



**FACTORY FIVE**  
R A C I N G



XTF  
Assembly Manual

## REVISION 1D, DECEMBER 1, 2023

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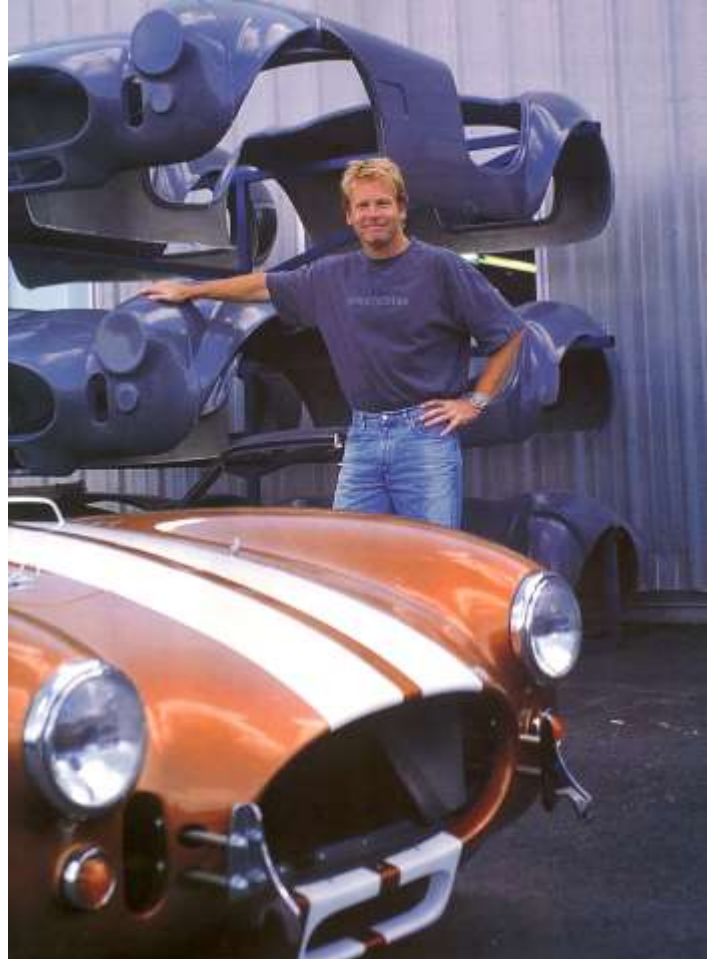


# General Information

## Foreword

If you are reading this, you are embarking on a mission to build your own vehicle, 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 vehicle 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 race car preparation bears repeating. There is no magic. There is only logic, common sense, forethought, vast amounts of hard work, and a fanatic dedication to the task at hand”.

Carroll Smith

“Prepare to Win”

I can't think of anything more appropriate to say about the right way to approach the serious work of building your own car. Carroll passed away not too long ago, but his accomplishments behind the Ford Lemans victories and his contributions to the motorsports community continues in his writings that are all at the top of my list of recommended readings for the car builder or racer. After being honest about the skills, responsibility, and dedication required to build a car, I feel the need to talk about the PROCESS of building a car in an equally candid manner.

The process of building a car is a lot like the process of having kids. As a matter of fact, it's absolutely the best analogy I can find (apologies in advance to all of you without kids, try and bear with me). Both things are easy to get started. With a car project you order a manual, talk to car guys, get all excited

over glossy photos and perhaps order a kit from us. With the whole pregnancy thing, well for most folks that's even easier to get started...

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

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

All the way through 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 truck 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 truck there 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 vehicles that we build are more than cars and trucks. 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 or 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 builds 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 vehicle 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 shortcuts.

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 truck you will be building is a highly capable machine, and your life depends on the quality of your workmanship.

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

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 truck or for those that purchase a finished build, to understand their truck 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 later when the part is available.** If the instructions are followed then the resulting truck should be a great performing truck.

---

I C O N   K E Y	
	Valuable information
	Tools needed
	Parts Needed

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

## What You Get

The Factory Five Pre Runner kit gives you everything you need to build your truck, in one big package. We include the frame, body panels, and all trim down to the smallest details like correct fasteners, brackets, and weatherstripping.

**Frame:** Complete jig-welded tube frame. Includes all mounts ready to accept 3.5L Ecoboost or 5.0L Coyote Ford Engines.

**Body panels:** Hand laid 1/8" laminate composite body panels made with vinyl ester resin.

**Chassis Aluminum Panels:** Laser cut, pre-formed 0.040" 6061-T6 and 0.125" 5052H32 aluminum panels for Truck bed and splash guards. 1200 pre-packaged rivets.

**Front Suspension:** Tubular upper and lower control arms, high performance remote reservoir rod-end shock absorbers.

**Rear Suspension:** 4-Link Suspension, tubular lower control arms, high performance remote reservoir rod-end shock absorbers.

**Fuel System:** Fuel pump and pressure extension harnesses and mounting brackets.

**Brake System:** Front and rear brake hoses, ABS and brake hose mounts.

**Drivetrain:** Front CV Axles.

## What you Need

- 2015-2020 Ford F150 Crew cab truck with 3.5L Ecoboost or 5.0L Coyote Engine.
- Good looking wheels with the correct offset with tires to match the desired look.
- See appendix for complete list

## Optional Parts

Factory Five will make new options available. Check [Factoryfiveparts.com](http://Factoryfiveparts.com) for the latest parts.

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

[www.factoryfiveparts.com/instructions/](http://www.factoryfiveparts.com/instructions/)

## Tool 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®, Lowes CRAFTSMAN®, Tekton, 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 + 1 1/8” socket
- \_\_\_\_\_ Deep sockets for some common sizes are helpful.
- \_\_\_\_\_ Torx star drive bit sockets
- \_\_\_\_\_ 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 (1/8”, 3/16”, 7/32”, 1/4”, 5/16”, 5/8”)
- \_\_\_\_\_ Driver bit set
- \_\_\_\_\_ Caulk gun
- \_\_\_\_\_ 24 oz. Plastic Dead Blow hammer
- \_\_\_\_\_ Razor knife
- \_\_\_\_\_ Bench top vise
- \_\_\_\_\_ Tape measure or straight edge ruler/T-square
- \_\_\_\_\_ Hydraulic floor jack
- \_\_\_\_\_ Work Bench or 2 Saw horses with 4’x 8’ 3/4” P.
- \_\_\_\_\_ Engine hoist
- \_\_\_\_\_ 6’ 5/16” chain (to lift engine)
- \_\_\_\_\_ Trim removal tool
- \_\_\_\_\_ 4 Jack 6000lb truck stands
- \_\_\_\_\_ Sawzall (metal blade)
- \_\_\_\_\_ 1/4” & 5/16” Fuel/brake line bender (hand held)
- \_\_\_\_\_ Torque wrench (Click style, 3/8” drive)
- \_\_\_\_\_ Eye protection
- \_\_\_\_\_ Gloves
- \_\_\_\_\_ The thing between your ears





## Required Supplies

- \_\_\_\_\_ Fluids - See Appendix
- \_\_\_\_\_ Blue Lok-tite
- \_\_\_\_\_ Chassis grease - Valvoline® Moly Fortified Multi-Purpose Grease - VV633
- \_\_\_\_\_ Silicone Door and window sealant, GE Silicone II or equivalent - 2 tubes
- \_\_\_\_\_ Black RTV sealant
- \_\_\_\_\_ Black permanent marker with pointed tip.



# F-150 DISASSEMBLY

- 👉 Before you start, take the truck to a shop with an Air conditioning recovery system and evacuate the refrigerant.
- 👉 Keep all fasteners taken off the truck “Just in Case”.

## Bed



Unbolt the bed by removing the six bolts down the center of the bed.





Remove the single bolt holding the fuel filler pipe so it can move freely and detach from the filler door.



Carefully remove the bed from the frame.



Remove the fuel filler door from the bed and save for later.

## Fuel System



For the fuel lines connecting to the fuel tank, remove the OEM connectors from the nylon tubes by carefully cutting the nylon with a razor knife. Do not cut deep or the barbs will get cut.



Save the fittings.

## Exhaust



Cut the tailpipe where it comes out under the leaf spring. This will allow the roller to clear your cab as you separate the two.

## Wiring

✂ Trim removal tool



Unplug the computer plugs in the engine bay.

Remove any grounds from the cab.



Use a trim removal tool or needle nose pliers to remove all of the plastic trees holding the harness to the frame.

## Grill/Radiator Shutters



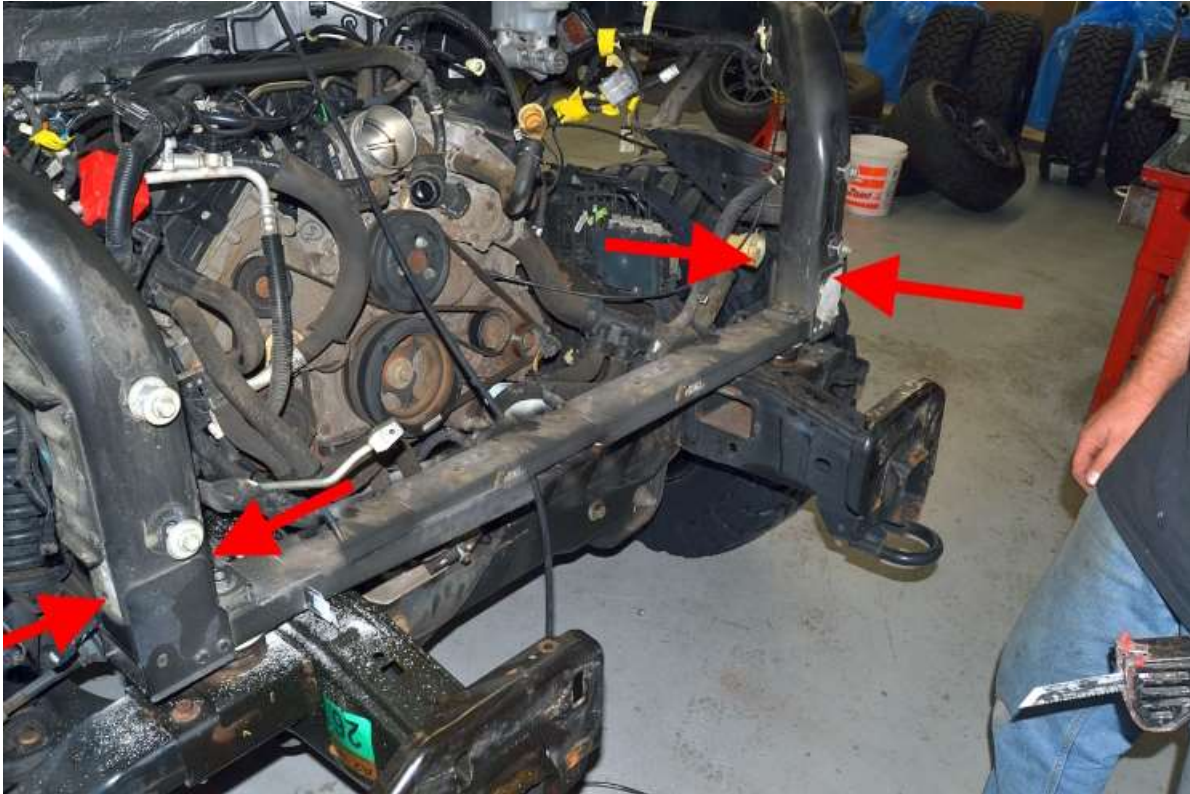
Remove the grill radiator shutters.



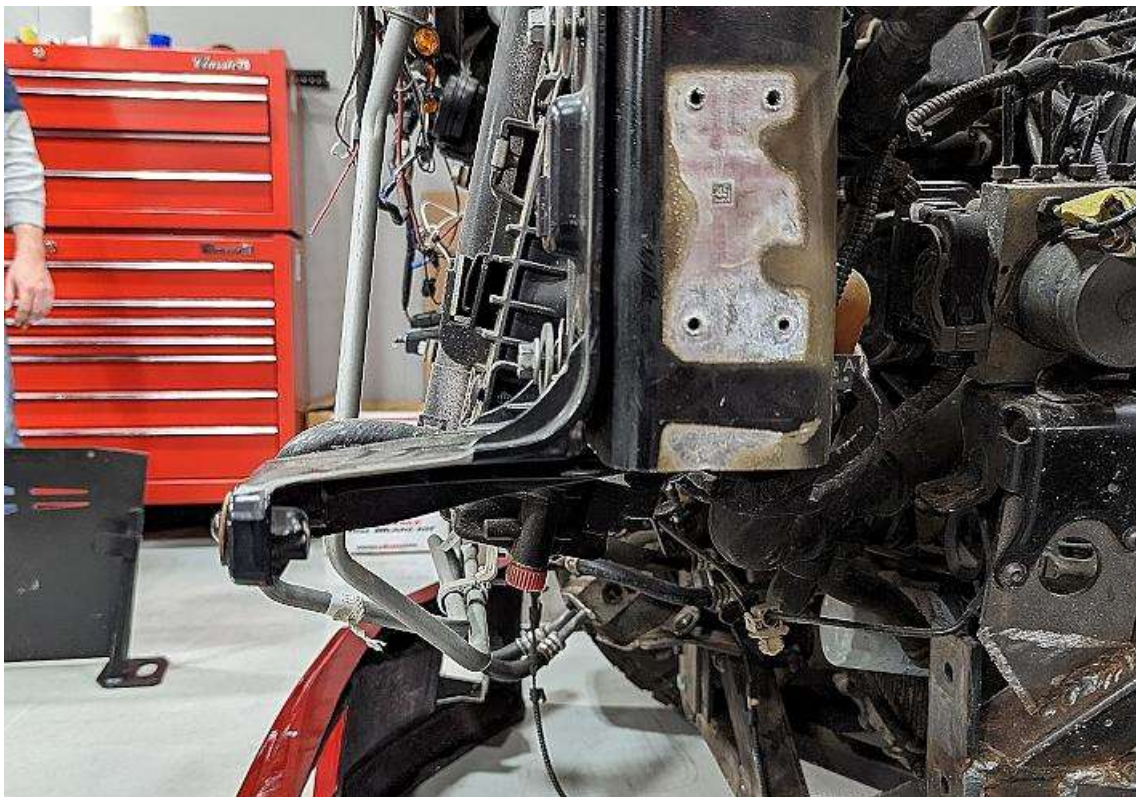
Remove and keep the motor and mark the harness plug with masking tape. The motor needs to be plugged in to prevent a "Check Engine" light.



## Front Supports



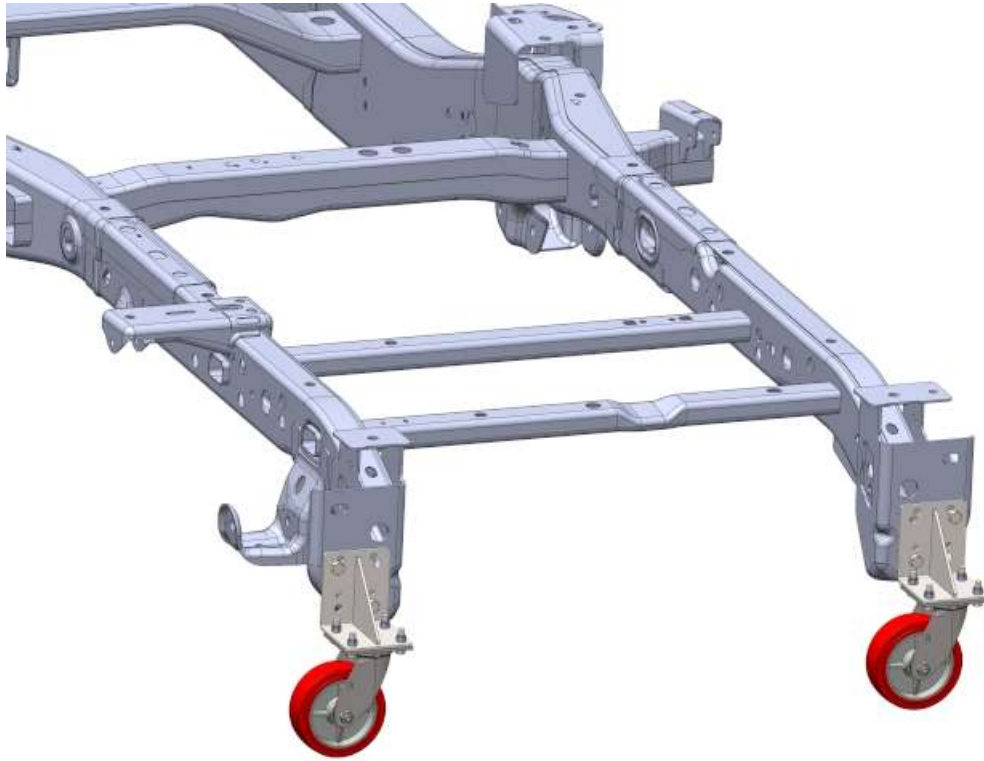
The front cab horns need to be trimmed just below where the 2 radiator support mounts bolt on.



Use a Sawzall to cut the front supports in front of the engine below the bolt on mount as shown; At the top of the cross tube bracket.



## Cab Removal



Attach two casters to the rear of the F150 frame using the  $\frac{1}{2}$ "x 1.25" and 1.50" bolts along with a  $\frac{3}{4}$ " wrench and socket.



Remove all of the obvious connections like the wiring, grounds and brake lines between the cab and the frame.



Remove the EVAP vent tube from the charcoal canister that is going to the top center of the transmission tunnel.







Between the cab and the transmission, remove the bolt holding the bracket and slide the end off the post it's attached to.








Locate the F150 in your garage so that the F150 frame will be able to come out the front of the truck and so that the Factory five Chassis can get installed from the side of the Cab.

## Wiring

-  Take note of the wiring harness locations then use a trim removal tool to remove the harness from the F150 chassis.
-  Swapping the truck cab should be performed by skilled professionals with the correct equipment and experience. The space needed to do this should be laid out ahead of time as the OEM chassis rolls out from under the cab toward the front and the new tubular chassis will fit easier from the side (without a lift). Once the cab is removed it is difficult to move so plan this space out before you begin.

## **KIT DISSASSEMBLY**

### 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.
-  The assembly manual will tell you which fasteners to use in which location.

## Aluminum Removal



Before removing the bed aluminum, mark the outside surface of the aluminum everywhere it is in contact with a flat surface of a tube. This is done to locate where to drill rivet holes when the panels are permanently mounted later.



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

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70209	BED FLOOR REAR FRONT	1
2	70210	BED FLOOR	1
3	70211	BED FRONT	1
4	70242	BED/FUEL TANK REAR COVER	1
5	70207	70308 - LEFT REAR SHOCK CVR	1
6	70207	70309 - RIGHT REAR SHOCK CVR	1
7	70206	70214 - LEFT BED SIDE	1
8	70206	70215 - RIGHT BED SIDE	1
9	70484	REAR WHEEL REAR SPLASH	1
10	70485	70487 - RT REAR WHEEL FRNT SPLASH	1
11	70484	REAR WHEEL REAR SPLASH	1
12	70485	70486 - LFT REAR WHEEL FRNT SPLASH	1
13	70488	FRNT WHEEL REAR SPLASH	2
14	70492	FRNT WHEEL REAR INSIDE SPLASH	2
15	70511	70512 - LFT REAR BED SIDE	1
16	70511	70513 - RT REAR BED SIDE	1
17	70680	70681 - LEFT INSIDE TAILLIGHT COVER	1
18	70663	LEFT REAR ENGINE BAY SIDE BLOCK-OFF	1
19	70665	LEFTFRONT ENGINE BAY SIDE BLOCK-OFF	1
20	70680	70682 - RIGHT INSIDE TAILLIGHT COVER	1
21	70664	RIGHT ENGINE BAY SIDE BLOCK-OFF	1

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	6/6/23	

<p>UNLESS OTHERWISE SPECIFIED:  DIMENSIONS ARE IN INCHES  TOLERANCES:  TWO PLACE DECIMAL +0.01  THREE PLACE DECIMAL +0.005  FOUR PLACE DECIMAL +0.001</p>		<p>NAME: _____ DATE: 8/11/23</p>
<p><b>PRE RUNNER</b></p>	<p>FACTORY FIVE RACING, Inc.</p>	<p>5</p>
<p>TITLE: PRE RUNNER ALUMINUM</p>		<p>REV: <b>A</b></p>
<p>MATERIAL: ALUMINUM</p>		<p>SIZE DWG. NO. <b>Prerunner</b></p>
<p>FINISH: _____</p>		<p>SCALE: 1:30 WEIGHT: _____</p>
<p>USED ON: _____</p>		<p>PRINTED: 11/13/2023</p>
<p>APPLICATION: _____</p>		<p>SHEET 2 OF 2</p>

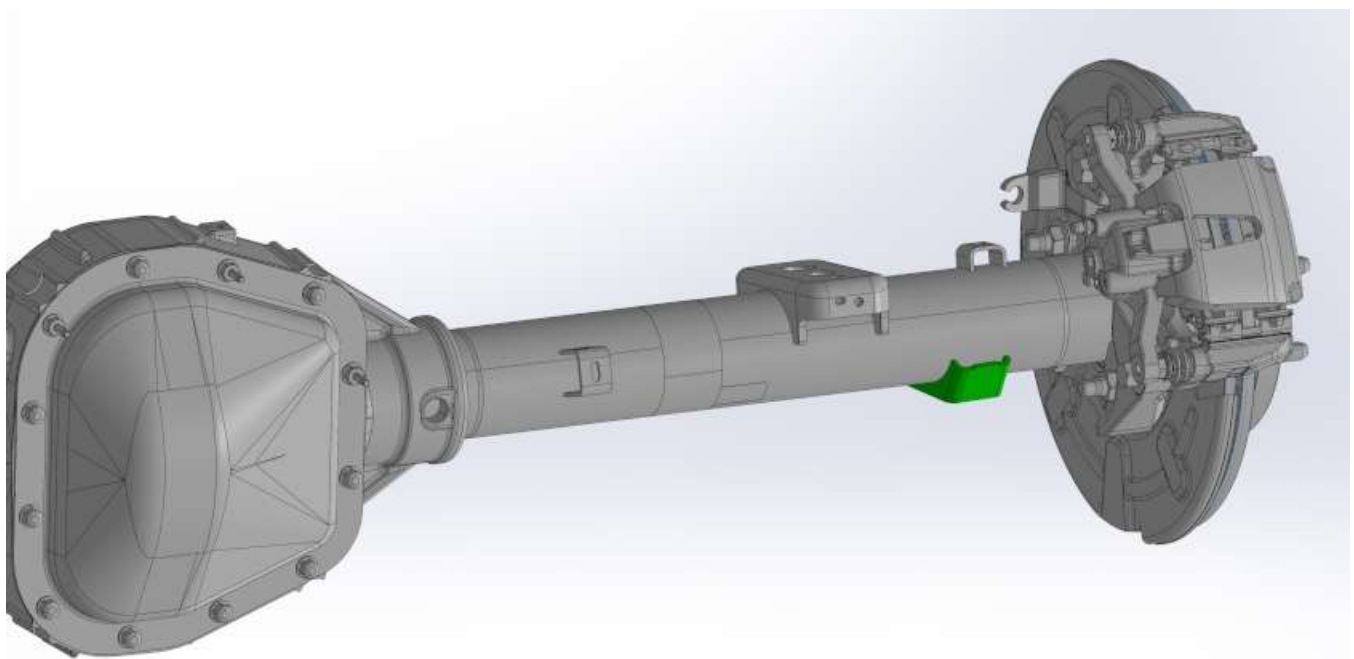
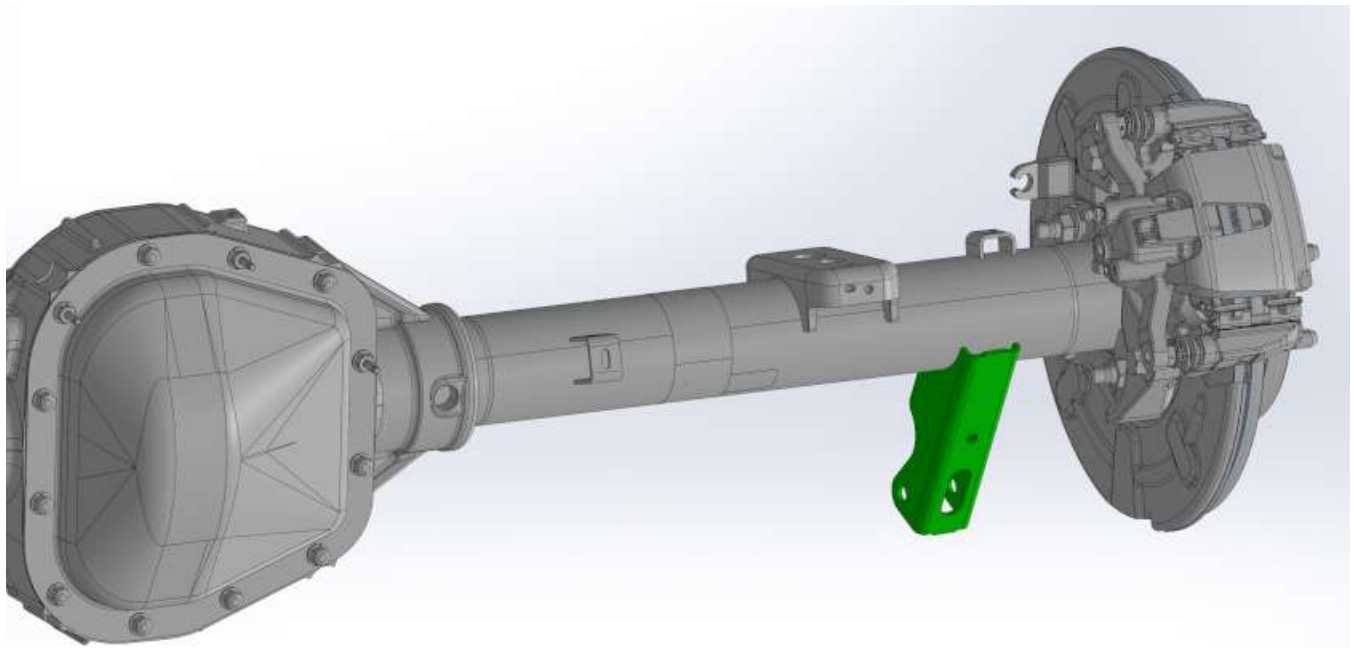
  

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## Rear Axle

### OEM SHOCK MOUNT

✂ Sawzall



Cut the OEM shock mount off the axle.

### AXLE SUPPORT MOUNT



Box 39



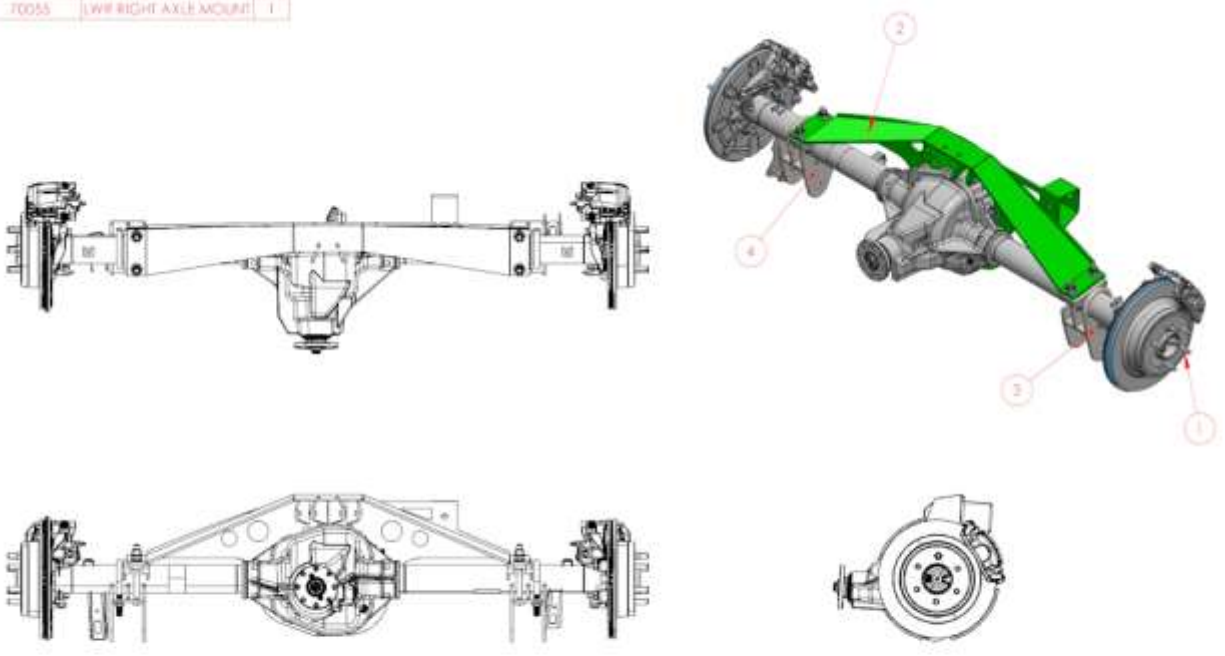
½" drill bit, razor, RTV,



There are two different axle support brackets. The 8.8" axle bracket has 3 holes on the right side while the 9.75" axle has 2 holes.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9.75" AXLE	F150 9.75" REAR AXLE	1
2	70584	9.75" AXLE BRACE	1
3	70055	LWR LEFT AXLE MOUNT	1
4	70055	LWR RIGHT AXLE MOUNT	1

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	6/5/23	

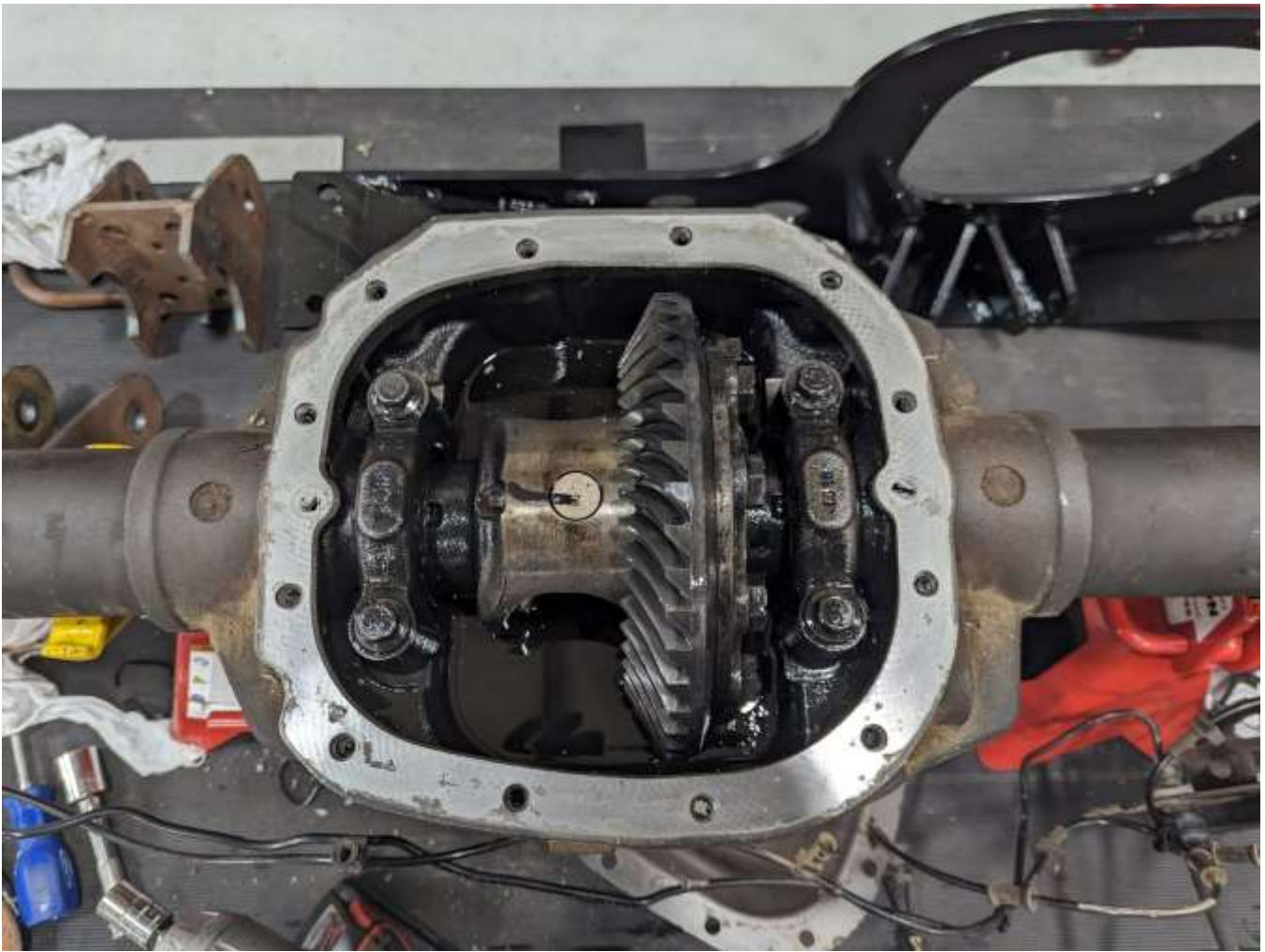


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FFR RUNNER	UNLESS OTHERWISE SPECIFIED:	NAME	DATE
	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL .0009 THREE PLACE DECIMAL .0008 FOUR PLACE DECIMAL .0001		
	MATERIAL:		
	FINISH:		
USED ON: APPLICATION: PRERUNNER		FWFV02	6/7/2023

**5** Factory Five Racing, Inc.  
 TITLE:  
**9.75" AXLE SUPPORT**  
 SIZE **A** DWG. NO. **axlewithbraces** REV **A**  
 SCALE: 1:15 WEIGHT: SHEET 2 OF 2

Place the axle on two jack stands with the rear cover facing up.



Remove the rear cover and clean the rear cover mounting surface on the axle and the cover.





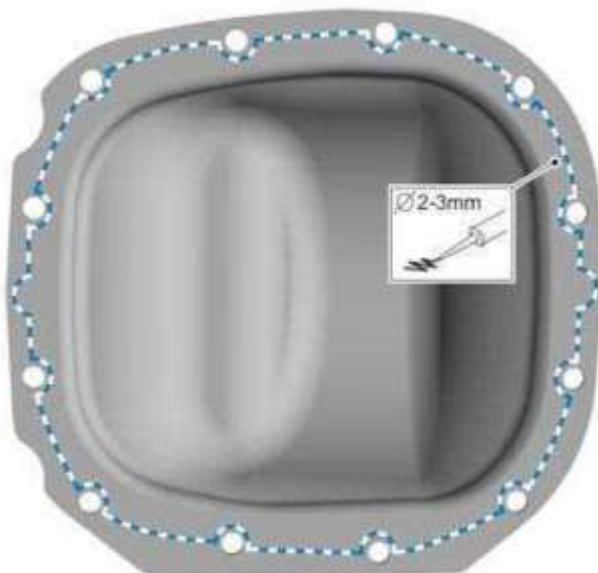
Test fit the axle support with a couple of the new longer rear cover bolts.



