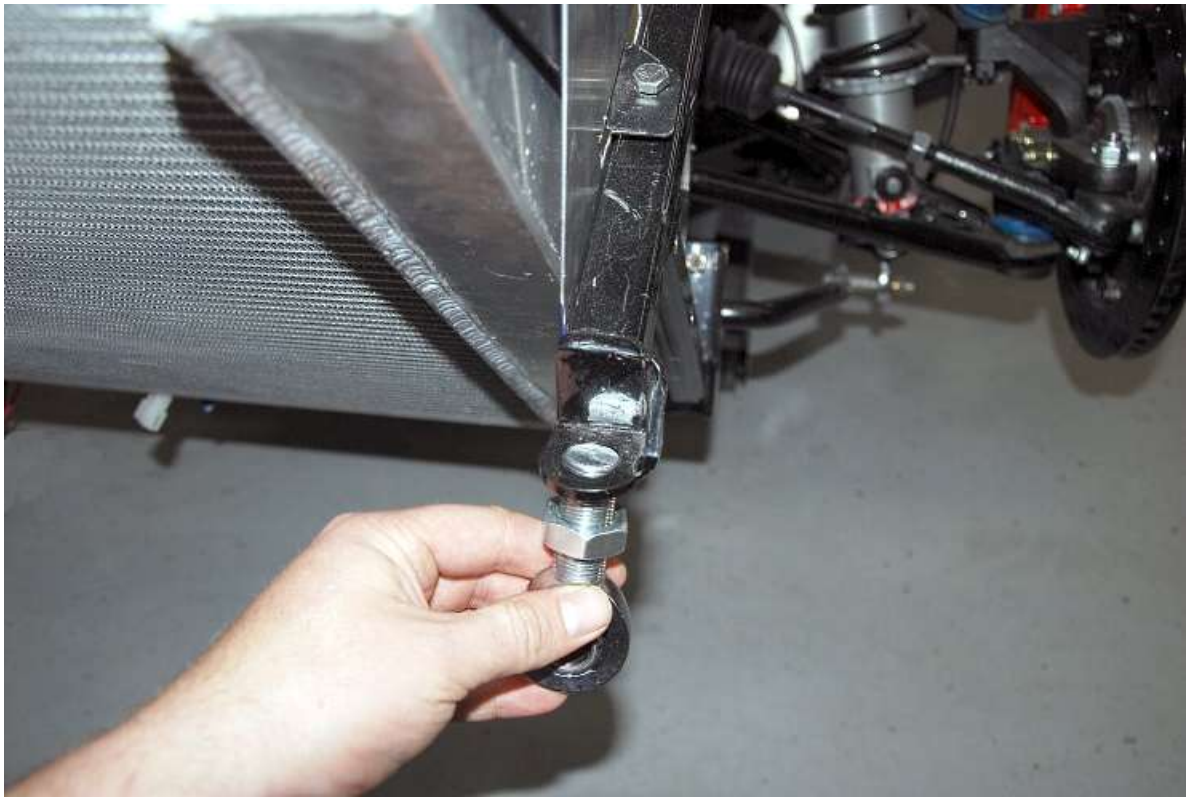
Nose Hinge

🛠 $^{15}/_{16}$" socket, $^{15}/_{16}$" wrench.

🚘 Nose fasteners – (2) $^{5}/_{8}$"x 3" bolts, washers, nylon locknuts, $^{5}/_{8}$" ID x $^{3}/_{8}$" spacers



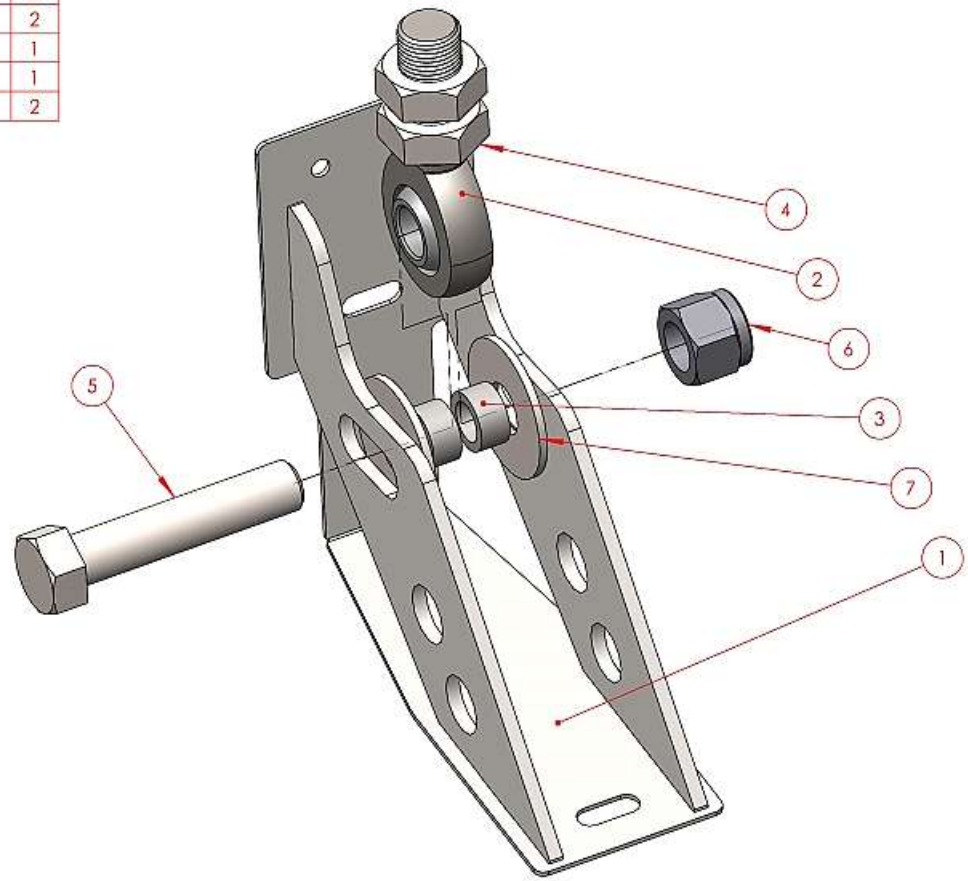
Screw the jam nut half way onto the rod end.



Put the end of the rod end up through the nose mount at the front of the frame loosely putting another jam nut ono the end of the rod end.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	60391	NOSE HINGE BRACKET	1
2	12348	12348 - 3/4"-16 THREAD x 5/8" BORE ROD END	1
3	33239	0.675" SPACER	2
4	12380	JAM NUT, RIGHT HAND THREAD	2
5	12382	5/8"-11 x 3" BOLT	1
6	12383	NYLON INSERT LOCKNUT, 5/8"-11	1
7	12387	5/8" WASHER	2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	11/8/16	



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	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN	JI	2/14/23	TITLE: NOSE FASTENERS
		COMMENTS:			
	MATERIAL				SIZE A / DWG. NO. 60346 / REV A
USED ON	FINISH				
APPLICATION		PRINTED 2/15/2023			SCALE: 1:2 / WEIGHT: / SHEET 1 OF 2

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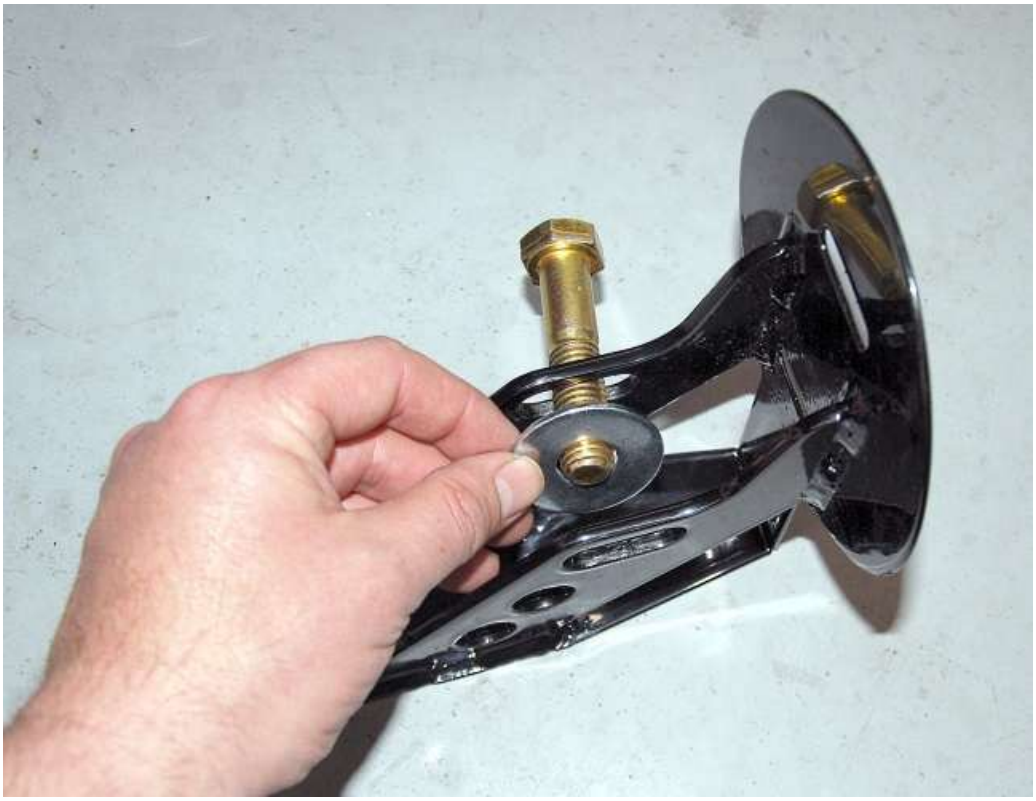
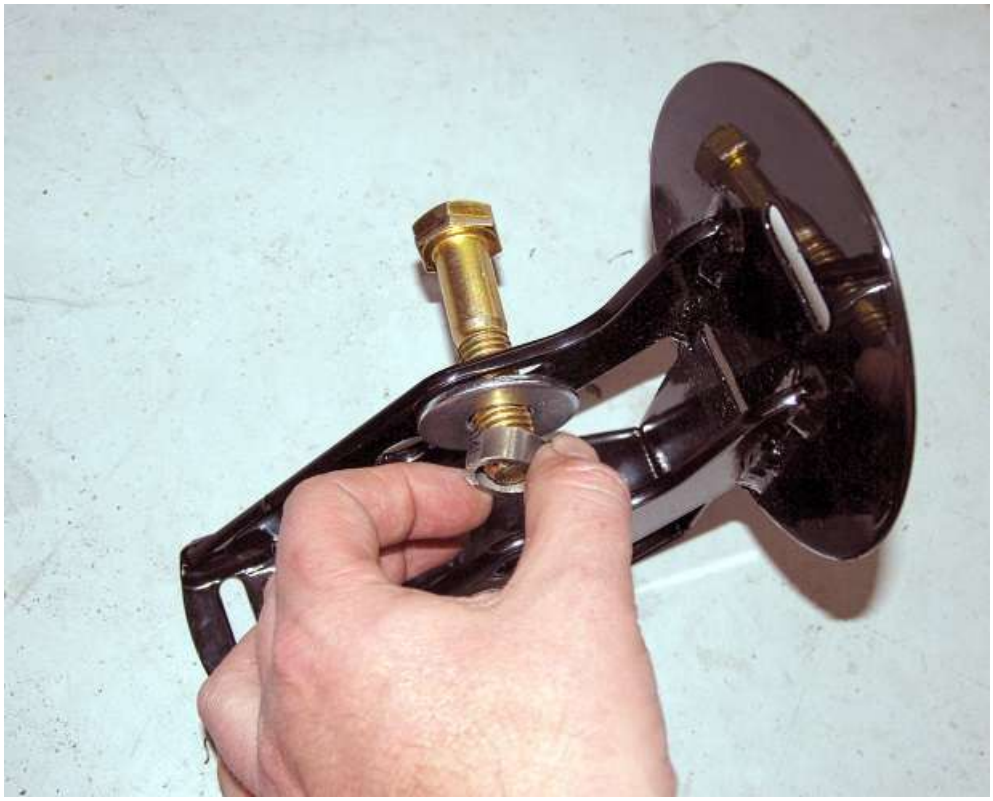
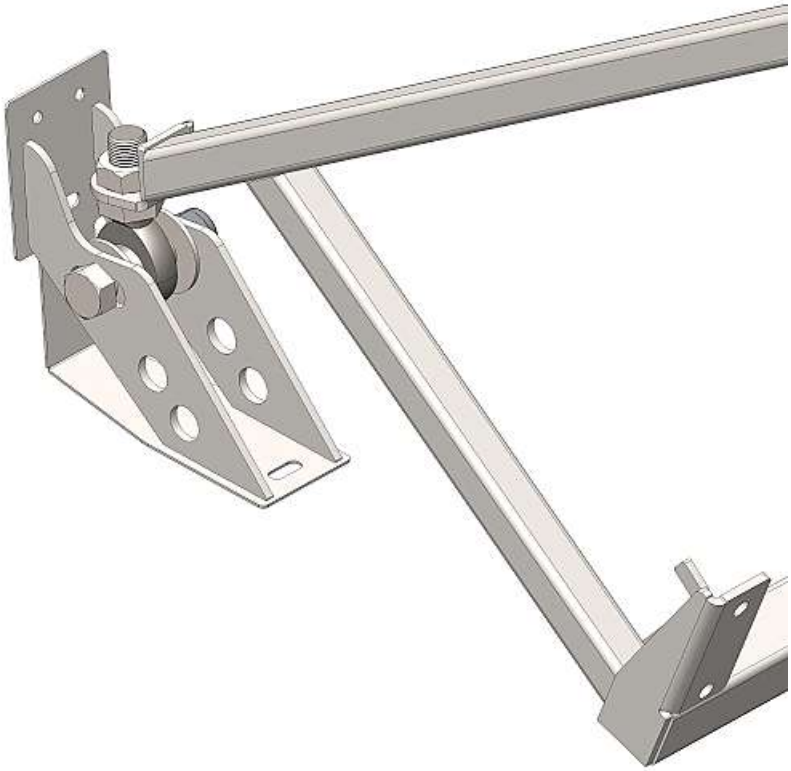


Pass one of the $^5/_8$" bolts through one side of the nose hinge bracket and place one of the $^5/_8$" washers on the bolt. Old bracket shown.



Place one of the $^3/_8$" spacers on the bolt. Old bracket shown.



Hold the hinge bracket up to the rod end on the frame and pass the bolt through the rod end, another $^{3}/_{8}$" spacer, $^{5}/_{8}$" washer, the other side of the bracket and loosely put a locknut on the bolt.

Do not tighten the locknut.

Nose fitment

🛠 $^{3}/_{16}$" hex key, ½" socket, ratchet, tape measure, duct tape, paint sticks.
🔩 $^{5}/_{16}$"x 1" button head screws, locknuts

With the latches unlatched, position the nose on the frame so that the nose mounts are seated on the body and the back side of the fog light holes.
Use jack stands in the front and duct tape on the back to keep the nose in place.
Raise or lower the front of the nose so that the bottom edge of the hood is parallel with the bottom edge of the body above the exhaust area.

Align the rear of the wheel well of the nose with the front of the body.

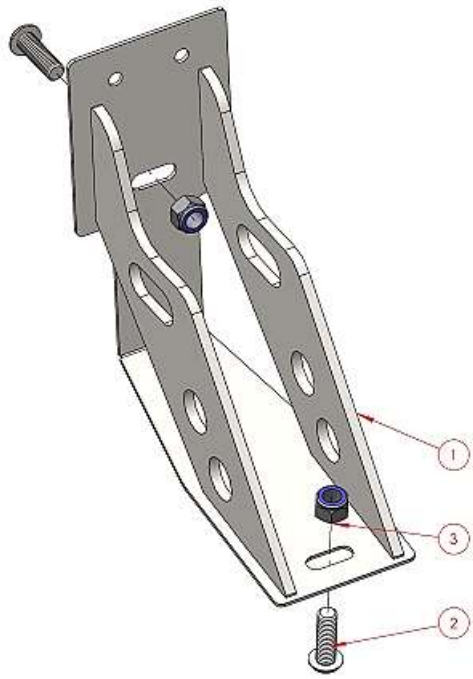
Move the nose around so there is a small gap (i.e. $^{3}/_{16}$") along the backside of the nose against the rear body clip and along the bottom edge of the nose. Use paint sticks or washers in the gap to keep it consistent.

Use a tape measure to measure in the wheel well from the edge of the body to the upper shock mount on one side. Measure the other side and adjust the nose left/right until the measurement is the same. Make sure you are reading same side of the tape measure on both sides (ie, front side of the tape on the left side and the front side of the tape on the right side).

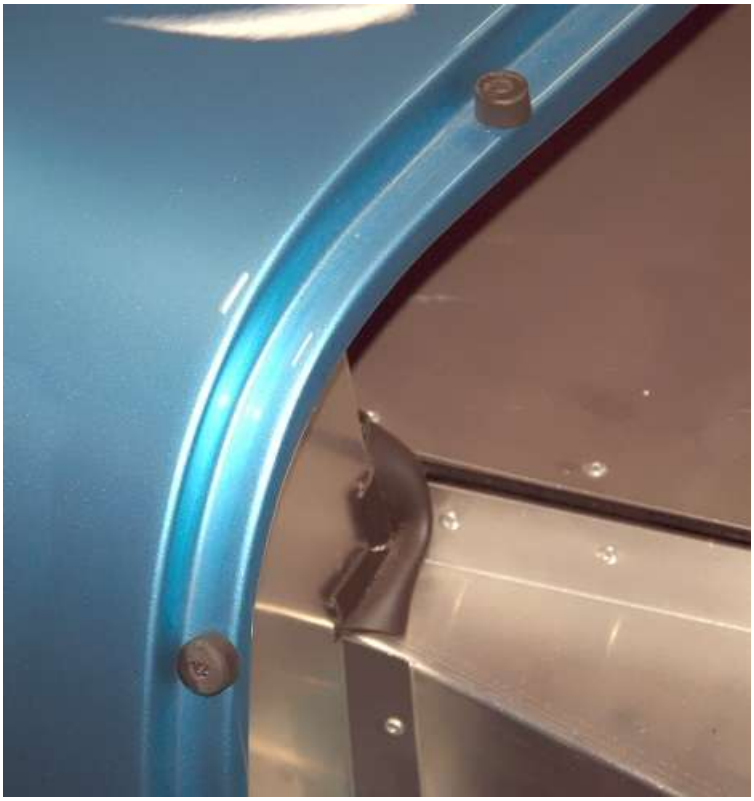
✋ The nose has been trimmed slightly oversized to allow the panel gaps to be sanded down to fit.

If necessary, raise or lower the rod end so that the Nose Hinge Bracket touches the nose and Mark the center of the mounting slots on each of the nose hinges.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	60391	NOSE HINGE BRACKET	1
2	11024	5/16"-18 x 1" BUTTON HEAD	2
3	13963	5/16-18 NYLON INSERT LOCKNUT	2



Drill a $^{5}/_{16}$" hole in the center of the lower fog light mark and the bottom mark made and attach the hinge brackets to the nose using $^{5}/_{16}$"x 1" button head screws, locknuts, $^{3}/_{16}$" hex key and ½" socket.



Put the small bumpers around the edge of the nose opening and try closing the nose so that the nose height is even with the body. 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. An easy way to set the gap is by using a marker. With the panel in place, run a marker around the edge of the panel so that it tubs the body lip all of the way around. This will leave a line on the panel that may be thicker or thinner in areas.

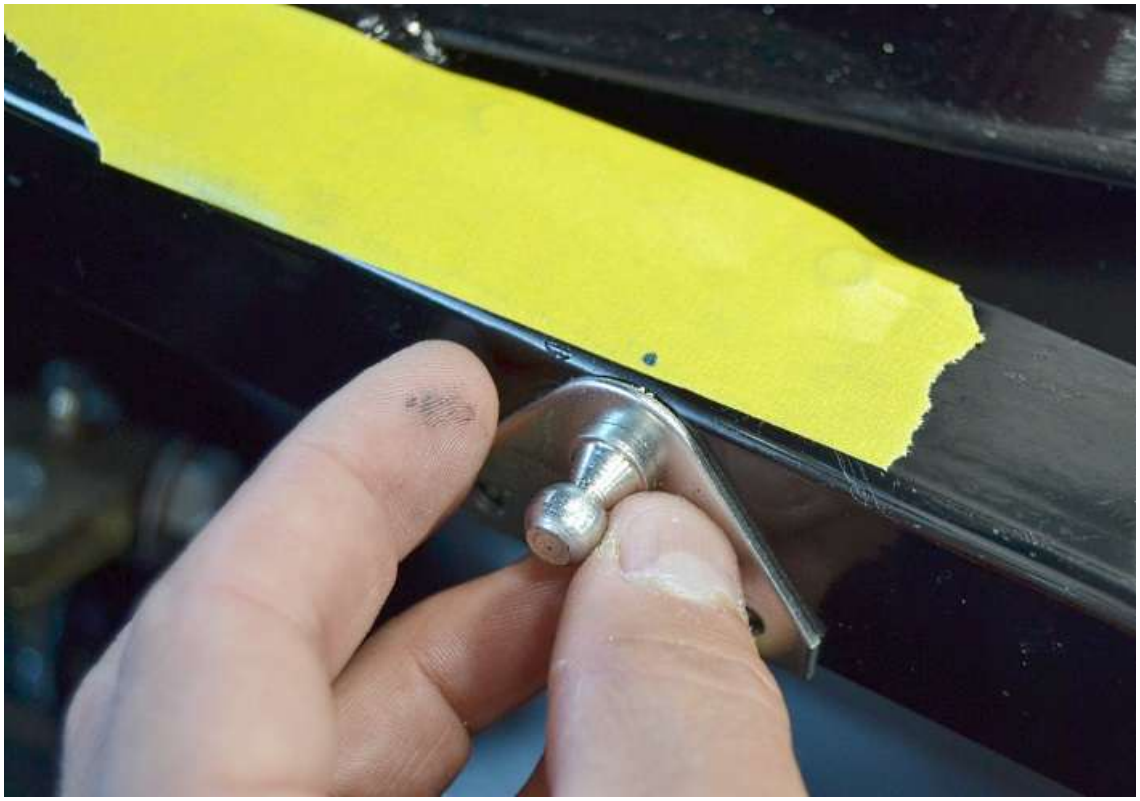
Sand, grind or cut the panel back so the marker line cannot be seen. Remount the panel and the resulting gap should be the same around the whole panel, about $^{3}/_{16}$".

Repeat this gap procedure later after mounting the doors.

Nose gas Struts

🛠 Marker, masking tape, $^{3}/_{16}$" drill bit, drill, rivet tool, $^{1}/_{8}$" hex key, $^{3}/_{8}$" socket, ratchet.
🚘 (6) 10-32 x $^{5}/_{8}$" black button head screws, nylon locknuts

In the engine bay measure back along the outer 1.50” tube behind the top shock mount 9.00” and mark the edge of the tube.



Hold the strut mounting bracket on the side of the tube so the ball stud is aligned with the mark made and the bottom of the bracket is aligned with the edge of the tube. Mark the center hole.

Remove the bracket and drill the mounting hole with a $^{3}/_{16}$” drill bit.

Remove the tape and insert a rivet through the center bracket hole and frame hole then drill the rear mounting hole using the bracket as a guide.
Insert another rivet in the second hole then use a rivet tool to pull the rivets.
Drill and rivet the last mounting hole.

On the nose measure up from the center pivot of the nose hinge 16.50” and mark the nose liner flange.

Hold the flat strut mounting bracket up to the outside of the flange on the nose. The point marked is center mounting hole again. Mark and the center mounting hole so that all three mounting holes are on the flange.

Drill the center hole using a $^{3}/_{16}$" drill bit.
Insert one of the black button head mounting screws through the bracket and flange.
Drill one of the other mounting holes then insert and tighten two of the button head screws using an $^{1}/_{8}$" hex key, $^{3}/_{8}$" socket and ratchet.
Drill and attach the remaining screw.

Attach the body end of the gas strut to the nose.

Attach the rod end of the gas strut to the frame.

Finished assembly.

Nose Side Locator Brackets

🛠 Drill, ⅛”, ⅜” drill bit, 1.25” hole saw, rivet gun, silicone, 5/16” hex key, 9/16” wrench.
🚘 Nose locator bracket assembly, secondary body fastener assembly

Hold the outside of the nose behind the wheel opening so that it is flush with the lower part of the body.
Clamp or hold the nose so that it will not move while drilling the locator hole.
Position the locator bracket on the backside of the nose so that it is aligned with the side of the nose.
Use a marker and mark all rivet holes and the large center hole.
Remove the locator bracket.
Drill a 1/8” hole through the center hole mark through both the nose and the lower body section.
Open the hose and drill the remaining rivet hole marks through the nose.
Enlarge center 1/8” hole with a 1.25” hole saw.
Drill the rivet location marks with a ⅛” drill bit.
Enlarge the hole drilled in the body section using the ⅜” drill bit.

Silicone and rivet the Locator bracket to the backside of the nose.

Place a washer on the $^{3}/_{8}$" locator bolt and pass it up from the underside of the body.
Place another washer on the topside of the body followed by the acorn nut.
Close the nose to test the locating pin height. Add or remove washers as needed to locate the side of the body correctly.

Driving lights

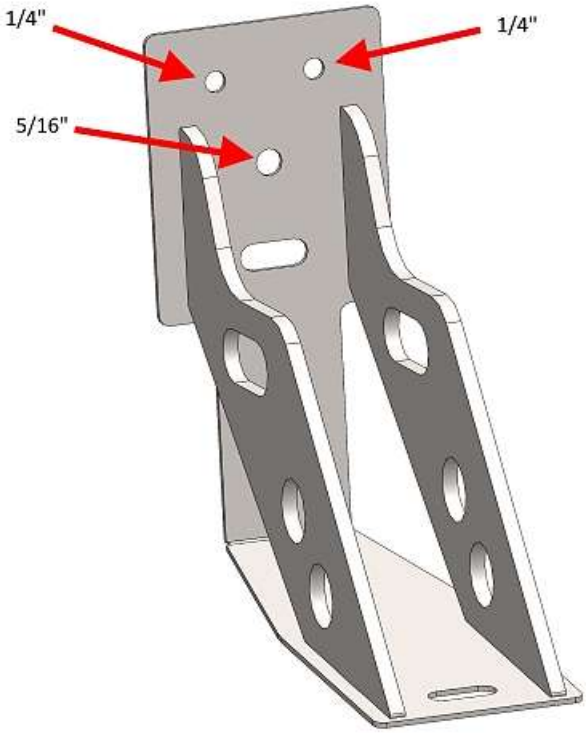
- Driving light parts (complete kit only)
- Drill, ¼", $^{5}/_{16}$" drill bit, $^{7}/_{16}$" socket, ratchet, extension, Philips head screwdriver, vise.
- Complete kit only, base kit uses the Mustang lights and wiring.

Remove the mounting bracket from the driving light using a Philips head screwdriver.

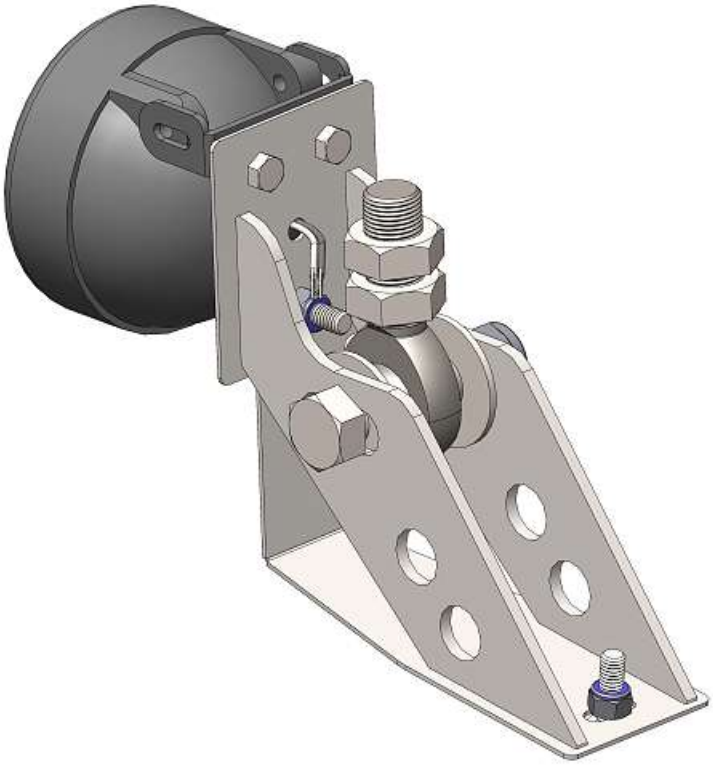
Hold the bracket in a vise and run a ¼” drill bit in the slots.

Reattach the bracket to the light with the tab on the bracket pointed down as shown.

Push the ¼” U-nuts onto the bracket from the bottom side as shown.



With the nose open, from the backside of the hinge bracket drill through the driving light fiberglass bucket using the bracket holes as a guide. Drill the top two holes with a ¼” drill bit and the lower middle hole with a $^{5}/_{16}$” drill bit.



(shown without nose) With the help of a second person, from the front of the nose, push the wires on the light through the lower $^{5}/_{16}$" hole and hold centered at the back of the bucket.

From the backside insert the ¼"x ¾" screws through the bracket, nose and thread into the U-nuts on the light. Tighten with a $^{7}/_{16}$" socket.

Hatch Hinge

🛠 $^{7}/_{16}$", $^{9}/_{16}$", $^{11}/_{16}$" wrench, ⅛", $^{3}/_{16}$" hex key, marker, drill, $^{7}/_{32}$", $^{7}/_{16}$" drill bit, hack saw, Philips head screwdriver, ruler, Friend

🚗 Rear glass hatch components, glass hatch.

✋ The hatch will not sit correctly until the weatherstrip has been installed after painting the body.

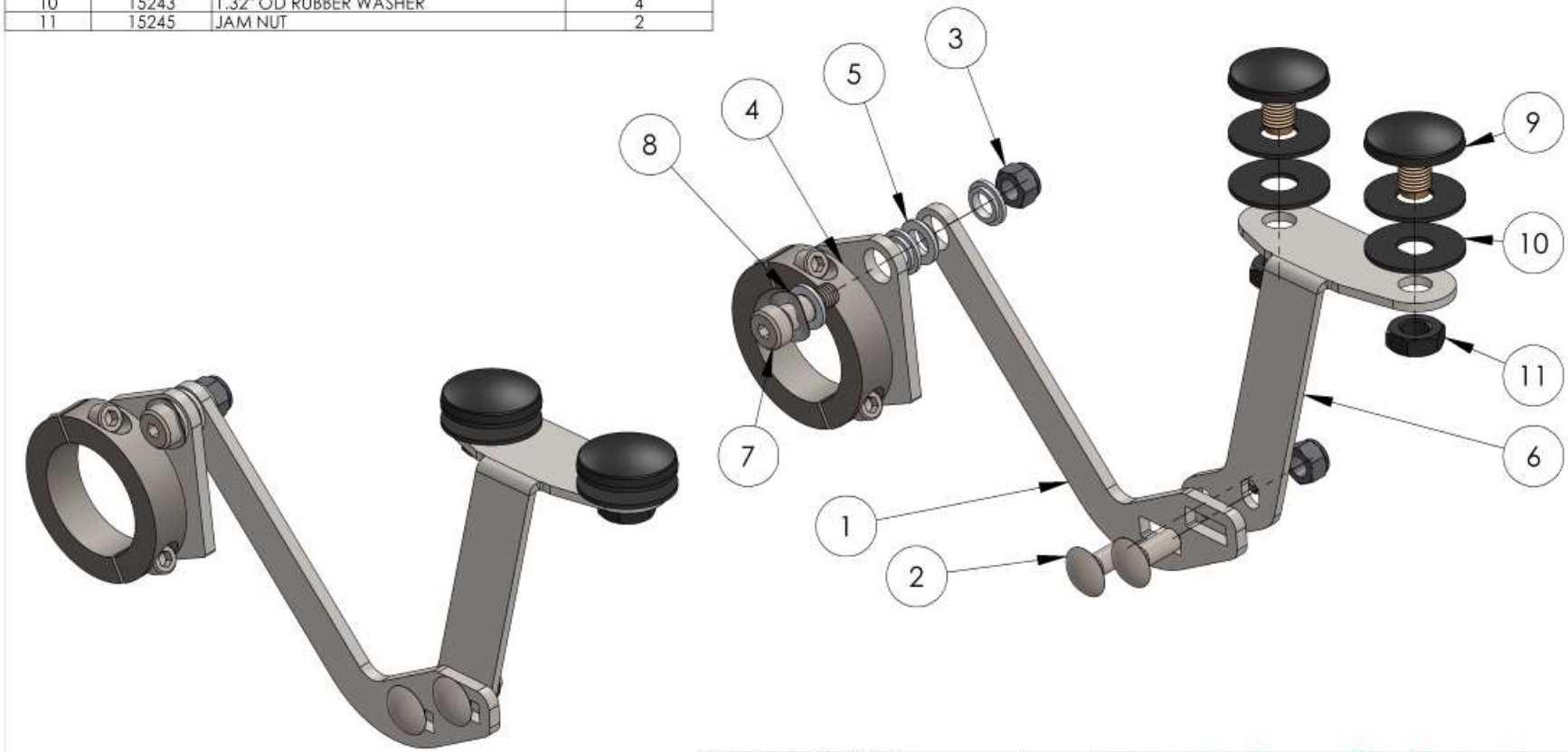
Push the large 1.32" rubber washers onto the large button studs.
From the outside of the glass, push the Large button studs through the hinge holes in the glass hatch
Push another large 1.32" rubber washers onto the large button studs on the inside of the glass.

Put the hatch hinge arms onto the button studs so that they point forward and the arms are on the inside.

Hand tighten the jam nuts on the bottom of the studs.

ITEM NO.	PART NUMBER	DESCRIPTION	RIGHT SIDE/QTY.
1	60685	REAR HATCH HINGE ARM FRAME SIDE	1
2	25562	SCREW, CARRIAGE, ZINC, 5/16"-18 x 3/4"	2
3	13963	5/16-18 NYLON INSERT LOCKNUT	3
4	60526	RIGHT SIDE	1
5	15165	NYLON BUSHING	4
6	60686	60826 - RIGHT SIDE HATCH HINGE ARM	1
7	13325	0.50" SHOULDER BOLT	1
8	15631	3/8" WAVE WASHER	1
9	15242	LARGE BUTTON STUD	2
10	15243	1.32" OD RUBBER WASHER	4
11	15245	JAM NUT	2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	3/11/17	



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COUPE

USED ON

APPLICATION
HATCH HINGE

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	3/11/11

COMMENTS:

PRINTED 12/14/2022

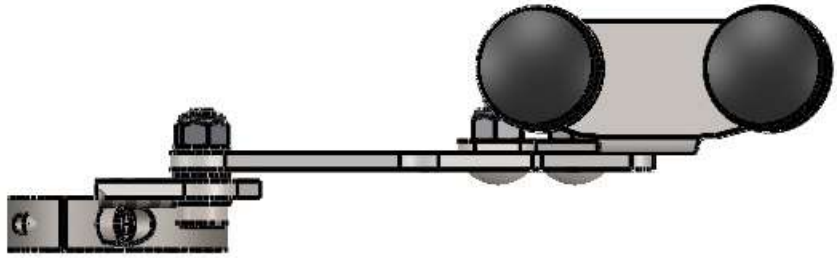
Factory Five Racing, Inc.

TITLE:
RIGHT SIDE HINGE ASSEMBLY

SIZE A | DWG. NO. HATCH HINGE | REV A

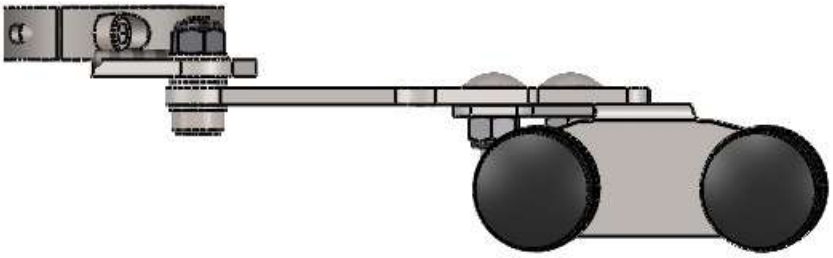
SCALE: 1:2 | WEIGHT: | SHEET 2 OF 3

www.factoryfive.com 508-291-3443



RIGHT SIDE

LEFT SIDE



Press a nylon bushing into both sides the hinge arms.

Push a nylon bushing into both sides of the rollbar clamp; left side shown.

Repeat for the other side.

Push the small 0.813” rubber washers on the small button studs.

Push the small button studs through the holes on the sides of the glass.

Push the medium 0.922” rubber washers onto the small button studs on the inside of the glass.
Put a washer on the small button stud.
Carefully thread on and tighten a jam nut on the bottom of the small button stud.
Thread on and tighten a ball stud on the small button stud.
Repeat for the other side.

Attach the hinge arm to the rollbar mount using the short shoulder bolts, wave washer, regular washer, locknut, $^{3}/_{16}$" hex key and ½" wrench. Do not fully tighten the locknut, the arm needs to be able to rotate. Right shown.

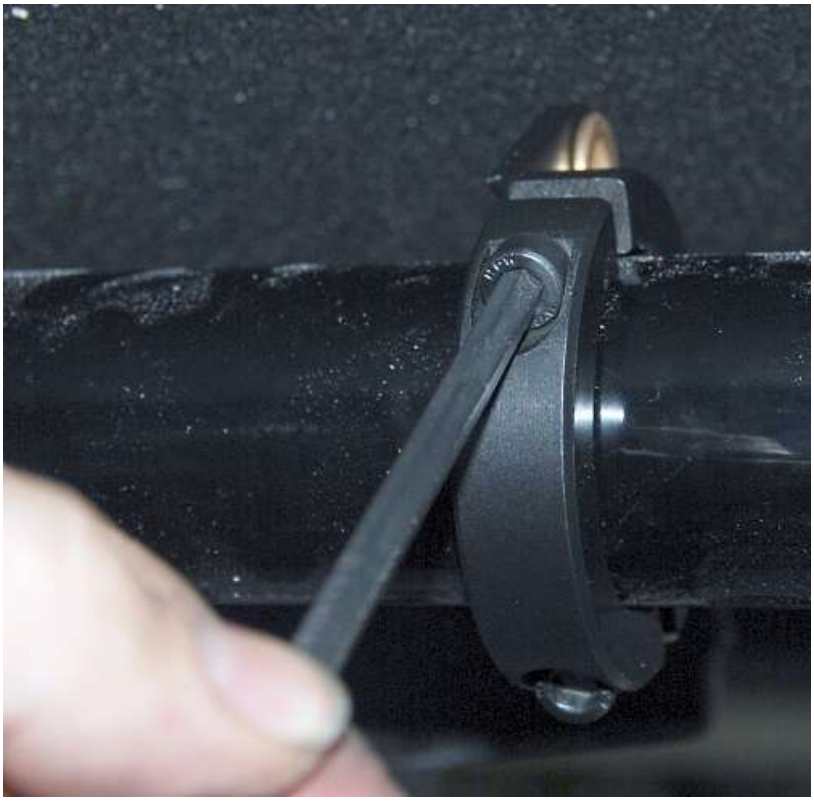
Measure and mark the centerline of the front end of the hatch opening on the body. From the centerline measure 11½" in each direction and make a mark for cutting the hinge arm clearance on the body.

