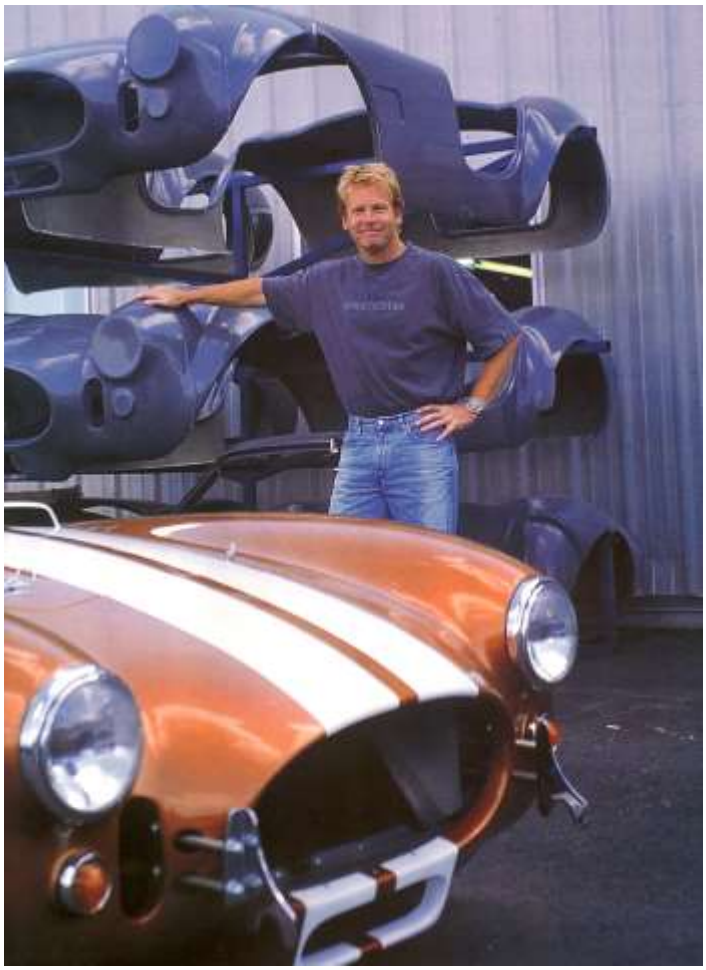
FACTORY FIVE RACING

XTF
Assembly Manual

Contents

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 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

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.

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.

Do not 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.

ICON KEY

- Valuable information
- Tools needed

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

Check the FFR Assembly manual page for the latest revision of this assembly manual.

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

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 ⅛" 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
- (2) 4”x 6” Posts at least 12 feet long

Optional Parts

Factory Five will make new options available. Check Factoryfiveparts.com for the latest parts. Part instructions for all Factory Five parts and options can be found online at:

www.factoryfiveparts.com/instructions/

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.

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.

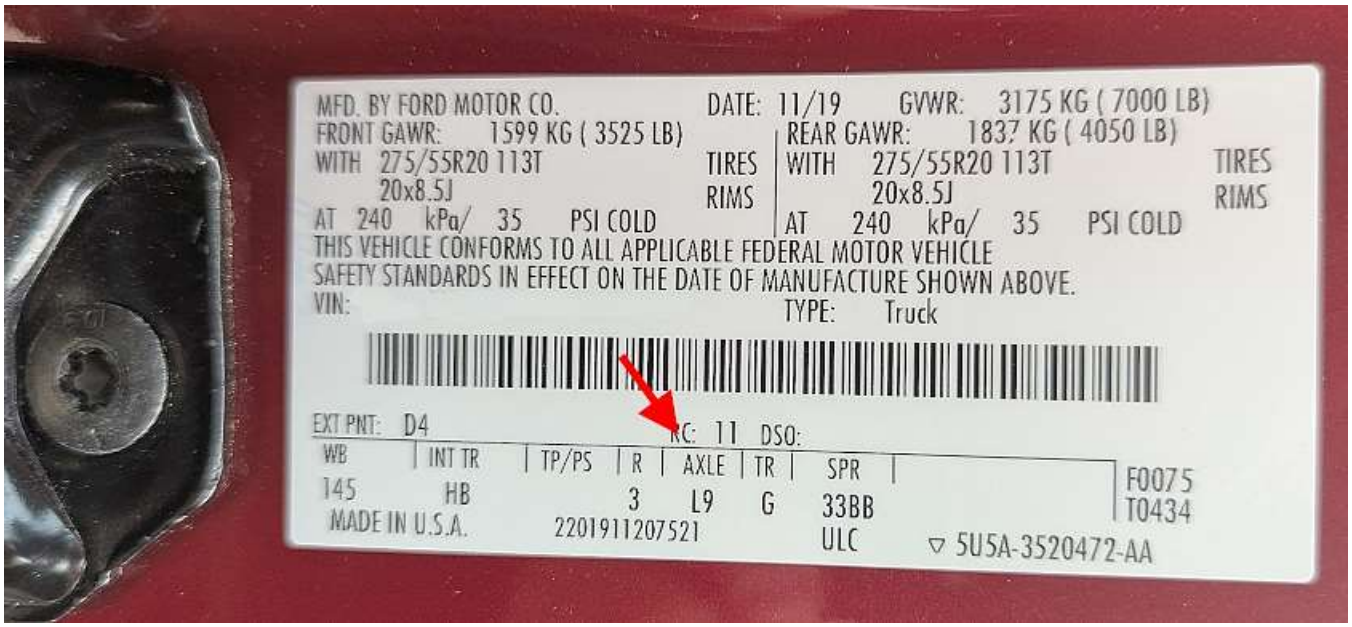
_____ Storage shelves for kit and running gear parts
_____ Body storage area (can be outside)
_____ SAE and metric socket set + 1⅛" socket
_____ Deep sockets for some common sizes are helpful.
_____ Torx star drive bit sockets
_____ SAE Combination wrench set ($^{3}/_{8}$"– $^{15}/_{16}$")
_____ Metric 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 (⅛", $^{3}/_{16}$", $^{7}/_{32}$", ¼", $^{5}/_{16}$", ⅝")
_____ 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' ¾"
_____ Engine hoist
_____ 6' $^{5}/_{16}$" chain (to lift engine)
_____ Trim removal tool
_____ 4 Jack 6000lb truck stands
_____ Sawzall (metal blade)
_____ ¼" & $^{5}/_{16}$" Fuel/brake line bender (hand held)
_____ Torque wrench (Click style, ⅜" drive)
_____ Eye protection
_____ Gloves
_____ The thing between your ears

Finding an F150

The XTF kit is designed to use a 2015-2020 Ford F150 Crew cab truck with 3.5L Ecoboost or 5.0L Coyote Engine.

Gears

We have found the front and rear axle gears in the truck is one area that is good to look at if choosing a truck to buy and build an XTF since most people will install larger tires. A higher gear ratio is preferable, 3.55, 3.73 or 4.10.



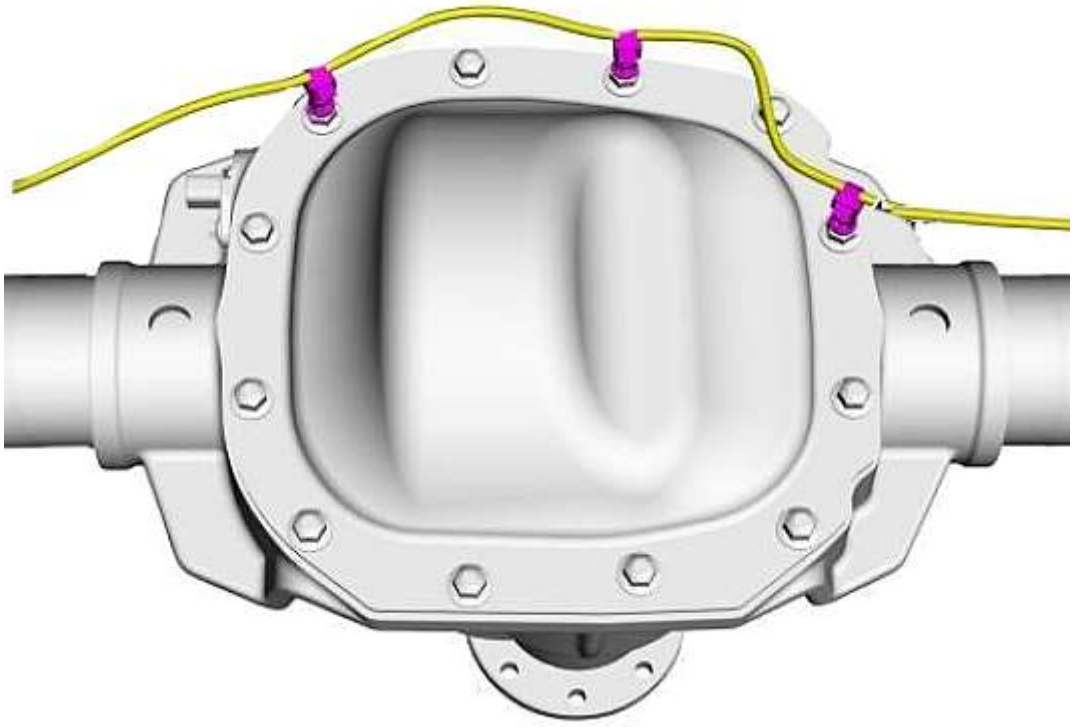
In the driver side door opening, look at the truck ID label. The label above shows “L9”.

REAR AXLE RATIO	NON-LIMITED SLIP	LIMITED SLIP	ELECTRONIC LOCKING
3.15	15	Not Available	L5
3.31	27	Not Available	L3
3.55	19	H9	L9
3.73	26	B6	L6
4.10	Not Available	Not Available	L4

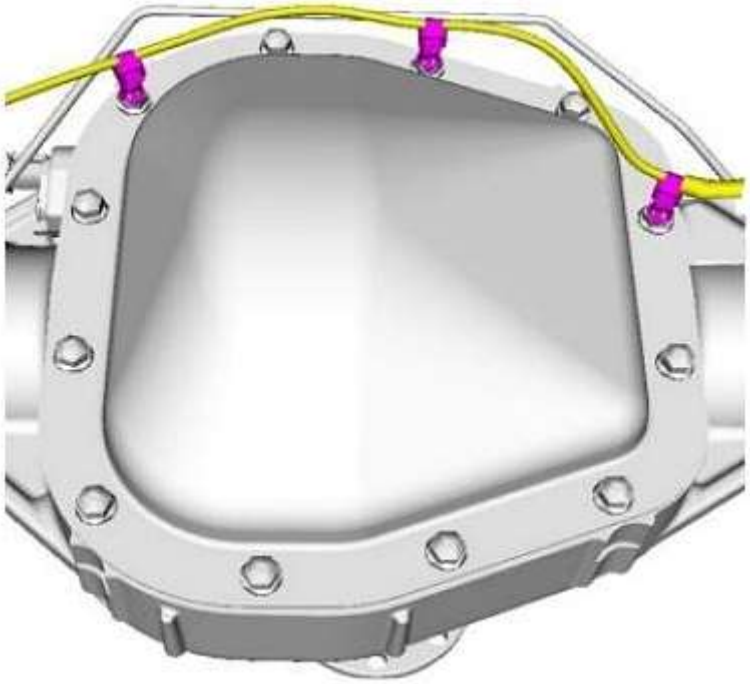
The “L9” shows it is a 3.55 ratio with electronic locking Diff.

Axle type

- The axle type needed by Factory Five in order to provide the correct axle bracket.
- If doing extreme off-roading or high horsepower applications, the 9.75” axle is a better option.



This is a Super 8.8” axle



This is the 9.75” axle

Note the shape differences.

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.

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.

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.

Front Fenders

Remove the front plastic wheel wells.
Remove the front grill.
Remove the front fenders.

Wiring

🛠 10mm socket and ratchet

Unplug the computer plugs in the engine bay.

Check for any remaining connections or grounds from the cab to the frame.

Disconnect the power steering rack and engine from the fuse box on the right fender.

- These connections have unique ends and can only go on in one location later but take a picture if unsure.

Remove the rear harness connection near the master cylinder.

Radiator

Disconnect the hood release cable from the latch.

- Make sure to loosely put the latch back on the support with the same screws, they have a special thread.

Remove the radiator, A/C condenser and support as one piece.

- Make sure to loosely put the lower support screws back in the support, they have a special thread.

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.

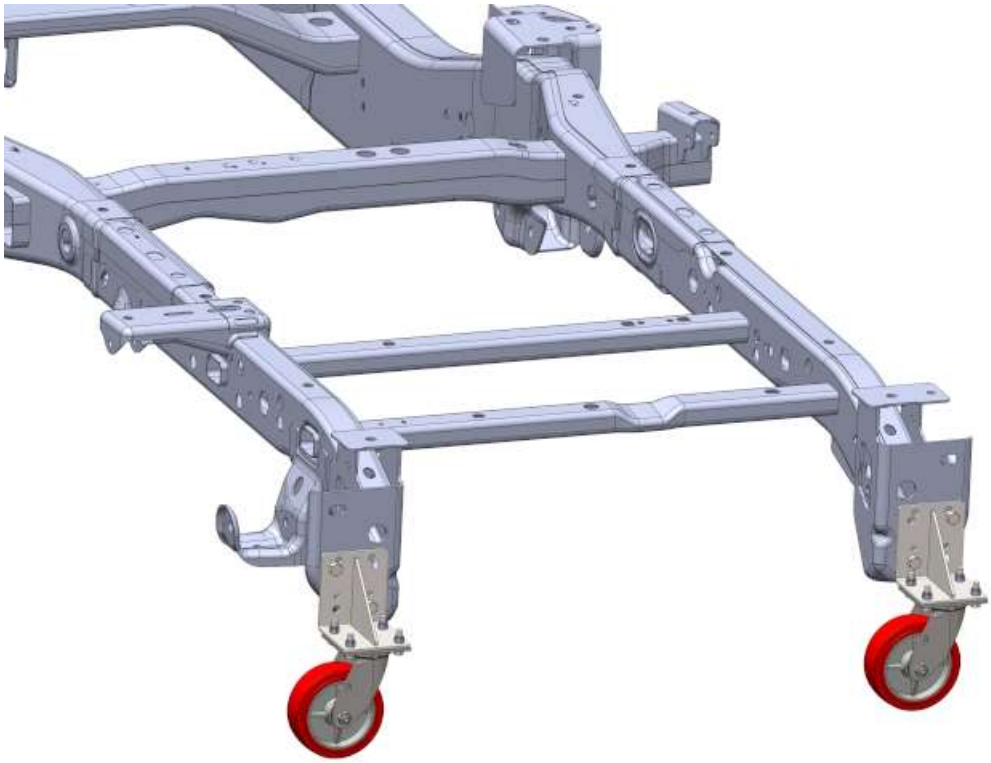
Front Supports

The front cross tube support needs to be cut just inside the front Cab support mounts.

Use a Sawzall to cut the front supports as shown.

Cab Removal

- 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.



Attach two casters to the rear of the F150 frame using the ½”x 1.25” and 1.50” bolts along with a ¾” wrench and socket.

Rear Axle

Remove the rear axle by unbolting the square bolts holding it in. Save the nuts for use with the front differential install.

Fuel

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

Brake

🛠 13mm, 15mm wrenches

Remove the flexible brake lines coming from the master cylinder going to the ABS module.

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.

Engine

🛠 Engine hoist

Remove the engine/transmission/transfer case as one unit using an engine hoist.

Wiring

- Take note of the wiring harness locations then use a trim removal tool to remove the harness from the F150 chassis.
- Trim removal tool.

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

Brake lines

- Trim removal tool.

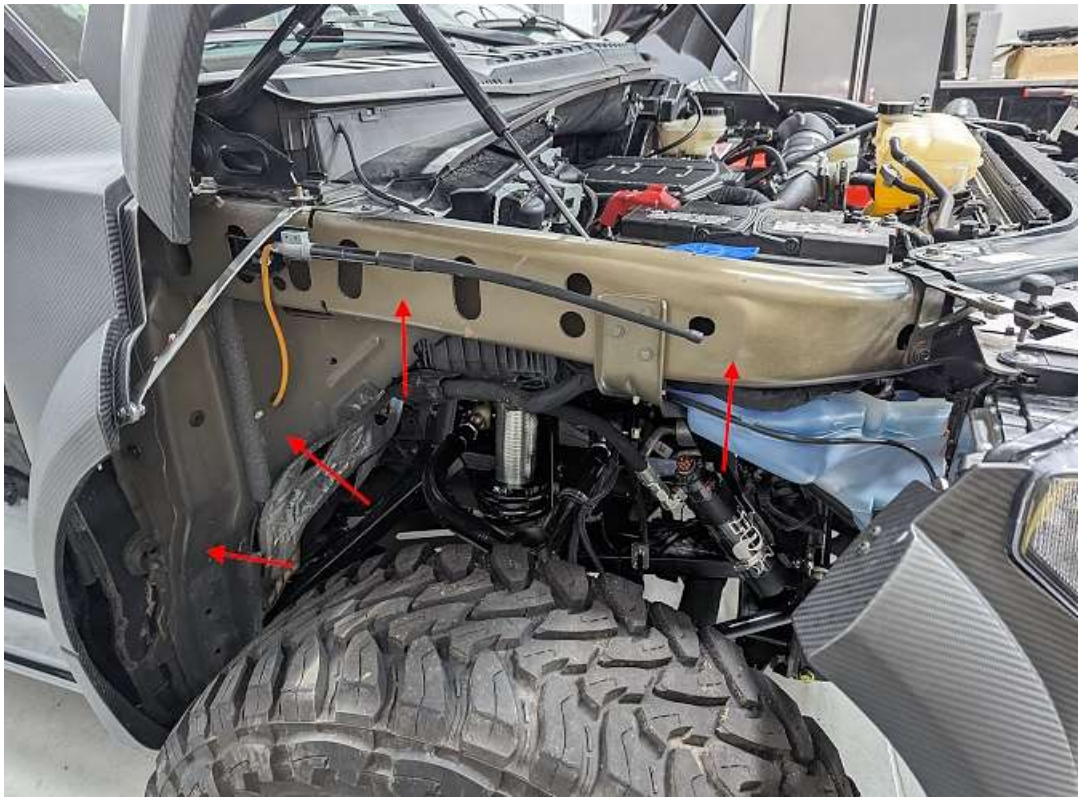
Remove the rear brake lines as one piece using a trim removal tool.
Remove the front brake lines using a trim removal tool.

Fuel lines

- Trim removal tool.

Remove all the fuel vapor lines using a trim removal tool.
Remove the fuel line going from the tank to the transmission area using a trim removal tool.

Parts Prep



Now is a good time to paint any OEM parts that might get seen. Above is a picture of the radiator support for a black truck. The brown areas shown are hidden on the F150 but are visible on the XTF.

KIT DISSASEMBLY

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

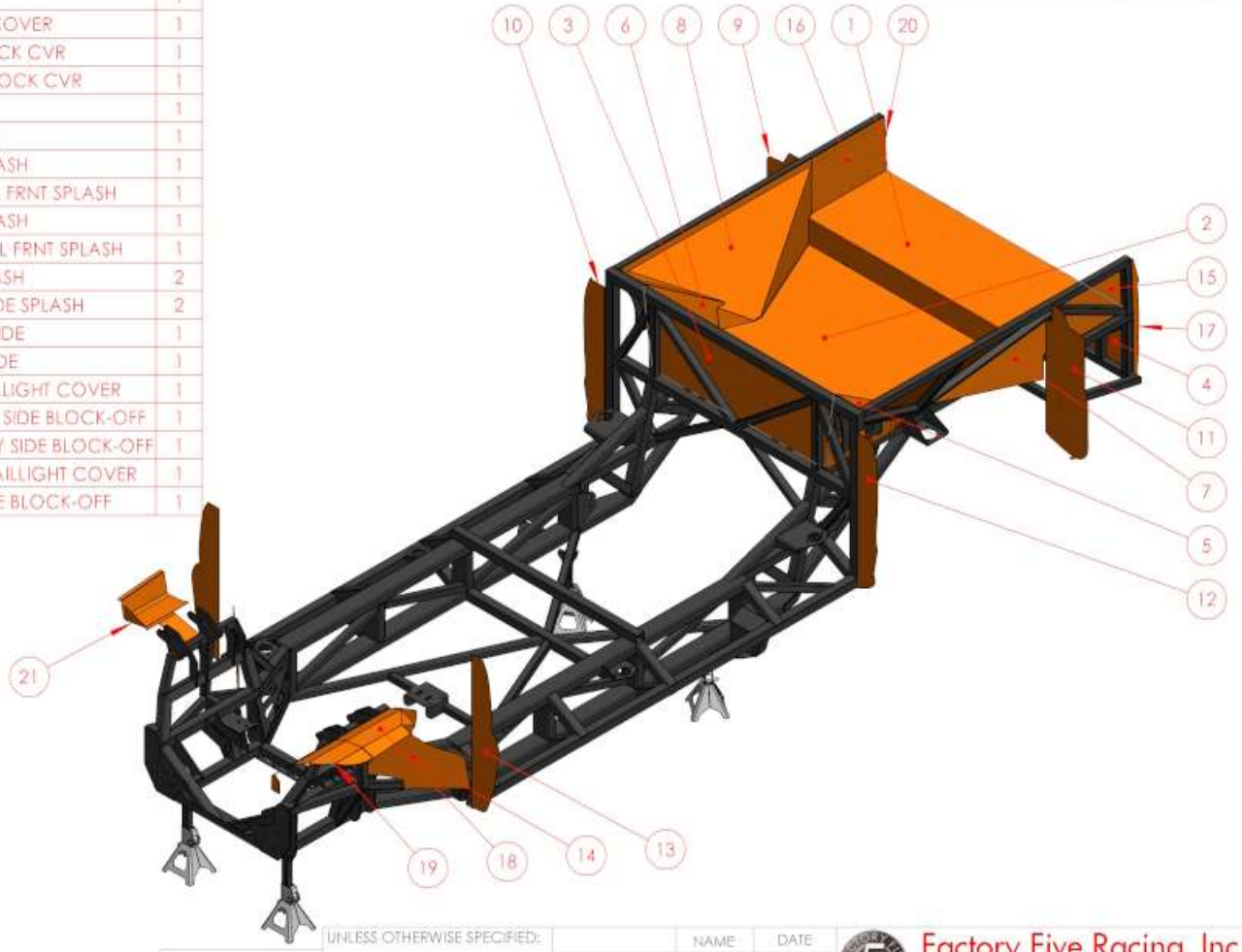
Before removing the bed aluminum, mark the outside surface of the aluminum everywhere it is in contact with a flat surface of a tube. This is done to locate where to drill rivet holes when the panels are permanently mounted later.

Once every part is marked double check them and then remove from the chassis.

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

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



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

Factory Five Racing, Inc.

TITLE:
PRE RUNNER ALUMINUM

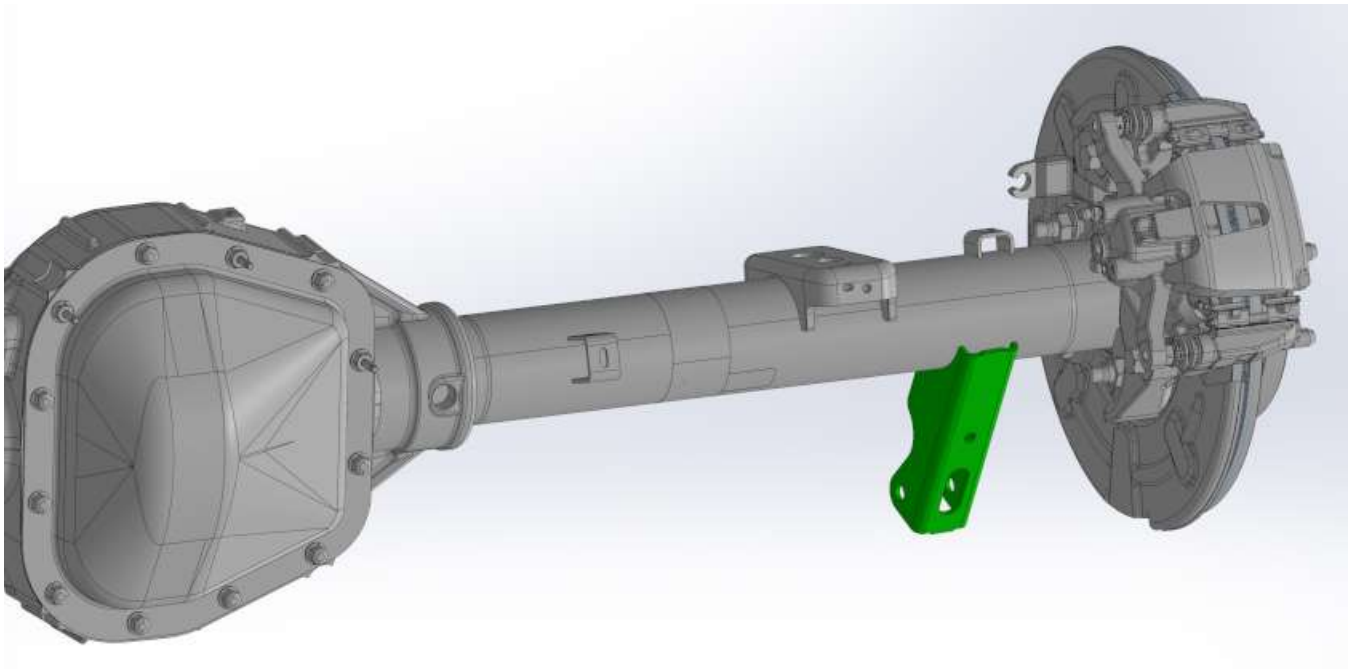
SIZE	DWG. NO.	REV
A	Prerunner	A

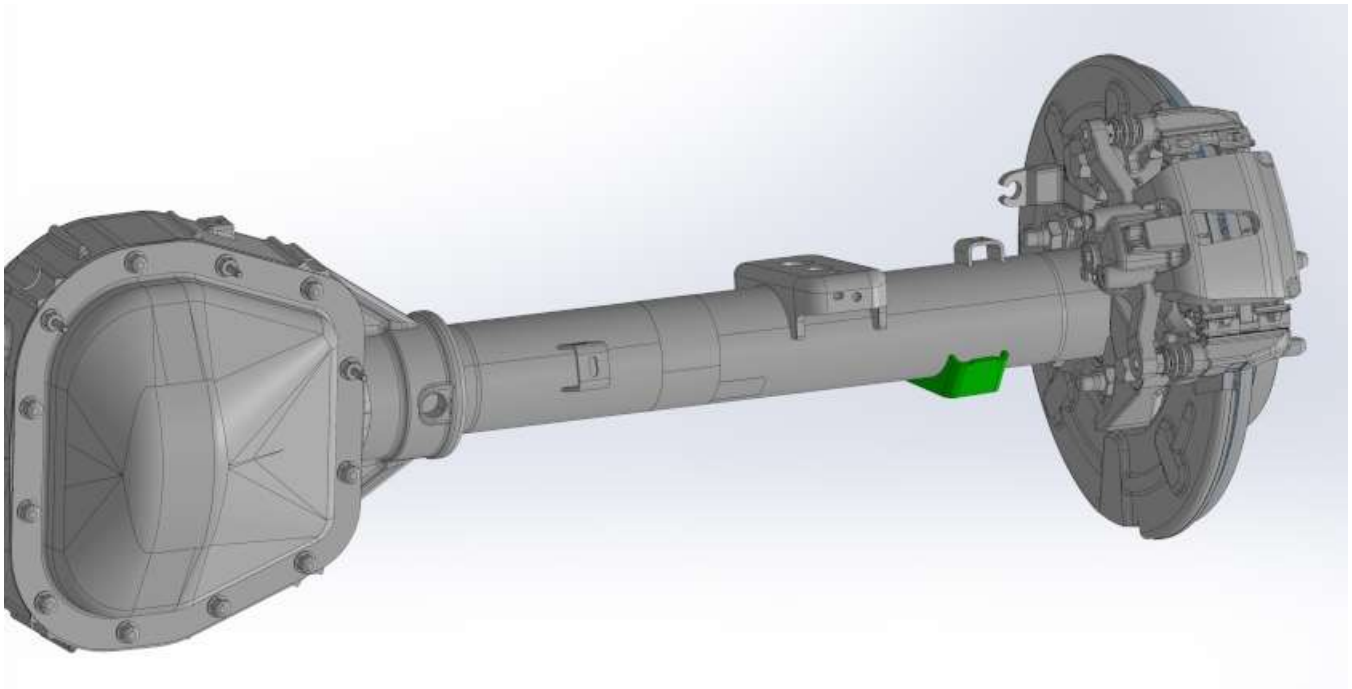
SCALE: 1:30 WEIGHT: SHEET 2 OF 2

Rear Axle

OEM Shock mount

🛠 Sawzall





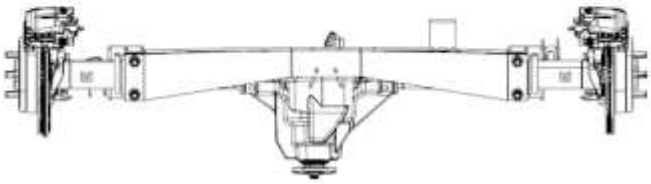
Cut the OEM shock mount off the axle.

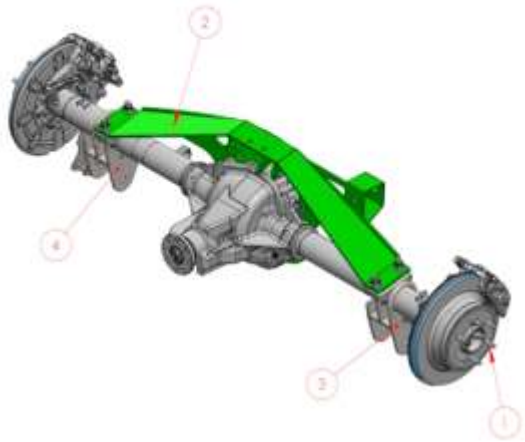
Axle Support Mount

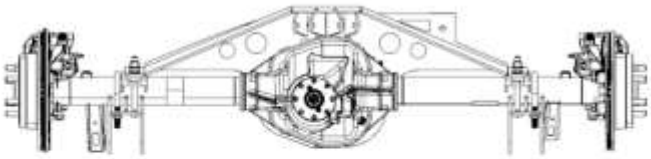
🚗 Box 39
🛠 ½” drill bit, razor, RTV,
✋ There are two different axle support brackets. The 8.8” axle bracket has 3 holes on the right side while the 9.75” axle has 2 holes.

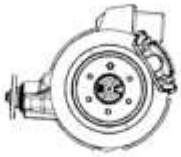
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9.75" AXLE	F150 9.75" REAR AXLE	1
2	70564	9.75" AXLE BRACE	1
3	70055	LWR LEFT AXLE MOUNT	1
4	70055	LWR RIGHT AXLE MOUNT	1

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









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

NAME | DATE
DRAWN
COMMENTS:

FFE RUNNER
USED ON
APPLICATION: PRERUNNER

PRINTED: 6/7/2023

Factory Five Racing, Inc.