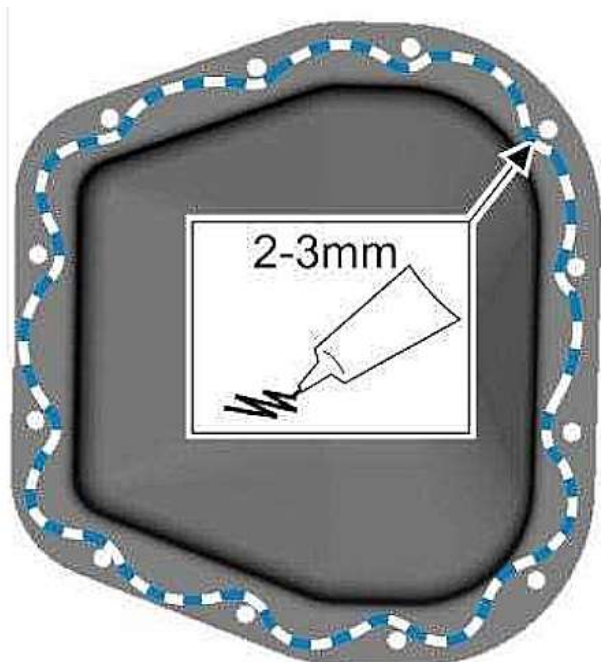


Run a bead of black RTV around the axle housing flange.

Place the axle support on the axle using a couple of the provided bolts and clamp the outsides to the old leaf spring mounting bracket.



8.8" Axle cover



9.75" Axle cover

Run a bead of black RTV around the rear cover.



Attach the rear cover to the axle using the new bolts provided and torque to **33 Lb-ft (45Nm)**.



Drill out the spring pads to accept the mounting bolts using a 5/8" drill bit.

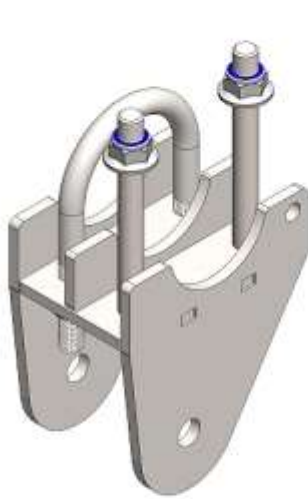
## **LOWER AXLE MOUNTS**

 Box 2

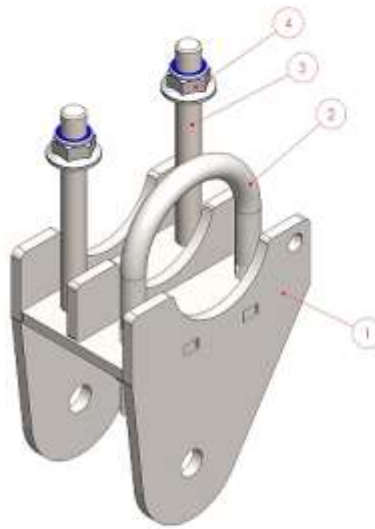


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70054	LOWER AXLE MOUNT	1
2	70057	3.25" ID U BOLT x 5/8"-18	1
3	70378	5/8"-18 x 6" BOLT	2
4	70408	5/8"-18 FLANGED NYLON LOCK NUT	4

REV.	REVISION	DATE	APPROVED
A	INITIAL RELEASE	5/11/23	



RIGHT SIDE



LEFT SIDE

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
FREE RUNNER	DIMENSIONS ARE IN INCHES	JS	
	TOLERANCES		
	TWO PLACE DECIMAL .0025		
	THREE PLACE DECIMAL .0005		
	FOUR PLACE DECIMAL .0001		
	MATERIAL		
USED ON	FINISH		
APPLICATION	PREP	6/5/2023	



**Factory Five Racing, Inc.**

TITLE

**LWR LEFT AXLE MOUNT**

SIZE DWG. NO. REV

**A 70055 A**

SCALE: 1:3 WEIGHT: SHEET 1 OF 1



Assemble the bolts, U-bolts and axle mounts on the axle in the positions shown.



Torque the U-bolts to **132 lb-ft (177Nm)**.

## REAR BRAKE HOSES

 Box 5



Remove the rubber brake hoses leading from the rear axle to the OEM frame mount.

Replace with the included longer brakes hoses.

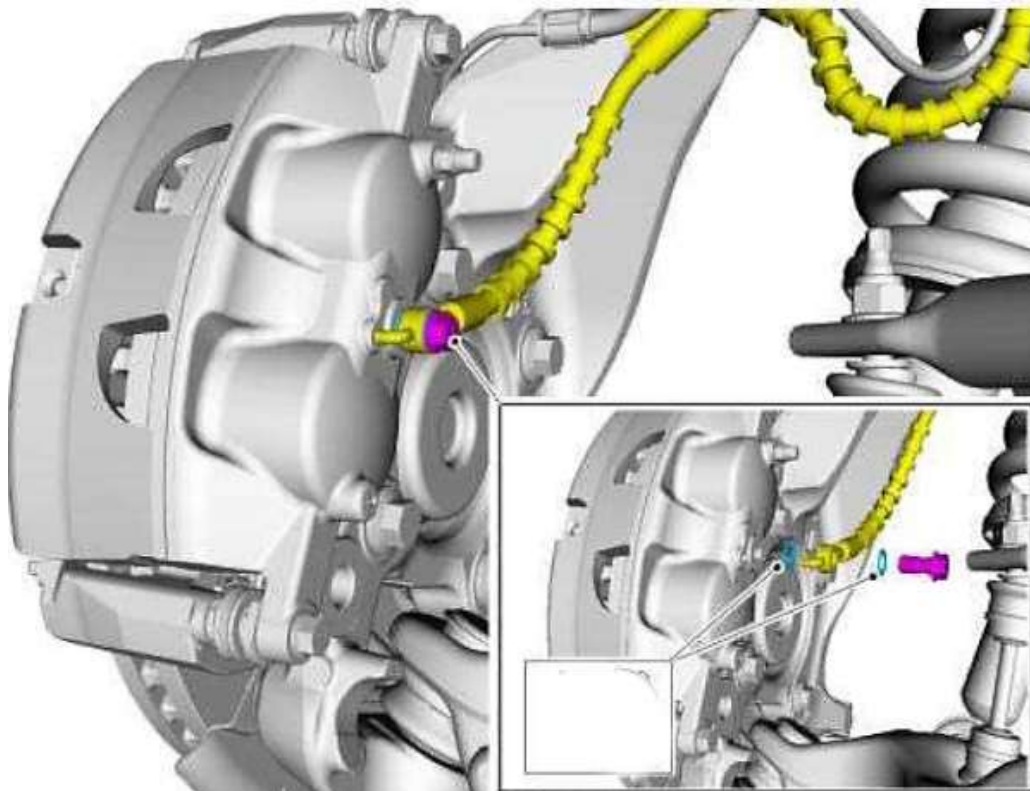


## REAR AXLE BRAKE LINES



Attach the OEM brake lines to the axle support.

## Front Brake Calipers



Remove the OEM front brake hose from the caliper.

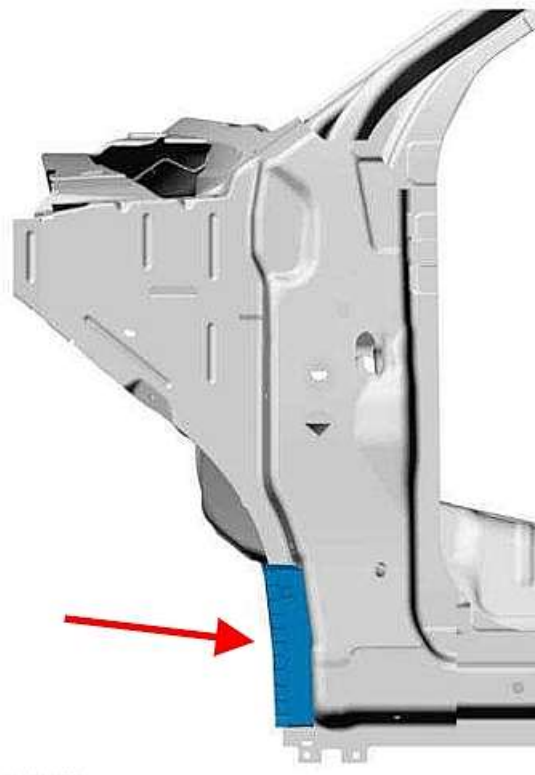
## Running Board Studs



The Studs on the inside lip of the rocker panels where the running boards mounted need to be trimmed off flush in order to give clearance for the new chassis rails.

## Front Cab Reinforcement

✂ Sawzall



Remove the cab reinforcement foam/plastic pieces behind the front wheel.

On The cab cut off the running board studs and open up the curved flange on the rear cab corners



## Paint



Paint any of the F150 parts that you desire. The Front tubular part of the cab and radiator support will show in the engine bay and are usually only primed.

## CHASSIS BUILD-UP

### Cab mounting



Swapping the truck cab should be performed by skilled professionals with the correct equipment and experience. The space needed to do this should be laid out ahead of time as the OEM chassis rolls out from under the cab toward the front and the new tubular chassis will fit easier from the side (without a lift). Once the cab is removed it is difficult to move so plan this space out before you begin.



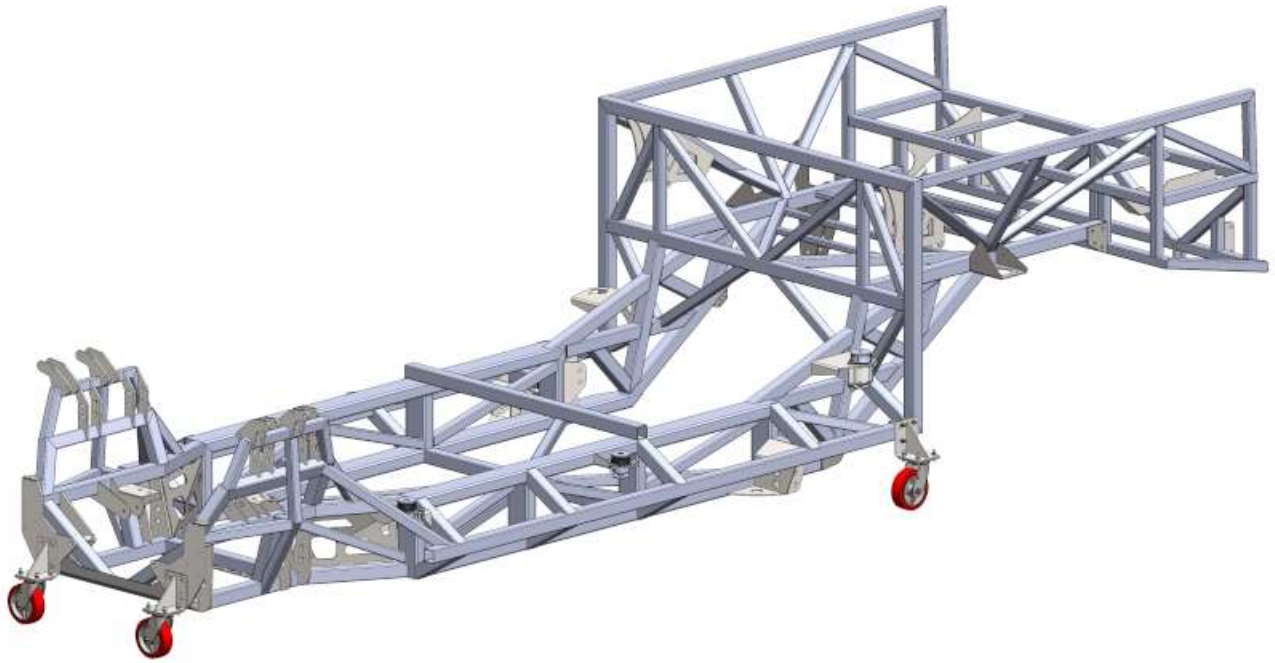
The cab installation process can be done without a lift.



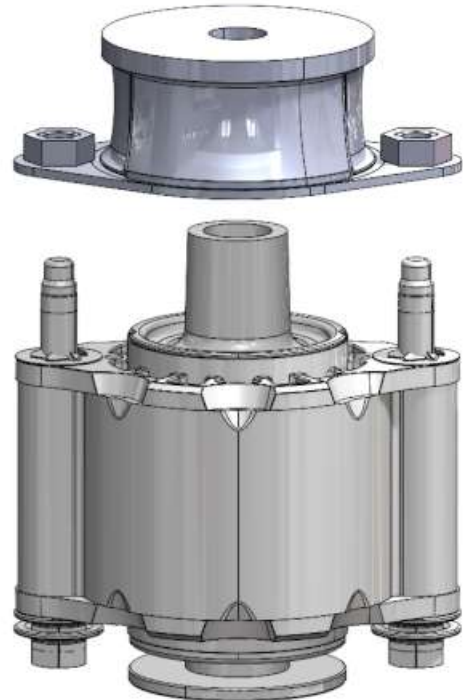
Cab mounts from donor



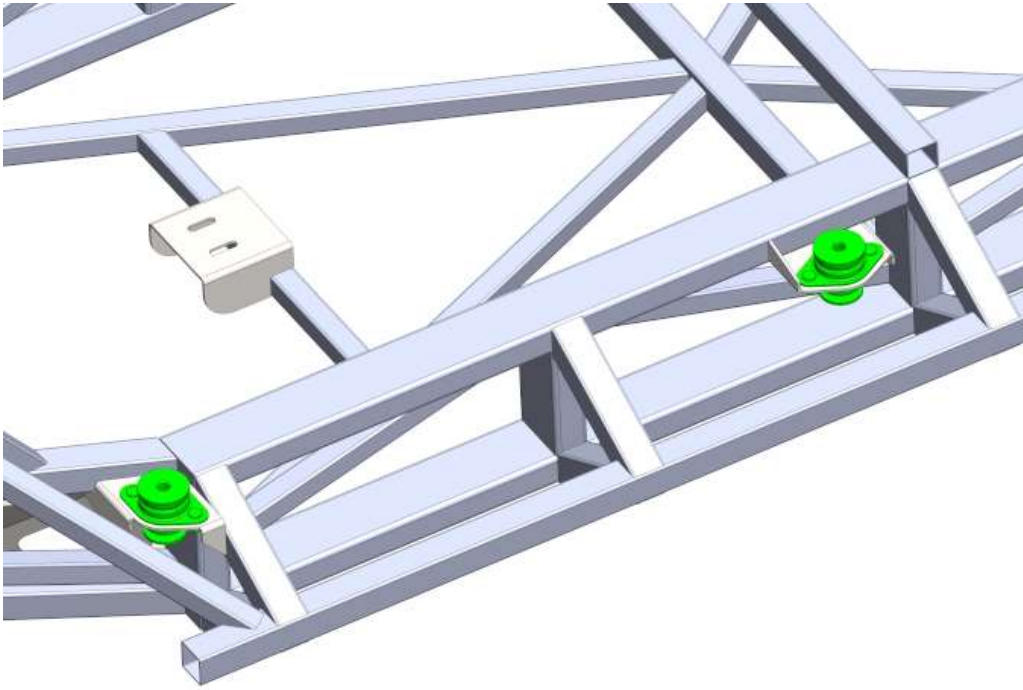
(2) 4" x 6" x 12 ft wood beams, (4) Jack stands, (1) Jack, A small chunk of 4" x 4", 15mm, 19mm sockets, ratchet.



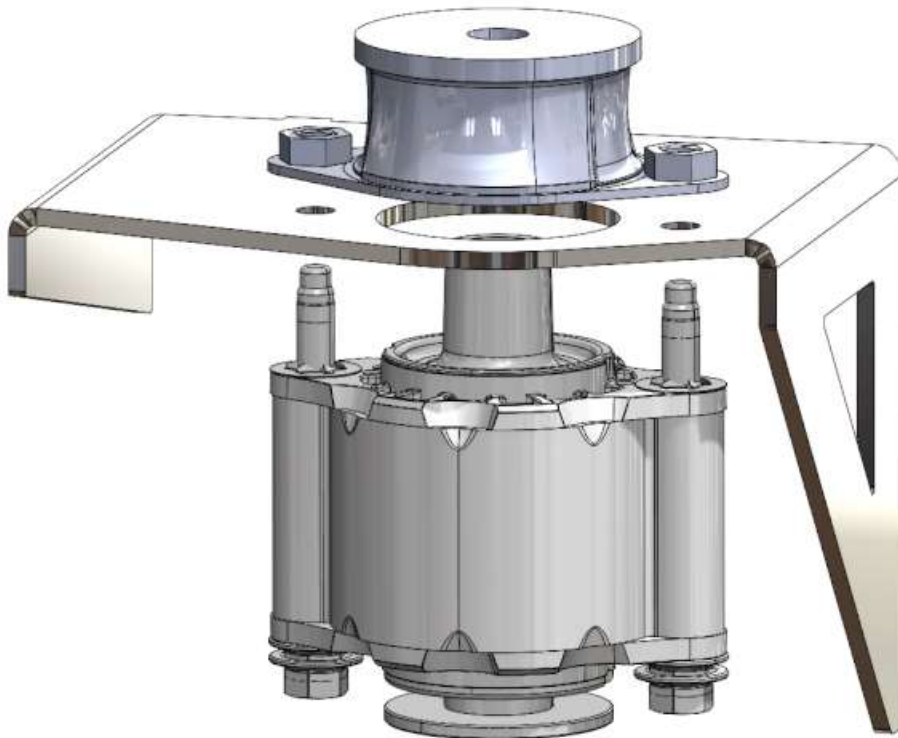
Re-attach casters to the chassis that were used to remove the oem frame from the cab.



The 4 Front mounts are the smaller one-piece design and the rear most two mounts are the larger 2-piece ones with the larger section mounting from below the chassis.



Attach the OEM front and middle Cab mounts to the top of the frame mounts.



Sandwich the OEM rear Cab mount to the rear frame mount location.





For the Cab install you will need (2) 4"x6" Posts at least 12 feet long to support the cab while the frame is rolled under.



One end at a time, place each post (so the 6" side is vertical) on a jack and roll it under the cab so you can lift the cab off the jackstands and move them so they are under the boards supporting the cab.



Position the jackstands one on the end of the beam and one halfway across, roughly under the pinch weld of the cab. Note you will need about 12 feet of room off one side of the cab (so at least ~18 feet of total space side-to-side). The jackstands should be set so there is at least 17" from the ground to the bottom of the beam.



Roll the new frame beside the cab. Note that the frame must roll in from the **SIDE**.





Starting at the rear of the cab, at the **Middle** of the chassis, jack the 4x6 up enough to move the jackstand to the outside end.



The front jack stand is moved in the same way, you may need to pick the jack up and place it in the center of the frame to have room to get the jack under the beam.

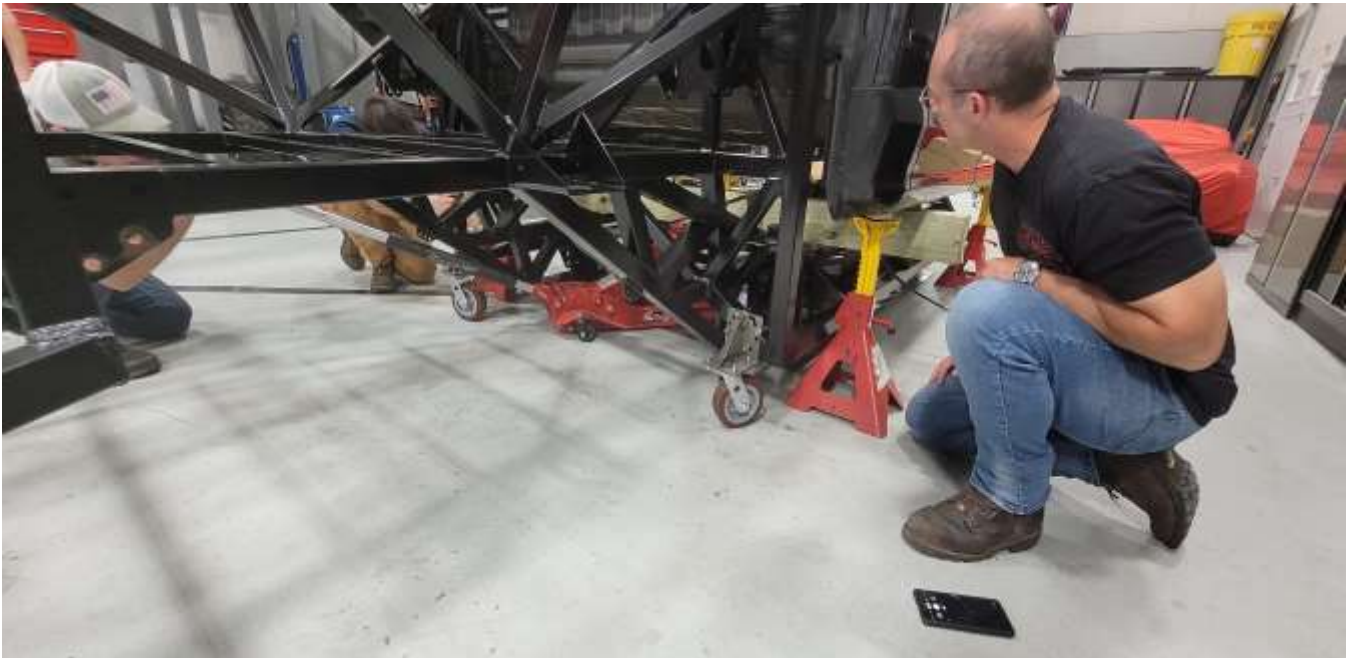




With the jackstands on the outside end of the beams you can now roll the chassis sideways underneath the cab. Go slowly and make sure you have enough room and no cables or wires are get caught as you go.



Center the chassis side to side under the cab and line the rear bed section up so it is 1¼ inches behind the rear window glass measured on the corners. (The cab curves so the frame will be closer to the cab in the middle)



Position the jack on centered on the chassis under the 4x6 and lift until the jackstands are free.

Move the jackstands, with the adjustment handles facing outward, under the pinch welds on the cab with them set high enough to allow space to remove the boards.



On the front it is easier to lift the entire chassis up until it raises the 2x6 and cab off of the jackstands.

Once the jackstands are loose move them under the pinch weld at the same height as the ones in the rear.





The boards should be free resting on the top of the chassis and can be carefully pulled out of the way.



Starting on one side of the cab from the pinch weld roughly below the front door handle, lift the cab just off the jackstands and lower them one click and set the frame back down.

Then alternating sides gradually lower the cab 2 teeth on the jackstand at a time until you are as low as the stands will go or less than an inch above the chassis.



Double check that you are still centered with the chassis and cab and lined up correctly front to back.



TO double check that you are in the correct location visually line up the threaded cab holes with the mounts on the chassis and adjust the cab location if needed.





Before you bring the chassis up to meet the cab make sure all wires, cables, and hoses are out of the way.

The ebrake cables along the drivers side is easy to get pinched if it is sitting in the wrong spot.

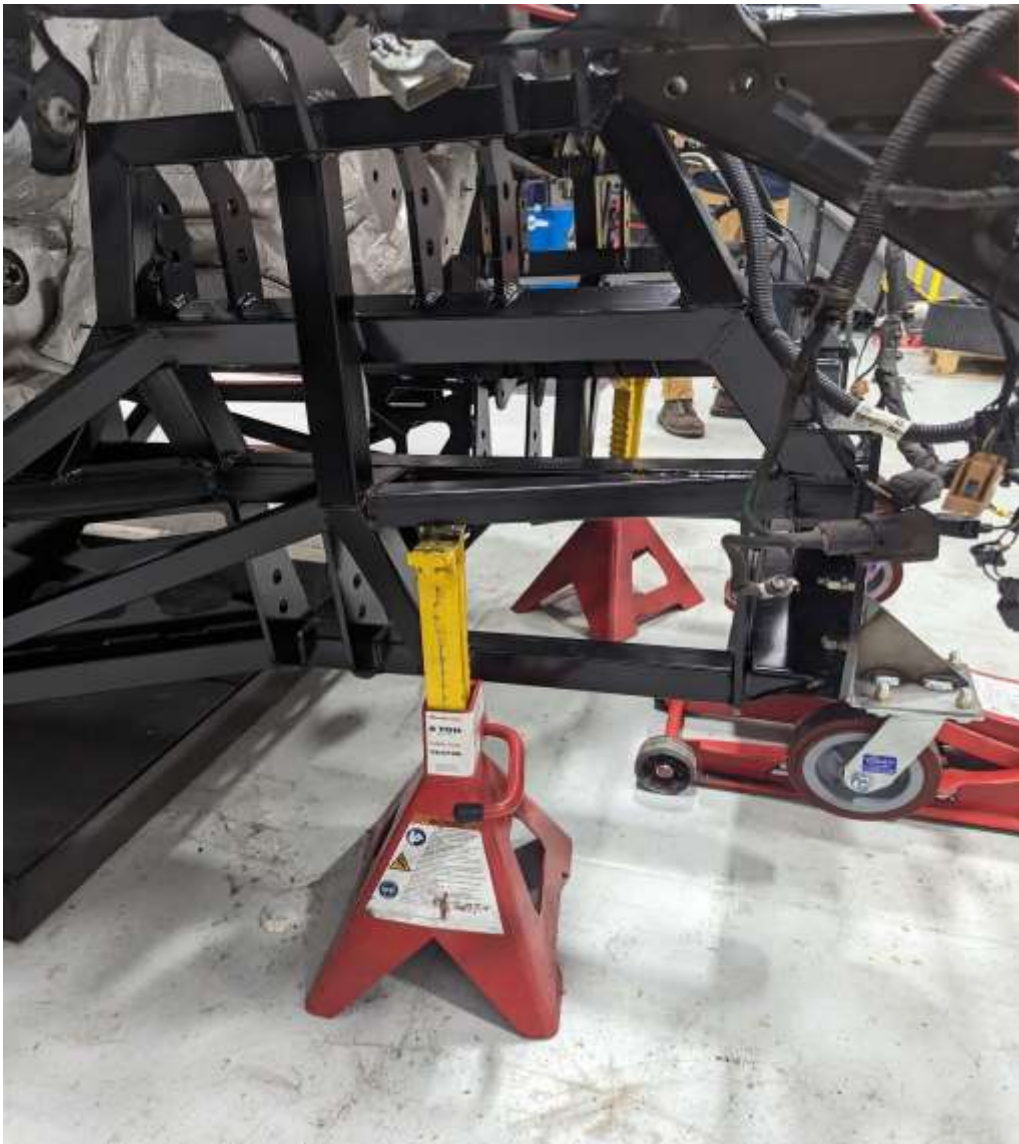


Jack the front of the chassis up until the cab mounting bolts can be started and threaded in at least 5-6 full turns.

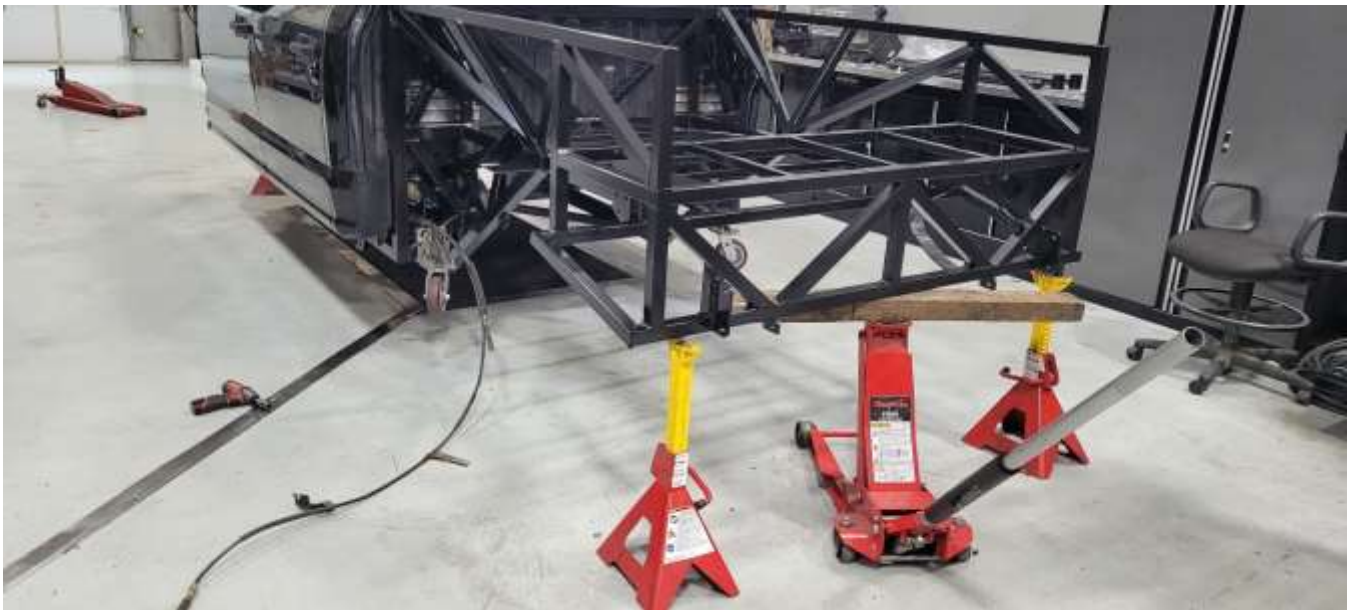


The front 4 cab mounts use the short 19mm bolts, and the rear two cab mounts use the long 19mm bolts. The front casters will need to be removed as you raise the frame to allow clearance to get fully in position.





Raise the chassis until the cab comes off the jackstands in front and move them underneath the outer front tubes around the front suspension.



Now lift the rear of the chassis so that the mounts contact the cab and move the jackstands from the pinch weld on the cab to underneath the chassis. Start the remaining 4 bolts by hand.

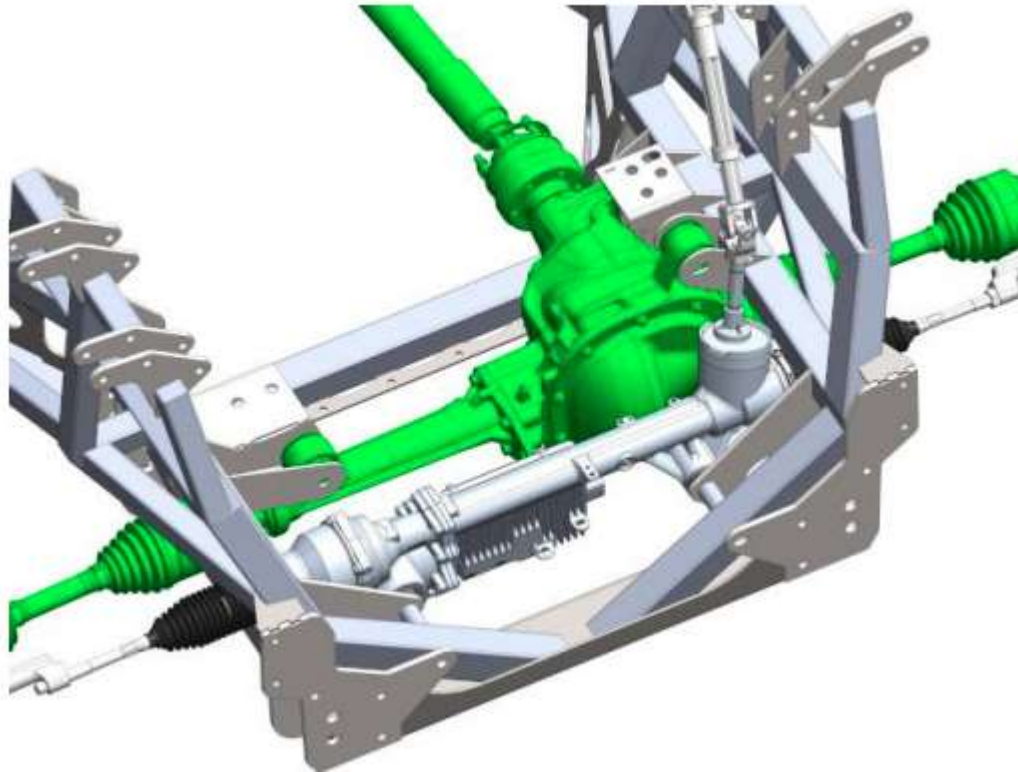


With the cab and chassis securely on jackstands tighten the six can bolts and the hardware attaching the mounts to the frame as well. Tighten the OEM mounting bolts to **85 lb-ft (115Nm)**. Tighten the OEM mounting nuts to **46 lb-ft (62Nm)**.

Jack up the rear-most crossmember of the frame to bring the rear cab mounts up to the bottom of the cab. You may need a small chunk of 4x4 if your jack runs out of lift. Install the cab mount bolts in both the rear and middle cab mounts. This step may require some gentle movement of the frame to get the bolt holes lined up. Move the jack stands out to the rear crossmember. You have now finished the cab installation process. We do not recommend setting down the entire assembly onto the casters, as they are

not rated for the weight of the cab and frame. Remove the casters and begin to work on installing the suspension components to get a rolling chassis.  
Roll the frame next to the Cab.

## FRONT DIFFERENTIAL



Install the front differential using the OEM fasteners.

Tighten the axle tube mount bolt and differential higher mount bolt to 111 lb-ft (150Nm).  
Tighten the rear differential mount bolt to 129 lb-ft (175Nm).

## STEERING RACK

 Box 44





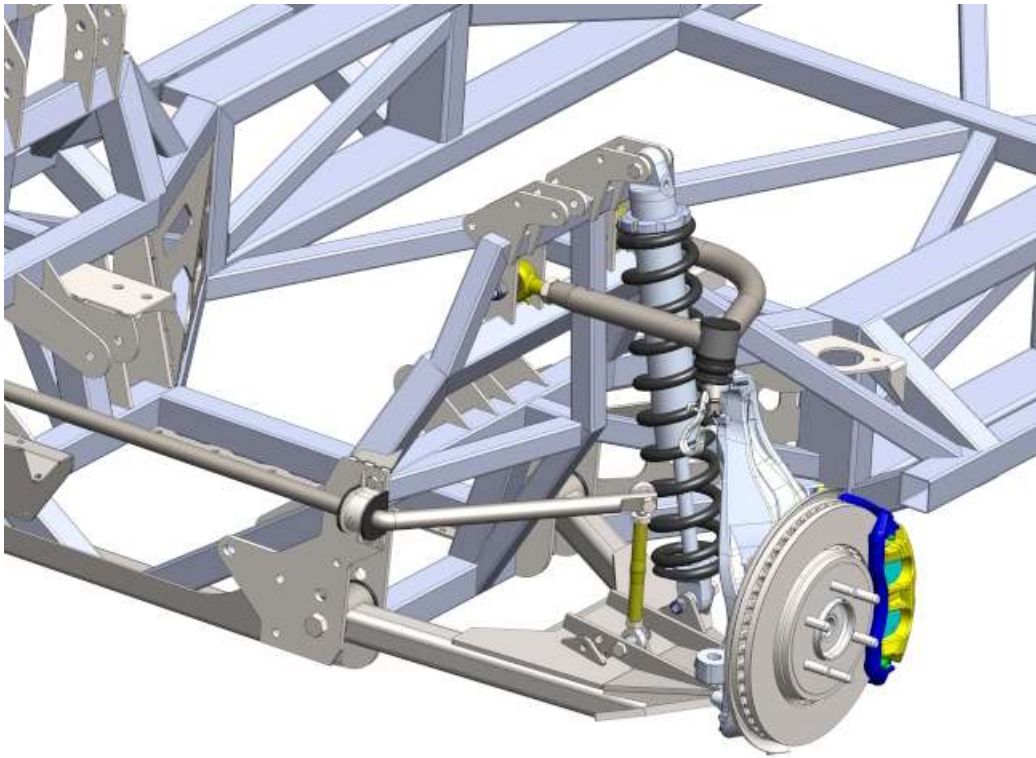
Install the steering rack using Blue Loctite and M16 bolts along with 14mm allen socket

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

## FRONT SUSPENSION

The frame is set-up with two sets of suspension holes. The lower holes are used when building a stock or raised truck. The upper holes are used for a lowered truck look.