At the area marked, measure 1” in each direction and draw a box leaving about ¼ in. of the flange at the top.

Cut along the line to give your opening. The trim looks best with a small radius at both the upper and lower corners as has been done on the right-hand side of the cut-out pictured.

Carefully place the hatch with the hinge arms onto the body and center in the opening.

Loosely attach the hatch rollbar mount (plate welded to the outside) to the rollbar, rotate the mount so that the pivot point is as close to the roof as possible and slide the mount out so you can use bolt to the hatch glass mount.



Tighten the rollbar mount.

Remove the hatch.

Hatch Struts

✋ The hatch will not sit correctly until the weatherstrip has been installed after painting the body.

Screw the ball stud into the tube collar using some locktite to prevent loosening.

Attach the tube collar to the rollcage rear leg on the frame so the ball stud is 7” from the back of the rollbar as shown and push on the shaft end of the gas strut.

Attach the body side of the strut to the hatch ball stud.

Hatch Latch

🛠 ⅜" socket, ratchet, flat head screwdriver, Philips head screwdriver, $^{3}/_{32}$" drill bit, drill

🚗 Rear glass hatch assembly

✋ The hatch will not sit correctly until the weatherstrip has been installed after painting the body.

Find the hatch latch and its striker plate

Insert the hatch latch into the hole.

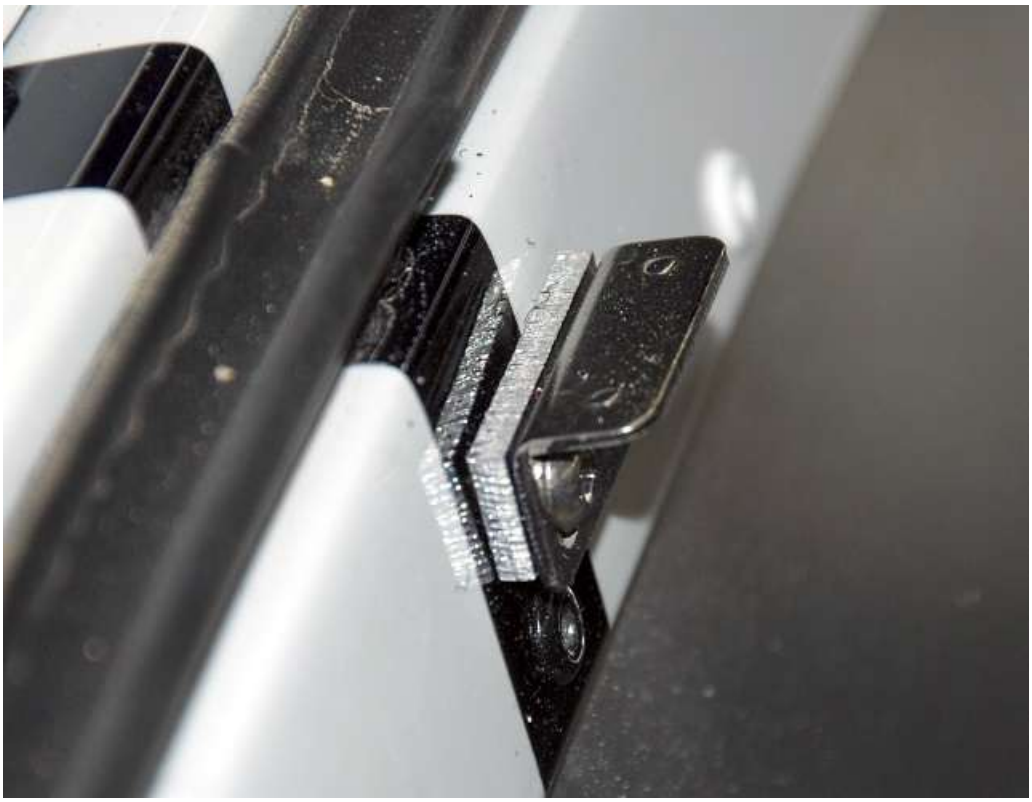
Screw the plastic nut onto the latch and orient the latch so that the striker points towards the back of the car then use a set of slip joint pliers to tighten the nut.

With the hatch raised, put tape on the back body flange inside the hatch area in the center where the hatch latch is located.

Measure down from the body $1^{3}/_{16}$" and mark the location on the tape where the hatch latch is located.

Hold the latch catch bracket against the flange so that the top of the bracket is aligned with the mark made then mark the mounting hole locations.

Drill $^{3}/_{32}$" holes in the center of the ovals marked.
Use the aluminum $^{1}/_{8}$" spacer and the black #6 x ½" Philips head screws to hold the bracket inn place.



🛠 An alternative would be to use the #10 x $^{5}/_{8}$" black button head screws provided and rivnuts.

Test the latch on the catch. Adjust the height of the catch if necessary.

Rear Spoiler

🛠 Sandpaper, ⅛” drill bit, drill, marker.
🚘 Coupe rear spoiler.
✋ On the original car, this was a riveted on part but some customers have had their body shops fiberglass the spoiler into the body.

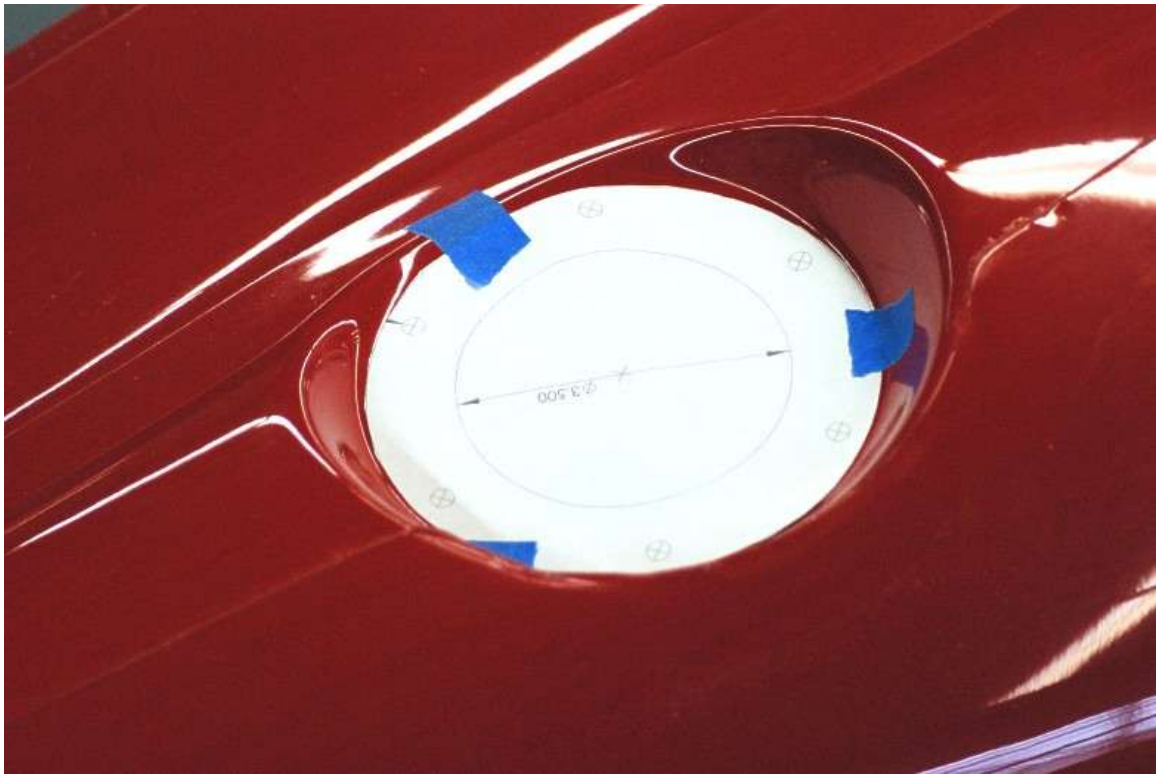
Hold the rear spoiler up to the body. Sand or cut the flange to fit or as desired.
Mark the location of the rivets.

Drill the spoiler and body for the rivets.

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 ⅛" drill bit for all except one of the outer screw holes. Use a $^{7}/_{32}$" bit drill for the last small hole.

Use a 3½" hole saw for the center opening, drill out the holes for the filler. 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.

Tail light

🛠 Drill, 7/32" drill bit, 1" hole saw, file, scissors, masking tape, ruler.
🚗 Tail light template, Red rear light

Cut the rear mesh area out and tape the tail light template on the back of the body aligning the rear mesh area on the template and body.

Mark the horizontal centerline between the two lights for the license plate bracket later.

Use a $^{7}/_{32}$" bit to drill the outer holes for the taillight studs then cut out the center using a 1" hole saw.

Test fit the tail light mounting plate and drill out the holes to fit if needed.

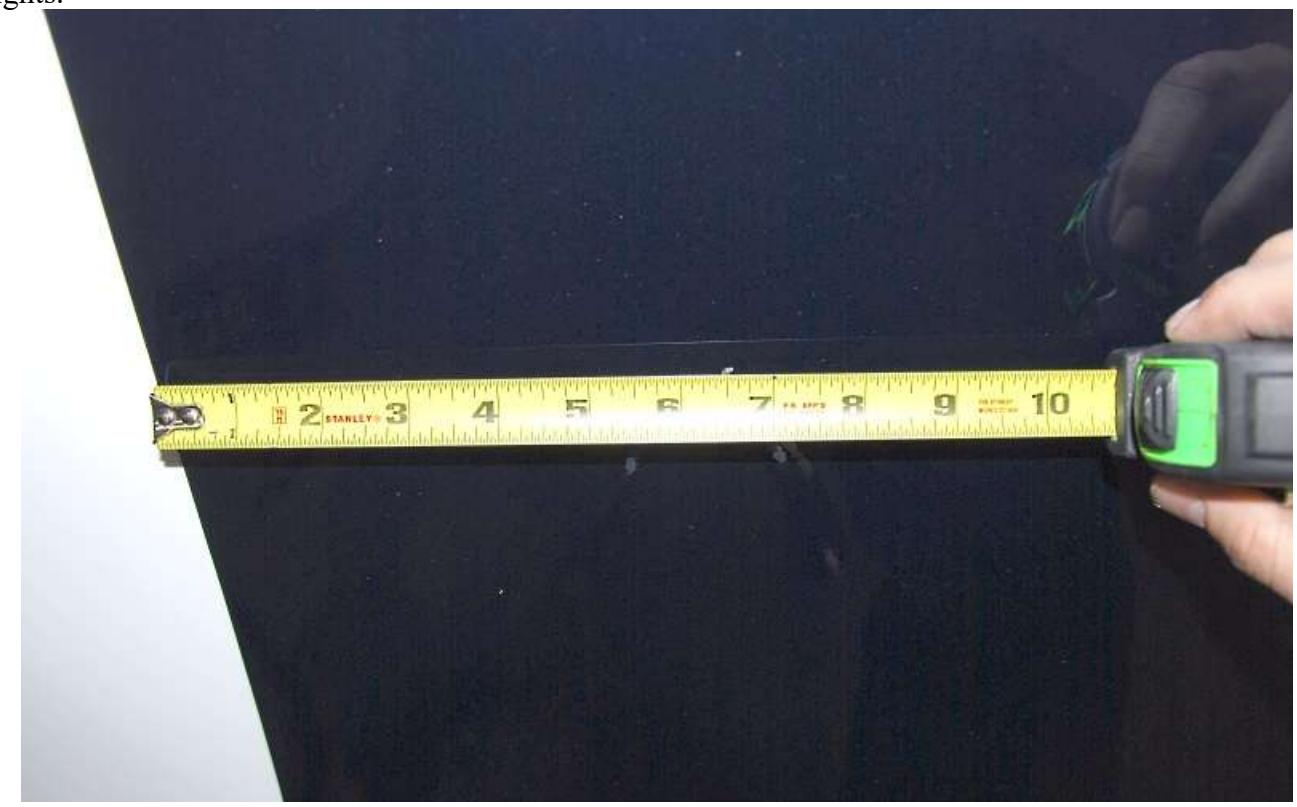
License plate bracket

🛠 Drill, $^{3}/_{16}$" drill bit, rivet tool, masking tape, marker, measuring tape.

License plate bracket, secondary body fasteners.

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.

If not marked when doing the taillight holes, mark the center vertically between the top and bottom lights.



From the center of the back, measure over 6.50” on the horizontal line between top and bottom lights.

Drill the mark using a $^{3}/_{16}$” drill bit.

Put a $^{3}/_{16}$" rivet through the bracket and into the hole drilled then level the bracket and drill through the other mounting hole in the bracket into the body.

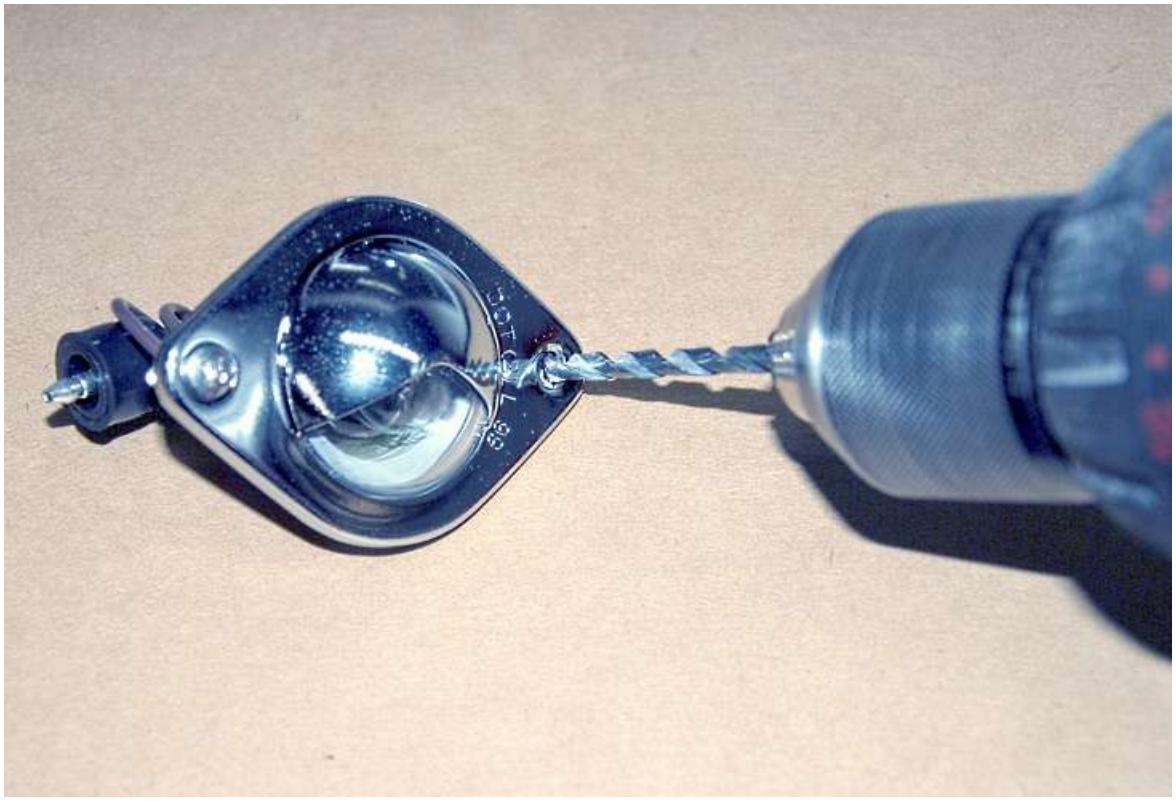
License plate light

🛠 Drill, $1^{7}/_{8}$" hole saw, $^{11}/_{64}$" drill bit, masking tape, marker
🚘 License plate light.

Put masking tape above the license plate bracket and mark 2” above and centered on the bracket.

If possible, use a $1^{7}/_{8}$” hole saw or if not available a 1¾” holes saw to drill the light location.

Test fit the light so that it will sit flat on the body. If it will not, open the hole up slightly.



Drill the screw holes in the light out using an $^{11}/_{64}$" drill bit.

Hold the light up to the body and use the light as a template to drill the $^{3}/_{16}$" mounting holes.

Turn Signal

🛠 Drill, ¾” hole saw, marker.
🚗 Front turn signal light

From the headlight mounting surface measure out and mark the bucket at 4” and 7” so that the turn signals will be lined up with the center of the headlight.

Drill the mounting holes with a ¾” hole saw.

Headlights

🛠 Drill, $^{1}/_{8}$”, ¼”, $^{7}/_{16}$” 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 $^{7}/_{16}$" 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.

Put the rubber gasket on the light bucket.

Push the rubber grommet into the bucket.

Test fit the light bucket making sure that they sit flat.

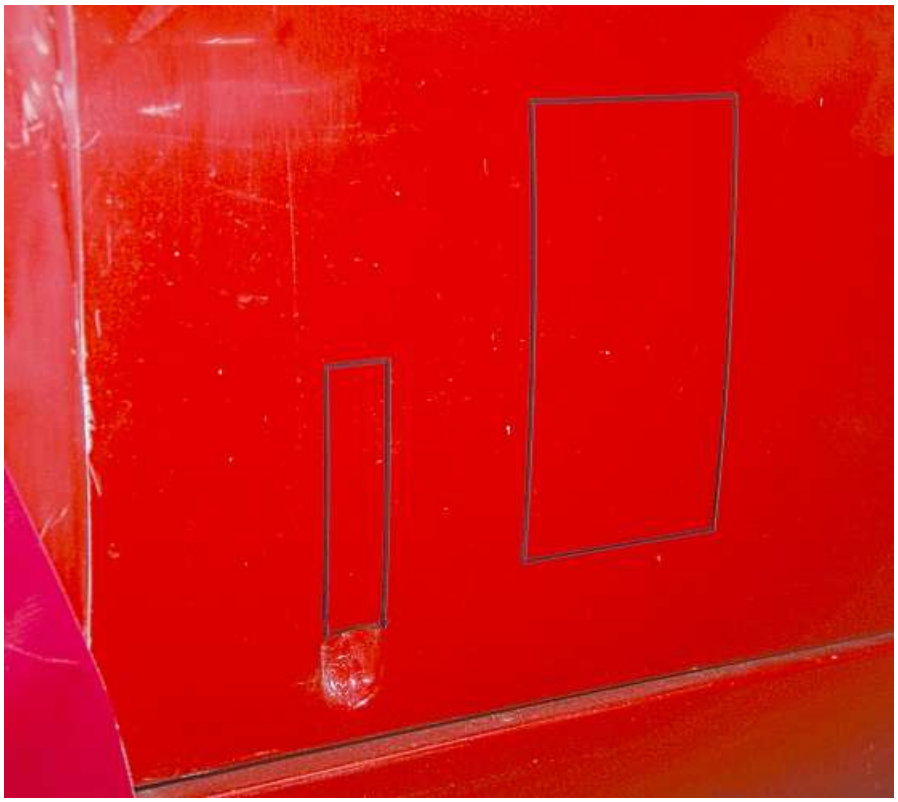
Drill the four mounting screw holes with the bucket as a template using a $^{1}/_{8}$" drill bit.

Side Mesh/Nose latch

🛠 Drill, ½" drill bit, jig saw or air saw, marker.

- Packaged aluminum

Hold the template up to the nose so that the bottom of the template is even with the bottom of the nose and the hood latch area is aligned with the finger recess.



Mark the template on the body.

Use a jigsaw or hacksaw to cut the holes leaving the finger recess for the latch as shown.

Nose Latch

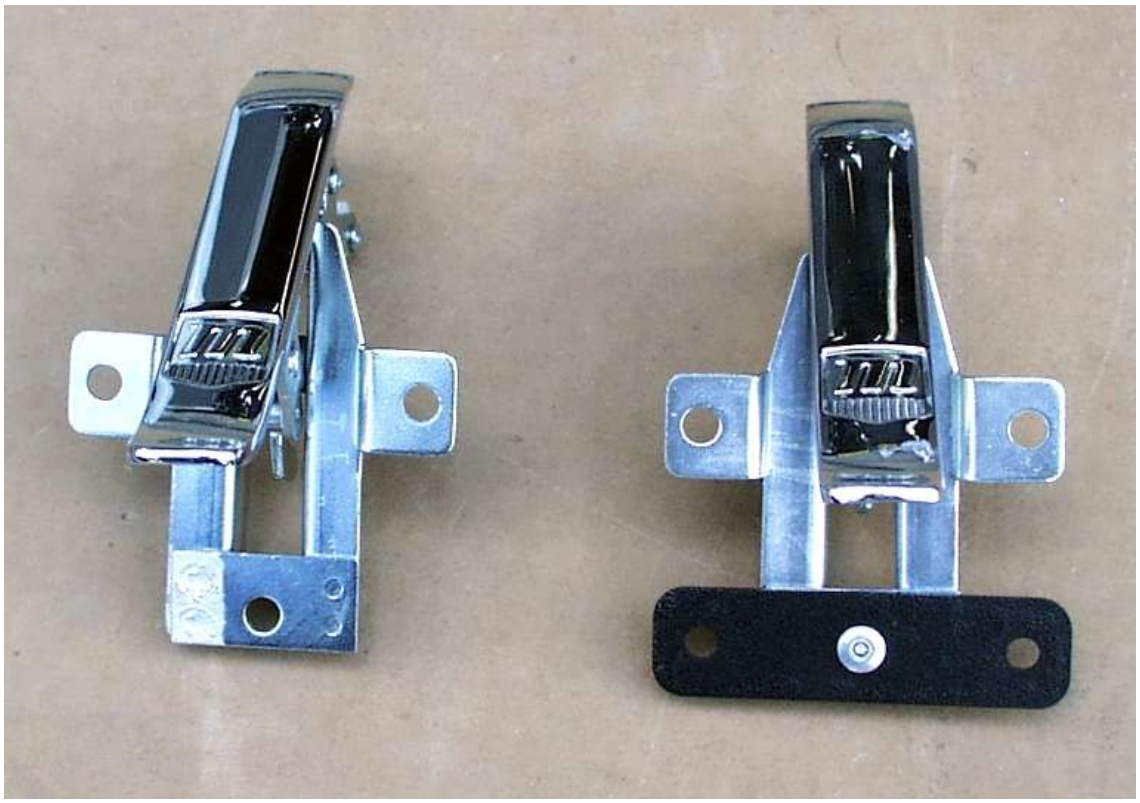
🛠 $^{7}/_{32}$" drill bit, drill, ⅛" hex key, $^{5}/_{16}$", $^{9}/_{16}$" wrench, $^{9}/_{16}$" deep socket, chassis grease, rivet gun, masking tape, vise.

🚘 Nose/trunk fastener assembly - (6) 10-32 x $^{5}/_{8}$" black button head screws, nylon locknuts

Open the latches and apply a little bit of chassis grease to the sides of the latch.

Work the latches a few times to help loosen them up.

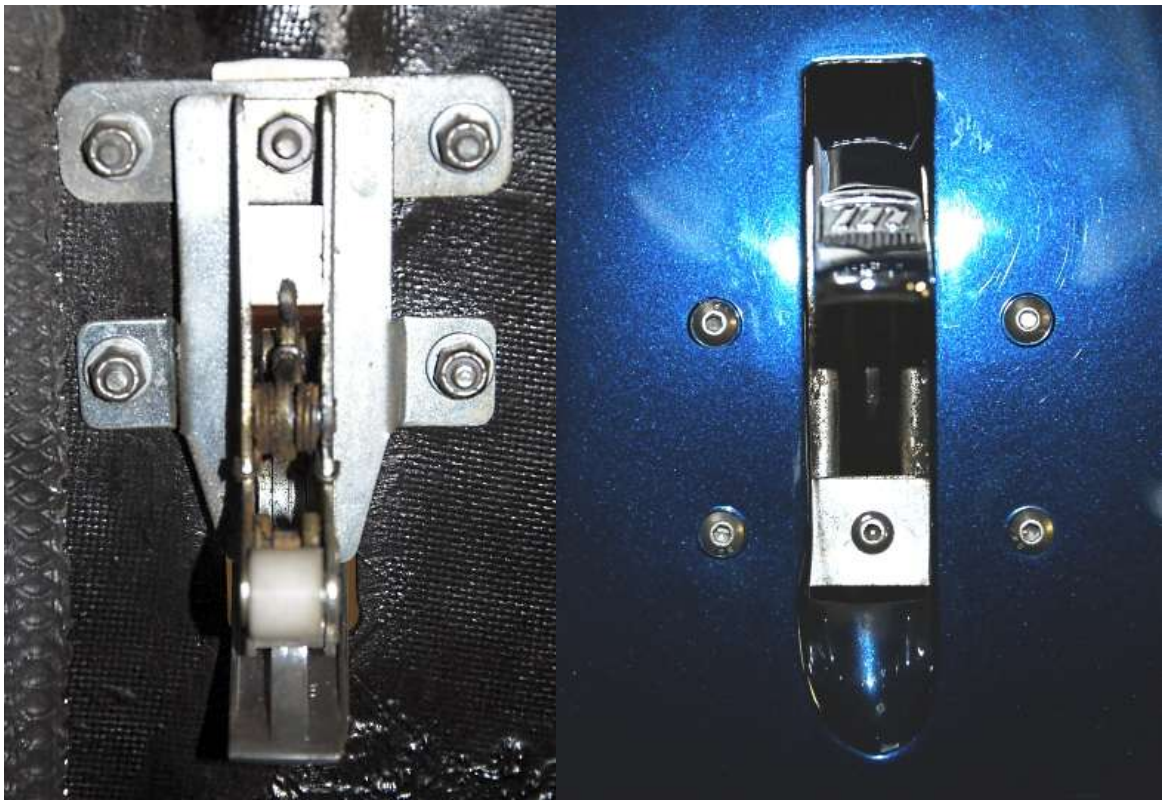
Use a vise to flatten the mounting ears on each nose latch.



Attach the latch mount plate to the front side of the latch as shown.

Position the latch from the backside of the body; make sure the latch looks straight in the cutout from the outside then mark the back side of the body through the mounting holes.

Drill $^{7}/_{32}$" holes for the mounting screws.



Mount the latches to the nose. Use the washers on the backside of the body.

Attach the “U” bolts to the nose latch striker mounts on the frame. Do not tighten them yet.

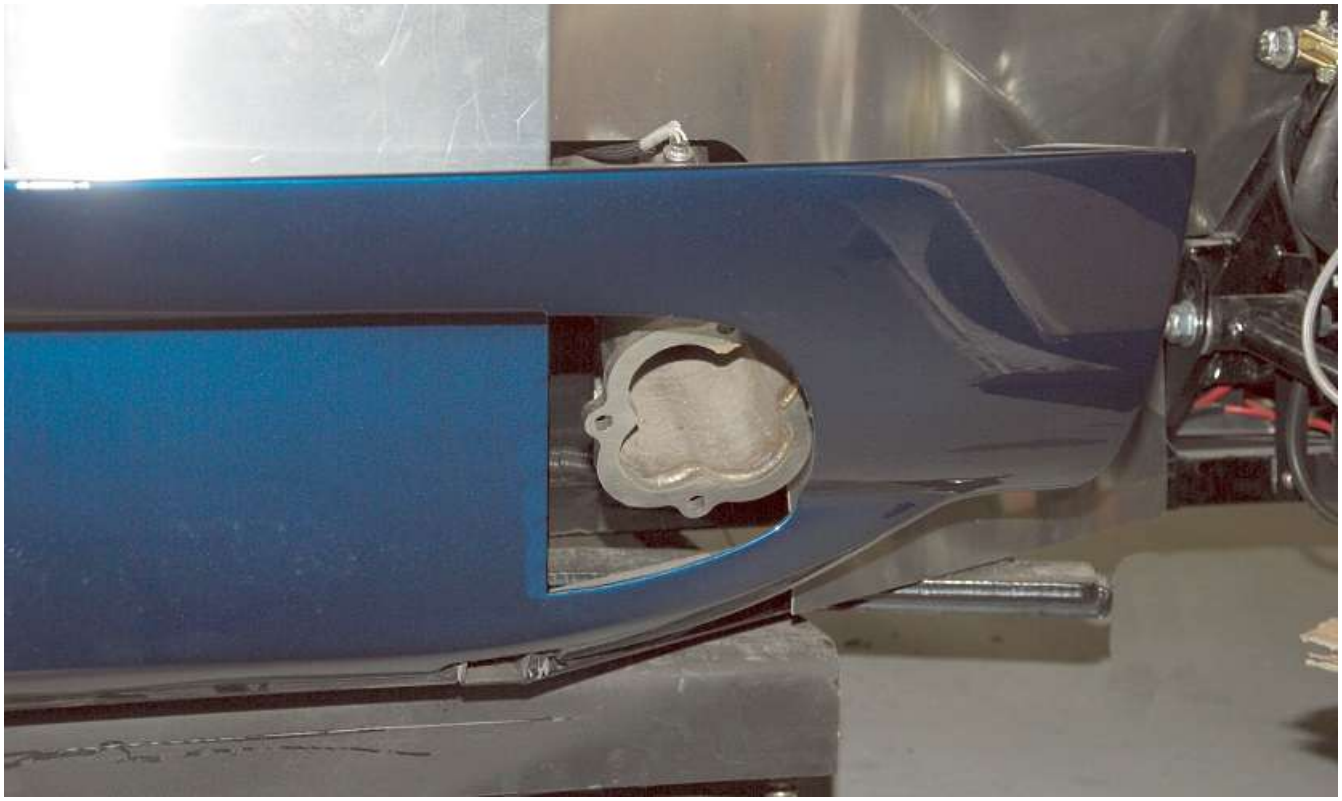
Radiator Exit opening

🛠 Air saw or jig saw.

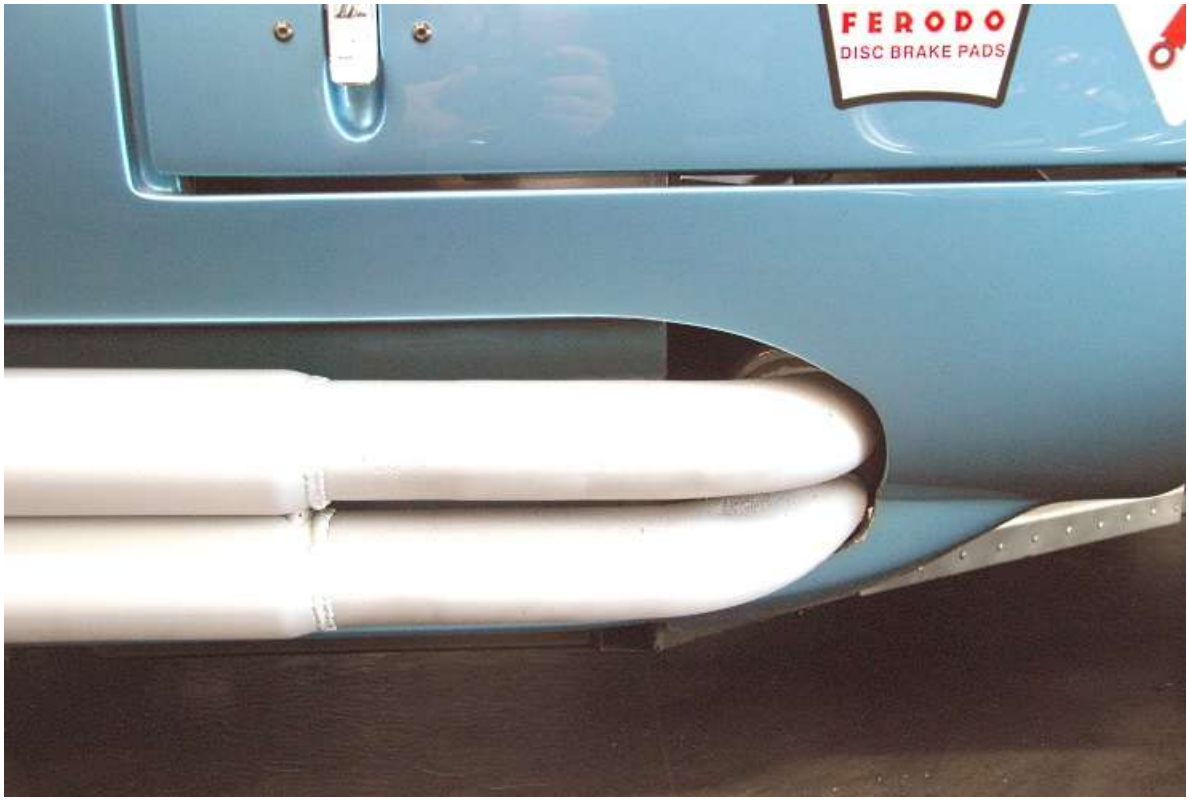
Use a jigsaw to make sure the opening is straight and even.

Side exhaust

🛠 Air saw or jig saw.

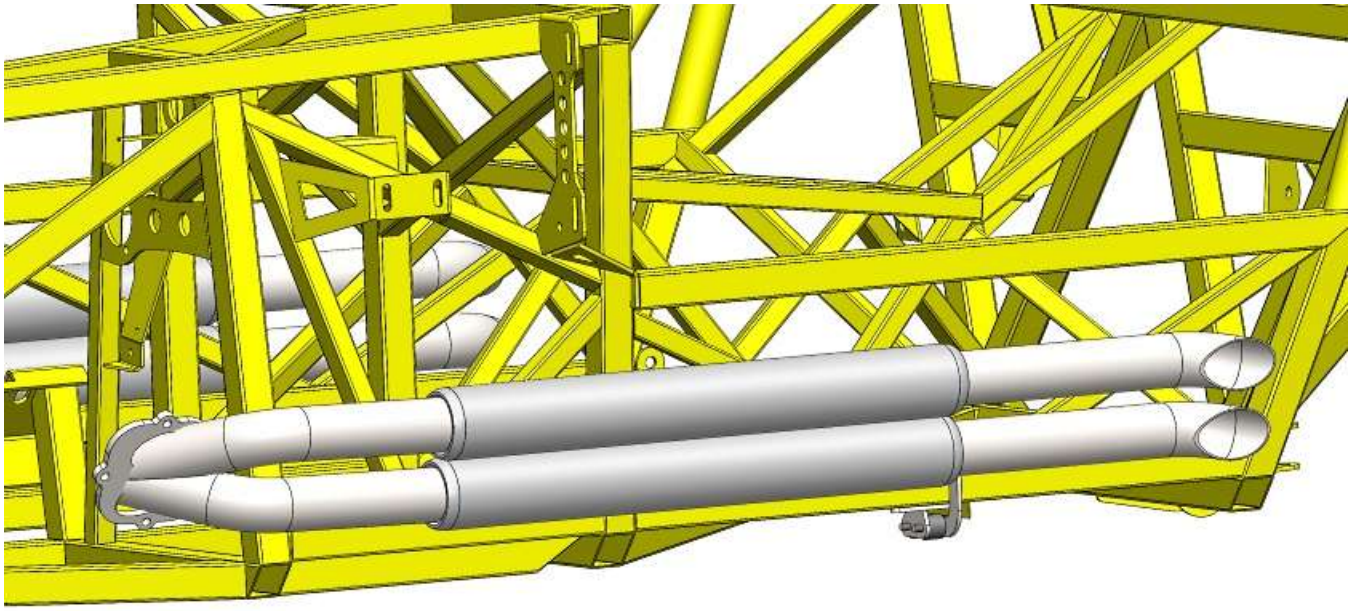


The pattern for the side exhaust cut out is pre-traced on the body. Use an air saw or jig saw to cut the area out.

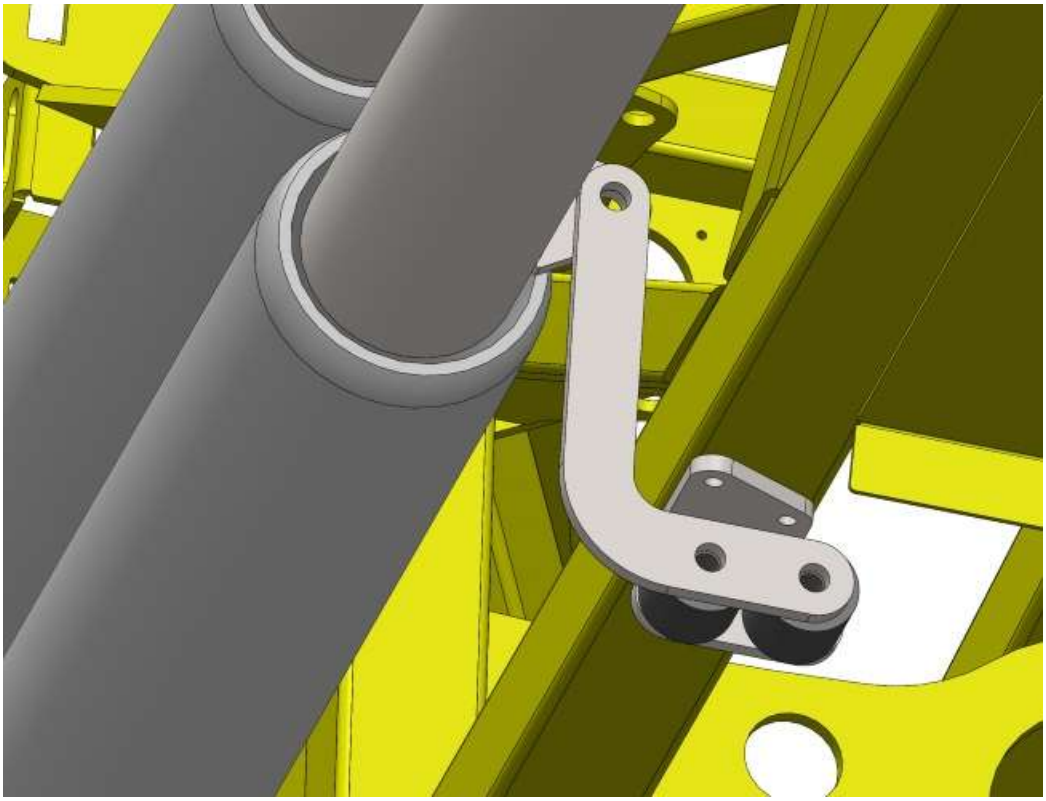


Hold up the side exhaust to make sure there is clearance especially the lower front corner.

Locate the side exhaust rear mount parts.

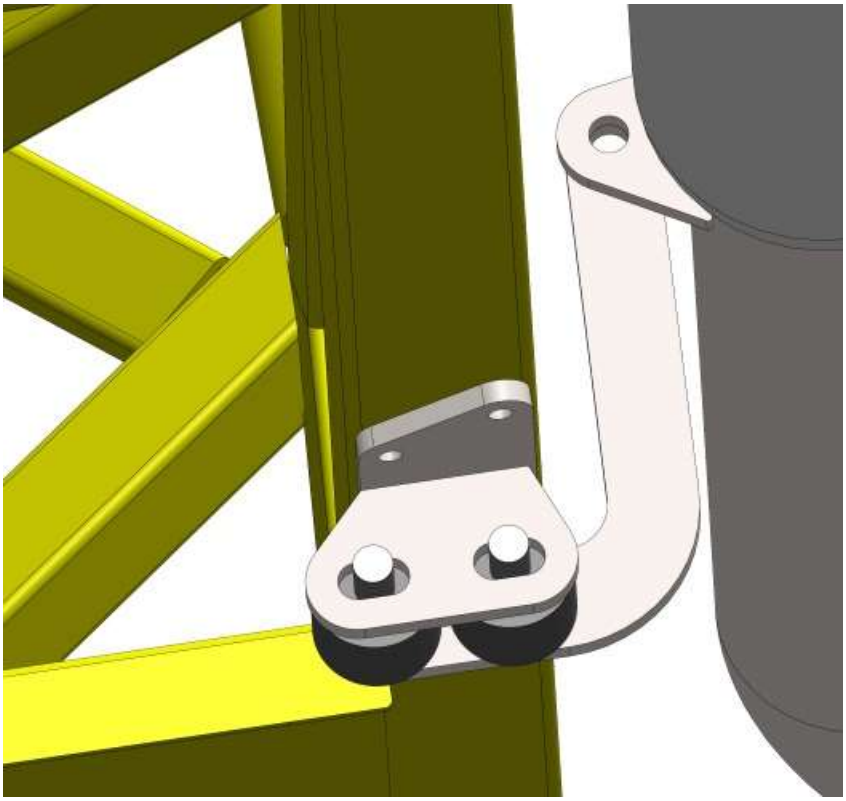


The mount will attach about half way back under the cockpit area. The body should be slotted for the hanger.