TITLE: 9.75" AXLE SUPPORT

SIZE	DWG. NO.	REV
A	axlewithbraces	A

SCALE: 1:15 WEIGHT: SHEET 2 OF 2

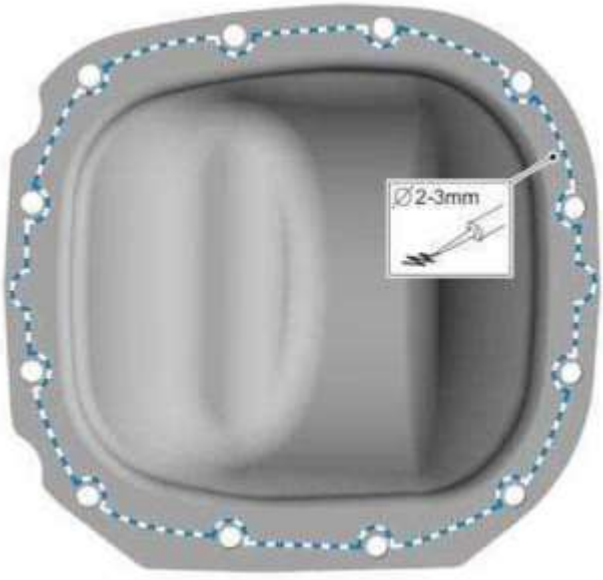
Place the axle on two jack stands with the rear cover facing up.

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

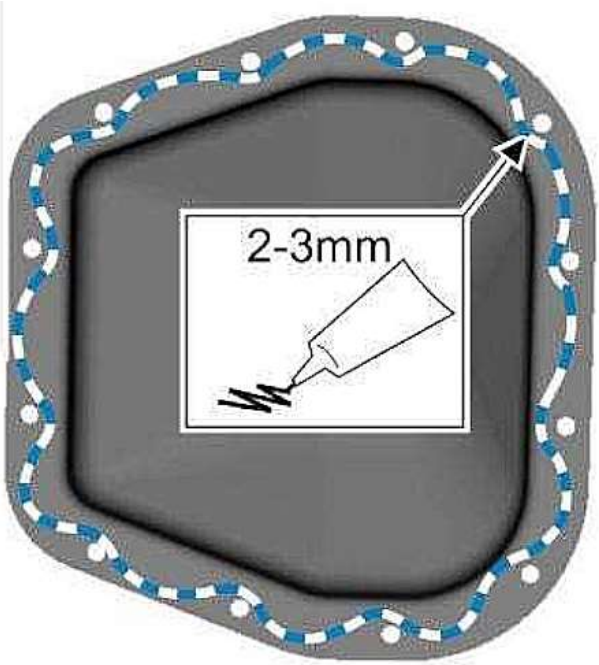
Test fit the axle support with a couple of the new longer rear cover bolts.

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

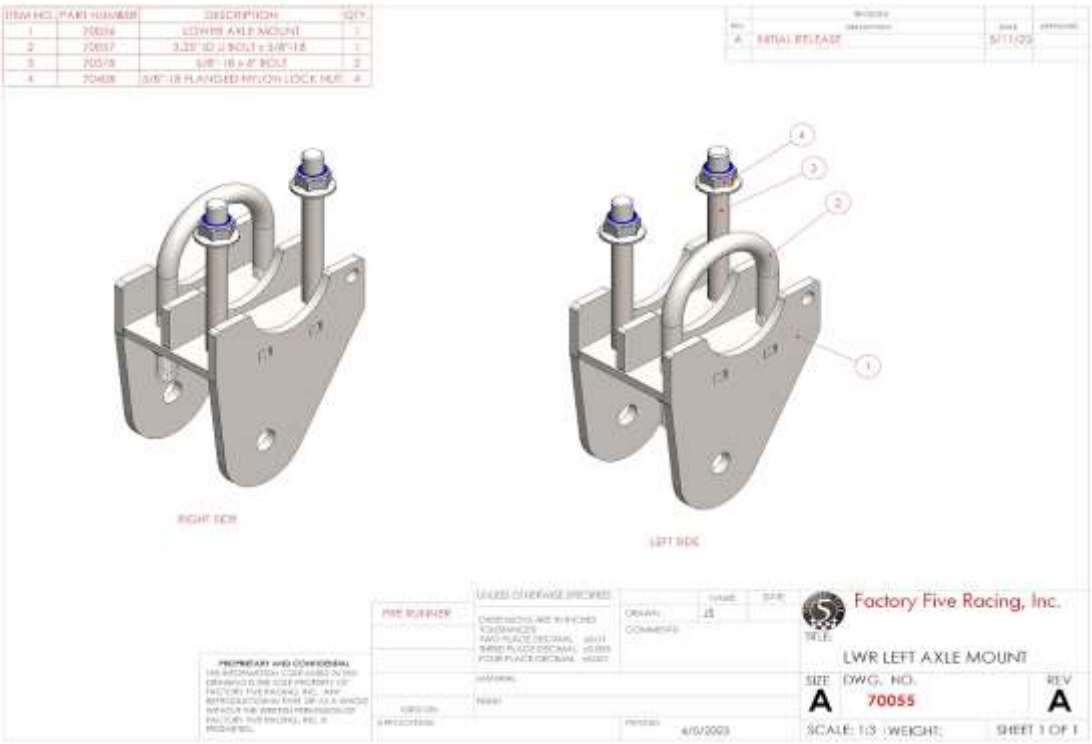
Run a bead of black RTV around the rear cover.

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

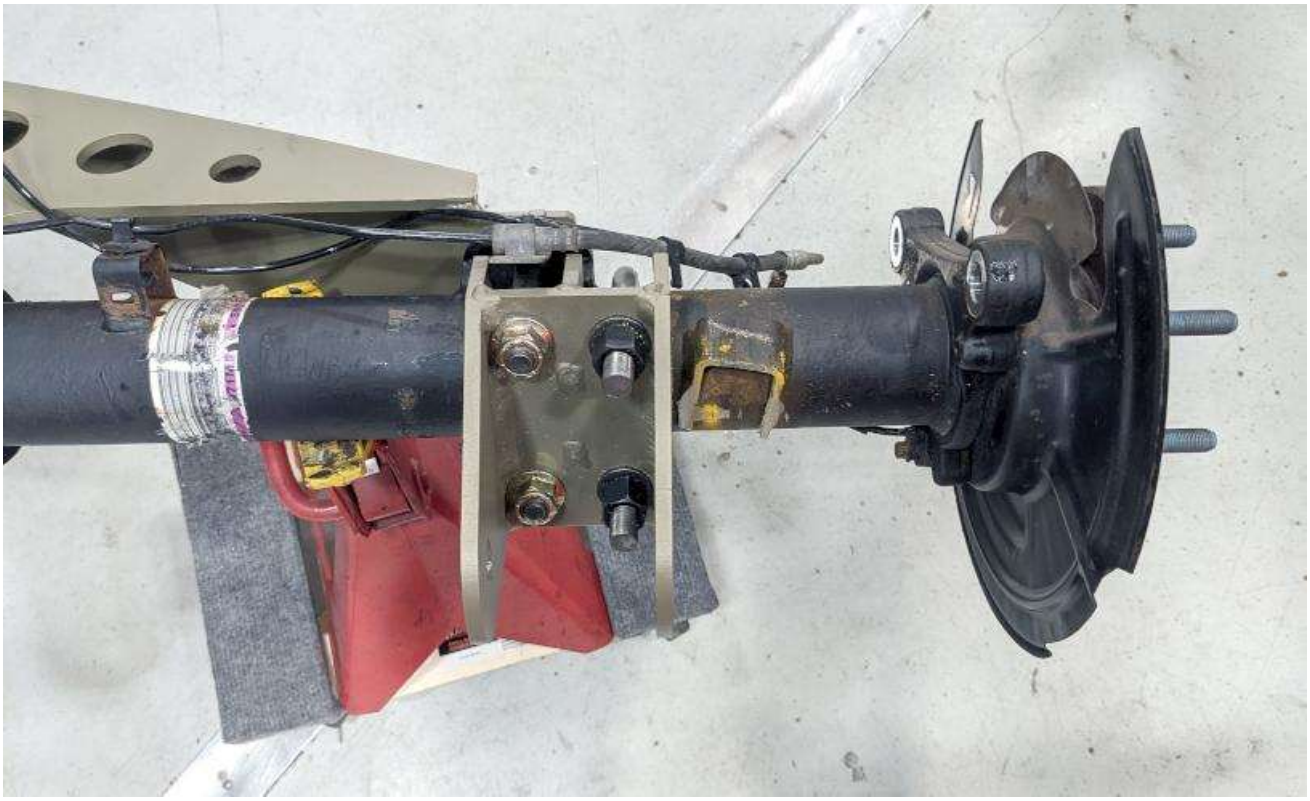
Drill out the spring pads to accept the mounting bolts using a ⅝” drill bit.

Lower Axle Mounts

🚗 Box 2



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



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

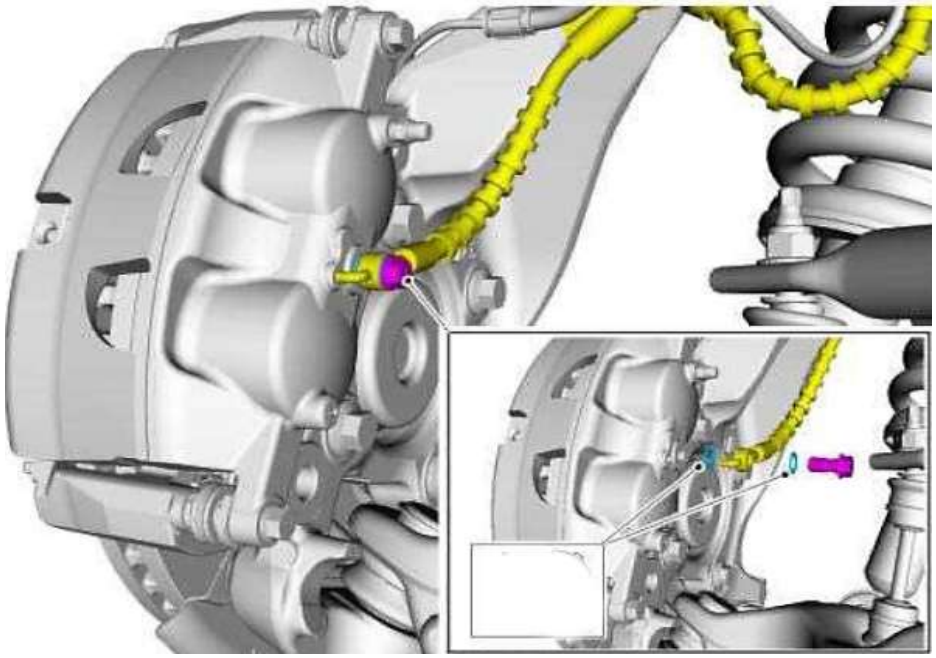
Rear Brake Hoses

Box 5

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

Replace with the included longer brakes hoses.

Front Brake Calipers



Remove the OEM front brake hose from the caliper saving the hardware.

Running Board Studs/Cab Corner

Cut the studs on the inside lip of the cab rocker panels where the running boards mounted to give clearance for the new chassis rails.

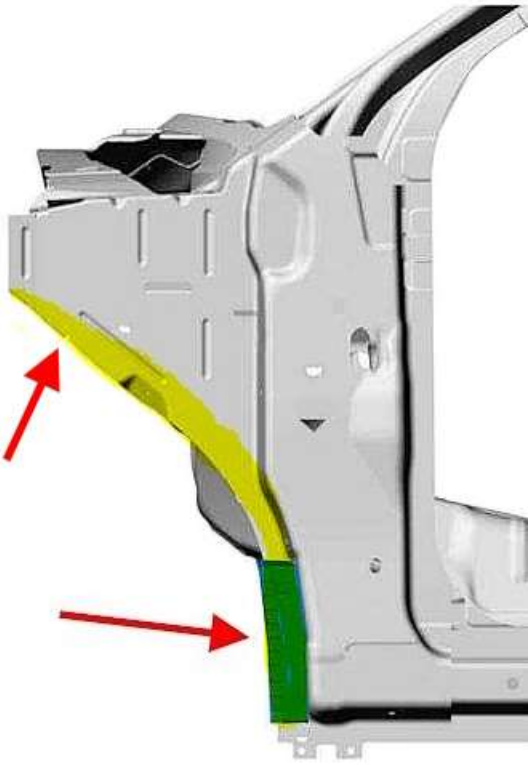
The bottom underside corner of the cab needs to be straightened out slightly for clearance, this is easiest with a small adjustable wrench with the jaws taped to prevent scratching.

At the rearmost corner of the rocker panel flange there is a 90° bend. Use the taped wrench or similiar tool to gradually unbend this by about half so it is now a 45° bend.

Front Cab Reinforcement

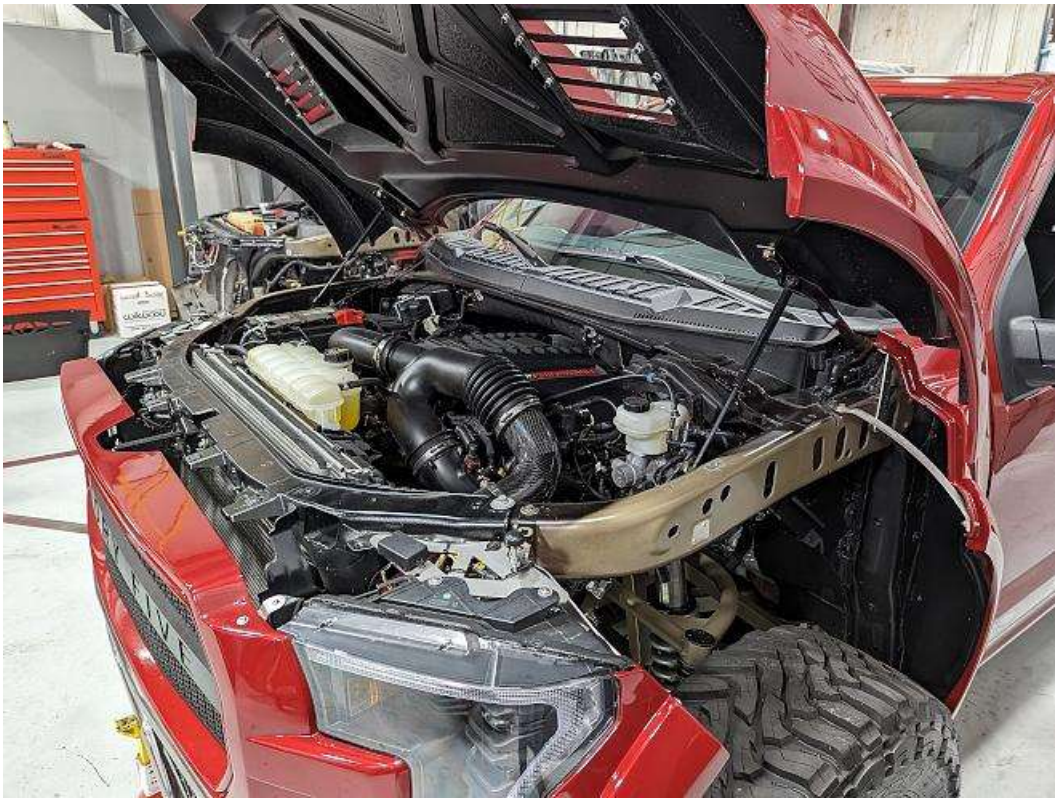
🛠 Sawzall

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



Use a Sawzall or similar to cut the aluminum flange as shown going up to the radiator support bar. Make sure not to cut the wiring harness.

Paint

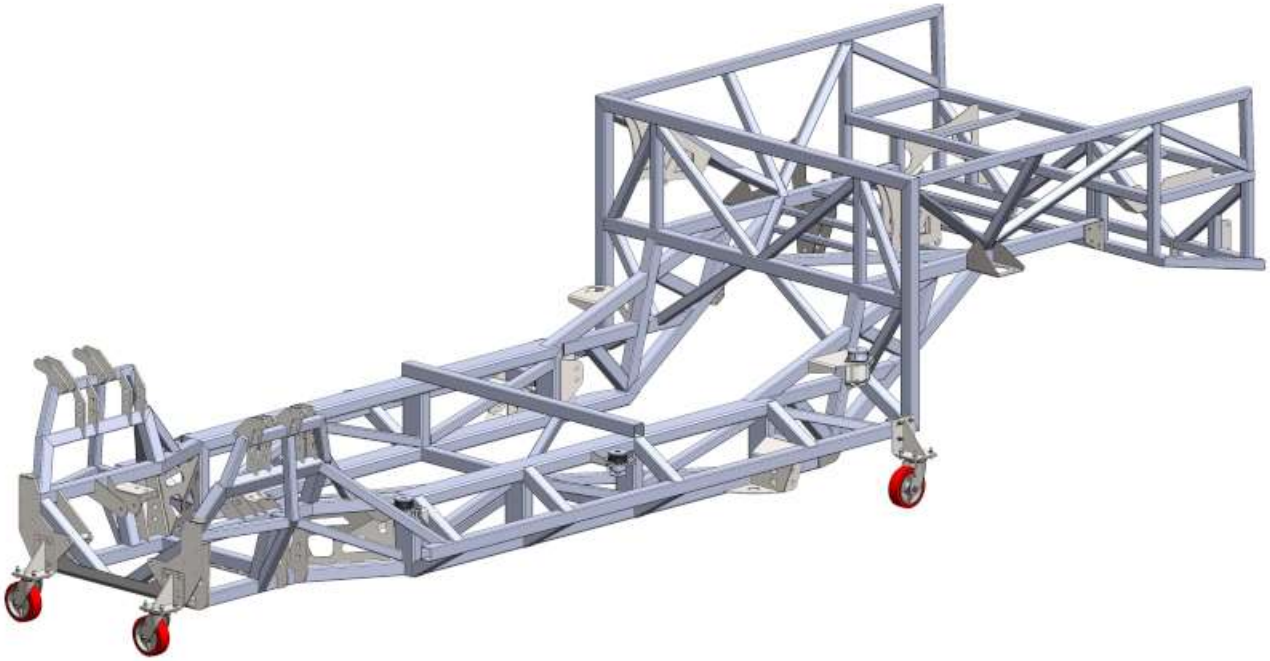


Paint any of the F150 parts that you desire. The Front tubular part of the cab and radiator support will show in the engine bay and are usually only primed.

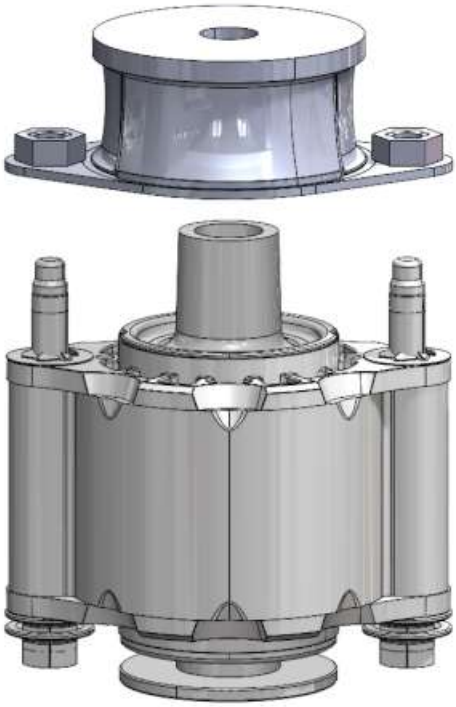
CHASSIS BUILD-UP

Cab mounting

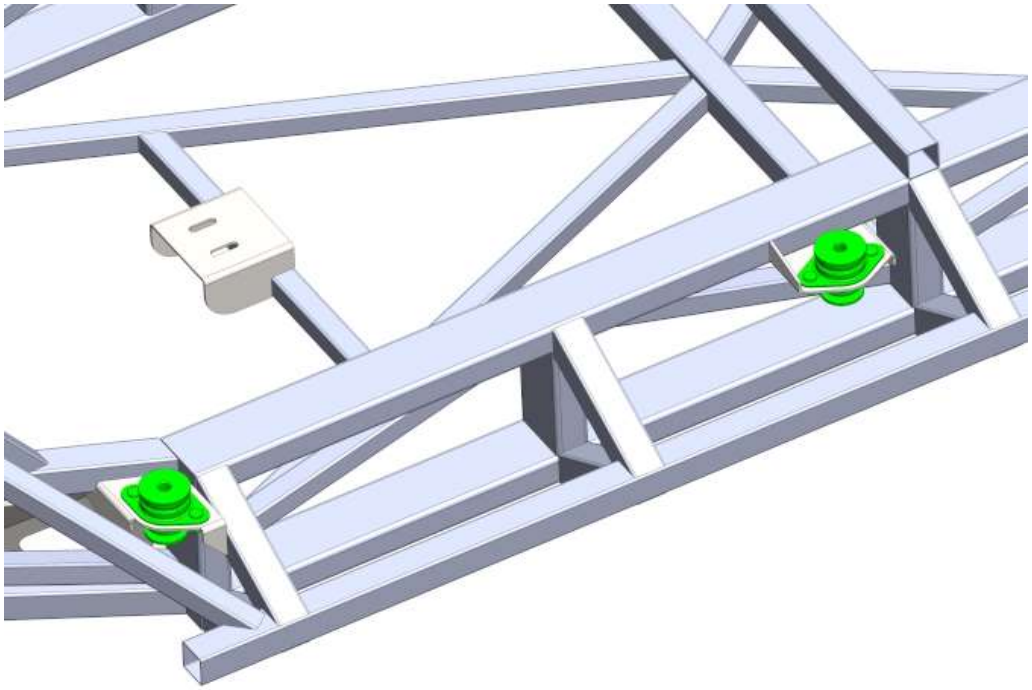
- Swapping the truck cab should be performed by skilled professionals with the correct equipment and experience. The space needed to do this should be laid out ahead of time as the OEM chassis rolls out from under the cab toward the front and the new tubular chassis will fit easier from the side (without 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.



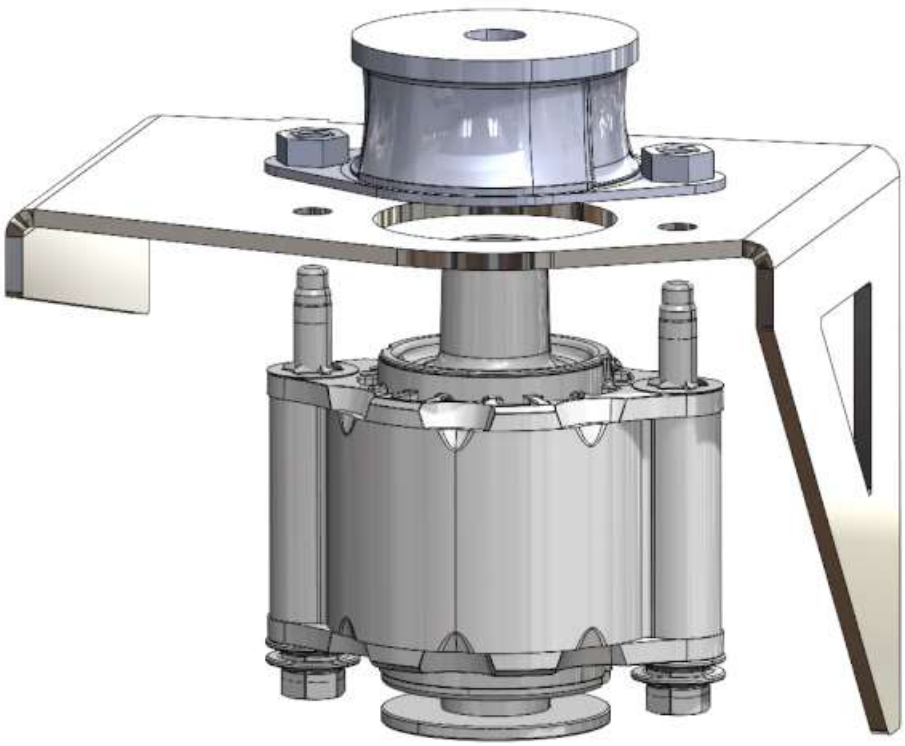
Re-attach casters to the chassis that were used to remove the OEM frame from the cab.



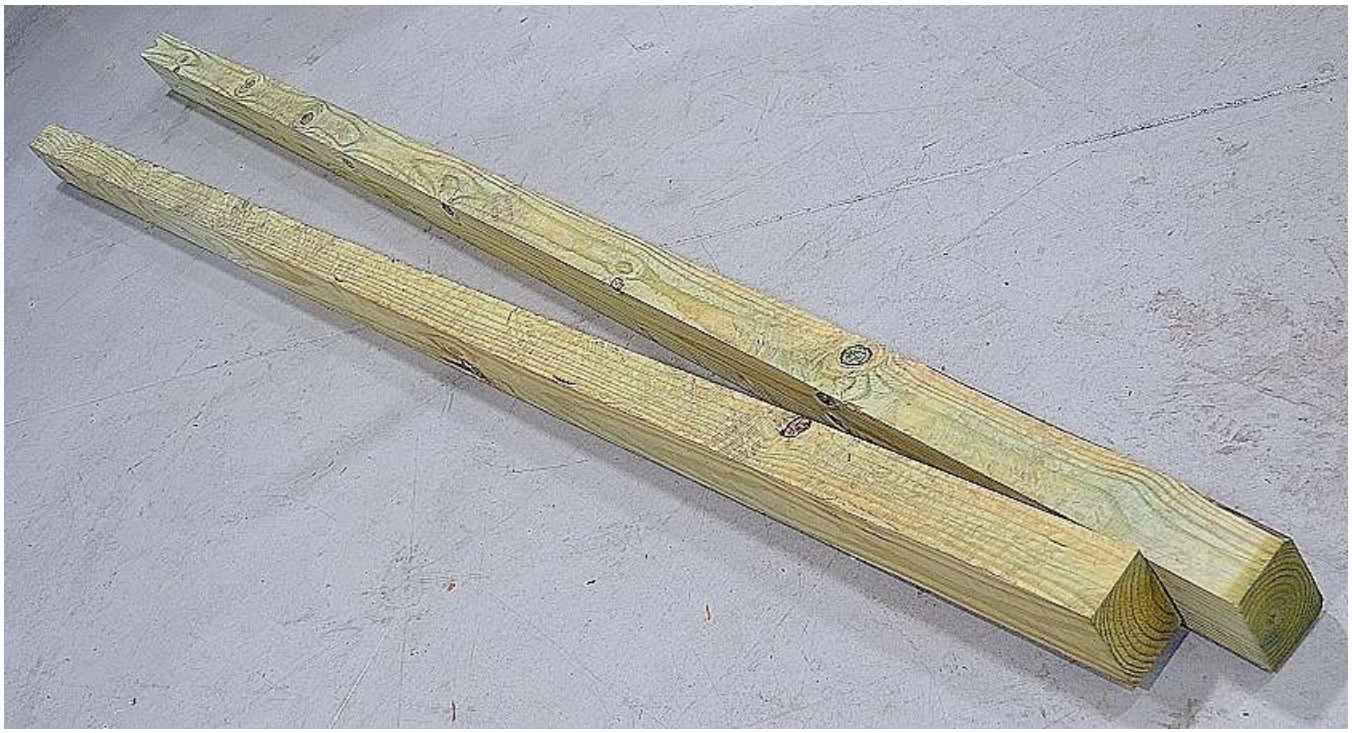
The four Front mounts are the smaller one-piece design and the rear most two mounts are the larger 2-piece ones with the larger section mounting from below the chassis.



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

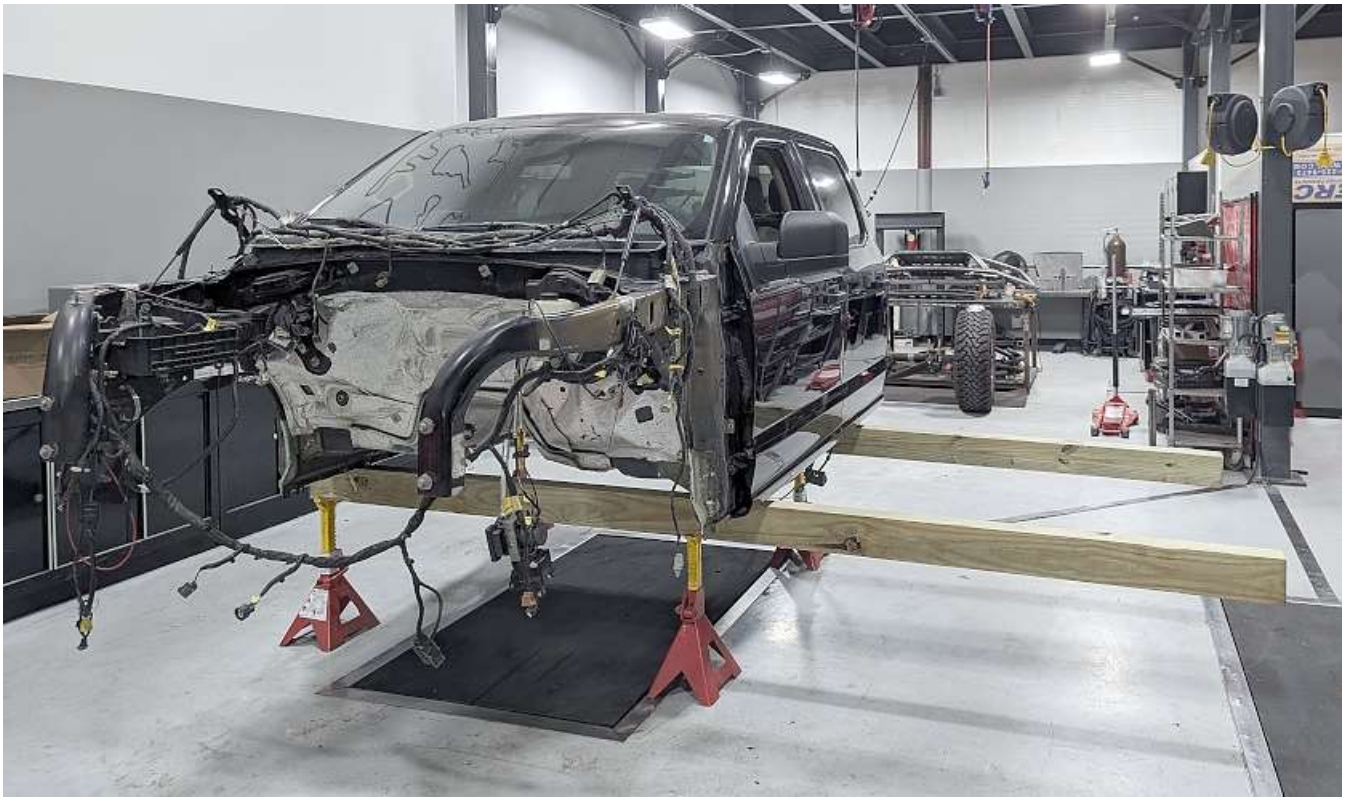


Sandwich the OEM rear Cab mount to the rear frame mount location.



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.