These instructions are written using the raised truck height suspension holes.



## FRONT LOWER CONTROL ARM



Box 26

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70053	BUSHING	4
2	12226	GRASS PETERS	1
3	1614-75P	W/LOCH ROBERT LOCKWIT. S&P-1A	2
4	70196	3/4" x 1 1/2" S 90° BOLT	2
5	70606	PIVOT SLEEVE	2

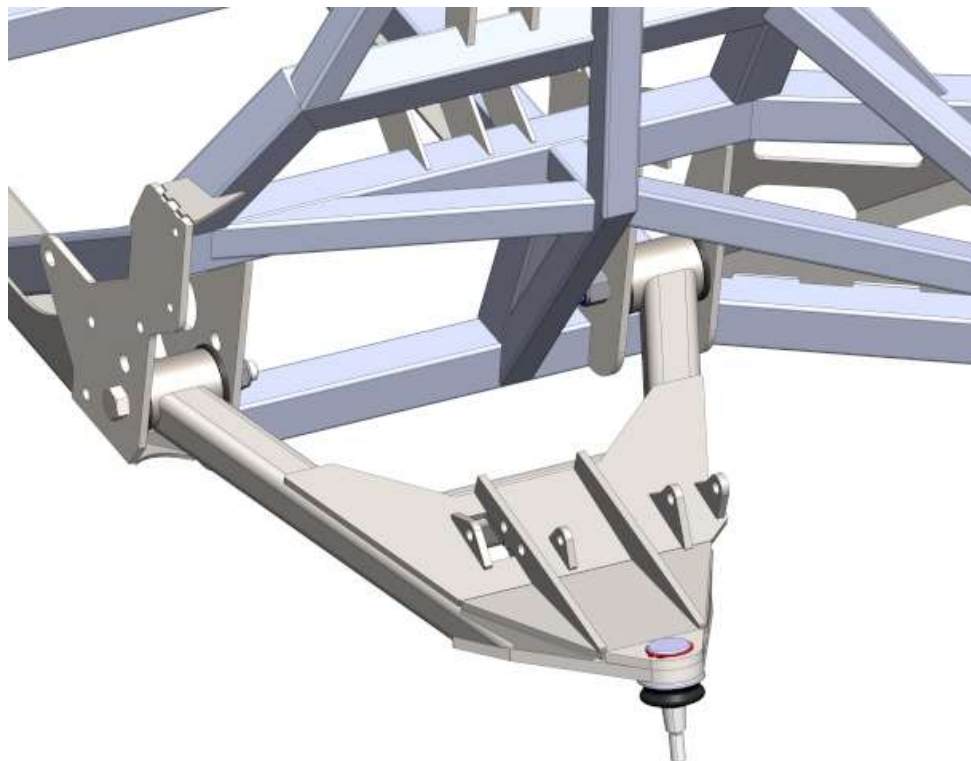
  

REV	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	6/5/23	

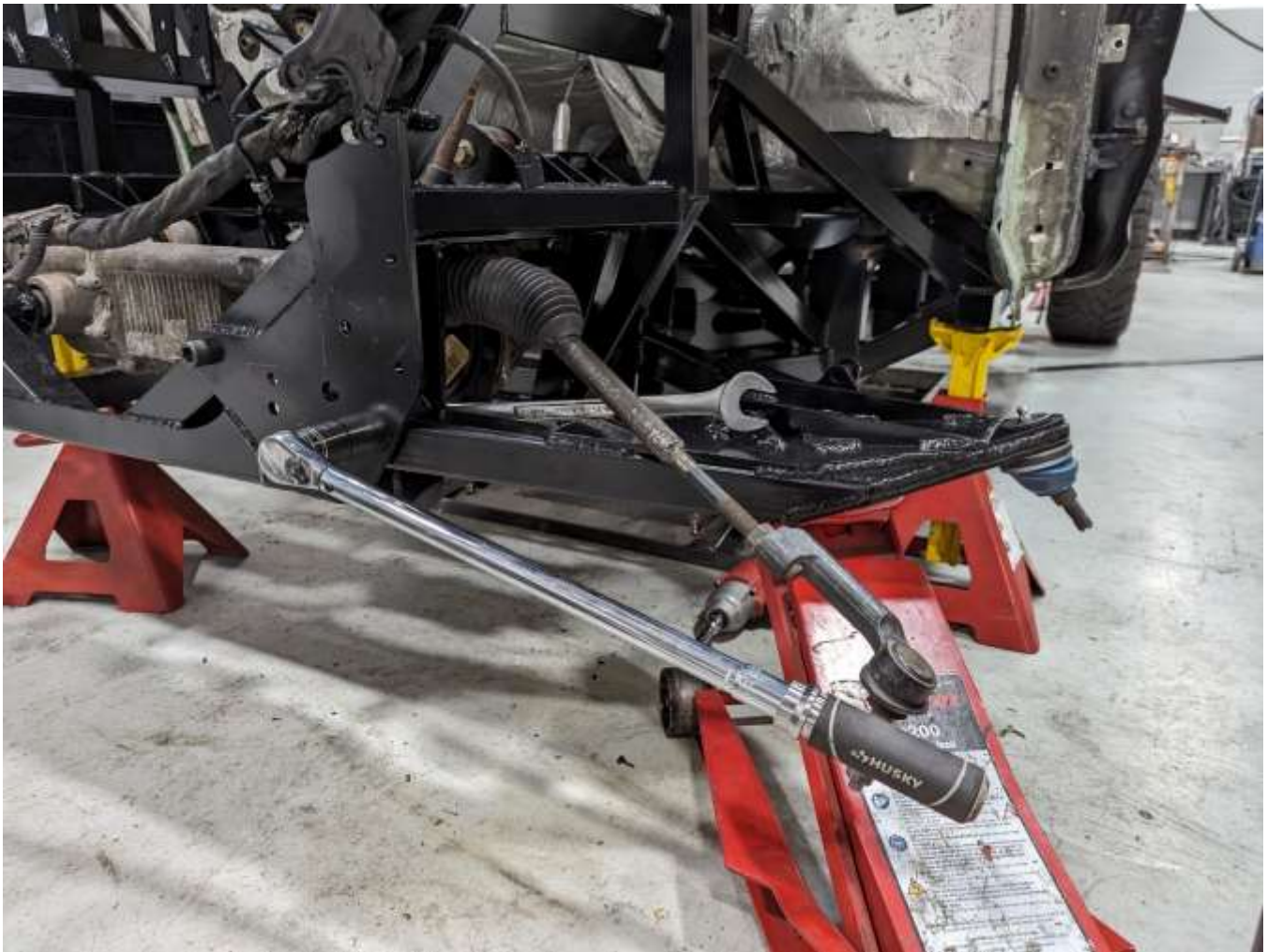
<b>FINISHES</b> DIMENSIONS AND FINISHES TOLERANCES UNLESS OTHERWISE SPECIFIED DIMENSIONS DECIMALS FRACTIONS HOLE PLACES DECIMAL HOLE PLACES DECIMAL HOLE	NAME DATE 15 5/2023	 <b>Factory Five Racing, Inc.</b> TITLE: FRNT LWR CNTRL ARM S&P DWG. NO. <b>70058</b> SCALE: 1:1 WEIGHT: SHEET 1 OF 1
	MATERIAL STEEL FINISH POWDERCOATED TIGER 223/80001 SEA/KOR SEAM	

**NOTES AND CONSIDERATIONS:**  
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Attach the lower control arm to the lower holes in the chassis.



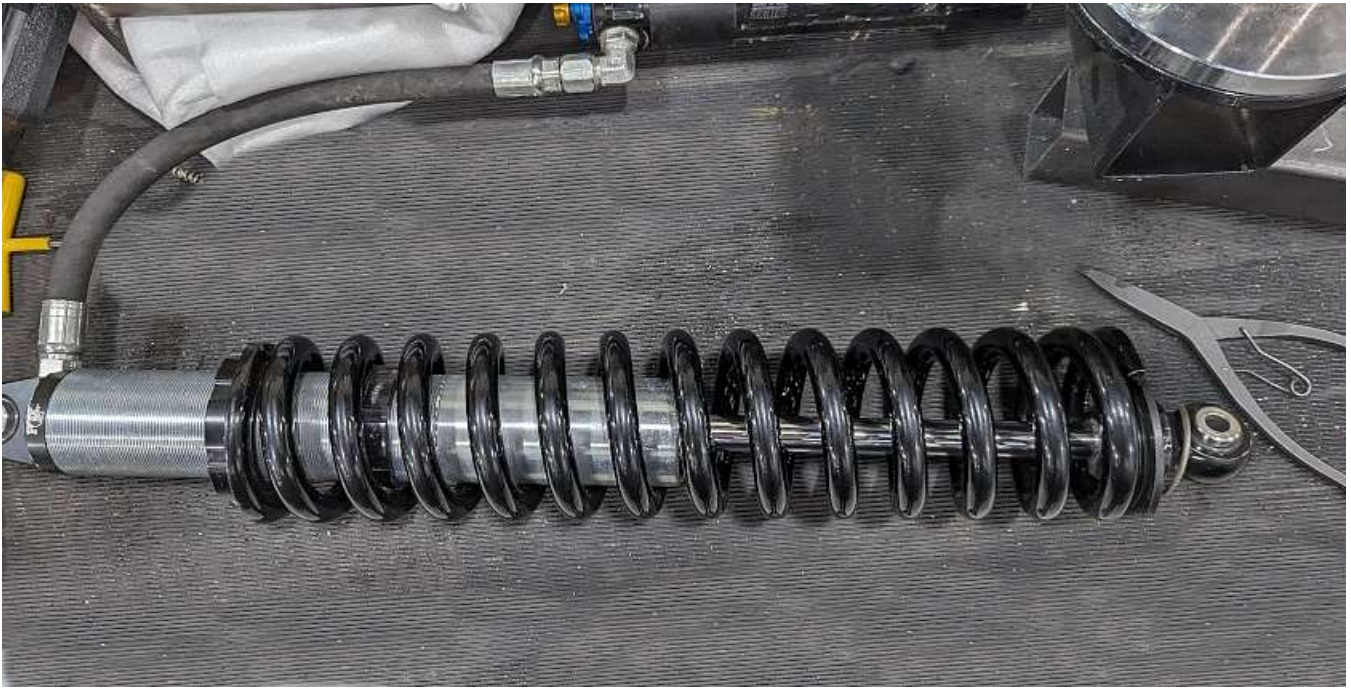


While holding the arm parallel to the ground, torque the bolts to **100-110 lb-ft (135-149Nm)**.

## COIL-OVER SHOCK

-  Box 3, 35
-  Snap ring pliers

Screw the coil seat onto the shock and remove the spring divider.

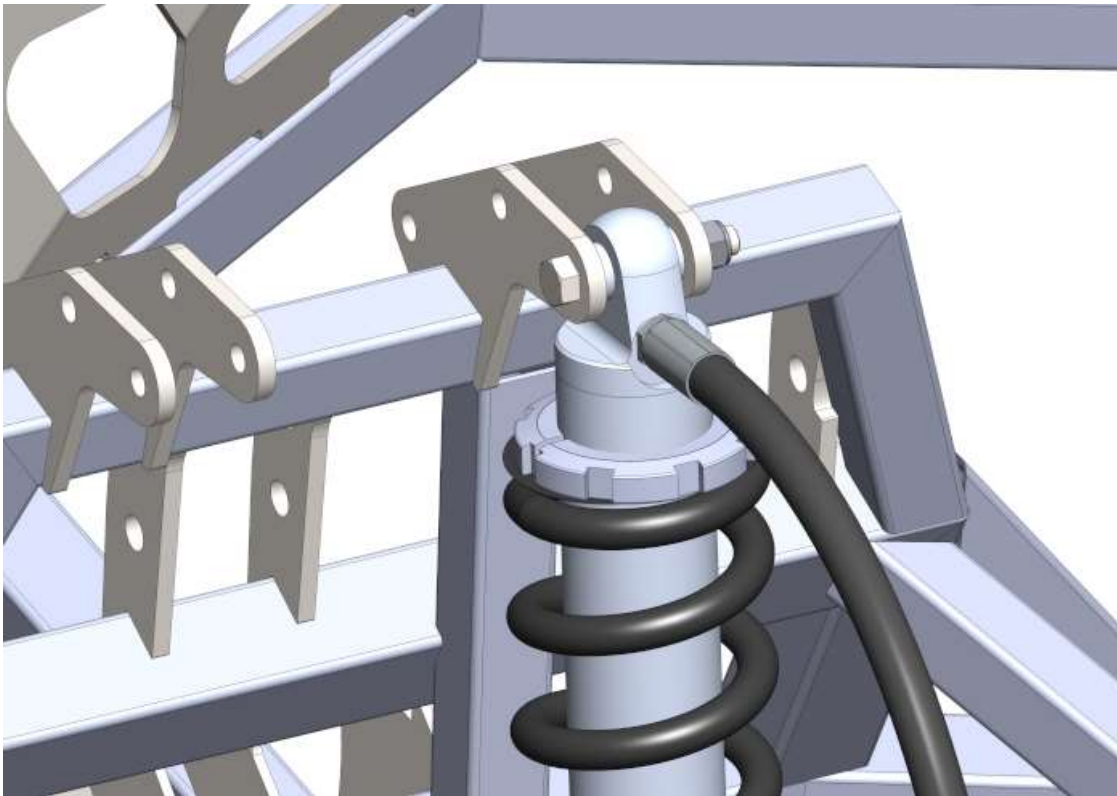


Slide the longest of the three sets of springs onto the shock. (600lb)



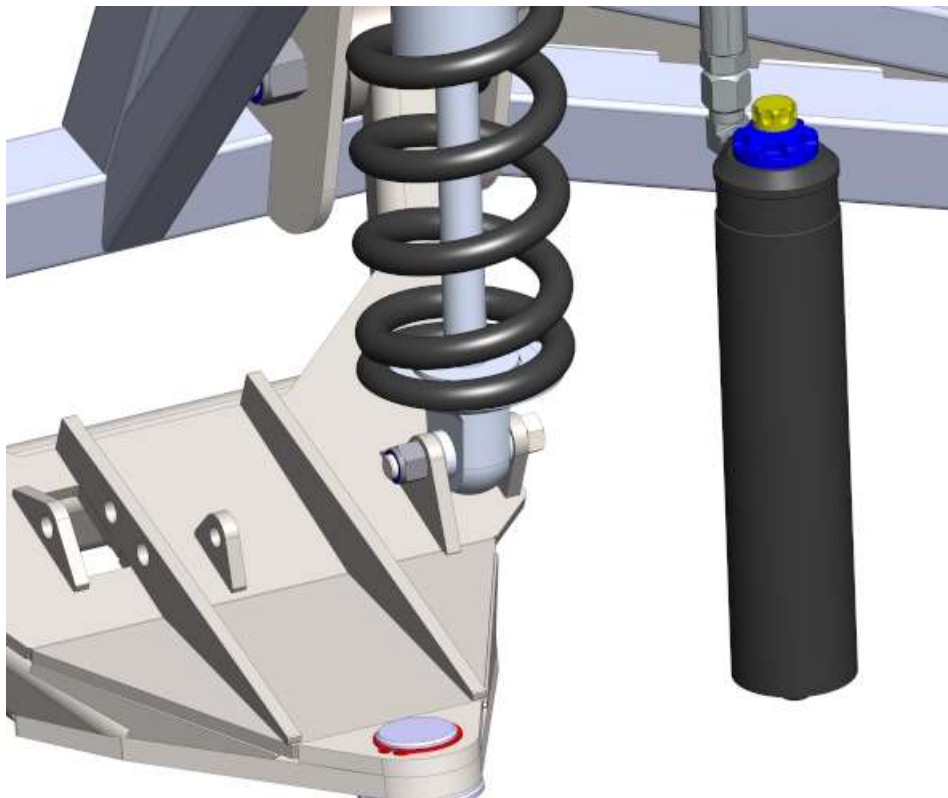
Slide the spring hat over the end then use a pair of snap ring pliers to put the snap ring in place.





Attach the body end of the coil-over shock to the frame with the reservoir hose sticking straight out.

Use a  $\frac{1}{2}$ " x 3" bolt and a  $\frac{3}{4}$ " wrench and socket.



Attach the rod end of the coil-over shock to the front lower control arm. Use a  $\frac{1}{2}$ " x 3" bolt and a  $\frac{3}{4}$ " wrench and socket.



## FRONT UPPER CONTROL ARM



Box 1



Recommended grease to use:

Valvoline® Moly Fortified Multi-Purpose Grease - VV633

Sta-Lube® Moly-Graph Multi-Purpose Grease - SL3330



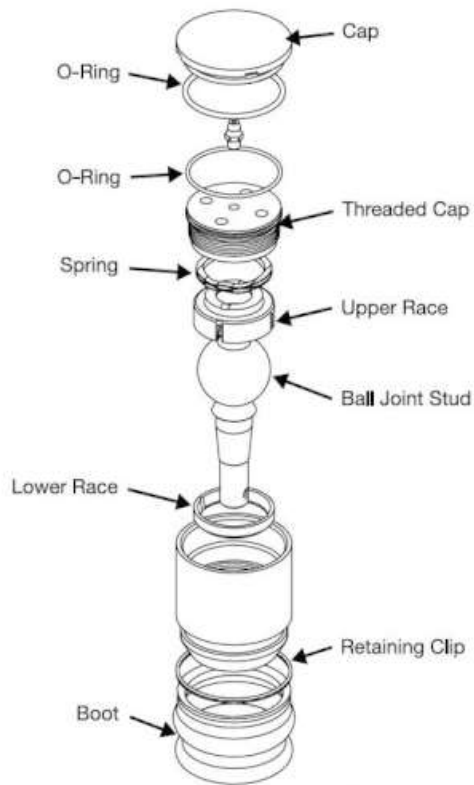
Maintenance Lubrication Interval - Add 5 to 10 pumps of grease to the ball joint at each oil change, or after operating the vehicle in wet or dusty conditions.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	REV.	DATE	APPROVED
1	70200	7/8"-14 RH JOHNNY JOINT	2	A	INITIAL RELEASE	5/5/23
2	70278	7/8"-14 JAM NUT	2			
3	70389	5/8"-11 x 4.00" BOLT	2			
4	12383	NYLON INSERT LOCKNUT, 5/8"-11	2			
5	70067	LFT FRNT UPPER ARM	1			

<p><b>PRERUNNER</b></p>	UNLESS OTHERWISE SPECIFIED:	NAME	DATE	 <b>Factory Five Racing, Inc.</b>
	<p>DIMENSIONS ARE IN INCHES</p> <p>TOLERANCES:</p> <p>TWO PLACE DECIMAL ±0.01</p> <p>THREE PLACE DECIMAL ±0.005</p> <p>FOUR PLACE DECIMAL ±0.001</p>	DRAWN	JS	
<p>MATERIAL:</p> <p>STEEL</p>				<p>TITLE:</p> <p><b>FRONT UPPER ARM PARTS</b></p>
<p>USED ON:</p> <p>APPLICATION:</p>	<p>FINISH:</p> <p>6/5/2023</p>	<p>SIZE</p> <p><b>A</b></p>	<p>DWG. NO.</p> <p><b>70066</b></p>	<p>REV</p> <p><b>A</b></p>
		SCALE: 1:5	WEIGHT:	SHEET 1 OF 1

## Balljoint Assembly



Install thinner O-ring onto threaded retainer cap and thicker O-ring onto cap.

Apply a small amount of grease to the inside of the lower race and install into housing with chamfer side down.

Apply a liberal coating of grease to the ball stud and install into the housing.  
Install upper race and spring as shown.



## Balljoint Tool



Insert the dowel pins into the balljoint tool plate.



Push the pins in so that they are flush with the opposite side. If necessary put it in a vise.







Use a  $\frac{3}{8}$ " Torque wrench and the balljoint tool to torque the threaded cap to **50 lb-ft [68 Nm]** and screw in supplied grease fitting.



Install boot and spiral retainer clip into outside housing groove.

Grease the ball joint via grease fitting. 5 to 10 pumps from a standard grease gun is sufficient.

**WARNING: FAILURE TO GREASE AND MAINTAIN THIS BALL JOINT MAY RESULT IN PREMATURE FAILURE.**

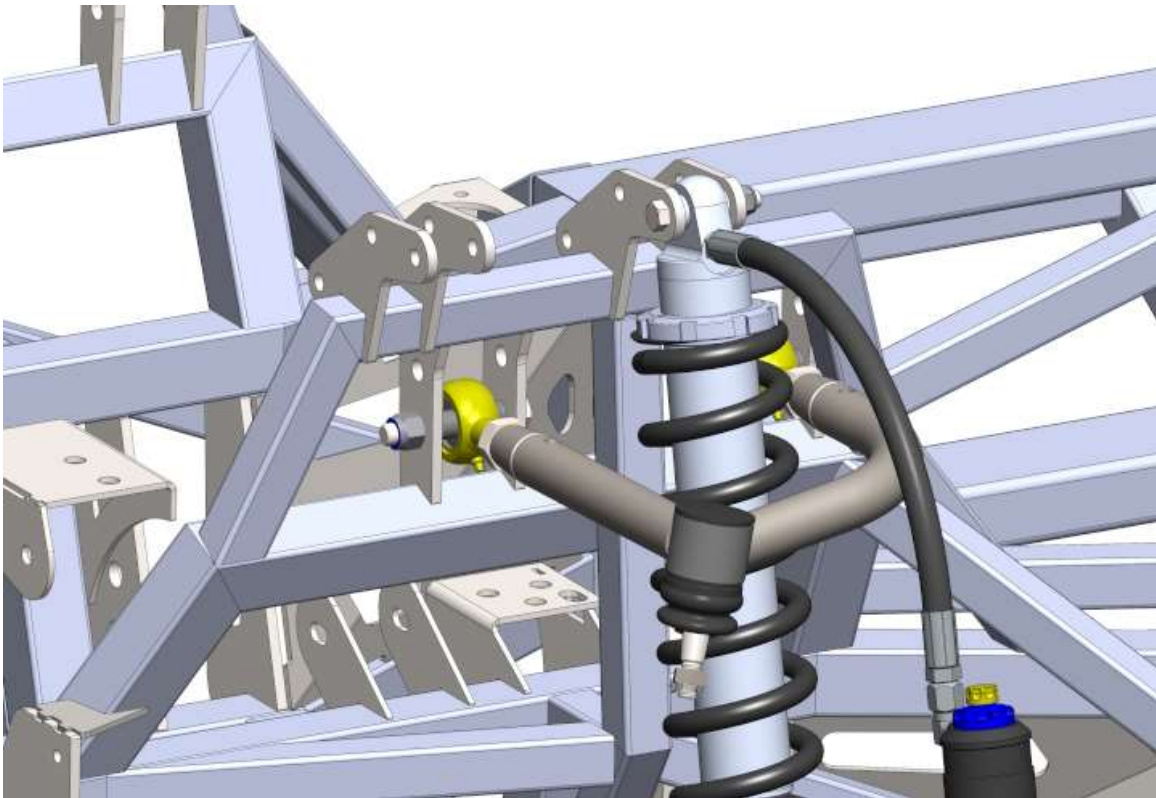


Push in the top cap until seated.







## Frame Assembly



Attach the front upper control arm to the lower suspension mounting holes.

## FRONT SWAYBAR

-  Box 38
-  Tools -

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/19/23	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70387	BUSHING MOUNT BRACKET	2
2	70385	1.0625" SWAYBAR BUSHING	2
3	70388	FRONT SWAYBAR	1
4	80058	ROD END, RH THREAD	2
5	80035	6.00" ADJUSTABLE TUBE	2
6	80056	ROD END, LH THREAD	2
7	80055	5/8"-18 LFT HAND JAM NUT	2
8	80057	5/8"-18 RT HAND JAM NUT	2
9	70481	1/2"-13 x 2.25" BOLT	2
10	10834	1/2"-13 NYLON INSERT LOCKNUT	4
11	13385	1/2"-13 x 2.5" BOLT	2
12	15665	0.50" SPACER	2
13	13210	1/2" ID x 0.125" THK SHIM	4
14	16003	M10-1.25 x 25MM BOLT	4
15	25376	M10 x 1.50 MECH LOCK NUT	4
16	16302	0.020" SPACER SHIM	6



UNLESS OTHERWISE SPECIFIED:	DRAWN	NAME	DATE	REV
DIMENSIONS ARE IN INCHES	JL		5/19/23	A
TOLERANCES:	COMMENTS:			
TWO PLACE DECIMAL ±0.01				
THREE PLACE DECIMAL ±0.005				
FOUR PLACE DECIMAL ±0.001				
MATERIAL	FRONT SWAYBAR PARTS			
FINISH	SIZE DWG. NO. <b>A 70382</b>			
USED ON	SCALE: 1:3 WEIGHT:			
APPLICATION	PRINTED: 6/6/2023 SHEET 1 OF 1			

**PRE RUNNER**

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

MATERIAL  
 FINISH

USED ON  
 APPLICATION

**Factory Five Racing, Inc.**

**5**

TITLE: FRONT SWAYBAR PARTS

REV **A**

SIZE DWG. NO. **A 70382**

SCALE: 1:3 WEIGHT:

PRINTED: 6/6/2023 SHEET 1 OF 1

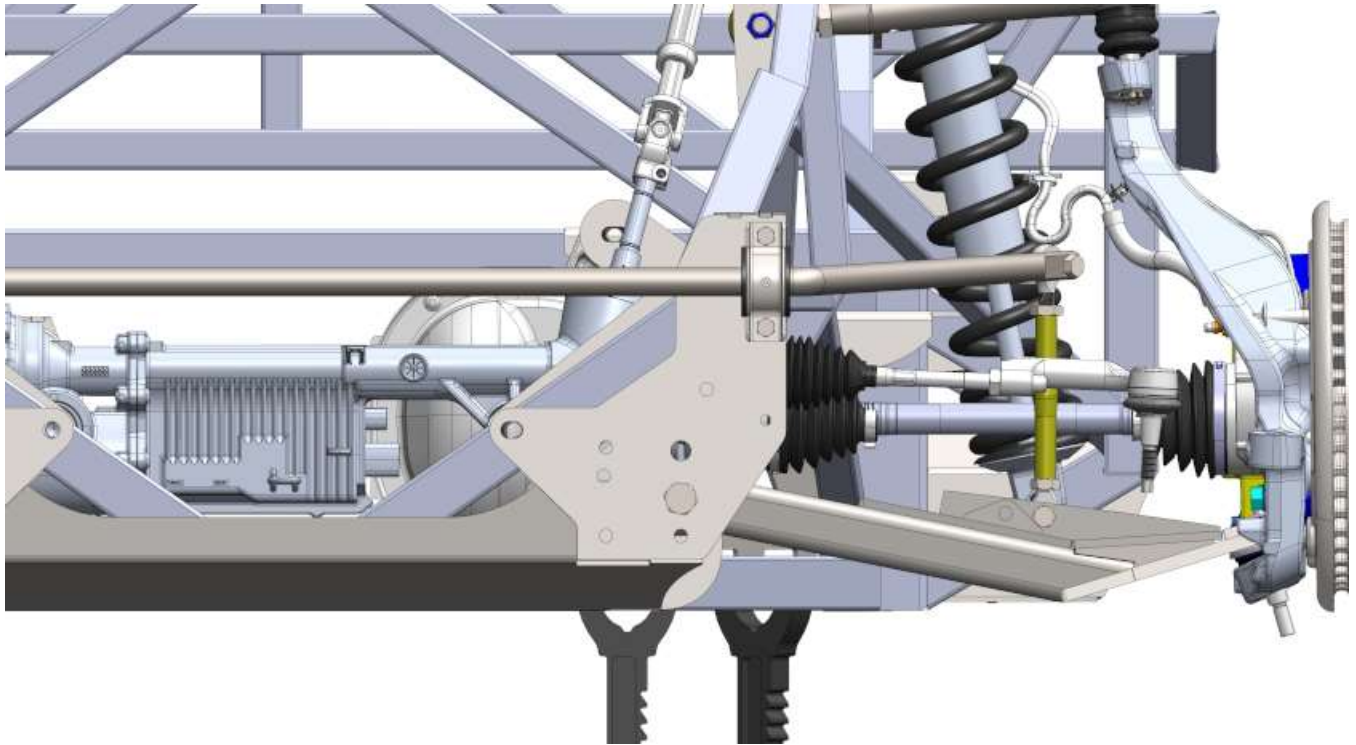
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Assemble the end links for the swaybar.



Attach the polyurethane mounts to the swaybar.

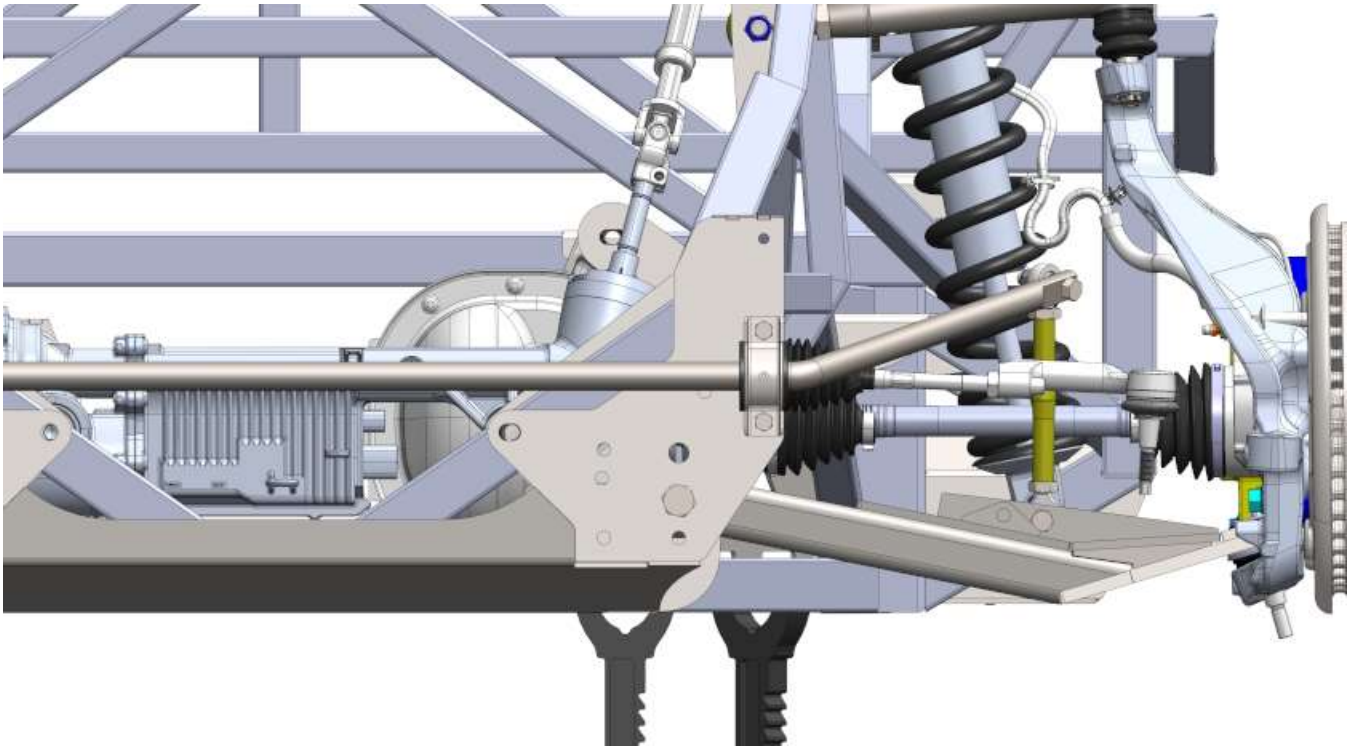
### 5.0L Coyote



5.0L Coyote frame mount location.

Attach the swaybar to the frame using a 16mm wrench and socket.  
Torque the bolts to **33 ft-lb (44Nm)**.

### 3.5L EcoBoost

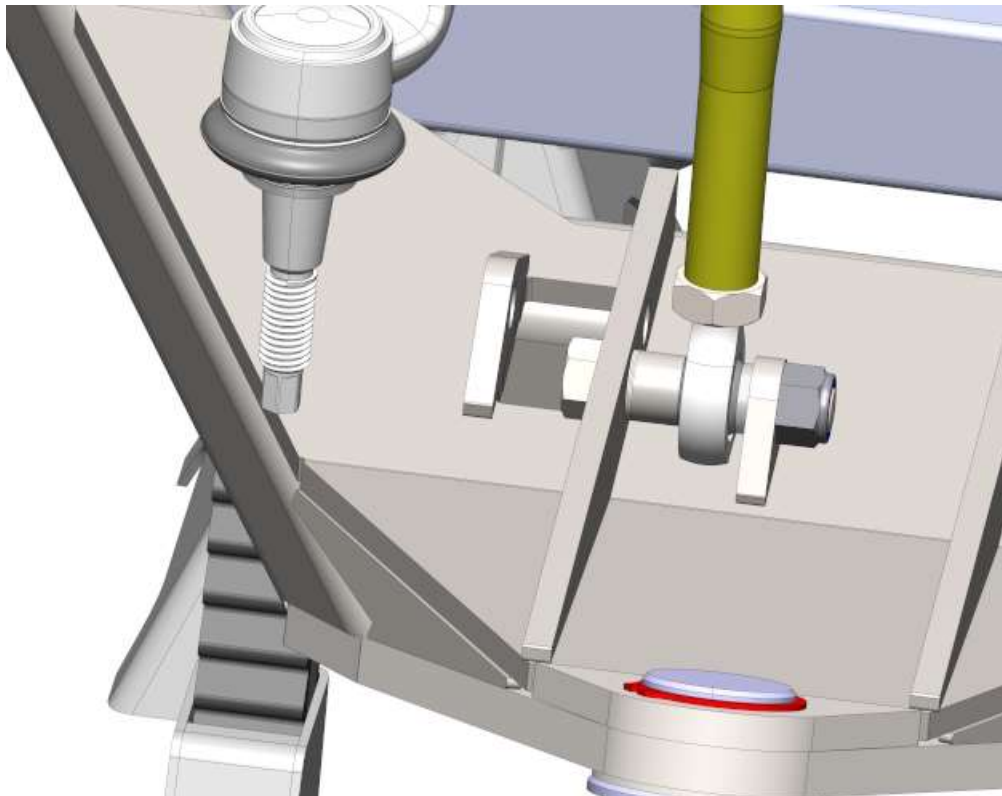


3.5L EcoBoost frame mount location.