Attach the long leg of the exhaust hanger to the back side of the side exhaust mount using a $^{5}/_{16}$" x 1" button head screw.

Attach the rubber mounts to short end of the hanger using the $^{5}/_{16}$" x ½" button head screws.



Attach the rubber hangers to the frame mount using the $^{5}/_{16}$" locknuts. The body will have to be cut for the mounts to attach to the frame.

Door hinge

🛠 $^{9}/_{16}$" socket, ratchet, $^{3}/_{16}$" long drill bit, drill, air saw or jig saw, masking tape, ruler, measuring tape.

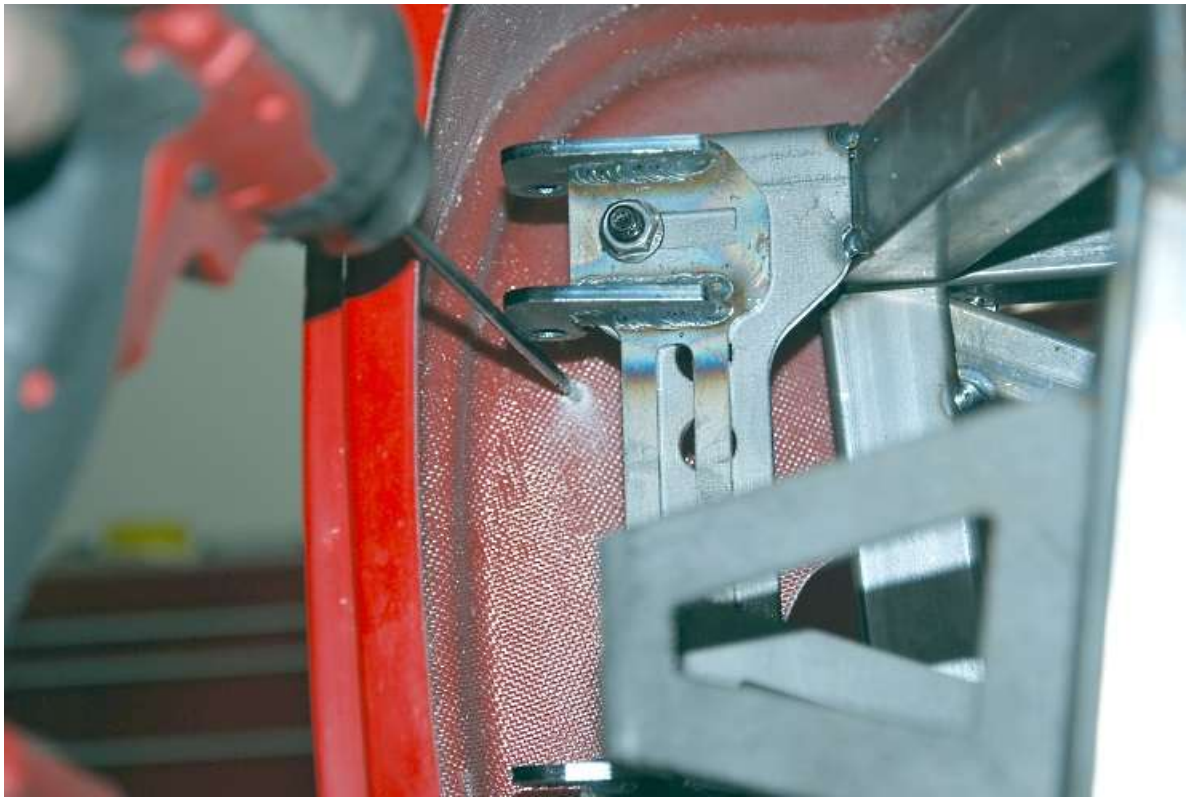
🚗 Door latch/hinge components

Attach the door hinge mounts to the front of the frame mounts and center them up and down in the slots using the $^{3}/_{8}$"x 1.25" carriage bolts, locknuts and $^{9}/_{16}$" socket.

On the door side, put masking tape over the whole hinge area.

Use a ruler to draw a line 0.25” in from the inner door recess.

Use a long $^{3}/_{16}$” drill bit directly above the door hinge and drill through the body.



Use a long $^{3}/_{16}$" drill bit directly below the door hinge and drill through the body.

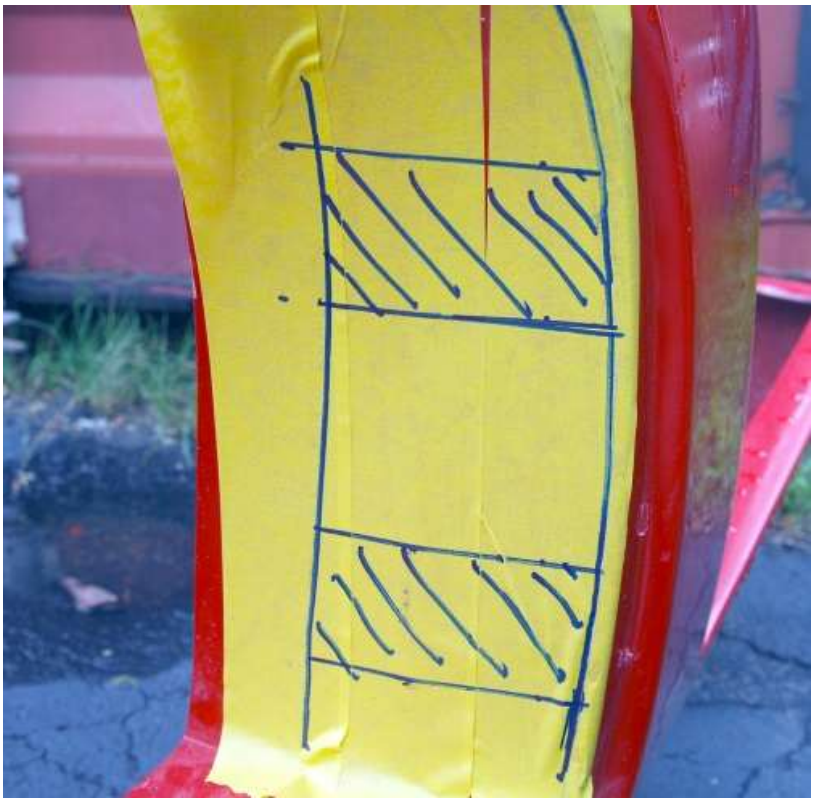
Repeat this for the bottom hinge arm.

On the inside of the door hinge area, draw a line 1.75" in from the edge of the body.

Use a tape measure to measure up from the lower door opening to the drill holes made and note the dimensions.

On the inside of the door opening, mark these same heights.

Draw lines across connecting the drilled holes and inner marks made.



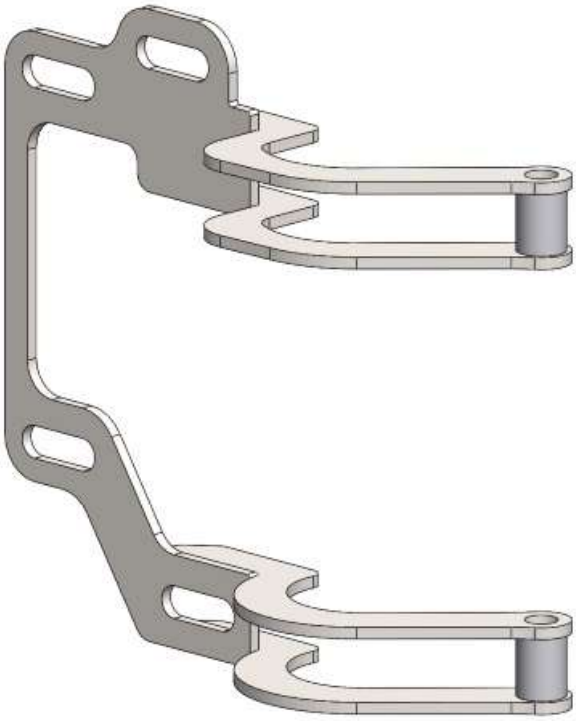
Mark the area between the lines that will need to get cut for the hinge arms.

Cut the areas out using an air saw or jig saw.

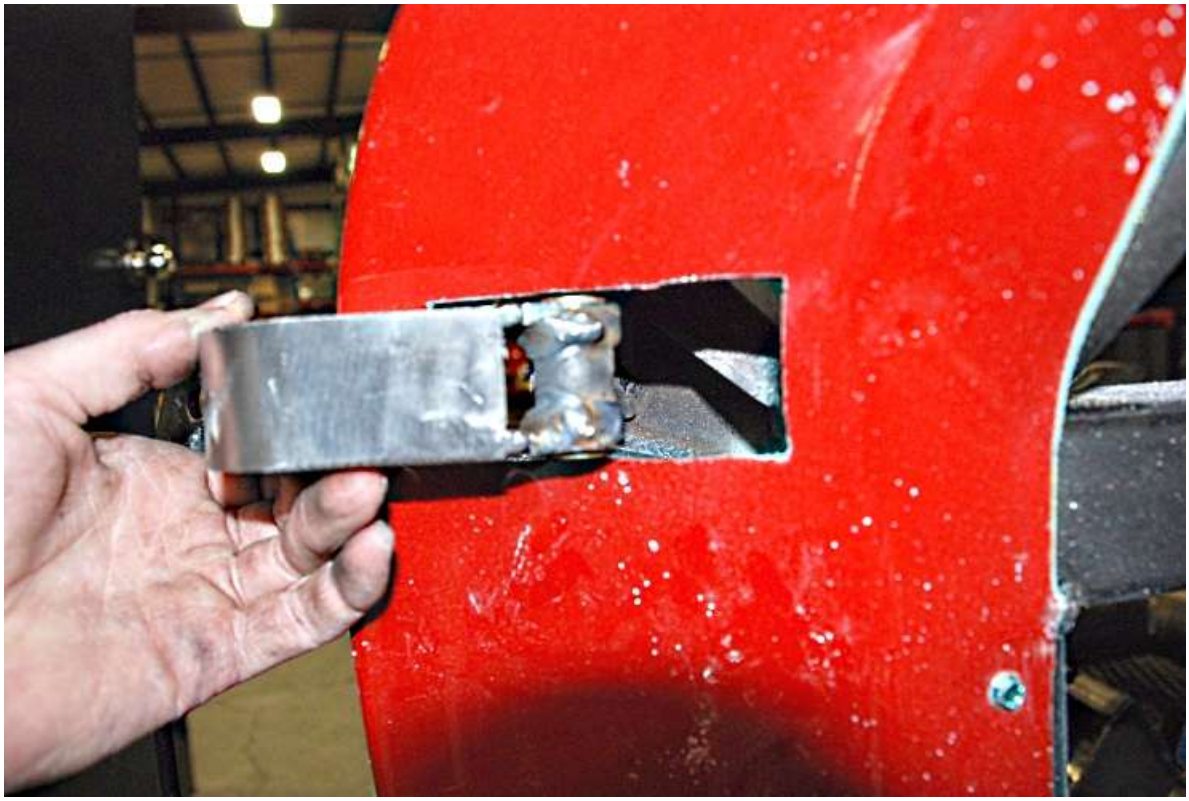
Door hinge

- Door latch/hinge components

Push the door hinge bushings into the door hinge arms.

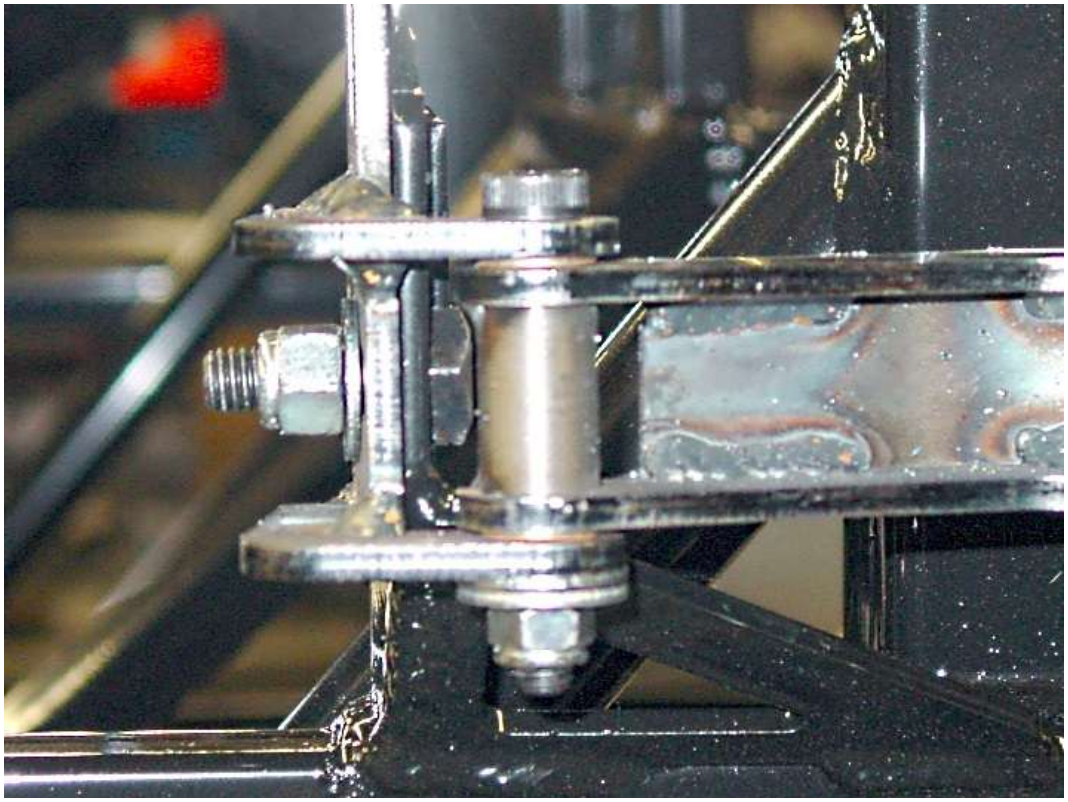


Left side door hinge.



Pass the hinge arms through the door hinge openings in the body and to the frame mounts.

Attach the hinge arm assembly to the adjuster plate using the 2" shoulder bolts, washers and $^{5}/_{16}$" nuts. It makes installing the shoulder bolts a bit easier if you grind an angle on the end of the shoulder instead of having it square.



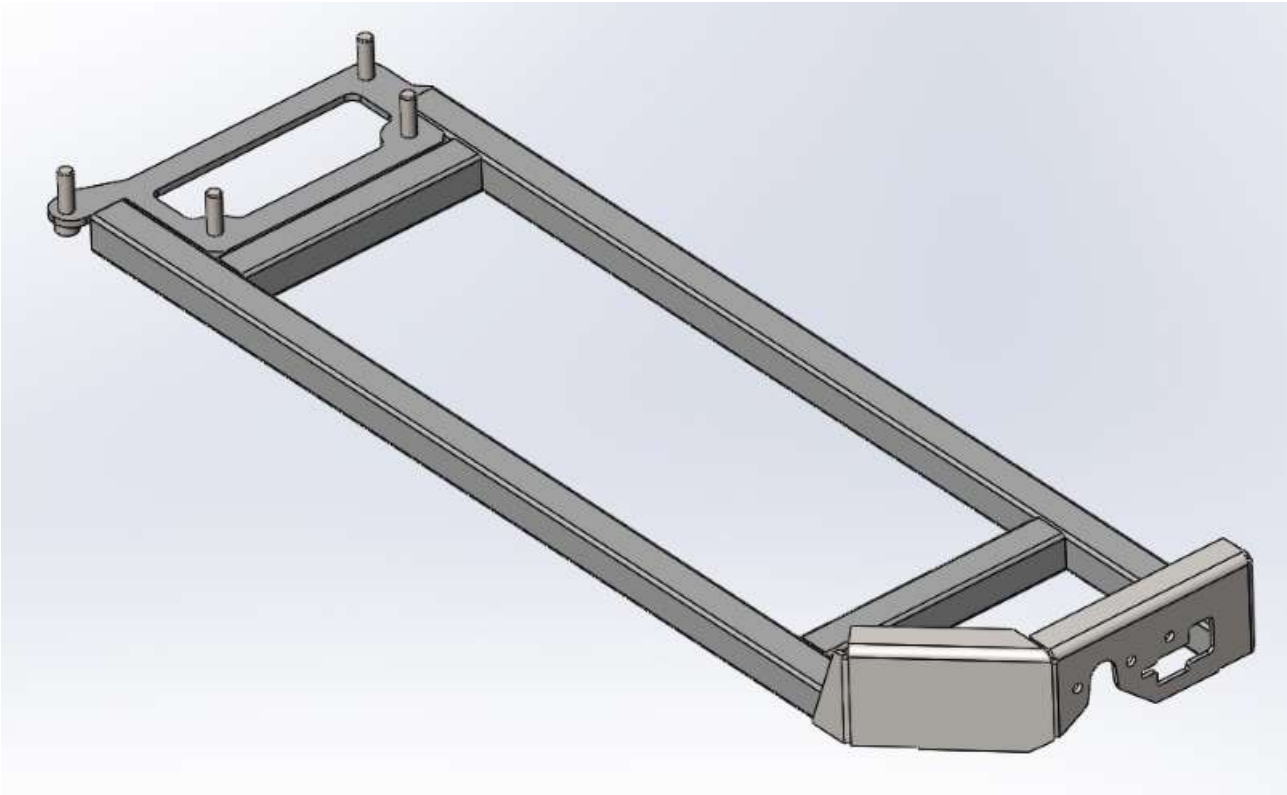
Tighten the nuts down until the arm is hard to move and then loosen slightly. If you tighten the nut down and you can still rotate the hinge easily then the washer is caught on the shoulder. Loosen slightly, adjust the washer and retighten.

Door frame prep

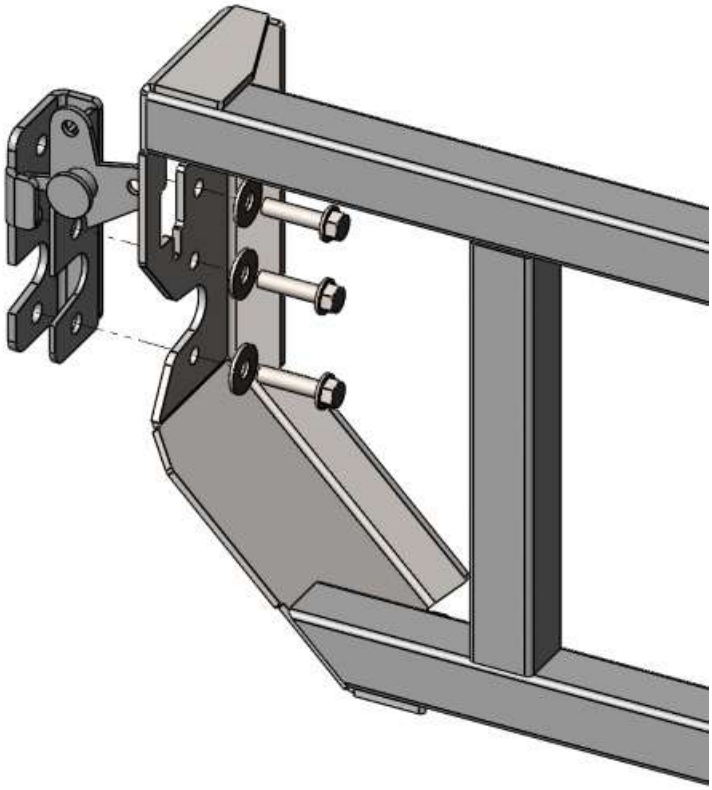
🛠 $^{3}/_{8}$" socket, ½" deep socket, $^{7}/_{16}$", (2) $^{9}/_{16}$" wrenches, $^{3}/_{16}$" hex key, Phillips head screwdriver, rivet tool.

🚗 Door components, body assembly, secondary body fasteners.

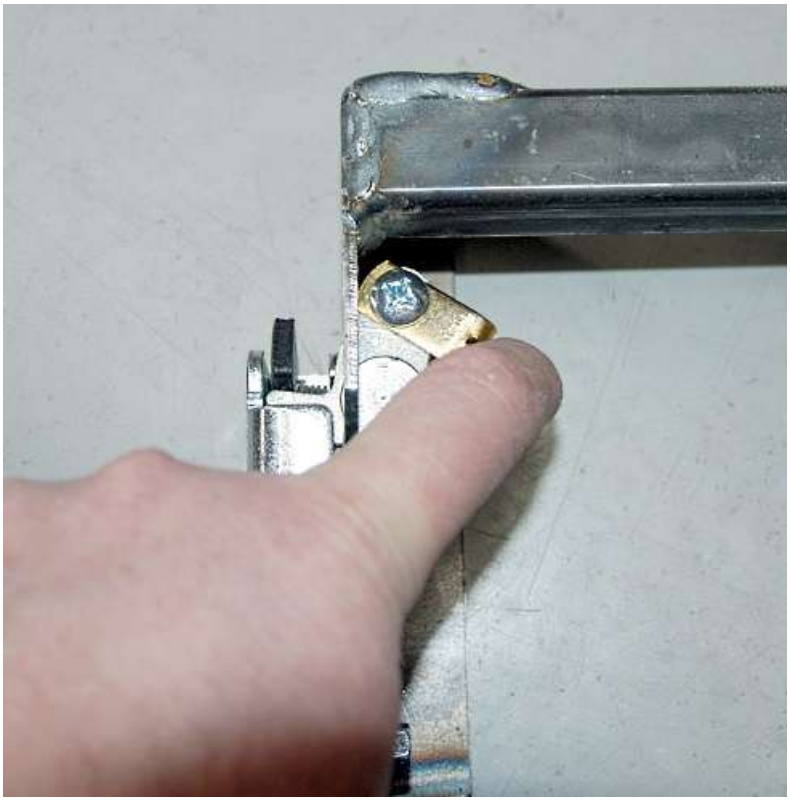
Latch



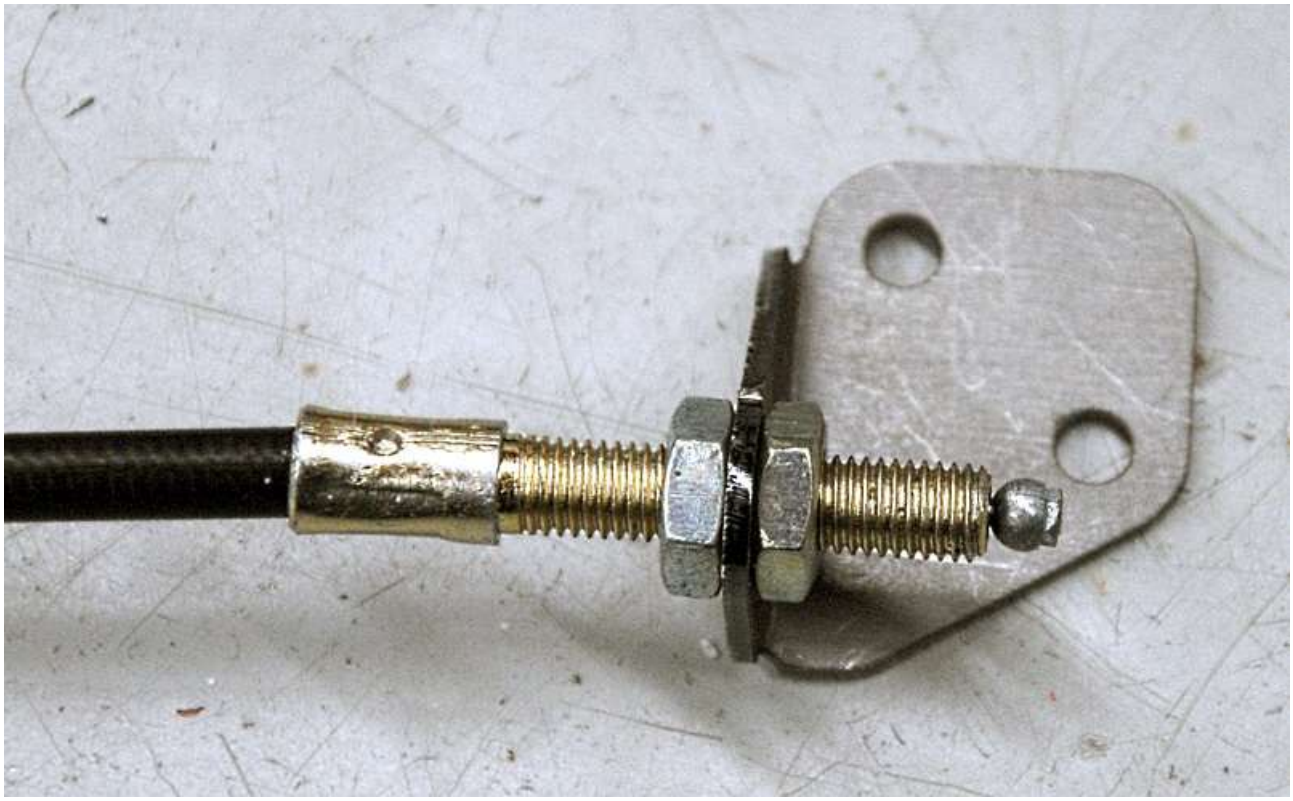
Locate the left door frame.



Attach the door latch to the door frame using the ¼”x 1” grade 8 flange bolts, washers, latch and 3/8” socket.

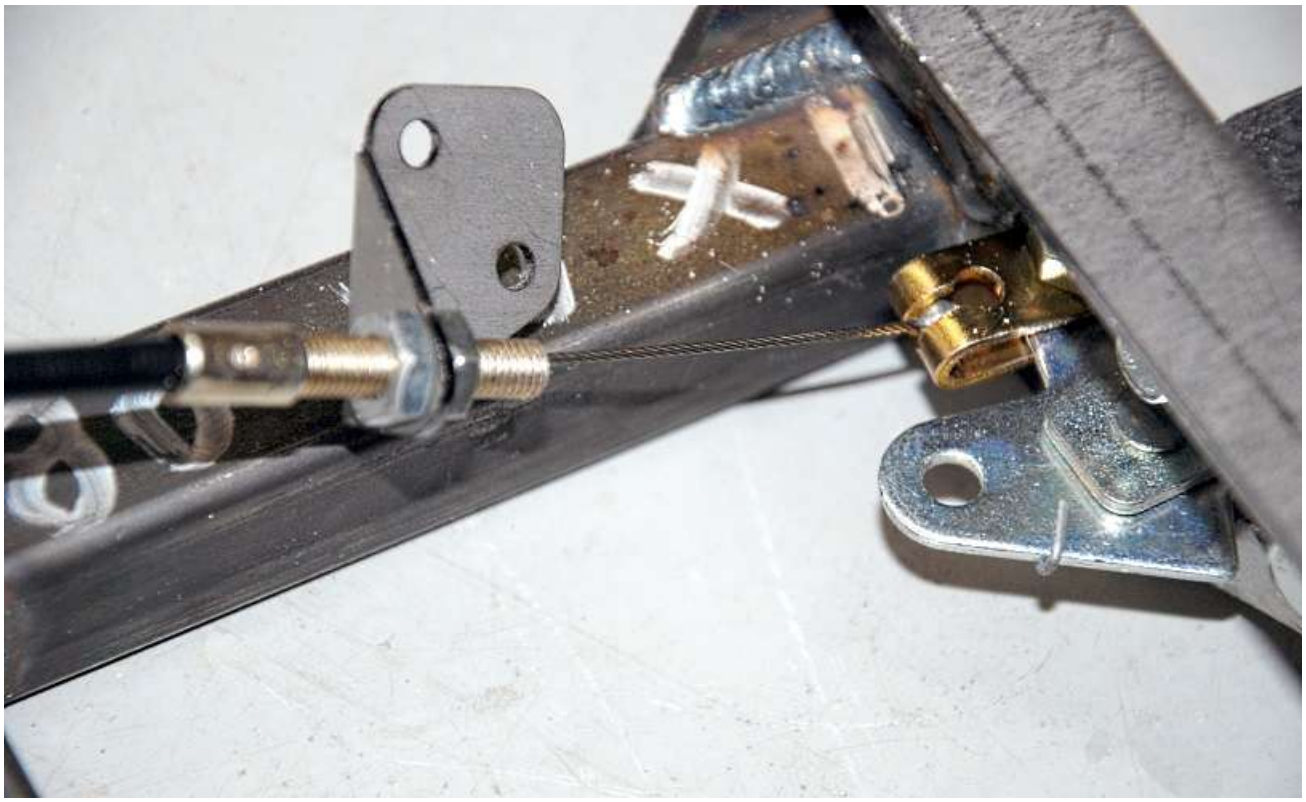


Attach the clevis to the release lever using the ¼” x ¾” screws, locknuts, Philips head screwdriver and $^{7}/_{16}$” wrench.



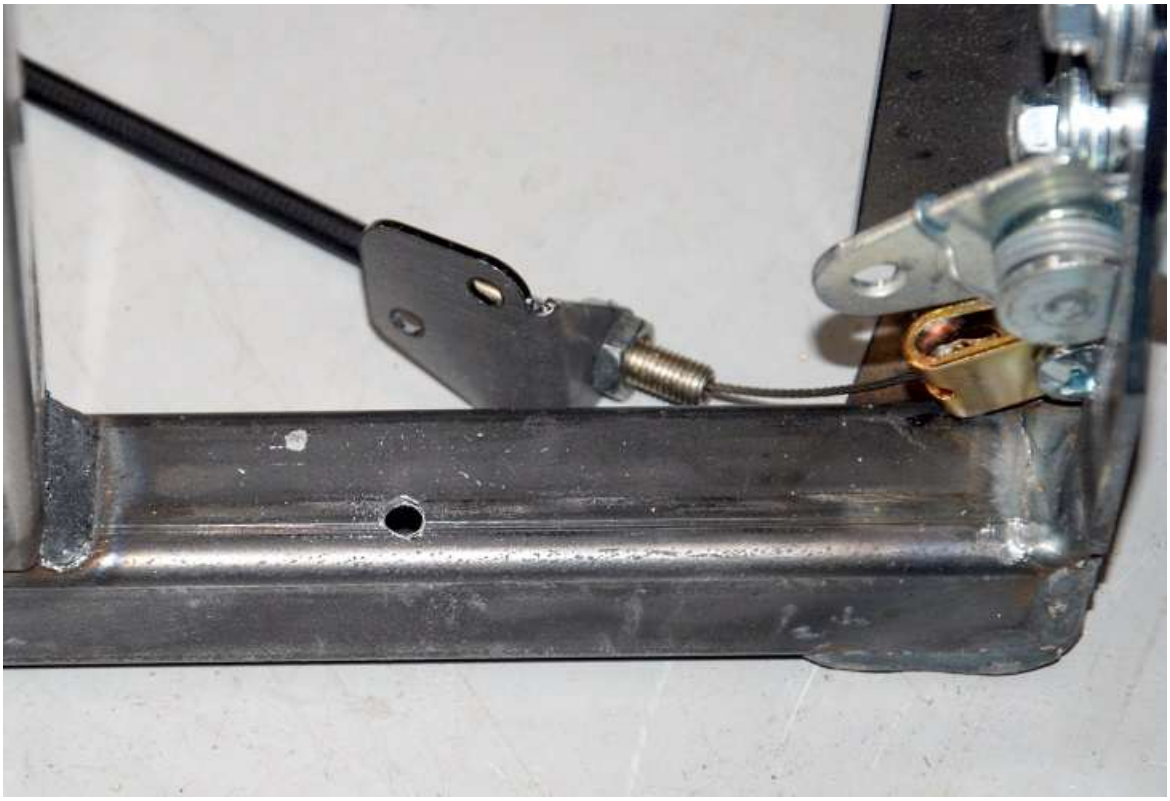
Locate the cable mount tabs, ¼” jam nuts and release cable. Attach the cable mount to the cable in the center of the adjustment range by hand only for now.

Attach the other end of the release cable to the handle as shown.

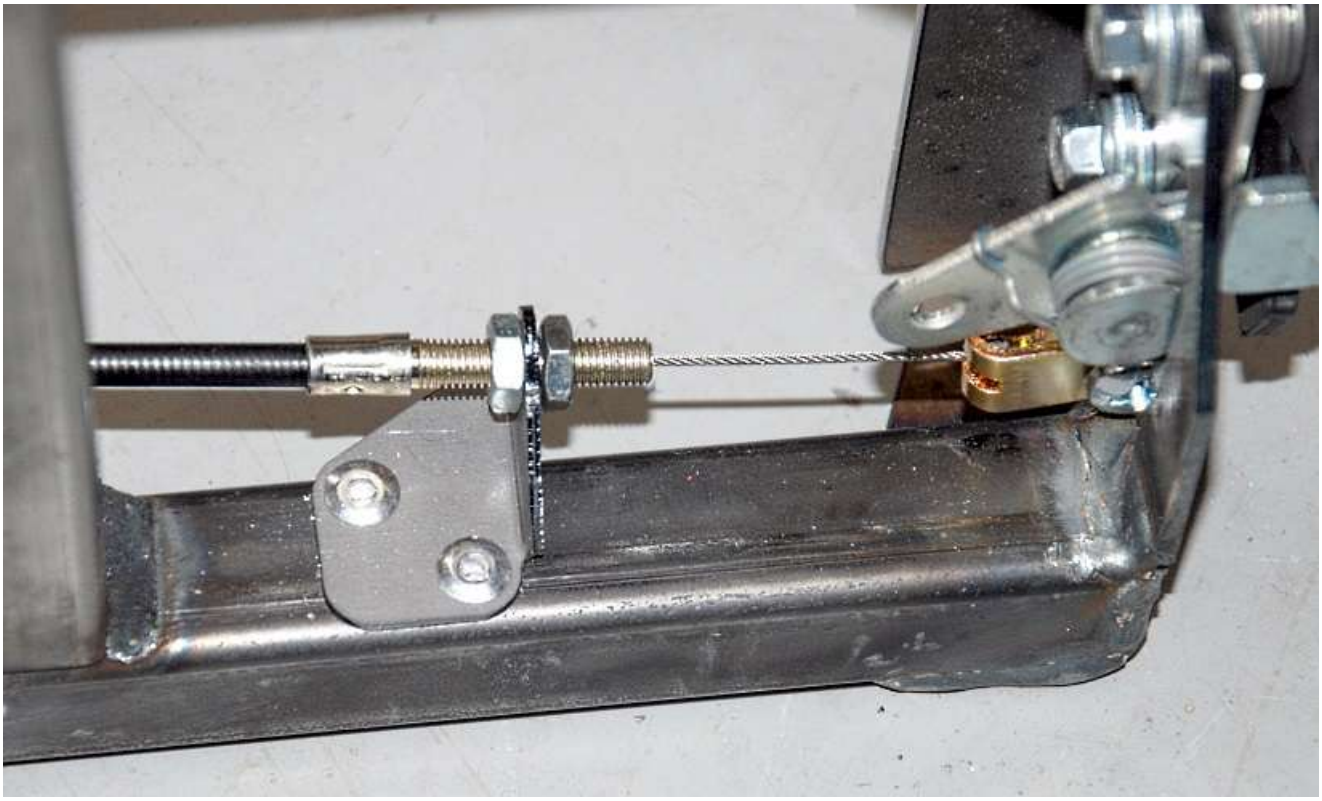


Insert the ball end into the clevis on the latch.

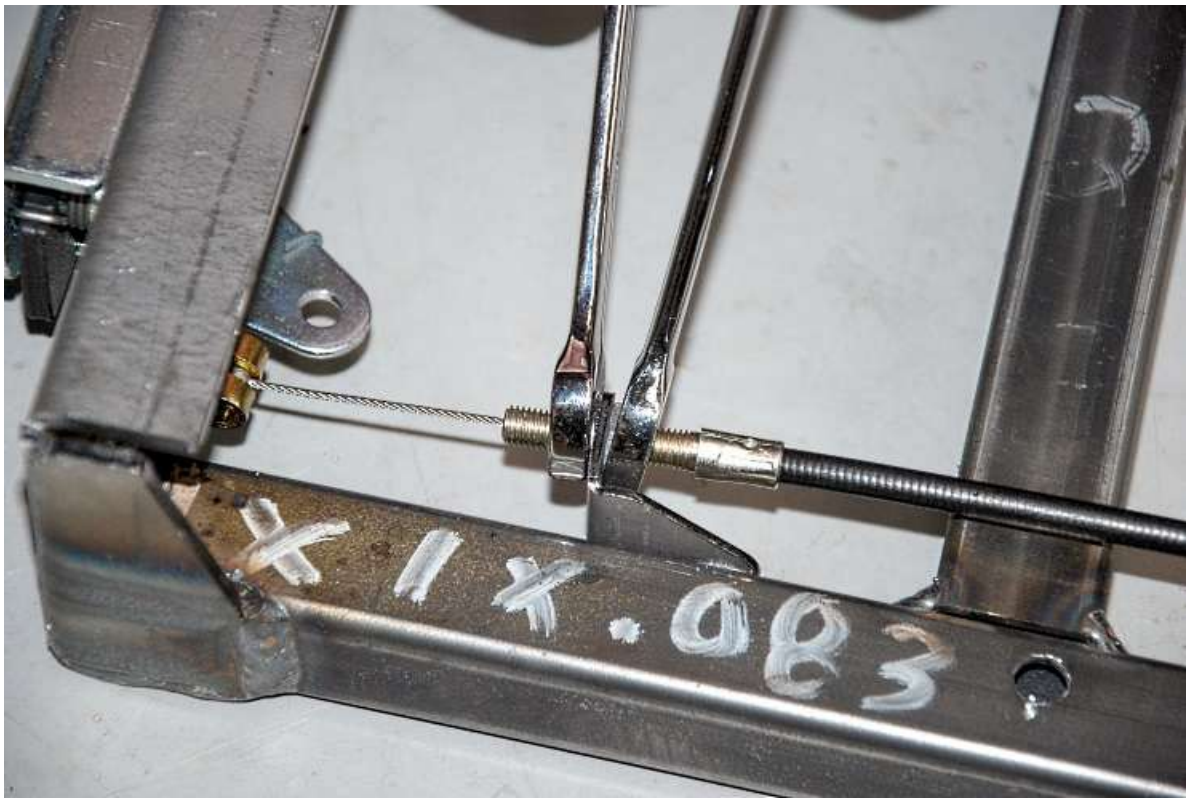
Locate the cable mount tab on the underside of the top tube so that the cable is tight but not pulling on the release lever and the mount tab does not stick out past the side of the frame that will touch the door liner (flat side). Mark the mounting holes.