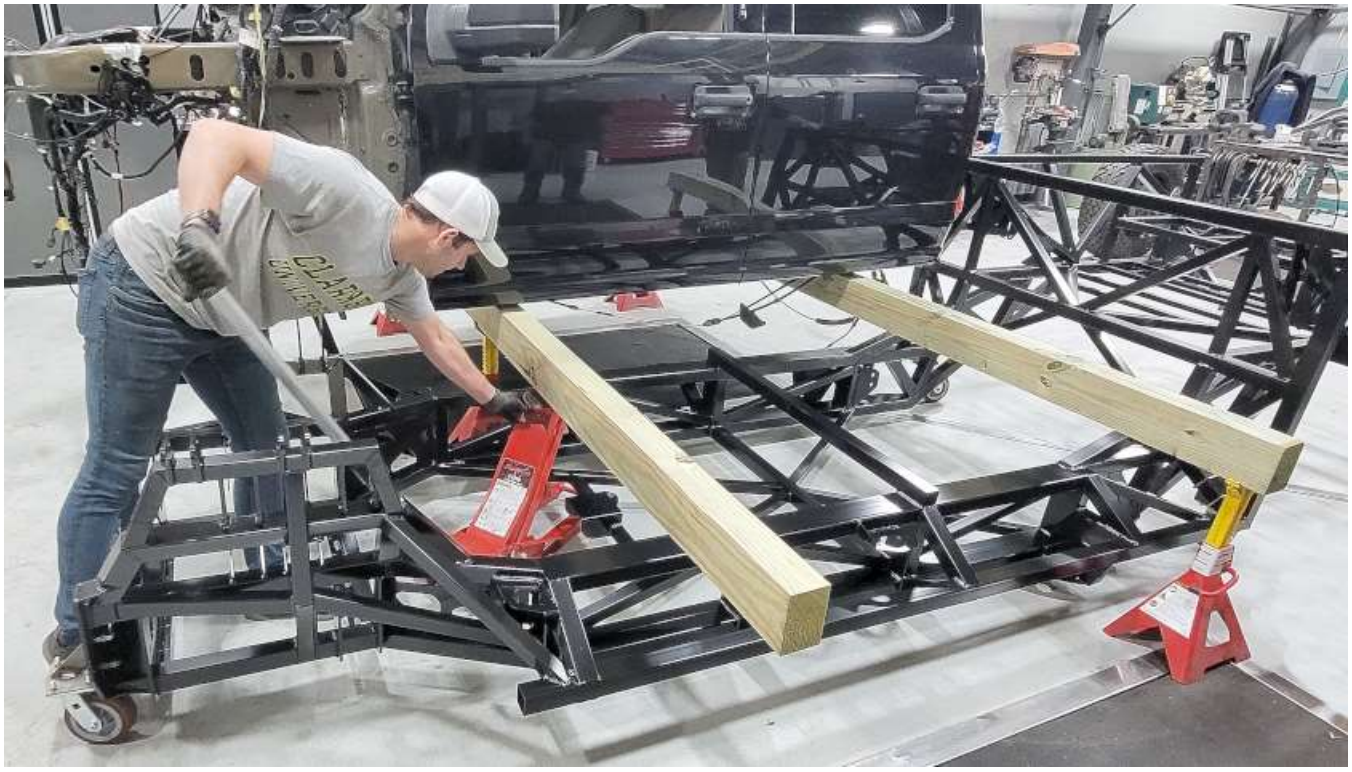
One end a time, place each post (so the 6” side is vertical) on a jack and roll it under the cab so you can lift the cab off the jackstands and move them so they are under the boards supporting the cab.



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. 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.

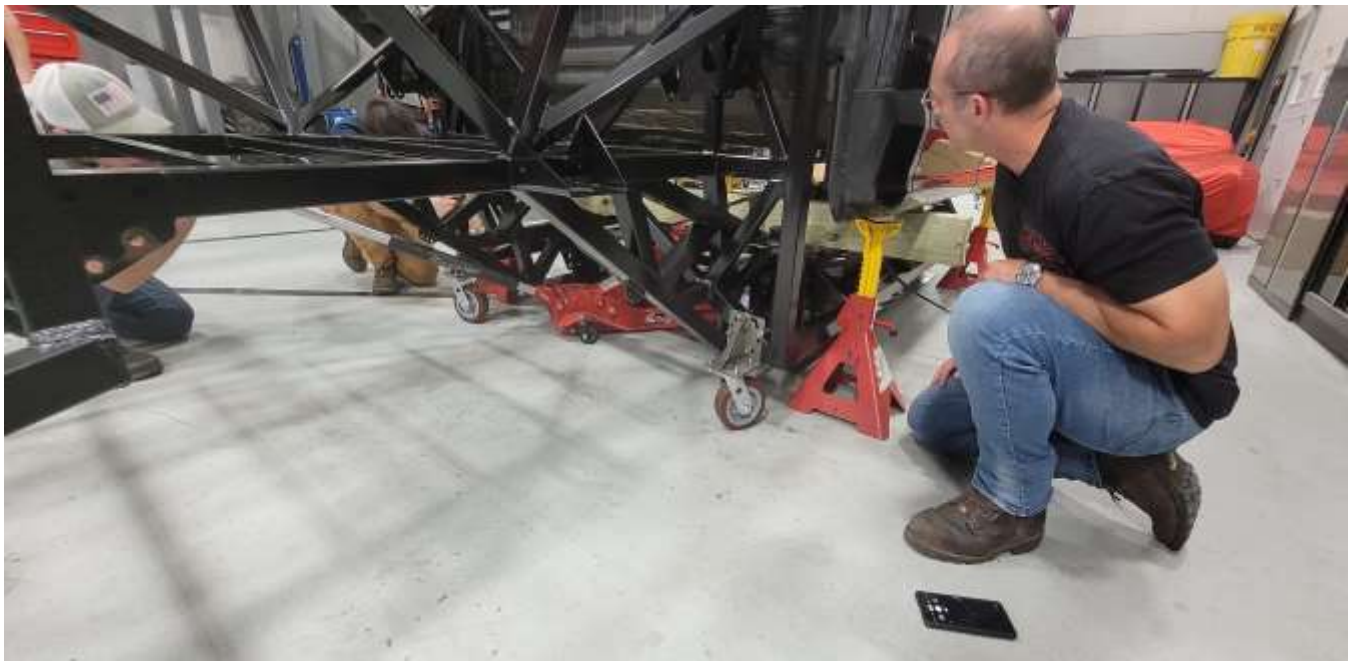


The front jack stand is moved in the same way, you may need to pick the jack up and place it in the center of the frame to have room to get the jack under the beam.

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)

Make sure that the front shock mount does not hit the vacuum booster sensor when moving the frame in.



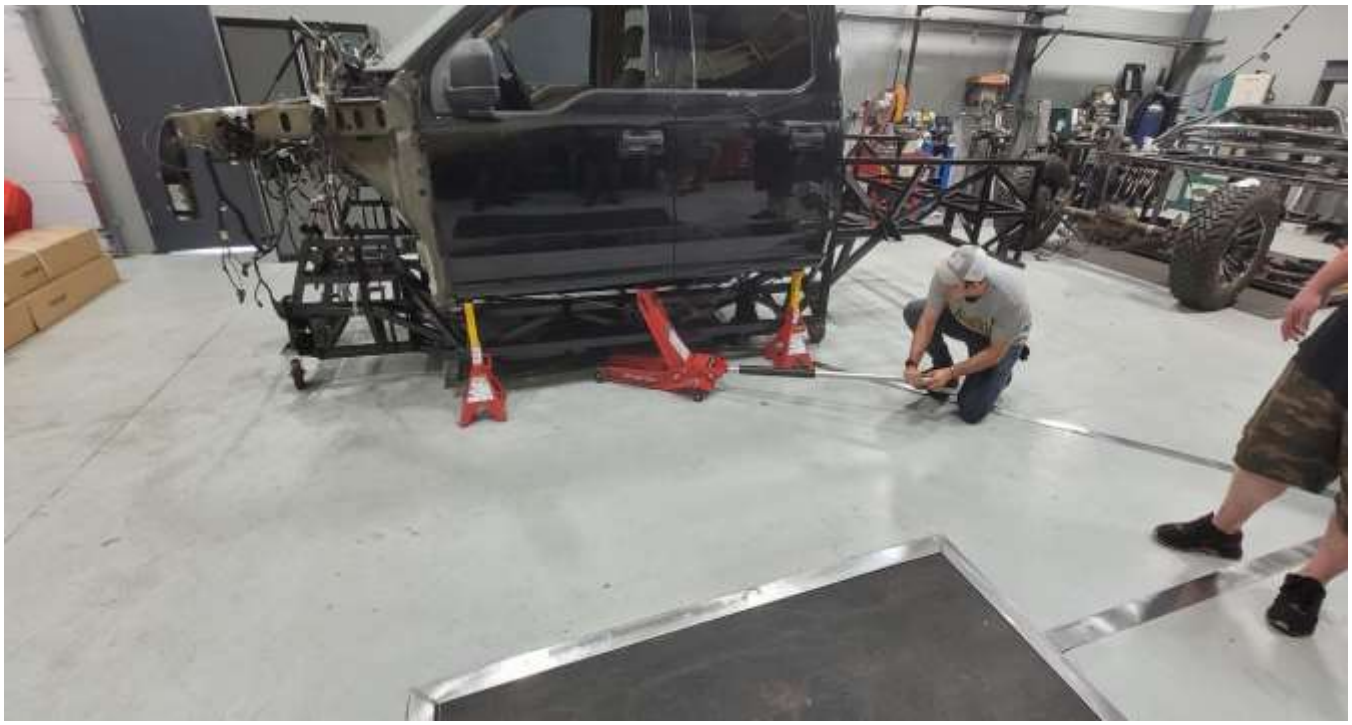
Position the jack on centered on the chassis under the 4x6 and lift until the jackstands are free.

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 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 at 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.

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 e-brake cables along the driver's side are 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.

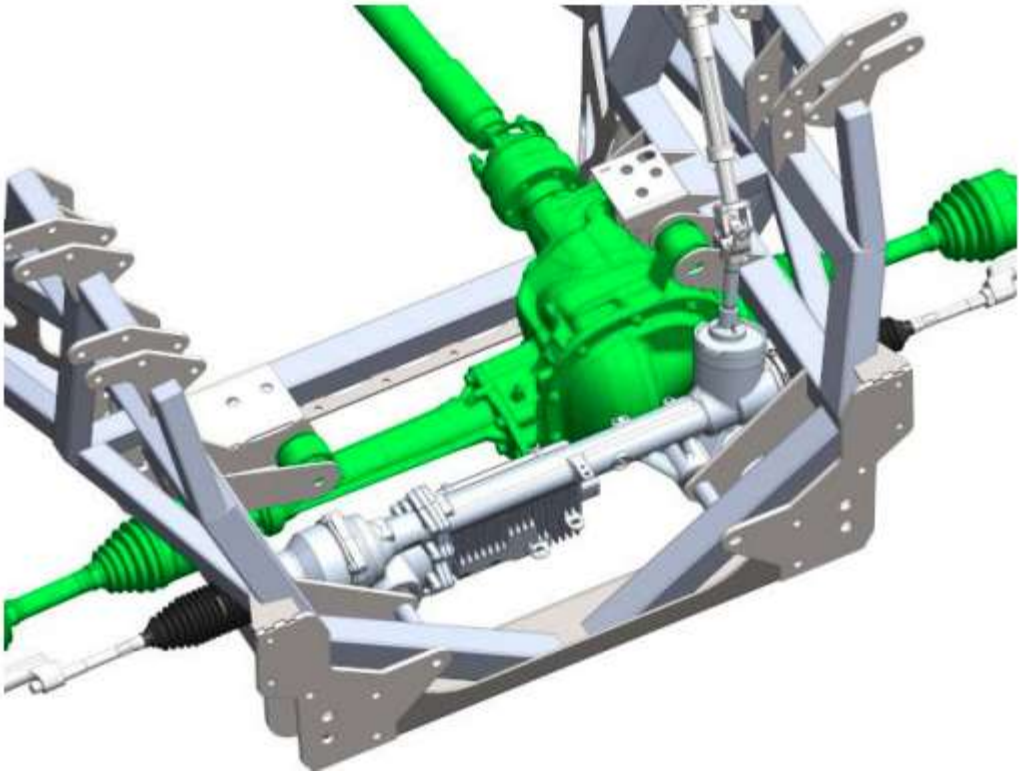
Now lift the rear of the chassis so that the mounts contact the cab and move the jackstands from the pinch weld on the cab to underneath the chassis. Start the remaining 4 bolts by hand.

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

- Front differential, rear spring square bolt locknuts



Install the front differential using the OEM fasteners and the rear spring square bolt locknuts on the left side.

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

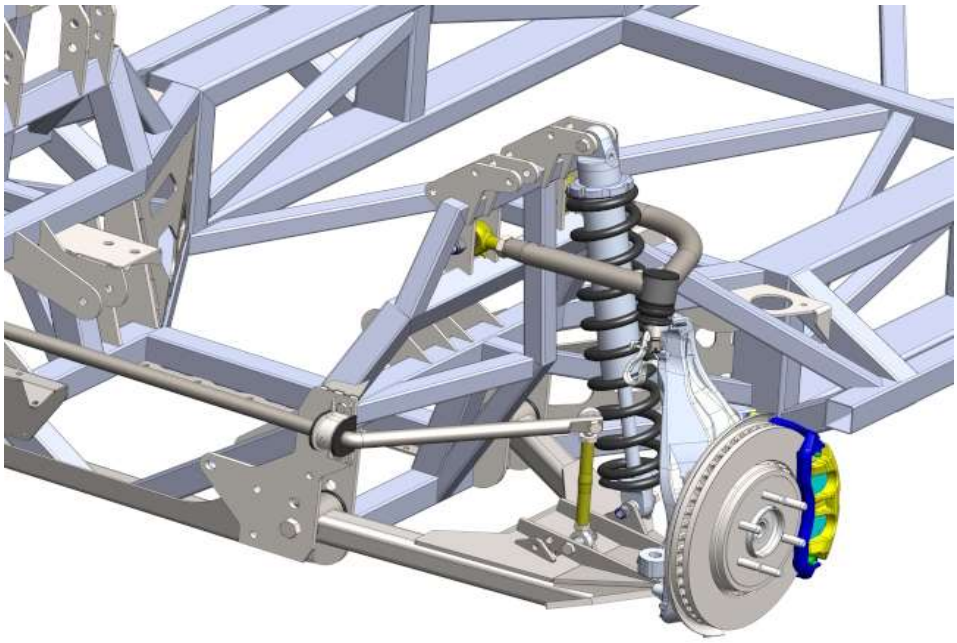
Box 44

Install the steering rack using Blue Loctite and M16 bolts along with 14mm socket head bolt.

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.

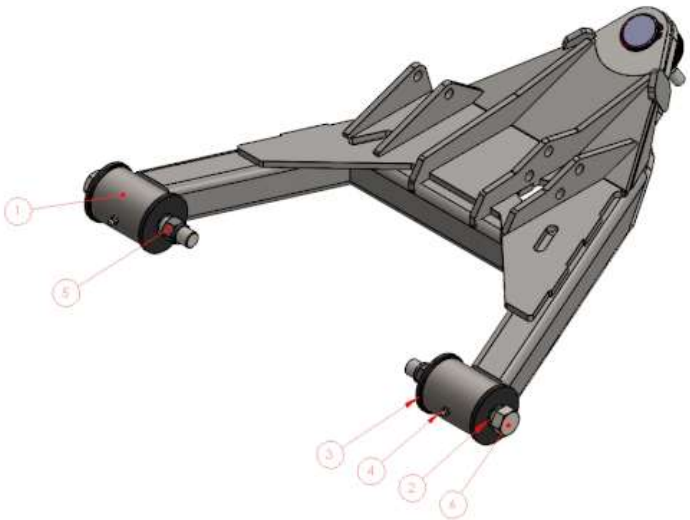


FRONT LOWER CONTROL ARM

- Box 26
- Torque Wrench

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70790	LFT FRNT LWR CNTRL ARM	1
2	70608	PIVOT SLEEVE	2
3	70593	BUSHING	4
4	12226	GREASE FITTING	2
5	12383	NYLON INSERT LOCKNUT, 5/8"-11	2
6	70196	3/4"-16 x 5.50" BOLT	2

REV	REVISION DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	3/29/24	



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TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
USED ON
APPLICATION

	NAME	DATE
DRAWN	JI	3/29/24
COMMENTS		

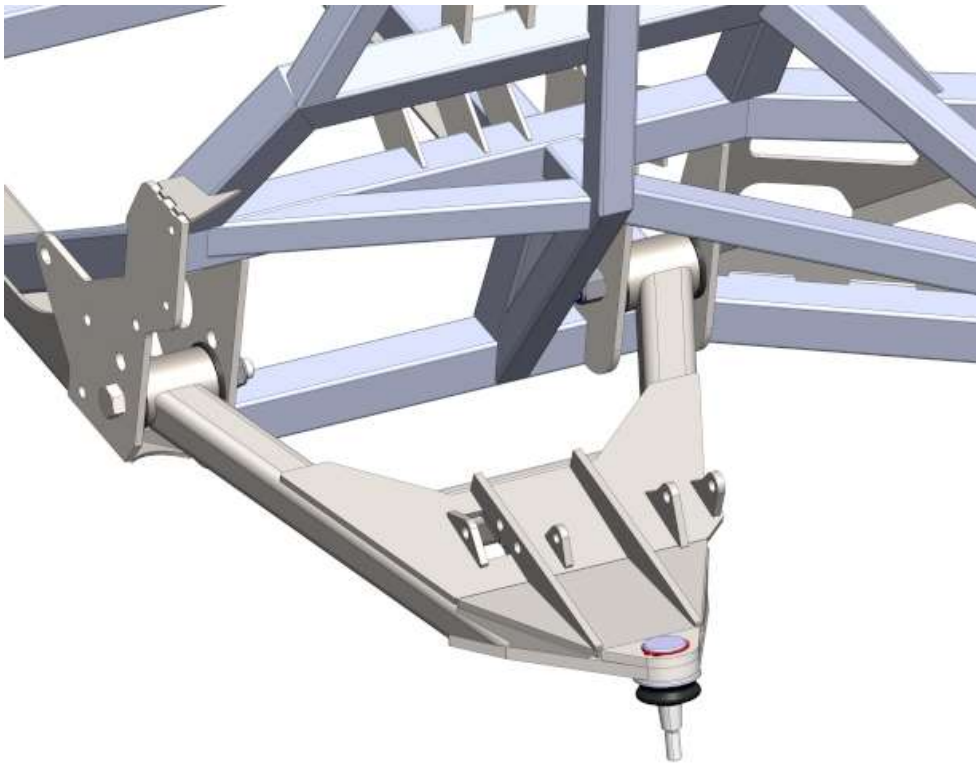
PRINTED 4/23/2024

Factory Five Racing, Inc.

TITLE: LFT FRNT LWR CNTRL ARM

SIZE	DWG. NO.	REV
A	70789	A

SCALE: 1:5 | WEIGHT: | SHEET 1 OF 1



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, vise, large adjustable wrench, blowtorch optional

Use a pair of snap ring pliers to remove the snap ring.

Remove the spring, spring divider, and place the shock shaft into a vise. If available, use soft aluminum jaws, or a cloth to prevent damage to the shaft.

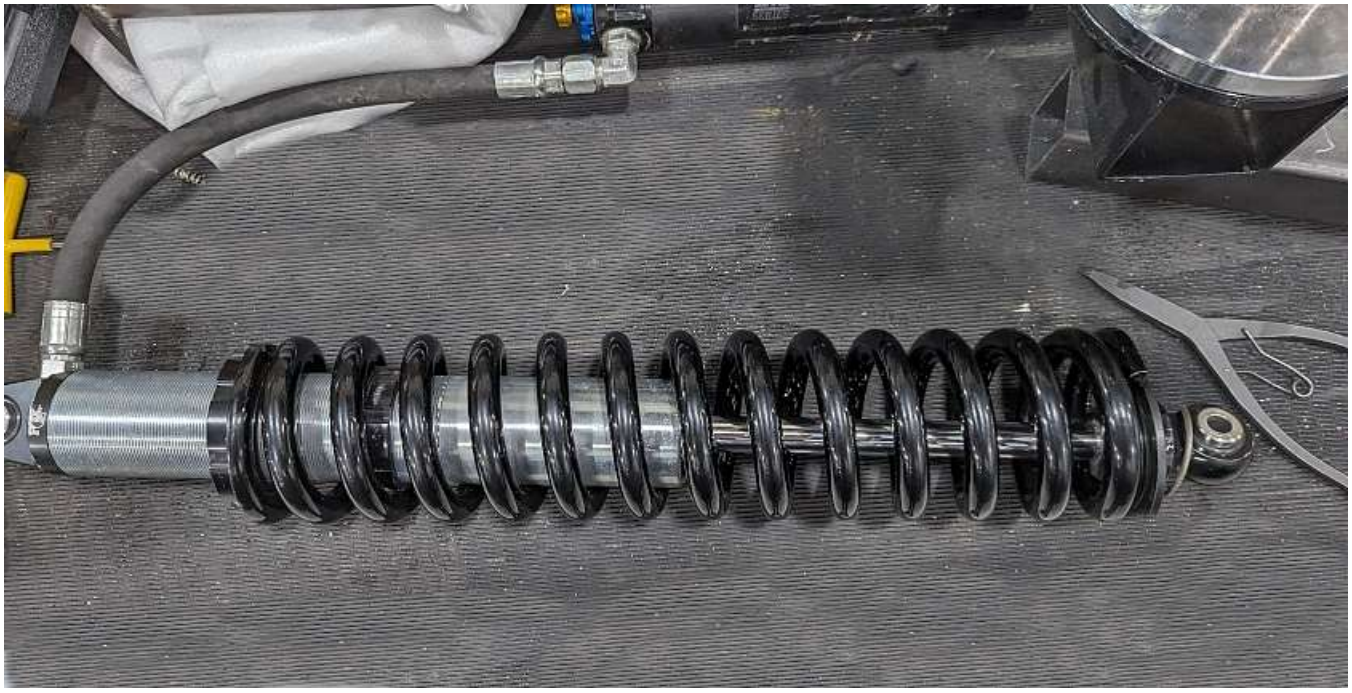
Optional; Using some heat can help loosen the factory thread locker. Make sure to slide the rubber bump stop out of way prior to applying heat.

Use a large adjustable wrench to unthread the shock end from the shock shaft.

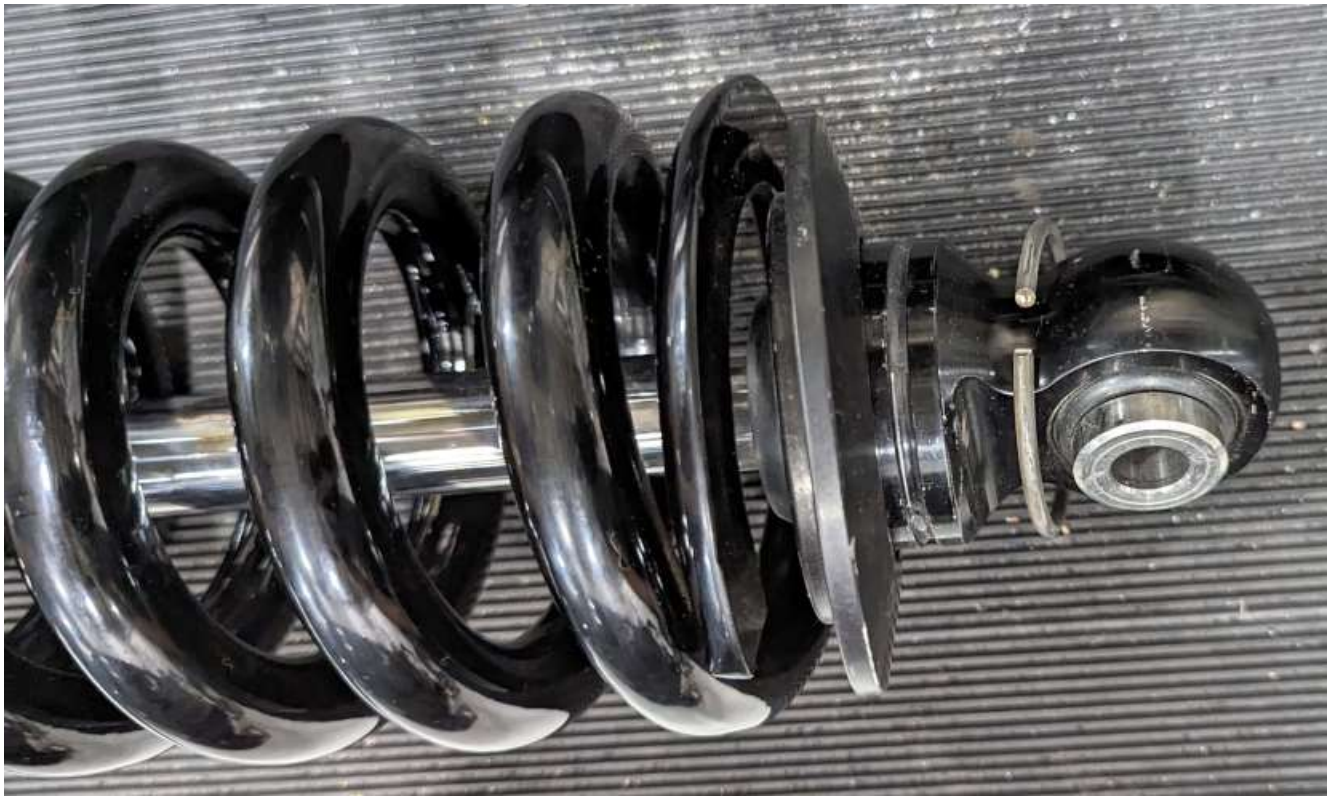
Remove the rubber bump stop from the shaft. Take this time to clean the threads on the shock shaft; a small pick or screwdriver can help.

Slide the provided large rubber bump stop on first, then the original small rubber bump stop. Apply some thread locker to the threads.

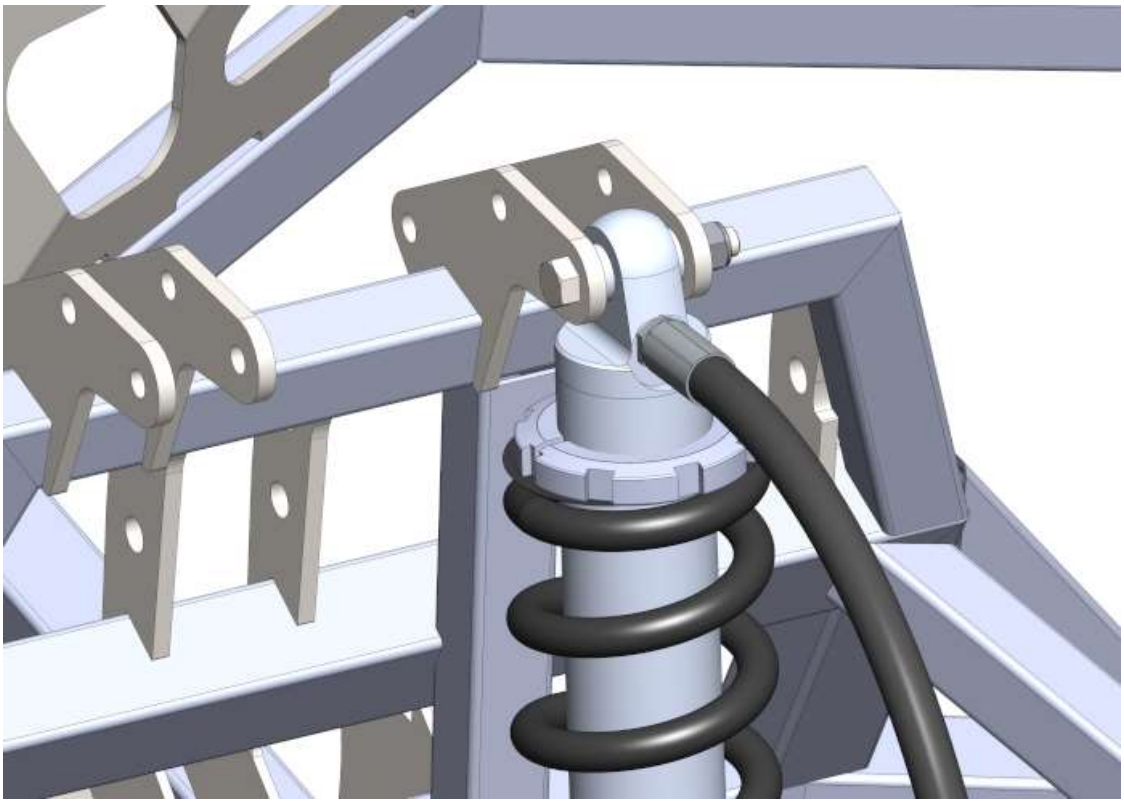
Reinstall the shock end.



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

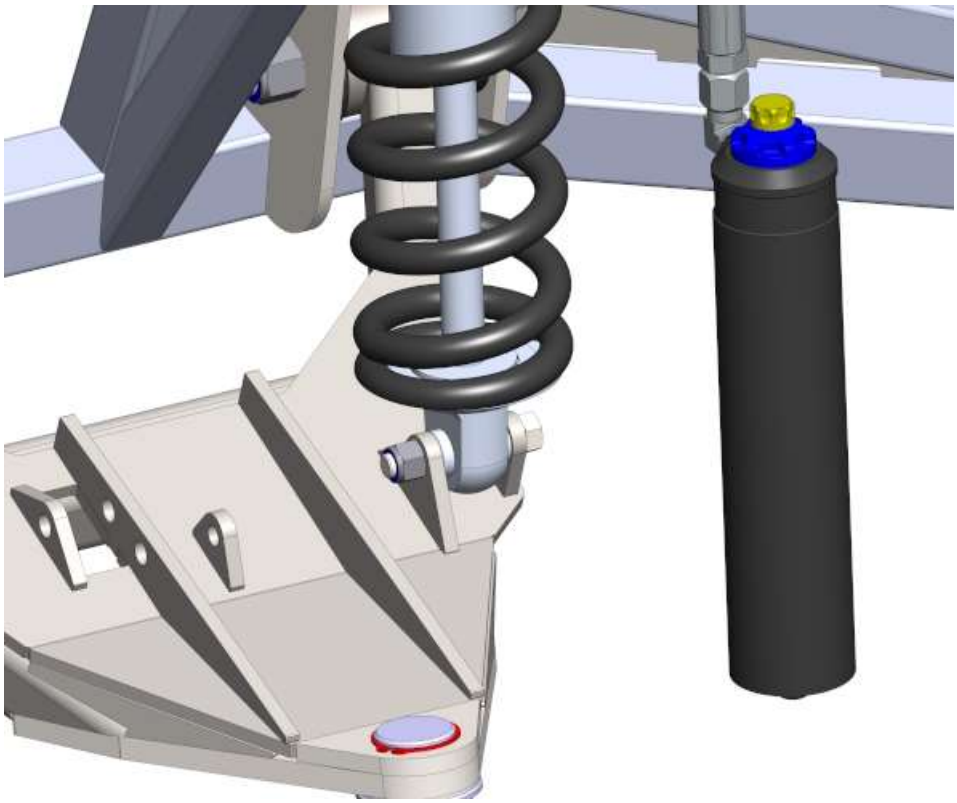


Slide the spring hat over the end then use a pair of snap ring pliers to put the snap ring back in place.