Attach the swaybar to the frame using a 16mm wrench and socket.

Torque the bolts to **33 ft-lb (44Nm)**.

If necessary, the end link tube can be cut 1" off each end to eliminate the angle of the swaybar.

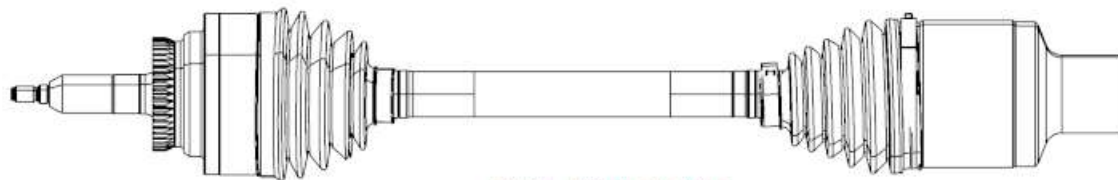


Attach the swaybar end link to the lower control arm. Note the location of the spacers.

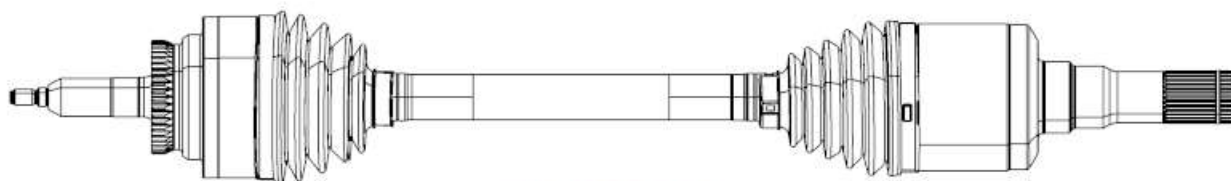
Torque the bolts to **50 ft-lb (67Nm)**.

## CV AXLE

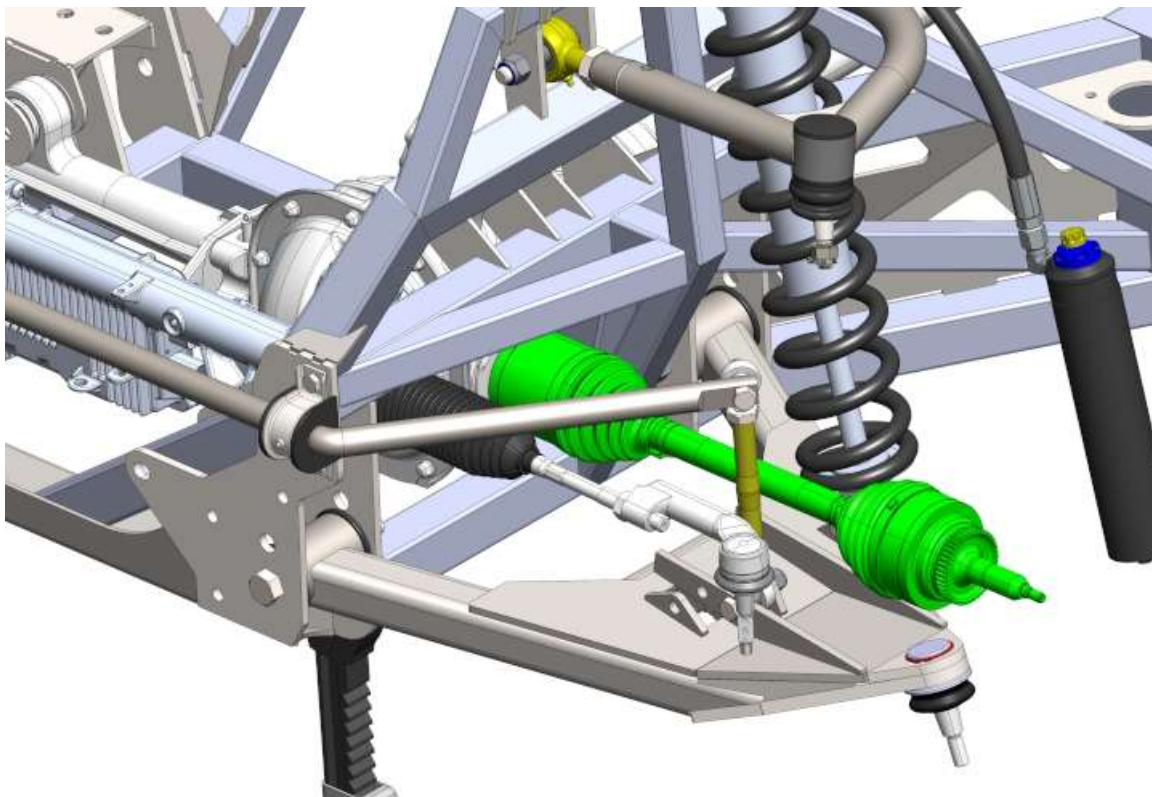
- 👤 Box 44
- 🔧 Tools -



70181 - RIGHT CV AXLE



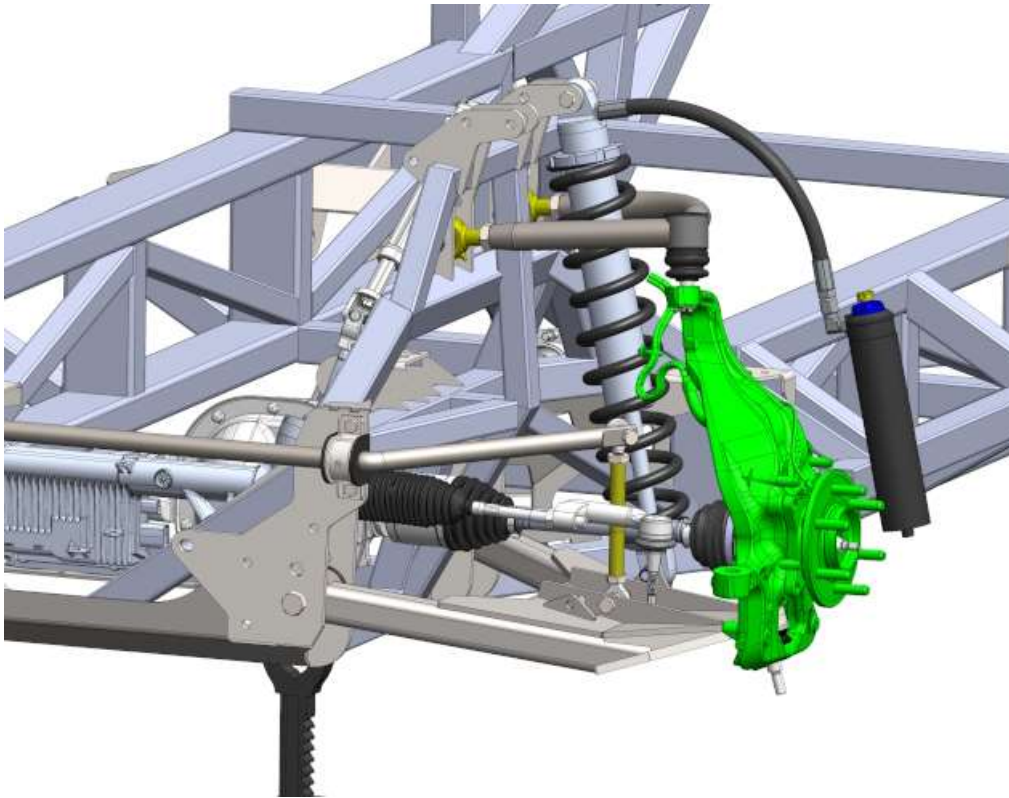
70180 - LEFT CV AXLE



Insert the inner CV axle into the Front Differential.

## SPINDLE





With the help of a friend, lift the Spindle onto the lower control arm balljoint and at the same time insert the CV axle end into the spindle.

Tighten the lower balljoint nut to **76 lb-ft (103Nm)**.

Insert the upper balljoint into the spindle and tighten the nut to **45 lb-ft (61 Nm)**; tighten further only as necessary to install the cotter pin.

Put blue lok-tite on the CV axle nut and attach it to the CV axle. Tighten the nut to **18 lb-ft (24Nm)**

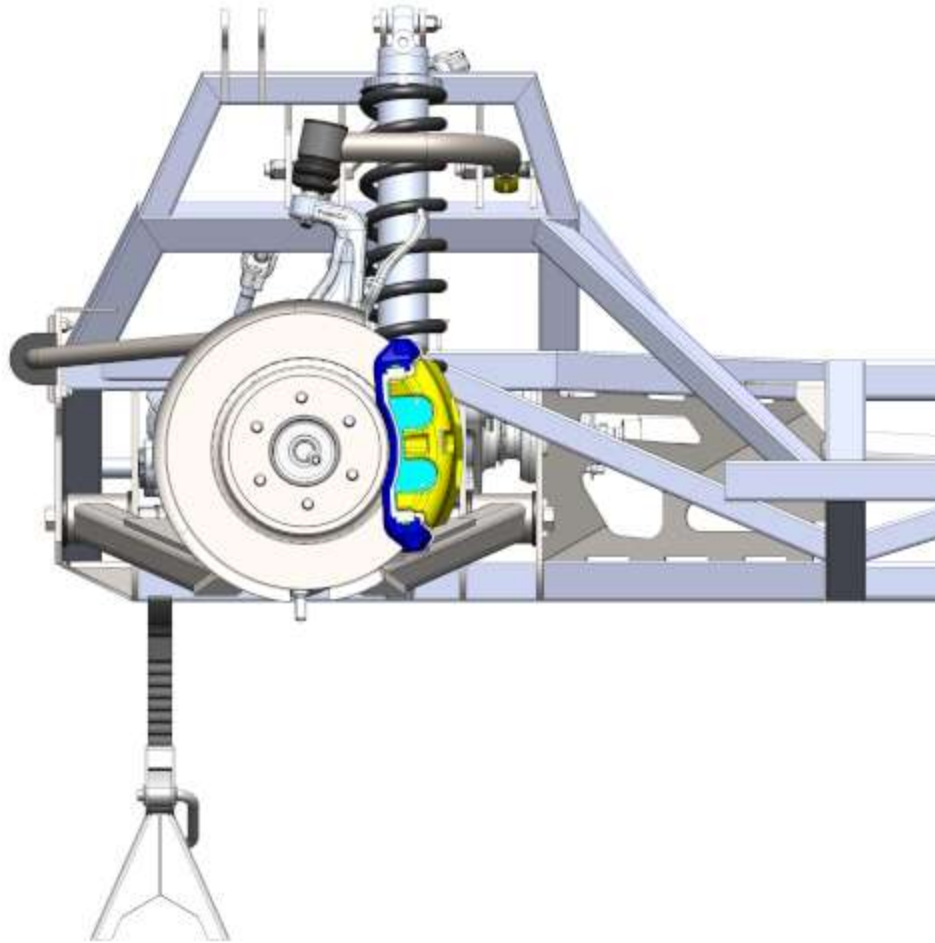
## FRONT BRAKES



Box 5, Box 6 rivets

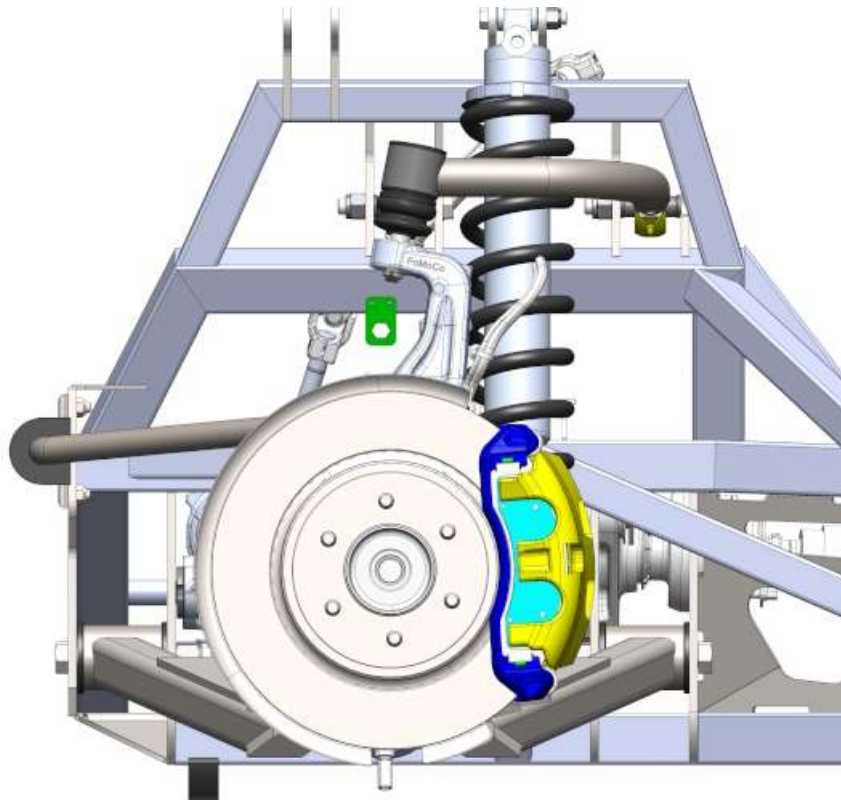


Now is a good time to put new brake pads/rotors on if yours are worn out.



If the brakes were removed, attach them to the spindle now. Torque the caliper bracket to spindle bolts to **184 lb-ft (250Nm)**.

Install the correct new hose on the brake caliper. Torque the Banjo bolt to **26 lb-ft (35Nm)**.

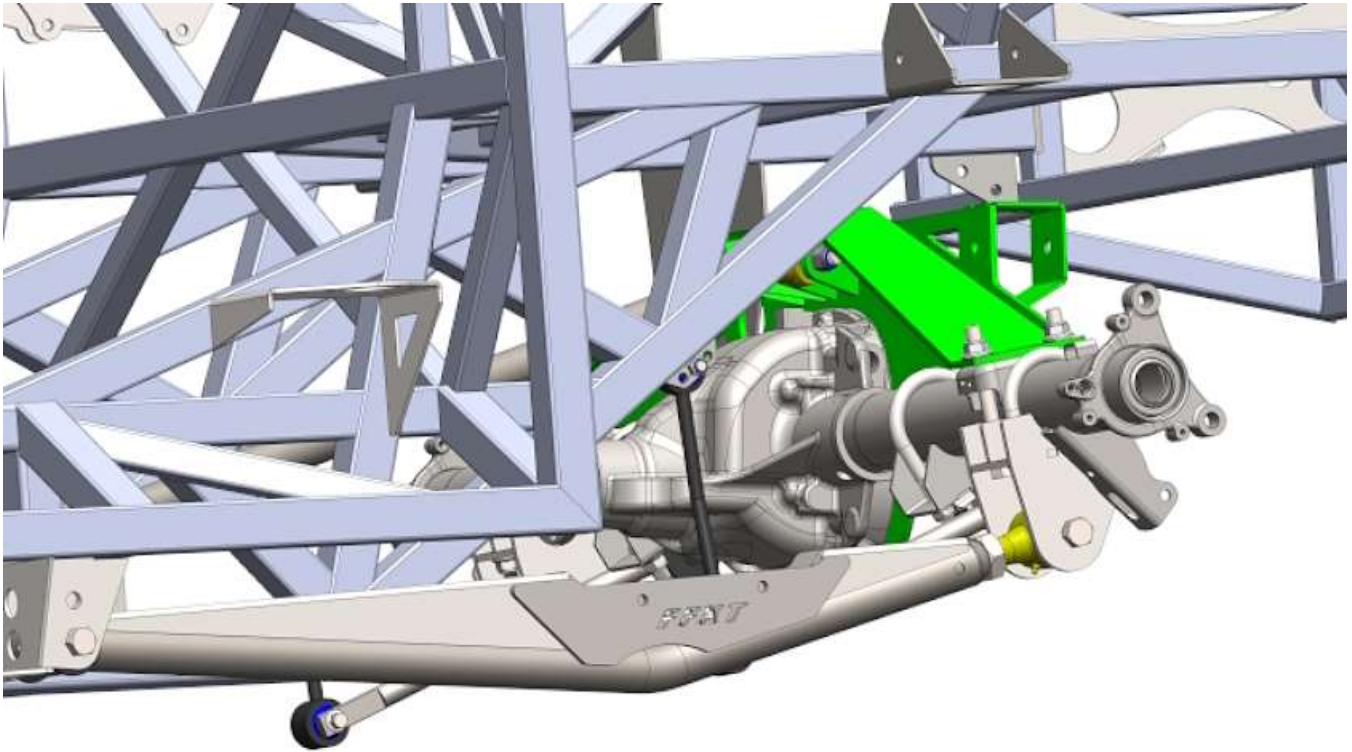


Attach the brake hose mount to the frame below the upper control arm mount using the kit  $\frac{3}{16}$ " rivets.



Attach the brake hose to the frame mount using the provided mount clip.



## REAR SUSPENSION



## REAR LOWER CONTROL ARMS

-  Box 45
-  Tape measure

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70038	REAR LWR CNTRL ARM	1
2	70593	BUSHING	2
3	70608	PIVOT SLEEVE	1
4	70051	1.25"-12 RH JOHNNY JOINT	1
5	NLN-75F	NYLON INSERT LOCKNUT, 3/4"-16	2
6	70196	3/4"-16 x 5.50" BOLT	2
7	70193	1.25"-12 JAM NUT, RH THREAD	1
8	12228	GREASE FITTING	1

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	6/5/23	



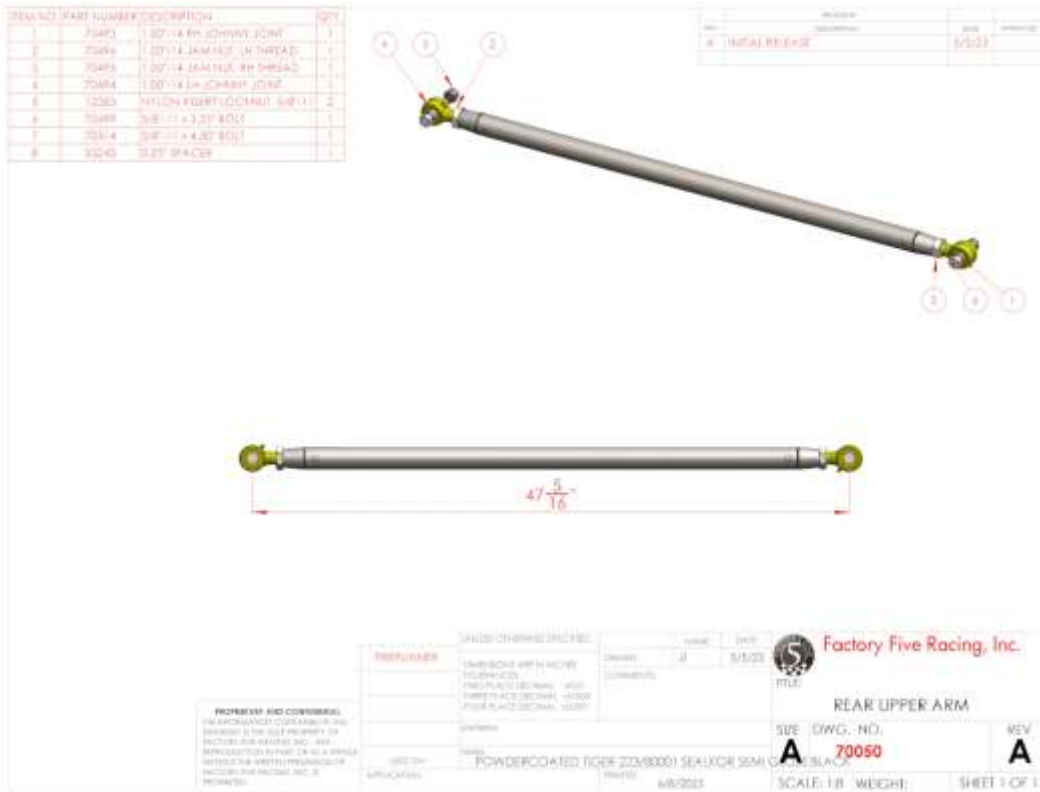
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PRE RUNNER	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	NAME	DATE	 Factory Five Racing, Inc. TITLE: REAR LWR ARM PARTS SIZE DWG. NO. REV <b>A 70199 A</b> SCALE: 1:8 WEIGHT: SHEET 1 OF 1
	MATERIAL: R7REH	DRAWN	5/5/23	
USED ON	APPLICATION	PRINTED	8/1/2023	

Assemble the rear lower control arm and set the distance from the end of the jam nut to the center of the Johnny joint as shown.

**REAR UPPER CONTROL ARMS**

- Box 45
- Tape measure



Assemble the rear upper control arm and set the distance from the center of one Johnny joint to the center of the other Johnny joint as shown.

## REAR BRAKE HOSES

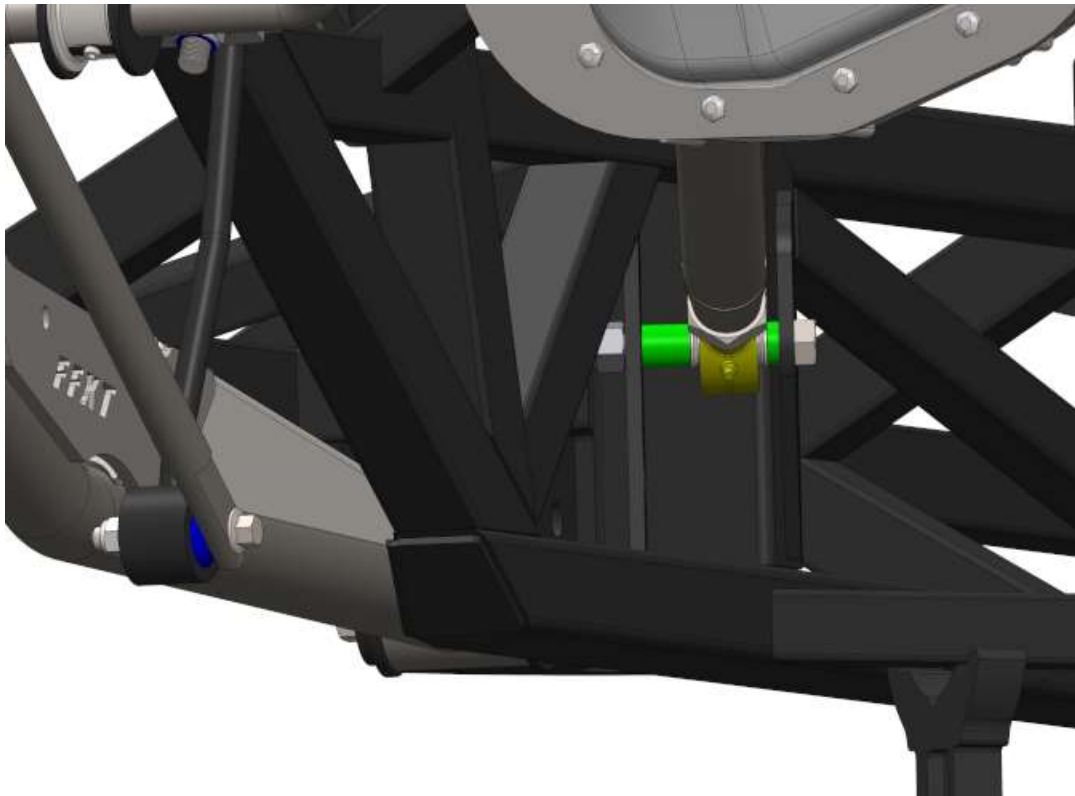


Attach the axle brake line bracket to the Axle support.

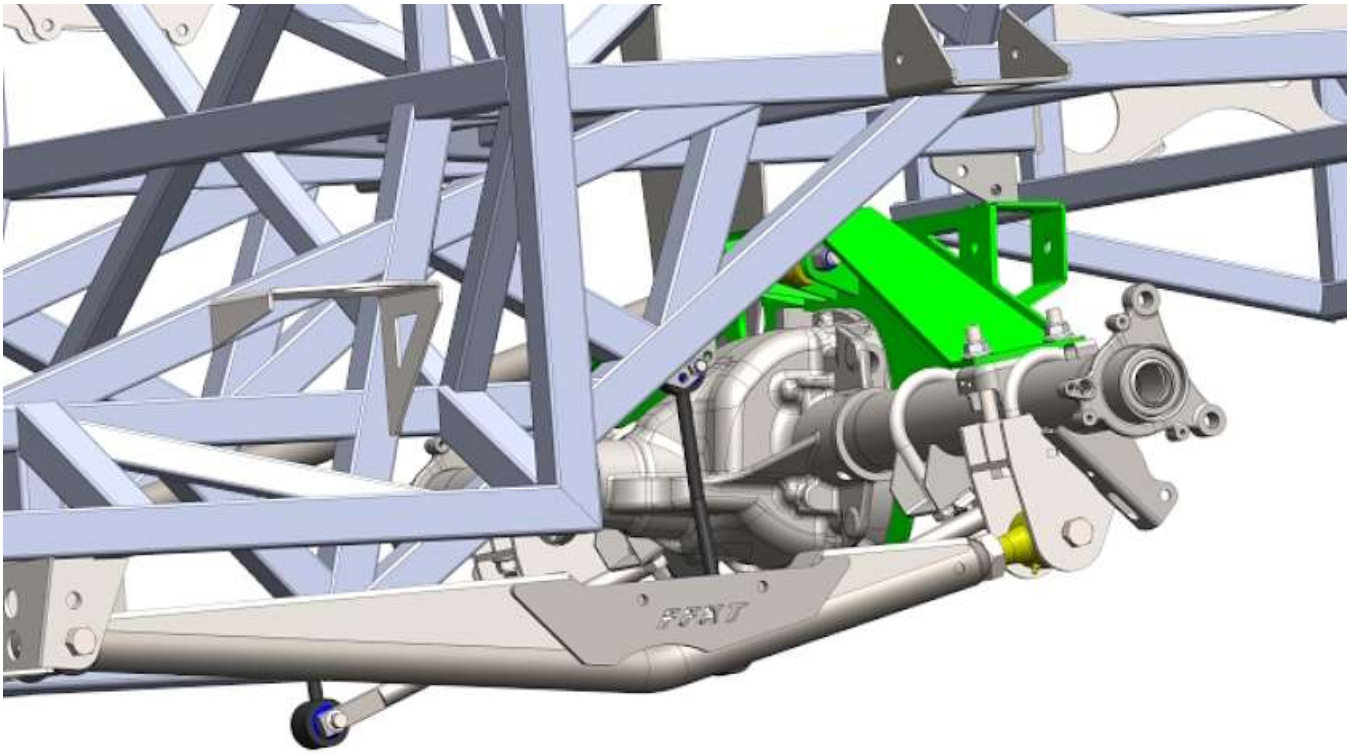


## REAR AXLE

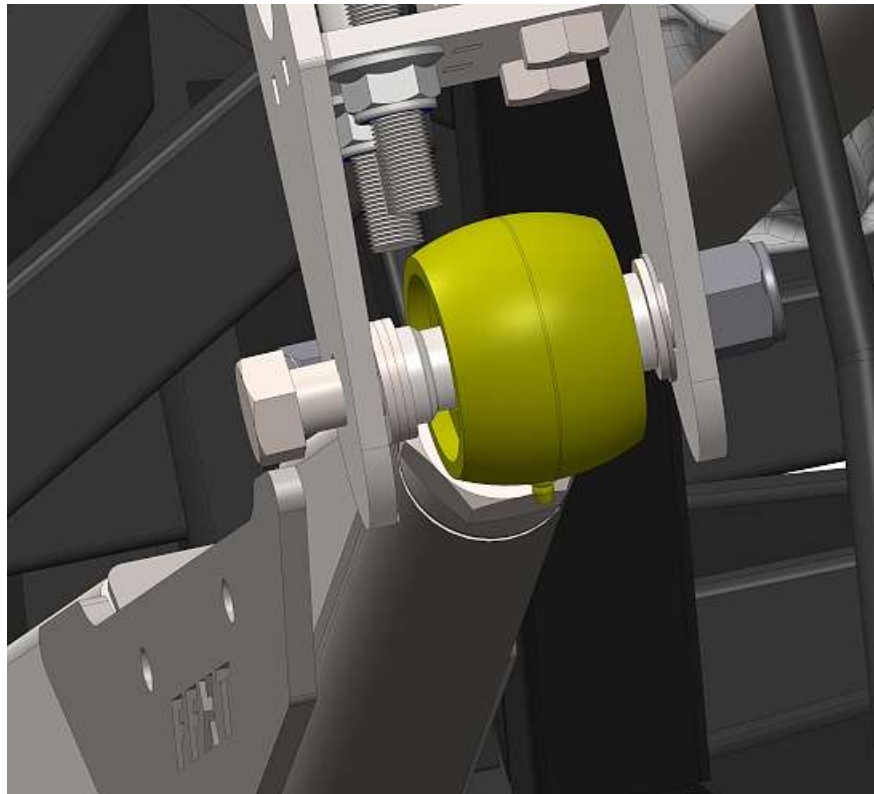
-  OEM axle
-  Floor jack



Shim the rear upper control arms to the frame as needed using the included spacers



Use a floor jack to lift the axle into place.





Shim the rear lower control arms to the axle as needed using the included washers and shims.



Attach the upper control arms to the axle.

## REAR SHOCKS

-  Box 4, 36
-  Tools –

Screw the coil seat onto the shock.

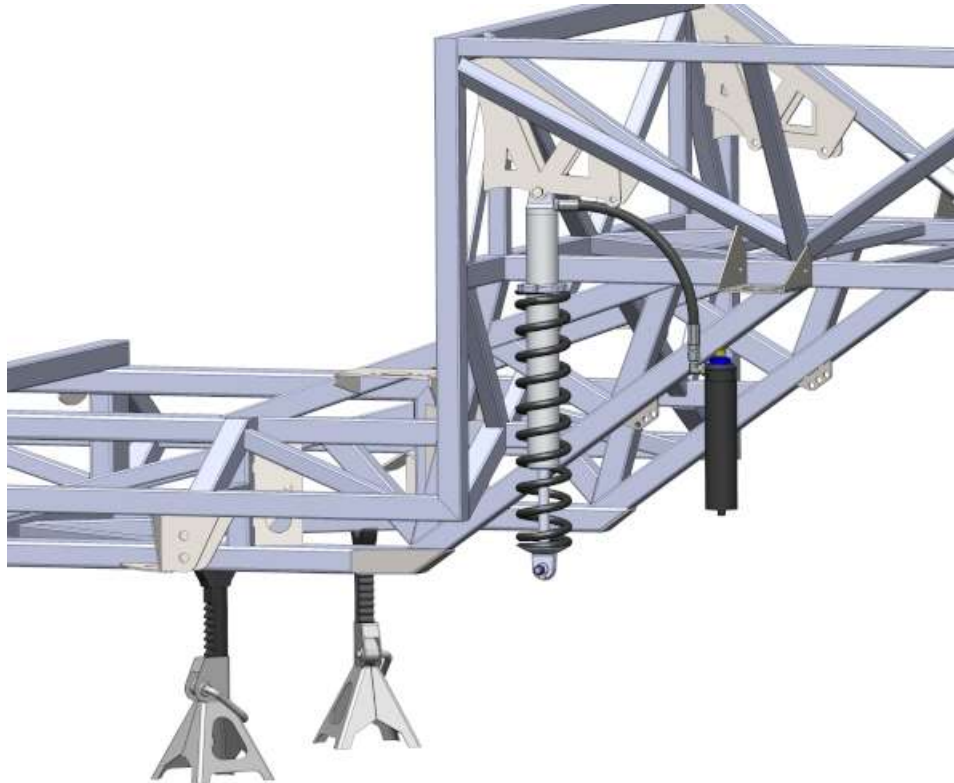


Slide the 450# spring onto the shock then the spring spacer followed by the 600# spring.





Slide the spring hat over the end then use a pair of snap ring pliers to put the snap ring in place.





Attach the top of the rear shock to the frame as shown with the reservoir hose pointed backwards.



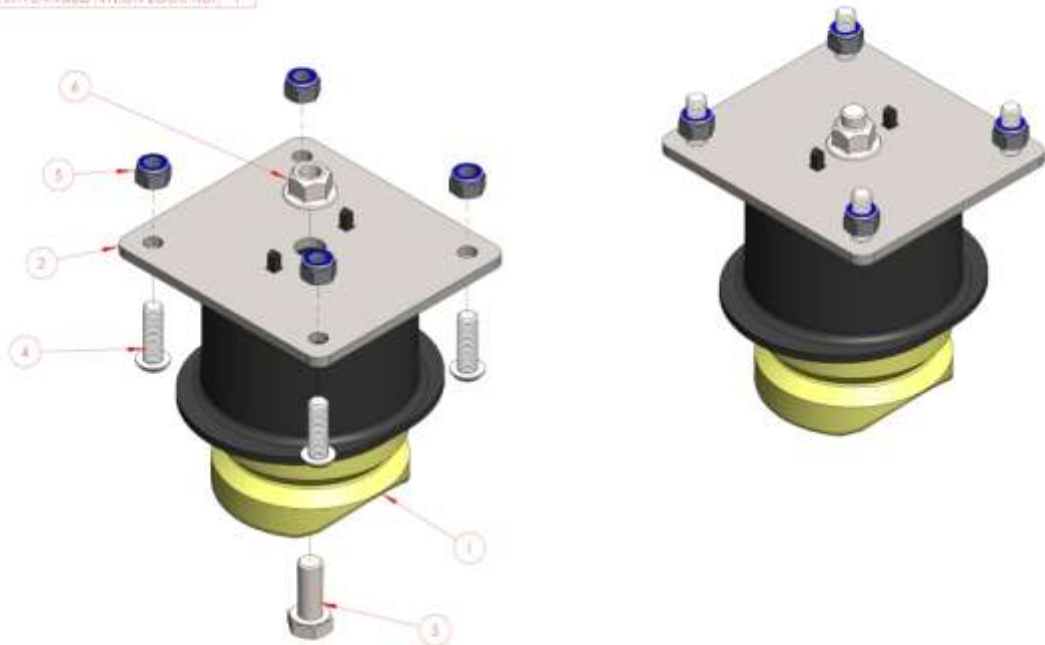
Mount the reservoir to the 2"x 2" square tube next to the shock using the #10 screws, bracket and hose clamp included.