Drill $^{3}/_{16}$" mounting holes where the mounting tab should be mounted.

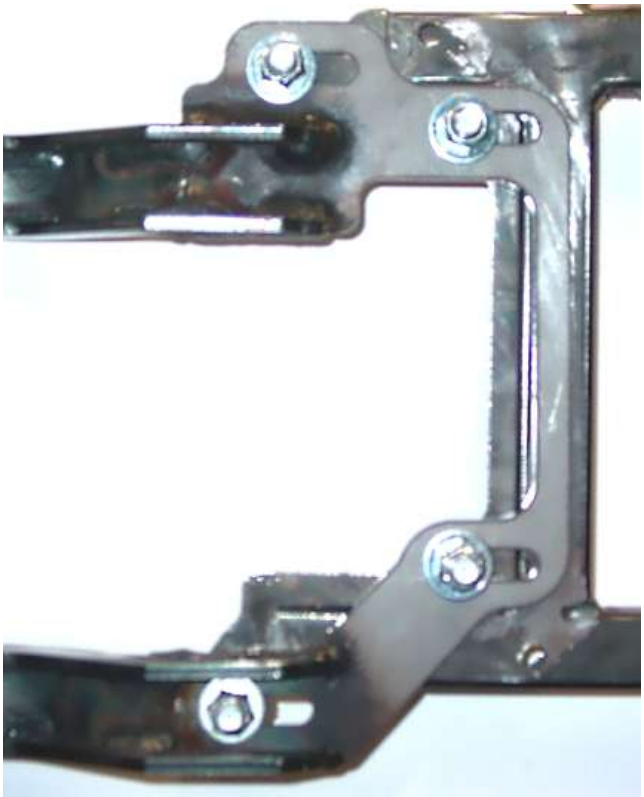


Attach the mounting tab using long $^{3}/_{16}$" rivets and a rivet tool.



Adjust the play in the cable then use some blue Loctite and tighten the jam nuts using (2) $^{9}/_{16}$" wrenches.

Repeat this assembly for the right door latch.



Attach the doors to the hinge arms using ⅜” lock nuts, washers and $^{9}/_{16}$” socket. Leave the locknuts loose enough so that the door frame can still slide.

Doors

🛠 Drill, ⅛”, $^{5}/_{16}$” drill bits, 1¼” hole saw, Loctite, marker, air saw or jig saw, vise-grip clamps, masking tape,

🚗 Door components, body assembly.

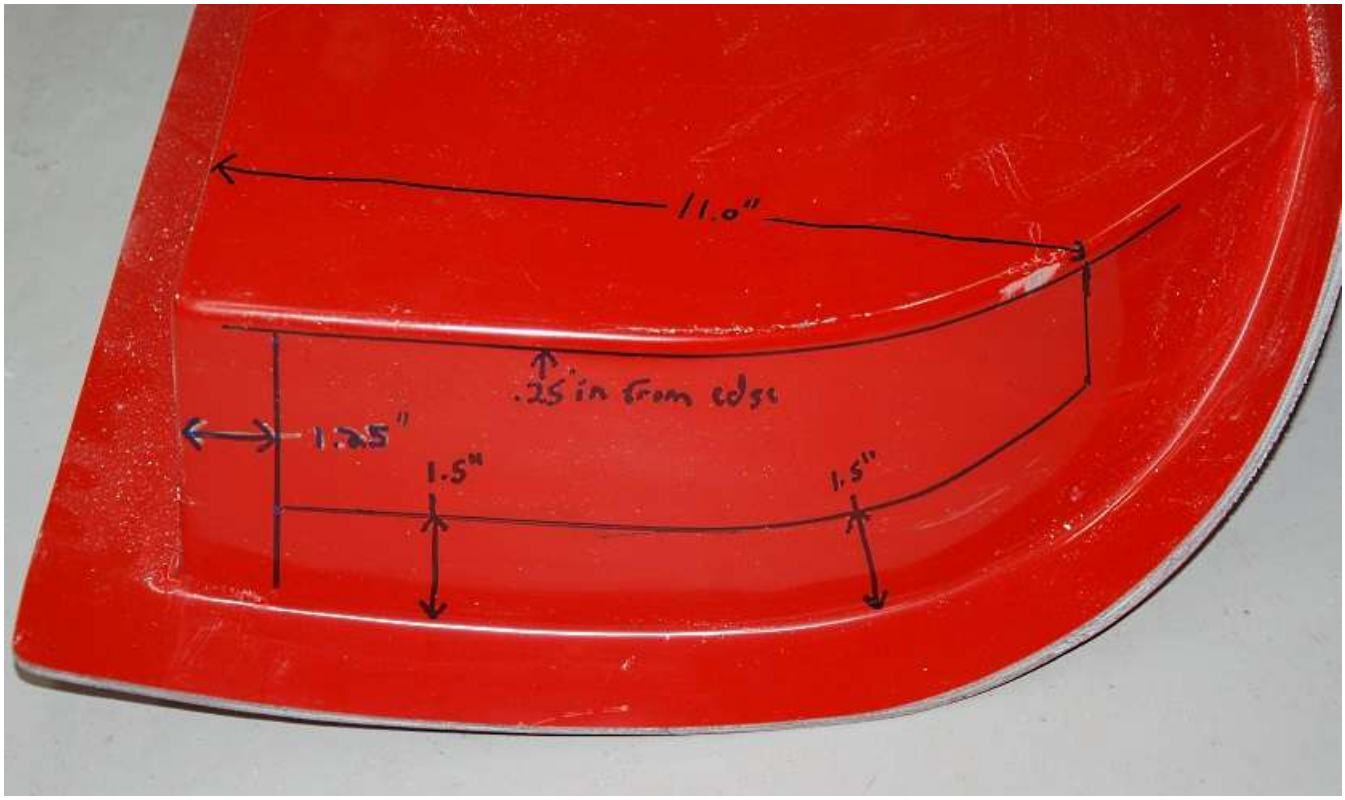
✋ Take your time to align the doors properly. There is plenty of built-in adjustability.

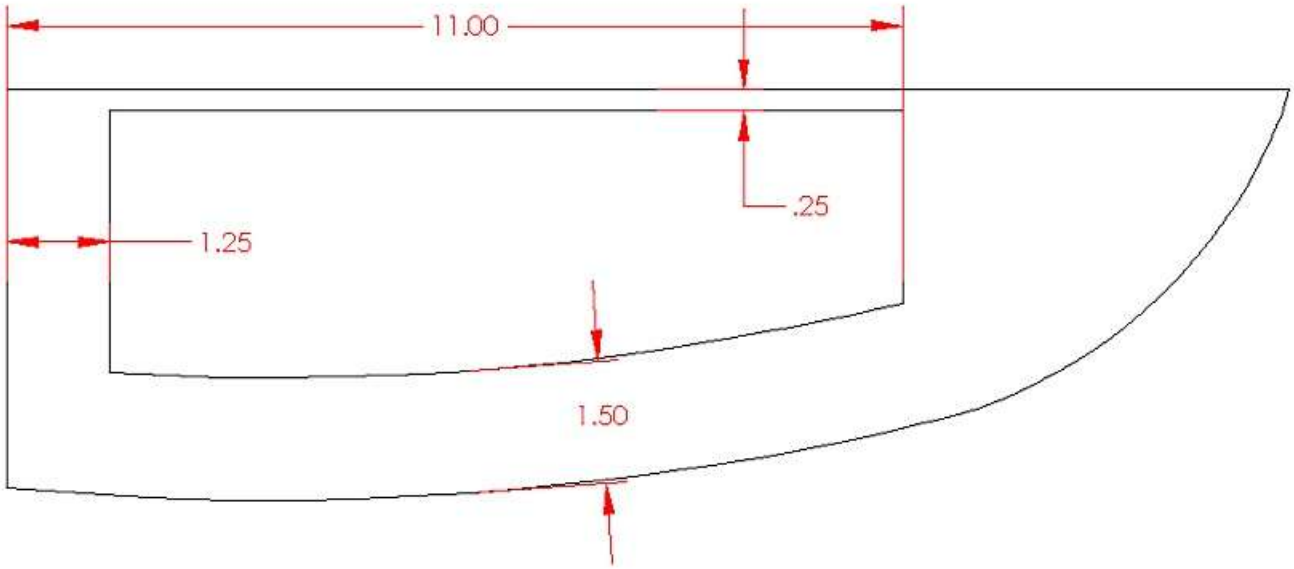
Trimming

Mark an even ½ inch flange around the door recess, you can use a washer or small block of wood to help keep an even spacing around the inside of the door area.

Drill a $^{5}/_{16}$" hole on the inside of the line marked to allow the saw blade to go into the door.

Cut the inside of the door out along the line leaving the flange.





At the front of the door use the dimensions above to draw the area to remove to insert the door frame.

Cut the marked area of the door front using an air saw or jig saw.

Door frame install

🛠 $^{5}/_{16}$" drill bit, drill, $^{5}/_{32}$" hex key, flashlight, ½" socket, ratchet, marker, ruler, measuring tape

✋ The install pictures are shown off the car. These steps are done with door frame attached to the frame still

With the door frame still on the car, start inserting the door onto the frame at the top rear corner then swing it down.

Push the door onto the door. The door frame will self-locate around the door cut-out, clamp the door frame to the inner door liner.

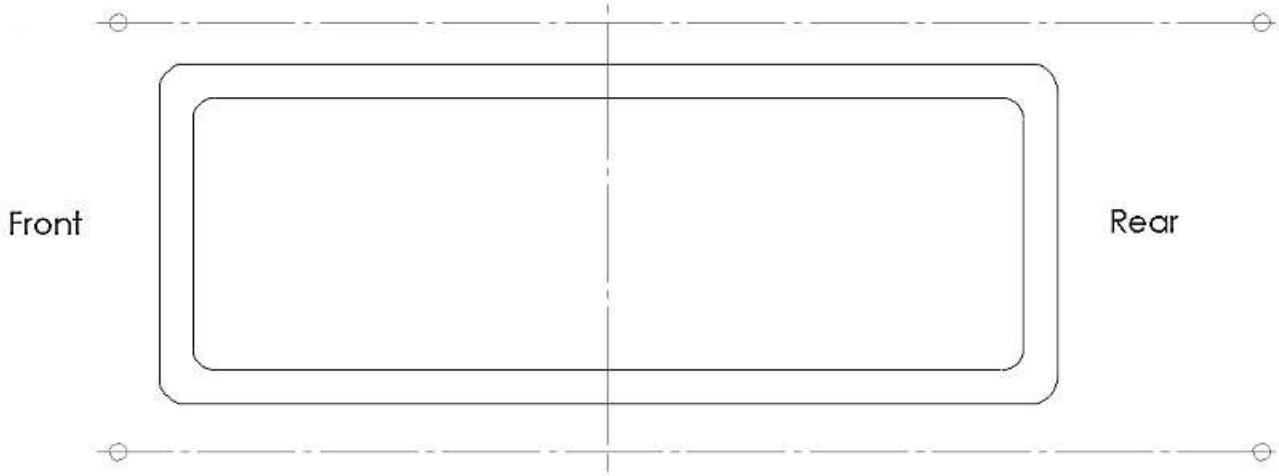
Carefully close the door remove material from the doors if necessary to allow a good fit in the door opening. Allow an ⅛”-$^{3}/_{16}$” gap on the bottom and front of the door. We usually use a paint stick as a guide, let the door sit on them and make sure it can fit around the front.

✋ The door frame should touch the back of the fiberglass door. If necessary, loosen and move the door frame.

Clamp the door to the door frame then using a ruler draw lines at the same location as the flanges in the door opening on all four sides.

Use a tape measure to measure on the inside of the door from the flange to the door frame.

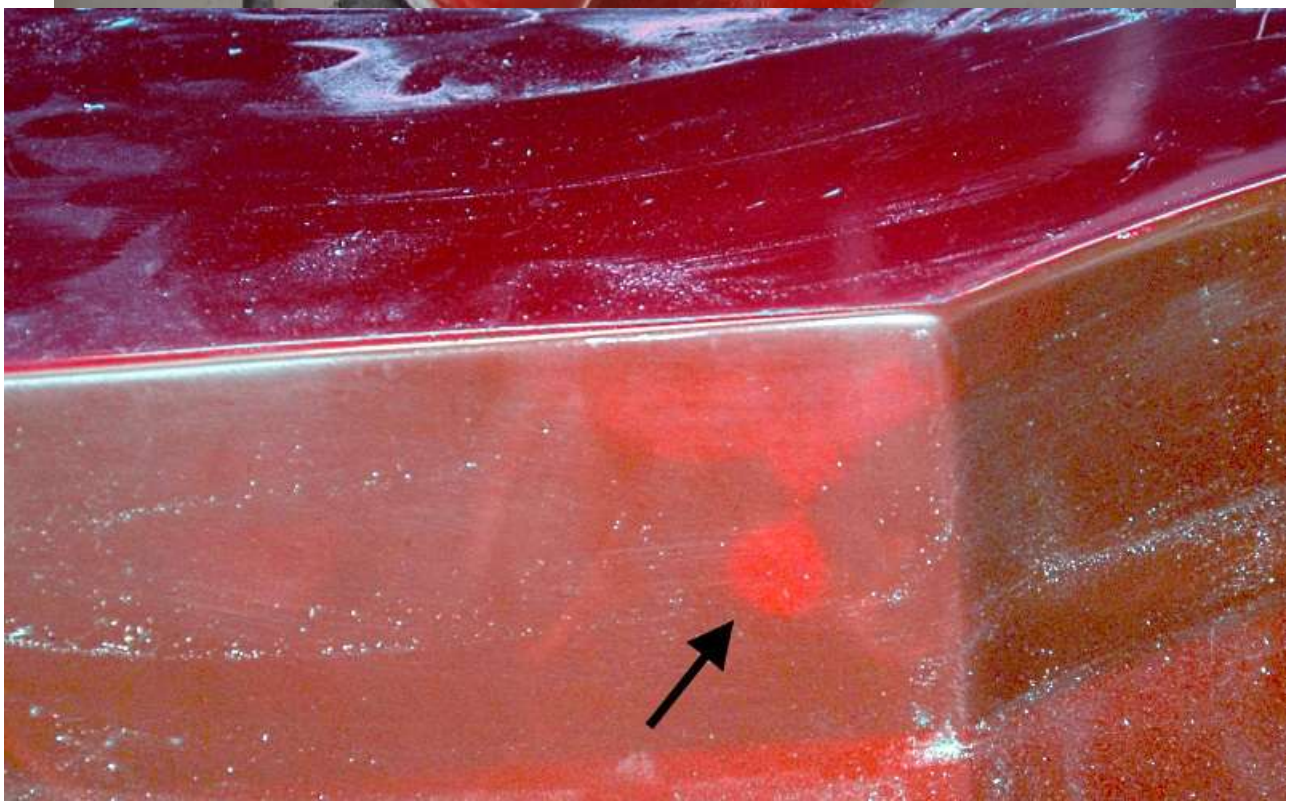
Add 0.50” to the measurement so that the mark will be in the center of the tube and mark the inside of the door so that there are four marks.



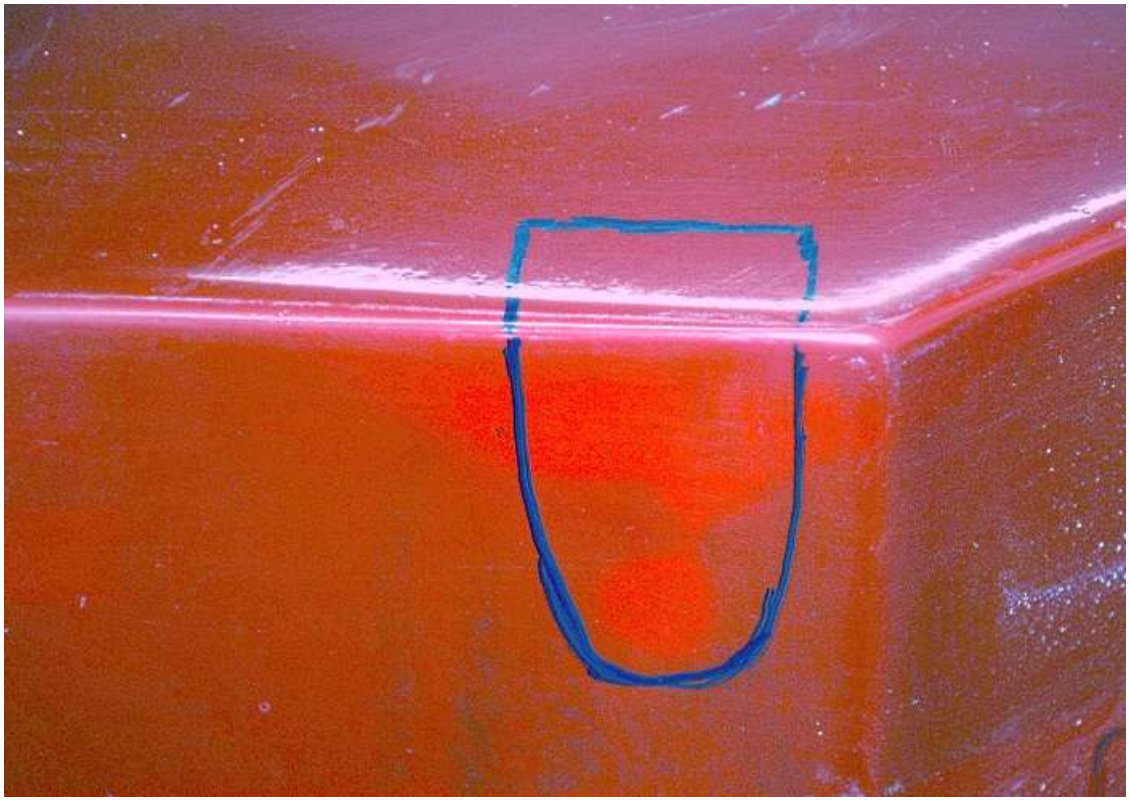
Rough locations of holes around door opening.

Drill through the door and frame with a $^{3}/_{16}$" bit then open it up to $^{5}/_{16}$".

Bolt the door to the door frame using the $^{5}/_{16}$" x 1.50" button head screws, locknuts, $^{5}/_{32}$" hex key and ½" socket.



Press the door latch so that it is in the locked position then use a flashlight to shine through the door opening at the back of the door so that you can see the circle of the door latch.



Mark the area to get cut for the door striker to go into the door. Allow room around the striker so that it will not hit the door fiberglass.

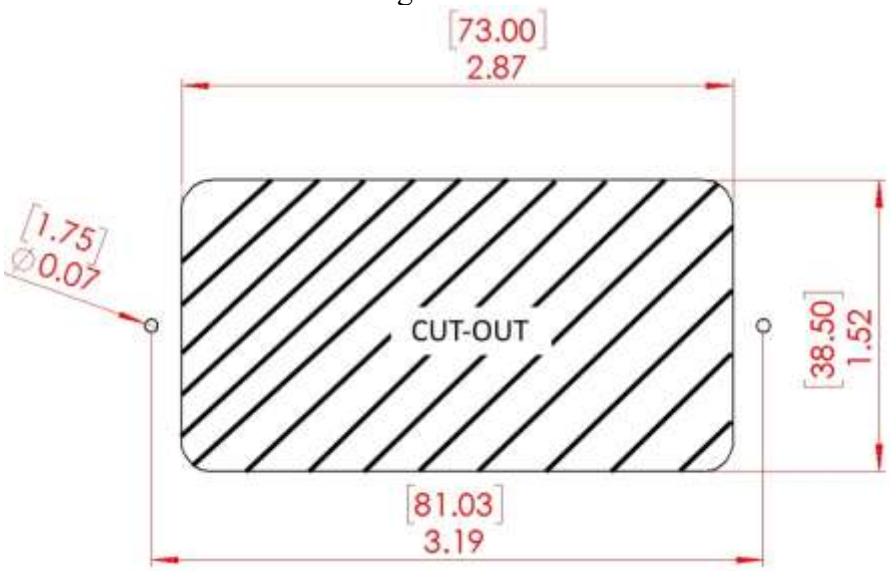
Remove the door from the door frame and use an air saw or jig saw to cut out the area marked on the door.

Reattach the door to the door frame.

Reattach the striker to the frame.
Test close the door to make sure there are no interferences between the door, latch, striker and body.

Inside door handle

- Marker, air saw, $^{3}/_{32}$" drill bit, drill, Philips head screwdriver.
- Make sure the hole will be above the upper door tube.
- The flat end of the cut-out area towards the back of the door.
- Some pictures show an older handle design.



Use the template above to mark the inside area to cut. Use a ruler to check the scale before using.

Hold the template up to the door with the flat end of the cut-out area towards the back of the door. Use the cable and handle still hooked to the latch as a guide for the max reach of the cable. Having a bend in the cable is ok. Make sure the hole will be above the upper door tube. Mark the inside of the template.

Use an air saw or jig saw to cut out the area marked on the door.

Remove the cable from the handle and insert the door handle into door hole just made and reattach the cable. Use the handle as a template to drill the $^{3}/_{32}$" mounting screw holes.

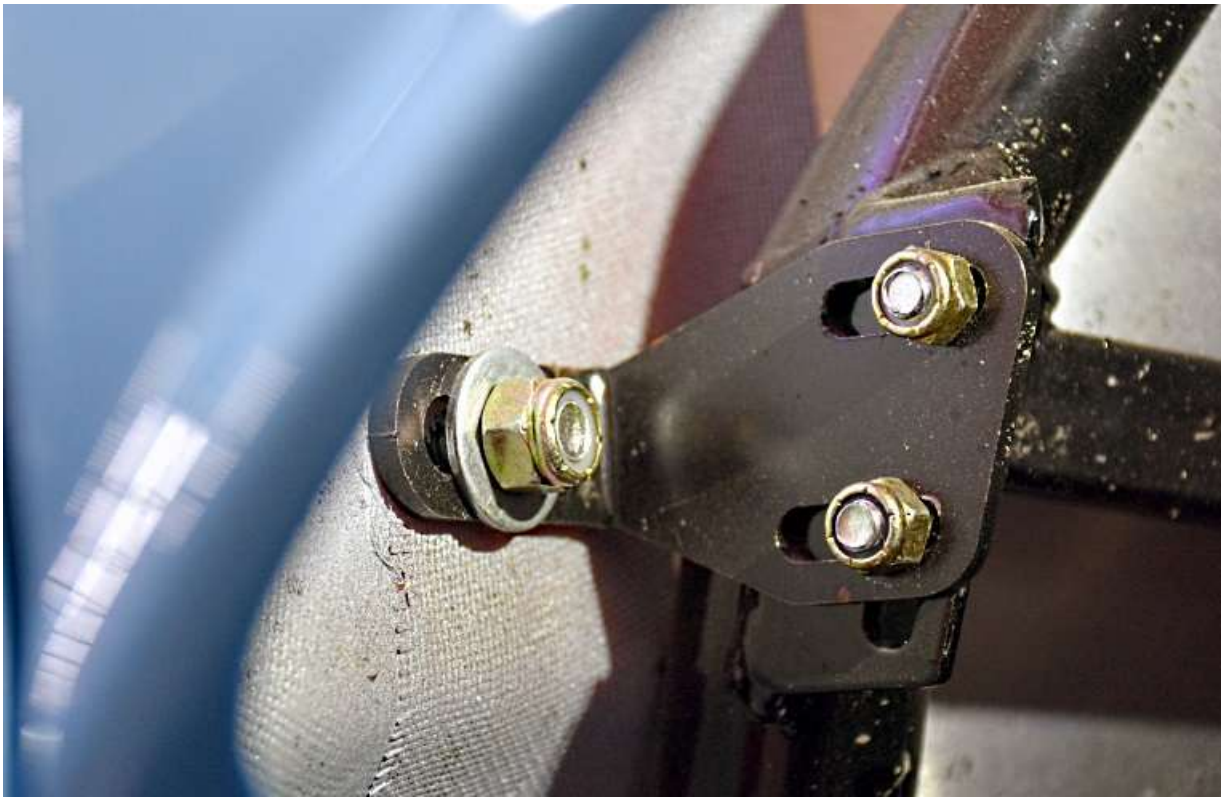
Attach the handle to the door using the #8 chrome oval head screws.

Door Striker

- (2) $^{7}/_{16}$" nylon locknuts, (2) $^{7}/_{16}$" washers, (4) $^{3}/_{8}$"x1.25" carriage bolts, (4) $^{3}/_{8}$" washers, (4) $^{3}/_{8}$" nylon locknuts.

From inside the door reach through the center of the door latch with a marker and mark the body for the door striker. It is easier to get a good center if the latch has been closed so you have a hole instead of an open slot to trace.

Use the 1¼" hole saw to drill for the striker.



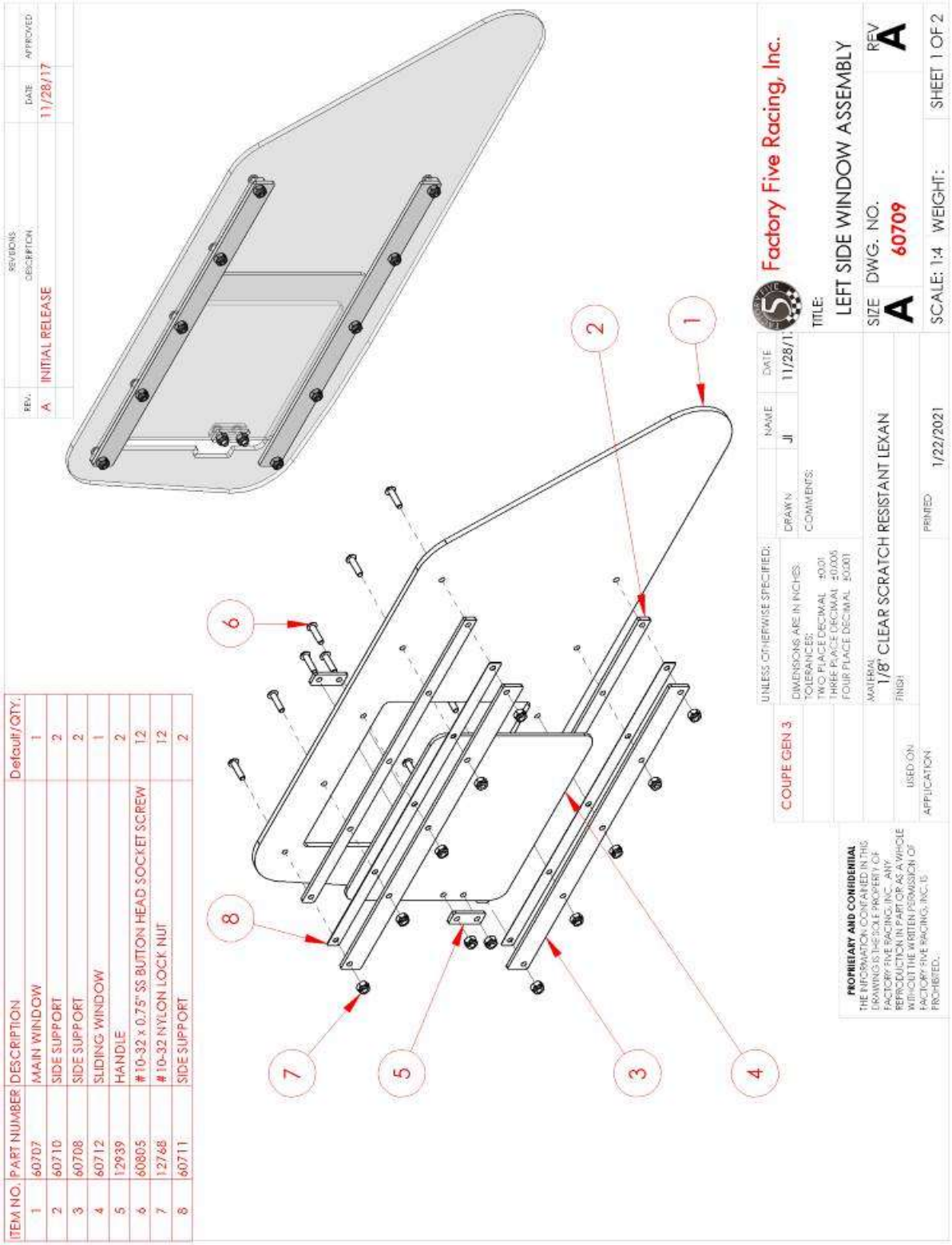
Bolt the striker plate to the frame and the striker to the plate using the center of the slot through the body as a starting point for adjustment.

Adjust the latch striker on the mount plate until you have a nice fit on the door and tighten.

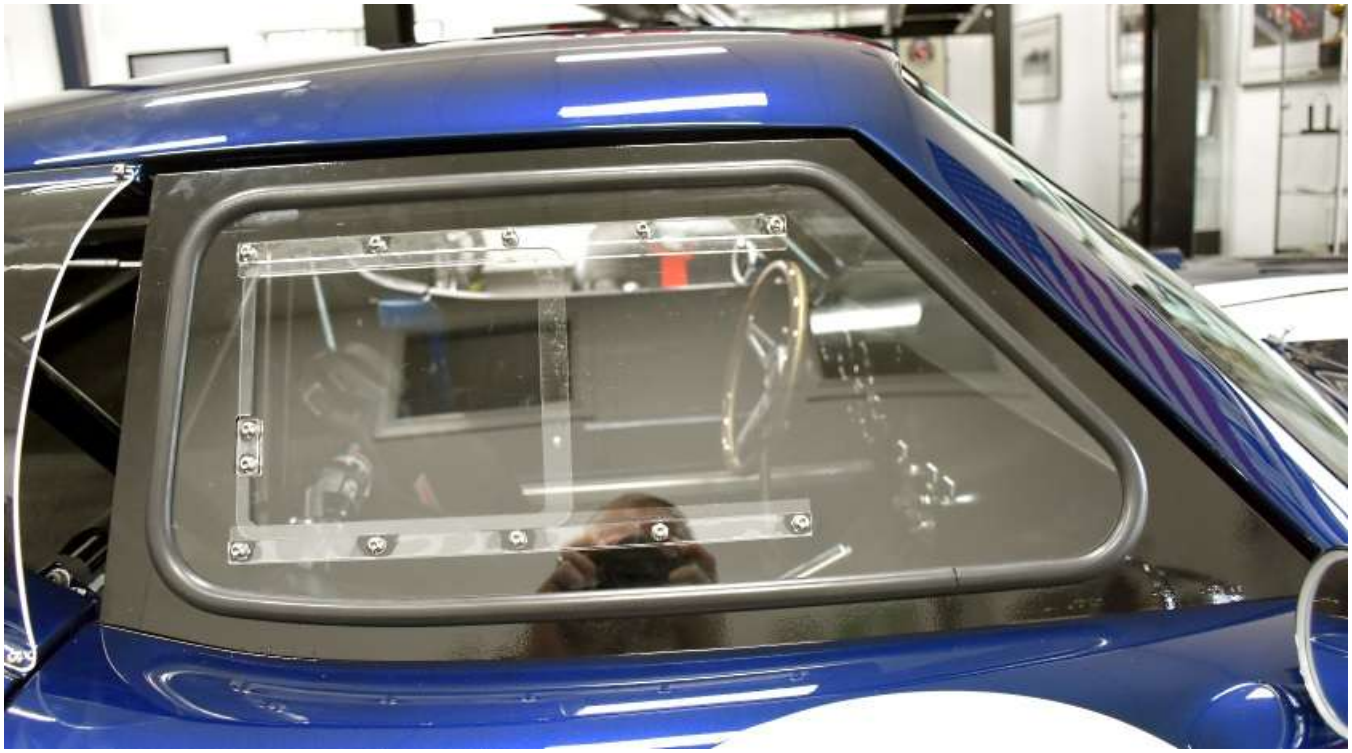
Side windows (Optional)

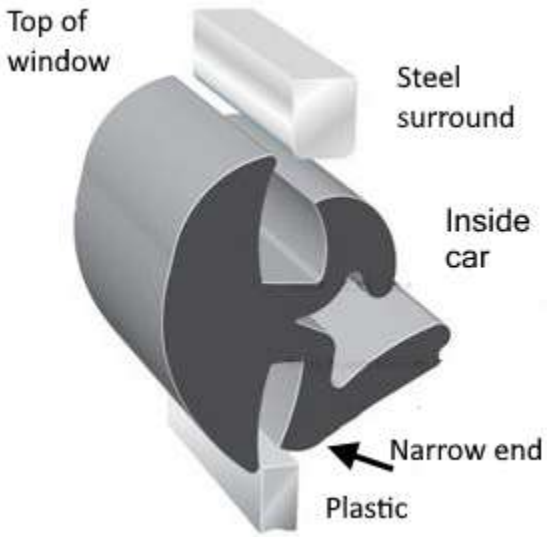
🛠 $^{5}/_{16}$" drill bit, ½" wrench, $^{3}/_{16}$" hex key, WD40, Window cleaner, paper towels, level.

✋ Be careful using the gasket tool while installing the window so that the plastic does not break.



Assemble the plastic side window using the hardware included. The left side shown, the right is a mirror image.



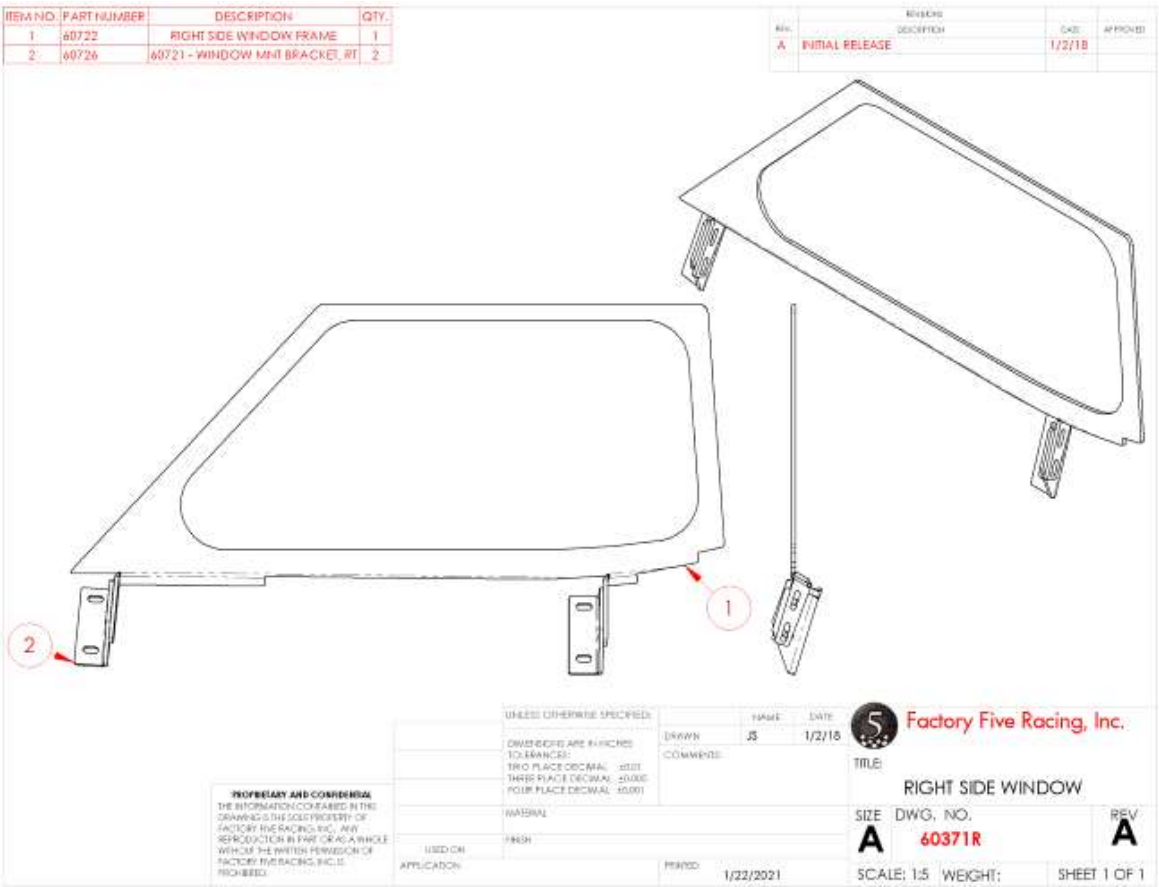


Push the gasket around the window frame so that the larger side of the gasket is on the frame and the locking tab is on the inside. The start/finish point should be on the bottom.

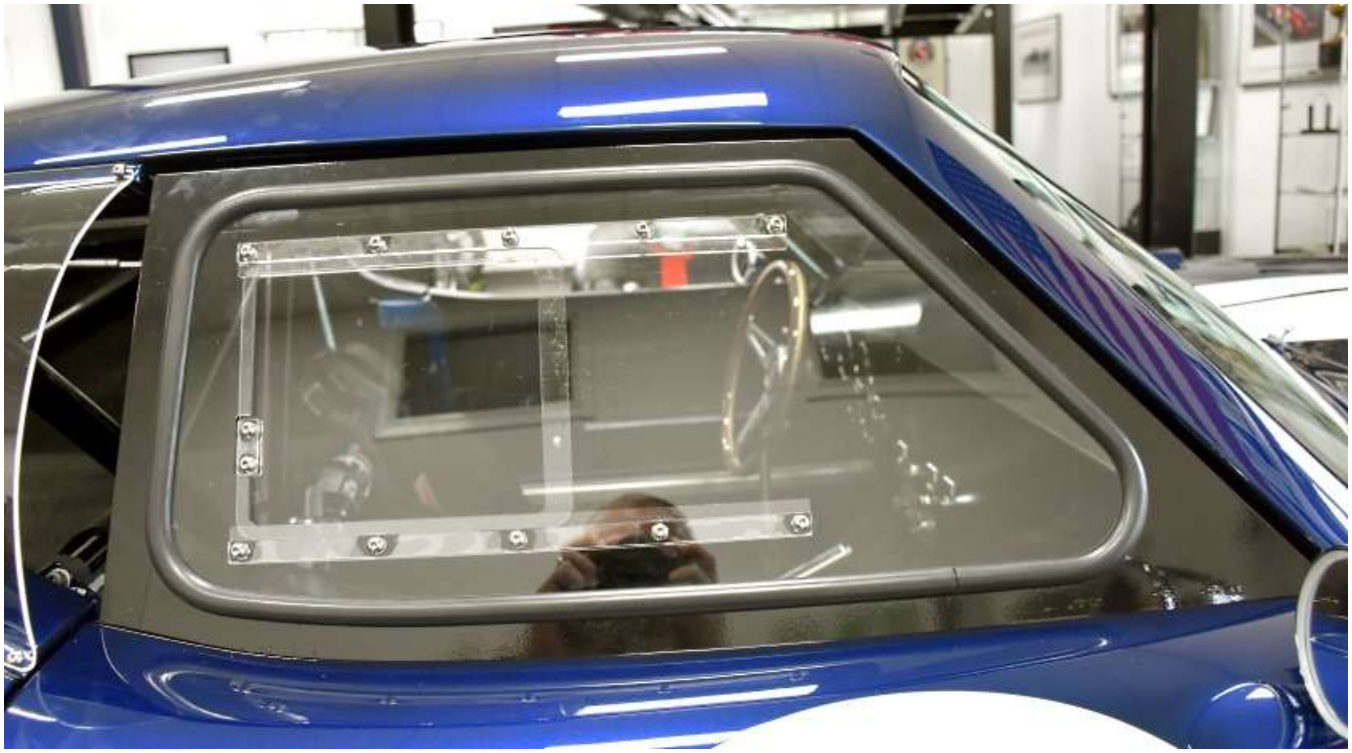
Push the plastic into the gasket as much as possible then WD40 the end of the install tool and use the install tool as shown above to lift the gasket around the glass.