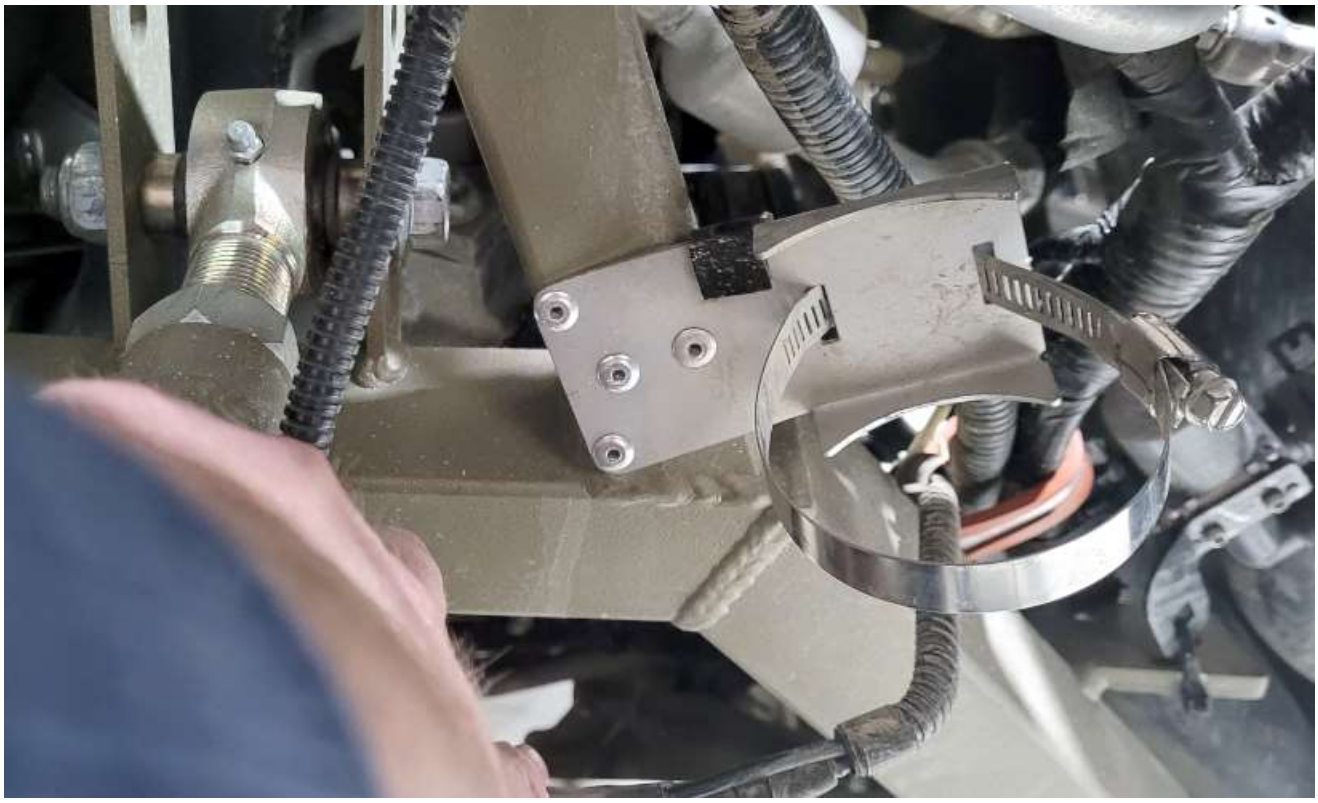


Attach the body end of the coil-over shock to the frame with the reservoir hose sticking straight out.

Use a ½” x 3” bolt and a ¾” wrench and socket.



Attach the rod end of the coil-over shock to the front lower control arm. Use a ½" x 3" bolt and a ¾" wrench and socket.



Attach the remote reservoir brackets to the chassis using rivets or the included #10 self tapping screws. The brackets need to get located one at each end, not in the middle in a location that does not kink the hose or allow it to get pinched above the tire. In front of the upper arm mounts is a good location.

Mount the reservoir and clamp into position making sure the hose is not kinked or in tension.

FRONT UPPER CONTROL ARM

Box 1

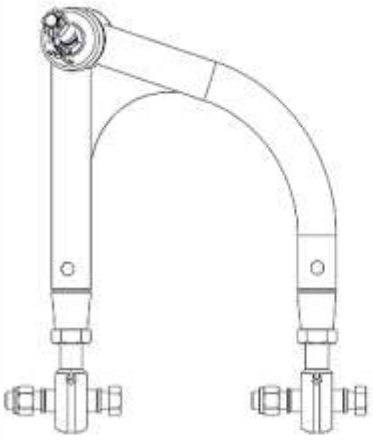
Recommended grease to use:

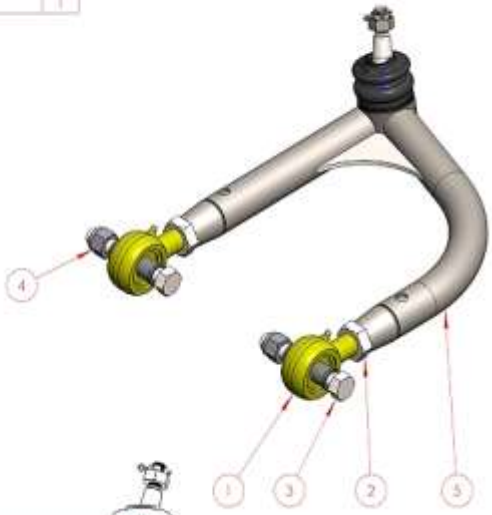
Valvoline® Moly Fortified Multi-Purpose Grease - VV633
Sta-Lube®Moly-Graph Multi-Purpose Grease - SL3330

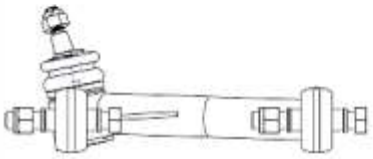
Maintenance Lubrication Interval - Add 5 to 10 pumps of grease to the ball joint at each oil change, or after operating the vehicle in wet or dusty conditions.

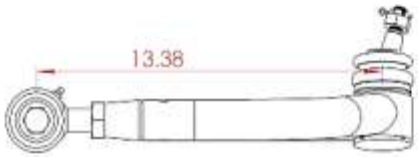
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	70200	7/8"-14 RH JOHNNY JOINT	2
2	70278	7/8"-14 JAM NUT	2
3	70089	5/8"-11 x 4.00" BOLT	2
4	12383	NYLON INSERT LOCKNUT, 5/8"-11	2
5	70067	LFT FRNT UPPER ARM	1

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









PREFERRED

UNLESS OTHERWISE SPECIFIED:

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

	NAME	DATE
DRAWN	JS	8/25/21

COMMENTS:

MATERIAL:

FINISH:

USED ON

APPLICATION

PRINTED 6/5/2023

Factory Five Racing, Inc.

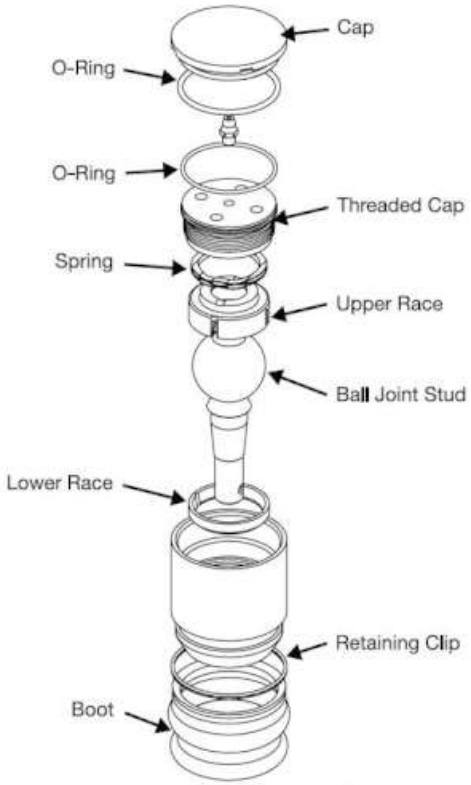
TITLE:
FRONT UPPER ARM PARTS

SIZE	DWG. NO.	REV
A	70066	A

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

Balljoint Assembly

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



Assemble the upper ball-joint in the order shown. The outside housing has already been welded onto the upper control arm and is not a separate collar as show in the diagram

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 pin in until it is fully flush on the back side

Push the second pin in flush, if necessary put it in a vise to get the pins fully seated.

Use a ⅜” Torque wrench and the balljoint tool to torque the threaded cap to **50 lb-ft (68 Nm)** then screw in supplied grease fitting.

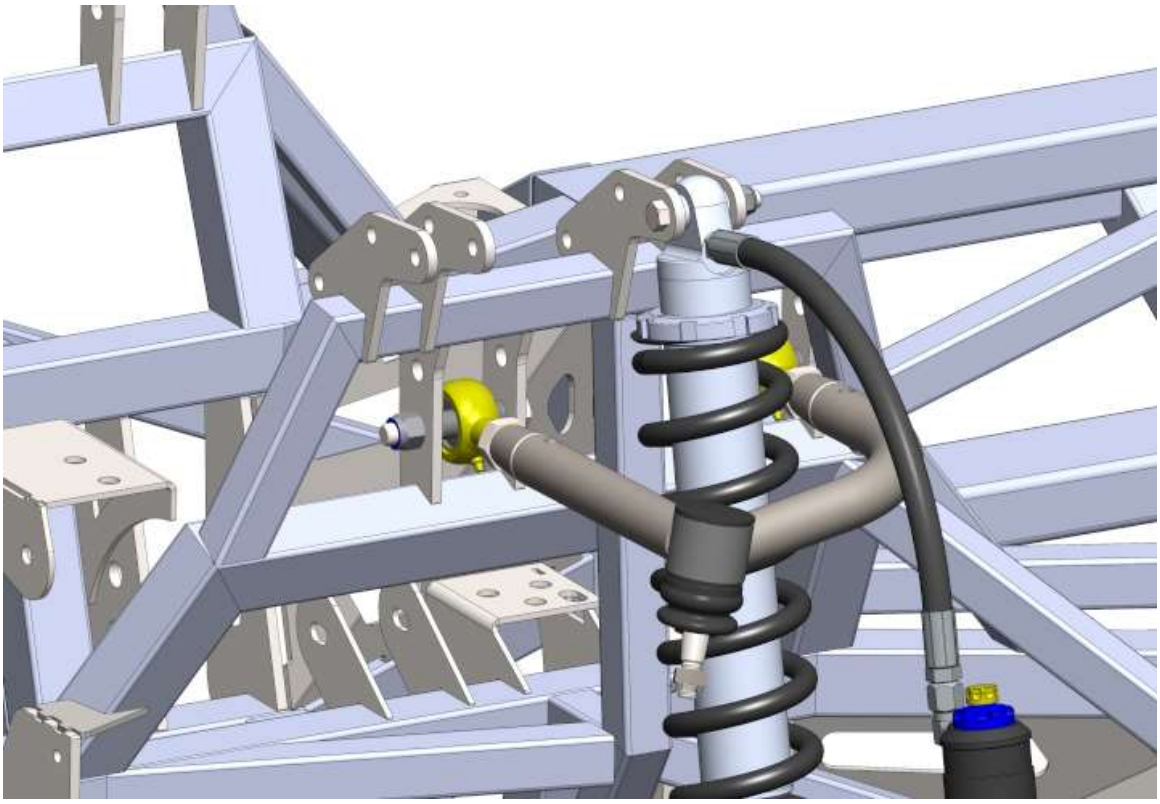
Install boot and spiral retainer clip into outside housing groove.

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

✋ FAILURE TO GREASE AND MAINTAIN THIS BALL JOINT MAY RESULT IN PREMATURE FAILURE.

Push in the top cap into the arm until seated.

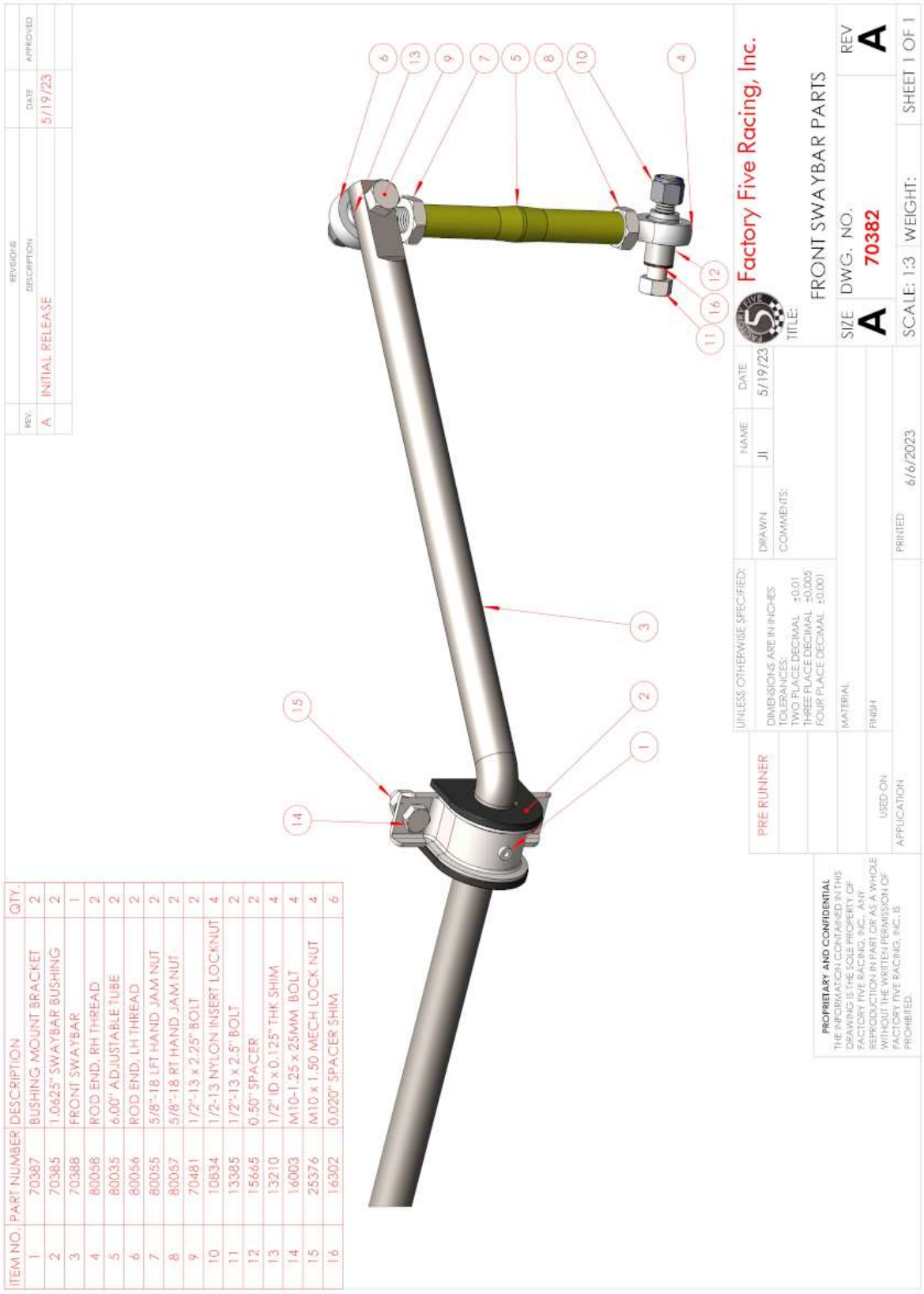
Screw the adjustable ends with the jamb nuts into the upper arms leaving around ½” of threads still showing to start.



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

FRONT SWAYBAR

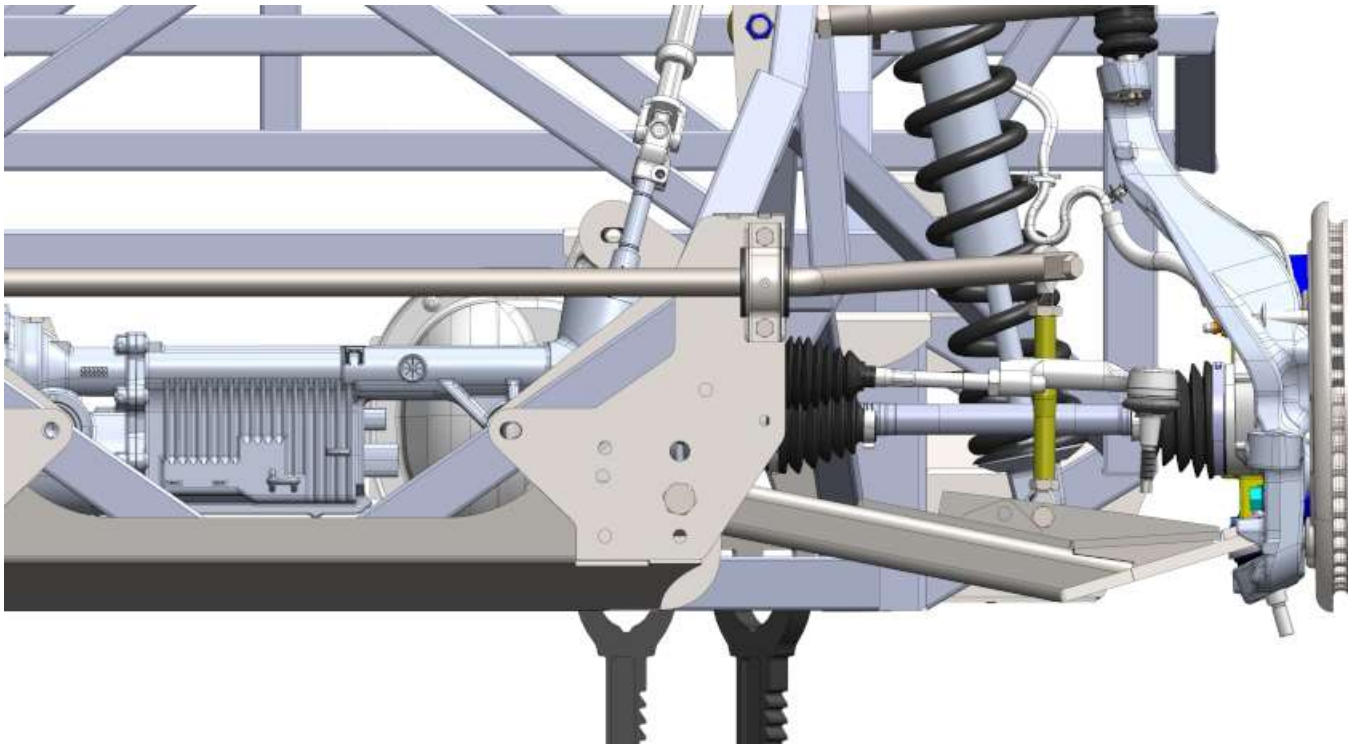
Box 38
Tools -



Assemble the end links for the swaybar.

Attach the polyurethane mounts to the swaybar.

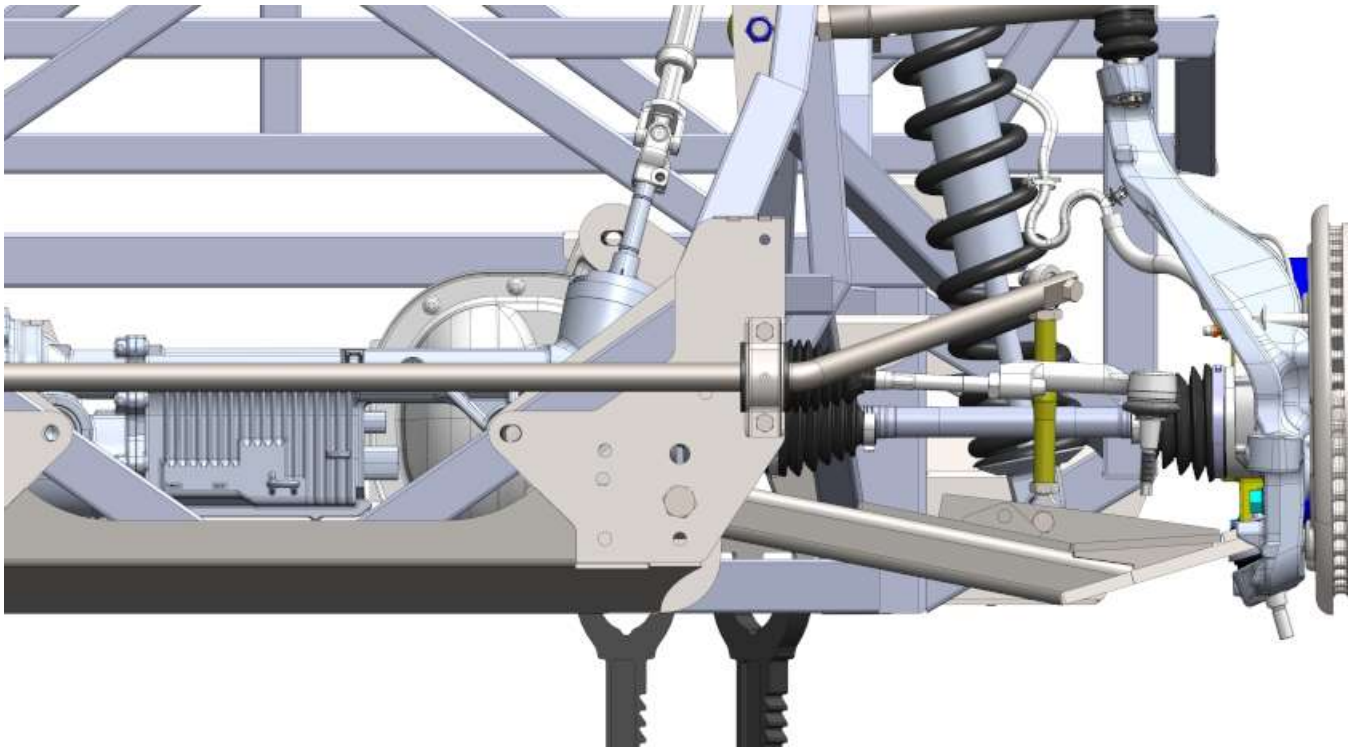
5.0L Coyote



5.0L Coyote frame mount location.

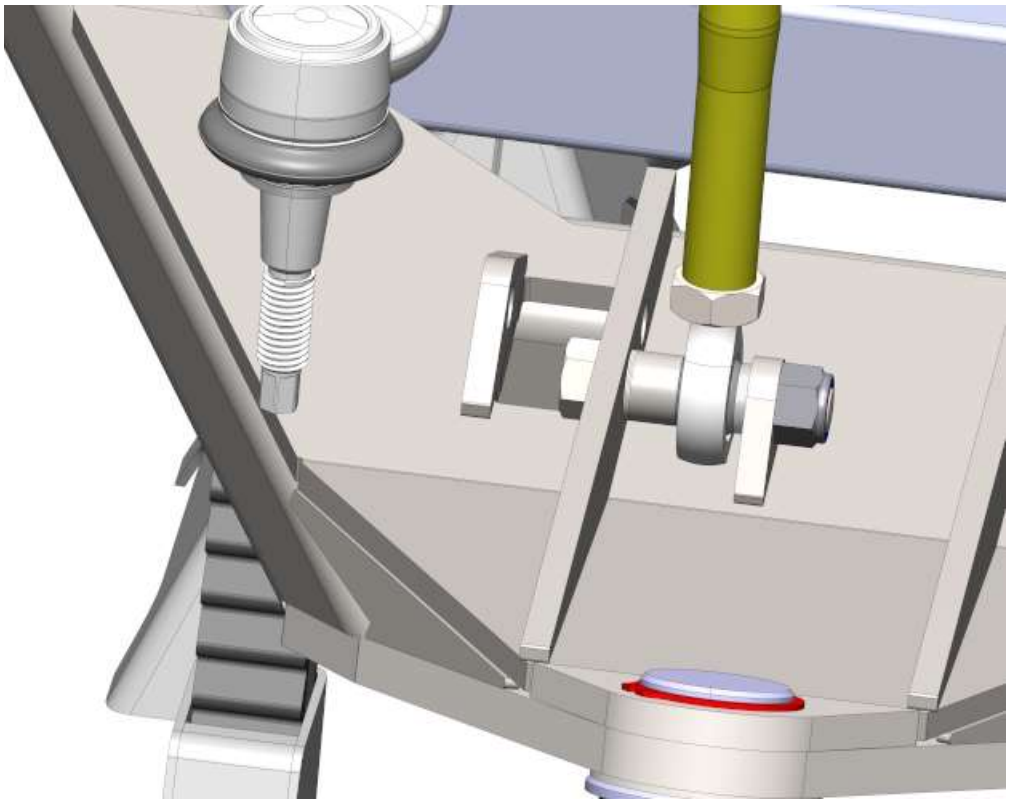
Attach the swaybar to the frame using a 16mm wrench and socket and torque the bolts to **33 ft-lb (44Nm)**.

3.5L Ecoboost



3.5L Ecoboost frame mount location.

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



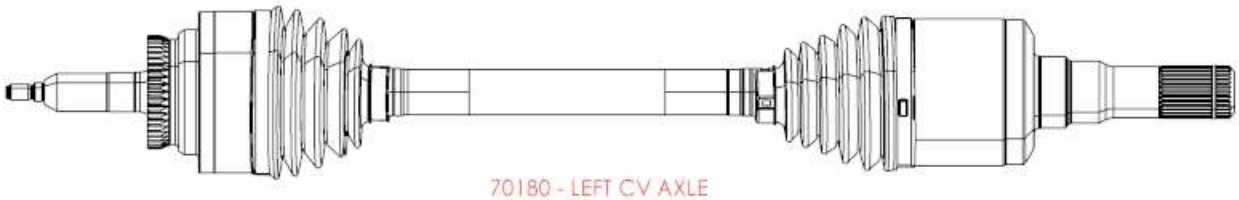
Attach the swaybar end link to the lower control arm. Note the location of the spacers.

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

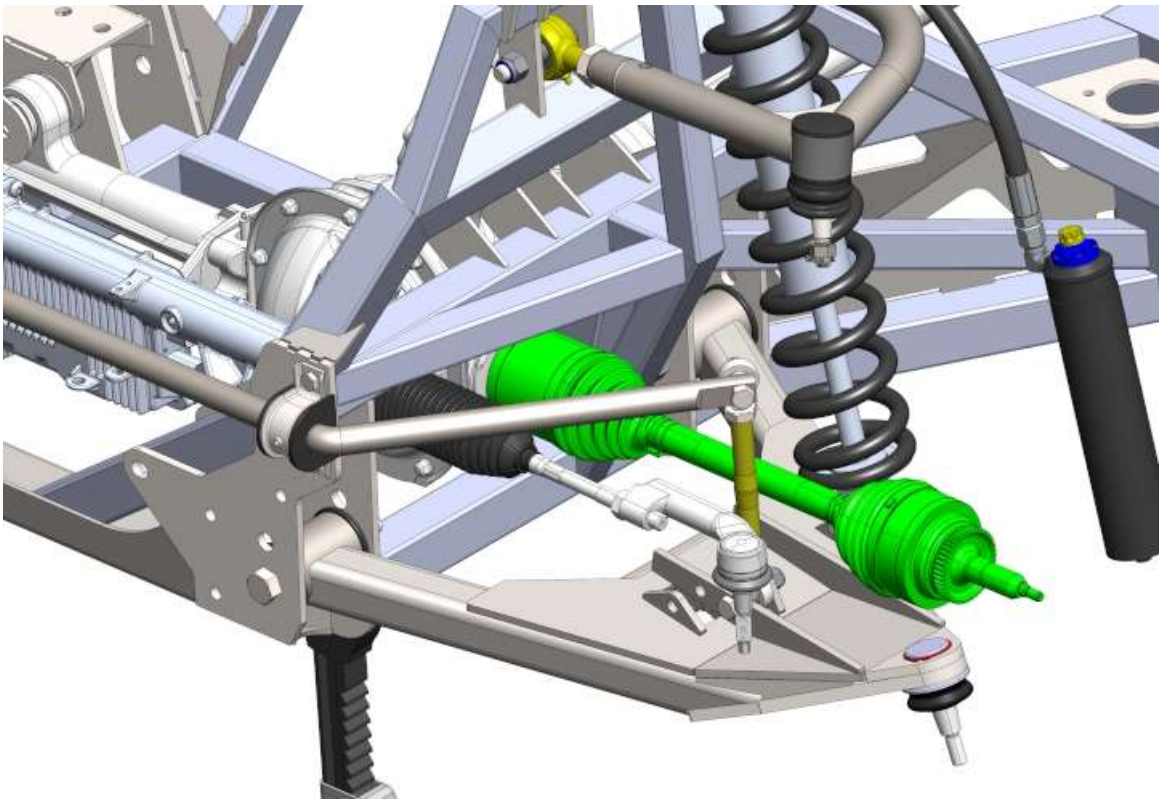
CV AXLE

Box 44
Tools -

70181 - RIGHT CV AXLE

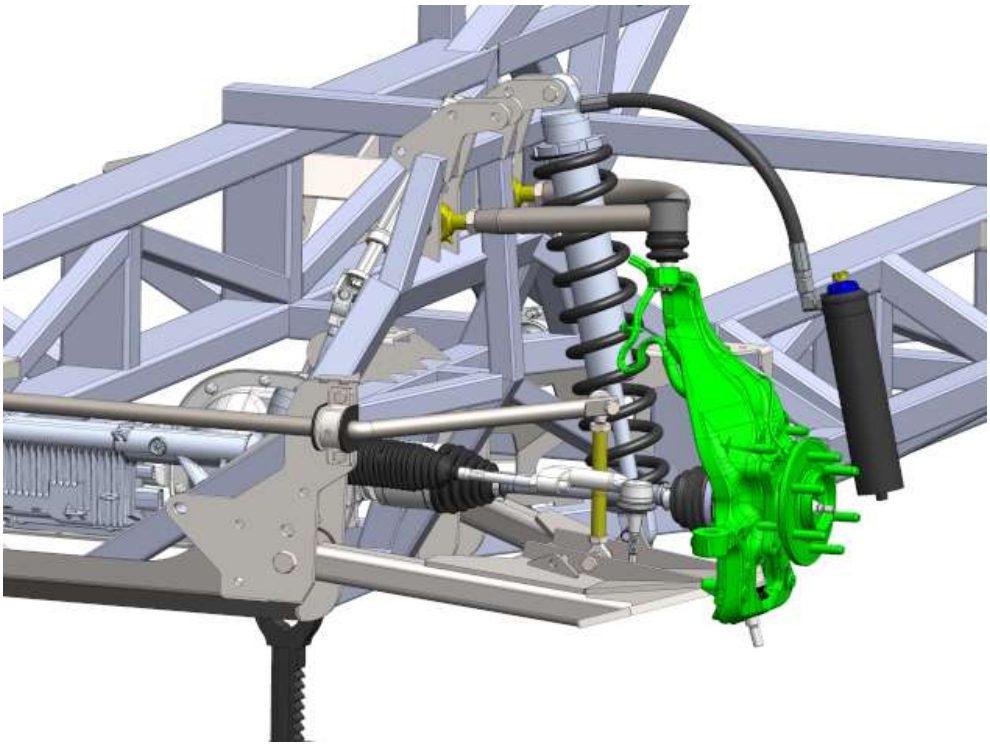


70180 - LEFT CV AXLE



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)** and install the cotter pin.