### **REAR AXLE BUMP STOPS**

-  OEM Bump stops, Rear bump stop parts
-  ½", 15mm Sockets, extension, ratchet, 15mm wrench, 3/16" Hex key.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	BUMP STOP	F-180 OE BUMP STOP	1
2	70494	OE BUMP STOP MOUNT	1
3	16003	M10-1.25 x 25MM BOLT	1
4	11024	5/16"-18 x 1" BUTTON HEAD	4
5	13963	5/16"-18 NYLON INSERT LOCKNUT	4
6	34877	10mm FLANGED NYLON LOCK NUT	1

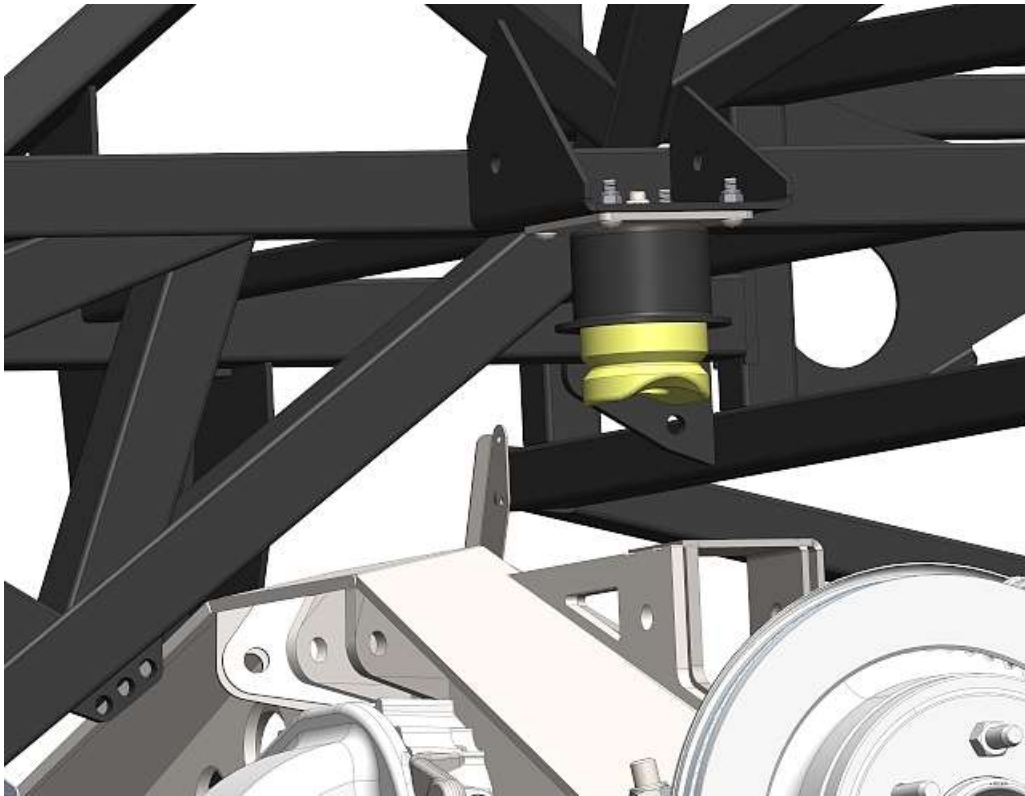
REV	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE	9/27/23	



<b>F180 PREPUNNER:</b> DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL: ±0.01 THREE PLACE DECIMAL: ±0.008 FOUR PLACE DECIMAL: ±0.001	UNLESS OTHERWISE SPECIFIED: MATERIAL: _____ FINISH: _____	NAME: _____ DATE: 9/27/23	<b>5</b> Factory Five Racing, Inc. TITLE: _____
	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FACTORY FIVE RACING, INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FACTORY FIVE RACING, INC. IS PROHIBITED.	DRAWN: _____ COMMENTS: _____	SCALE: 1:2 WEIGHT: _____
USED ON: _____ APPLICATION: _____	DESIGNED: _____ DATE: 9/27/2023	SHEET 1 OF 2	

Attach the OEM mount to the mounting plate using a 15mm socket, extension and wrench



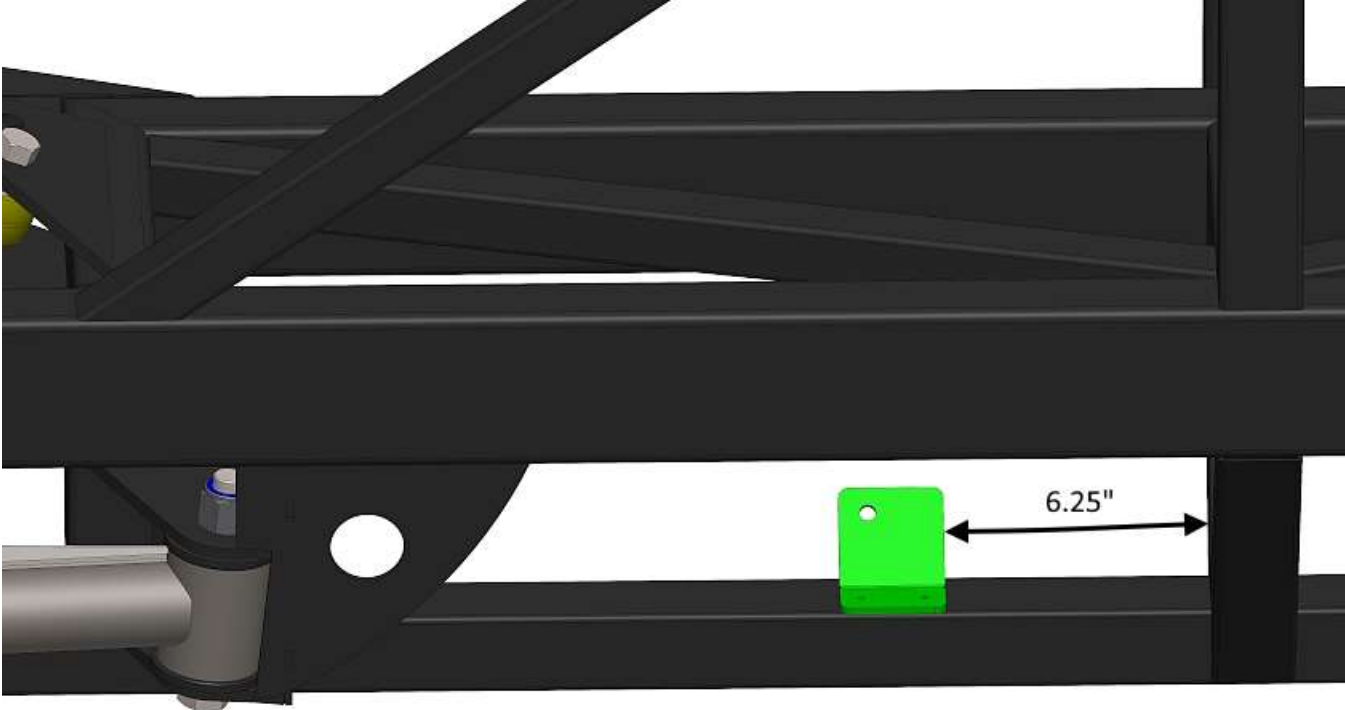


Attach the bump stop mount to the underside of the frame mount above the rear axle using a  $\frac{3}{16}$ " hex key and  $\frac{1}{2}$ " socket.

### **REAR BRAKE LINE MOUNT**

Attach the frame brake line mount to a bed support tube. Make sure the bracket does not stick up past the tube so it will hit the bed aluminum.

**E-BRAKE CABLES (2015-2017 ONLY)**

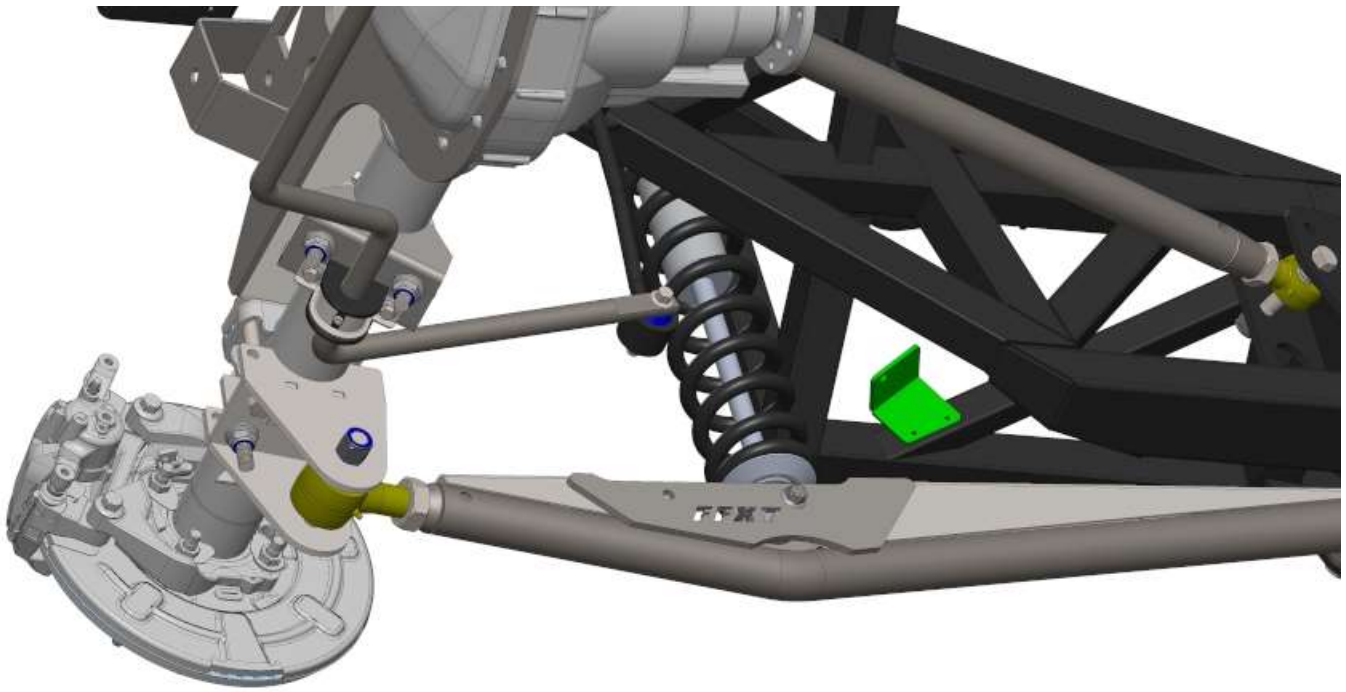


Attach the front E-brake mount roughly 6.25” from the frame tube shown.



Attach the OEM front E-brake mount to the frame bracket.





Attach the rear frame mount to the chassis as shown.

# REAR SWAYBAR (OPTIONAL)

Box 38

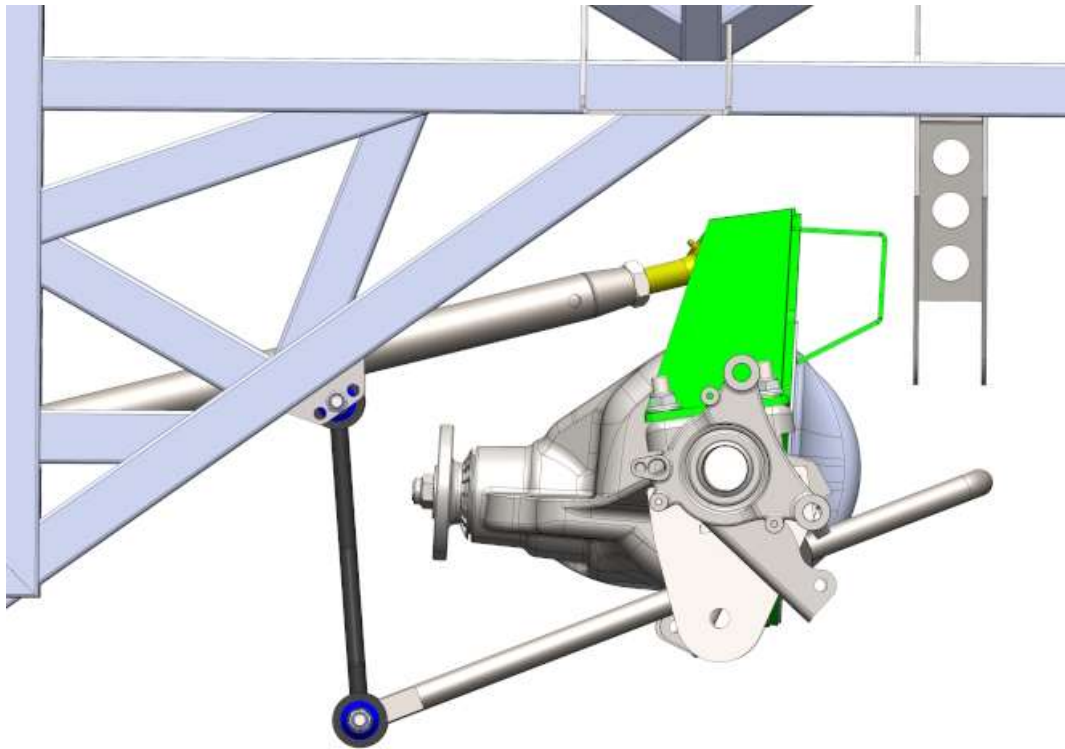
	REV. <b>A</b>	REVISIONS: DESCRIPTION <b>INITIAL RELEASE</b>	DATE <b>6/6/23</b>	APPROVED
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UNLESS OTHERWISE SPECIFIED:		NAME	DATE	
<b>PRE RUNNER</b>	DIMENSIONS ARE IN INCHES	DRAWN	8/11/21	<b>Factory Five Racing, Inc.</b>
	TOLERANCES: TWO PLACE DECIMAL +0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	COMMENTS:		TITLE:
	MATERIAL			SIZE DWG. NO.
USED ON:				<b>A Prerunner</b>
APPLICATION		PRINTED: 6/6/2023		REV <b>A</b>
				SCALE: 1:10 WEIGHT: SHEET 3 OF 4

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Attach the swaybar mount bracket to the axle at a 30° angle.



Bolt the swaybar links to the chassis bracket



ENGINE





**TRANSMISSION MOUNT**



Set the transmission mount on the frame mount.





Attach the transmission mount to the frame using the OEM nuts.







Steering shaft



Push the steering shaft up onto the upper steering shaft coming out of the cab.



Slide the steering shaft down onto the steering rack input shaft.





Put blue lock-tite on the OEM steering shaft bolts.



Tighten the lower steering shaft bolt to **22 lbft (30Nm)**.



Tighten the upper steering shaft bolt to **22 lbft (30Nm)**.

## Brake System



The brake lines will have to be unbent and bent. Be careful not to kink the lines.

## ABS MOUNT



ABS mount



$\frac{5}{16}$ " nut driver, drill





Attach the ABS mount to the front left part of the frame below the shock reservoir using the #10 sheet metal screws and  $\frac{5}{16}$ " nut driver.



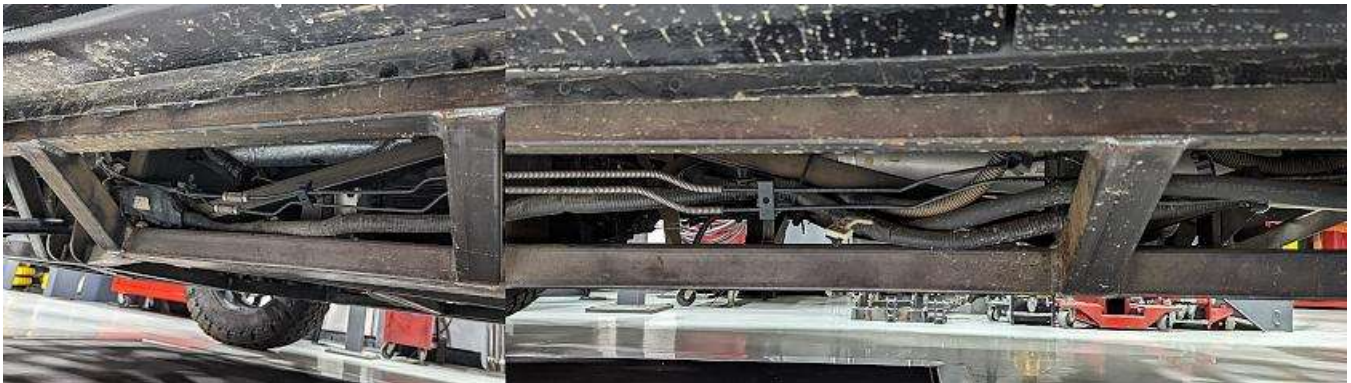
Attach the OEM ABS mount to the FFR mount using the carriage bolts and lock nuts.



## **BRAKE LINES**

Run the front OEM brake lines from the ABS module to the front brake line mounts.







Run the rear OEM brake lines either inside the frame or through the frame side triangle area to the rear of the frame.

Attach the brake lines to the brake hoses on the OEM frame bracket.





## Transmission Cooler

-  Transmission cooler mount (Box 5)
-  Clamp,  $\frac{5}{16}$ " nut driver, drill



Clamp the transmission cooler bracket to the right front of the frame so the 3 mounting screws will go into the frame.





Attach the transmission cooler bracket using the #10 sheet metal screws and  $\frac{5}{16}$ " nut driver.



Attach the transmission cooler to the mount using the  $\frac{5}{16}$ " bolts and locknuts.

## FUEL SYSTEM

 Box 5

✂ 9/16" deep socket, ratchet, OEM Fuel tank, straps and cover, Razor knife,  
**TANK**



Raise the 26 gallon fuel tank into position with the fuel filler on the left side.



Use the OEM fuel tank straps by inserting the non bolt end into the frame mounting bracket.





Attach the strap at the back of the frame using lock nuts and carriage bolts provided.

Wait until the wiring is installed to locate the fuel vapor canister and fuel pump control module.



## FILLER NECK



Trim the OEM filler hose. Attach the fuel filler hose to the fuel tank and attach with a hose clamp.



Slide another hose clamp onto the filler hose then insert the end of the fuel filler neck into the hose and lightly tighten the clamp. The angle will get changed once the fender is attached later.





## FUEL LINES







Run the  $\frac{3}{8}$ " and  $\frac{5}{8}$ " fuel lines from the tank area down the frame to the transmission tunnel area.

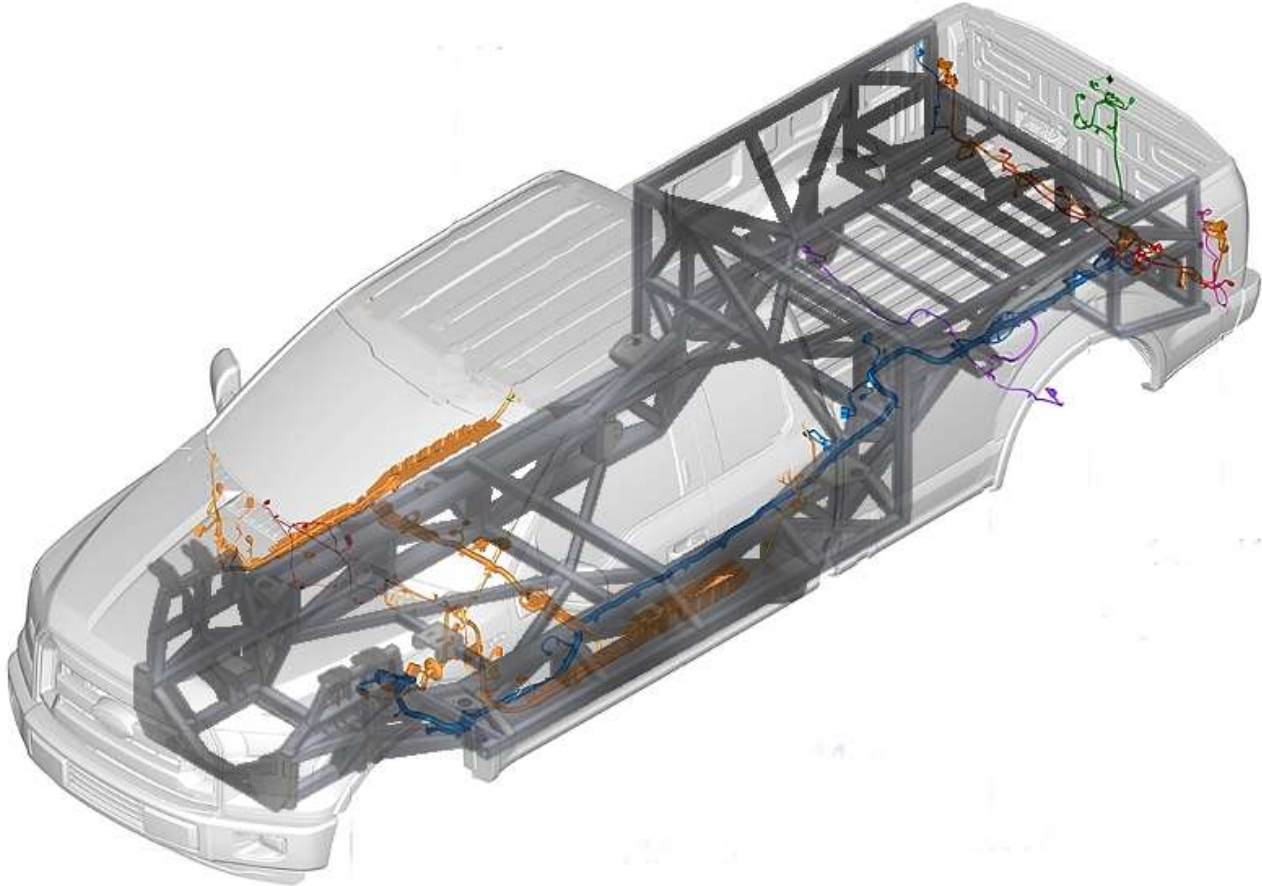


At the tank, on the  $\frac{3}{8}$ " fuel line slide the hose clamp onto the  $\frac{3}{8}$ " fuel line then push the nylon OEM connector into the fuel line and tighten the hose clamps.



## WIRING

-  Box 6, OEM chassis harness
-  Wire cutters
-  Use zip ties to attach the harness to the frame tubes.
-  Make sure to remove any frame coating when attaching a ground terminal to the frame.



Lay the wiring out the same way it was in the F-150.

### REAR HARNESS

-  Box 5

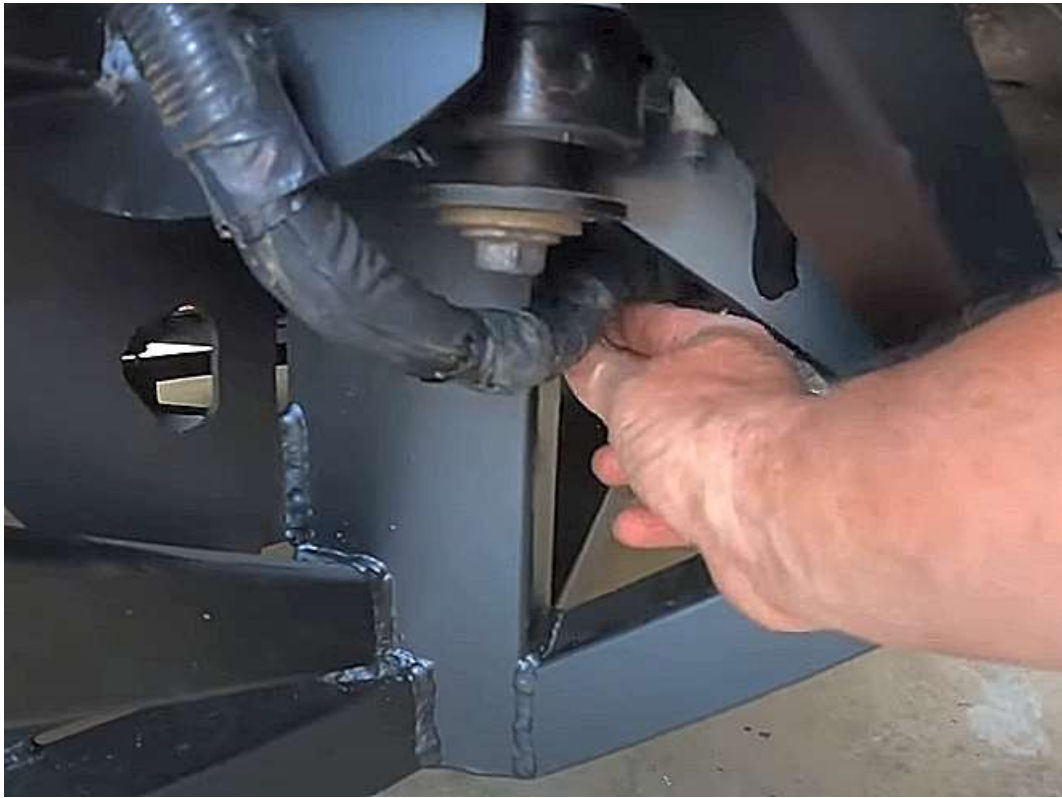


Next to the brake booster, attach the cab plugs to each other keeping the plugs to the inside of the frame to prevent tire clearance problems.



Run the rear harness down below the cab to the front cab mount.





Run the rear wiring either through the frame triangular section or to the inside of the frame to the back of the cab.





Run the wires up the angled tubes; attach the Fuel pump control module to the included bracket (Box 5) using the OEM screws and included lock nuts then attach it to the frame using the #10 sheet metal screws.



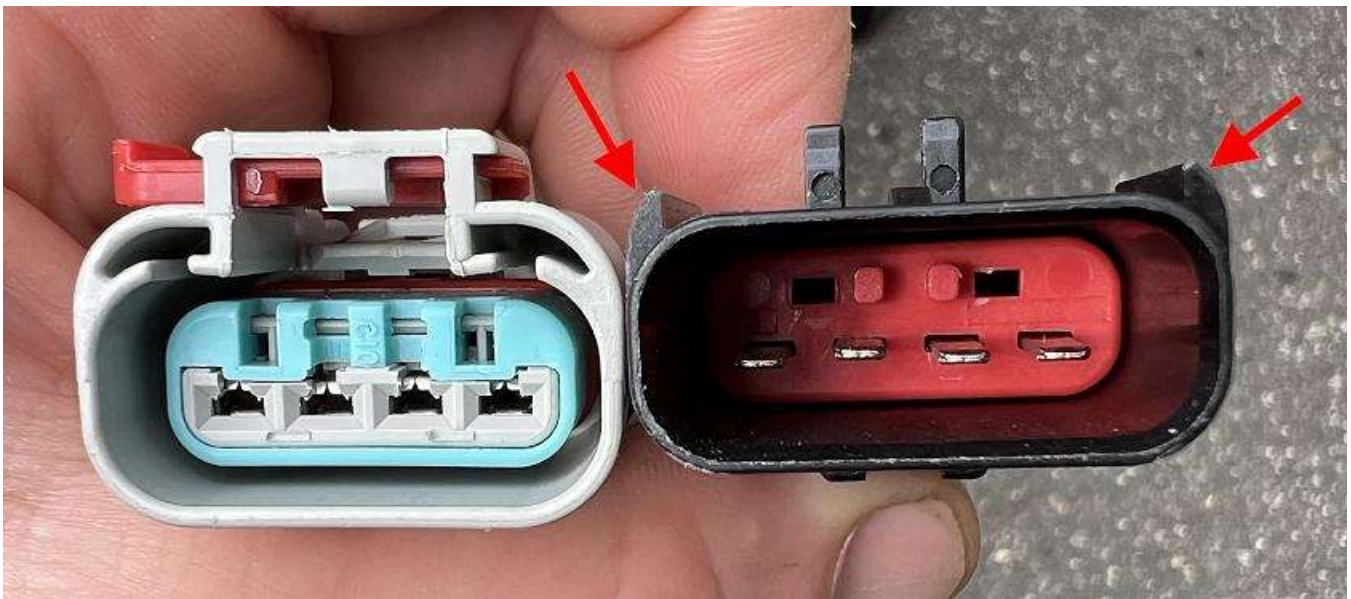




At the back of the frame run the harness around the corner then back to the fuel pump area on top of the fuel tank.

### **FUEL PUMP/SENDER HARNESS EXTENSION**

✂ File



If the extension harness you receive has black plugs on the ends, file the ears shown above off the black connector so that it can connect to the OEM truck harness.





Connect the fuel pump connector then run the rear light wires to the back of the frame and down.

## **EVAP SENSOR**

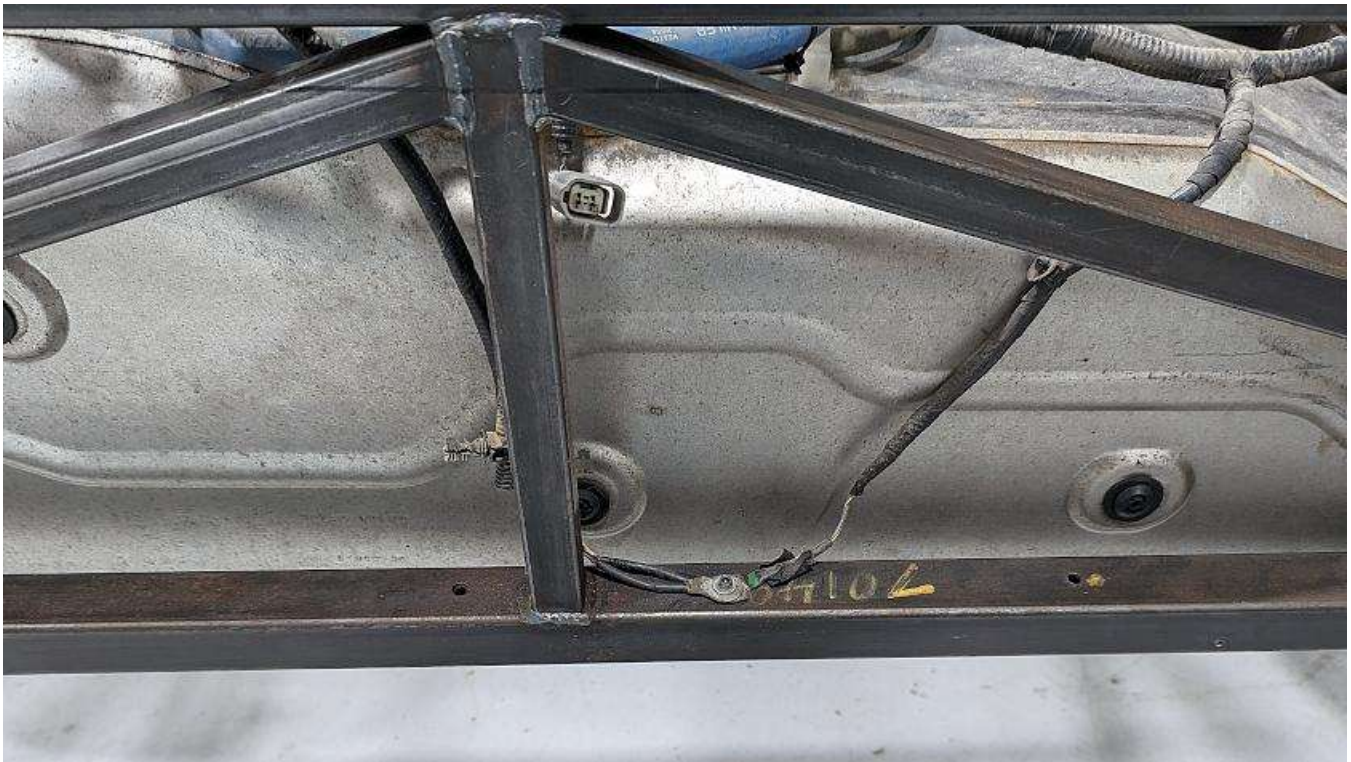


Cut and insert the EVAP sensor into the Evap canister  $\frac{5}{8}$ " line and attach the EVAP sensor jumper wire.



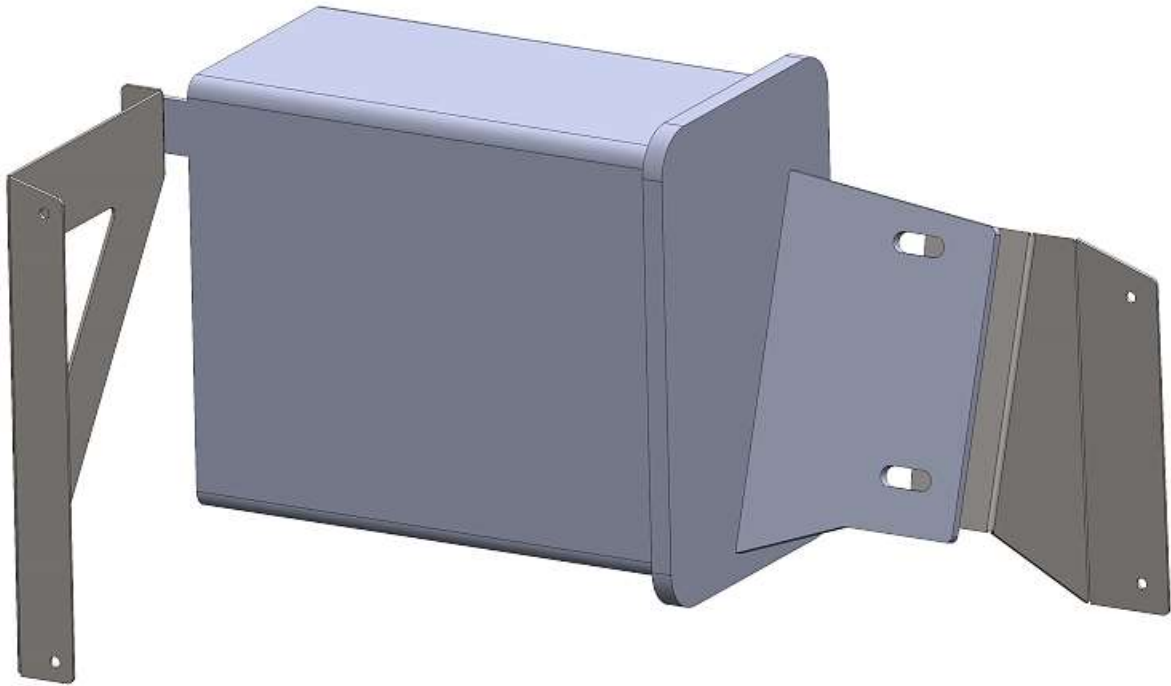


Run the right-side light harness across the bottom of the frame to the right side of the frame.



Attach the rear harness ground to the frame near the middle of the fuel tank on the rear lower frame tube.

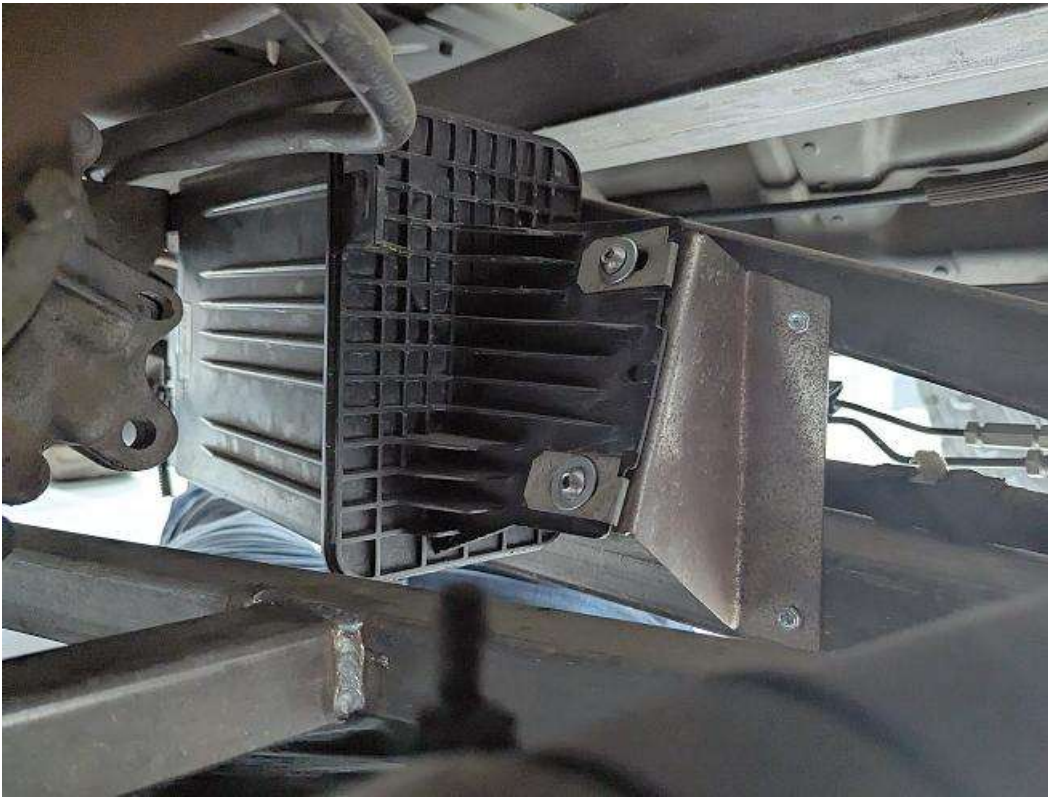
## 2015-2017 FUEL VAPOR CANISTER



Attach the included front and rear mounting brackets to the fuel vapor canister.