Spray WD40 on the locking tab part of the gasket all around the window frame.

Use the install tool angled slightly as shown to lift the small section of gasket with the end which will allow the roller part to push the locking tab down under the small section.



Attach the window mounting brackets to the window frame. The right side is shown above, the mounting brackets go on the front side of the frame.



With the help of another person, hold the window up in the opening so that there is an even gap around the frame then mark the mounting bracket location on the inside of the door.

Stick some of the ½ moon weatherstrip on the bend side of the window frame to seal against the door.

Drill and bolt the brackets to the door using a $^{5}/_{16}$" drill bit, $^{3}/_{16}$" hex key and ½" wrench.

Repeat for the other window.

Inner quarter window (Optional)

✋ This is used to seal the rear quarter window for use with A/C.

Push weatherstripping onto the front edge of the plastic.

Attach a small bumper to the bracket using a $^{1}/_{8}$" rivet.

Locate the inner quarter window in the opening.

Locate the bracket so that the window can just slide in and out if desired.

Attach the bracket to the body using a small truss head screw.

Nose Scoops (Optional)

- From FFR, the nose scoops are cosmetic; we do not include parts to make them fresh air ducts for the footboxes like the originals.

If installing the optional nose scoops, drill the mounting holes for them now. Left side shown.

Right side duct.

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.
- 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.
- We suggest painting the wheel well, backside of body near exhaust, underside of nose and rear mesh insert area flat black.

- Doors

- Rear wheel well front

- Backside of body near exhaust area

- Main radiator opening
- Door hinge openings

- Underside of Nose and fender flange

- Hatch hinge area flange.

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.
- 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

Emergency Brake Boot

🛠 $^1/_8$" drill bit, drill, Philips head screwdriver
🚘 Interior Trim/Carpet

Unpack the e-brake boot.

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.

Shifter Handle and Boot

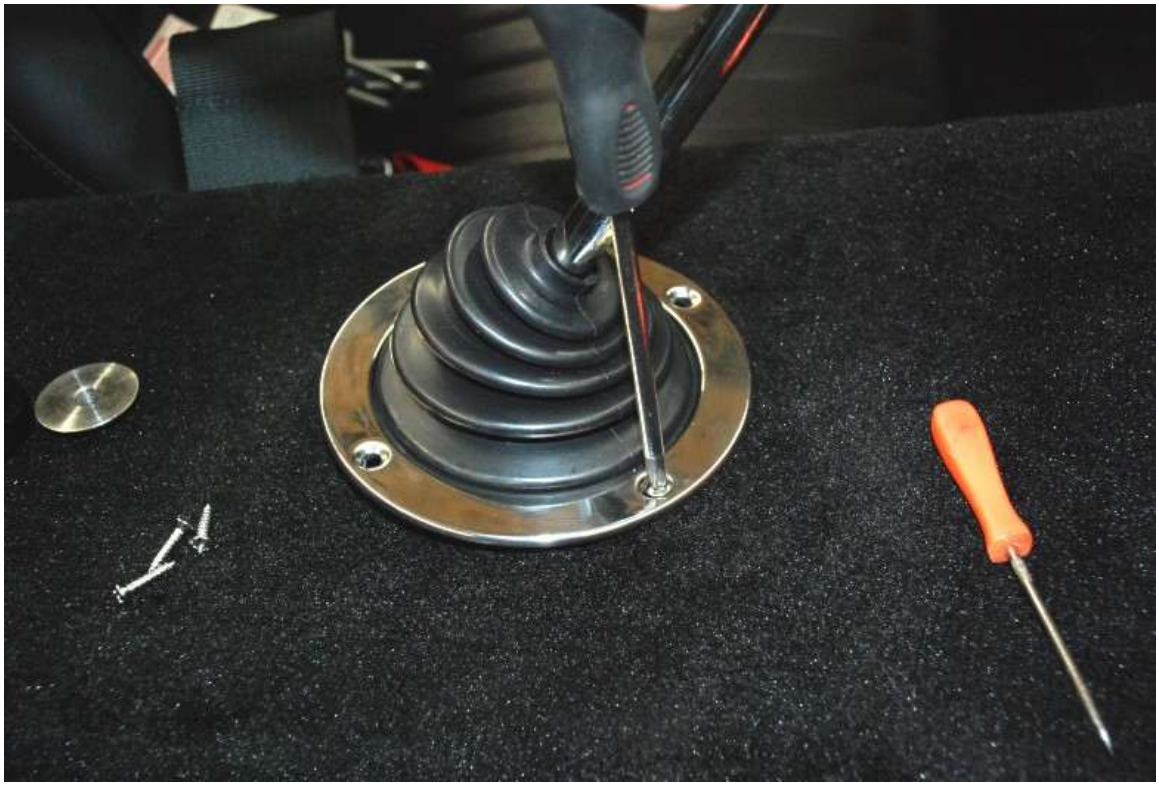
🛠 ½" wrench, $^1/_8$" drill bit, drill, Philips head screwdriver, marker, thread lock
🚘 Shifter handle components

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.



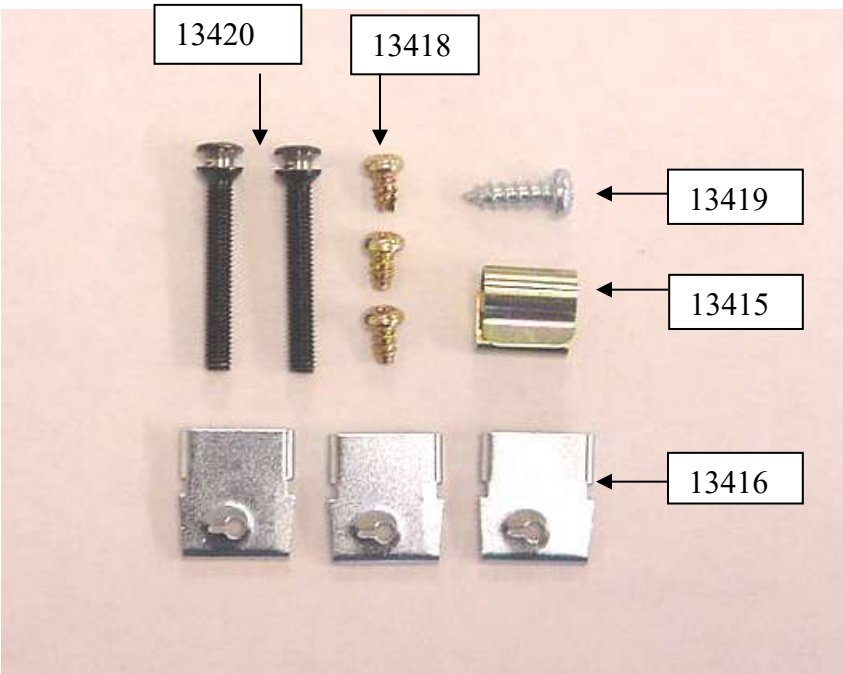
Re-install the boot and screw down to the tunnel with the countersunk screws. A small screwdriver can help to locate the holes.

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.

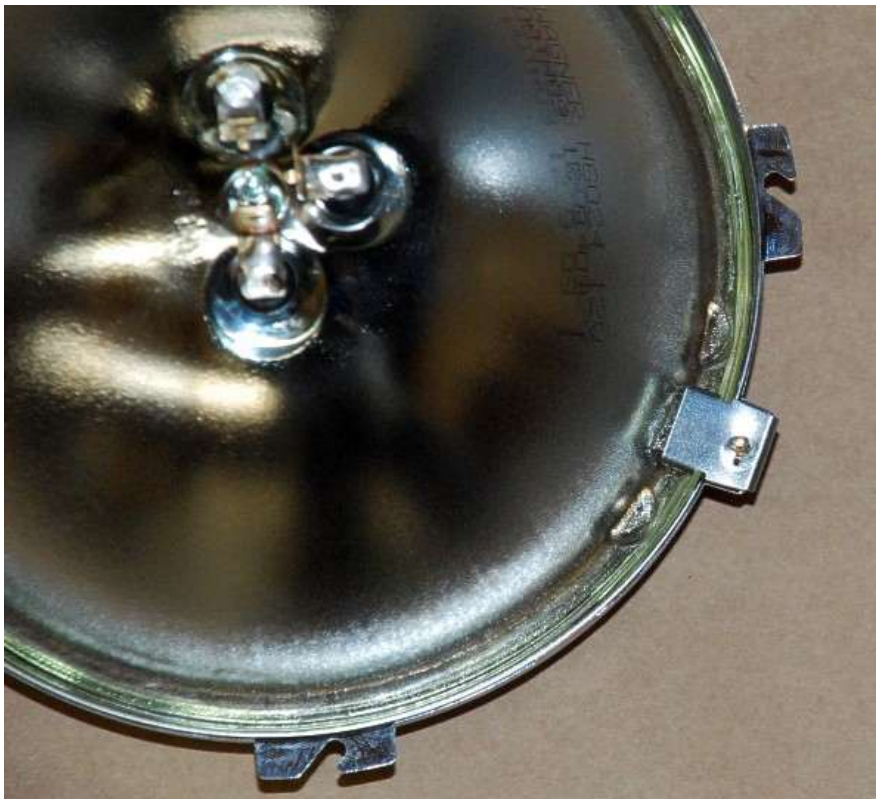
Screw the adjuster screws about halfway into the buckets.

Push the grommet into the side of the bucket.

Screw the bucket onto the body.

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.

Plug the light into the connector.

Mount the bulb to the bucket. The slotted parts of the mounting flange go onto the adjusting screws between the screw head and flange at the top and left side of the light.

The bottom right screw attaches the bucket to the light mounting flange.

Push the spring clip onto the boss near the bottom of the bucket.

The trim ring hooks over the bucket on the top and gets a screw it in the bottom using the oval head screw. Drill a hole through the bottom of the nose headlight area so that a Philips head screwdriver will line up with the mounting hole location.

Turn Signals

- Front turn signal lights

Push the rubber bushing into the body hole.

Slide the trim ring onto the light.

Pass the wires through the grommet.

Push the light into the rubber bushing.

Headlight Covers

🛠 Drill, ⅛” drill bit, Philips head screwdriver, masking tape, marker, ruler, and sandpaper.

- Headlamp covers/fasteners – (8) #6x ½” stainless truss head screws, (8) mount tabs.

Put masking tape around the edge and on the inside around the edge of the headlight bucket so the paint will not get scratched.

Position the headlight cover in the opening with your hands as shown in the picture. Only press down at four points on the cover. Move your fingers as necessary so that the cover is flush with the body everywhere. If necessary, use sandpaper on the edge of the plastic to shape the plastic.

Mark on the masking tape where your fingers were located.
Remove the cover.
At the points marked, measure down from the edge of the bucket ⅛” and mark the tape.

Tape four of the mounting tabs in the bucket opening at the points marked.

Mark the locations of the mounting tap holes.

Drill $^{3}/_{16}$" holes into the bucket.

Use $^{3}/_{16}$" rivets to attach the tabs to the headlight bucket.

Reposition the cover carefully.

If necessary, use a pair of pliers to bend the tabs to match the surface of the lens.

- A drill bit for plastic is suggested to prevent cracking

Mark and drill $^{3}/_{16}$" holes on the locations marked on the cover.

Before final mounting the edges should be sanded to a smooth finish. Start with 400 grit paper and work down to 1200 grit before finishing with 3M plastic polish for a nice finished edge. Be extra careful not to scratch the surface of the lens, using a small paint stick to wrap the paper around helps.

Attach the cover to the mounting tabs using the #6 truss head screws and a Philips head screwdriver.

Tail lights

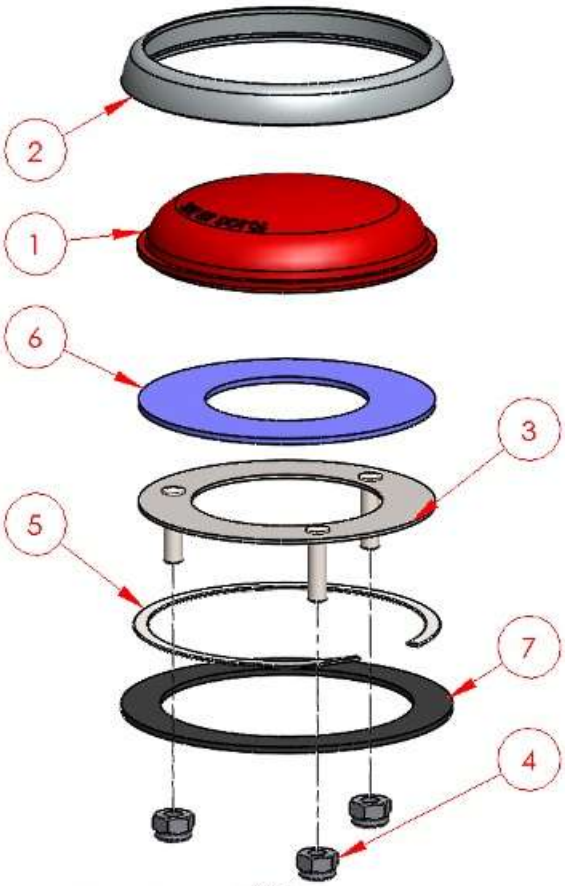
🛠 Pliers, masking tape, $^{3}/_{8}$" socket, ratchet

🚗 Tail light components

Unpack the tail light components.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	60291	RED TAIL LIGHT	1
2	60292	TAILIGHT TRIM RING	1
3	60418	TAIL LIGHT MOUNTING RING	1
4	NLN-#10-32C	NYLON INSERT LOCKNUT, #10-32 UNC	3
5	91663A740	3" INTERNAL RETAINING RING	1
6	60290	INNER TAIL LIGHT GASKET	1
7	60289	TAIL LIGHT MOUNT GASKET	1

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	10/6/16	



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COUPE GEN 3

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	10/6/16

COMMENTS:

PRINTED 5/18/2017

Factory Five Racing, Inc.

TITLE:

TAIL LIGHT

SIZE A | DWG. NO. 60417 | REV A

SCALE: 1:1.6 WEIGHT: | SHEET 1 OF 1

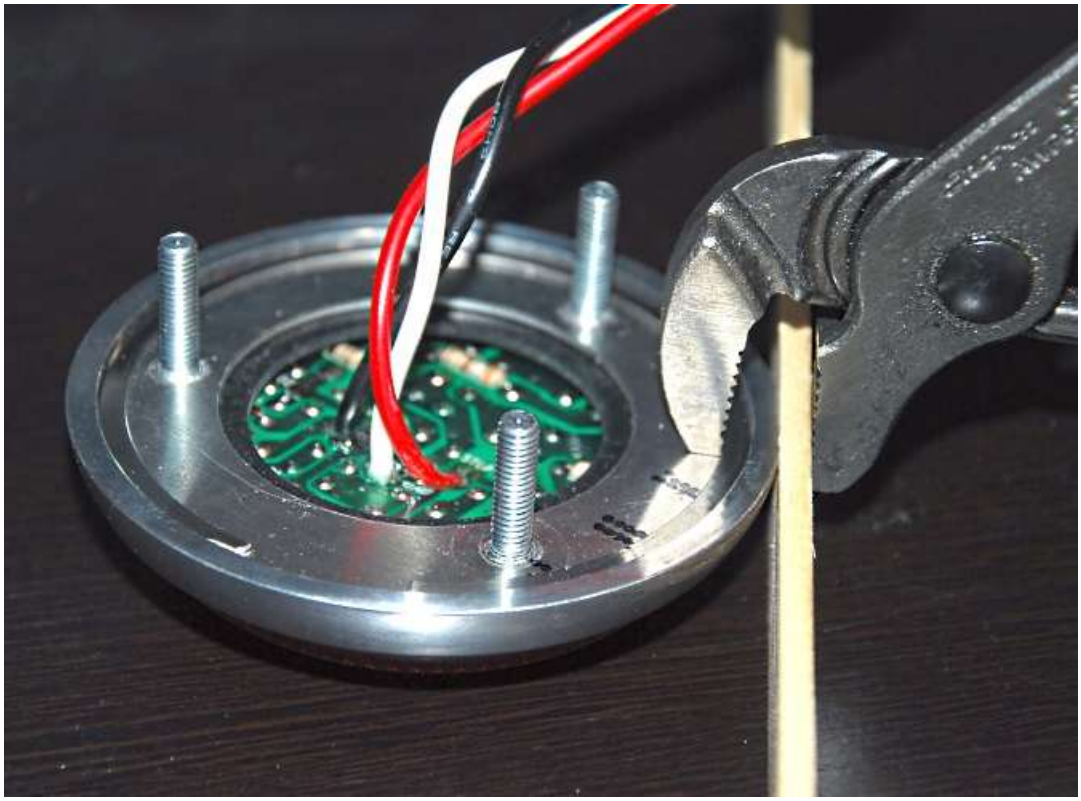
www.factoryfive.com 508-291-3443

Put the light in the trim ring.

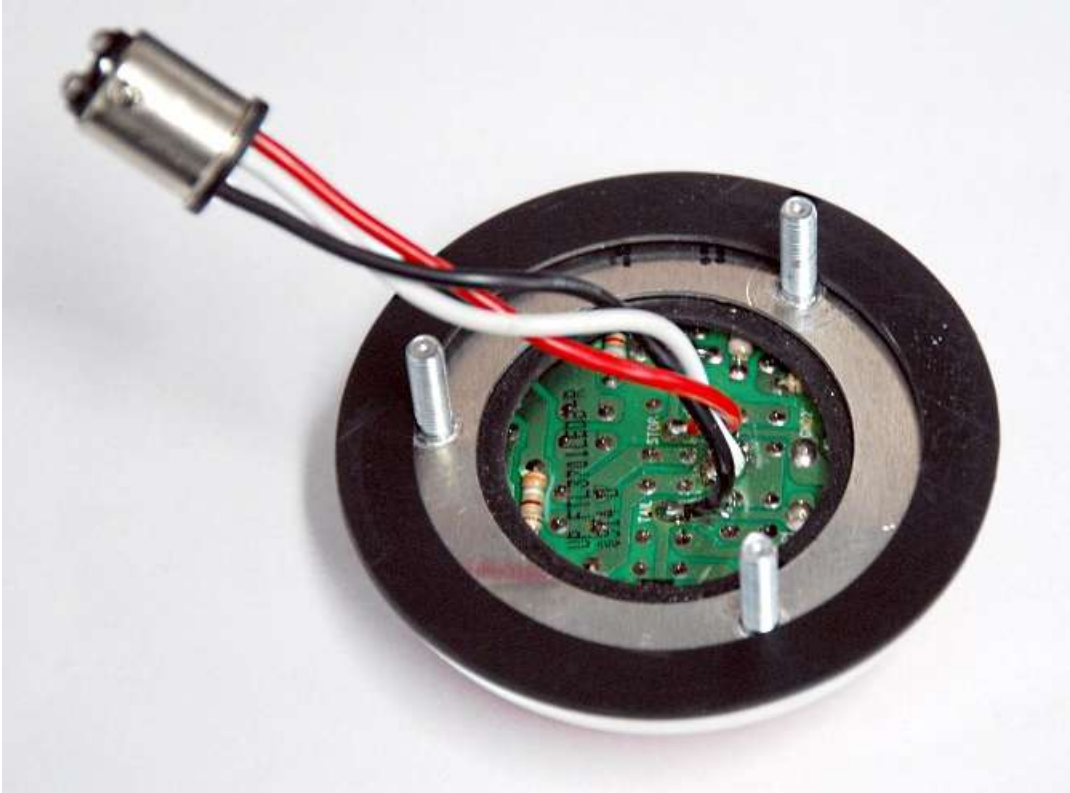
Put the inner rubber gasket in on top of the light.

Put the mounting ring in on top of the gasket and orient the studs so that there is one stud at the top of the light and two at the bottom when looking at the text on the lens.

Starting with the squared off end, push the snap ring into the retaining groove in the trim ring.



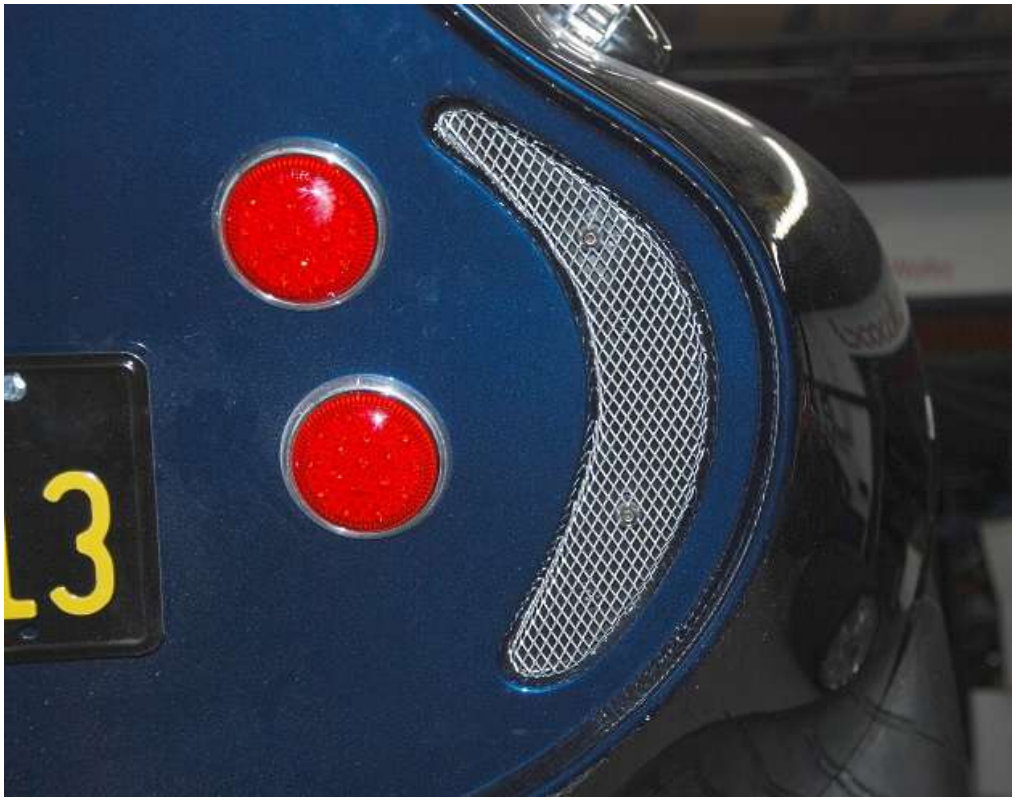
Put masking or duct tape or use a paint stick around one of the jaws on a set of pliers and squeeze the snap ring into the groove so that it is seated all the way.



Put the rubber mounting gasket onto the light assembly.

Cut the plug off the wires right next to the plug.

Push the wires through the body mounting hole then attach the light to the body using the 10-32 locknuts, $^{3}/_{8}$" socket and ratchet.

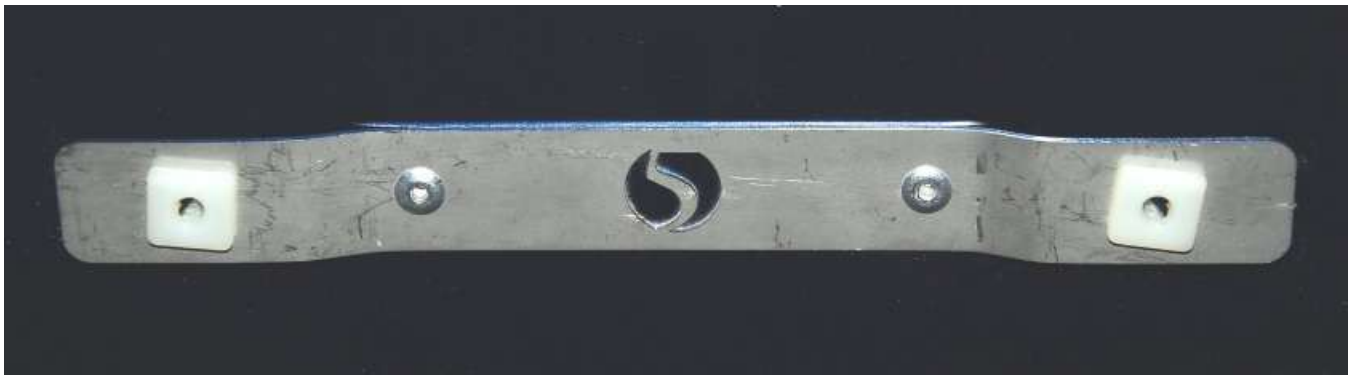


Mounted taillights.

License plate bracket

🛠 Rivet gun, Philips head screwdriver, $^{11}/_{32}$" or 9mm wrench.
🚗 Secondary body fasteners, license plate light/bracket components.

If not already in, push the plastic license plate nuts into the bracket.



Attach the license plate bracket to the body using $^{3}/_{16}$" rivets.

License plate light

Insert the #8 x 1" oval head stainless screws through the light and body.

Hand tighten the #8 locknuts for now.

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.

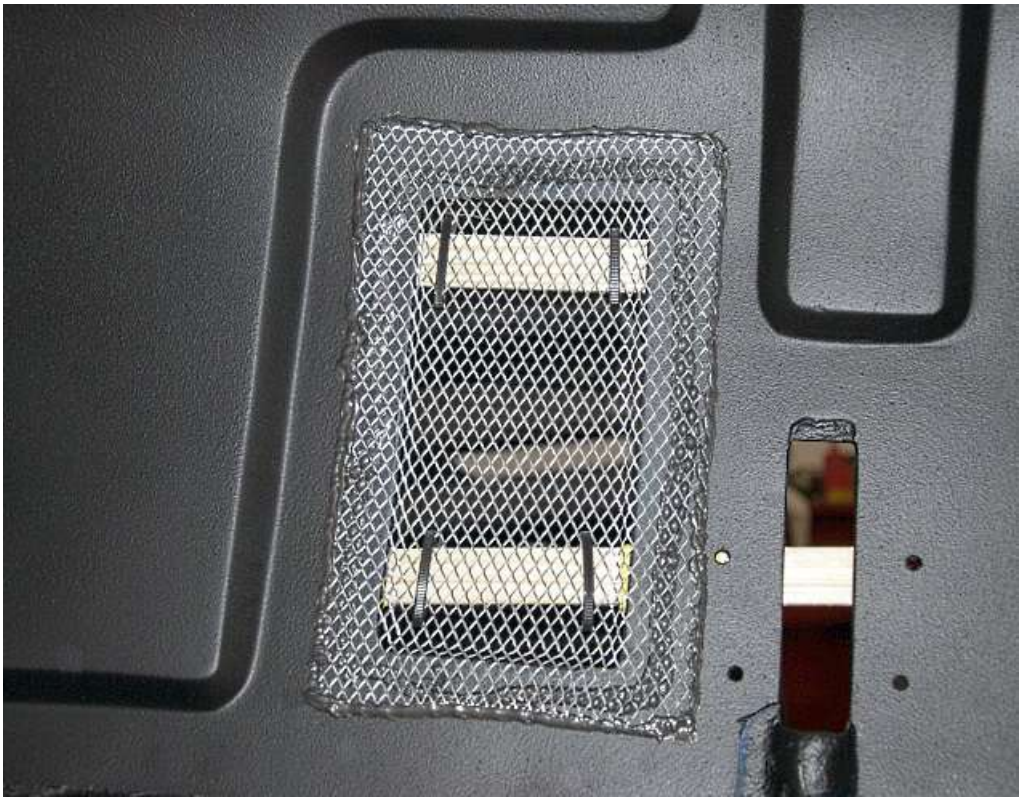
The one remaining cap fastener is a longer screw and nut used for the ground strap, screw it in from the top then put the ground strap washer and nut on from underneath.

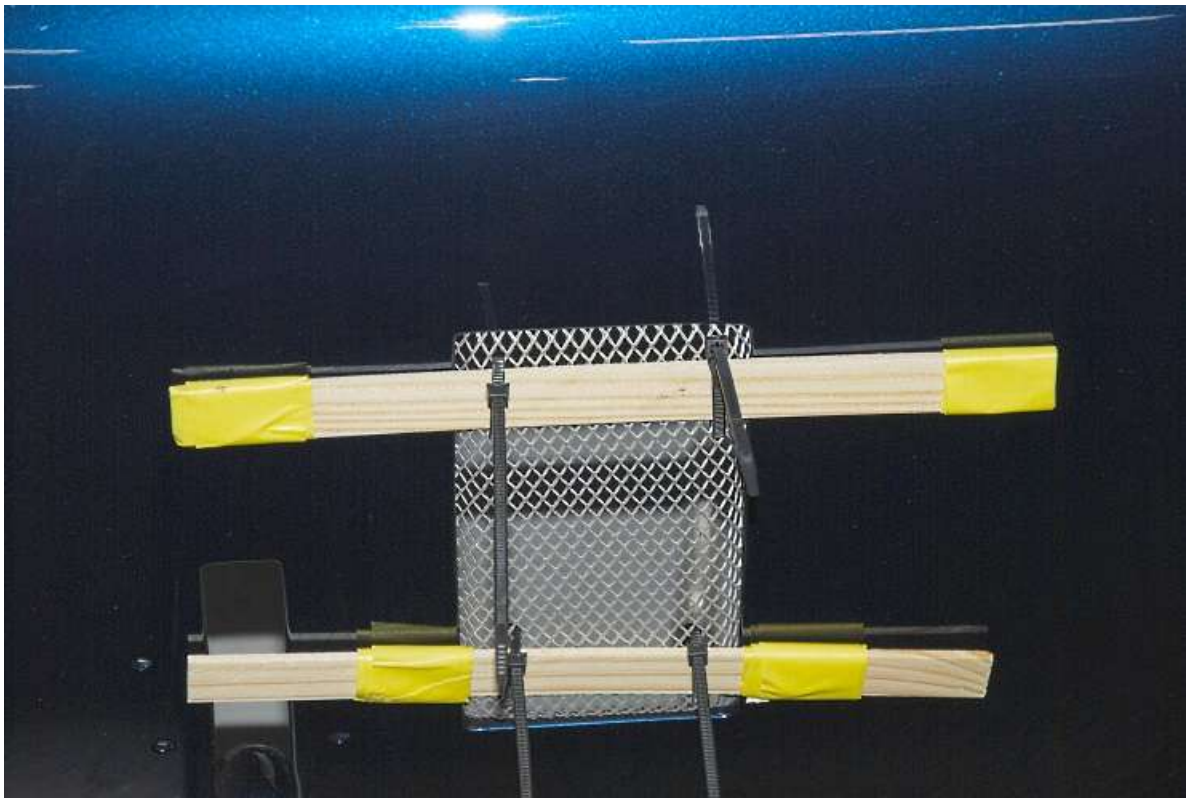
Nose side mesh

🛠 Silicone, caulking gun, duct tape
🚘 Coupe pressed mesh.

Position the mesh screen behind the louver cut-out area on the nose to see where the mesh will touch.

Apply silicone around the cut-out area on the nose that the mesh will touch.





Push the mesh into the silicone and use masking tape on the back to hold it in place or paint sticks and zip ties from the outside.

Rear mesh

- Tin snips, marker
- Coupe pressed mesh
- The rear mesh is a nice touch for looks but not necessary.
- There are different ways to mount the mesh, using spacers and fasteners or bend the sides and use silicone, it is up to you.

Headliner

- Razor knife, tape, newspaper/large paper, spray glue, rags.
- Interior trim assembly.
- Put some clean rags on the ground to prevent scratching the roof of the body.
- With the help of a friend, turn the body upside down and place the roof on the rags.

- The adhesive used to hold the headliner down is 3M® Super77™ or Super90™ work best. We have had the best results following the directions and spraying both material and body and waiting 1 minute to get tacky before final fit.

Pre-fit the headliner to make sure you have it lined up so there will be no gaps. Rough trim if there is excessive material left over but the final trim is best after the liner is glued in place.

The liner should follow the windshield pillars down to where they reach the dash and door opening. Trim material around this area to get the liner to sit nicely into this channel.

When laying out the liner, look for any high spots or bumps in the fiberglass that don't allow the liner to sit flat. Using coarse sandpaper or a small sanding wheel, carefully bring these areas down flush to the roof.

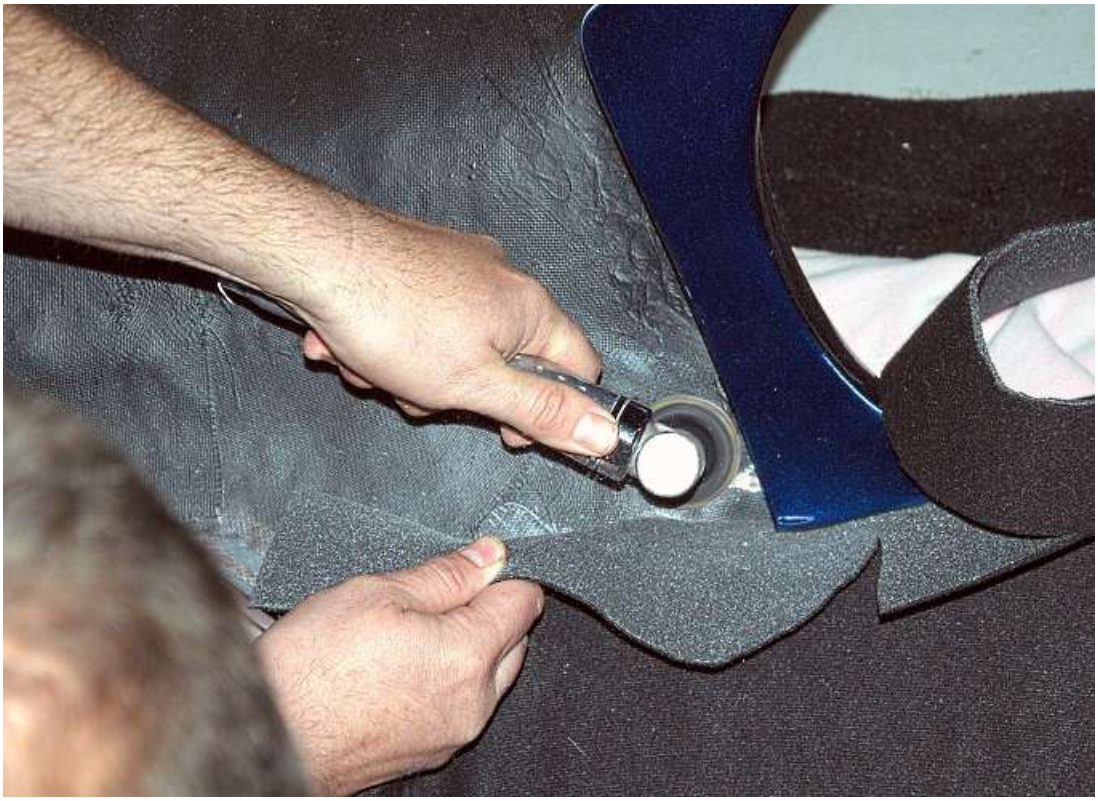
Starting with the liner in position, lift the front half of the roof (not the window pillars) while keeping either some books or helping hands holding the liners' position on the body. Spray both the liner and roof and then after 1 minute lay the liner back down slowly working from the middle out to prevent wrinkles or air pockets.

Pay extra attention to the edges and tucking the material in tightly to the inside corners make sure the adhesive is nice and uniform and covers these areas completely as they are where separation is the most likely to happen.

Spray and fit the windshield pillars still leaving them a little oversize to be trimmed later.

With the front glued in place and the rear half still loose check the fitment around the rear quarter window scoops and trim where needed to get the material to sit nice and flat.

Making pie cuts around the tighter curves helps get the material to lay flat.



Due to the mold seam location this is also a likely spot for bumps or high spots, sand these away being careful not to go deeper than flush.

Spray and stick the rear half of the liner also working from front to back and saving the quarter window edges until last.

With the liner tight against all corners and edges you can now trim it very carefully with a razor knife. It is ok to leave a little extra around the window and pillar area as this will be covered up by weatherstripping.

The windshield weather strip without the bulb is for the windshield surround.

The weather stripping with the build is for the side windows, the bulb faces toward the outside of the car.

The side window trim and windshield area trim will hide the rough-cut edge of the liner. In order to get the liner to not get pushed off the body, start at an angle with the trim covering the liner side and then push it on so the body side edge is what is what is sliding in place.

If needed, you can open up the trim with a punch or screwdriver to help if it is too tight and pulling back the liner.

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.

Nose mounting

Reattach the nose hinges to the nose.

Reattach the nose latches to the nose.

Door and Latch mount

Reattach the doors and latches.

Windshield Mounting

Windshield

- Windshield assembly.
- Handle the windshield with care and store in a safe place.
- We highly recommend having a professional windshield installation shop do this installation. Most glass shops prefer to use their own weather strip and materials to install the glass since they warranty the installation. Our local installer used 409 T 102 weather stripping on our race car.
- There are two ways to install the windshield, with weatherstrip around the edge of the windshield or without weatherstrip. We prefer without

Have the installer put 1” of primer around the sides and top and 2” along the bottom.

Apply urethane around the windshield flange.

Push the windshield into place. Tape it if necessary so that it will not slip down.
Do not move/touch the windshield for 24 hours.

Windshield mounted on the body without weatherstrip.

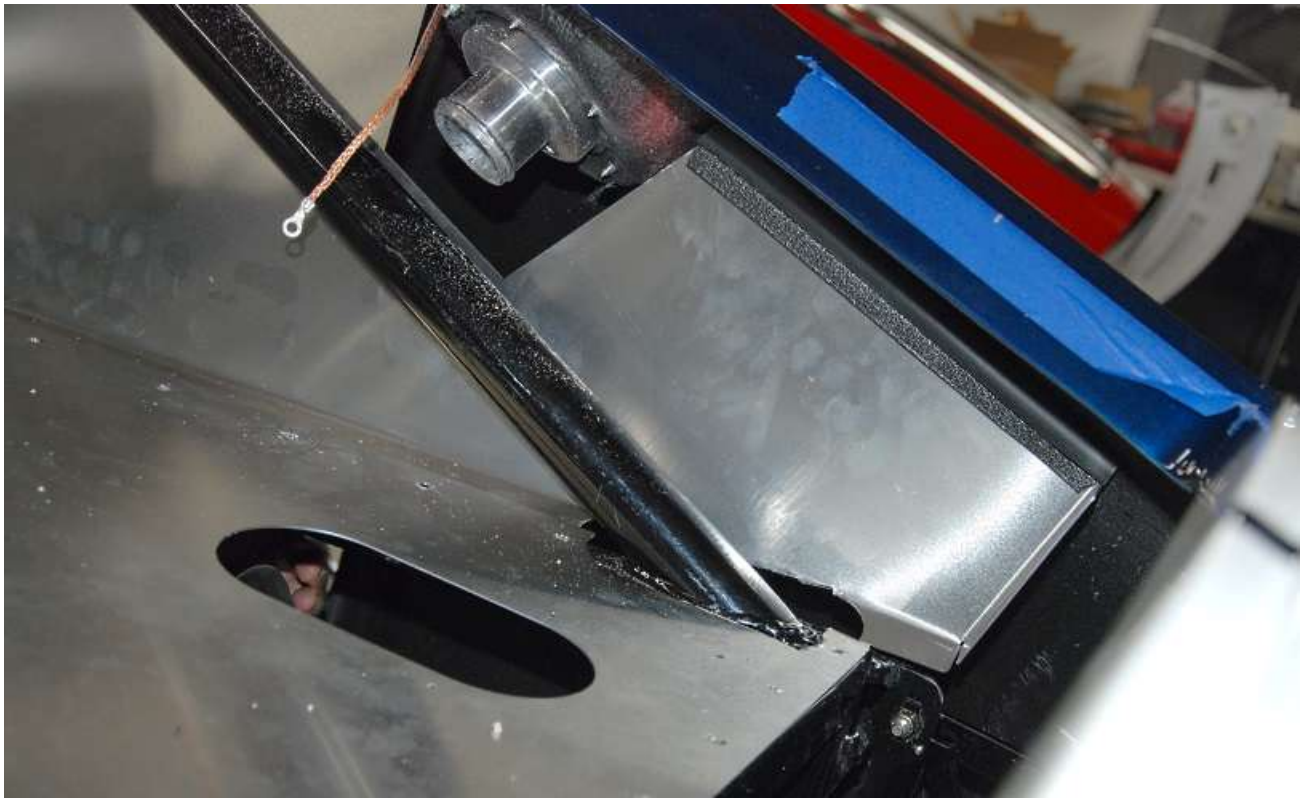
Windshield mounted on the body with 409 T 102 weatherstrip

Hatch side aluminum

Push weatherstrip onto the top edge of the hatch side aluminum. Right side shown.