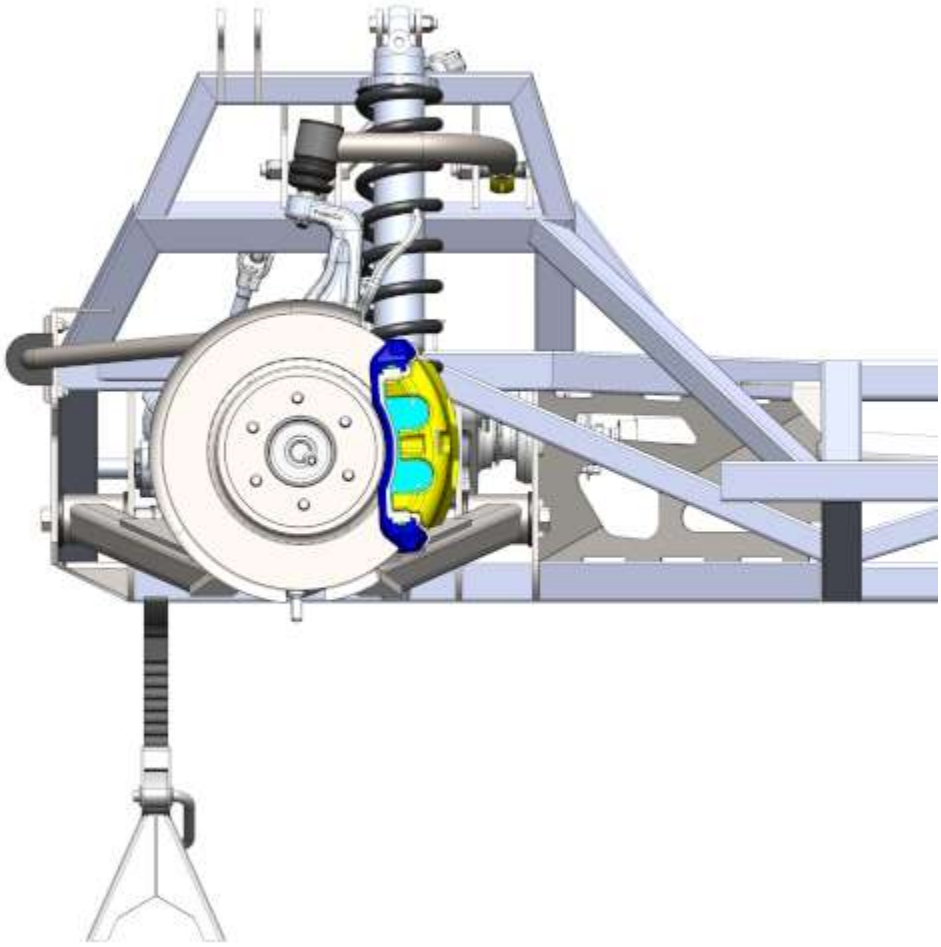
Insert the upper balljoint into the spindle and tighten the nut to **45 lb-ft (61 Nm)**; tighten further only as necessary to install the cotter pin.

Put blue Loctite on the CV axle nut and attach it to the CV axle. Tighten the nut to **30 lb-ft (40Nm).**

Front Brakes

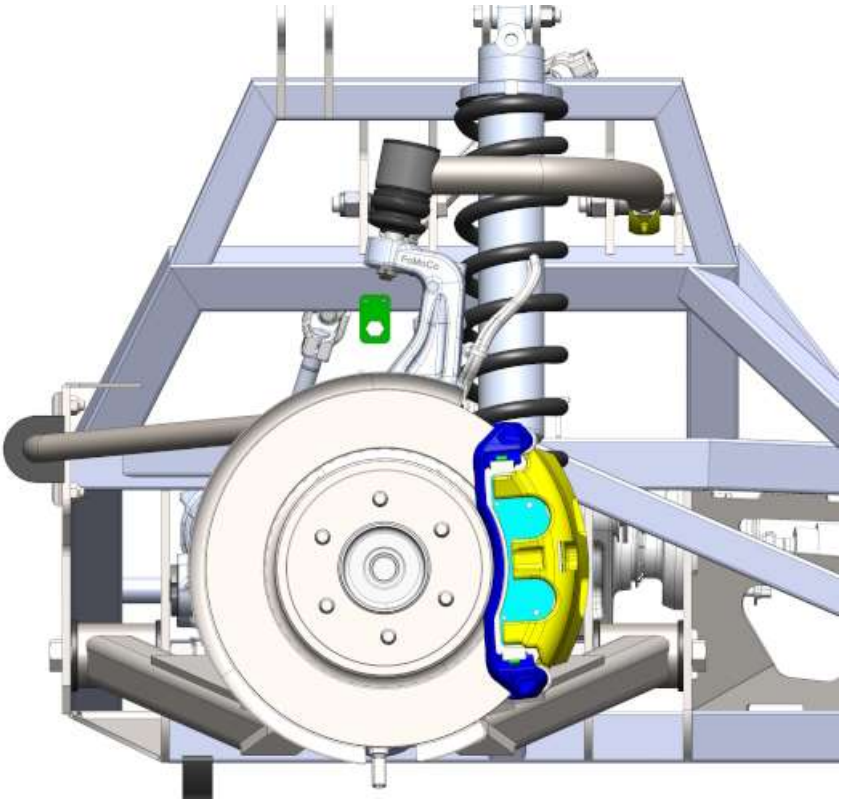
Box 5, Box 6 rivets

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

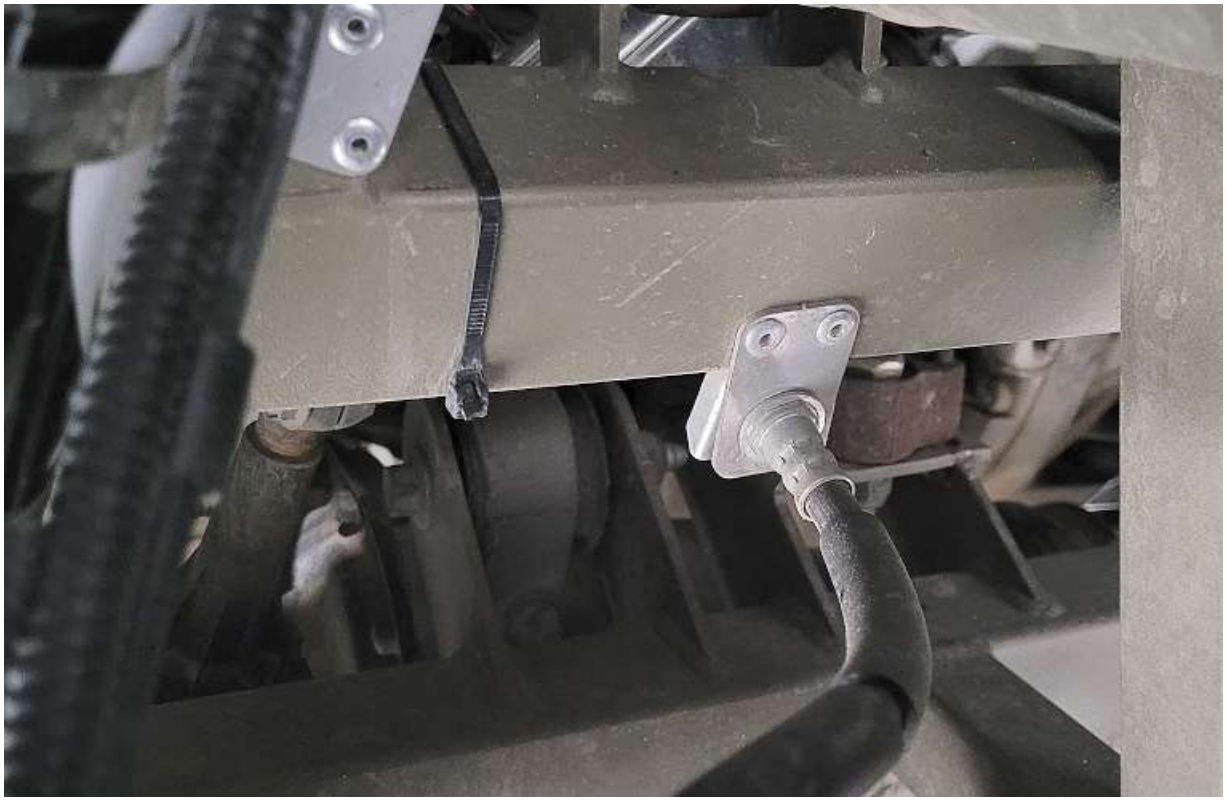


If the brakes were removed, attach them to the spindle now. Torque the caliper bracket to spindle bolts to **184 lb-ft (250Nm)**.

Install the correct new longer hoses to the brake calipers. Torque the Banjo bolt to **26 lb-ft (35Nm)**.

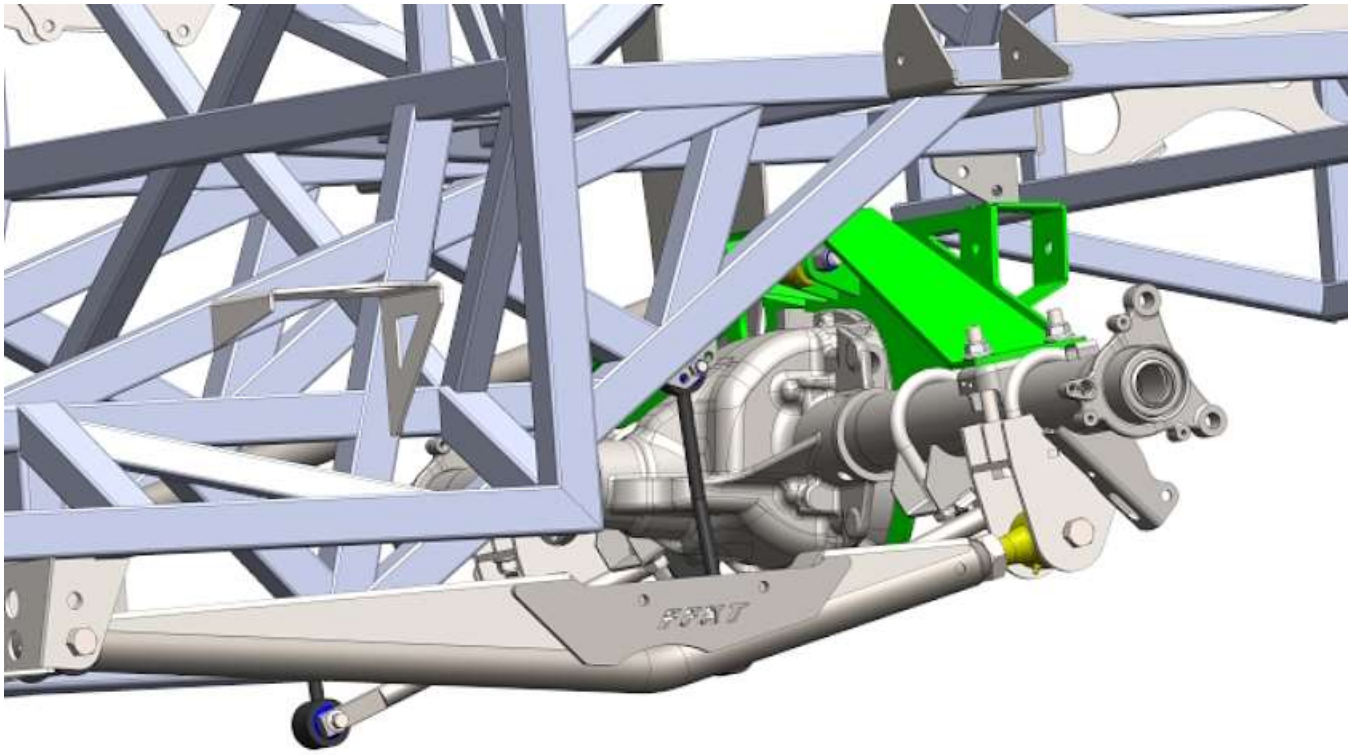


Attach the brake hose mount to the frame below the upper control arm mount using the kit $^{3}/_{16}$" rivets.



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

Rear Suspension

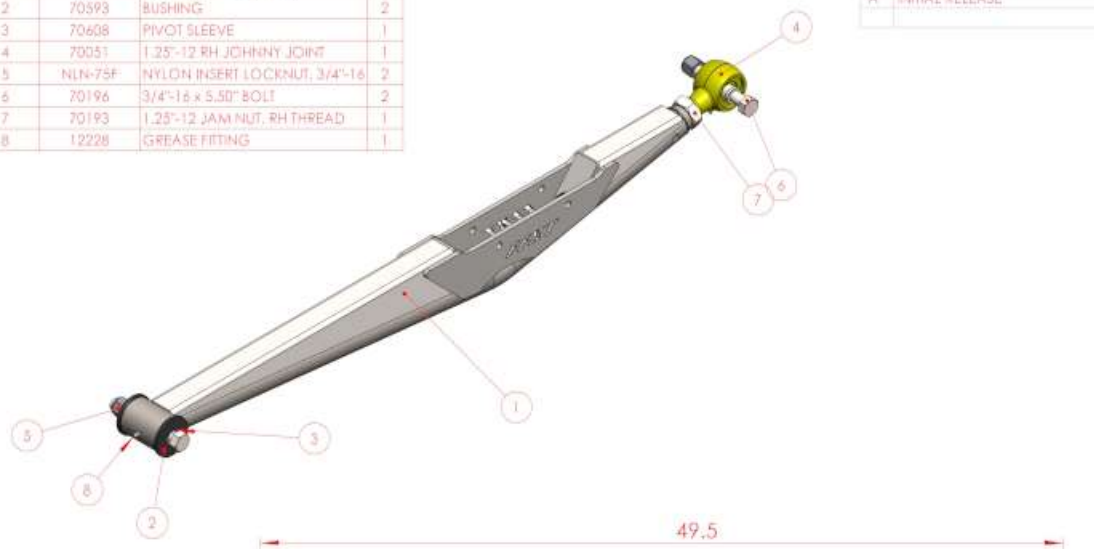


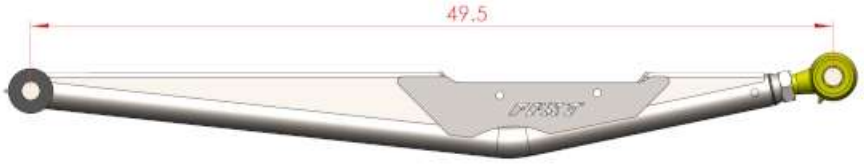
REAR LOWER CONTROL ARMS

Box 43
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

REVISIONS			
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
		DRAWN	5/5/23
		COMMENTS:	
	MATERIAL		
USED ON	FINISH		
APPLICATION		PRINTED	8/1/2023

Factory Five Racing, Inc.

TITLE: REAR LWR ARM PARTS

SIZE	DWG. NO.	REV
A	70199	A

SCALE: 1:8 | WEIGHT: | SHEET 1 OF 1

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

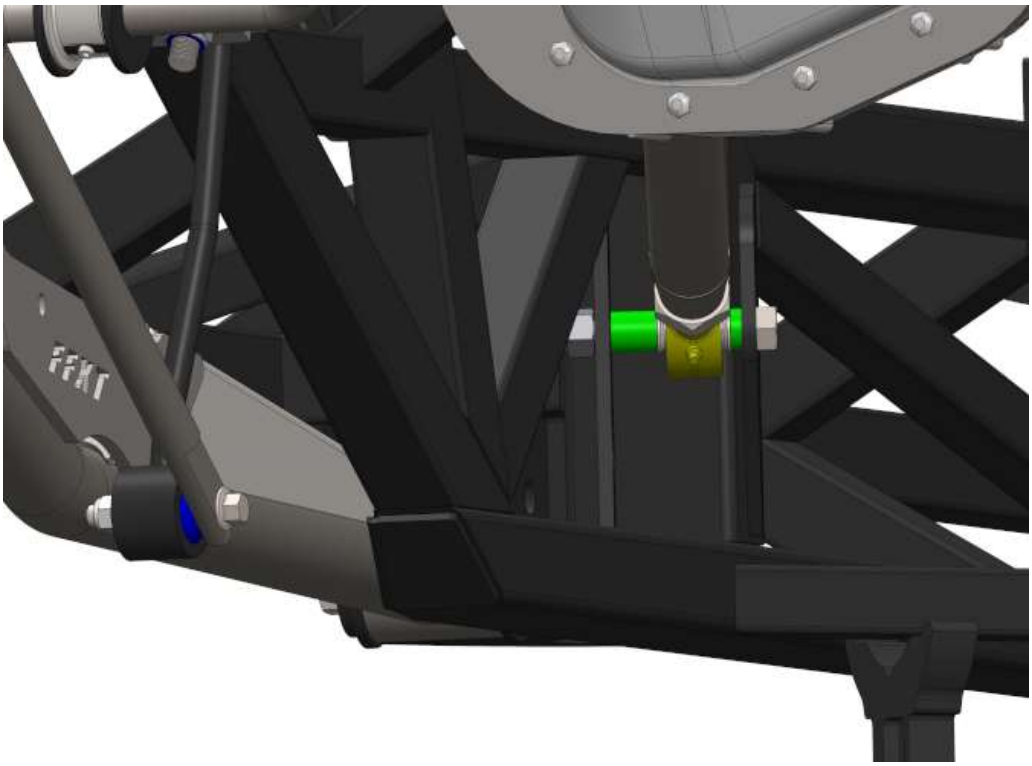
REAR UPPER CONTROL ARMS

- Box 45
- Tape measure

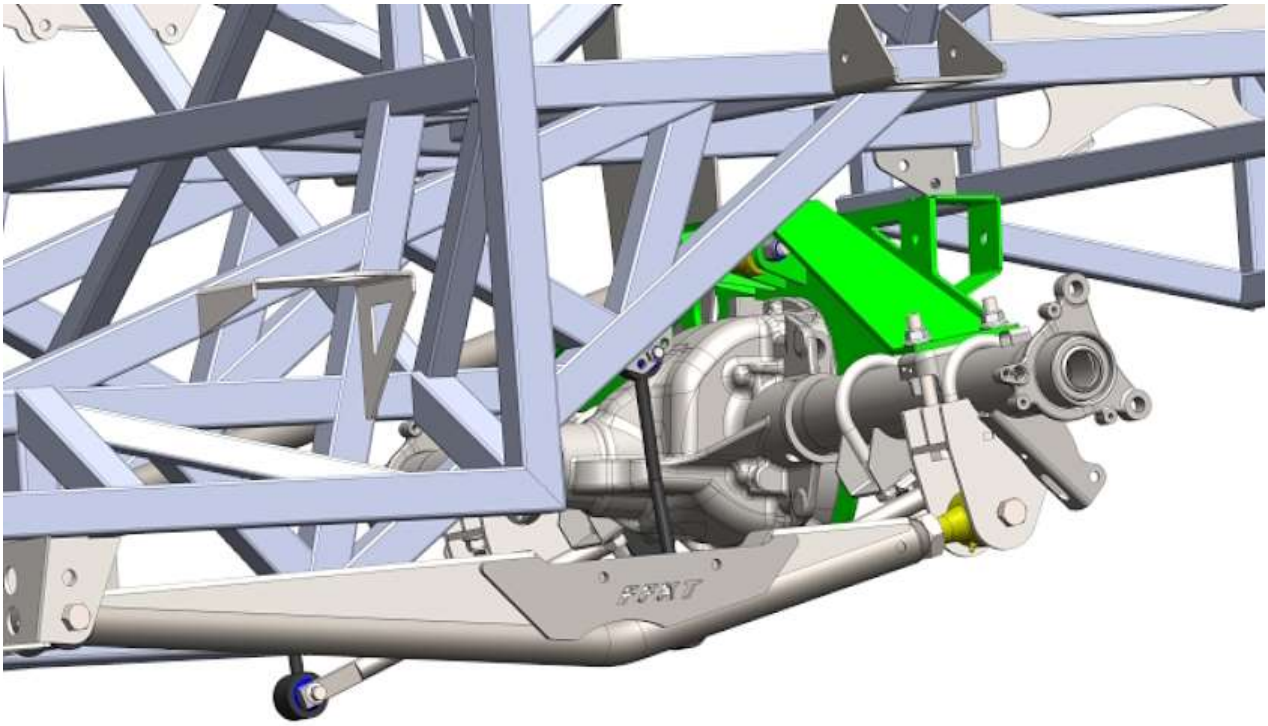
Assemble the rear upper control arm and set the distance from the center of one adjustable joint to the center of the other Johnny joint as shown.

REAR AXLE

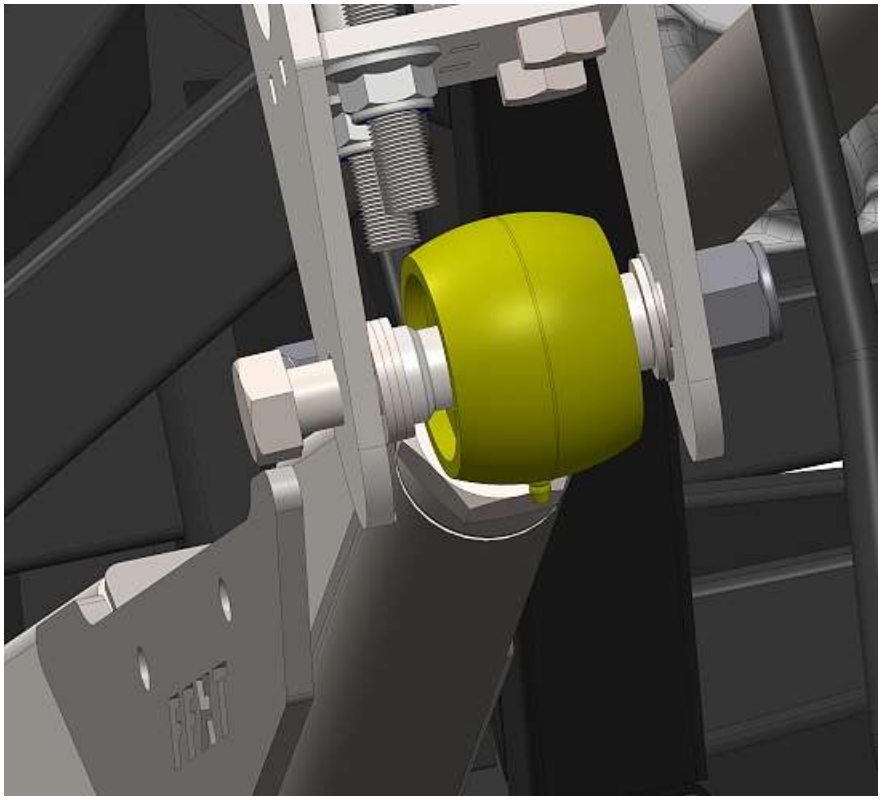
- OEM axle
- Floor jack



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.

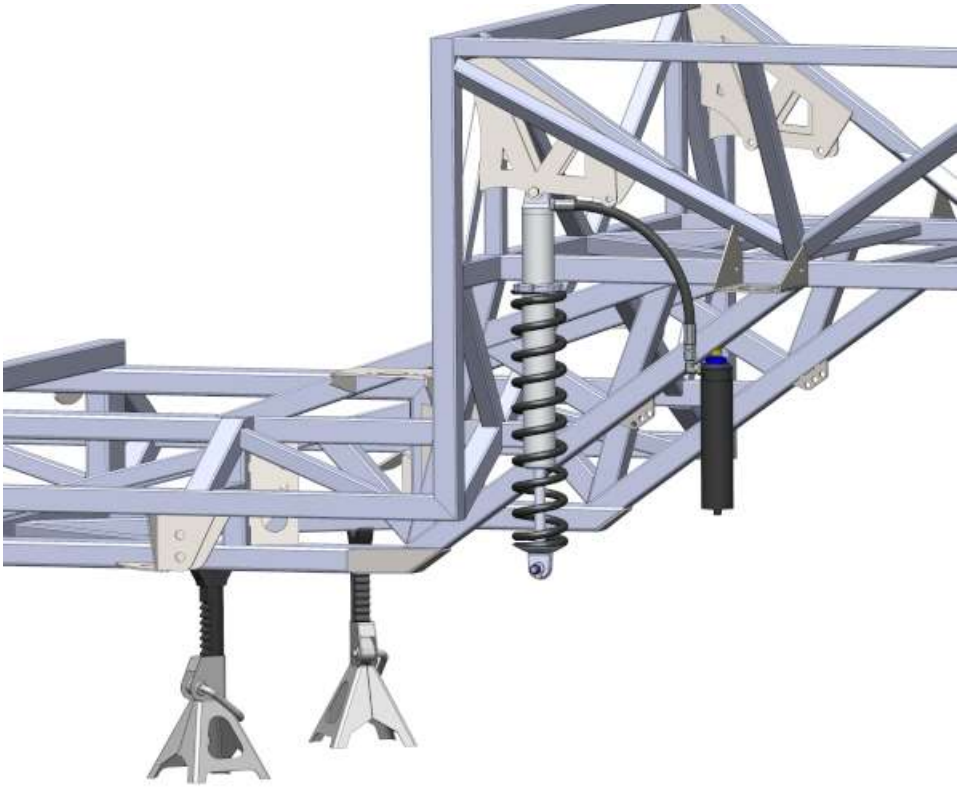
REAR SHOCKS

Box 4, 36

🛠 External Snap Ring Pliers

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.

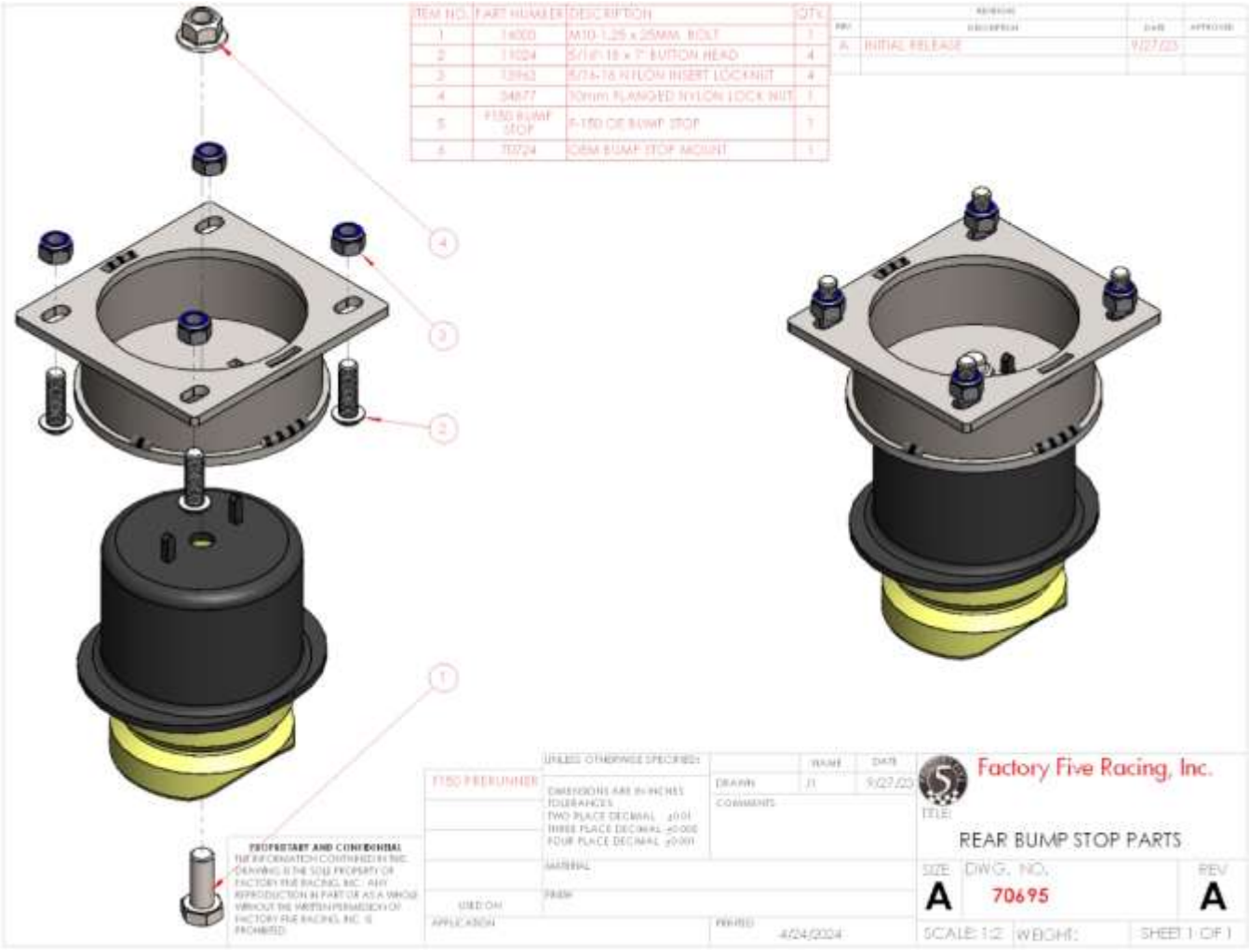


Attach the top of the rear shock to the frame as shown with the reservoir hose pointed backwards.

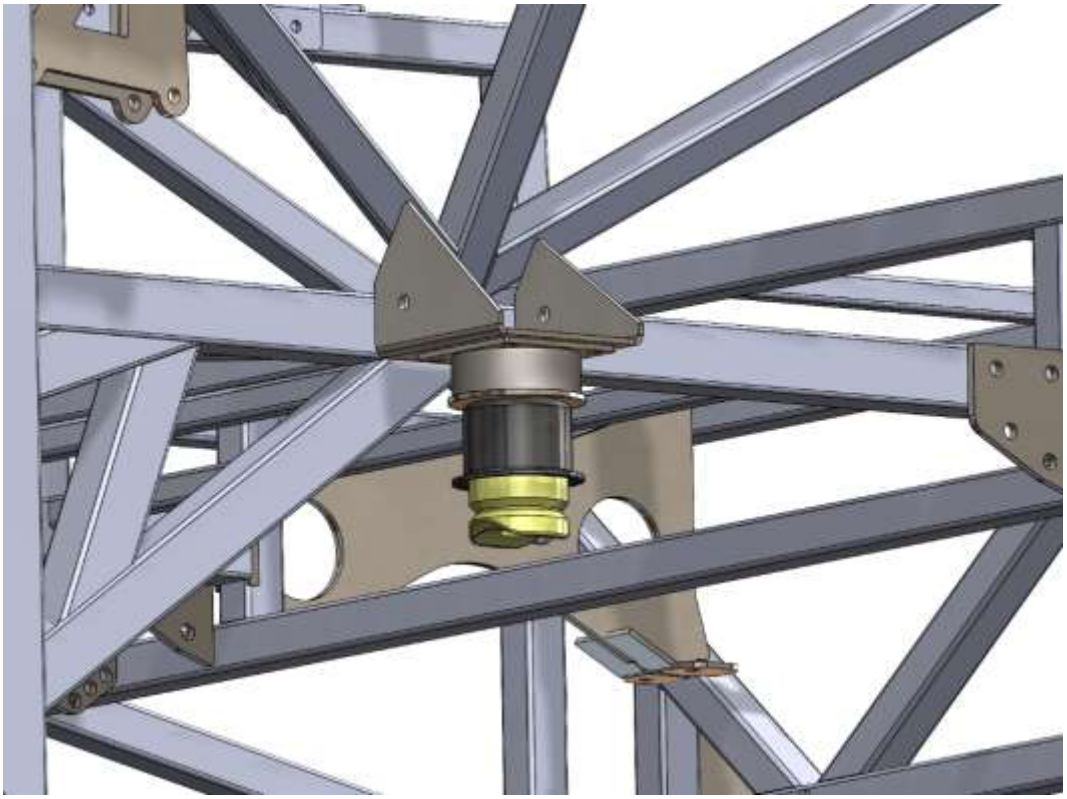
Mount the reservoir to the 2”x 2” square tube next to the shock using rivets or the included #10 self-tapping screws. The brackets need to get located one at each end, not in the middle in a location that does not kink the hose or allow it to get pinched above the tire.