Locate the Fuel Vapor Solenoid plug under the left side of the cab half way back and plug it into the fuel vapor canister.





Locate the canister so that the front bracket mounts to the 2"x 4" tube and the rear will attach to the 1.50" tube.

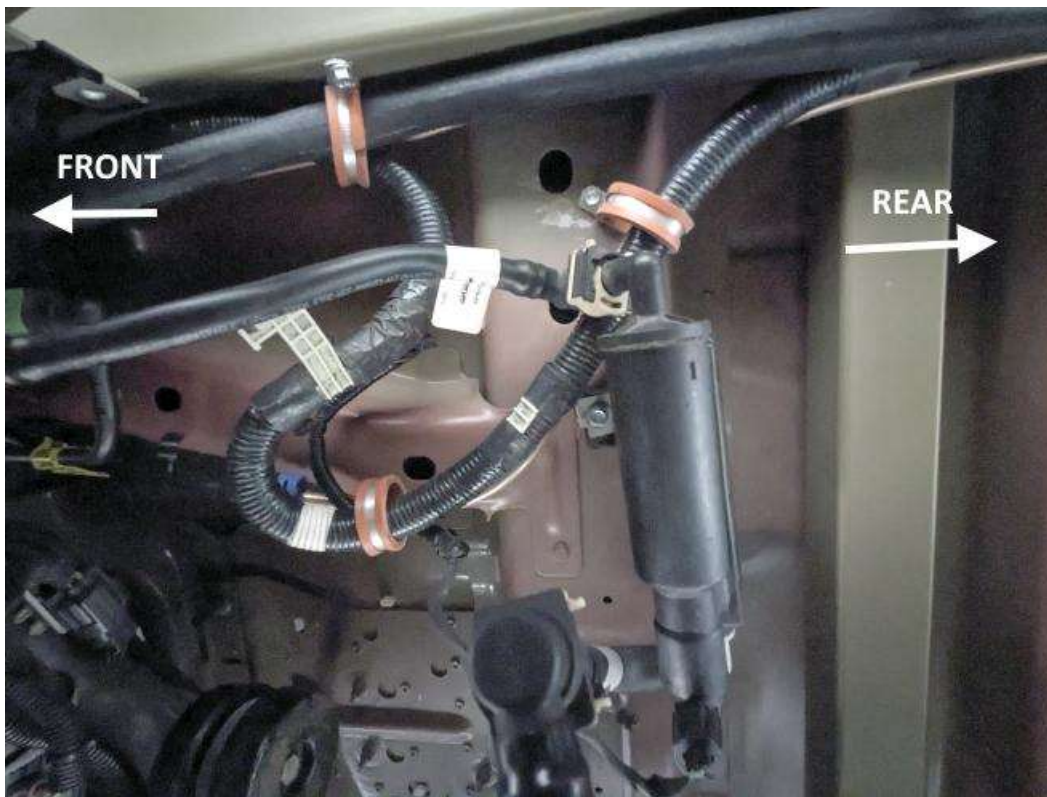
Attach the brackets to the frame using the #10 sheet metal screws.





Attach the OEM canister line to the canister and the CAB.

### 2018+ FUEL VAPOR CANISTER



Locate the Fuel Vapor Solenoid under the left side of the cab half way back.





Connect the fuel vapor line from the solenoid to the canister then use this as a guide to locate the canister next to the transfer case.



Attach the included "Front bracket" to the front of the canister using the #10 button head screws and locknuts then locate the bracket on the 1.50" square angled tube.





Locate the rear of the canister so the lower built in bracket hole can be used on the angled 1.50" square tube.

Attach the canister brackets to the frame using the #10 sheet metal screws.



Attach the OEM canister line to the canister and the CAB.

## GRILL SHUTTER MOTOR

Plug the OEM shutter motor back into the harness and attach to the frame. This motor prevents a “Check Engine” light.

## STEERING RACK GROUND

- 🔩 Body Finish components Box 6 #10 screw
- ✂ Pliers, Drill, sand paper/cookie



Locate the steering rack ground and flatten the bent part with a pair of pliers.





Locate the ground on the frame front crossmember.



Use a drill with a nut driver to attach the ground to the frame.





Remove the ground screw and use sandpaper or a cookie wheel to remove the frame coating for a good ground.



Reattach the ground.

# EXHAUST

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	12/29/21	
B	REAR TUBE SPLIT	2/21/23	

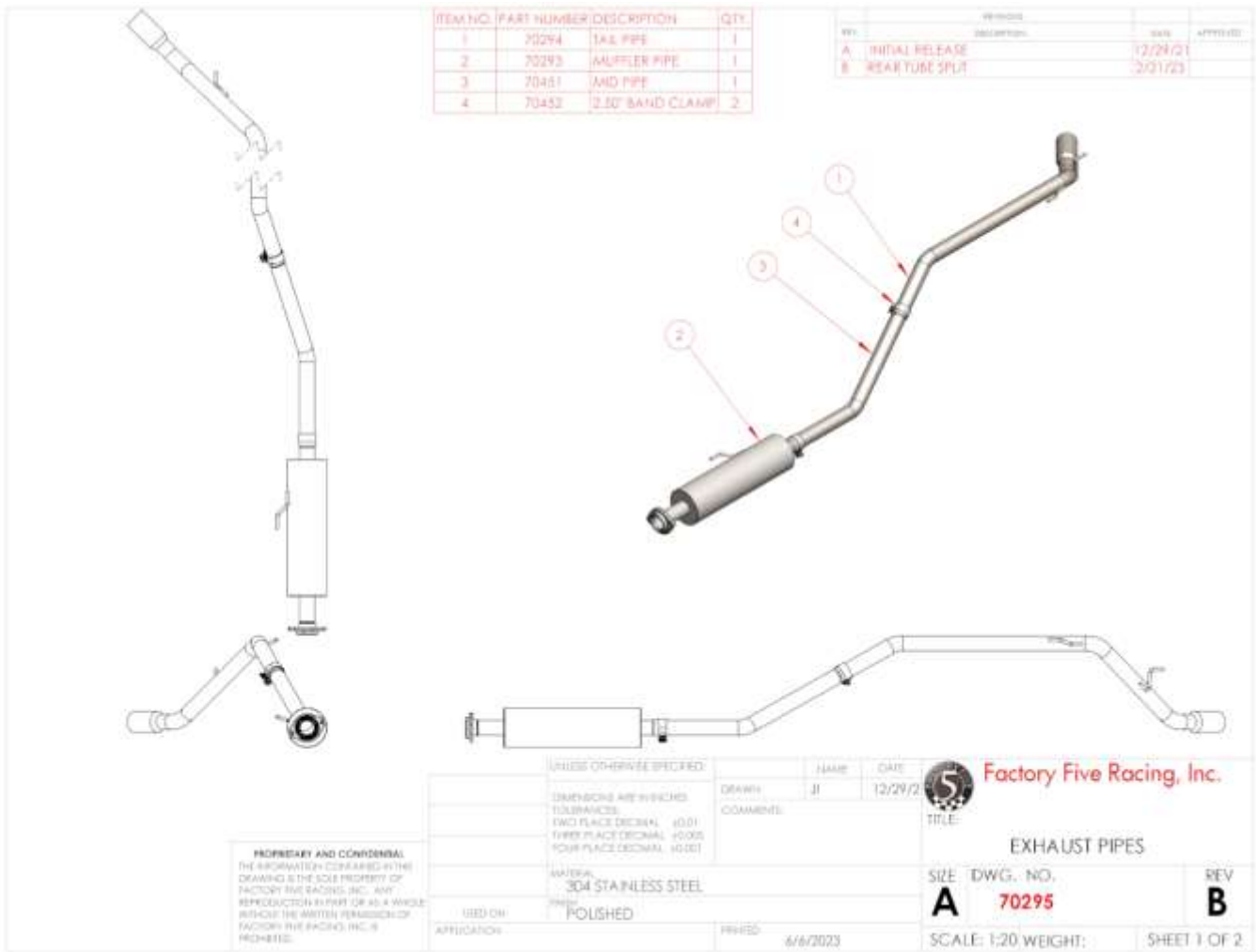
UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES	JL	12/29/21
TOLERANCES:	DRAWN	COMMENTS:
TWO PLACE DECIMAL ±0.01		
THREE PLACE DECIMAL ±0.005		
FOUR PLACE DECIMAL ±0.001		
MATERIAL:	304 STAINLESS STEEL	
FINISH:	POLISHED	
USED ON:	6/6/2023	
APPLICATION:	PRINTED	

PRE RUNNER	Factory Five Racing, Inc.
	EXHAUST PIPES
	SIZE DWG. NO. <b>A 70295</b>
	REV <b>B</b>
	SCALE: 1:40 WEIGHT: SHEET 2 OF 2

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Attach OEM Catalytic Converter pipe to the engine.

Loosely bolt the muffler to the Cat pipe.

Push a band clamp onto the end of the mid pipe then push the mid pipe onto the end of the muffler.

Push a band clamp onto the end of the tail pipe then push the tail pipe onto the mid pipe.

## HEADLIGHTS/ NOSE PANEL

 Box 9 headlight hardware.

  $\frac{5}{32}$ " hex key,  $\frac{7}{16}$ " wrench.





















Attach the top outside



70504/05 bottom nose mounts





Attach the mounts to the OE Radiator mount so the longer part is towards the middle of the truck as shown. Do not drill mounting holes in the grill surround yet if installing the street bumper.



Attach the top of the headlight to the 70501 top main headlight bracket.



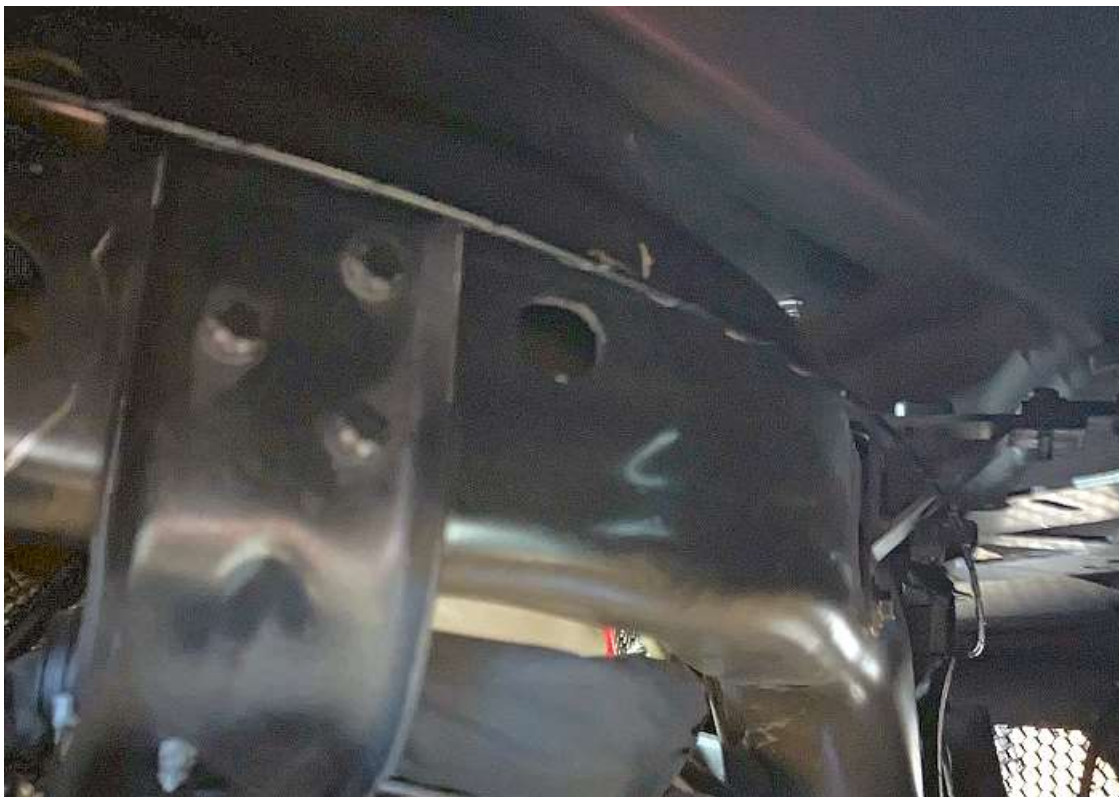


Attach the inside headlight bracket to the frame and light using a spacer on the top frame mount, none on the bottom.

## HORIZONTAL



Attach the antenna base to the OEM radiator support.



Bend the antenna wrapping it around the front of the radiator support. Hold the antenna using an insulated clip or similar so that it does not bounce around.



## FRONT BODY PANELS



The fiberglass panels will need some sanding and trimming to fit.

The Carbon fiber panels are thinner and may require washers/spacers to move the panel out to align the panels correctly.

### FRONT FENDER EXTENSION



OEM fasteners, Front Fender extension panels, Fender extension hardware (Box 6)

10mm wrench, 10mm socket, ratchet, drill, drill bits, vise grip pliers.



With the door open, hold the Fender extension up so that it is even with the hood noting the top mount location (arrow in picture).





Close the door and move the panel to even out the front and rear panel gaps keeping the top level with the hood.



Open the door and mark the top mount location.

Remove the panel and drill the location marked with the correct size bit for the fastener size.



For the carbon panels space the panel out using washers behind the panel.



Attach the Fender extension to the top mount.





Close the door and bring the bottom of the Fender Extension up so that it is even with the bottom of the cab mounting location and the front of it is slightly forward of the mount.



Set the gap by moving the bottom forward and back. Clamp in place.

Carefully try opening the door. It will be close but should clear. If necessary remove the panel and slot the top mount to move the panel forward slightly.





Pushing the bottom of the panel up will bow the middle out slightly.



If necessary trim more of the OEM foam in the bottom corner to allow the bottom of the panel to move up more.



The Carbon panel will need to get spaced out for correct fitment and door clearance.



Once the panel is aligned, drill the lower mounting hole locations and attach the Fender extension to the frame using the OEM fasteners.





Attach the Forward front Fender Extension mount to the top of the frame using an OEM bolt.



Hold the front edge of the Fender extension so that it aligns with the edge of the hood.





Clamp the fender mount to the Fender extension.



Open the hood, drill a  $\frac{3}{16}$ " hole for the fender mount through the flange.

Attach the fender mount using a #10 black button head screw and locknut.



In the engine bay, remove the screw under the front inside of the Fender extension (left side shown).



Bolt the Fender extension top mount to the frame and locate where to drill the flange on the Fender Extension.

Drill the 1/4" mounting hole then use the included 1/4" button head screws and washers to help set the height to match the hood.



## HOOD



Attach the hood latch striker to the hood using the M6 bolts. Tighten the screws to **106 in-lb (12Nm)**.



Attach the hood to the hood hinge brackets using the M10 bolts and tighten the bolts to **18 ft-lb (25Nm)**.



Center the hood on the cab by matching the shape of the cowl to the trailing edge of the hood.



Attach the front hood bumpers to the extensions and mount them further out on the OEM bumper mount. Screw them all the way down for now.



Attach the hood latch to the chassis centering the bolts in the slots.



Close the hood and make sure the striker and latch engage.



With the hood closed, measure from the windshield to the start of the hood on each side of the truck.


If necessary open the hood, loosen the mounting bolts slightly and adjust the hood so that the measurements are the same side to side.

Close the hood and double check the measurements and readjust if necessary.





Raise or lower the hood latch so that the gap is even between the hood and the Fender extension. If necessary, adjust the Fender extension mounts to help with the fitment.

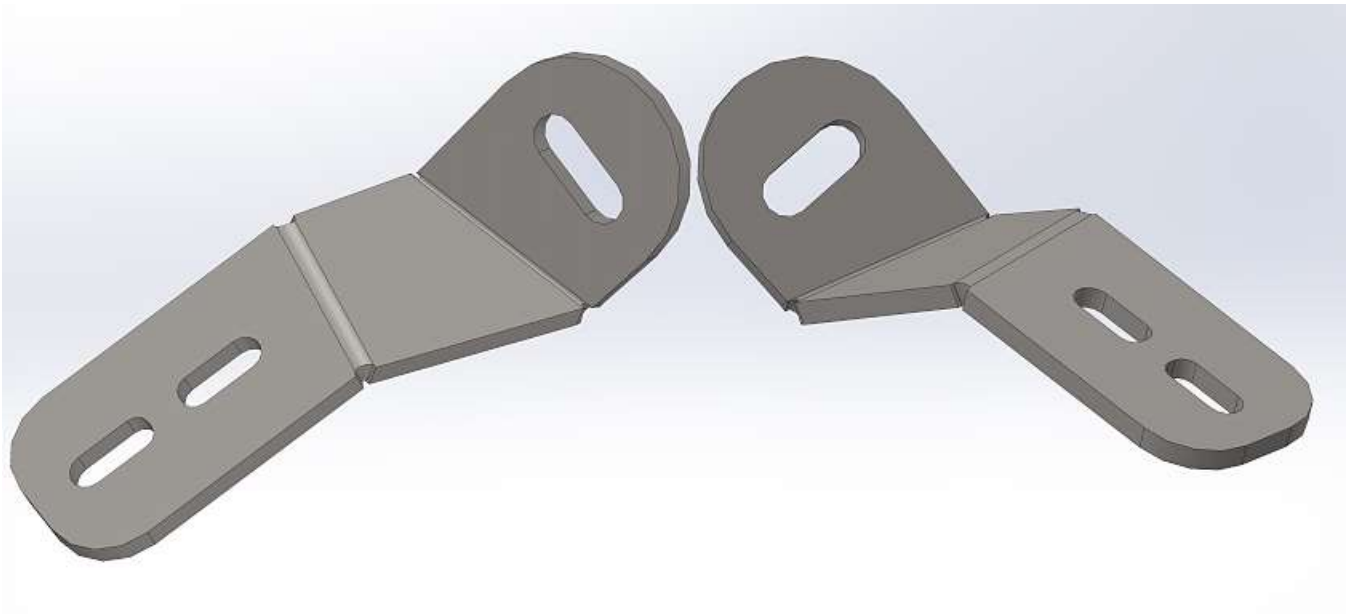
 Nose panel, box 9 Headlight hardware, box 6 Nose mount Fasteners



70506 Top inside mount.



Attach the nose to the headlights at the top inside of the headlight using the 1/4" flanged button head bolts.



70509/10 top outside headlight mounts.



Attach the top outside





70504/05 bottom nose mounts



Attach the mounts to the OE Radiator mount so the longer part is towards the middle of the truck as shown. Do not drill mounting holes in the grill surround yet if installing the street bumper.



Adjust the nose/headlights so that the panel aligns with the hood.



## ANTENNA

There are two ways to mount the antenna, vertical like stock or horizontal under the body.



The horizontal mounting may reduce the range of the antenna slightly.

### VERTICAL



On the right side, attach the antenna mount to the frame so that the mount sits just below the body panel.





Drill a hole through the body panel to pass the antenna through and screw into the mount.

### **FRONT STREET BUMPER**



Box 33

$\frac{5}{32}$ " hex key,  $\frac{7}{16}$ " wrench,  $\frac{1}{4}$ " drill bit, drill.

These show installation of the left side fog light.

## FOG LIGHT MOUNTING



Remove the screw holding the metal bracket on the light.



Remove the metal bracket.



Drill the plastic boss on the side of the plastic bracket with the  $\frac{1}{4}$ "-20 drill tap included in the kit. Be careful not to go too far and hit the light.



Mark the end of the plastic bracket 0.25" in from the end.





Carefully cut the plastic bracket where marked.



Insert the light into the bumper hole. Left side shown



Note the slot locations on the bracket.



Attach the left mount bracket to the plastic light bracket using the  $\frac{1}{4}$ " x 0.50" screw.



Attach the L bracket to the underside of the light and to the mount bracket using the stock screw and the ¼” carriage bolt.

Locate the light so the mount bracket holes are near the back of the light mount area and mark the center of the slots on the bumper.

Remove the light from the bumper by disassembling the brackets from the light.

Use a short ⅜” drill bit and a 90° drill to drill the mounting hole locations.

Attach the mounting bracket to the backside of the bumper using the #10 black screws and locknuts.





Attach the bumper to the nose panel using the ¼" x 1" flanged screw

# Skid Plate

REVISIONS		DATE	APPROVED
REV. A	INITIAL RELEASE	9/5/23	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70678	INTERCOOLER MOUNT TAB	2
2	25460	1/4"-20 x 3/4"	4
3	34986	1/4"-20 FLANGED NYLON LOCK NUT	4
4	70727	70727 - INTERCOOLER LEFT TOP MOUNT	1
5	70728	70728 - INTERCOOLER RIGHT TOP MOUNT	1

**DETAIL A**  
SCALE 1 : 2

UNLESS OTHERWISE SPECIFIED:		DRAWN	NAME	DATE
DIMENSIONS ARE IN INCHES		JS		4/6/23
TOLERANCES:		COMMENTS:		
TWO PLACE DECIMAL ±0.01				
THREE PLACE DECIMAL ±0.003				
FOUR PLACE DECIMAL ±0.001				
MATERIAL		STEEL		
FINISH		POWDERCOATED TIGER 223/80001 SEAL/KOR SEMI GLOSS BLACK		
USED ON		APPLICATION		
PRINTED		11/7/2023		

<b>XTF PRE RUNNER</b>				
<p><b>FACTORY FIVE RACING, Inc.</b></p>				
<p><b>3.5L STREET BUMPER SKID PLATE</b></p>				
			SIZE	DWG. NO.
			<b>A</b>	<b>70234</b>
			REV	<b>A</b>
			SCALE: 1:8	WEIGHT:
				SHEET 2 OF 2

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3.5L Intercooler mounts on skid plate

# Optional Off-road Bumper

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	11/16/23	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70732	PWDR RIGHT FRNT BUMPER MNT	1
2	70731	PWDR LFT FRNT BUMPER MNT	1
3	70738	RIGHT BUMPER SUPPORT	1
4	70737	LEFT BUMPER SUPPORT	1
5	70320	TUBULAR FRNT BUMPER	1
6	70747	OFFROAD SKID PLATE	1
7	70748	LOWER INTERCOOLER MOUNT	1
8	70749	70751 - RIGHT TOP INTERCOOLER MOUNT	1
9	70749	70750 - LEFT TOP INTERCOOLER MOUNT	1
10	34365	1/4"-20 x 1" BLACK BUTTON HEAD BOLT	4
11	10802	1/4" NYLON INSERT LOCKNUT	4
12	60518	5/16"-18 x 0.75" BOLT	14
13	34526	5/16"-18 FLANGED NYLON LOCK NUT	4
14	15138	1/2"-20 x 1.75" FLNG HEAD	12
15	35152	1/2-20 NYLON INSERT LOCKNUT	12
16	13963	5/16-18 NYLON INSERT LOCKNUT	14
17	16703	1/2"-13 x 1.50" BOLT	4
18	10834	1/2-13 NYLON INSERT LOCKNUT	4
19	13976	1/2" WASHER	4
20	11024	5/16"-18 x 1" BUTTON HEAD	4

NAME	DATE
DRAWN	10/23/23
CW	

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

**PRE-RUNNER**

USED ON:  
APPLICATION

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**Factory Five Racing, Inc.**

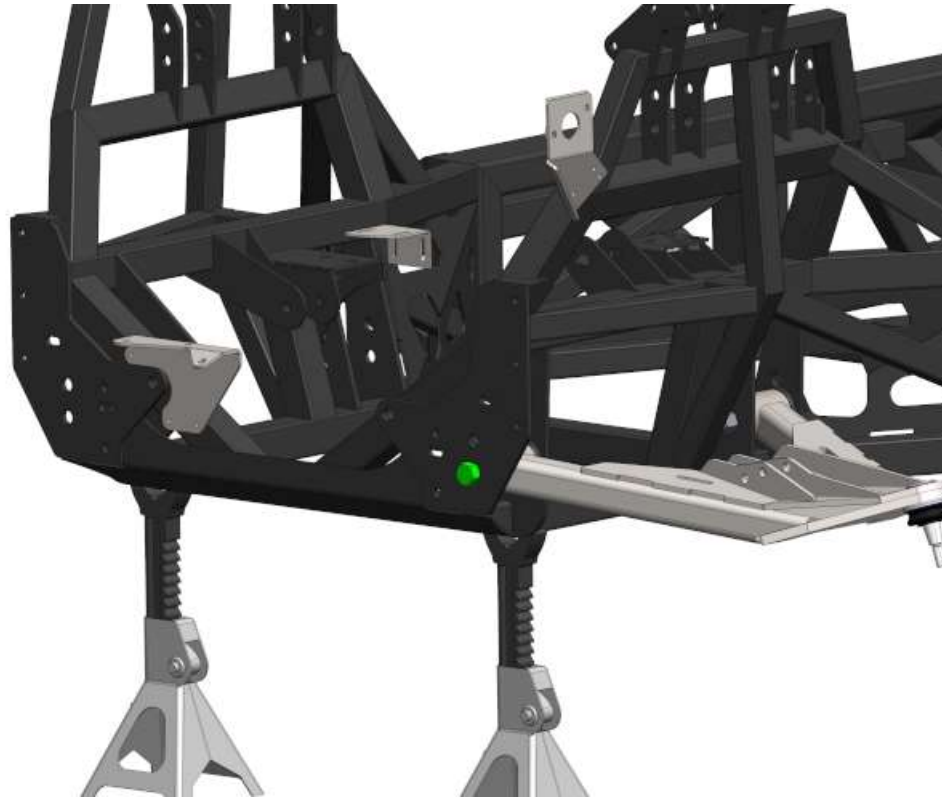
TITLE: FRONT TUBULAR BUMPER

SIZE: **A** DWG. NO.: **70302**

SCALE: 1:12 WEIGHT: SHEET 1 OF 2



Raise the truck so that the front tire just touches the ground taking the weight off the front suspension.



Remove the front lower control arm bolt.



Attach the front bumper mounts to the front of the frame using the 1/2"x1.25" bolts from the back forward and the front lower control arm bolts.



Attach the bumper supports using the ½” x 1.75” flange bolts.



There is adjustment available between these parts in order to get a tight fit to the nose/headlights.

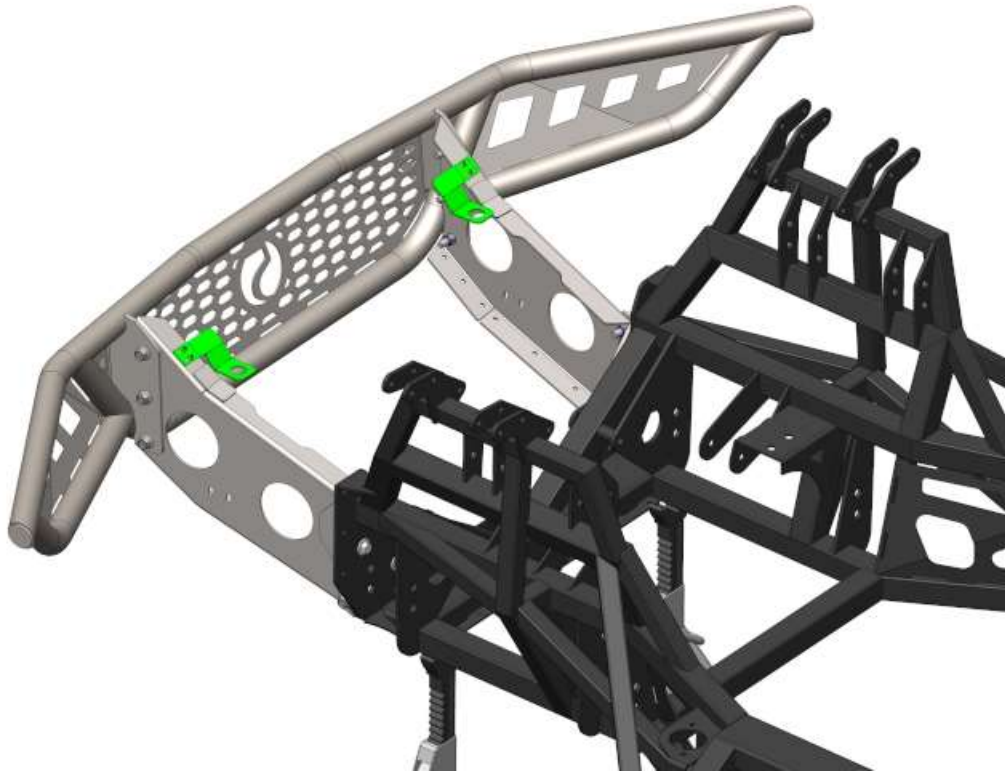


Attach the tubular bumper to the bumper supports using the ½” x 1.75” flange bolts. Position the bumper so that it has an even gap between the bumper and the nose/headlights.

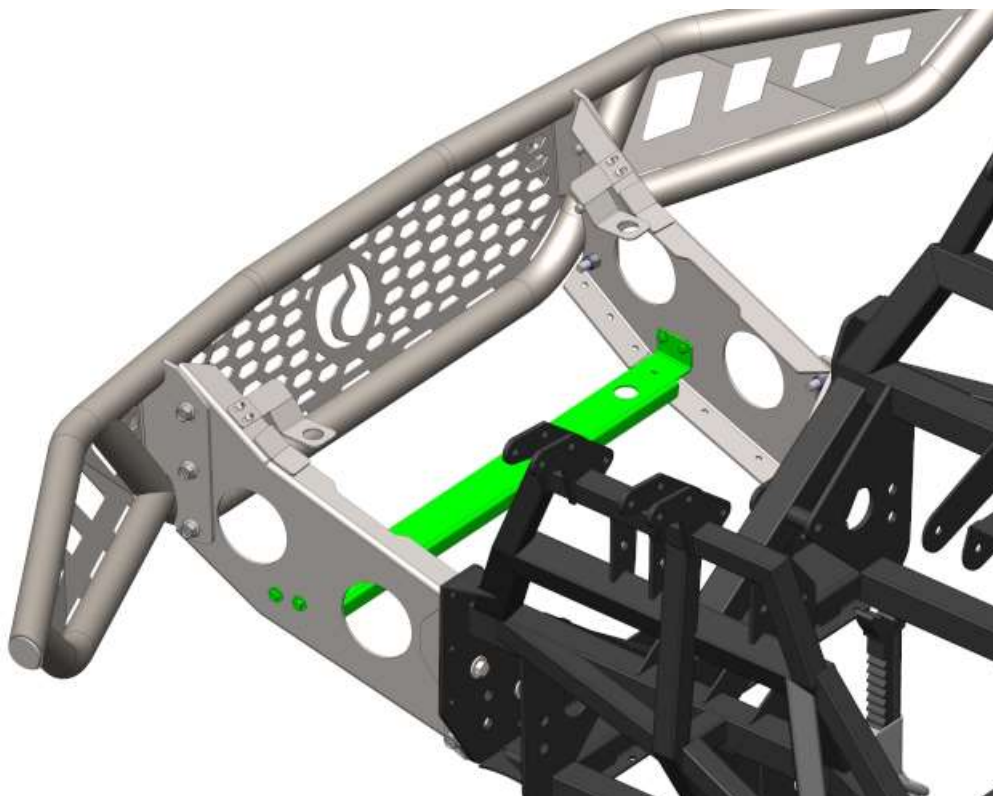
### 3.5L ENGINE ONLY



The following 2 steps are for OEM Intercooler in the stock mounting location.



Attach the top intercooler mounts to the top of the bumper supports.





Hold the intercooler up to the top mounts and attach the lower intercooler mount to the bumper supports.





Attach the skid plate using the  $\frac{5}{16}$ " x  $\frac{3}{4}$ " bolts and locknuts.

## Grill

-  Front Grill components (Box 17)
-  Razor knife,  $\frac{3}{32}$ " Hex key,  $\frac{11}{32}$ " wrench, clamps, drill,  $\frac{5}{32}$ " drill bit



If desired paint the grill.



Factory Five provides stainless steel letters for the grill. Test fit the letters in the grill.



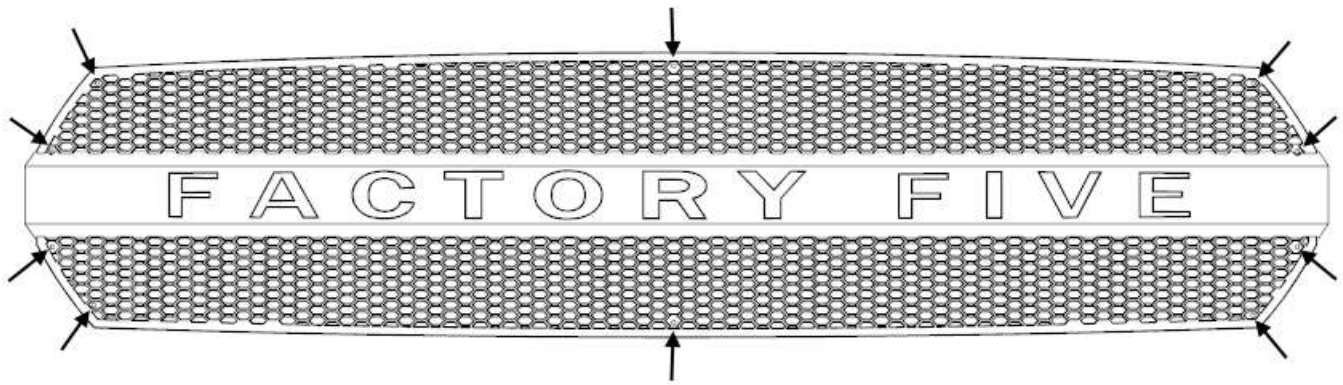
Attach double stick tape to the back side of each of the letters.



Remove the tape backing and push the letters into the grill letter locations.

Clamp the grill in place on the nose.





Use the holes in the grill as a guide to drill the mounting holes for the grill in the nose using a  $\frac{5}{32}$ " drill bit

Engine Bay Aluminum

**RADIATOR SUPPORT TO NOSE**

**Left side**



Position the panel so that it matches the curve of the Radiator Support.