From the wheel well, push the hatch side aluminum into place so that the lower flange goes under the floor aluminum.

Push the front bottom in so that the side panel touches the side of the floor.



At the back, push the panel in again so that the side panel touches the side of the floor.

Fuel Filler Neck

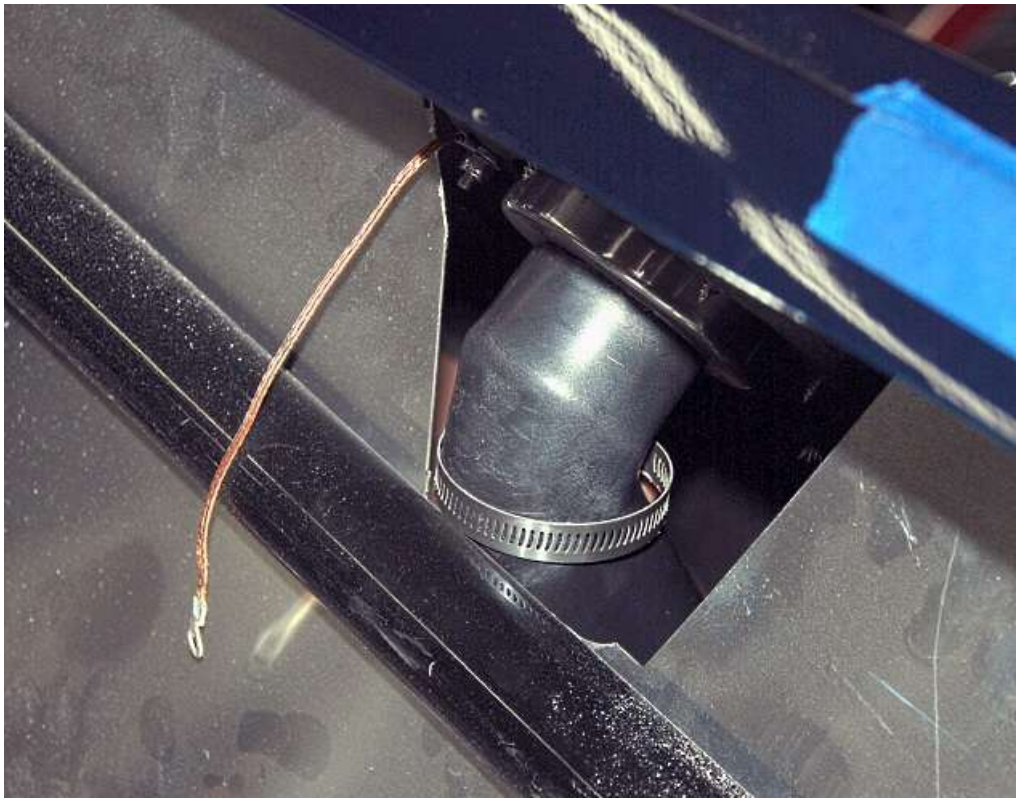
🛠 Razor knife, ⅜” socket, ratchet, $^{3}/_{16}$” drill bit, drill
🚘 Aston Lemans Cap components

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.

Use a measuring tape and marker to mark the filler tube 3.50” up from the lower bent section and 3” up from the line marked.

Cut the hose at the two places marked.



Push the lower 90° hose section onto the gas cap along with a hose clamp.

Rotate the hose so it points down towards the fuel tank filler.

Connect the other section of filler tube and hose to the fuel tube in the tank as shown.

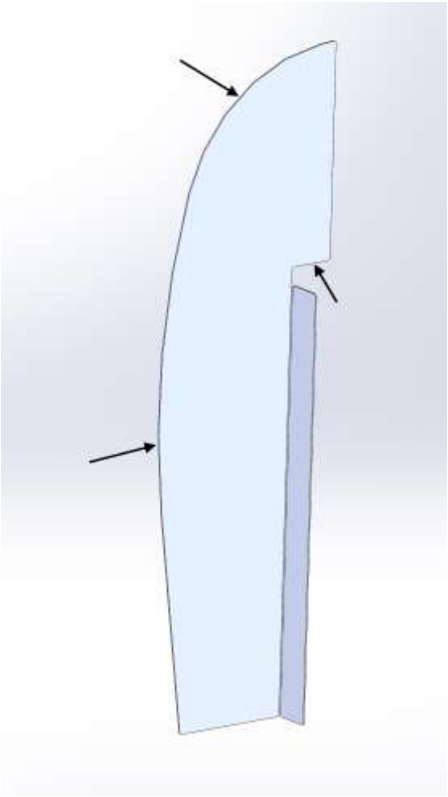
Assemble the pieces together before tightening the hose clamps.

Screw the plastic gas cap into the Aston Lemans style cap.

Aluminum

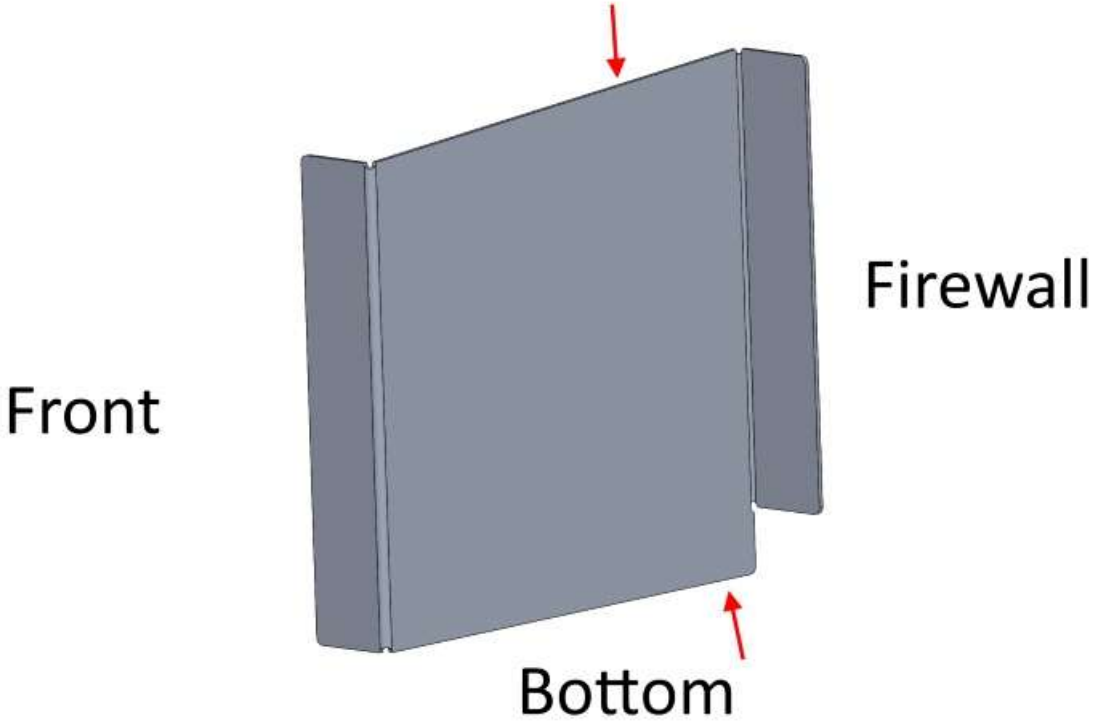
🛠 $^{1}/_{8}$" drill bit, drill, rivet gun, silicone, caulking gun
🚘 Secondary body fasteners, packaged aluminum

FIREWALL EXTENSION



Push weatherstrip around the curve of the panel and the horizontal area shown. Right side shown.

Insert the panel into the area in front of the door hinge from the engine bay side.

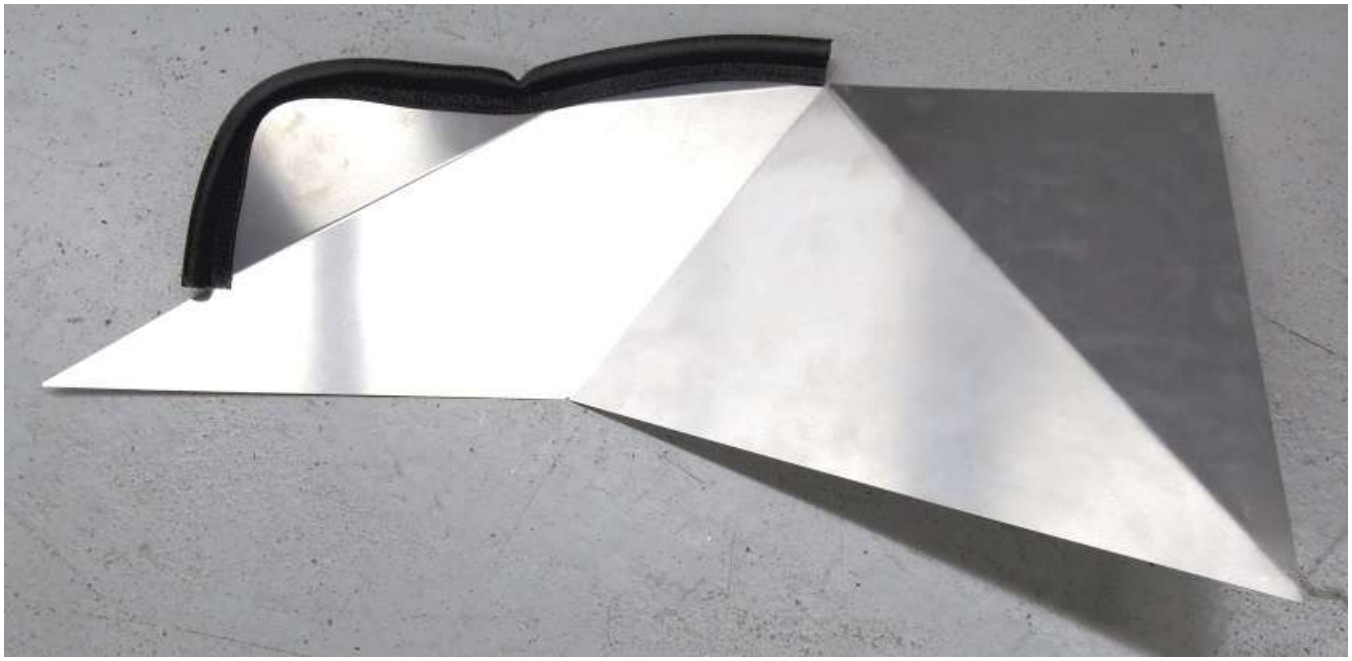


Attach weatherstrip to the top and bottom of the inner firewall extension. Right side shown.

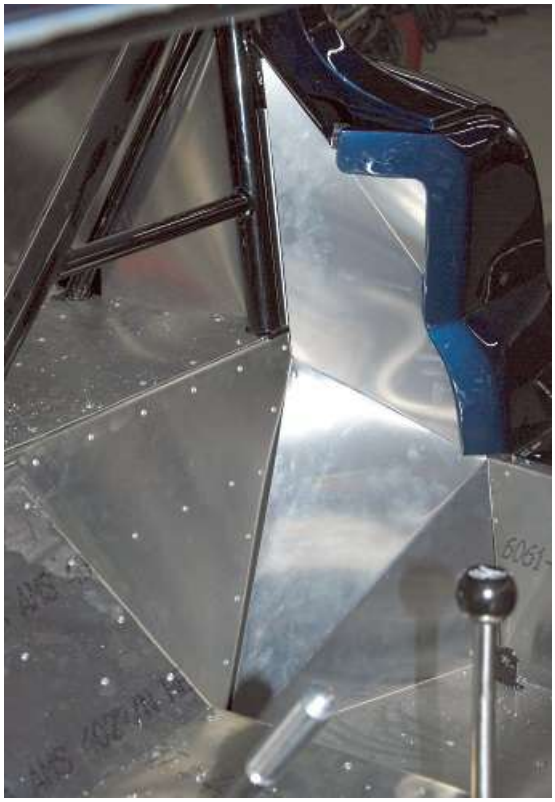
Insert the inner extension panel and move the panels until they fit together. Trim the outer panel around the body if necessary.

Use the kit aluminum screws to attach the panels together; to the firewall; and to the outside of the footbox.

Cockpit lower outside corners



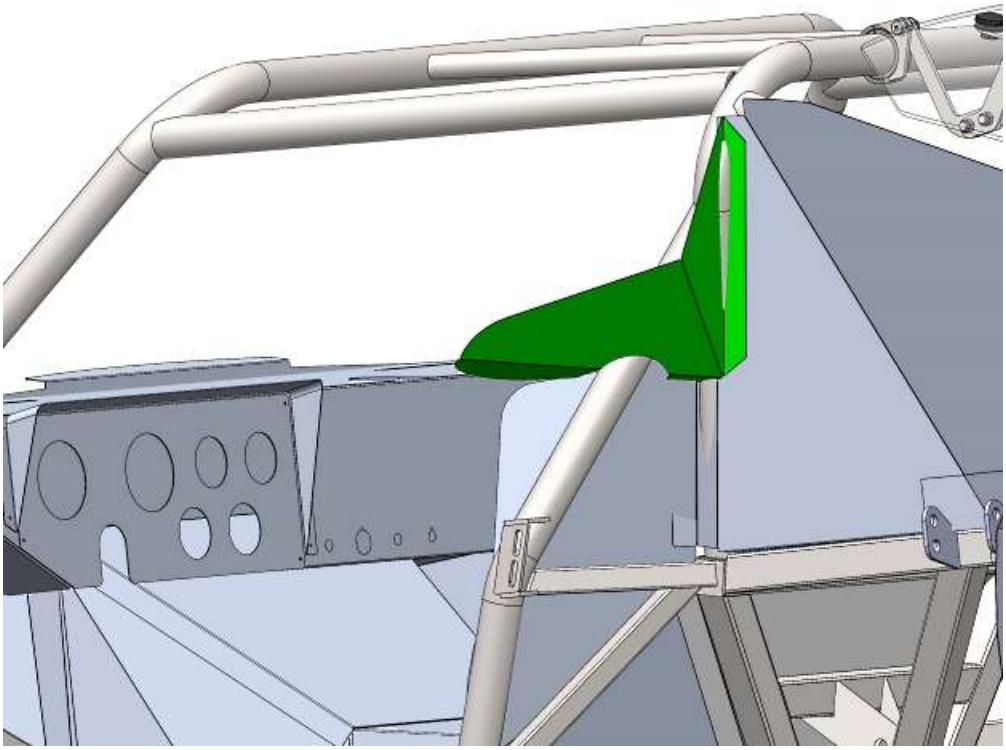
Push weatherstrip on to the curve of the aluminum panels as shown.



Attach the panel to the chassis by putting the panel behind the body flange and so it rests against the rollbar tubes.

Cockpit upper outside corners

✋ Shown with the body off to see location.



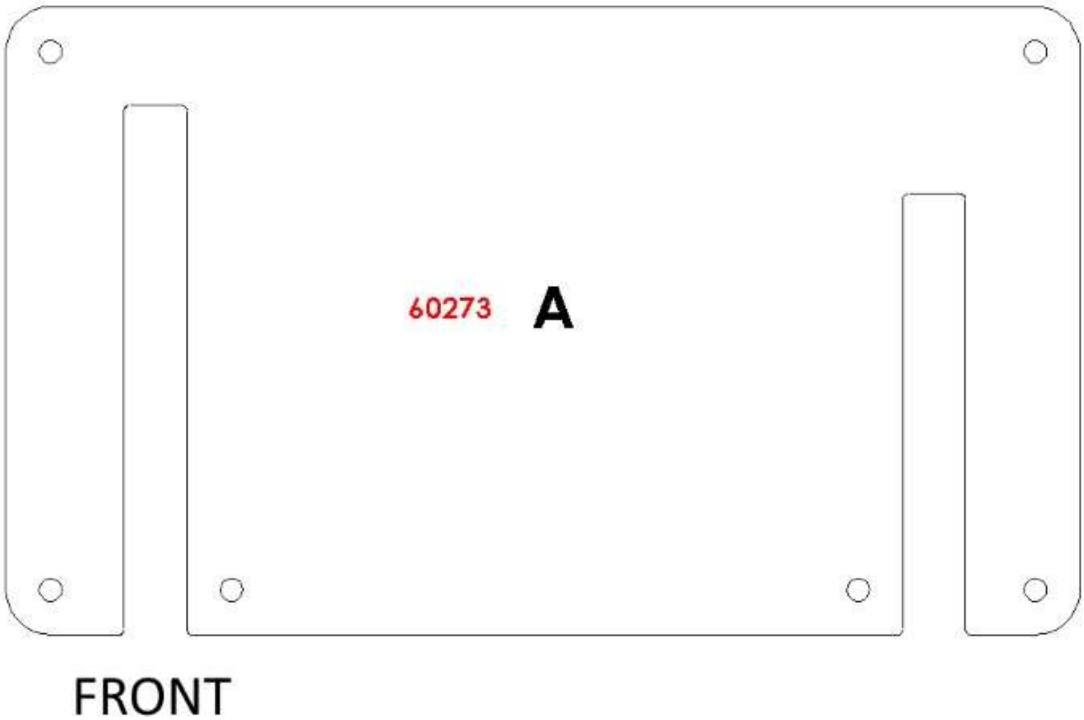
Test fit the panel and trim if necessary so there is $^{3}/_{8}$" gap for the push-on weather-strip.

Push weatherstrip on to the curve of the aluminum panel.

Attach the panel to the chassis.

Push the upper splash forward so the weatherstrip seals against the body and then attach the support bracket using rivets between the upper and lower splash panels to keep them against body.

Outside nose mount cover



Locate the Outside nose mount covers.

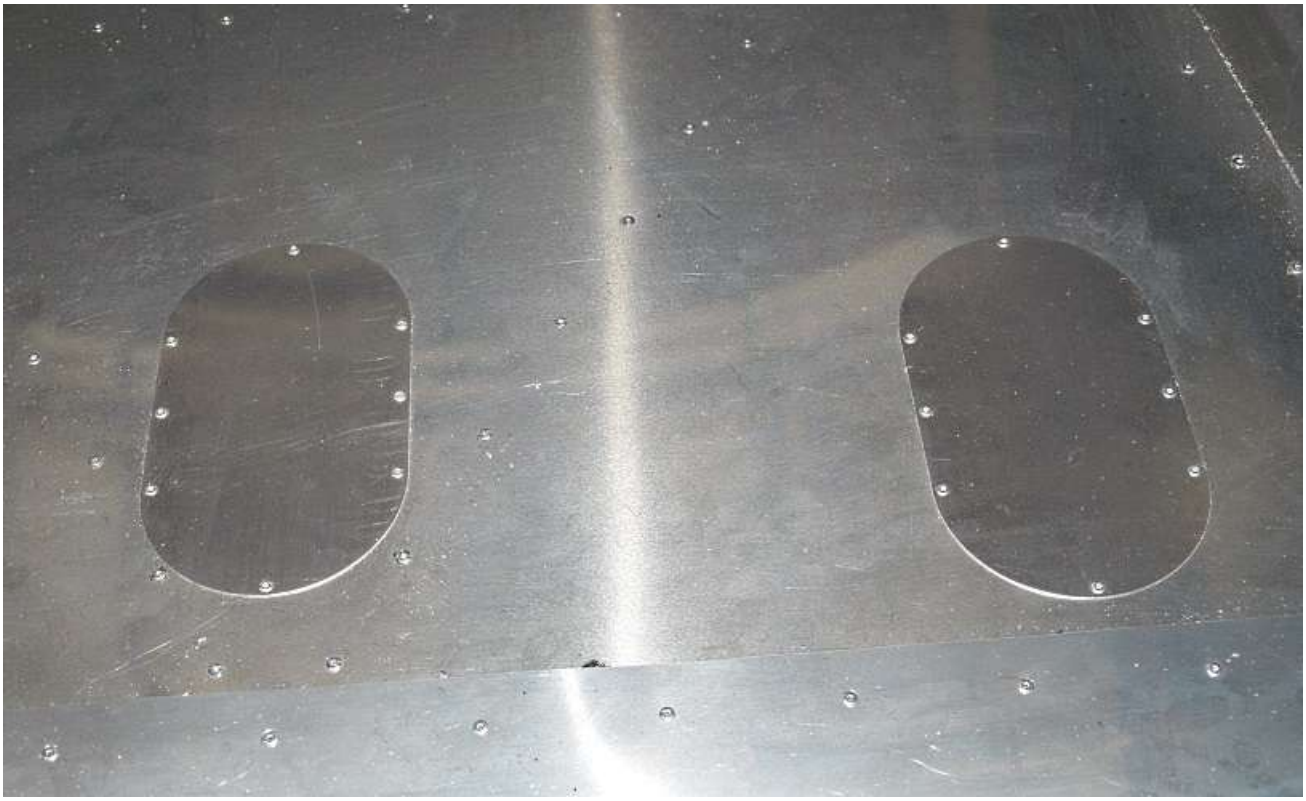
Drill silicone and rivet the panel behind the nose latch mounts.

Inside shock tower cover

Check the fit of the hatch area inside shock tower cover and note the locations available for rivets.

Silicone, drill and rivet the covers in place.

Fuel tank access covers



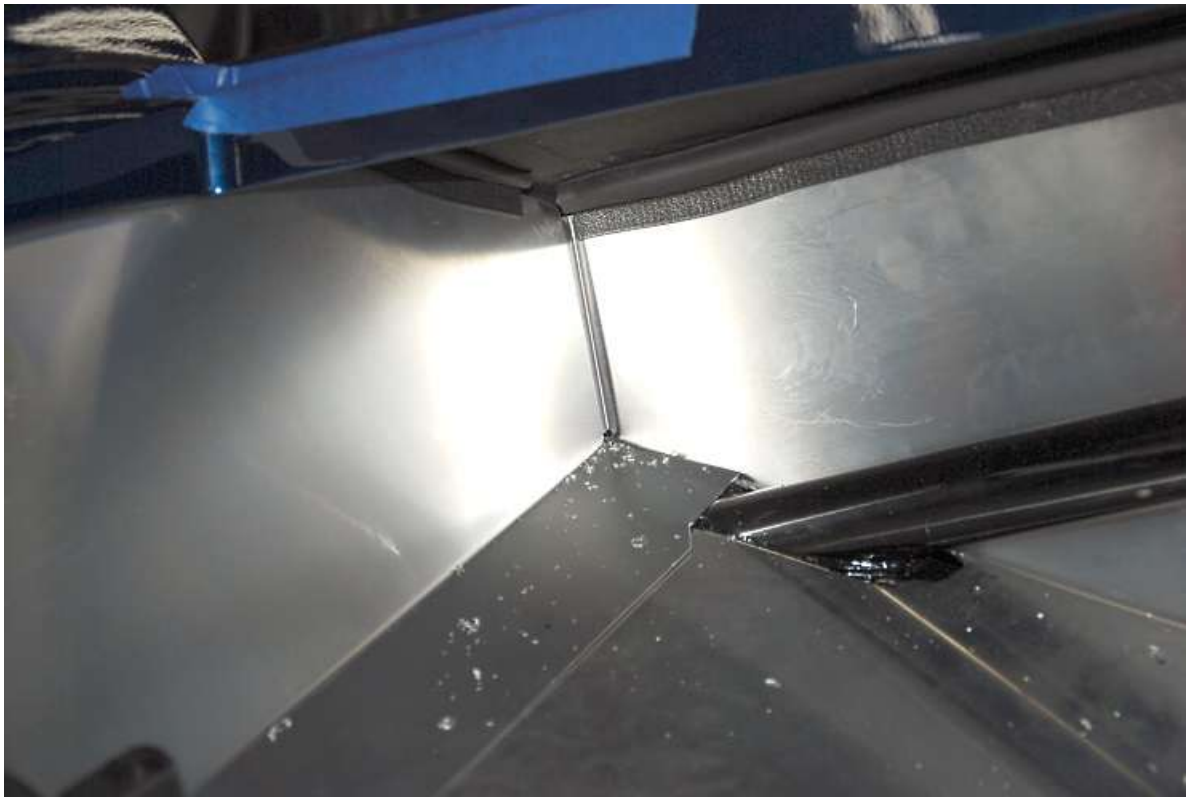
Silicone and install the patch panels in the hatch area that cover the fuel sender and pickup access holes.

Hatch area rear wall

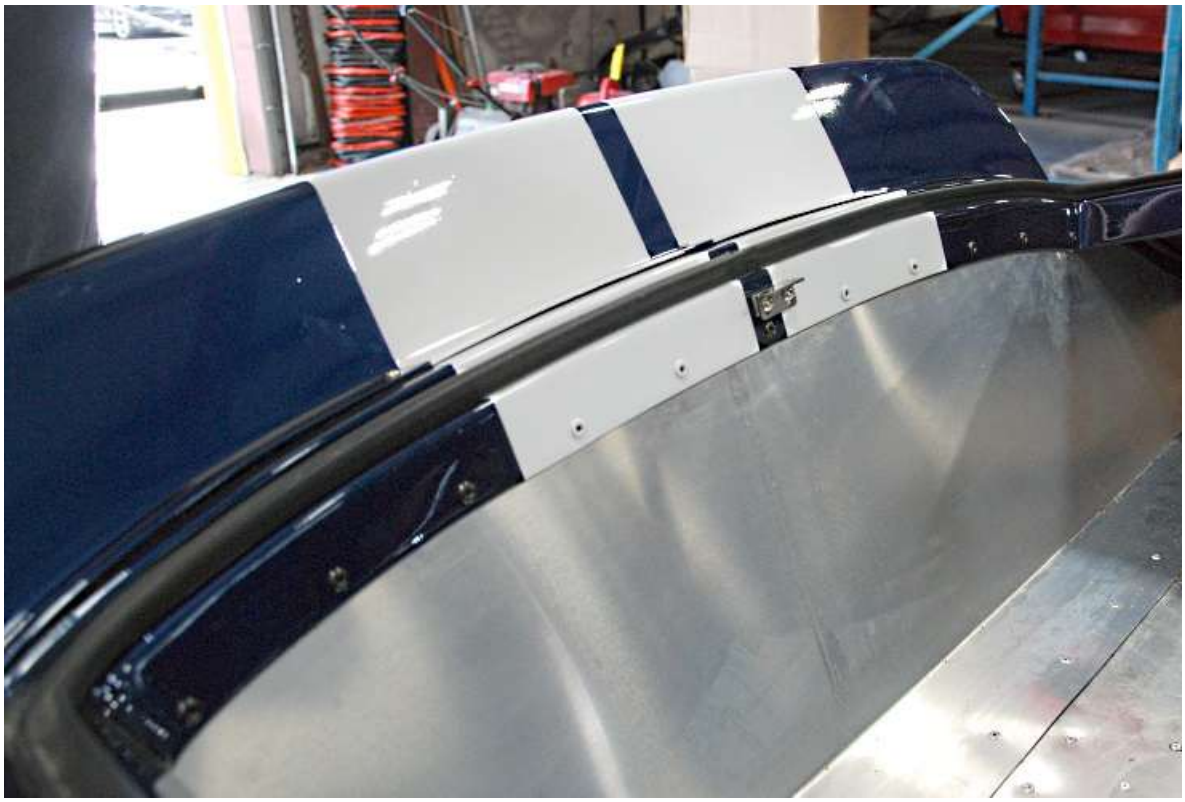
Put weatherstrip on the top edge of the aluminum leaving $^{3}/_{8}$" at each end so the weatherstrip on the side panels does not hit the weatherstrip on this panel.

Insert the panel through the hatch area.

From the wheel well, push the hatch side aluminum flange behind the rear wall and use masking tape to hold it in place.



Drill and rivet the panel to the floor panel and the side hatch flange aluminum.



Use a broom handle or similar to hold the aluminum panel against the body hatch area flange then drill and rivet the panel to the flange.

Rear hatch final

🛠 Razor knife, ½” socket, ratchet.

🚗 Secondary body fasteners.

The rear hatch uses the weather stripping that has two legs on it, one longer than the other, the longer leg goes on the inside towards the hatch area.

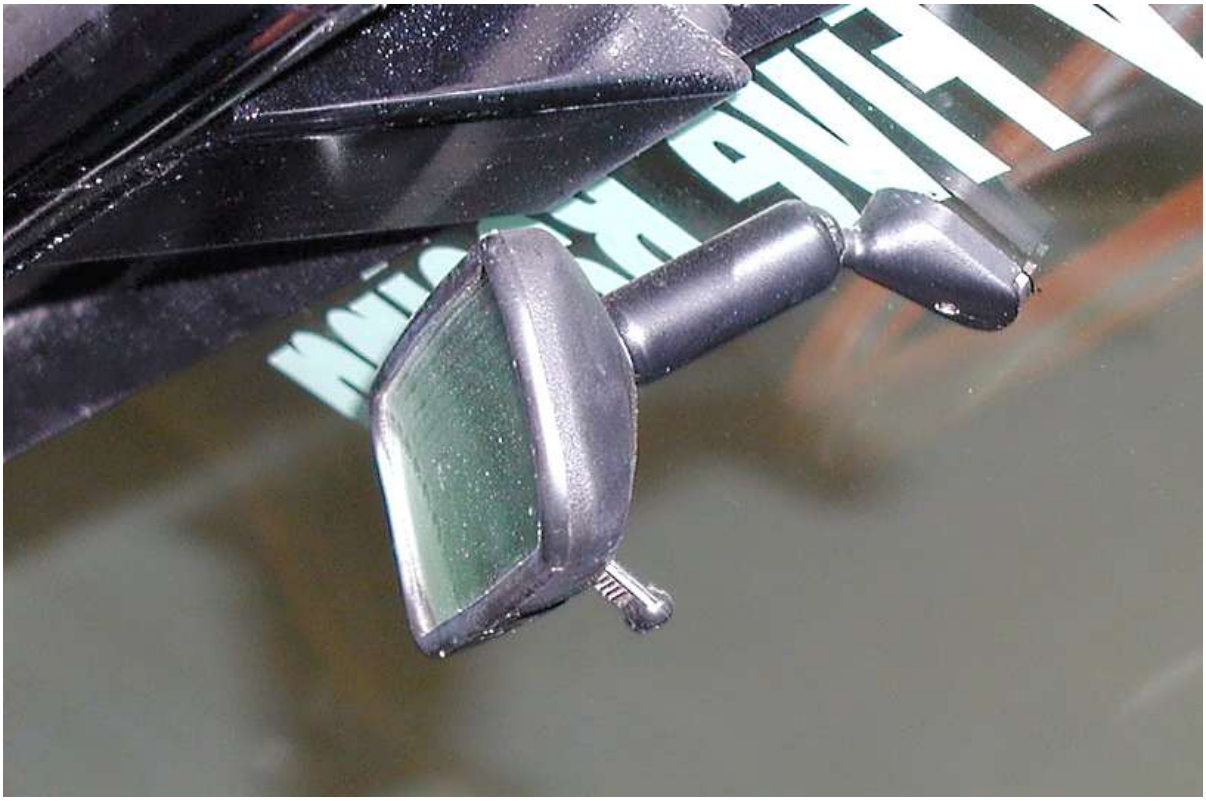
Starting at the bottom in the middle, press the weather stripping onto the body with the longer leg towards the inside of the hatch to help prevent water getting to the hatch area.

Remount the hatch by placing the glass back in the opening, set the gap around the body opening and bolting the two halves of the hinge arms together.

Interior Rearview Mirror

🛠 Tape measure, marker, windshield rearview mirror glue, hex key set.
🚘 Rearview mirrors

Use a ruler and marker pen to mark the center of the top windshield area mount on the windshield. Hold the mirror in place to find the best location up/down and mark this on the windshield.



Follow the directions on the glue for attaching the mount to the windshield.

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.

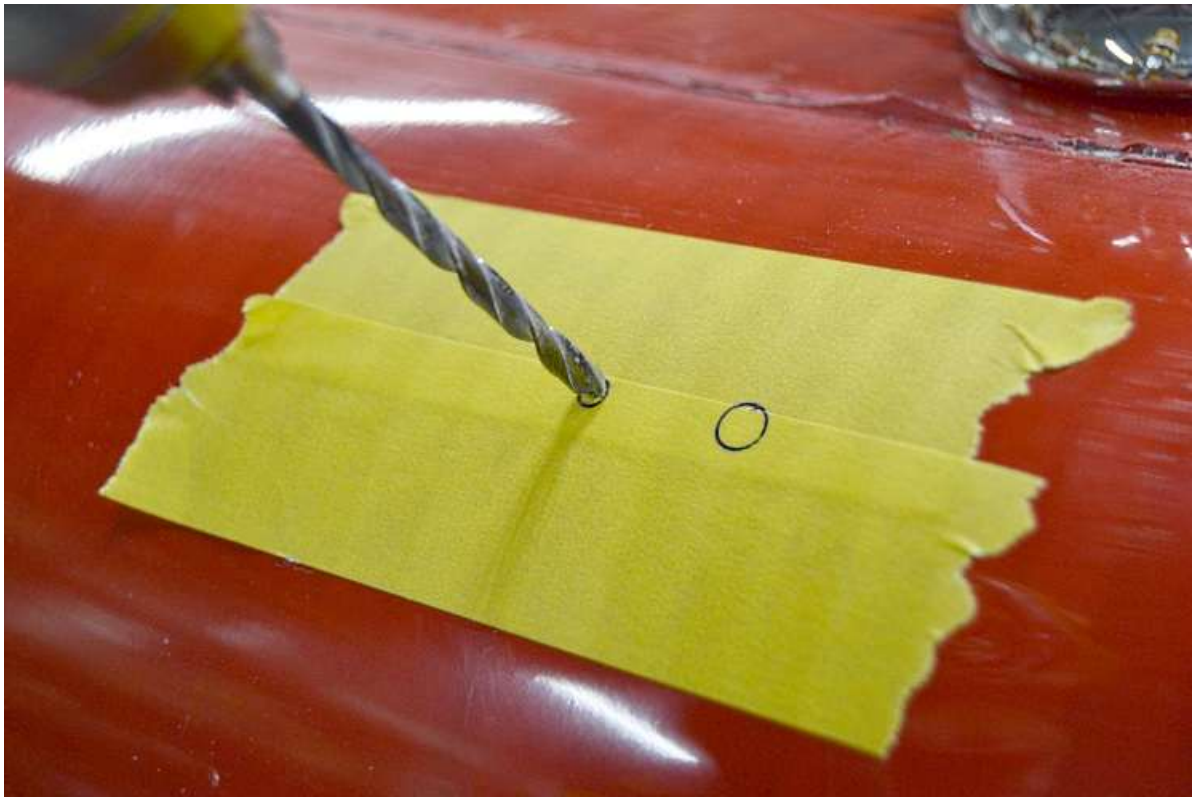
Put the gasket on the bottom of the mirror so the holes line up with the threaded hole locations.

Put masking tape in the rough location of the mirror.

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

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 inside the door, use a $^{5}/_{16}$" socket to attach the mirror to the door.

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

Headlight

- On the headlight, there are three wires, black is ground, white is high beam and the red is low beam.
- Factory Five Racing includes trailer plugs that can be used to wire the headlights and turn signals so that the nose can be removed

Wire in the headlights to the chassis harness. Left headlight shown with trailer plug.

Right headlight shown with trailer plug.

Turn Signal

- On the light, the **white** wire is the **ground** and the **black** wire is the **parking light,** and the **red wire** is the **Turn Signal**.

Wire the turn signals up to the chassis harness.

Tail lights

- On the light, the **white** wire is the **ground** and the **black** wire is the **parking light,** and the **red wire** is the **Stop or Turn Signal**.

We normally run the upper lights in the rear for brakes and the lower for turn signals.
Attach the white ground wires together then connect to the harness ground.
Attach the black parking wires together then connect to the harness tan parking wire.
Attach the red wire to either the brake or turn signal wire depending on your preference for location.

License Plate light

The frame of the light is the ground. On the backside of the body place the ground wire for the light on one of the screws and then place a washer and locknut and tighten using a Philips head screwdriver and $^{11}/_{32}$" or 9mm wrench.

Wire the license plate light wire to the tan parking light wire.

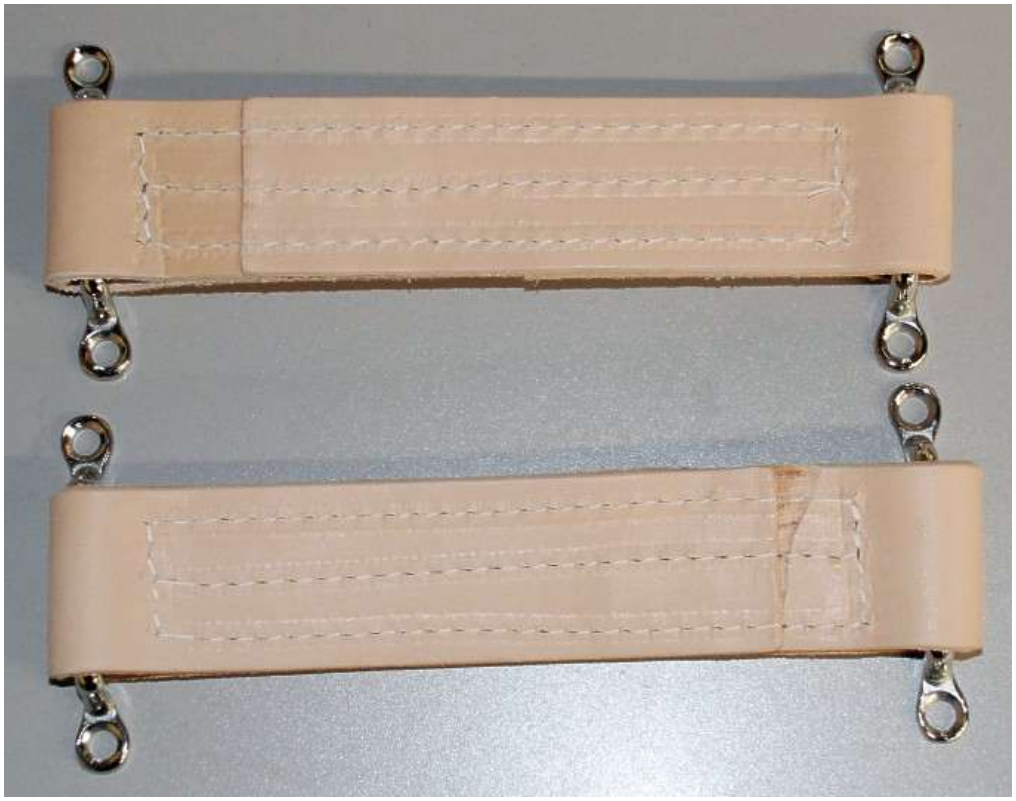
Driving lights

🛠 $^{7}/_{16}$" socket, ratchet, blue Locktite.