REAR AXLE BUMP STOPS

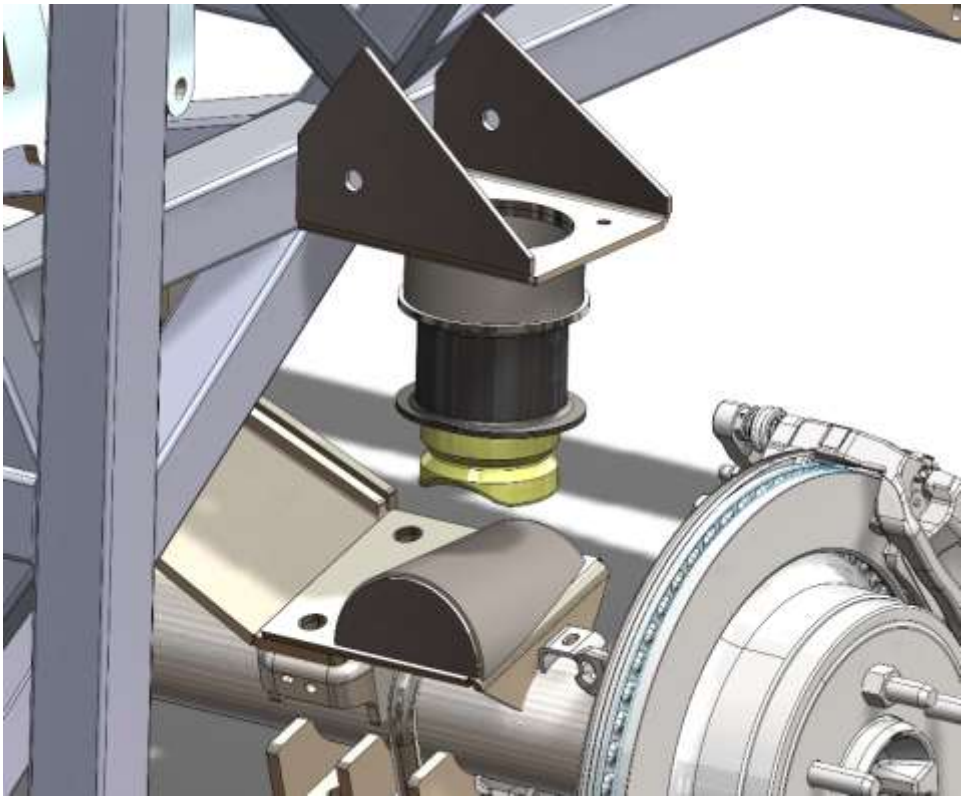
🚘 OEM Bump stops, Rear bump stop parts
🛠 ½”, 15mm Sockets, extension, ratchet, 15mm wrench, 3/16” Hex key.



Attach the OEM mount to the spacers using a 15mm socket, extension, and wrench.

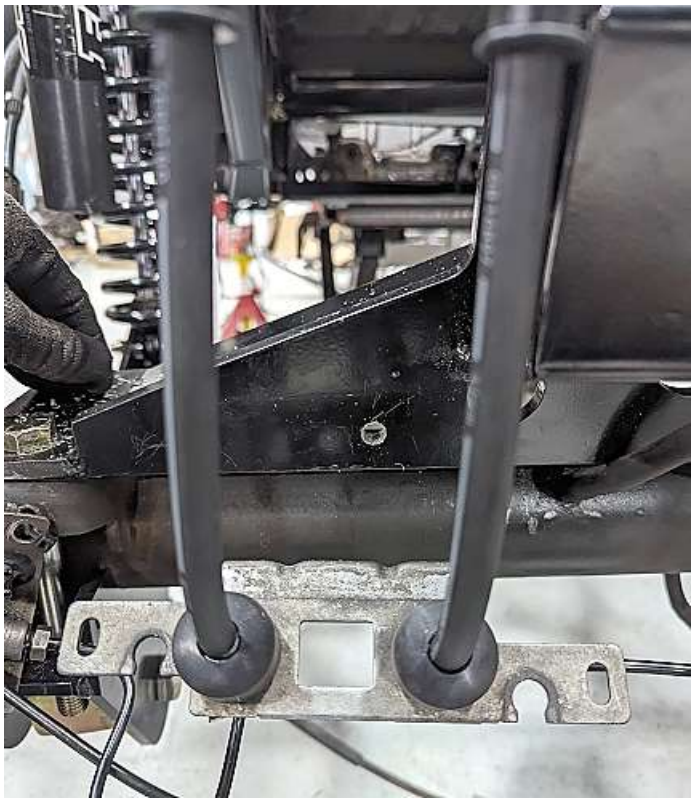


Attach the bump stop mount to the underside of the frame mount above the rear axle using a 3/16" hex key and ½" socket. The circular cutout in the bump stop should run parallel to the length of the frame (perpendicular to the axle).



Attach the axle-side bump adapter to the axle by using the same bolts that hold the axle brace on. The chunk of 4 inch round should be **level** when the axle is in full compression, so the angle should tilt **back** at ride height.

REAR BRAKE HOSES



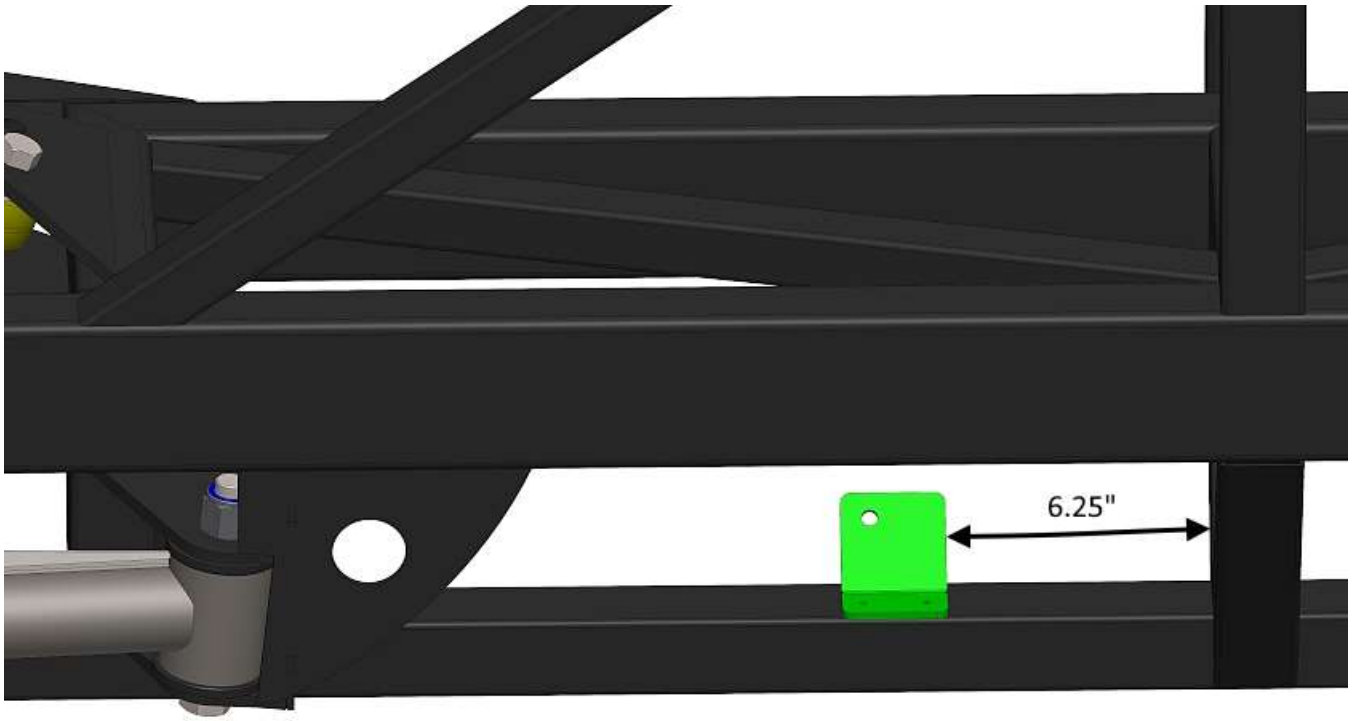
Using the stock bracket as a guide to mark and drill and attach the brake line bracket to the axle.

Bolt the bracket in place and attach the axle mounted hard brake lines.

Clamp the OEM chassis side brake line bracket to the far left side of the frame on a 1” square tube being careful to note clearance for the bed aluminum and the axle. It is helpful to run the axle through its travel while still clamped to ensure you are in a good spot before drilling.

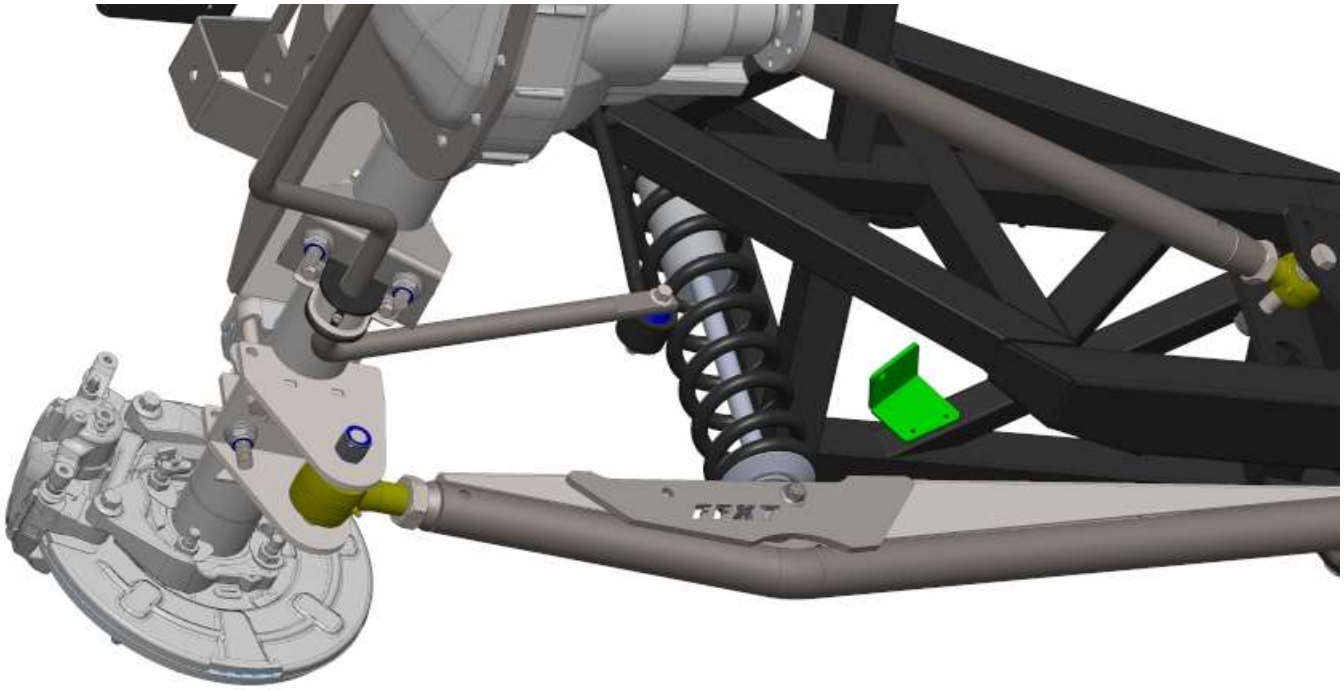
Drill and bolt the bracket in place on the chassis.

E-BRAKE CABLES (If no electric parking brakes)



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.

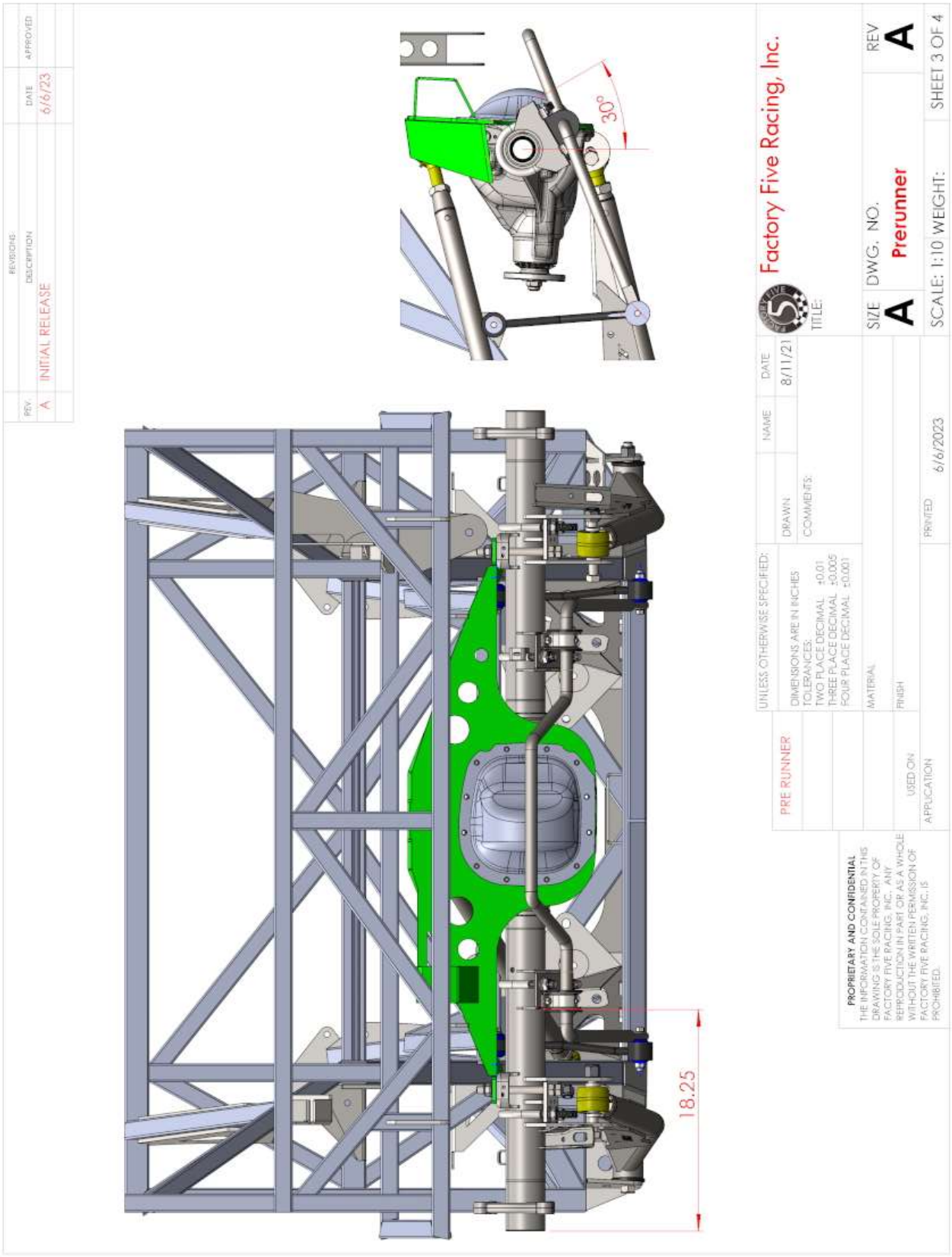


Attach the brake cable locating bracket to the chassis as shown.

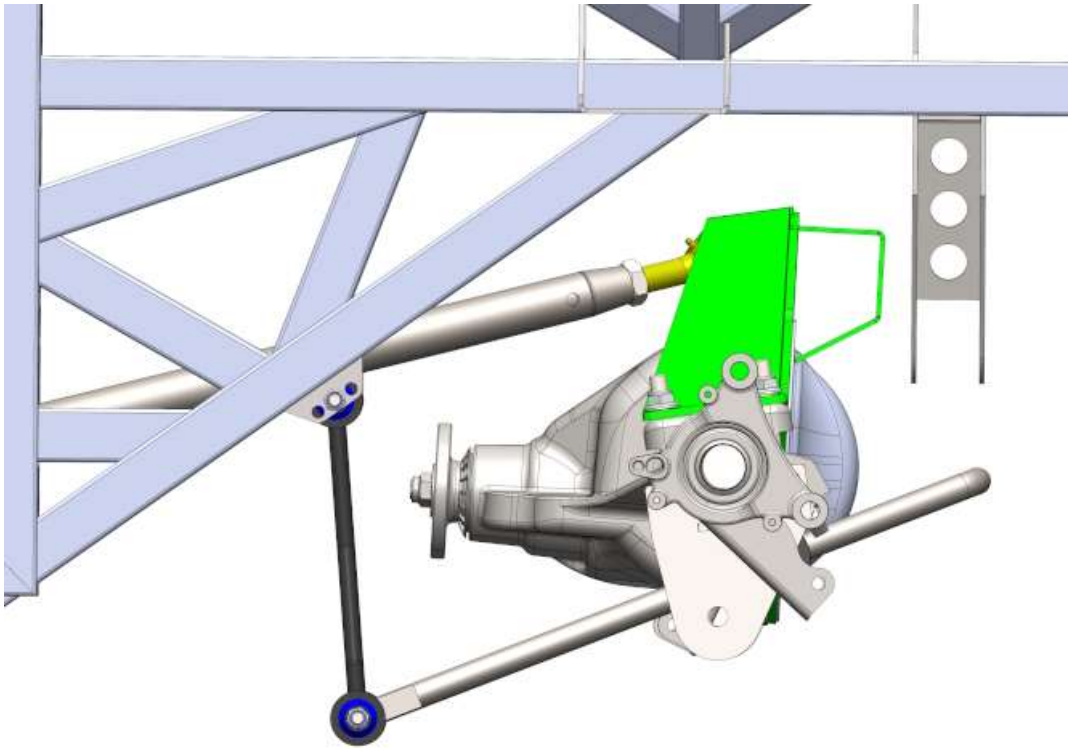
Attach the OEM cable clamp to the cable locating bracket.

REAR SWAYBAR (OPTIONAL)

Box 38



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



Bolt the swaybar links to the chassis bracket

Engine

Zip tie the front radiator/headlight harness to the cowl.

✋ Do not pinch the wiring between the firewall and the engine when installing the engine.

Install the engine, transmission, and transfer case as a single unit and adjust until the mounts line up with the chassis plates.

Install the mounting hardware for the factory engine mounts, for the left side shorter bolts are provided so they do not bottom out.

TRANSMISSION MOUNT

Line up the transmission mount studs with the slots on the frame.

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

Re-attach the transmission linkage.

Make sure there is no interference and the linkage can operate smoothly.

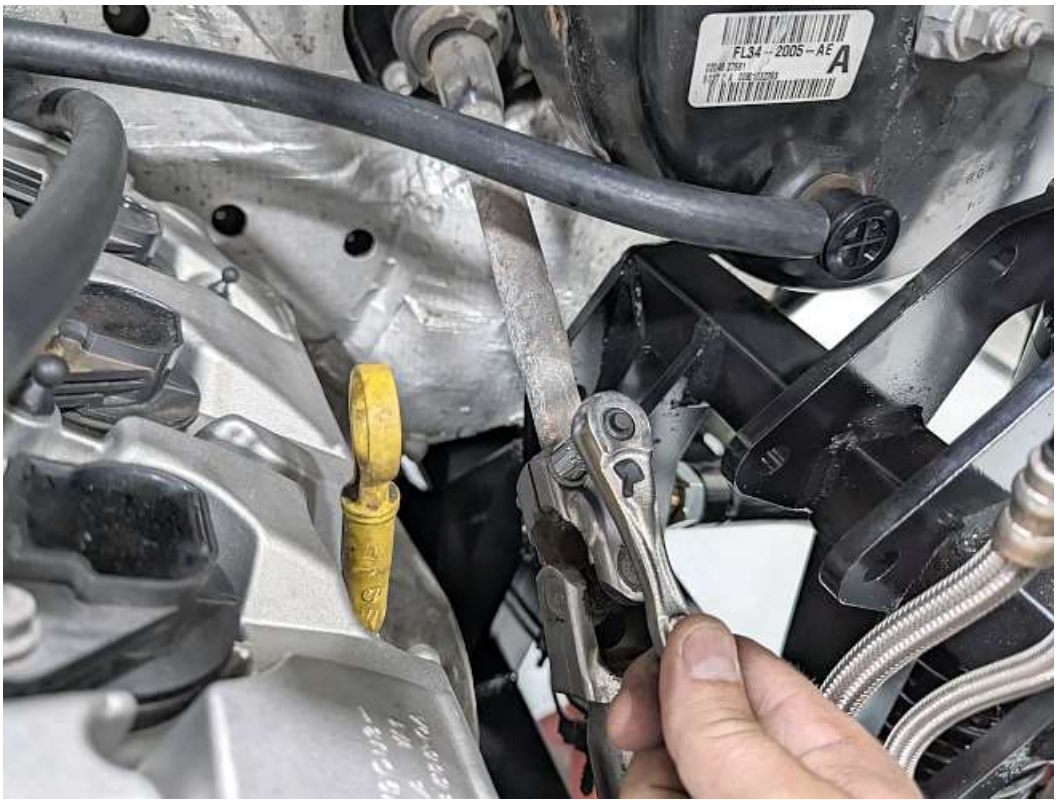
Steering shaft

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 Loctite 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 to clear the shock tower. Be careful not to kink the lines.

ABS Mount

ABS mount
$^{5}/_{16}$" 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 $^{5}/_{16}$" nut driver.

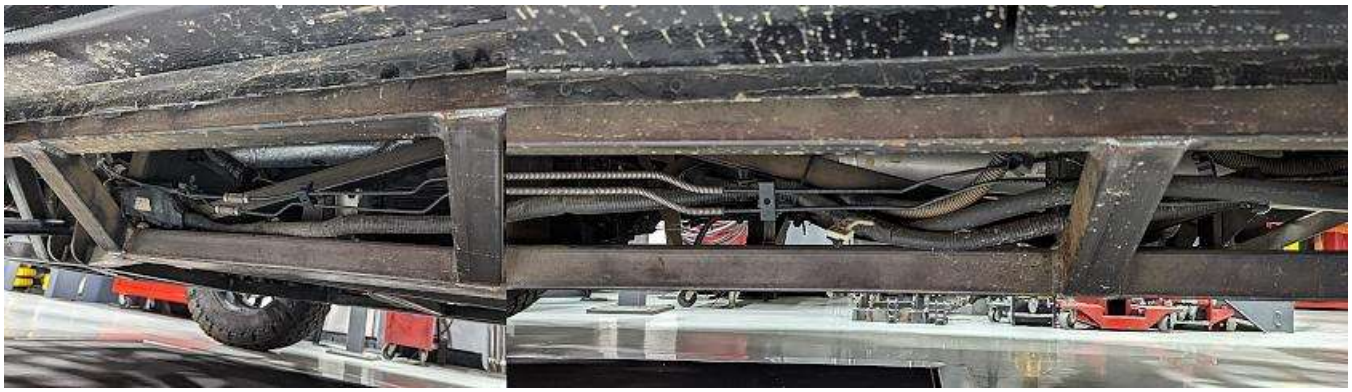
Attach the OEM ABS mount to the FFR mount using the carriage bolts and lock nuts.

Brake lines

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

Start routing the brake lines down the chassis from the ABS module.

Straighten out the OEM lines and route them down toward the chassis under the rocker panels, making sure to stay clear of where the front wheel will travel.



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.

At the rear of the cab run the lines up to the bed floor, keeping them along the side and out of the way of the control arms.

Transmission Cooler

- Transmission cooler mount (Box 5)
- Clamp, $^{5}/_{16}$" nut driver, drill
- Not all years had transmission coolers.

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 $^{5}/_{16}$" nut driver.

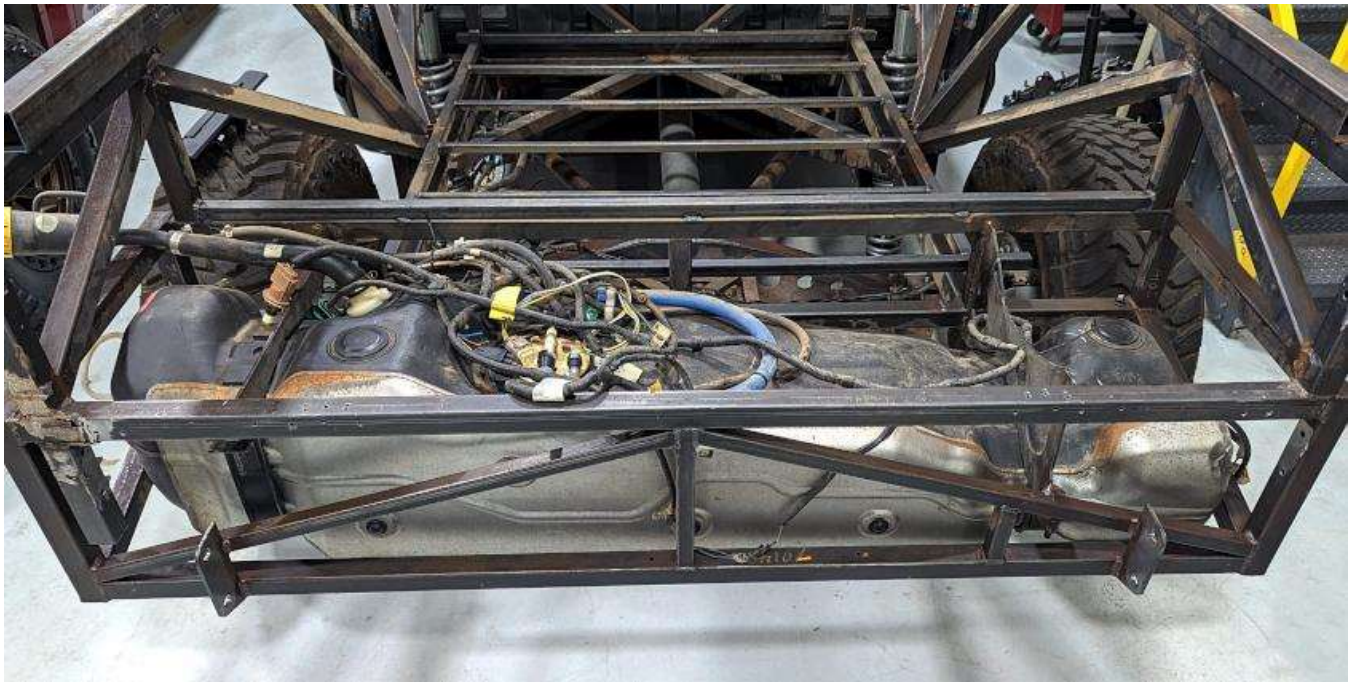
Attach the transmission cooler to the mount using the $^{5}/_{16}$" bolts and locknuts.

Fuel System

- Box 5, OEM Fuel tank, straps and cover.
- $^{9}/_{16}$" deep socket, ratchet, razor knife.
- The 26gallon fuel tank is required
- If the tank you have is the incorrect size, the correct size tank is **JL3Z-9002-H**
- If installing a new tank, the correct sending unit is Motorcraft **PFS-1229** and O-ring **CG-807**

TANK

JL3Z-9002-H tank in the frame.



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.

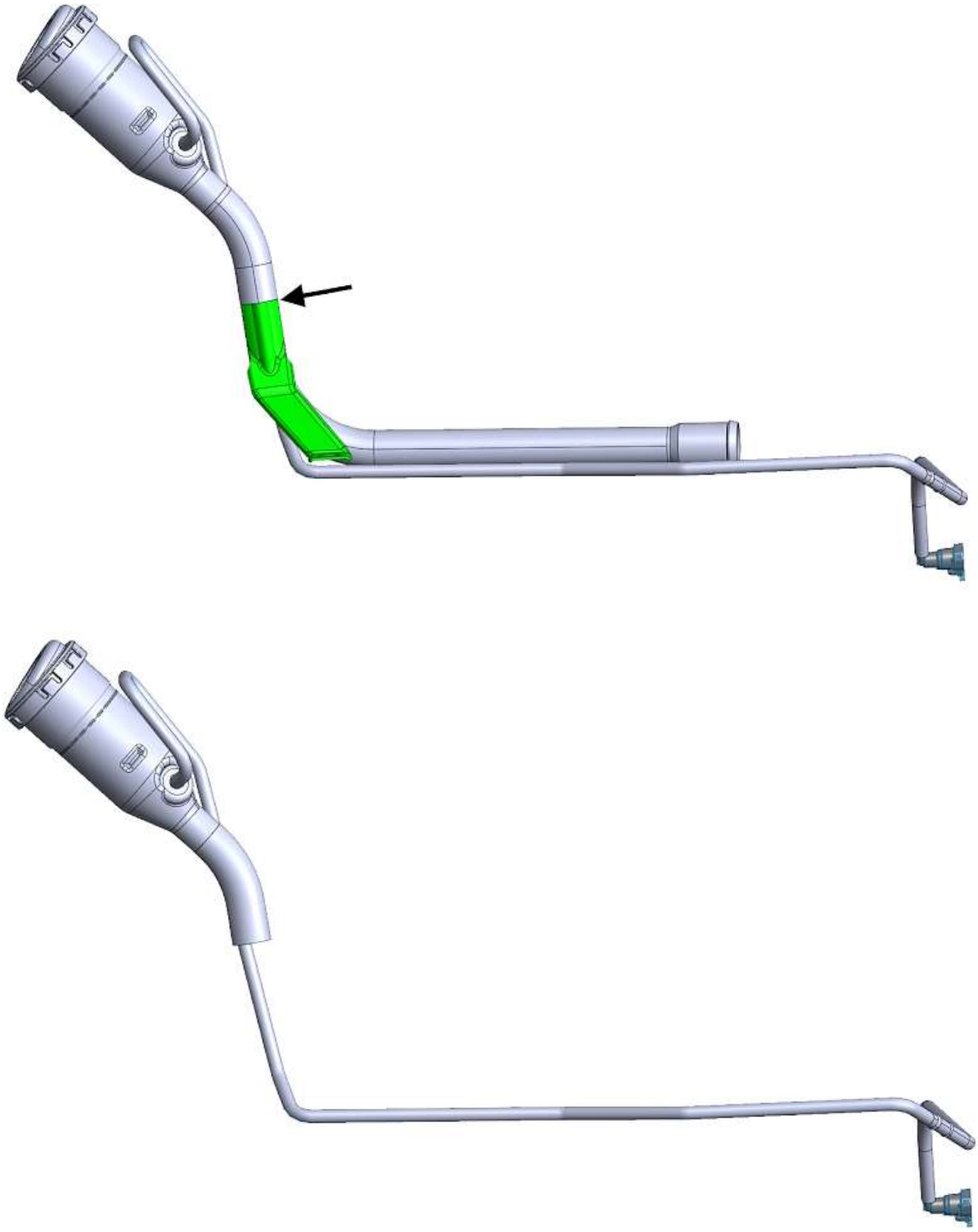
The tank should fit snug up against the flaps in both brackets.

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

- Box 5 Fuel and Brake components



Cut the OEM filler neck just above the mount bracket leaving the vent tube.

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

Use a short piece of the 3/8" fuel line included to connect the filler vent line to the tank.

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.

The filler hose angle should allow the hose to sit in the recess of the tank mounting bracket to give clearance for the floor panel.