Position the panel

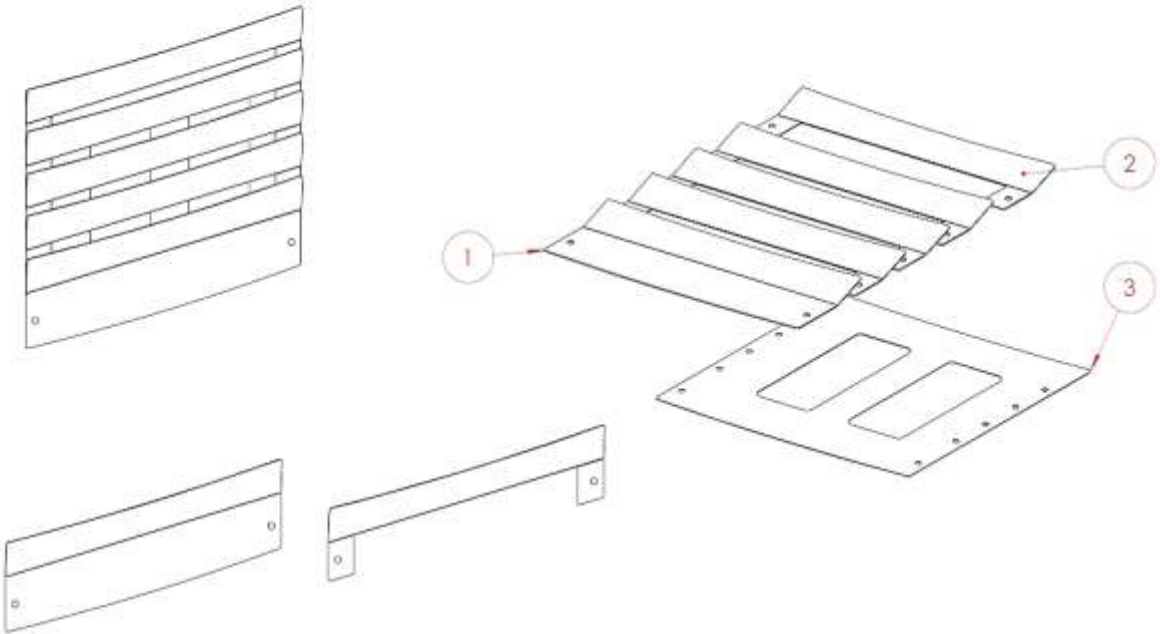



Tighten the  $\frac{1}{4}$ " flange head screws with a  $\frac{5}{32}$ " Hex key.

# HOOD VENTS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70530	LFT FRNT LOUVER	1
2	70533	70533 - LEFT LOUVER	4
3	70535	LOUVER TEMPLATE	1

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/5/23	



PRELUNNEY	UNLESS OTHERWISE SPECIFIED	TIME	DATE	 <b>Factory Five Racing, Inc.</b>
	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL +0.01 THREE PLACE DECIMAL -0.005 FOUR PLACE DECIMAL +0.001	DRAWN JS	5/10/23	
	MATERIAL: <b>1/8 GA 304 STAINLESS STEEL</b>			SIZE <b>A</b> DWG. NO. <b>LOUVER</b> REV <b>A</b>
BUILT ON APPLICATION		PRINTED 6/5/2023	SCALE: 1:5 WEIGHT:	SHEET 2 OF 2

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Place the template on top of the hood in the vent area and drill the 1/4" holes in the template.





Starting at the back, bolt each piece of the louver through the hood using the ¼" black button head screws.

REAR FENDERS











TAIL LIGHTS



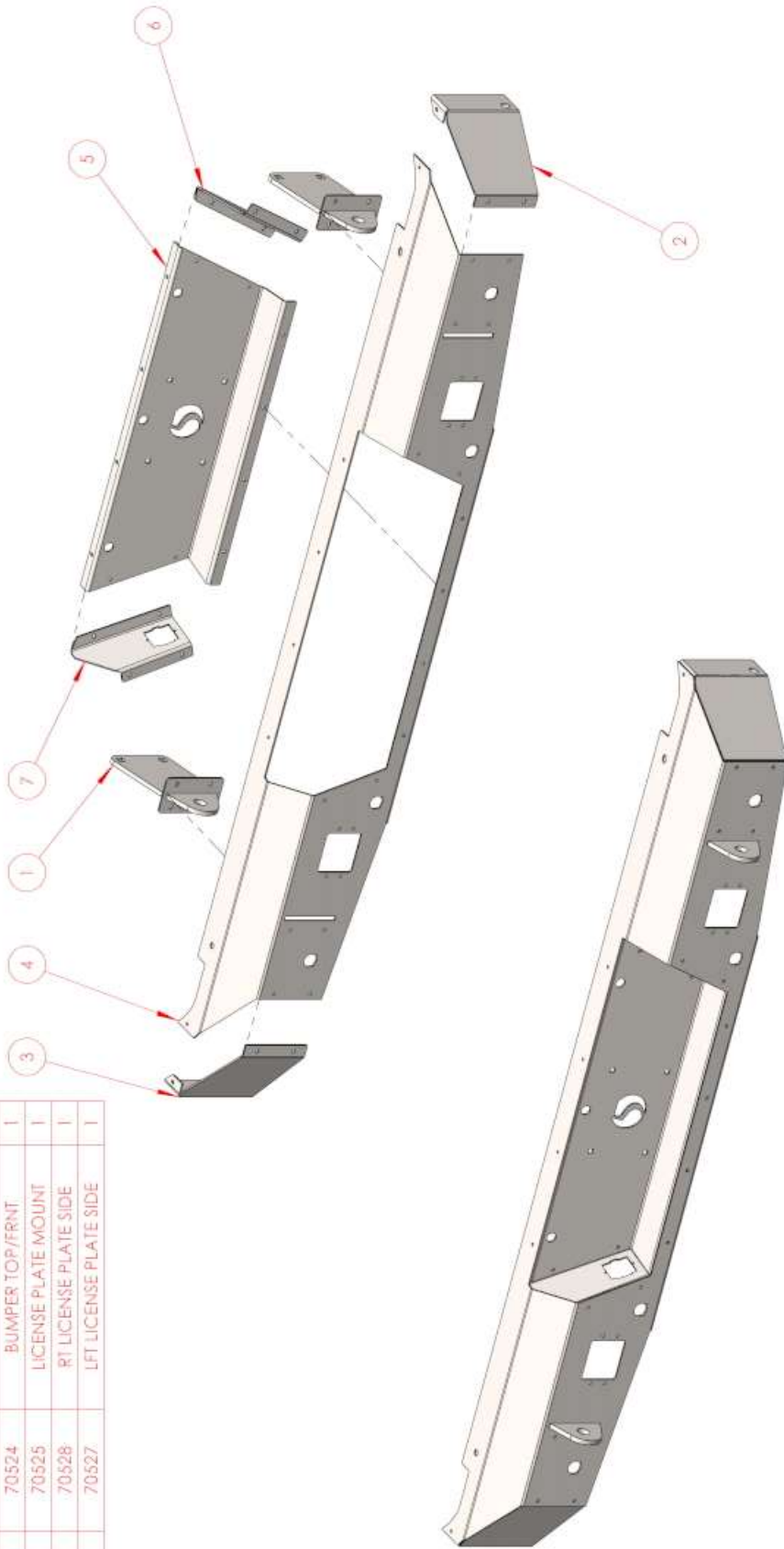




REAR BUMPER

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70518	BUMPER MOUNT	2
2	70523	RIGHT SIDE	1
3	70522	LEFT SIDE	1
4	70524	BUMPER TOP/FRNT	1
5	70525	LICENSE PLATE MOUNT	1
6	70528	RT LICENSE PLATE SIDE	1
7	70527	LFT LICENSE PLATE SIDE	1

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/11/23	



UNLESS OTHERWISE SPECIFIED:	DRAWN	NAME	DATE
DIMENSIONS ARE IN INCHES	JL		4/14/22
TOLERANCES:	COMMENTS:		
TWO PLACE DECIMAL ±0.01			
THREE PLACE DECIMAL ±0.003			
FOUR PLACE DECIMAL ±0.001			
MATERIAL:			
FINISH:			
USED ON:			
APPLICATION:			
		PRINTED	9/7/2023
		SCALE:	1:12 WEIGHT:
			SHEET 1 OF 2

**Factory Five Racing, Inc.**

**5**

TITLE: SHEETMETAL REAR BUMPER PARTS

SIZE DWG. NO. **A 70280** REV **A**

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Assemble the bumper except for the bumper mount using the 1/4" black button head screws, locknuts and 5/32" hex key leaving the locknuts just loose enough for the parts to slide around until all parts are assembled.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	70018	BUMPER MOUNT	2
2	10802	1/4" NYLON INSERT LOCKNUT	3
3	34364	1/4"-20 x 2/4" BLACK BUTTON HEAD BOLT	34
4	33487	1/2" x 1.50" CARRIAGE BOLT	4
5	10834	1/2"-13 NYLON INSERT LOCKNUT	4
6	10984	#14 x 1/2" SCREW	2
7	70093	BACK-UP SENSOR MOUNT	4
8	70063	REVERSE LIGHT	2
9	13774	LICENSE PLATE 1/4" NUT	2
10	70202	RED MARKER LIGHT	3
11	LICENSE PLATE LIGHT	GRAM F150 LICENSE PLATE LIGHT	2

REV	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/11/23	

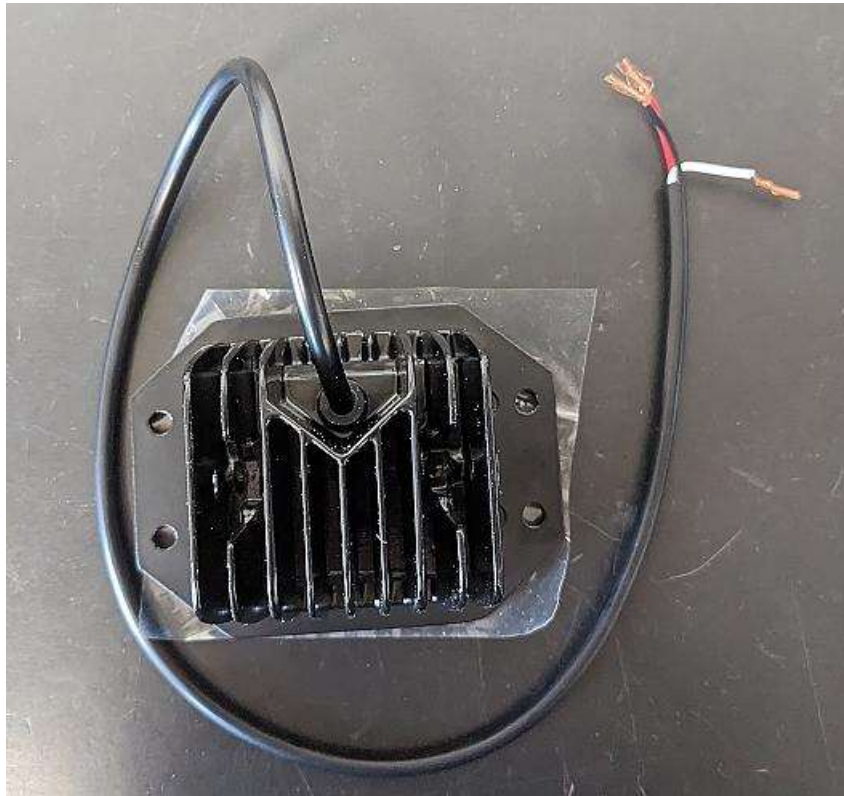
PRE-RUNNER	UNLESS OTHERWISE SPECIFIED	DATE	4/4/22
	DIMENSIONS ARE IN INCHES	DRAWN	JL
	TOLERANCES:	COMMENTS:	
	TWO PLACE DECIMAL ±.010		
	THREE PLACE DECIMAL ±.005		
	FOUR PLACE DECIMAL ±.001		
	MATERIAL:		
	FINISH:		
USED ON	PRINTED	6/29/2023	
APPLICATION			

<b>SHEETMETAL REAR BUMPER PARTS</b>	
SIZE	DWG. NO.
<b>A</b>	<b>70280</b>
REV	
<b>A</b>	
SCALE: 1:10	WEIGHT:
	SHEET 2 OF 2

Push the 3/4" red lights into the bumper  
 Push the license plate plastic nuts into the bumper



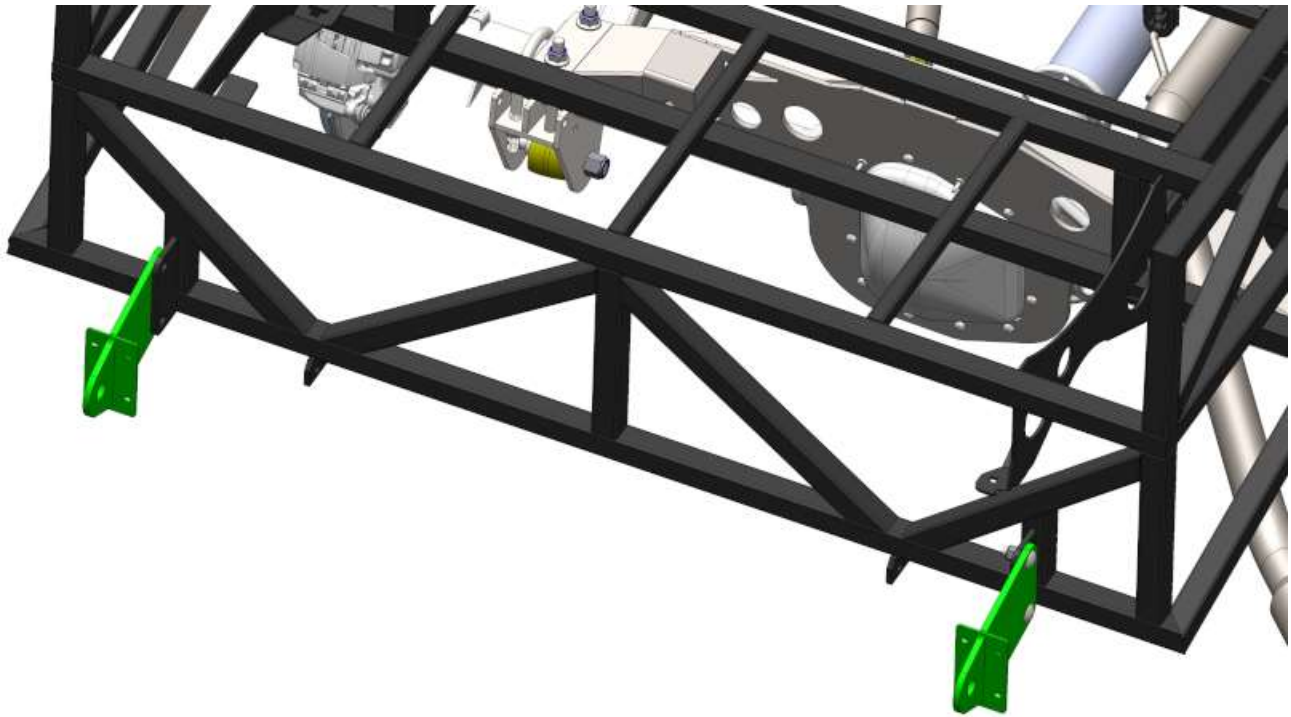


Install the reverse lights into the bumper using the ¼" button head screws and locknuts.

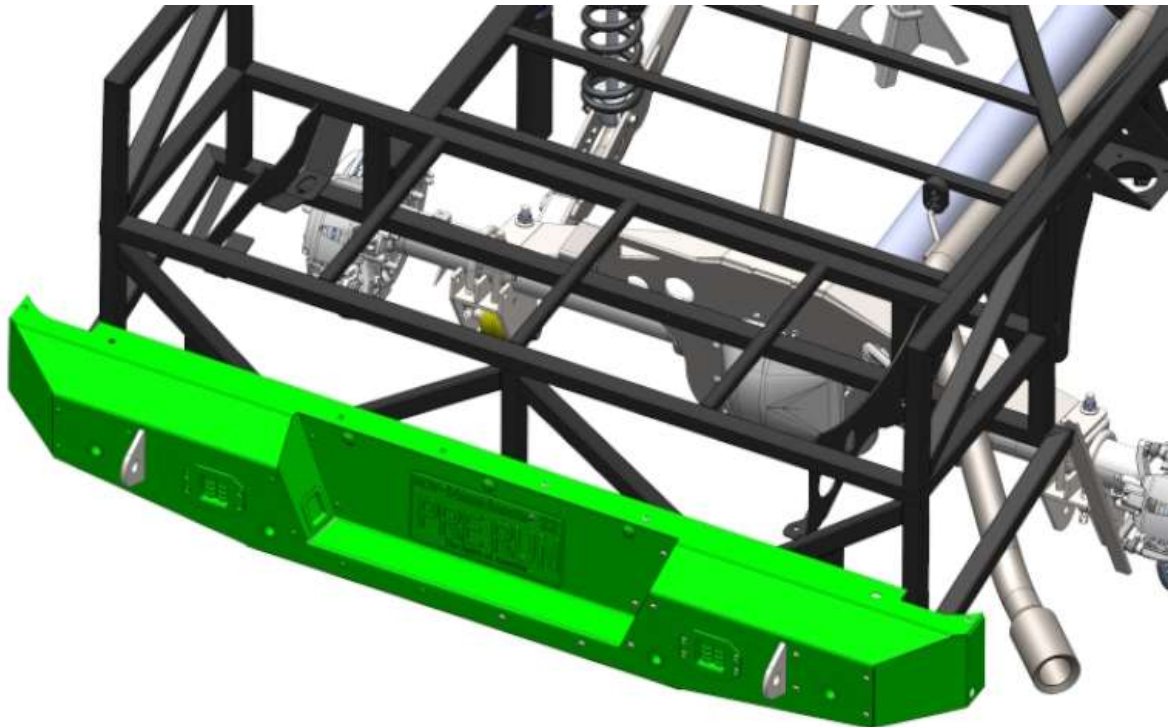
Install the OEM license plate lights

Install the included back-up sensor mounts into the bumper.

If the F-150 was equipped, install the OEM back-up sensors into the sensor mounts. If not equipped with back-up sensors, install the included hole plugs into the sensor mounts.



Attach the bumper mounts to the outside of the frame mount using the 1/2" carriage bolts and locknuts.



Attach the bumper to the bumper mounts using the 1/4" black button head screws and locknuts.



If desired, silicone the aluminum behind the Factory Five in the tailgate bar so that the Factory Five stands out more.

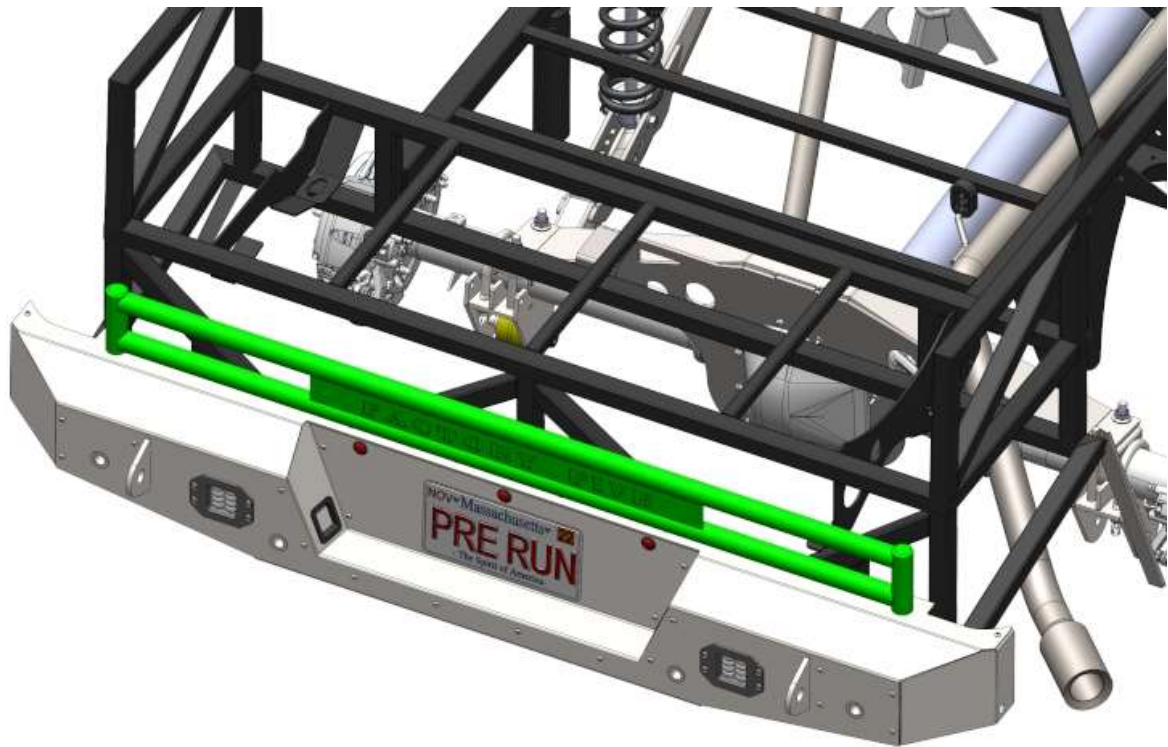
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	70537	TAILGATE BARS	1
2	70541	TRIM PANEL COVER	1
3	70543	1.50" OD PLASTIC END CAP	2
4	10833	1/2"-13 x 1.20" BOLT	2
5	10834	1/2"-13 NYLON INSERT LOCKNUT	2

REV.	REVISION	DATE	APPROVED
A	INITIAL RELEASE	5/10/23	

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UNLESS OTHERWISE SPECIFIED:		NAME	DATE
PRE RUNNER	DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL .2500 THREE PLACE DECIMAL .0005 FOUR PLACE DECIMAL .0000	JL	5/10/23
MATERIAL:		COMMENTS:	
FINISH:		TITLE: <b>Factory Five Racing, Inc.</b>	
USED ON:		TAILGATE BAR PARTS	
APPLICATION:		SIZE <b>A</b>	DWG. NO. <b>70542</b>
PRINTED: 6/29/2023		REV <b>A</b>	
		SCALE: 1:6	WEIGHT:
		SHEET 1 OF 1	





Attach the tailgate bars to the bumper using ½” x 1.25” bolts and locknuts then push the plastic tube cap into the ends of the tube.

## BED 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.
-  If installing the tailgate with backup camera, install the tailgate first so you can have the wires coming out in the desired location.
-  Do not mount or attach the top/rear fuel tank cover until the bumper and all the sensors on it are connected. The wiring harness may need to be repositioned.

The panels should all be marked where the frame tubes touch during kit disassembly.  
Mark the 3” rivet spacing on the panel where the tubes will sit.



Drill the panel where marked.

# ORDER OF INSTALLATION

REV.	DESCRIPTION	DATE	APPROVED

**Factory Five Racing, Inc.**

**5**

**TITLE: BED ALUMINUM**

SIZE: **A** DWG. NO.: **Prerunner** REV: **A**

SCALE: 1:12 WEIGHT: SHEET 3 OF 3

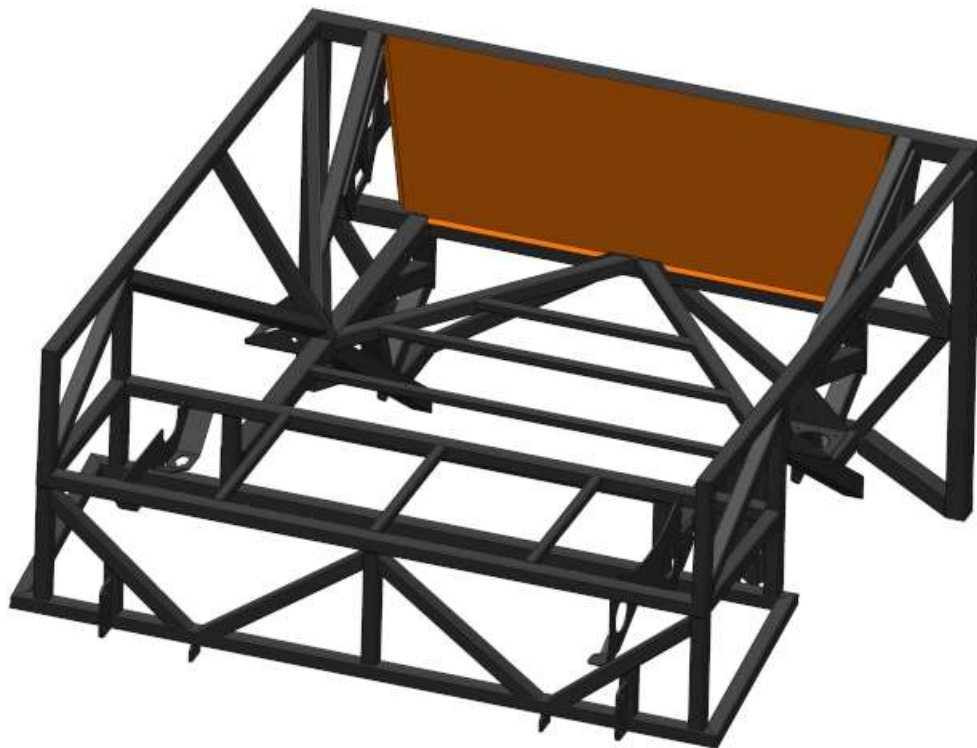
UNLESS OTHERWISE SPECIFIED:	DRAWN	NAME	DATE	COMMENTS:
DIMENSIONS ARE IN INCHES:			8/11/21	
TOLERANCES:				
TWO PLACE DECIMAL ±0.01				
THREE PLACE DECIMAL ±0.005				
FOUR PLACE DECIMAL ±0.001				
MATERIAL				
FINISH				
USED ON				
APPLICATION			11/13/2023	PRINTED

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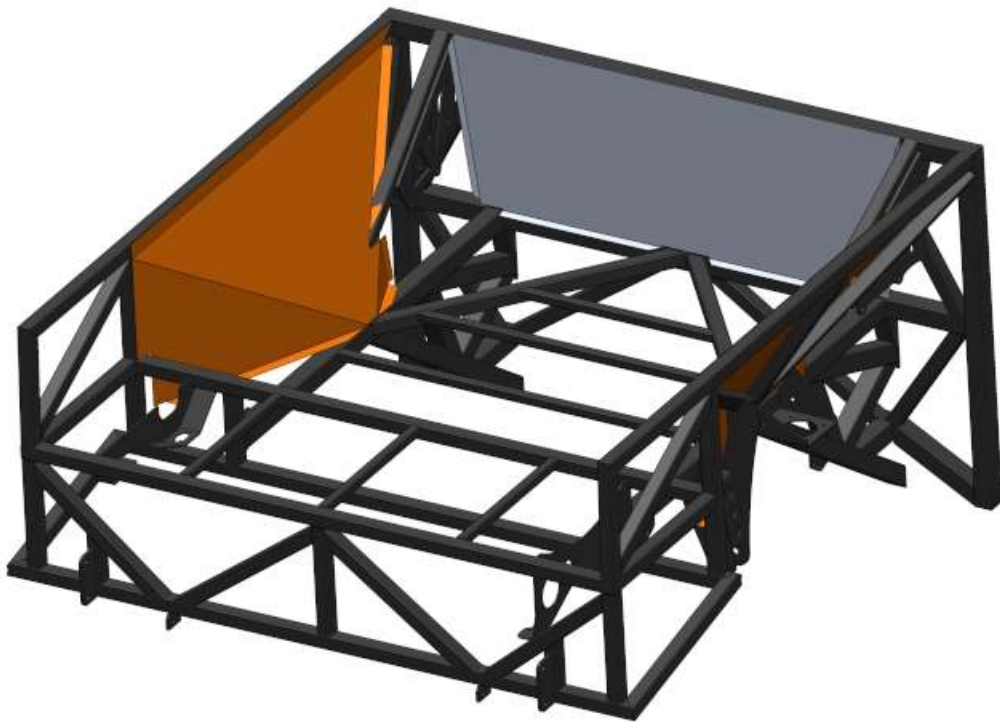
Silicone the frame where the front bed panel will attach.



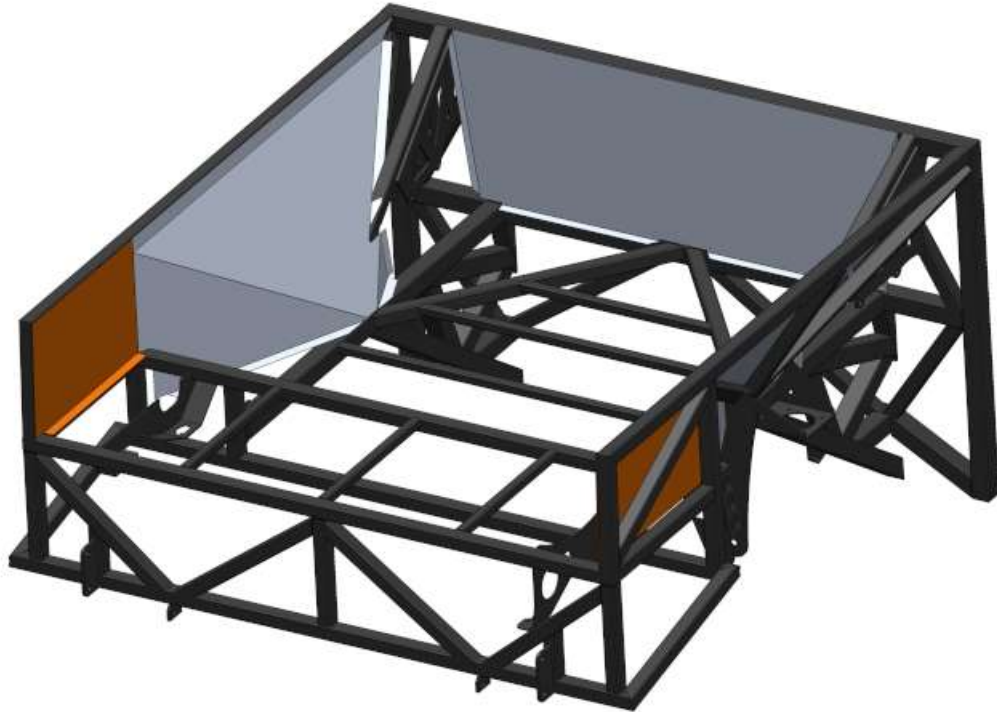
Position the front bed panel.



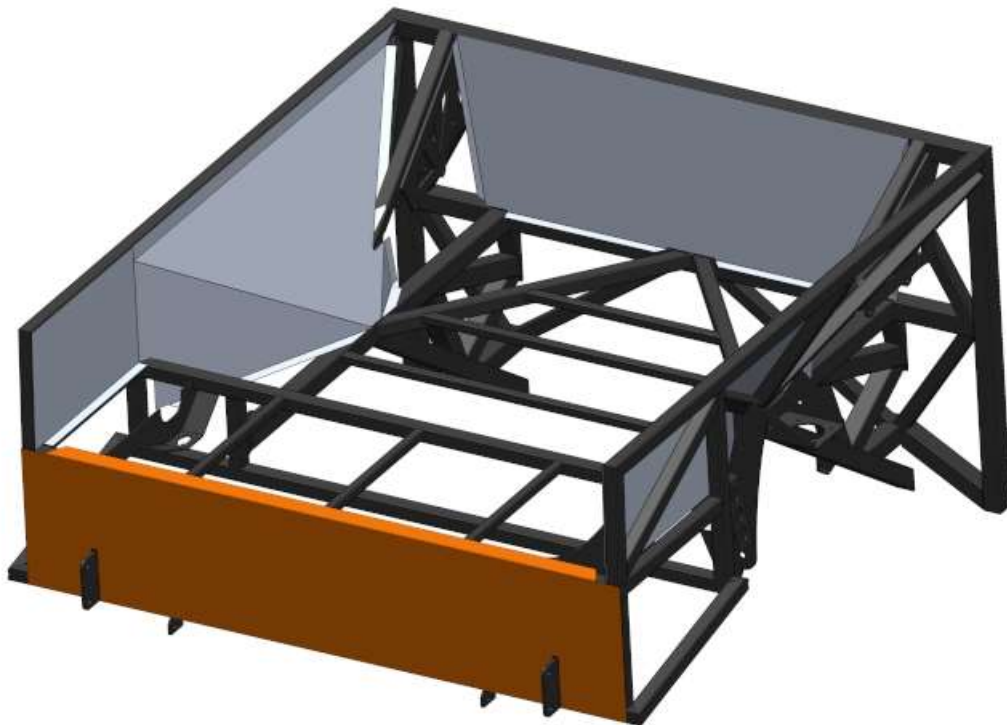
Drill and rivet the panel in place using 1/8" rivets.



Attach the Bed sides

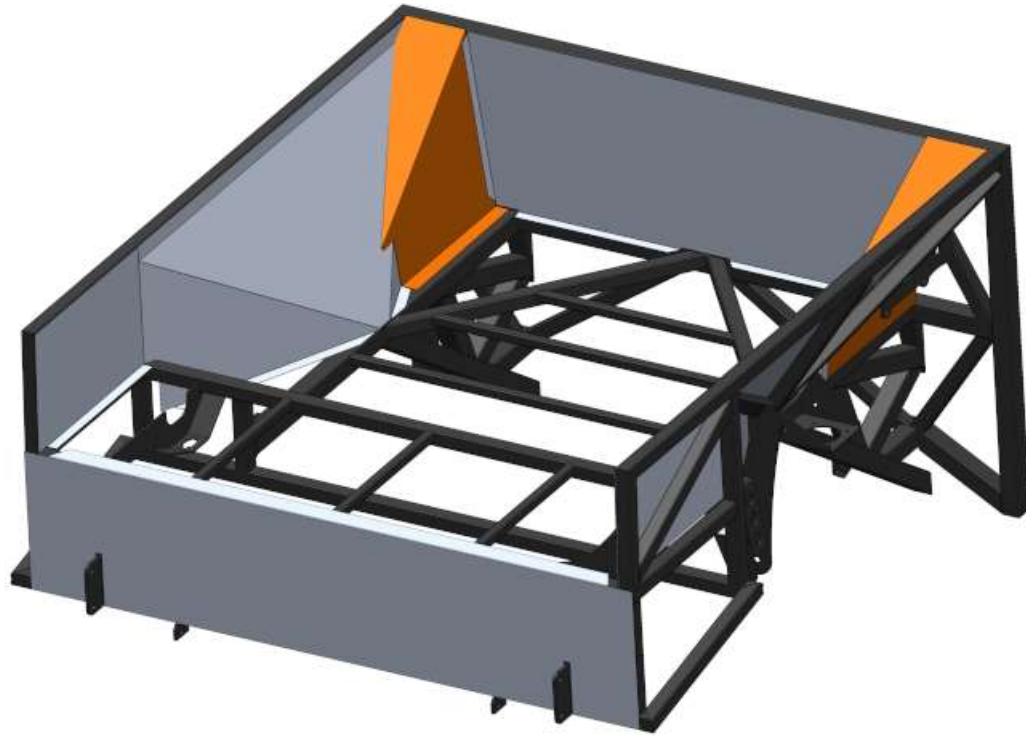


Attach the rear bed sides.