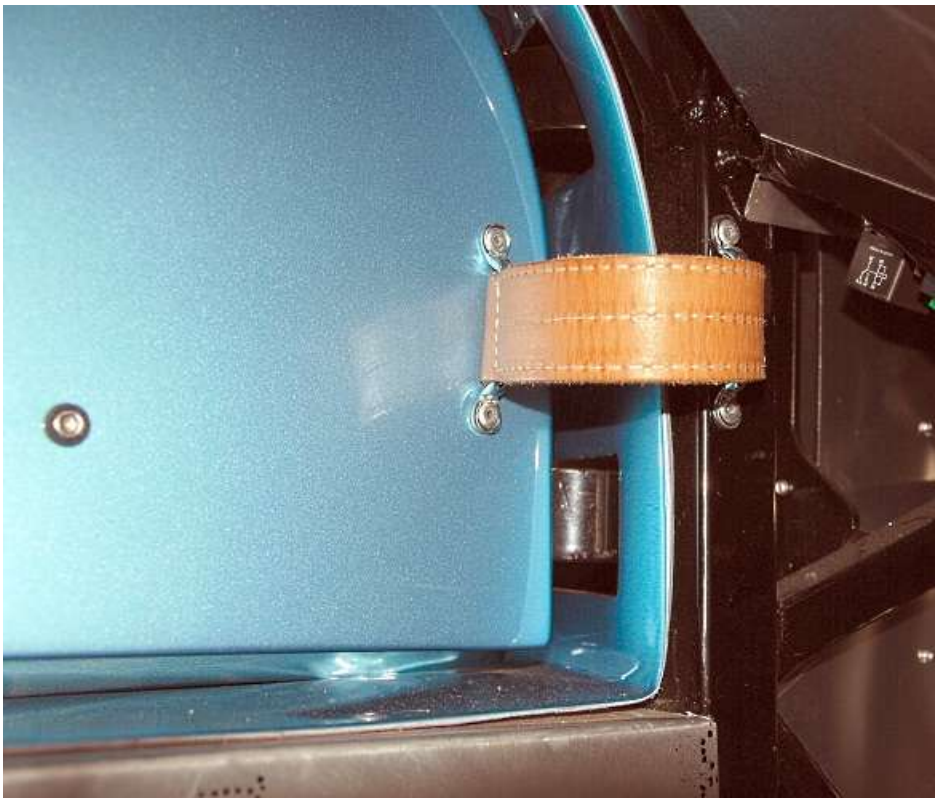
Put a dot of blue Locktite on the driving light ¼"x ¾" screws.
Pass the light wires through the lower $^{5}/_{16}$" hole and reattach the driving lights using a $^{7}/_{16}$" socket.
Connect the black light wire to the black driving light wire run previously.
Connect the white light wire to the red driving light wire run previously.

Check straps

🛠 $^{3}/_{16}$" drill bit, drill, rivet tool, marker, masking tape.
🚗 Secondary body fasteners, door components

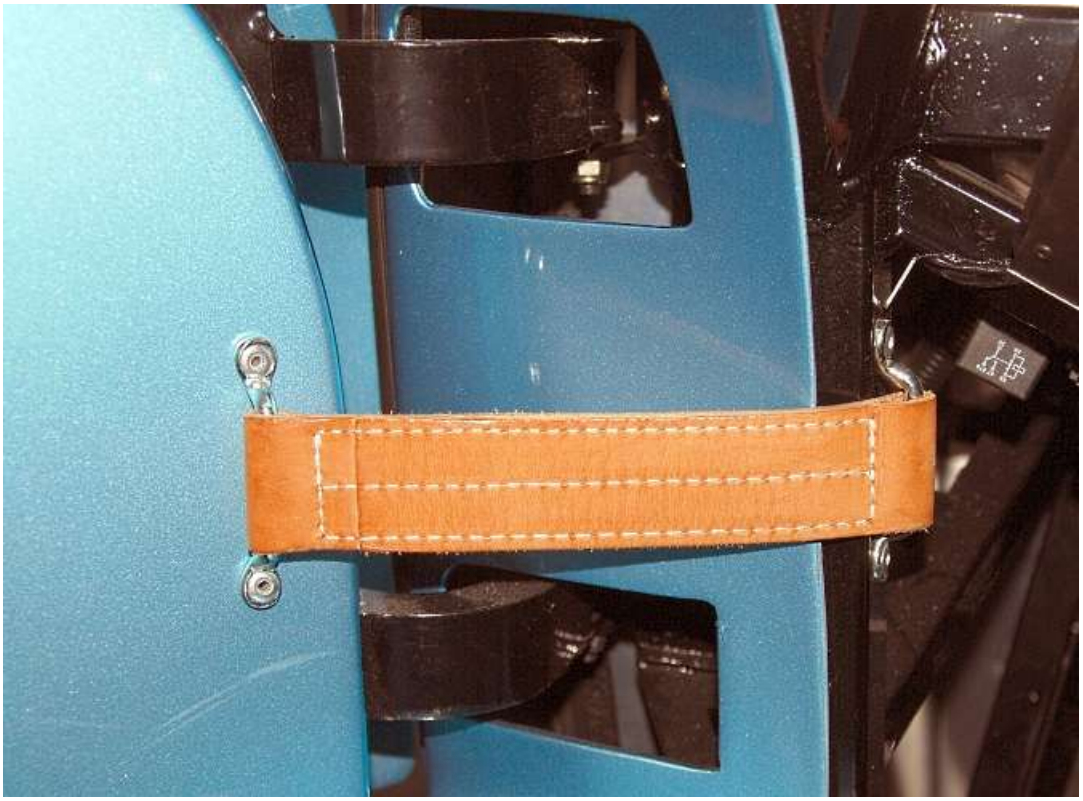


Unpack the door check-straps.



Drill and rivet the check-strap to the 1.50” vertical frame tube near the top of the tube using a $^{3}/_{16}$” rivet.

Put masking tape on the door near the front.



Open the door wide but not enough so that the door hits the body or the hinges hit the side of the cut-out. The straps will stretch slightly over time so allow enough room for this by closing the door slightly from the maximum. Use the check strap and mark the hole locations on the door.

Drill and rivet the check-strap to the door.

Steering wheel center section

🛠 WD40, $^{5}/_{32}$" hex key
🚘 Steering wheel/hardware, Factory Five Badge

With the steering wheel in the position that is most comfortable for you tighten the set screws on the upper steering bearing collar.

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.

Optional leather steering wheel.

Rear Quarter side windows

- 🛠 $^{5}/_{32}$" drill bit, drill, sand paper, fine blade hack saw (finer the better), masking tape, marker
- 🚗 Quarter windows
- ✋ A drill bit designed for plastic with a 60° point instead of the standard 118° or 135° point will reduce the chance of cracking during drilling. It has been included in the kit

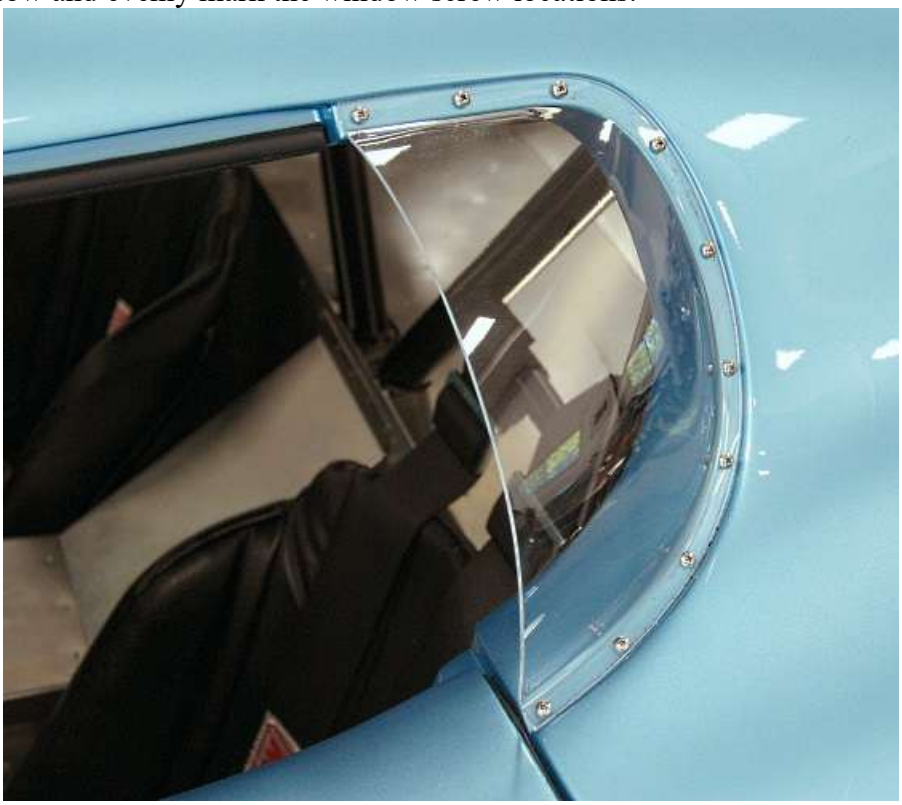
Leave the protective film on the quarter window to prevent scratching.
Open the door.

Hold the quarter window up to the body for fitment and mark the areas that need to be sanded away or trimmed for a perfect fit.

The bottom edge usually has the most overhang, make a mark on the window that lines up with the leading edge of the door.

From your edge mark draw a straight line up to the top flange of the quarter window for trimming.

Remove the window and evenly mark the window screw locations.



After trimming and rough edging drill holes and mount the window using the screws provided.

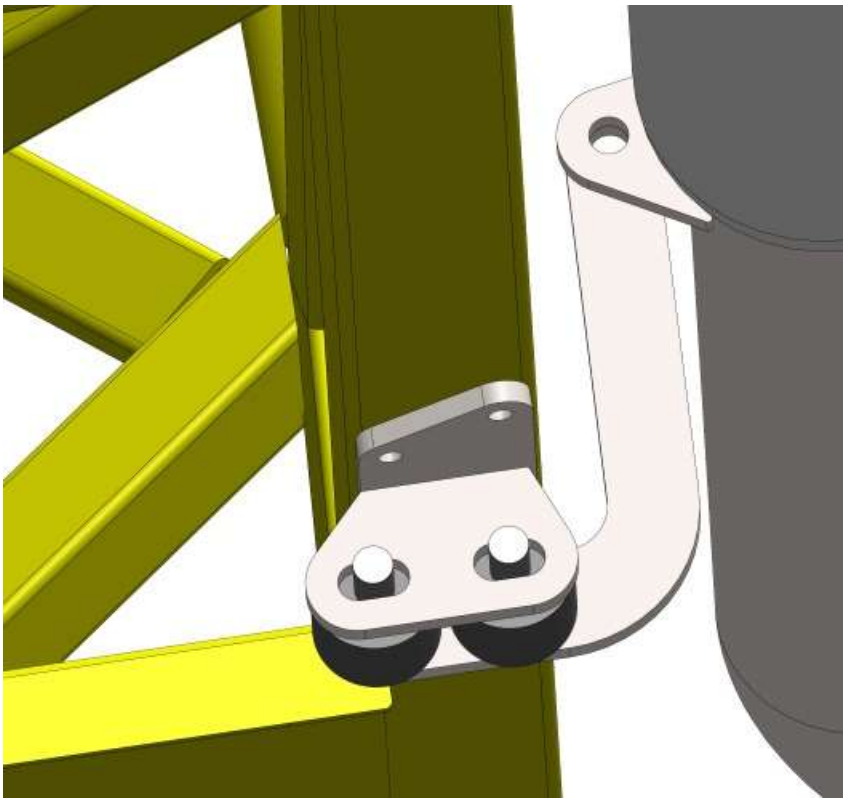
Once you are happy with the mounted fit you can polish the finish edge. We usually start with 400 grit sand paper and step up to a 1200 grit before finishing with 3M plastic polish.

Side Exhaust

🛠 $^{3}/_{16}$", $^{5}/_{16}$" Hex key, ⅜", ½", $^{9}/_{16}$" socket, ratchet, $^{9}/_{16}$" wrench, drill

🚘 Side Exhaust

Attach the side exhaust using the kit fasteners, $^{9}/_{16}$" wrench and socket.



Attach the frame mounts to the underside of the 1.50" tubing using the #10 x 1" self-tapping screws.

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, rear inside

Rivet the front wheel rear inside panel to the frame so that the exhaust goes through the hole it makes.

Front wheel rear lower

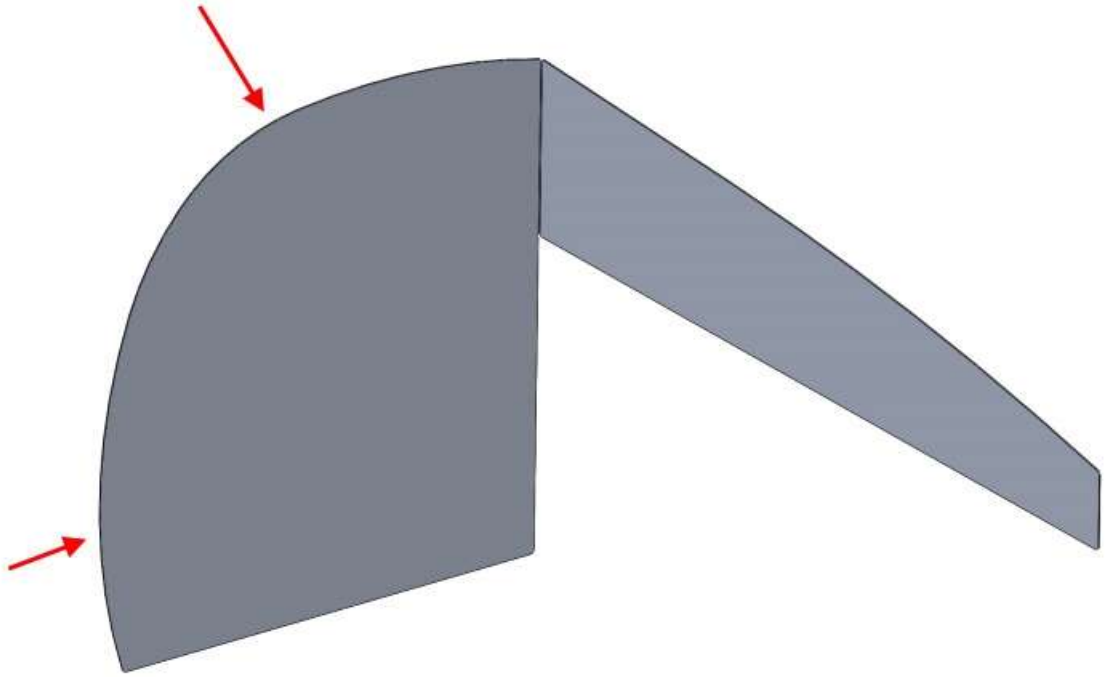
With the nose up, put a wheel and tire on the front and turn the steering so that the rear of the tire is as close as possible to the frame.
Put some of the press-on bulb seal around the outside edge of the aluminum where they will contact the body.

Clamp the front lower splash guard to the inner splash panel and the outside to the front part of the body in front of the side exhaust.

Use a level to make sure the surface that will be close to the nose is flat.

Put a wheel and tire on the car and check for aluminum clearance. If necessary, push the aluminum back and mark the location on the inner aluminum panel.
Remove the wheel.
Drill and rivet the lower splash panel on.

Front upper splash panels



Push weatherstrip on the outside of the upper splash panel to the bend only, not the thin part that goes forward. Right side shown.

Close the nose and align the splash panel with the lower splash panel and clamp the front part to the flange on the nose.
Open the nose and rivet the panel to the nose flange and silicone the backside of the weatherstrip to the side of the nose.

Rear Wheel

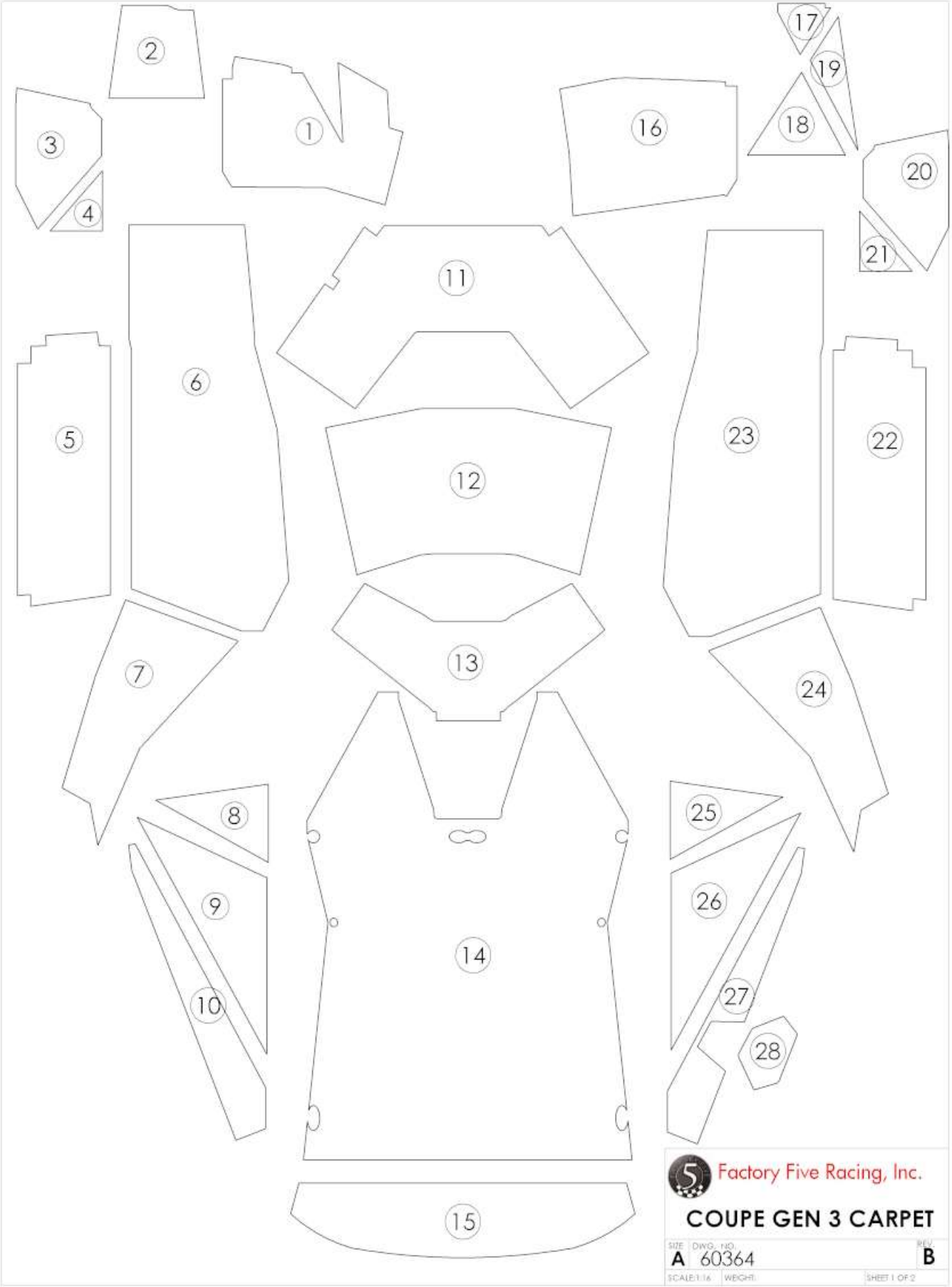
Push a piece of the bulb seal weather stripping around both rear splash guards where they will contact the body.

Fit the panels in place trimming the outside perimeter if needed. The small tab on the bottom faces towards the rear of the car and is on the bottom. Push the panel in so that the bulb of the weatherstrip is not visible from the outside.

Silicone and rivet the panels in place.
Use a long 1/8" rivet as low as possible to attach the tab to the lower fender.

Carpet (Optional)

🛠 Razor knife, silicone, caulking gun, spray glue, brake cleaner or acetone.
🚘 Interior trim/carpet
✋ The carpet kit is optional on the Coupe although not originally equipped with it, it helps with sound and noise insulation and makes the cockpit a more comfortable place on long drives.



www.factoryfive.com 508-291-3443

1	60560	LEFT FOOTBOX INSIDE CARPET	EA	1.00
2	60561	LEFT FOOTBOX FRONT CARPET	EA	1.00
3	60563	LEFT FOOTBOX OUTSIDE CARPET	EA	1.00
4	60562	LEFT FOOTBOX OUTSIDE TRIANGLE CARPET	EA	1.00
5	60564	LEFT UNDER DOOR CARPET	EA	1.00
6	60566	LEFT FLOOR CARPET	EA	1.00
7	60569	COCKPIT REAR OUTSIDE, LEFT	EA	1.00
8	60571	LEFT HATCH SIDE FRONT	EA	1.00
9	60573	LEFT HATCH SIDE MIDDLE	EA	1.00
10	60575	LEFT HATCH SIDE REAR	EA	1.00
11	60556	TRANSMISSION TUNNEL FRONT CARPET	EA	1.00
12	60557	TRANSMISSION TUNNEL TOP CARPET	EA	1.00
13	60558	TRANSMISSION TUNNEL REAR CARPET	EA	1.00
14	60559	COCKPIT REAR WALL AND HATCH CARPET	EA	1.00
15	60577	HATCH REAR WALL	EA	1.00
16	60578	RIGHT FOOTBOX INSIDE WALL	EA	1.00
17	60579	RIGHT FOOTBOX FRONT TOP	EA	1.00
18	60580	RIGHT FOOTBOX FRONT BOTTOM	EA	1.00
19	60581	RIGHT FOOTBOX FRONT RIGHT	EA	1.00
20	60582	RIGHT FOOTBOX OUTSIDE CARPET	EA	1.00
21	60583	RIGHT FOOTBOX OUTSIDE TRIANGLE CARPET	EA	1.00
22	60565	RIGHT UNDER DOOR CARPET	EA	1.00
23	60567	RIGHT FLOOR CARPET	EA	1.00
24	60570	COCKPIT REAR OUTSIDE, RIGHT	EA	1.00
25	60572	RIGHT HATCH SIDE FRONT	EA	1.00
26	60574	RIGHT HATCH SIDE MIDDLE	EA	1.00
27	60576	RIGHT HATCH SIDE REAR	EA	1.00
28	60584	FUEL NECK COVER CARPET	EA	1.00

The adhesive used to hold the carpet down is the same as we used on the dash pad. 3M® Super77™ or Super90™ work best.

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.

Install the carpet pieces

Finishing Touches

Review the Race car checklist in the appendix.

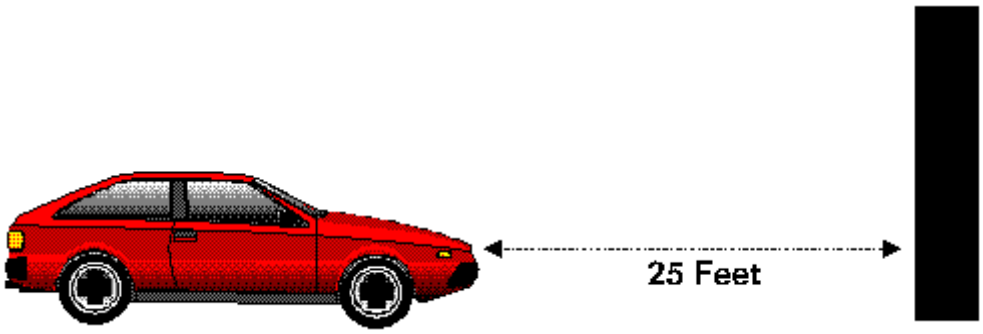
Ride height

- Street car ride height should be 4½” at the front and 4½” at the back measured to the bottom of the frame with the normal number of people/weight in the car and the suspension parts in the lower hole locations
- Race car ride height can be 3.25” at the front and 3.25” at the back measured to the bottom of the frame with the normal number of people/weight in the car and the suspension parts in the upper hole locations.

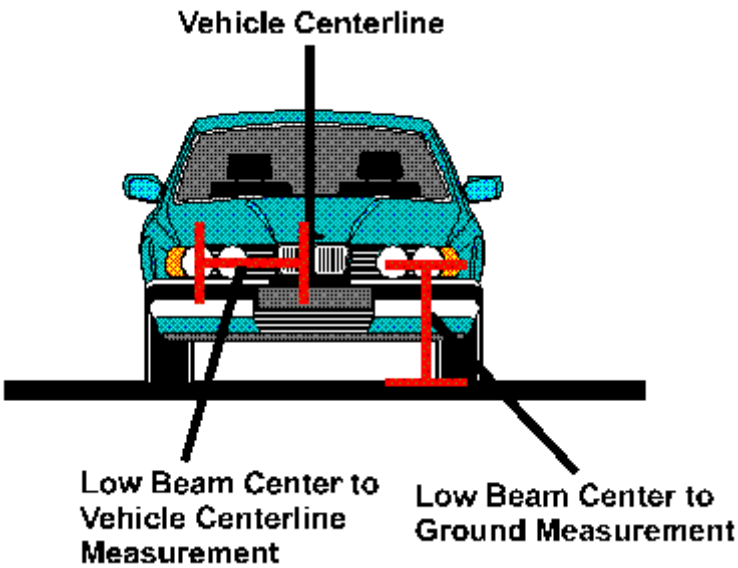
Headlight Alignment

- Masking tape, marker, tape measure
- 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.



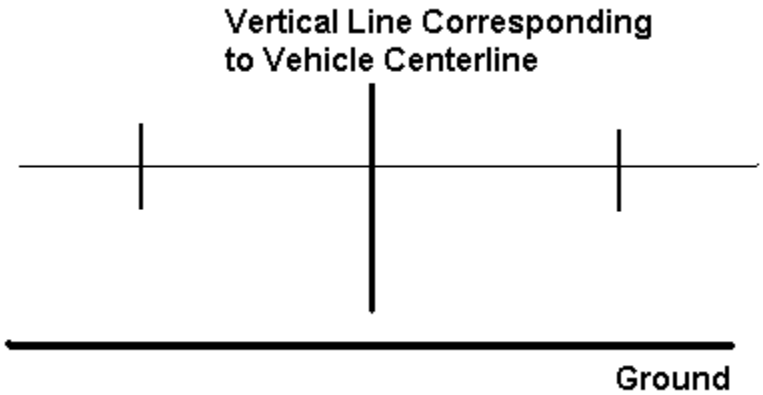
Pull the car straight back until the headlights are 25 feet from the wall.



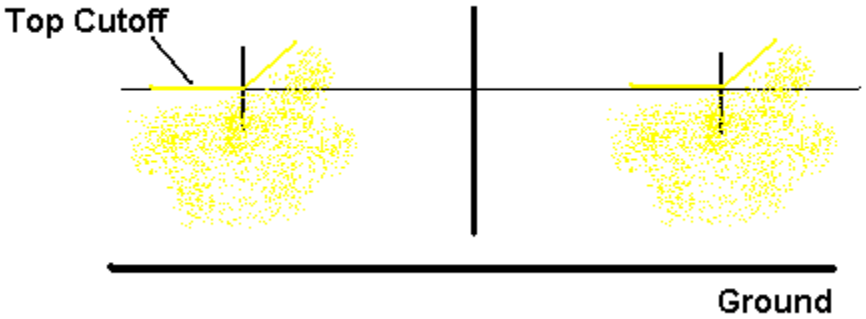
Make the following two measurements:

Measurement A: From the ground to the geometric center of one of the headlight lenses
Measurement B: From one of the low beam headlights to the vehicle centerline.
(Also measure from high beam center to vehicle centerline for 4 headlight systems)
Note these measurements.

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

✋ Make sure the ride height is set before aligning the suspension.

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: $^{1}/_{16}$" in or 0.14° in

For a car using power steering car use the following specifications:

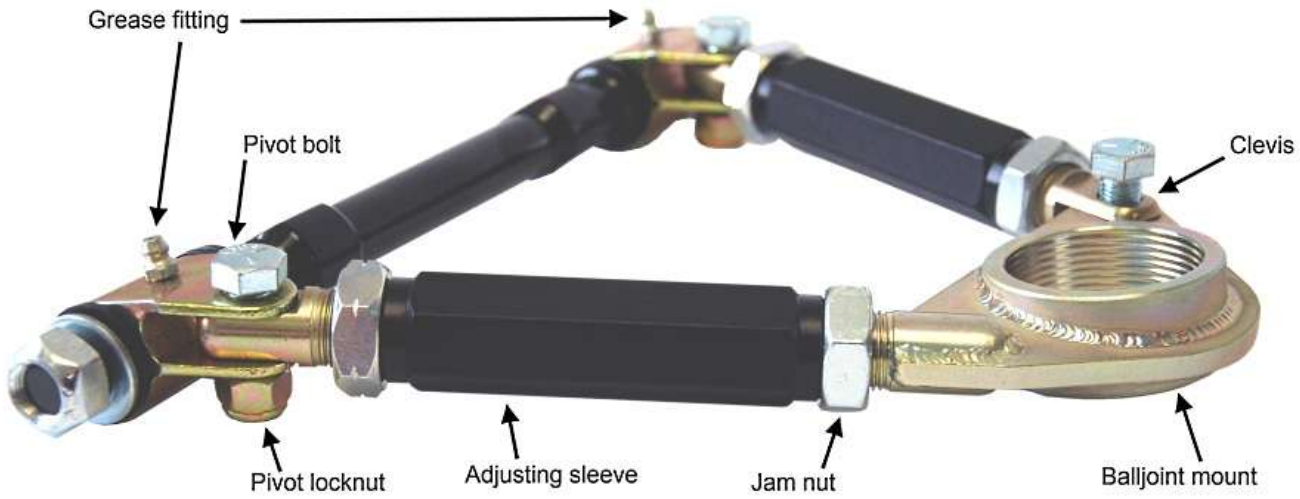
Caster: 7°
Camber: -0.5°
Total Toe: $^{1}/_{16}$" in or 0.14° in

2015 IRS only

Camber: -0.5°to -0.75°
Total Toe: $^{1}/_{8}$" Toe in 0.28° 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 **lb-ft**.
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 car check sheet in the Appendix on a yearly basis or before track days depending on how hard the car is driven.

Wheels and Tires

✋ If using a wheel wider than 7", FFR front lower control arms are needed to prevent the wheels rubbing the control arms.

The front of the car can accommodate up to a 10" wheel with 315/35R-17. The rear of the car can accommodate up to a 12" wheel with 335/35R-17

If you are using bolt-on aluminum Halibrand style wheel, we recommend using B.F. Goodrich® Radial T/A's, but in different sizes. The dimensions are the same 235/60/R15's up front, but bigger 275/50/R15's in the rear.

Tire	Rim	Acceptable range
235/60 15		6.5 – 8.5
245/45 17	8	7.5 – 9
275/50 15		7.5 – 10
275/40 17	9	9 – 11
315/35 17	10	10 – 12
335/35 17	11	11 – 13

Information from Pirelli.com, yokohamatire.com and bfgoodrich.com

The max rim width for a 3-link is a 10.50"
If you have any questions, please email the Tech department tech@factoryfive.com.

Wheel specifications

	Best	Acceptable range
Front:		
8" rim	5" Backspace	
9" rim	5" Backspace	5"-6"
10" rim	6" Backspace	
Rear:		
9" rim	6" Backspace	4"- 6"
10" rim	6" Backspace	4"- 6"
11" rim	6" Backspace	5"- 6"
12" rim	6" Backspace	

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.

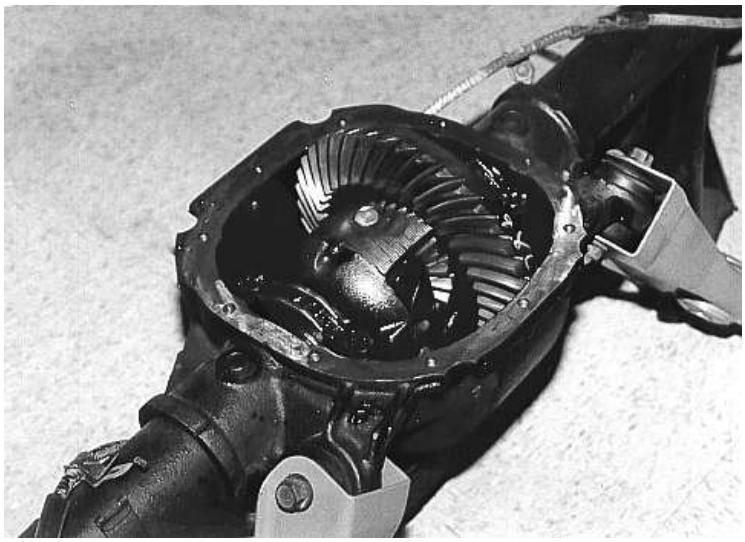
For a more vintage look, take a look at our Halibrand style wheels. Our online parts catalog: www.factoryfiveparts.com has more views of these wheels on cars.

Left: 18” FFR Halibrand style w/soft lip. Right 17” FFR Halibrand Style

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 2,300 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.

www.Factoryfiveparts.com has brand new 8.8" solid ales available with 3.55 gears.

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.
- Below is information for a pushrod 302 (1987-1995 Mustang) engine.

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 freer 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. A change to a Tremec TKO 500 or 600 is needed if the engine that will be used has 300 lb-ft 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 customers prefer to use power steering. This can be done by using the stock 1987-1993 15:1 Mustang power rack rack extenders and power steering pump. If changing to a power 15:1 rack, a universal joint with a different number of splines will be necessary in order to connect the steering shaft to the steering rack. www.Factoryfiveparts.com has both the universal joint and power steering packages 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.
- If doing a donor build, 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. The complete kit uses Stoptech brake pads

Miscellaneous Brake Information

Porterfield Enterprises Ltd.	800-537-6842	www.porterfield-brakes.com
Hawk Brake, Inc.	800-542-0972	www.hawkbrake.com

Superchargers

Factory Five Racing customers have successfully installed Kenne Bell, Vortech, Powerdyne and Edelbrock 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 Edelbrock supercharger.

Seats

For the racers 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.
- Check out old and new build videos on our YouTube channel for additional help.
- See our Assembly manual page for the latest revision of the assembly manual.

Helpful

- 5.0L Ford Dyno Tests. By Richard Holdener. www.cartechbooks.com
- Ford Coyote Engines by Jim Smart. www.cartechbooks.com
- Engineer to Win. By Carroll Smith. www.amazon.com
- Prepare to Win. By Carroll Smith. www.amazon.com

Catalogs/Parts

- **Ford Performance Parts** - www.performanceparts.ford.com
- **Tire Rack** - Tire and wheel source. www.tirerack.com
- **Jeg's Performance** - High performance products. www.jegs.com
- **Summit Racing** - High performance products. www.summitracing.com
- **Paint over Rust 15** - Stops rust. 800-4576715. www.por15.com

Factory Five Aftermarket

- Check out the vendors section of https://thefactoryfiveforum.com/content.php?124-vendors

Tools

- **Craftsman Tools** - Lowes brand "guaranteed forever" tools. 800-549-4505. www.craftsman.com
- **Husky Tools** – Home Depot "guaranteed forever" tools. www.homedepot.com
- **Kobalt Tools** – Lowe's "guaranteed forever" tools. www.lowes.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
- Hagerty Insurance - www.hagerty.com

A Final Note about Completed Cars and Car Builders

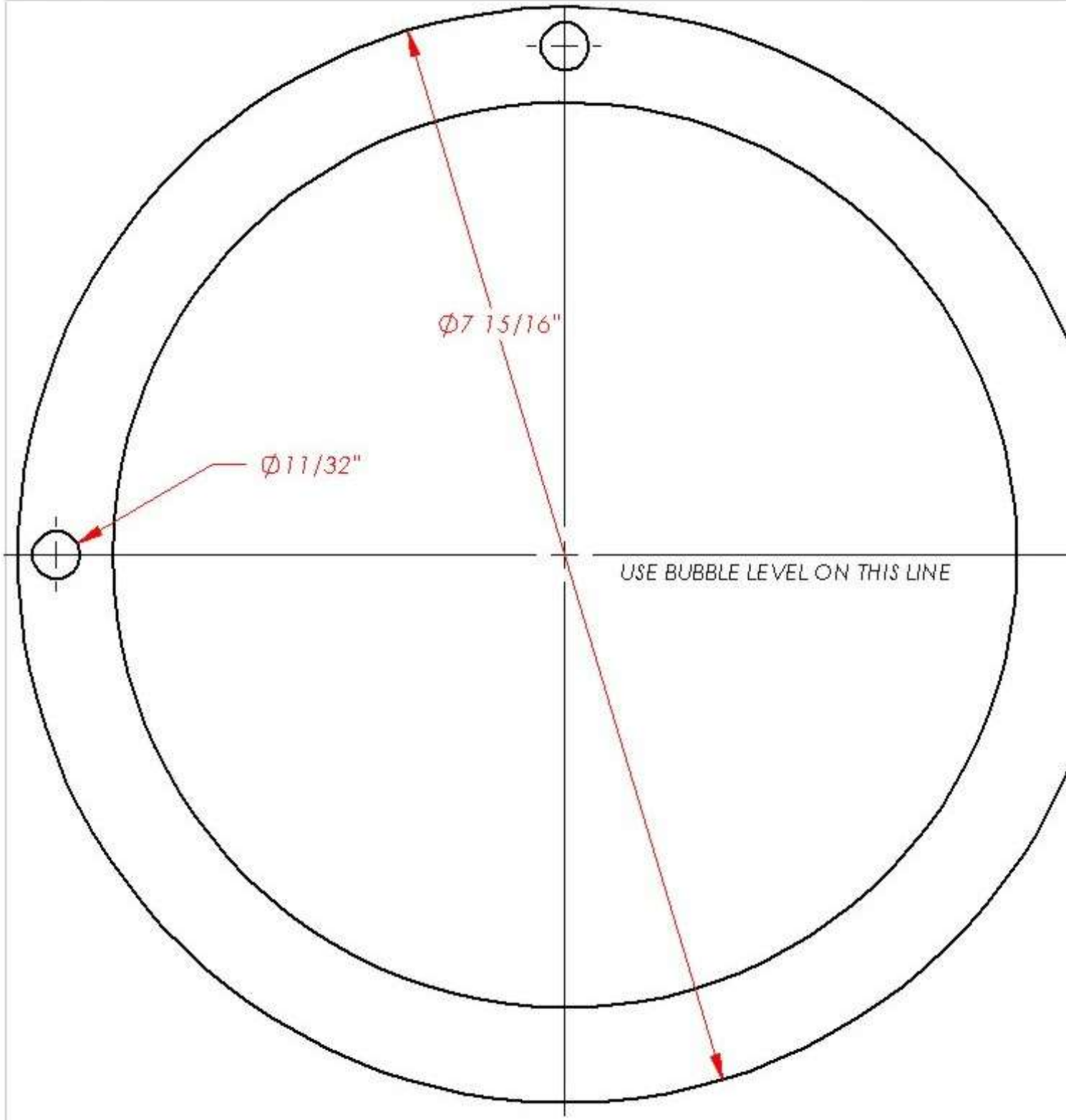
If you are reading this manual then you are at least contemplating the idea of building your own race car. Many component car companies offer services to those folks who find part or all of this too much to tackle. We don't.