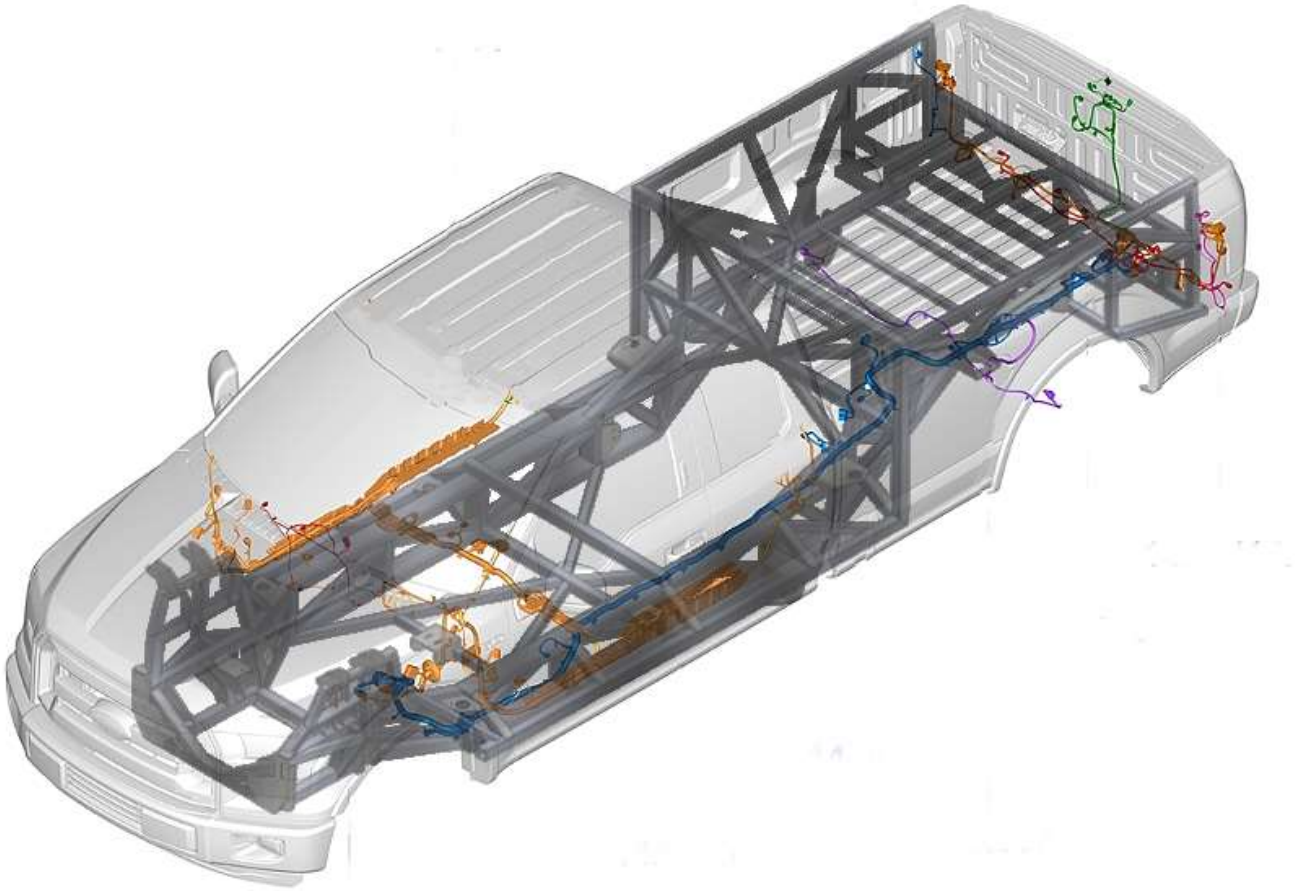
FUEL LINES

Run the ⅜” and ⅝” fuel lines from the tank area down the frame to the transmission tunnel area.

At the tank, on the ⅜” fuel line, slide the hose clamp onto the ⅜” 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.

Route the harness through the plate gusset where it is high and protected.

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

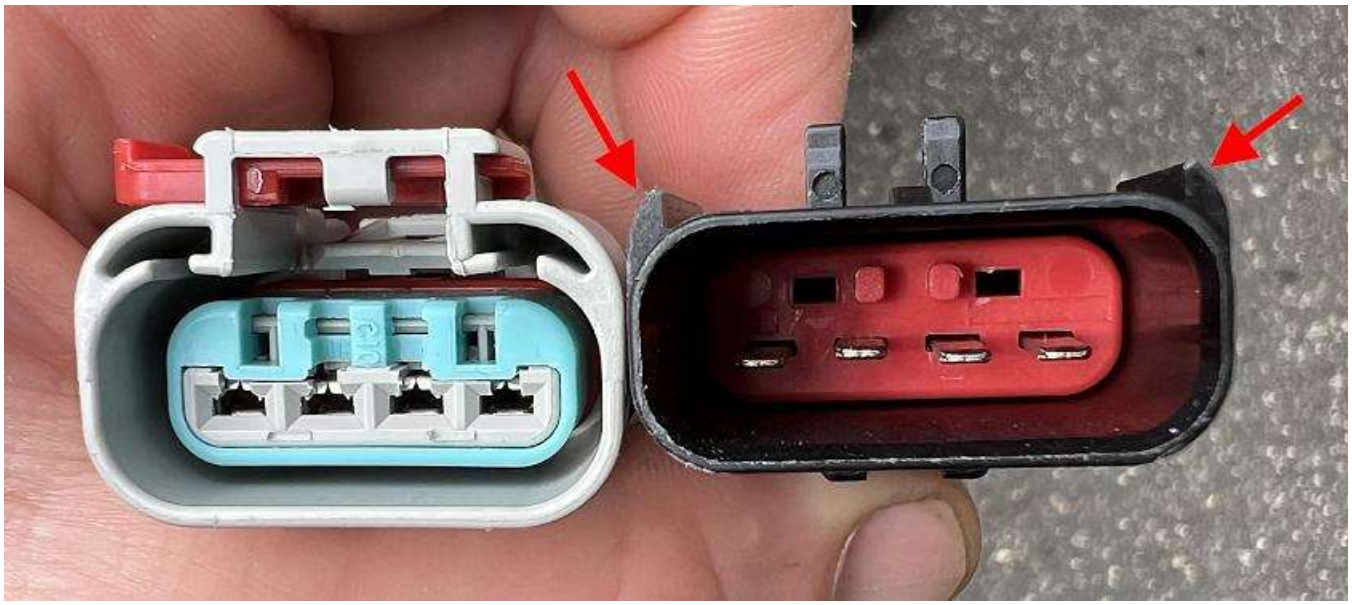
Mount the fuel pump module to the mounting bracket.

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.

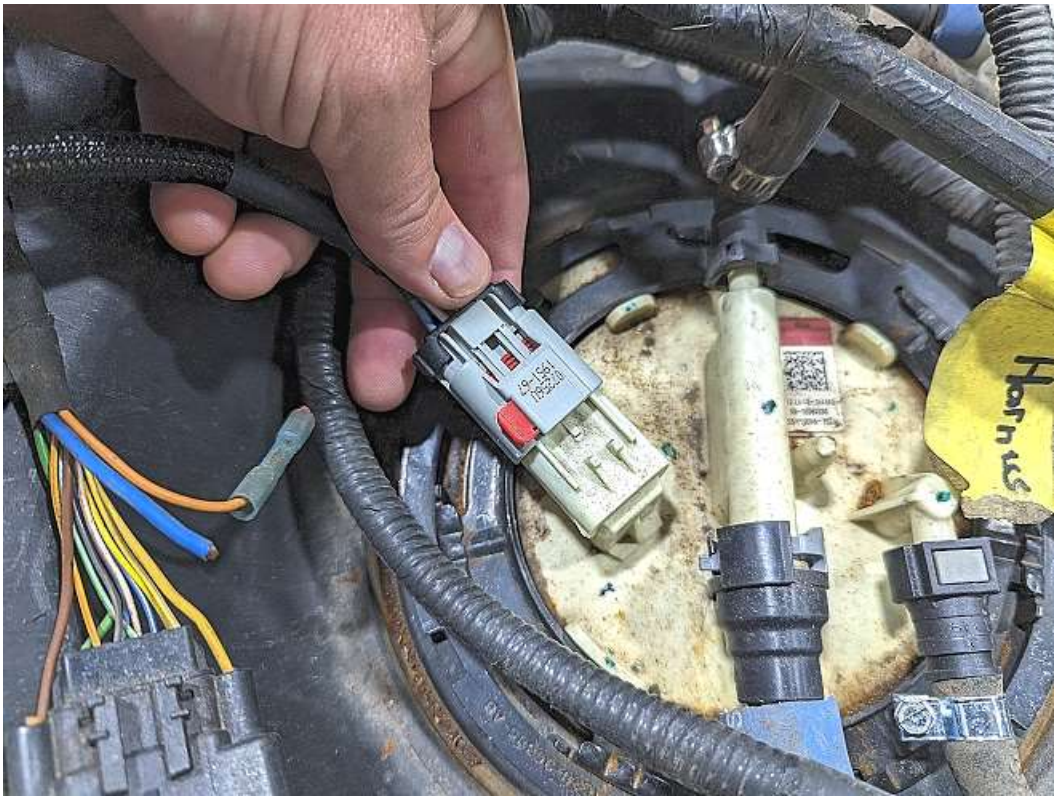
At the back of the frame run the harness around the corner then back to the fuel pump area on top of the fuel tank.

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.

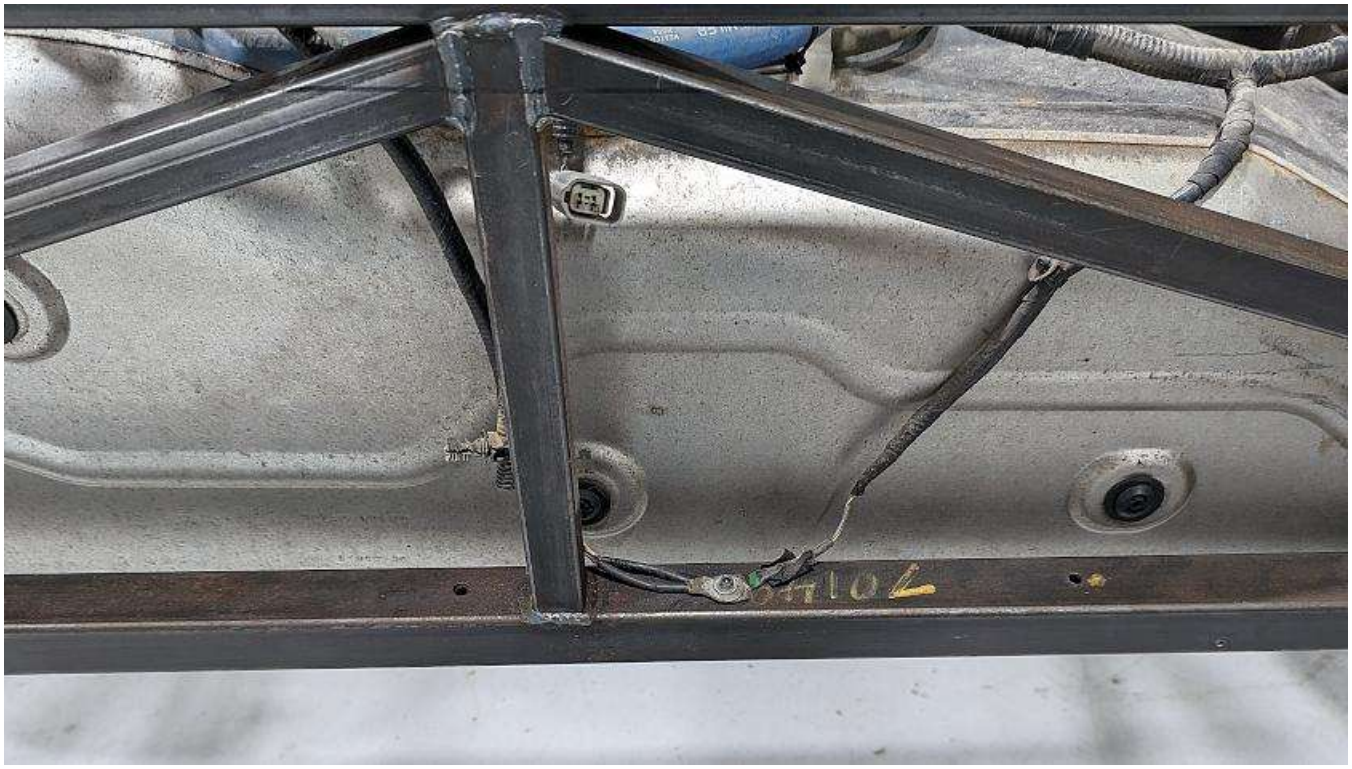


Connect the fuel pump connector then run the rear light wires to the back of the frame and down.

EVAP SENSOR

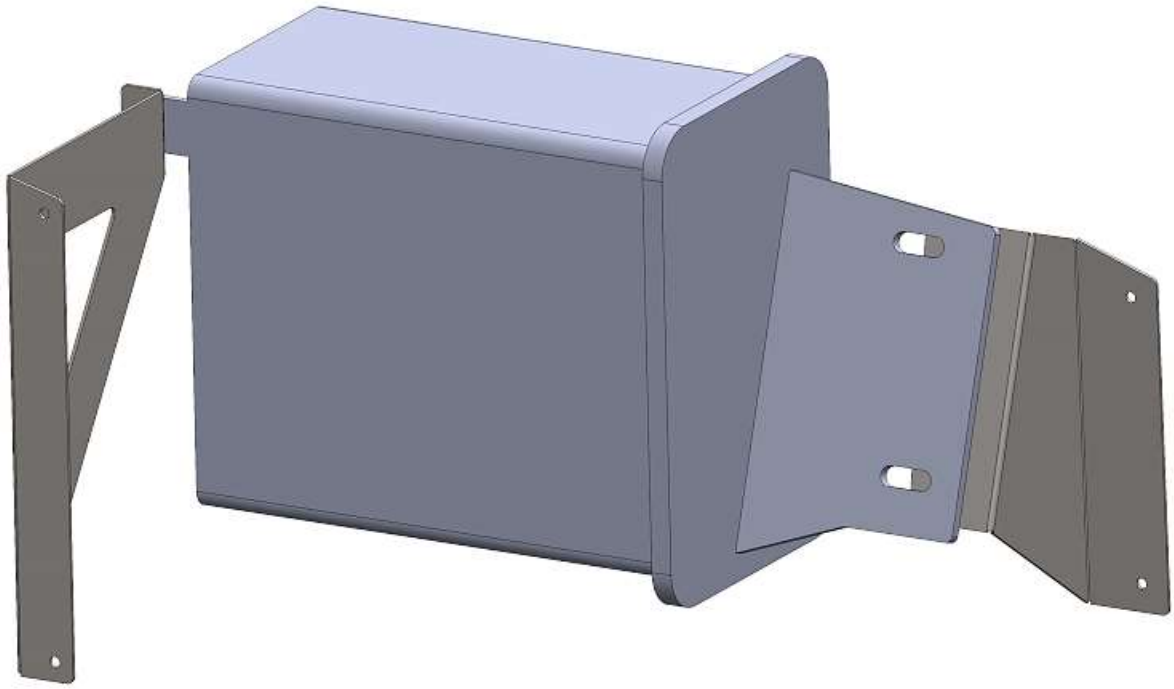
Cut and insert the EVAP sensor into the Evap canister ⅝” line and attach the EVAP sensor jumper wire.

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



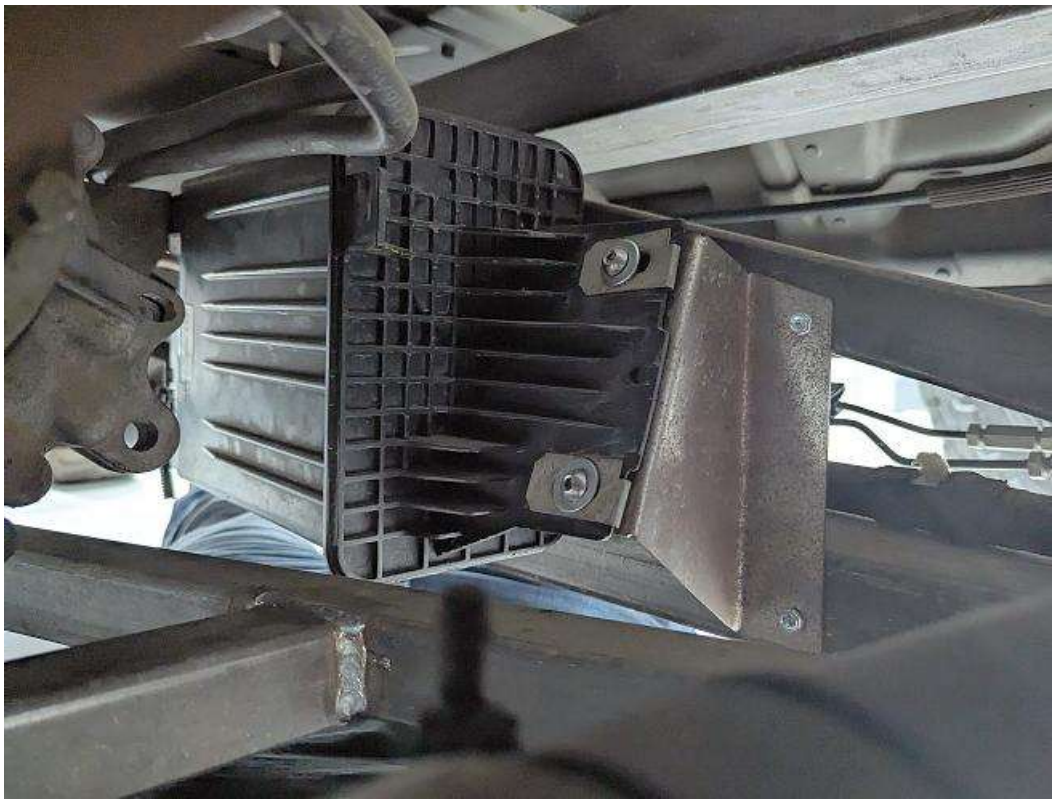
Attach the rear harness ground to the frame near the middle of the fuel tank on the rear lower frame tube.

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.

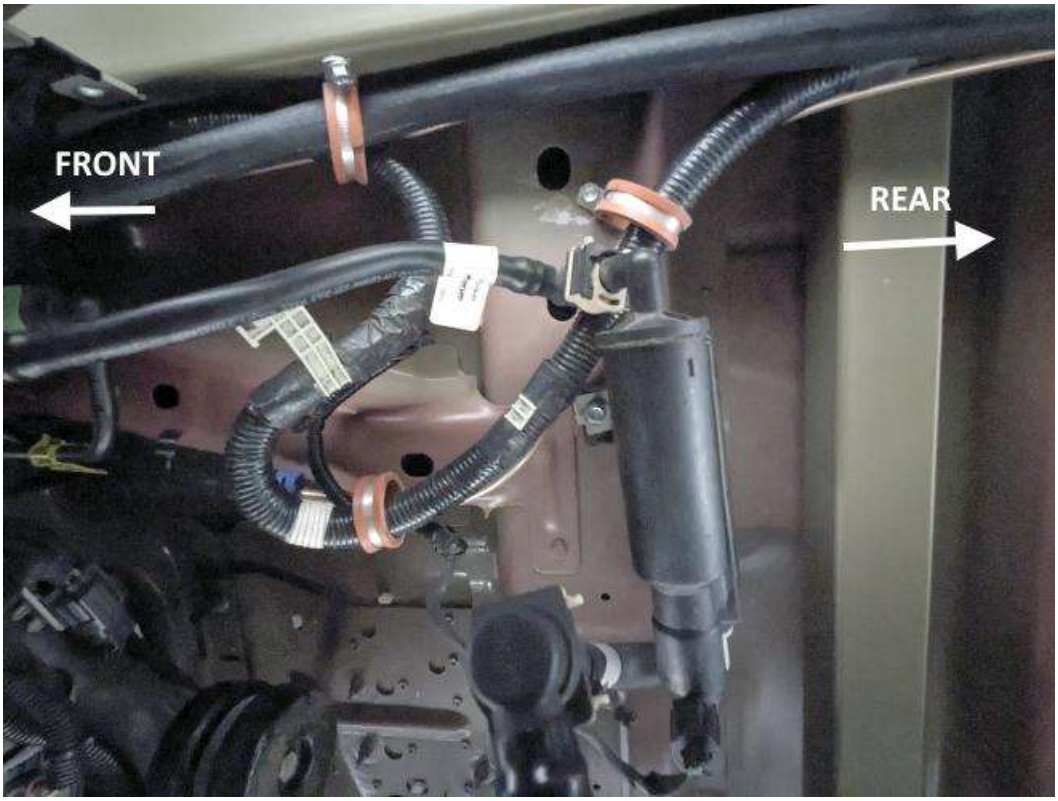


Locate the vapor canister so that the front bracket mounts to the 2”x 4” tube and the rear will attach to the 1.50” tube.

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.

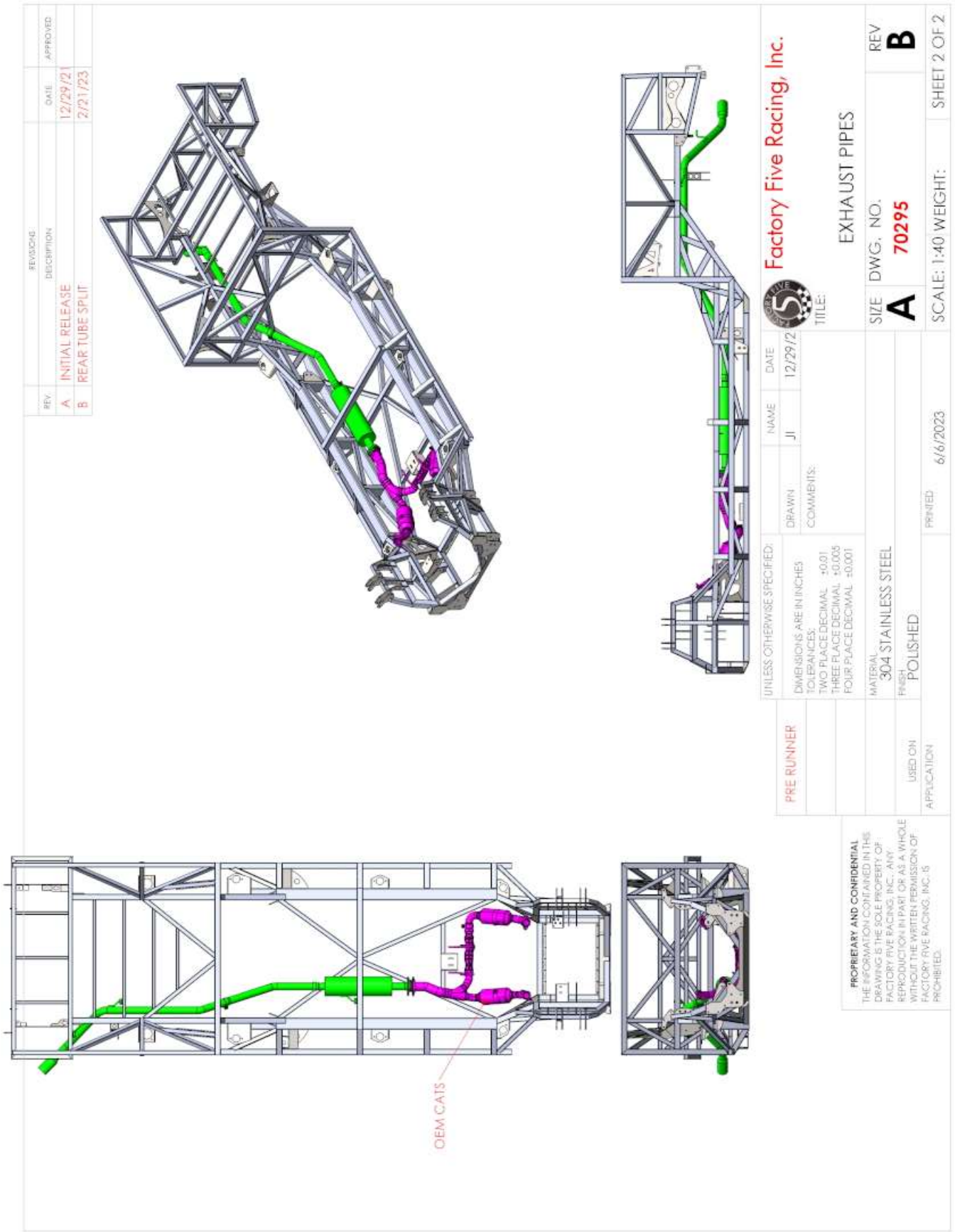
Locate the ground on the frame front crossmember.

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


REVISIONS
REV.
DESCRIPTION
DATE
APPROVED
A INITIAL RELEASE 12/29/21
B REAR TUBE SPLIT 2/21/23
Factory Five Racing, Inc.
EXHAUST PIPES
SIZE A
DWG. NO. 70295
REV B
SCALE: 1:40 WEIGHT:
SHEET 2 OF 2
UNLESS OTHERWISE SPECIFIED:
DRAWN JI 12/29/2
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.0001
COMMENTS:
MATERIAL 304 STAINLESS STEEL
FINISH POLISHED
PRINTED 6/6/2023
PRE RUNNER
USED ON
APPLICATION
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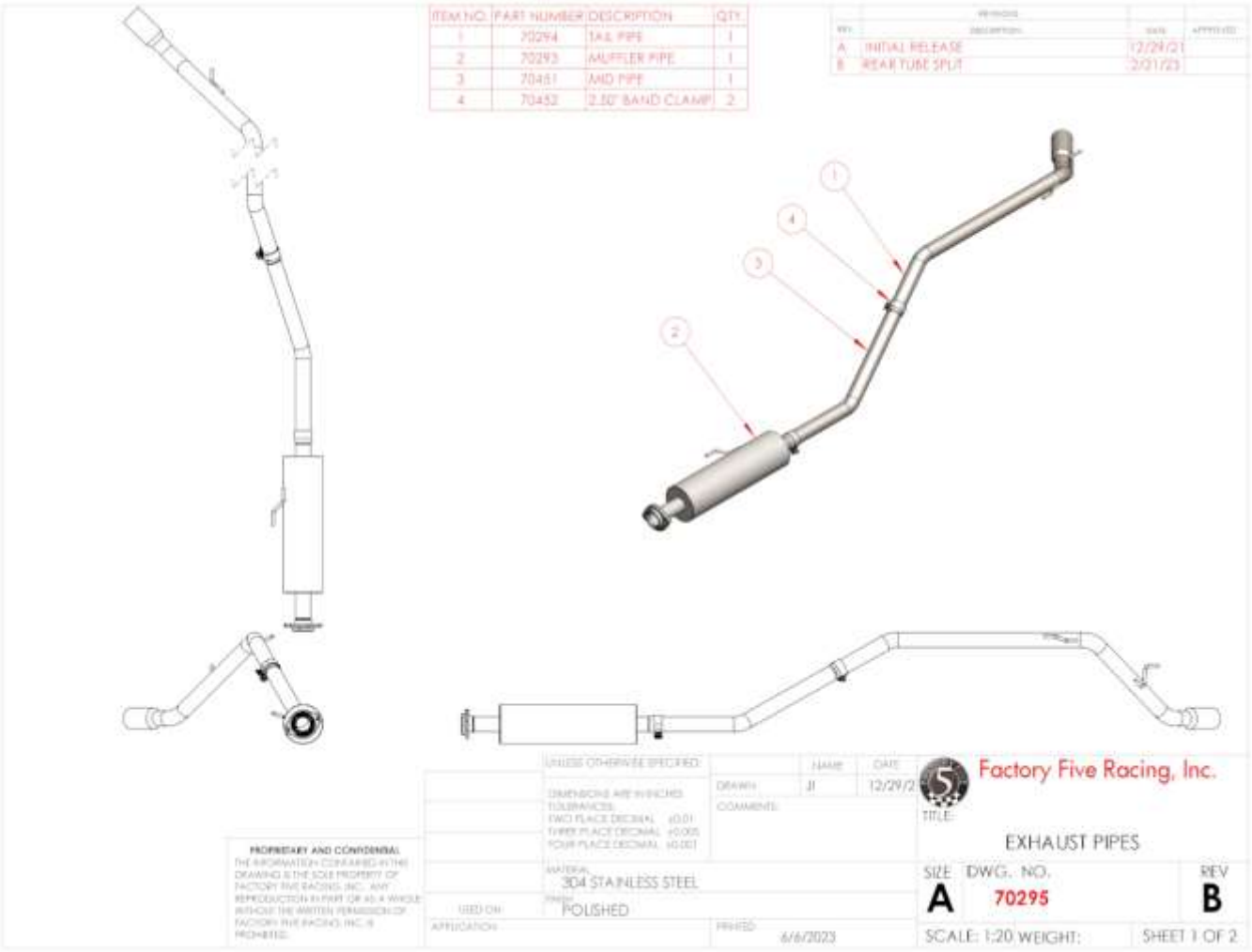
OEM CATS



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

- Nose panel, Box 9 Headlight hardware, Box 6 Nose mount Fasteners, Box 6 Clearance lights
- $^{5}/_{32}$" hex key, $^{7}/_{16}$" wrench, 10mm deep, $^{7}/_{16}$" socket, Ratchet, Drill, ¼" drill bit, wire crimper, heat gun or small torch, wire strippers.

Insert a headlight into the nose.

Locate the top nose mount tabs.

Attach the round hole to the top of the headlight using a ¼” x ¾” screw and locknut leaving it loose enough so it can rotate.

Holding the headlight against the nose, rotate the mount tab onto the nose and mark the center of the slot.

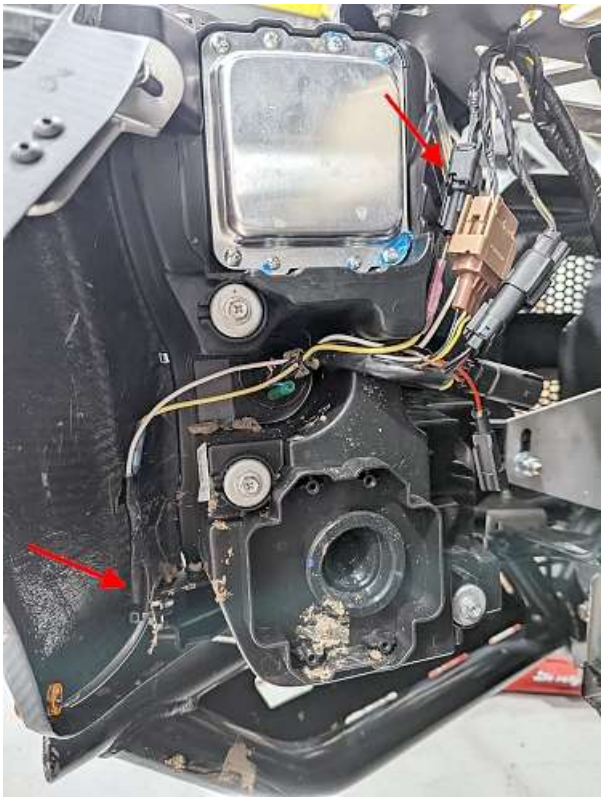
Drill a ¼” mounting hole and attach the headlight to the nose.

The bottom headlight mount stops the headlight from popping out of the nose on the bottom edge.

Attach the bracket to the headlight bosses on the bottom with the OEM plastic screws. Mark and drill holes in the bottom flange of the nose and attach with the provided ¼-20 hardware.

Drill and mount three orange clearance lights 12” apart in the center of the nose.