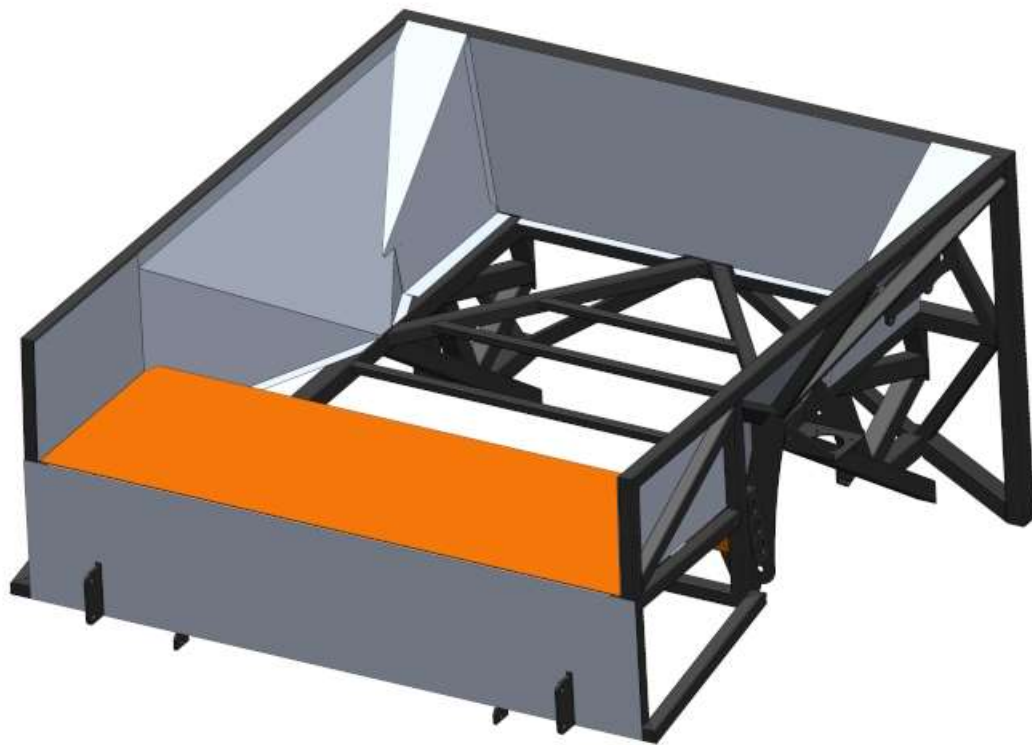


Attach the Bed/Fuel tank rear cover.

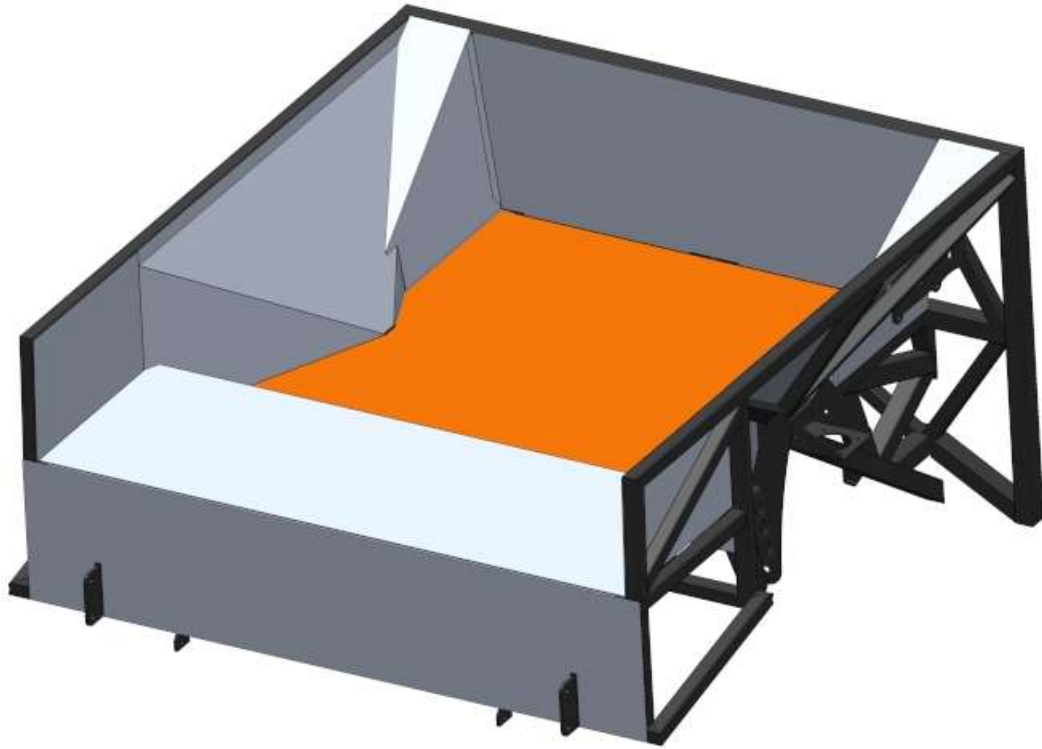




Attach the Rear shock covers.



Attach the rear bed floor.



Attach the bed floor.

## STREET TAILGATE

Disassemble the OEM tailgate, retaining the striker bolts and latches, handle and actuator, metal rods going to each latch as well as from the handle to the actuator, and wiring. Retain all hardware.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70545	LATCH BRACKET	2
2	70540	TAILGATE FRAME	1
3	70547	TAILGATE HINGE PARTS	2
4	70548	TAILGATE INSIDE COVER	1
5	70549	TAILGATE BOTTOM COVER	1
6	19962	M14-2.0 x 100MM FLANGE HEAD BOLT	2
7	70572	M8-1.25 LOCKNUT	1
8	84364	1/4"-20 x 3/4" BLACK BUTTON HEAD BOLT	4
9	25862	1/4"-20 X 1.5" BUTTON HEAD BOLT	2
10	10822	1/4" NYLON INSERT LOCKNUT	2
11	7057A	TAILGATE CORNER BRACKET	2

REV.	REVISION DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/16/23	

<b>PRE RUNNER</b> DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	UNLESS OTHERWISE SPECIFIED:	NAME	DATE
	MATERIAL: FINISH: USED ON: APPLICATION:	DRAWN: COMMENTS:	

<b>Factory Five Racing, Inc.</b> TITLE: TAILGATE PARTS	
SIZE <b>A</b> DWG. NO. <b>70559</b>	REV
SCALE: 1:10 WEIGHT:	SHEET 1 OF 1

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PRINTED: 10/27/2023

Assemble the street tailgate as shown above. There is a bracket on each side to bolt on the OEM latches that will latch the striker bolts. On the bottom, bolt the entire hinge assembly to the tailgate. Inside, the OEM handle bolts to the upper slots, and the actuator bolts to the lower slots. For power tailgate trucks, the distance between these two is not critical, so just adjust the actuator up or down in the slots such that the rods operate smoothly to open the latches. For manual tailgate trucks, the metal rod goes between the handle and actuator, so set the handle height to make the tailgate fit well on the truck and then the actuator will be located by the rod. NOTE: the OEM rods may need to be straightened and re-bent or trimmed to fit YOUR truck depending on how you set up your tailgate fitment.

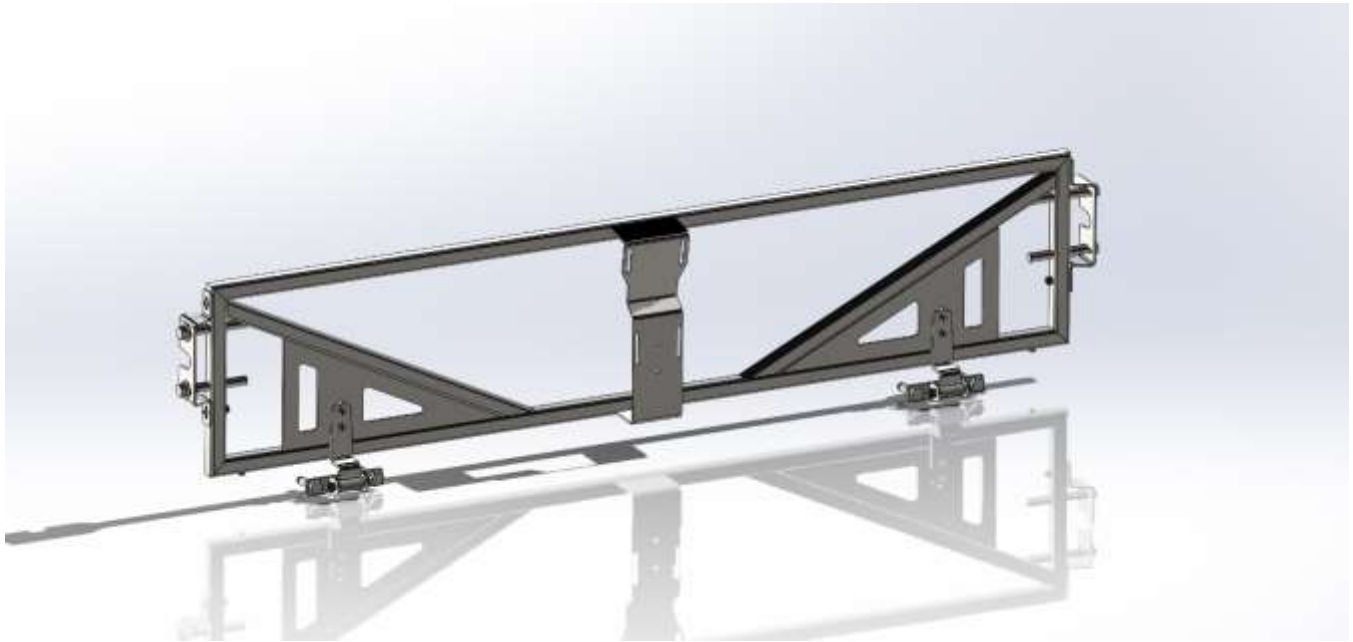




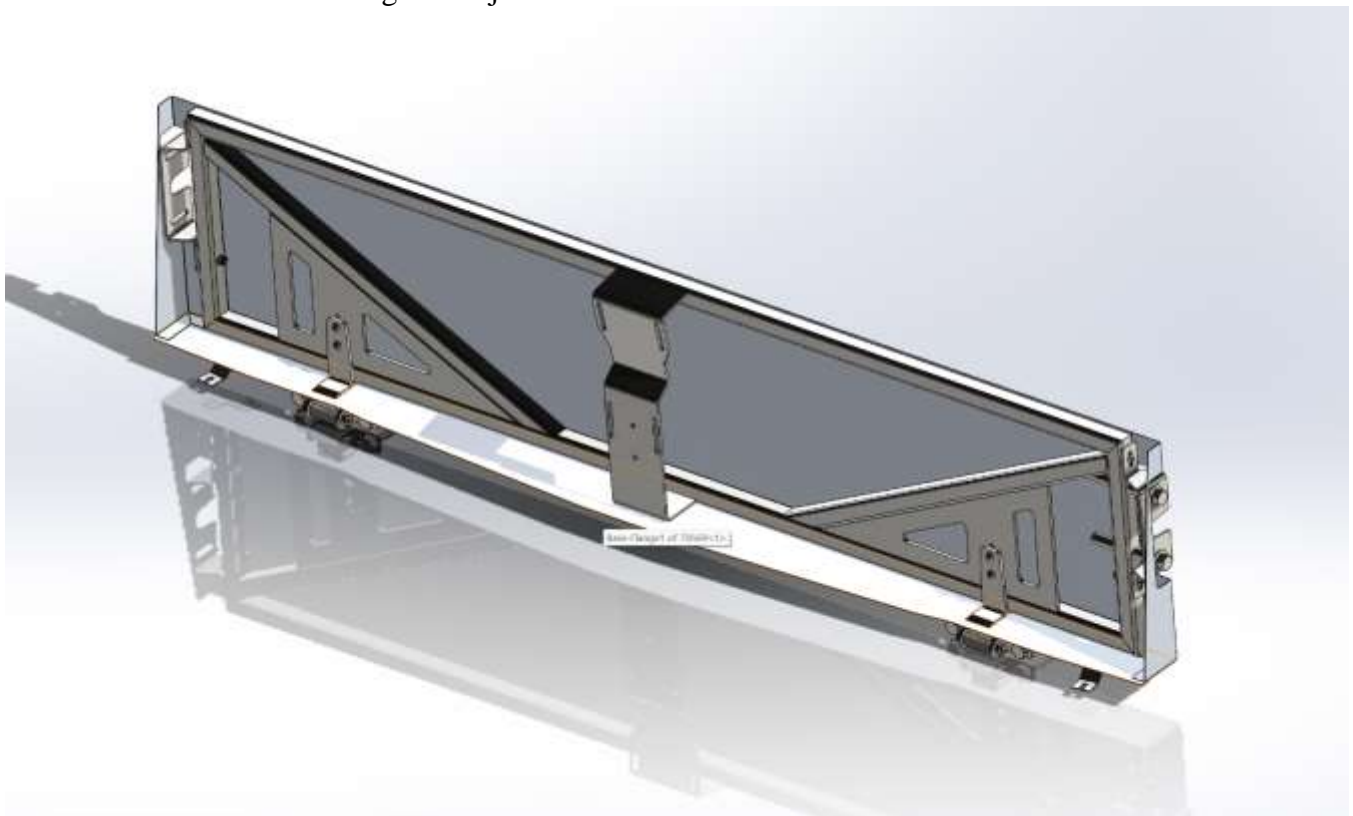
The OEM latches need trimmed to avoid sticking up past the inside surface of the tailgate.



Assembling the whole hinge assembly will make it easier to properly mount to the truck frame. This will maintain the proper distance between hinges and make sure the hinge sleeve is concentric to the hinge mount holes.



Above is a fully assembled tailgate ready to put on the truck. Sandwich the fiberglass tailgate between the OEM handle and the tailgate structure, and adjust to fit properly. Mount the entire assembly on the truck, taking time to set side-to-side distance, up-and-down adjustment and swing action. Everything is slotted to allow for fine-tuning and adjustment.



Add the laser cut aluminum cover to the inside of the tailgate and bottom edge. Rivet to the tailgate frame and add the bottom tabs to pull the bottom fiberglass corners to your desired look. Note that once the covers are in place, you will lose access to the handle and actuator adjustment, so make sure everything functions as desired.







Attach the provided lanyards by holding the tailgate parallel to the ground (90° from fully closed), and hold it in place using a piece of 2x4, metal, etc while you drill and tap a hole for the lanyard bolt. This should get mounted to the 2x2 metal tube at the top of the bed, NOT to the sheet metal only. The other end of the lanyard attaches to the back of the bottom bolt holding the latch to the tailgate. Repeat on the other side so both lanyards are equally supporting the tailgate when fully opened.





For power tailgates you will need to drill and grommet a hole for the harness to pass through.

### Front Wheel well Aluminum

- 📦 Box 10 Packaged Aluminum, #8 Screws, Box 6 Body Finish components
- 🔧 Drill, 1/4" nut driver



**LEFT SIDE**



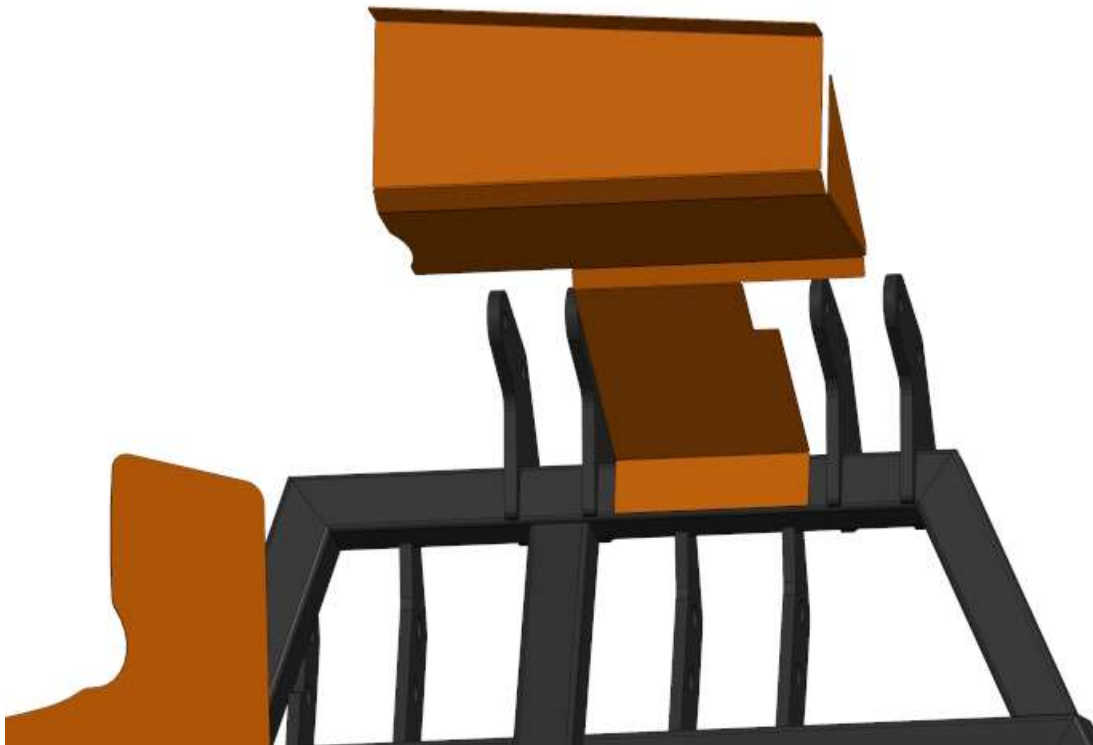
Attach the left rear engine bay side panel to the chassis between the shock mounts going over to the Radiator support.



Attach the left front engine bay side panel to the rear panel closing off the engine bay from the wheel.

Add the black edge trim wherever the panel comes close to wires or cables to prevent any damage.

**RIGHT SIDE**



Attach the right engine bay cover to the inside of the wheel area above the shock/tire.



This panel is important and will save your wiring and computer if off-roading the truck. Notice the tire marks on the radiator support as well.

## **REAR**

Push weatherstripping onto the outside edge of the front wheel well rear splash panel.





Attach the splash panel to the Cab bracket that is half way up the panel and a 1/4" black button head screw and locknut.

## Rear Wheel well Aluminum

- ☞ Box 10 Packaged Aluminum, #8 Screws, Box 6 Body Finish components
- ✂ Drill, 1/4" nut driver

Push weatherstripping around the outside edge of the rear splash guard.

Push weatherstripping around the outside edge of the front splash guard.



Attach the rear splash guard to the front of the fuel tank tubes on the chassis using #8 screws.




Attach the splash guard to the fender at the bottom.



Push the front splash guard into the space between the fender and frame so that the panel is flush with the front of the fender when viewed from the outside.



# FINISHING TOUCHES

## Ride Height

-  Tape measure
-  Make sure that the truck is at the correct ride height before the alignment procedure is done.
-  Ride height is adjusted by lowering or raising the spring seat on the coil-over shock.

Set the ride height to the desired height. Standard ride height is 11” measured from the ground to the bottom of the frame. This can be changed up to 4” higher or 2” lower for the desired look.

Tighten the spring seat using a hex key

-  Check the ride height on both sides of the truck at the front and rear of the frame.
-  If the ride height is changed after an alignment, the alignment must be redone.

## Alignment

Take your truck to an alignment shop and have the truck aligned.




Use modified 2015 F150 specs:

Caster 4.50° to 5.00°

Camber -0.50° to -0.75°

Total Toe  $-\frac{3}{16}$ ”

## Headlight Alignment

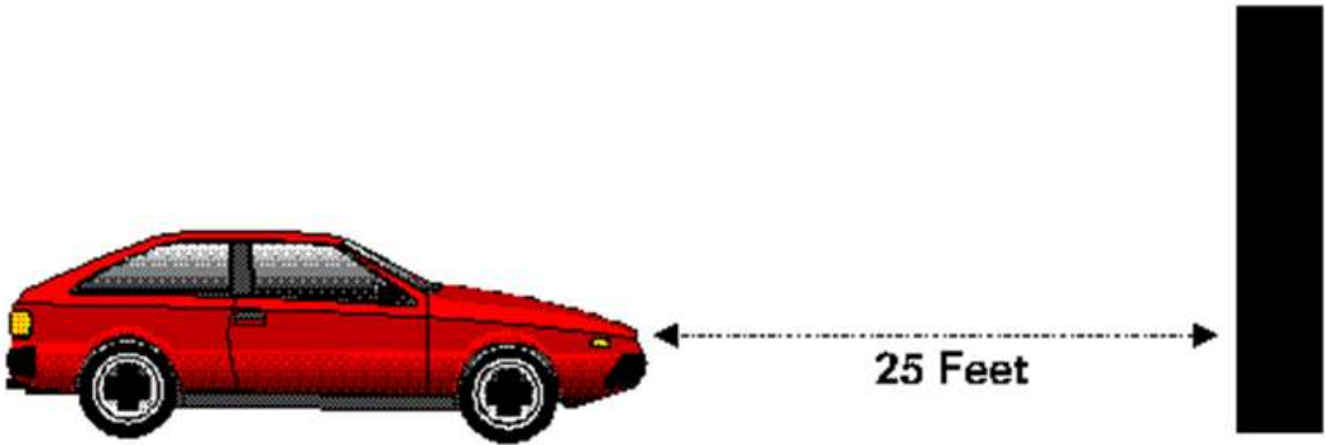
-  Masking tape, marker, tape measure
-  Make sure that the truck is at the correct ride height before the alignment procedure is done. Standard ride height is 11” measured to the bottom of the frame. This can be changed up to 4” higher or 2” lower.
-  It is important that the headlights are aimed properly 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.





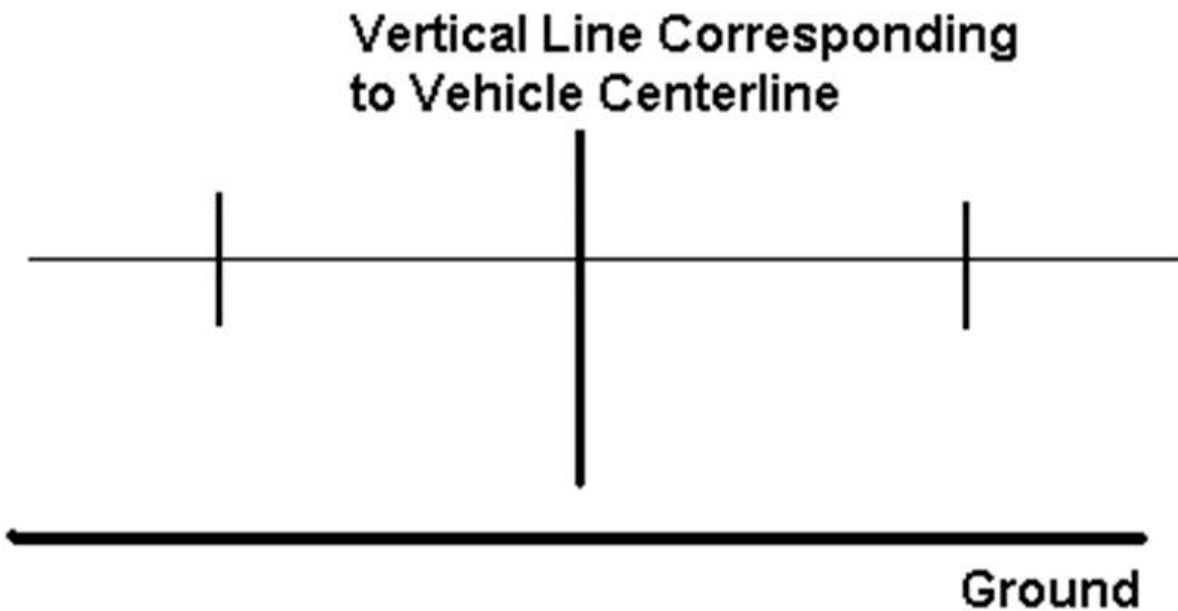
Pull the truck straight back until the headlights are 25 feet from the wall.

Make the following two measurements and write them down:

**Measurement A:** From the ground to the geometric center of one of the headlight lenses

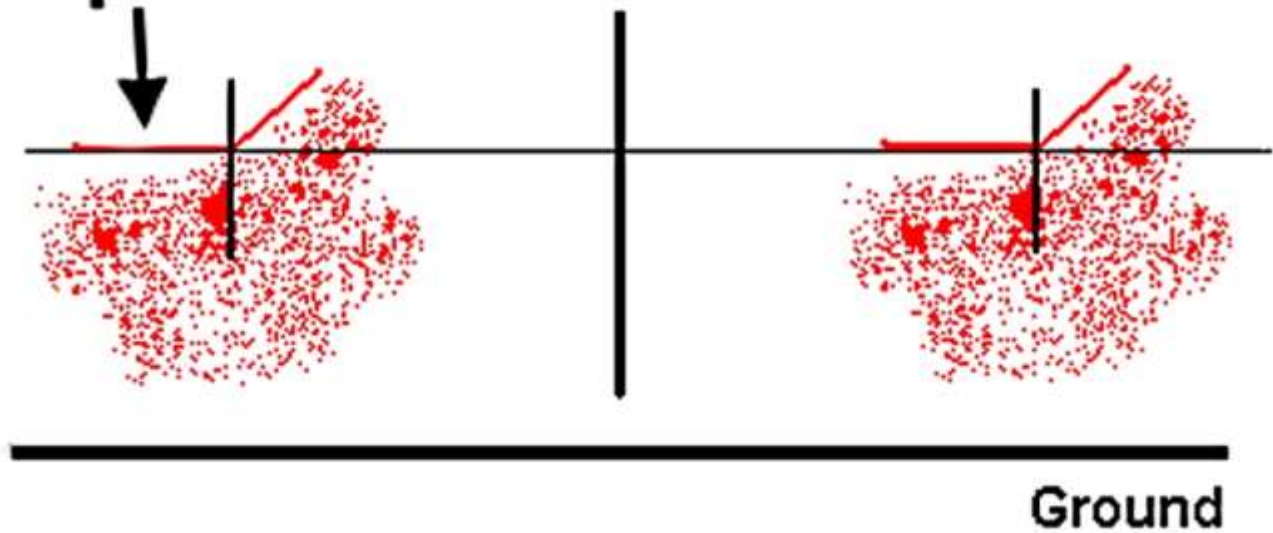
**Measurement B:** From one of the low beam headlights to the vehicle centerline.

With 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.

# Top Cutoff



Turn the headlights on and adjust the vertical aim of the headlights so that the top horizontal cutoff of each of the beams is located along the horizontal line drawn on the wall.

Adjust the horizontal aim of the low beam headlights so that the point at which the top cutoff of the beam begins to slope upwards is located at the vertical marks.

## Appendix A – Maintenance

Check the items on a yearly basis or sooner depending on how hard the truck is driven.

### Steering

- Rack mount bolts tight \_\_\_\_\_
- Tie Rod extension to Outer tie rod nuts tight \_\_\_\_\_
- Outer Tie rod to spindle nut tight \_\_\_\_\_
- Steering free lock to lock \_\_\_\_\_

### Front Suspension

- Ride height \_\_\_\_\_
- Front wheel bearings tight \_\_\_\_\_
- Upper and lower ball joint nuts tight \_\_\_\_\_
- Upper control arm to frame bolts tight \_\_\_\_\_
- Upper control arm jam nuts tight \_\_\_\_\_
- Lower control arm bolts tight \_\_\_\_\_
- Shock mounting bolts tight \_\_\_\_\_
- Spring collar set screw snug \_\_\_\_\_
- Tire pressure set \_\_\_\_\_
- 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 \_\_\_\_\_
- Reservoir full \_\_\_\_\_
- Flexible lines tied up and undamaged \_\_\_\_\_

### 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 \_\_\_\_\_
- Upper control arm to frame bolts tight \_\_\_\_\_
- Upper control arm jam nuts tight \_\_\_\_\_
- Lower control arm bolts tight \_\_\_\_\_
- Shock mounting bolts tight \_\_\_\_\_
- Spring collar set screw snug \_\_\_\_\_
- Tire pressure set \_\_\_\_\_
- Lug nuts tight (90 lb-ft) \_\_\_\_\_

### Engine

- Oil level checked/changed/cap tight \_\_\_\_\_
- Water level checked including reservoir \_\_\_\_\_
- Belts tight \_\_\_\_\_
- Engine mount nuts tight \_\_\_\_\_
- Fuel lines no leaks under pressure \_\_\_\_\_
- No coolant or oil leaks \_\_\_\_\_
- Exhaust tight \_\_\_\_\_



## Appendix B - F-150 parts needed

Front Spindles & brakes (left & right)	_____
Steering rack, shaft and fasteners	_____
Radiator & hoses	_____
Grill shutter motor	_____
A/C Condenser & lines	_____
Brake lines - All hard lines	_____
E-brake cables (2015-2017)	_____
ABS module & bracket	_____
Fuel lines - All	_____
Fuel vapor lines and canister & fasteners	_____
Fuel tank - 26 gallon tank, straps & fasteners	_____
Fuel door housing and filler pipe	_____
Engine/Transmission/Transfer case	_____
Rear axle & brakes	_____
F150 Super Cab - 2015 up to 2020	_____
Wiring harness - Complete with all sensors	_____
Cab mounts - Complete with fasteners	_____
License plate lights	_____
Tail lights	_____
Battery	_____

Save all fasteners removed.

## Appendix C - Wheels

Optimum wheel specs: 17x9/20x9 with +25mm offset front and 17/20 x 10 -75mm offset rear

Most rear wheels will need spacers to get to -75mm offset.

Wheels with different offsets available in the same design that require a wheel spacer:

	FRONT	OFFSET	REAR	OFFSET
XD Wheels XD811 ROCKSTAR	20x9	30	20x10	-24
Fuel Convert or Fuel Beast	20x9	20	20x10	-18
Alloy ION 143	20x9	25	20x10	-19
Method 305	20x9	18	20x10	-18
Anthem Havoc/Intimidator	20x9	18	20x10	-18/-24
Raceline Clutch/Gauge/Scout	20x9	18	20x10	-18

## Appendix D – 3.5L Ecoboost Capacities/Specs

### CAPACITIES AND SPECIFICATIONS - 3.5L ECOBOOST™

#### Capacities

#### WARNING



The air conditioning refrigerant system contains refrigerant under high pressure. Only qualified personnel should service the air conditioning refrigerant system. Opening the air conditioning refrigerant system can cause personal injury.

Item	Capacity
Engine oil - 5W-30	6.0 qt (5.7 L)
Engine coolant - Orange	15.6 qt (14.75 L)
Brake fluid - DOT 4	Between MIN/MAX on brake fluid reservoir
Front axle fluid (Four-wheel drive)-80W-90	3.5 pt (1.7 L)
Rear axle fluid - 75W-85	5.5 pt (2.6 L)
Automatic transmission fluid*- <b>Mercron LV</b>	13.1 qt (12.4 L)
Transfer case fluid Four-wheel drive (Electronic Shift-on-the-Fly) - <b>XL-12</b>	1.5 qt (1.4 L)
Transfer case fluid Automatic four-wheel drive (Torque on demand) - <b>Mercron LV XT-10-QLVC</b>	1.5 qt (1.4 L)
Windshield washer fluid	Fill as required
Fuel tank	23.0 gal (87.1 L)
A/C Refrigerant - <b>R-134a</b>	1.5 lb (0.68 kg)
A/C Refrigerant Compressor Oil	3.4 fl oz (100.5 ml)

\*Approximate dry fill capacity. Actual amount may vary during fluid changes.



## Appendix E – 5.0L Capacities/Specs

### CAPACITIES AND SPECIFICATIONS - 5.0L

#### Capacities

#### WARNING



The air conditioning refrigerant system contains refrigerant under high pressure. Only qualified personnel should service the air conditioning refrigerant system. Opening the air conditioning refrigerant system can cause personal injury.

Item	Capacity
Engine oil - 5W-20	7.7 qt (7.3 L)
Engine coolant - Orange	15.9 qt (15 L)
Brake fluid - DOT 4	Between MIN/MAX on brake fluid reservoir
Front axle fluid (Four-wheel drive)-80W-90	3.5 pt (1.7 L)
Rear axle fluid - 75W-85	5.5 pt (2.6 L)
Automatic transmission fluid*- <b>Mercron LV</b>	13.1 qt (12.4 L)
Transfer case fluid Four-wheel drive (Electronic Shift-on-the-Fly) - <b>XL-12</b>	1.5 qt (1.4 L)
Transfer case fluid Automatic four-wheel drive (Torque on demand) - <b>Mercron LV XT-10-QLVC</b>	1.5 qt (1.4 L)
Windshield washer fluid	Fill as required
Fuel tank	23.0 gal (87.1 L)
A/C Refrigerant - <b>R-134a</b>	1.5 lb (0.68 kg)
A/C Refrigerant Compressor Oil	3.4 fl oz (100.5 ml)

\*Approximate dry fill capacity. Actual amount may vary during fluid changes.

# Appendix F – Alignment Specifications

	LEFT	RIGHT	TOTAL
Camber	$-0.50^{\circ} \pm 0.25^{\circ}$	$-0.50^{\circ} \pm 0.25^{\circ}$	
Caster	$4.75^{\circ} \pm 0.25^{\circ}$	$4.75^{\circ} \pm 0.25^{\circ}$	
Total Toe	-	-	$0.20^{\circ} \pm 0.20^{\circ}$
Rear Thrust angle	-	-	$0^{\circ} \pm 0.50^{\circ}$

## Appendix G – Torque Specifications

General Bolt torque specifications\*

Thread	SAE English
Zinc Plated	Ft-Lb.
¼”-20	8
5/16”-18	17
3/8”-16	30
7/16”-14	48
½”-13	75
½”-20	83
5/8”-11	100
¾”-18	

Thread	SAE Metric
Zinc Plated	Ft-Lb.
M8	18
M10	33
M12	61
M14	98
M16	120

ATTENTION: Use the following specs in order to torque Stainless Bolts.

#10                      11 ft-lb (132 in-lb)  
 3/8”                      16 ft-lb (192 in-lb)

\*Use above specs unless otherwise noted in the assembly process.



## Appendix H - 2020-2021 differences

- Heavy duty 9.75 Rear axle is 1.67" (42.5mm) wider per side
- Front 4 Body mounts are larger diameter 2.638 inches (67 mm) they don't fit into the frame
- Drivers side motor mount pad is narrower between the casting and bolt holes so the frame mount needed trimming approx .25 inch
- Gen 14 Evap canister changed requires different mounts
- Fuel system plumbing requires 5/8 ID hose
- New ABS housing interferes with driver shock tower
- Cowl plastic needs retrofitting from older gen
- The hood striker and latch are different part numbers
- Gen 14 vapor canister has a different angle on the front and allows mounting to the outer frame on the drivers side after clipping off the tabs that fit into the F150 frame.
- Front upper balljoint needs a different pin, 25006.
- Ford reversed the exhaust flange setup from Gen 13 to Gen 14
- Front Differential - The passenger side has plenty of space between the ears of the bracket to allow for misalignment .
- Front Differential - The drivers side seems like it was slightly misaligned even considering the bushing adjustment as the housing was not centered in the ears of the frame mount.
- Body panel lines do not line up with lines on panels.
- The rack just touches the oil pan. Removed the ribs from the steering rack and now it fits with 1/16 clearance.