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



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ROADSTER	
SPEC CAR	
COUPE	
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 6/30/2010

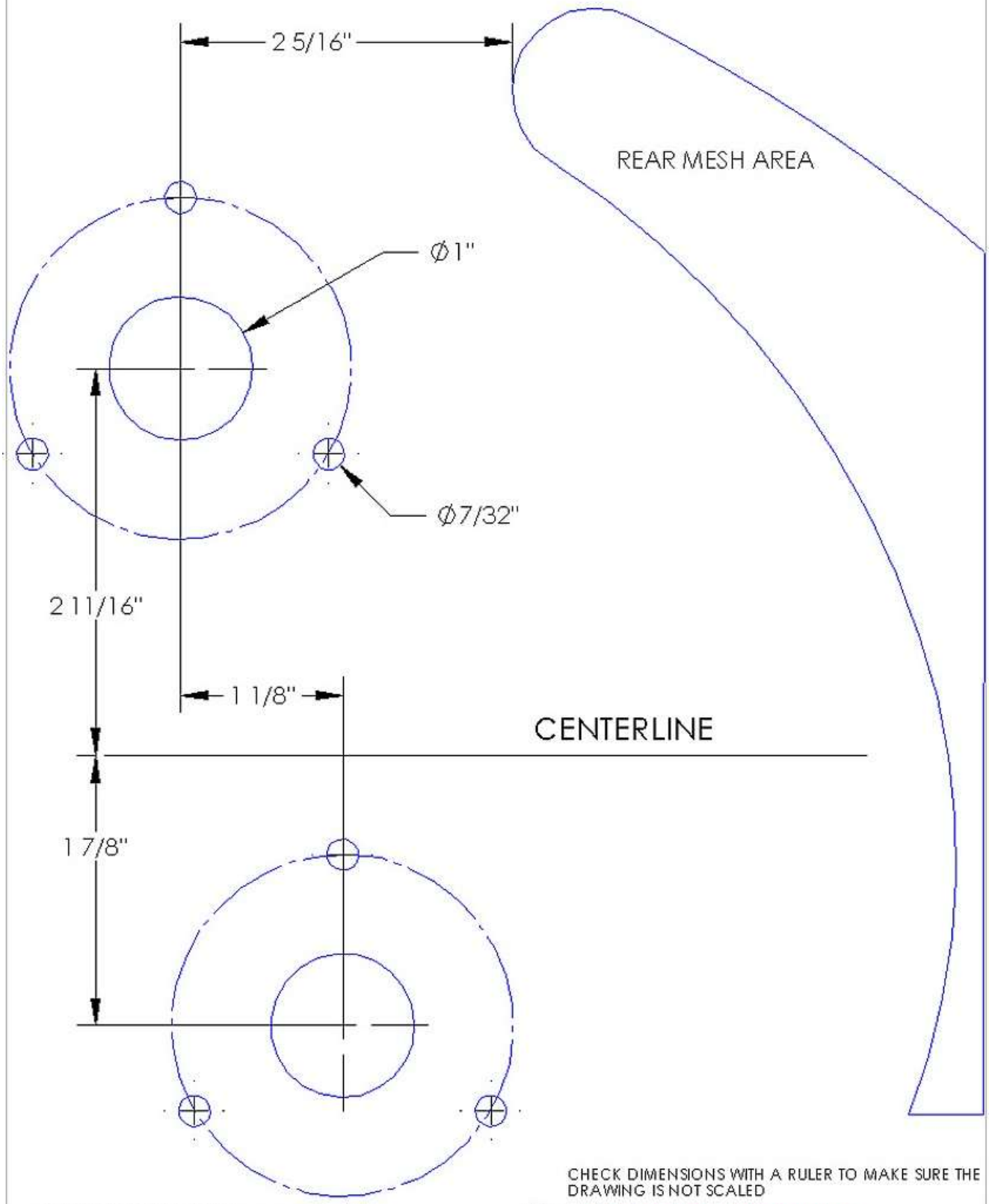
	NAME	DATE
DRAWN	JI	12/14/09
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

Factory Five Racing, Inc.

HEADLIGHT TEMPLATE

SIZE A DWG. NO. 11001 REV. C

SCALE: 1:1 WEIGHT: SHEET 1 OF 1



CHECK DIMENSIONS WITH A RULER TO MAKE SURE THE DRAWING IS NOT SCALED

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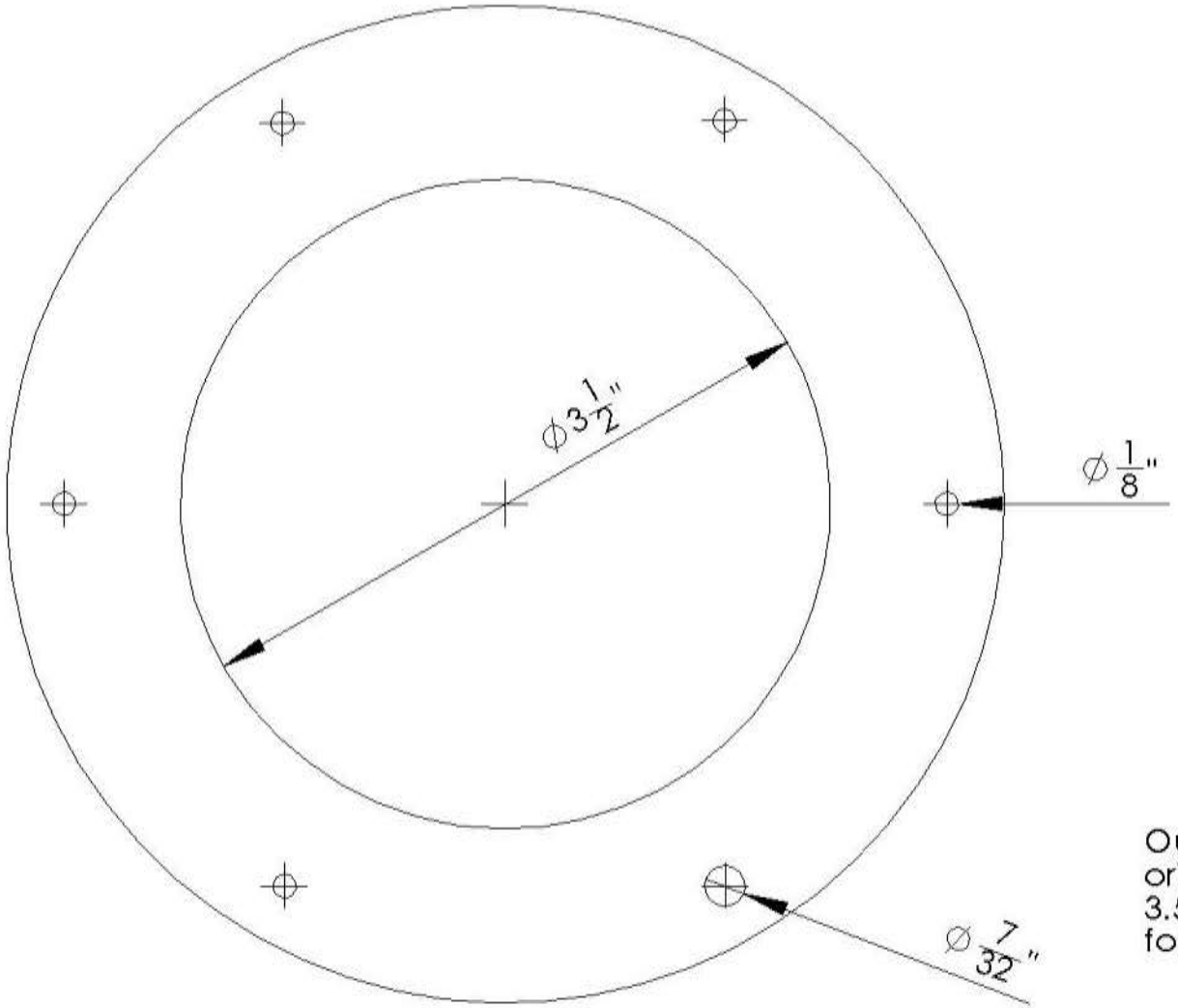
				NAME	DATE	TAILLIGHT TEMPLATE
	USED ON	FINISH	DRAWN	JI	2/24/17	
	APPLICATION	PRINTED 5/18/2017	COMMENTS:	SIZE A	DWG. NO.	REV. A
				SCALE:1:1		



Outside circle is shown for placement orientation only, do not cut. Use a 3.5" holesaw in center and 1/8" drill bi for all except one small hole.

	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	9/26/97
COUPE		CHECKED		
		ENG APPR.		
		MFG APPR.		
	MATERIAL	Q.A.		
USED ON	FINISH	COMMENTS:		

Factory Five Racing,

TITLE:
FUEL NECK FLANGE TEMPL

SIZE A

DWG. NO. 11009

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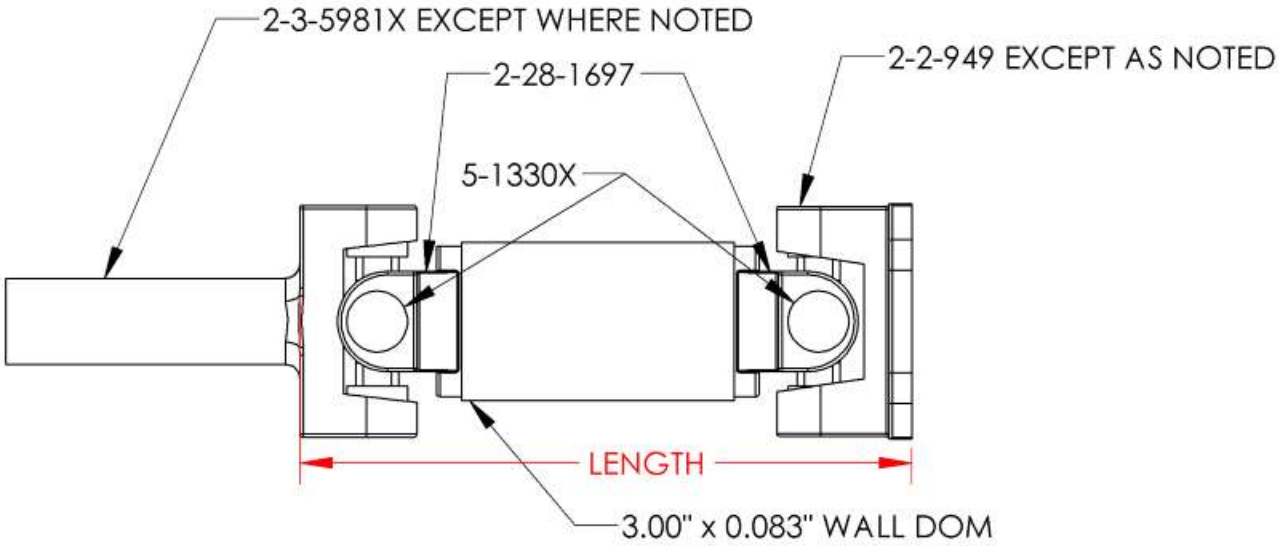
MODEL	FFR#	SPLINE	DESCRIPTION	LENGTH
COUPE	60375	31	COYOTE w/2015 IRS, 6SPD MAGNUM, 2-3-6041X YOKE, 2-2-489 FLG	9.75
COUPE	60453	28	302/351 w/2015 IRS, T-5/AOD, 2-2-489 FLG	10.50
COUPE	60450	31	302/351 6 SPD MAGNUM, 2-3-6041X YOKE	10.50
COUPE	60175	31	302/351 w/2015 IRS, TKO, 4.6L/COYOTE TKO ROADSTER, 2-3-6041X YOKE, 2-2-489 FLG	10.50
COUPE	60455	31	COYOTE 6 SPD MAGNUM, 2-3-6041X YOKE	12.75
COUPE	60376	31	COYOTE w/2015 IRS, TKO, 2-3-6041X YOKE, 2-2-489 FLG	12.75
COUPE	60454	28	302/351 T-5/AOD	13.50
COUPE	16349	31	302/351 TKO, 2-3-6041X YOKE	13.50
COUPE	60452	31	COYOTE TKO, 2-3-6041X YOKE	15.75
HOT ROD	34048	27	CHEVY w/2015 IRS, 700R4/4L60/4L65E (EXCEPT VETTE), 2-3-12051X YOKE, 2-2-489 FLG	31.00
HOT ROD	34049	31	302/351/4.6L/COYOTE/HEMI w/2015 IRS, TKO, 2-3-6041X YOKE, 2-2-489 FLG	31.25
HOT ROD	34050	28	302/351/4.6L/COYOTE w/2015 IRS, T-5/AOD, 2-2-489 FLG	31.25
HOT ROD	34046	31	CHEVY w/2015 IRS, TKO, 2-3-6041X YOKE, 2-2-489 FLG	32.1875
HOT ROD	34880	27	CHEVY 700R4/4L60/4L65E (EXCEPT CORVETTE), 2-3-12051X YOKE	35.00
HOT ROD	34881	28	302/351/4.6L/COYOTE T-5/AOD	35.25
HOT ROD	34882	31	302/351/4.6L/COYOTE/HEMI TKO, 2-3-6041X YOKE	35.25
HOT ROD	34883	27	CHEVY 4L60/4L65E, 2-3-12051X YOKE	35.75
HOT ROD	34884	31	CHEVY TKO, 2-3-6041X YOKE	36.1875
ROADSTER	15956	28	302/351 w/2015 IRS, T-5/AOD, 2-2-489 FLG	8.375
ROADSTER	16038	31	302/351 w/2015 IRS, TKO, COYOTE/LS T-56, 2-3-6041X YOKE, 2-2-489 FLG	8.375
ROADSTER	16348	28	302/351 T-5/AOD	11.25
ROADSTER	16350	31	302/351 TKO, 2-3-6041X YOKE	11.25
ROADSTER	16349	31	4.6L/COYOTE/LS TKO/T-45/3650, BIG BLOCK TKO, 302/351 TKO COUPE, 2-3-6041X YOKE	13.50
35 TRUCK	35201	28	302/351/4.6L/COYOTE USING T-5/AOD, USE 2-2-489 FLG	42.50
35 TRUCK	35202	31	302/351/4.6L/COYOTE/HEMI USING TKO, USE 2-3-6041X YOKE AND 2-2-489 FLG	42.50
35 TRUCK	35203	27	CHEVY USING 4L60/4L65E (1998+), USE 2-3-12051X YOKE AND 2-2-489 FLG	42.50
35 TRUCK	35204	27	CHEVY USING 700R4/4L60 (93-97 EXCEPT VETTE), USE 2-3-12051X YOKE AND 2-2-489 FLG	43.00
35 TRUCK	35205	31	CHEVY USING TREMEC TRANS. 2-3-6041X YOKE AND 2-2-489 FLG	43.4375



NOTE: 1. FOR ALL OTHER TRANSMISSIONS, INSTALL TRANS. AND MEASURE.
2. 94-95 BELLHOUSING AND T-5 TRANS ARE LONGER SO SHORTEN DRIVESHAFT BY 0.75".

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ROADSTER
COUPE
HOT ROD
35 TRUCK
USED ON
APPLICATION

DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
PRINTED 11/11/2022

Factory Five Racing, Inc.

DRIVESHAFT DIAGRAM

	NAME	DATE
DRAWN	JI	12/18/03

COMMENTS: 2015 IRS USE SPICER 2-2-489 PINION FLANGE

SIZE A DWG. NO. 13023 REV. X
SCALE:1:3 WEIGHT: SHEET 1 OF 1

Appendix B – Donor Parts List

In some cases, not all parts listed below will be necessary, but it is suggested to obtain all parts to avoid future difficulties.

	PART NAME	CHECK
Engine/Drivetrain	Engine	
	Engine mount, (L, R) w/nuts and bolts	
	Starter	
	Transmission, bell-housing, clutch, and shifter components	
	Transmission mount w/nuts and bolts	
	Driveshaft w/4 bolts	
	Clutch cable w/bell-housing retaining c-clip	
	Speedometer speed sensor w/plastic gear	
	Mass air sensor with flexible elbow	
Exhaust	Oxygen sensors	
	Exhaust headers w/nuts and bolts	
Cooling	Heater hoses to firewall w/clamps	
Fuel Sys.	Fuel tank w/plastic under tray, gas cap, and mounting straps	
	Filler neck	
	Fuel filter w/mounting bracket and hoses	
	High pressure fuel line, tank to filter	
	Low pressure return line to fuel tank	
	High and low pressure solid fuel lines attached to engine fuel rails	
	Fuel evaporative canister, solenoid and tubing	
Brakes/Wheels	Rear brake rotor/drum, calipers, pads, flexible lines, etc.	
	Rear brake line mount, riveted to donor	
	Rear upper control arms w/nuts and bolts	
	Rear lower control arms w/nuts and bolts	
	8.8inch complete rear axle assembly	
	Front lower A-arms w/nuts and bolts	
Steering	Power steering lines if using power steering	
	Steering rack with mounting bushings	
	Inner and outer tie-rod ends (87-93 applications only)	
Electrical	Wiring harness (all)	
	Emergency inertia cut-off switch	
	Turn signal stalk, and ignition cylinder w/key from steering column	
	Horns	
	Battery w/ground cable	
	Coil, starter solenoid	
	EEC IV Computer w/holder	

Appendix C – Race / Yearly 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 D – Torque Specifications

General Bolt torque specifications*

Thread	SAE English
	Zinc Plated
	lb-ft
¼ -20	8
¼ -28	10
5/16 -18	17
5/16 -24	19
⅜ -16	30
⅜ -24	34
7/16 -14	48
7/16 -24	54
½ -13	75
½ -20	83
9/16 -12	100
9/16 -18	100
⅝ -11	100
⅝ -14	100

Thread	SAE Metric
	Zinc Plated
	lb-ft
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 E – Mustang Specifications

Between 1996 and 1998 Ford made 125,231 GT and 28,708 Cobra versions of the Mustang
Between 1999 and 2004 Ford made ~200,000 GT, 5,582 Bullitt, 9,652 Mach 1 and 20,727 Cobra versions of the Mustang.

(All information is based on V8 Ford Mustangs from 1979 to 2004)

Special Version Mustangs with Specifications

Year & Model	Engine	HP	Torque	Rear Susp.	Transmission	Wheels
93' Cobra	302, 5.0L	235@4600	280@4000	Solid Axle	T-5	17"x8"
93' Cobra "R"	302, 5.0L	235@4600	280@4000	Solid Axle	T-5	17"x8"
94'-95' Cobra	302, 5.0L	240@4800	285@4000	Solid Axle	T-5	17"x8"
95' Cobra "R"	351, 5.8L	300@4800	365@3750	Solid Axle	Tremec 3550	17"x9"
96'-98' Cobra	DOHC 4.6L	305@5800	300@4800	Solid Axle	T-45	17"x8"
99'-02' Cobra	DOHC 4.6L	320@5000	317@4750	Independent	T-45	17"x8"
00' Cobra "R"	331, 5.4L	385@6250	385@4250	Independent	T-56	18"x9.5"
01' Bullitt	SOHC 4.6L	265@5000	305@4000	Solid Axle	T-45	17"x8"
03'-04' Cobra	DOHC 4.6L Supercharged	390@6000	390@3500	Independent	T-56	17"x8"
03'-04' Mach 1	DOHC 4.6L	305@5800	320@4200	Solid Axle	Tremec 3650	17"x8"

Engine

Year/Engine	Horsepower	Torque Rating	Induction	Comp Ratio
1982 5.0L V8	157 @ 4200	240 @ 2400	2V carb	8.3:1
1983 5.0L V8	175 @ 4200	245 @ 2400	4V carb	8.3:1
1984 5.0L V8	175 @ 4200	245 @ 2400	4V carb	8.3:1
1984 5.0L V8	165 @ 3800	245 @ 2000	CFI	8.3:1
1985 5.0L V8	210 @ 4400	270 @ 3200	4V carb	8.4:1
1985 5.0L V8	180 @ 4200	260 @ 2600	CFI	8.4:1
1986 5.0L V8	200 @ 4000	285 @ 3000	SFI	9.2:1
1987-93 5.0L V8	225 @ 4000	300 @ 3000	SFI	9.0:1
1994-95 5.0L V8	225 @ 4000	300 @ 3000	SFI	9.0:1
1996-97 SOHC	215 @ 4400	285 @ 3500	SFI	9.5:1
1998 SOHC	225 @ 4400	290 @ 3500	SFI	9.0:1
1999-04 SOHC	260 @ 5250	302 @ 4000	SFI	9.4:1

Transmission

Year	Type	1st	2nd	3rd	4th	5th	6th	R	Torque lbft	Part Number	Weight
1983.5	T-5	2.95	1.94	1.34	1.00	0.725	N/A	2.76	265	E3ZR-7003-A	75
1984	T-5	2.95	1.94	1.34	1.00	0.625	N/A	2.76	265	E4ZR-7003-DA	75

1985-89 T-5	3.35	1.93	1.29	1.00	0.675	N/A	3.15	265	E(5,6) ZR-7003-(FA,FB)	75
1989-93 T-5	3.35	1.99	1.33	1.00	0.675	N/A	3.15	300	F(Z,9,0) ZR-7003-(A,AA)	75
1994-95 T-5	3.35	1.99	1.33	1.00	0.675	N/A	3.15	300		75
1995 TR3550	3.27	1.98	1.34	1.00	0.680	N/A	3.00	350		100
1996-98 T-45	3.37	1.99	1.33	1.00	0.670	N/A	3.22	325		109
1999-02 TR-3650	3.38	2.00	1.32	1.00	0.620	N/A	3.38	360		120
2003-04 T-56	2.97	2.07	1.43	1.00	0.800	0.62	3.28	450		129

Rear Axle Ratio

	Manual	Optional	Automatic
2004	3.55		2.49
2003	3.55		3.27
1996-2002	3.27		3.27
1995	3.08		3.27
1994	3.08		3.27
1987-1993	2.73	3.08	3.27

From 1986 to 2004 8.8" rear axles were used in Mustangs. In 1994 they went from a 4.25" 4-lug bolt pattern to a 4.5" 5-lug bolt pattern. Most wheels fit the 59.25" width the best. Make sure you know what axle you have before ordering wheels.

Year	Rear End Width	Rear Brake Type	
87-93	59.25"	9" drum	
94-98	61.125"	10.5" solid disc (GT)	11.65" vented disc (Cobra)
99-04	62.52"	10.5" solid disc (GT)	11.65" vented disc (Cobra)

Oxygen Sensors

Oxygen sensors are placed in the exhaust to measure the oxygen content of the exhaust. From 1986-1995, Ford Mustangs used two oxygen sensors, one in each side of the exhaust system. From 1996-2004, Mustangs used four oxygen sensors, two per side. At full throttle the oxygen sensor signals are not used by the computer, because the computer has a built in program to run the engine rich at wide open throttle. Oxygen sensors will usually be most effective when placed near the collection point of headers because the exhaust will remain very hot, and an average measurement of all of the cylinders can be taken. All oxygen sensors are recommended to be used when placing a fuel injected engine into a Factory Five kit.

Exhaust headers

1986 to 1993 Mustang headers have 1.5" tubes, and remained the same shape. From 1994 to 1995 Mustang headers still have 1.5" headers, but the collector flanges have a larger ball and socket joint. 1996 to 2004 Mustangs used cast exhaust manifolds. SOHC engines had circular exhaust ports, and the DOHC had oval ports; however the collector flange changed in 2003 and 2004. Factory Five Produces J-pipes to connect stock Mustang headers in a reversed position to Roadster 4 port side pipes for the following years: 1986-1995, 1996-2004. 4 into 4 headers are also available from Factory Five for the following applications: 302, 351W, Coyote and LS.

Steering components

Power steering racks from 1987-2004 are 15:1. In 1994 the racks switched from having a splined shaft for attachment to the steering column to a triangle shaped end, as well as changing the inner and outer tie rod ends. The 1994 to 2004 inner and outer tie rods are too long and do not work with an FFR kit. The Factory Five 4.6L steering kit includes the correct inner and outer tie rod ends along with the correct steering adapter.

Appendix F – Fluid Specifications

Engine

	Oil Type	Capacity
302	10W-30	5.0 qts.
4.6L	5W-30	8.0 qts. w/FFR pan
5.0L Coyote	5W-20	8.0 qts. w/FFR pan

Transmission

Oil Type	T-5	T-45	3650	TKO	T-56
Mercon/Dexron III Trans. Fluid	2.8 qts.	3.25 qts.	4.0 qts.	2.64 qts.	4.0 qts.

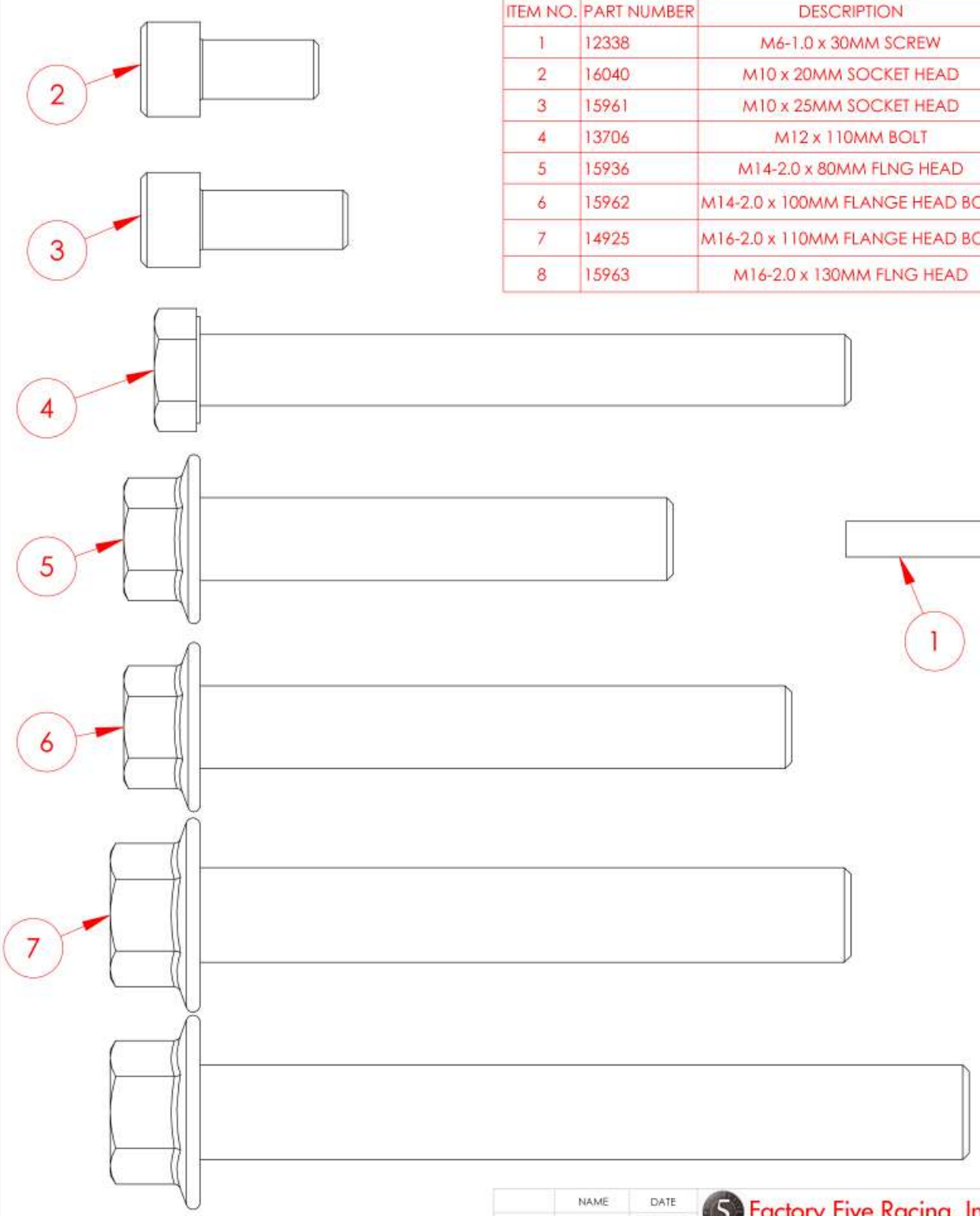
8.8 Solid Rear Axle

Oil Type	Capacity	Friction Modifier
80W-90 Gear oil	1.875 qts.	4 oz.

8.8 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)

Appendix G – Metric Fastener Lengths



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	12338	M6-1.0 x 30MM SCREW	1
2	16040	M10 x 20MM SOCKET HEAD	1
3	15961	M10 x 25MM SOCKET HEAD	1
4	13706	M12 x 110MM BOLT	1
5	15936	M14-2.0 x 80MM FLNG HEAD	1
6	15962	M14-2.0 x 100MM FLANGE HEAD BOLT	1
7	14925	M16-2.0 x 110MM FLANGE HEAD BOLT	1
8	15963	M16-2.0 x 130MM FLNG HEAD	1

	NAME	DATE
DRAWN	JI	3/1/22

COMMENTS:

PRINTED 3/1/2022

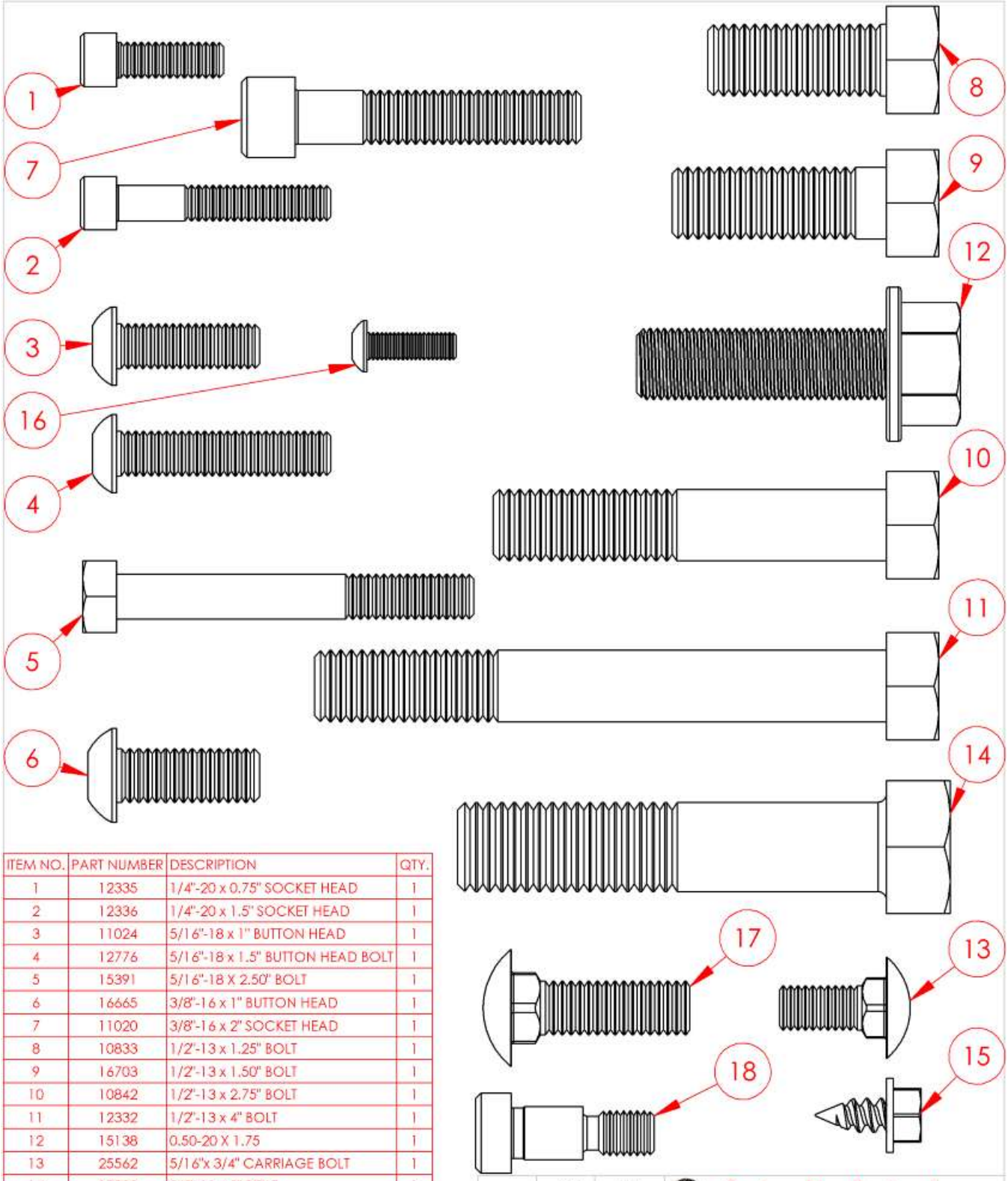
Factory Five Racing, Inc.

METRIC FASTENER LENGTHS

SIZE A | DWG. NO. METRIC FASTENERS | REV. A

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

Appendix H – Std Fastener Lengths



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	12335	1/4"-20 x 0.75" SOCKET HEAD	1
2	12336	1/4"-20 x 1.5" SOCKET HEAD	1
3	11024	5/16"-18 x 1" BUTTON HEAD	1
4	12776	5/16"-18 x 1.5" BUTTON HEAD BOLT	1
5	15391	5/16"-18 X 2.50" BOLT	1
6	16665	3/8"-16 x 1" BUTTON HEAD	1
7	11020	3/8"-16 x 2" SOCKET HEAD	1
8	10833	1/2"-13 x 1.25" BOLT	1
9	16703	1/2"-13 x 1.50" BOLT	1
10	10842	1/2"-13 x 2.75" BOLT	1
11	12332	1/2"-13 x 4" BOLT	1
12	15138	0.50-20 X 1.75	1
13	25562	5/16"x 3/4" CARRIAGE BOLT	1
14	12382	5/8"-11 x 3" BOLT	1
15	10984	#14 x 1/2" SCREW	1
16	80837	10-32 x 0.625" BUTTON HEAD	1
17	60343	3/8"-16 x 1.25" CARRIAGE BOLT	1
18	13325	0.50" SHOULDER BOLT	1

	NAME	DATE
DRAWN	JI	3/1/22
COMMENTS:		
PRINTED	12/13/2022	

Factory Five Racing, Inc.

STANDARD FASTENER LENGTHS

SIZE A | DWG. NO. STANDARD FASTENERS CP | REV. A

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

Appendix I – Fastener Pack List

PART	DESCRIPTION	QUANTITY	UNIT
60859	COUPE FASTENER PACK	1.00	EA
12156	#10 SS WASHER	14.00	EA
10635	#10 WASHER	3.00	EA
10995	#10 x 1" SCREW	14.00	EA
12768	#10-32 SS NYLON LOCK NUT	23.00	EA
80837	#10-32 x 0.625" BLK BUTTON HD	18.00	EA
80414	#10-32 x 0.625" PHILIPS HEAD	2.00	EA
10851	#14 x 1.50" SCREW	2.00	EA
10984	#14 x 1/2" SCREW	17.00	EA
60801	#6x 1/2" OVAL HEAD SCREW	4.00	EA
12962	#6 x 1/2" SCREW	16.00	EA
12780	#6 x 1/2" TRUSS HEAD SCREW	26.00	EA
10983	#8 X 3/4" OVAL HEAD SCREW	24.00	EA
13979	#8 x 3/4" SCREW w/WASHER	8.00	EA
14627	#8-18 x 1/2" TAPPING SCREW	4.00	EA
14464	#8-32 1" SCREW	2.00	EA
14465	#8-32 NYLON LOCKNUT	2.00	EA
13325	0.50" SHOULDER BOLT	2.00	EA
13976	1/2" WASHER	34.00	EA
10834	1/2"-13 NYLON LOCK NUT	25.00	EA
12218	1/2"-20 MECH LOCK NUT	4.00	EA
10833	1/2"-13 x 1.25" BOLT	10.00	EA
15138	1/2"-20 x 1.75" FLNG HEAD	4.00	EA
10842	1/2"-13 x 2.75" BOLT	6.00	EA
12386	1/2"-13 x 3.25" BOLT	3.00	EA
12332	1/2"-13 x 4" BOLT	2.00	EA
25590	1/2"x 1.25" CARRIAGE BOLT	4.00	EA
12337	1/4" FENDER WASHER	2.00	EA
10802	1/4" NYLON LOCK NUT	20.00	EA
11088	1/4" WASHER	8.00	EA
16486	1/4"-20 x 0.625" BUTTON HEAD	1.00	EA
80539	1/4"-20 x 0.75" BOLT	2.00	EA
33524	1/4"-20 x 1" FLNG HEAD	6.00	EA
15638	1/4"-20 X 1.25" BOLT	2.00	EA
12336	1/4"-20 x 1.5" SOCKET HEAD	1.00	EA
33696	1/4"-20 X 1.75" BOLT	4.00	EA
33688	1/4"-20 x 1/2" FLNG BUTTON	4.00	EA
15166	1/4"-20 x 10.00" L BOLT	1.00	EA
60519	1/4"-20 X 2.25" BOLT	2.00	EA
60520	1/4"-20 X 8.00" BOLT	2.00	EA
25461	1/4"-20x 1" FLNG BUTTON	1.00	EA
15377	1/4"-28 JAM NUT	4.00	EA
16779	1/4"x 0.75" ELEVATOR BOLT	4.00	EA
13564	2.00" SHOULDER BOLT	4.00	EA

14725	3/8"-16 JAM NUT	4.00	EA
13964	3/8"-16 NYLON LOCK NUT	2.00	EA
10520	3/8"-16 x 1" SOCKET HEAD	1.00	EA
16665	3/8"-16 x 1" BUTTON HEAD	2.00	EA
60343	3/8"-16 x 1.25" CARRIAGE BOLT	4.00	EA
11040	3/8"-16 x 1.25" SOCKET HEAD	1.00	EA
11020	3/8"-16 x 2" SOCKET HEAD	1.00	EA
60503	3/8"-16 x 2.25" BOLT	4.00	EA
60381	3/8"-16 FLNGD NYLN LOCK	16.00	EA
12908	5/16" SS WASHER	4.00	EA
11005	5/16" WASHER	47.00	EA
13963	5/16"-18 NYLON LOCK NUT	50.00	EA
60589	5/16"-18 x 0.50" BUTTON HEAD	4.00	EA
11024	5/16"-18 x 1" BUTTON HEAD	18.00	EA
12776	5/16"-18 x 1.5" BUTTON HEAD	14.00	EA
15391	5/16"-18 x 2.5" BOLT	8.00	EA
25562	5/16"x 3/4" CARRIAGE BOLT	8.00	EA
60518	5/16-18 x 0.75" BOLT	2.00	EA
11212	5/16-24 LOCK NUT	1.00	EA
12383	5/8"-11 NYLON LOCK NUT	2.00	EA
12382	5/8"-11 x 3" BOLT	2.00	EA
12909	7/16" SS WASHER	6.00	EA
13965	7/16"-14 NYLON LOCK NUT	2.00	EA
12339	M6-1.0 LOCK NUT	6.00	EA
12338	M6-1.0 x 30MM SCREW	6.00	EA