Drill and mount one orange clearance light into the front lower corner of the nose.



Use half the wire and connectors in the clearance light hardware to make a harness for the clearance lights. Run the harness to one side and connect to the running light connector for the headlight.

Locate the 70504/05 bottom nose mounts.

Attach the mounts to the OE Radiator mount using the OEM fasteners 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 top main headlight bracket. The bottom of the picture is the front of the truck.

Attach the inside headlight bracket to the frame using the OEM fasteners and use the 0.40” spacer next to the light.

Attach the top outer bracket that goes from the top headlight bracket to the fender. Tighten the upper bolts in the middle of the slot.

Drill two $^{3}/_{16}$" holes in the fender in the center of the lower slots and attach with the provided 10-32 hardware.

Hood Bumpers

🚘 Box 6 hood bumper mounts, ¼" drill tap from rear fender mount hardware.
🛠 Needle nose pliers, $^{5}/_{32}$" hex key, $^{7}/_{16}$" wrench.

Remove the hood bumper mounts from the front engine bay area on the cab by squeezing the tabs on the bottom side with needle nose pliers.

Push the bumper mount into the included extension bracket.

If removed, screw the hood bumper into the mount.

Use the included ¼” drill tap to open up and tap the small hole in the end of the stock mount.

Attatch the extension mount to the OEM bumper mount using a ¼”x ¾” screw and locknut. Screw the bumpers all the way down for now.

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).

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.

Cut the wider flange edge off the plastic cover then push a 38” piece of weatherstrip onto the OEM plastic fender seal.

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.

Upper mount

¼”-20 x ¾” black button head screw, ¼”-20 locknut

Some of the older trucks (2015 shown) have different hood hinges with an additional flange on the side, which interferes with the fender mount. This flange will need trimmed with a hacksaw, cutoff wheel, or by drilling the two holes where the flange is stamped together. Alternatively, you could buy the newer hinges that do not have this side flange and replace the old ones. Ford Part Number FL3Z-16796-B (right) (16797 left).

Hold up the mount flush against the frame and raise until the top flange hits the underside of the body, up near the cowl and points in towards the center of the truck where the hood meets the fender extension. Mark the centers of both slots.

Drill one ¼” hole through the frame where you marked.

Use one nut and bolt to attach the mount firmly to the frame. You can also rivnut these holes if you choose to make installation and adjustment a bit easier. Double check that the upper flange is still in the proper location to hit the fender flange. Drill the second hole in the center of the slot.

Attach the mount to the frame with both bolts.

Mark and drill the ¼” bolt location in the middle of the slot on the upper flange.

Attach the top flange with using a ¼”-20 x ¾” black button head screw and lock nut. Adjust the panel by loosening the screws, then tighten down the fasteners.

Side mount

Clamp the outer mount in place on the inner flange of the body and drill (2) ¼” holes. Attach with provided ¼-20 hardware.

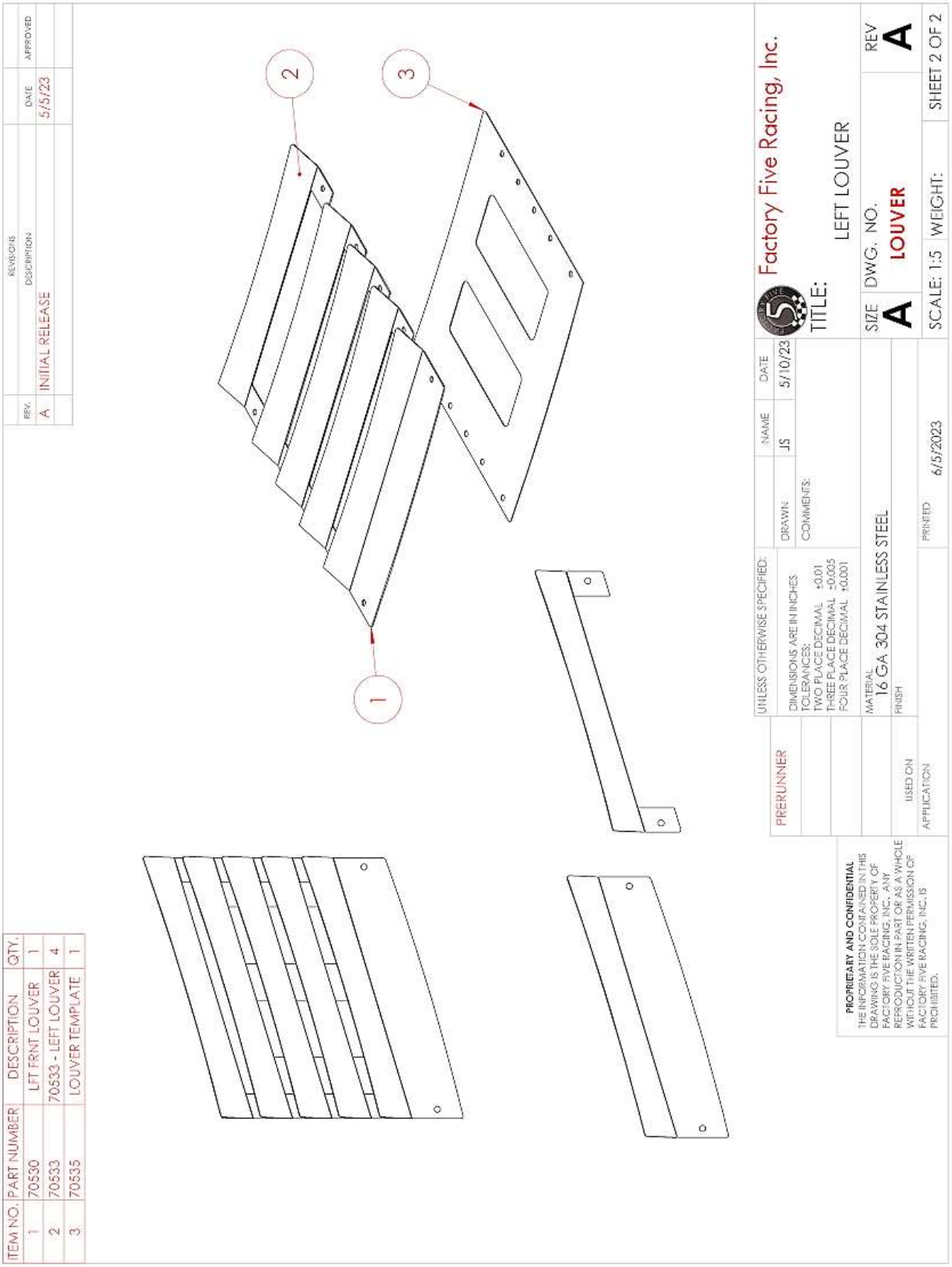
Bolt the inner fender mount to the outer mount attached to the fender using the $^{5}/_{16}$”x 1” button head screws. Leave the bolts just loose enough so the bracket can move in the slots. Hold the inner bracket against the frame and mark the middle of the mounting slots on the frame.

Remove the bracket and drill two $^{5}/_{16}$” mounting holes where marked then through-bolt with the $^{5}/_{16}$”x 1” button head screws and a lock nut on the backside.

Use the slots to adjust the fender to the desired position, then tighten down the bolts. Having a friend hold the fender in place while tightening the bolts is very helpful.

Hood

Hood Vents



Place the template on top of the hood in the vent area and drill the ¼" holes in the template.

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

Hood mounting

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 leave it slightly loose to allow adjustment.

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

Tighten the hood hinge bolts to **18 ft-lb (25Nm)**.

Hood Latch

- Box 9 Headlight hardware

Locate the OEM hood latch bolts and (2) of the 0.40” spacers in the headlight hardware.

Space and attach the hood latch to the chassis centering the OEM bolts in the slots.

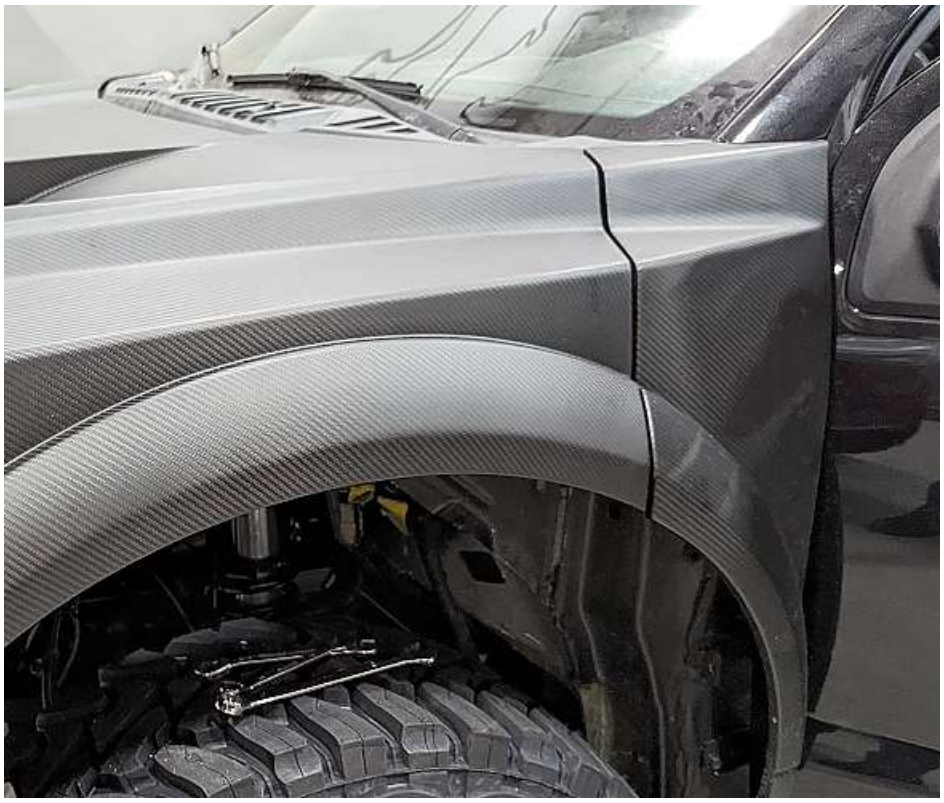
Close the hood and make sure the striker and latch engage.

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.

Hold the front edge of the Fender extension so that it aligns with the edge of the hood and reclamp the fender extension mount 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.

Raising the headlight/Nose panel may be necessary to set the gap at the front of 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.

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 Street Bumper

Box 33

$^{5}/_{32}$" hex key, $^{7}/_{16}$" wrench, ¼" 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 ¼”-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

Locate the light in the hole so that it is centered then attach the mount bracket to the plastic light bracket using the ¼” x 0.50” screw.

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

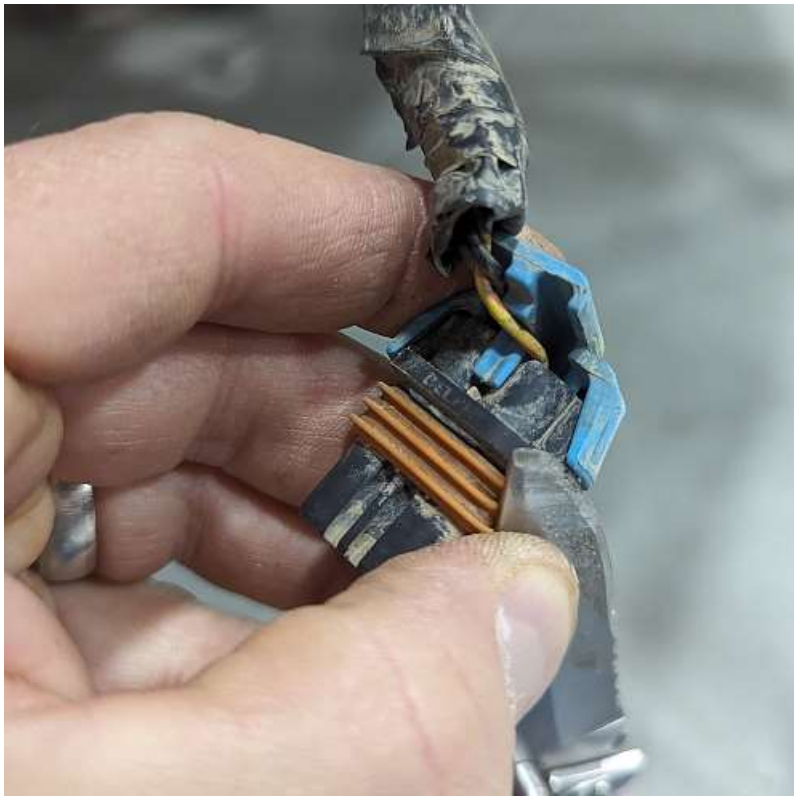
Locate the light so the mount bracket holes are near the back of the light mount area and mark the center of the slots on the bumper.

Remove the light from the bumper by disassembling the brackets from the light.
Use a 3/16" drill bit to drill the mounting hole locations.
Attach the mounting bracket to the backside of the bumper using the #10 black screws and locknuts.
Locate the OEM fog light connectors.
Locate the fog light wiring harness that came with the lights.

Fog light Connectors

🛠 Paper clip or thin straight pick, small flathead screwdriver
🚘 Fog light harness

The OEM and included fog lights use the same pins but different connector housings. OEM on left, new fog light connector on right.

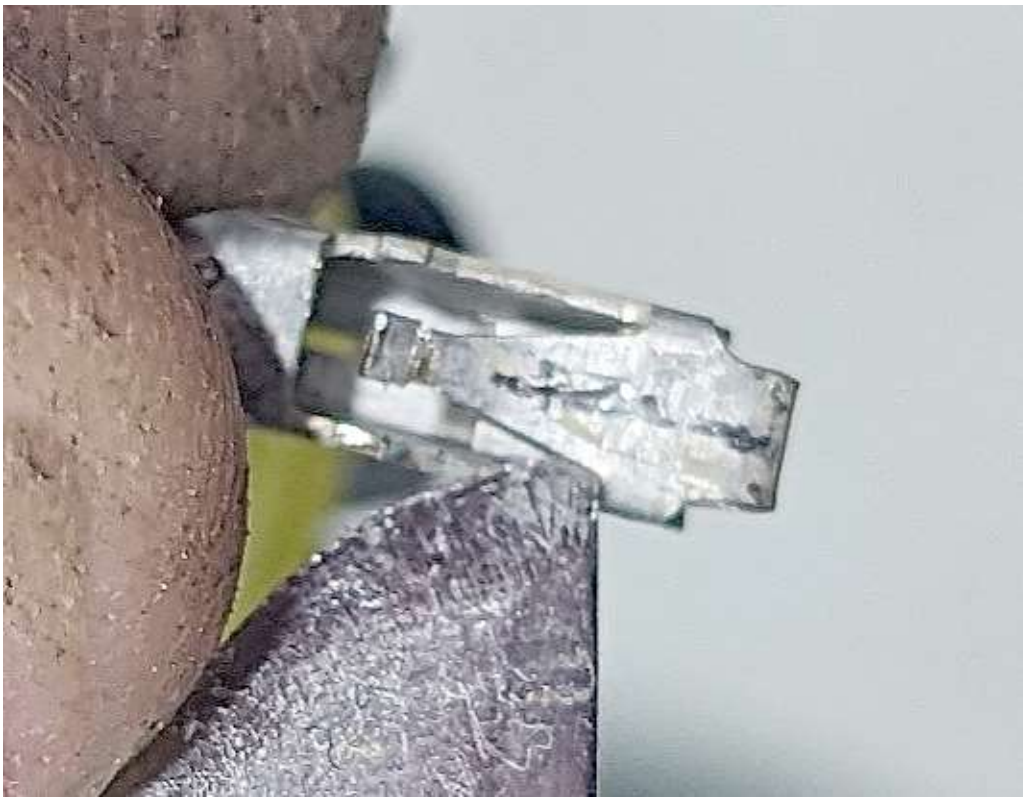


Remove the back cover on the OEM connector with a small flat head screwdriver or knife on the sides of the cover.

Push a paper clip or thin straight pick in on one of the middle (inside) part of the connector and then pull the wire out of the back of the connector.

Remove the back cover on the new fog light connector with a small flat head screwdriver or knife on the top and bottom of the connector.

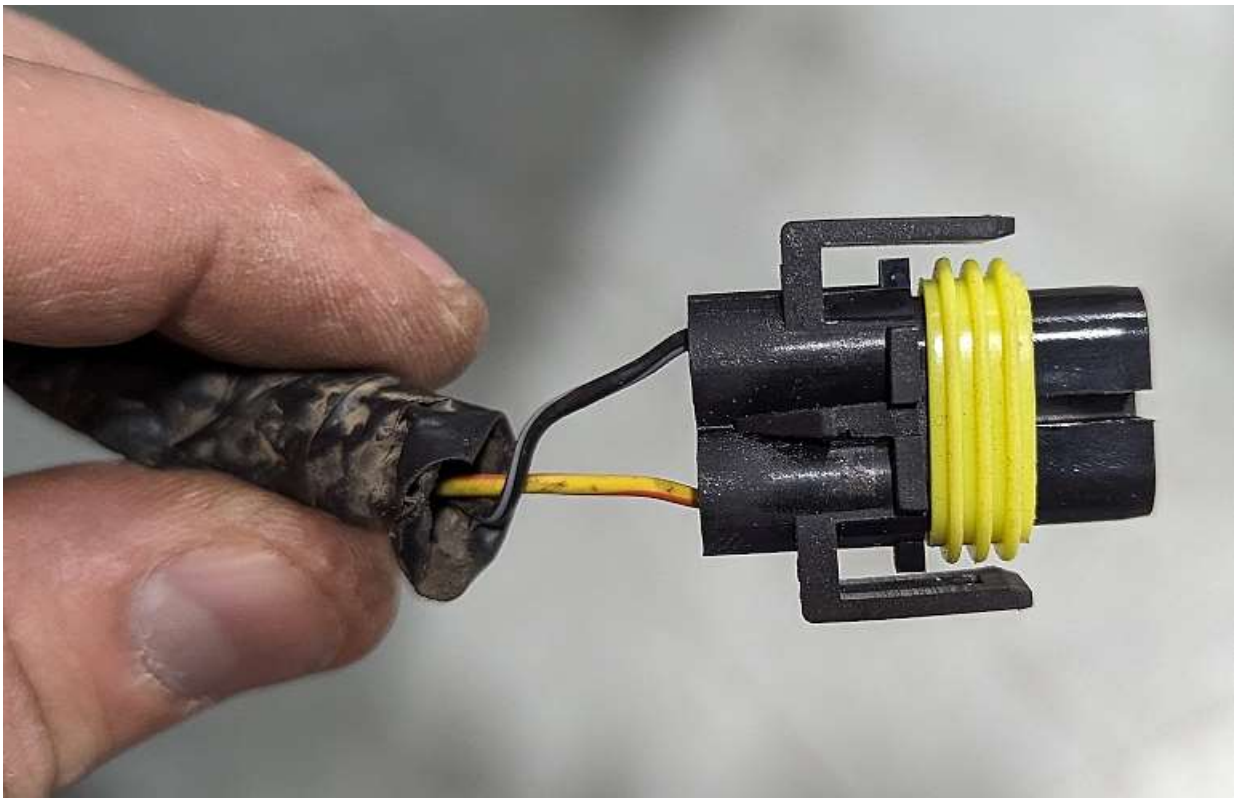
Push a paper clip or thin straight pick in on one of the outside part of the connector and then pull the wire out of the back of the connector.



Check each of the Ford connector pins, the small tab should stick up past the top of the pin slightly. If necessary pry the small tab up with a small flathead screwdriver or knife.

Take the colored Ford wire and, with the pin oriented as shown, push the pin into right side of the new connector.

Take the black Ford wire and, with the pin oriented as shown, push the pin into the new connector.



Lightly pull on the wires to make sure they will not pull out and make sure the wires are not twisted.

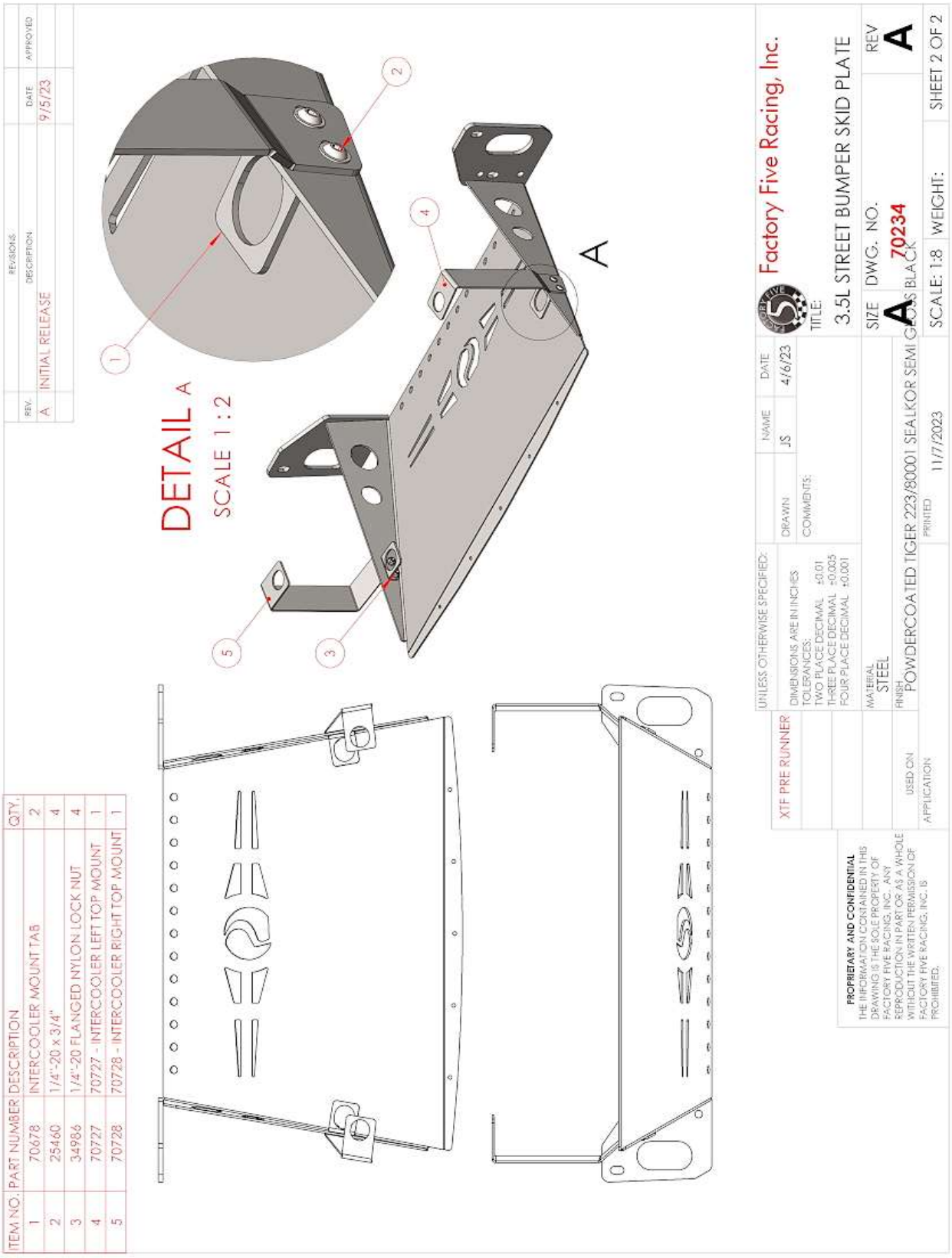
Push the connector back cover onto the connector making sure it “clicks”.

Clamp the bumper to the nose on the lower nose mounts so that the outside of the panels align.

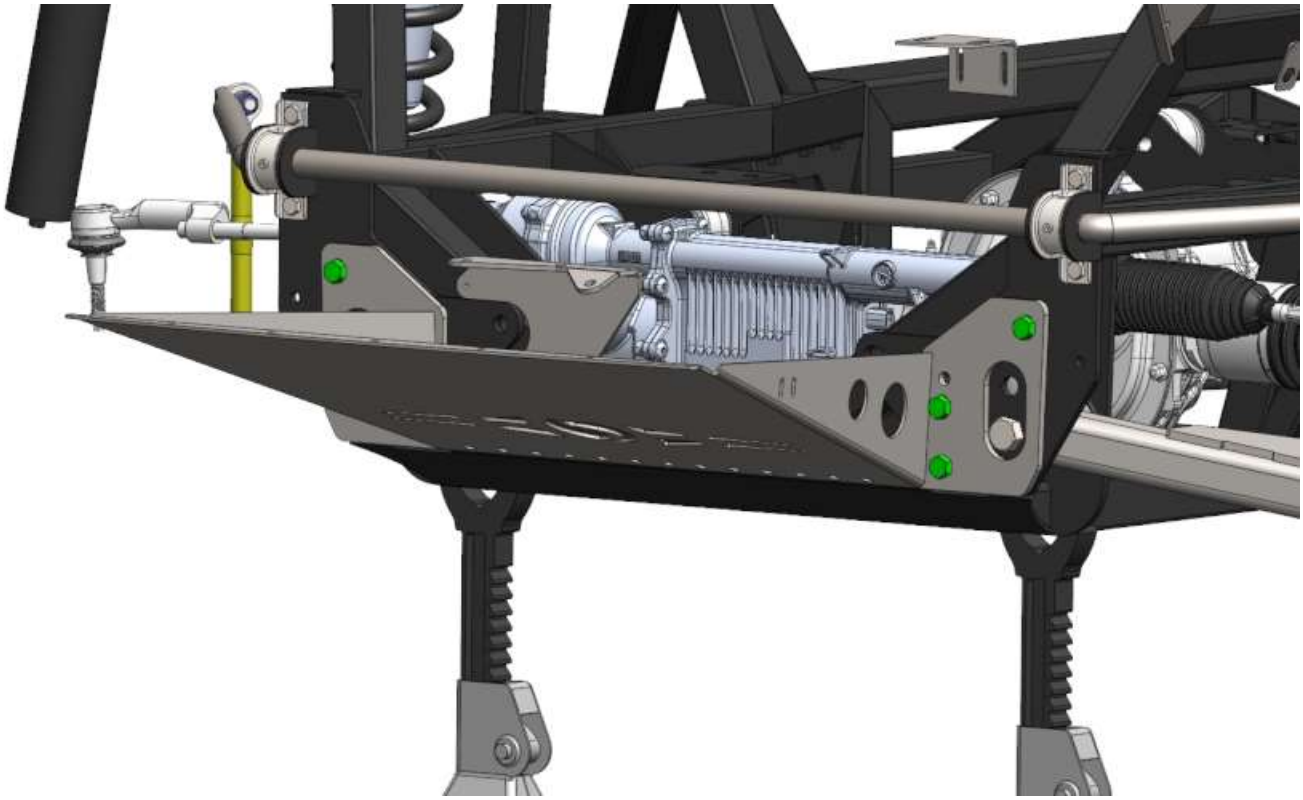
Drill ¼” holes through the center of the lower nose mount slot, through the nose and the bumper and connect the three parts using ¼”x1” flanged bolt and flanged locknuts.

Drill ¼” holes spaced evenly around the bumper and attach the bumper to the nose panel using the ¼” x 1” flanged screws and flanged locknuts.

Skid Plate

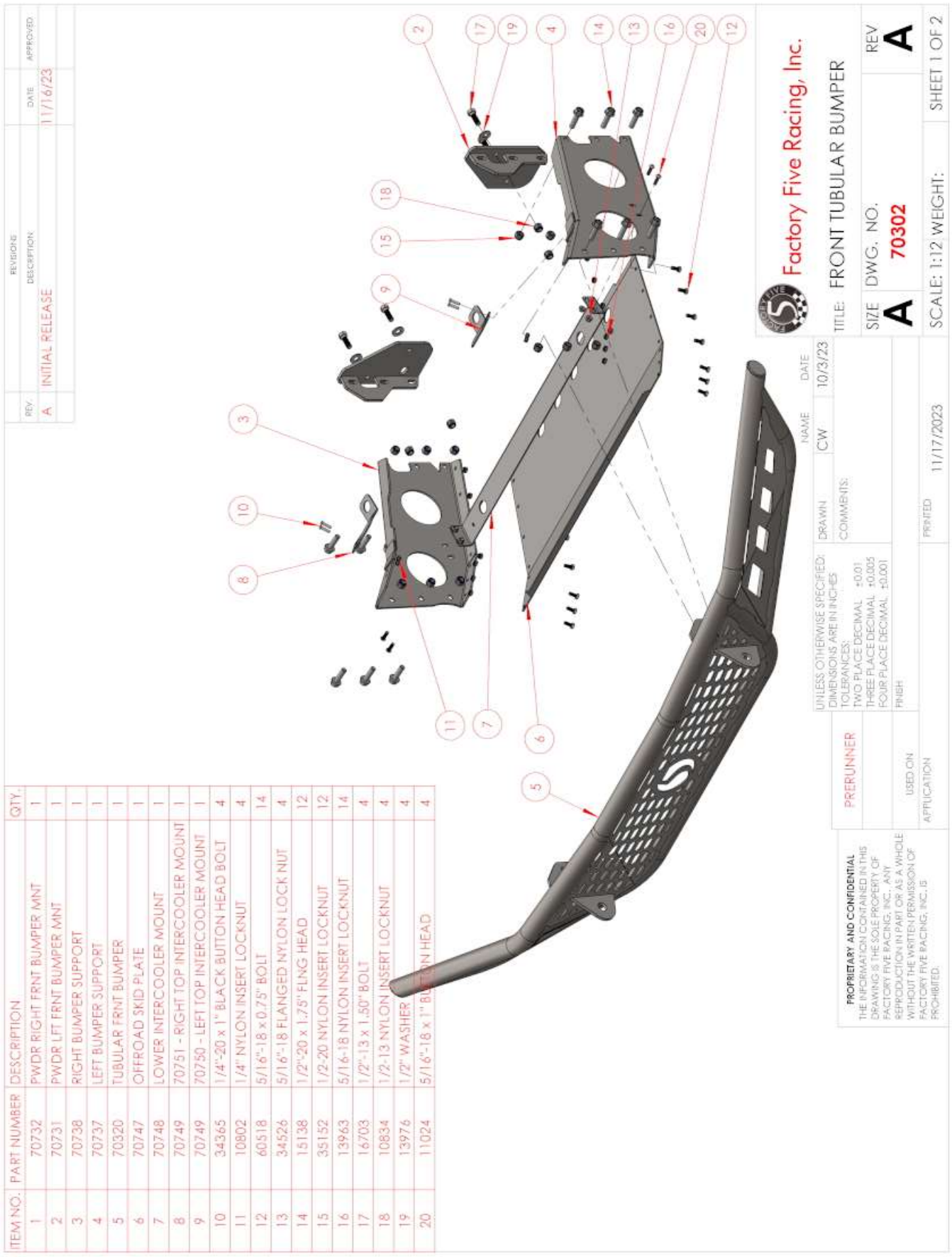


3.5L Intercooler mounts shown on skid plate.



Attach the skid plate to the frame using the top two ½”x 1.25” bolts and locknuts as shown, adjust the skid plate so that it sits on top of the lower bumper flange then tighten.

Optional Off-road Bumper



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

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

Factory Five Racing, Inc.

TITLE: FRONT TUBULAR BUMPER

SIZE A | DWG. NO. 70302 | REV A

SCALE: 1:12 | WEIGHT: | SHEET 1 OF 2

	NAME	DATE
DRAWN	CW	10/3/23
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		
PRINTED		11/17/2023

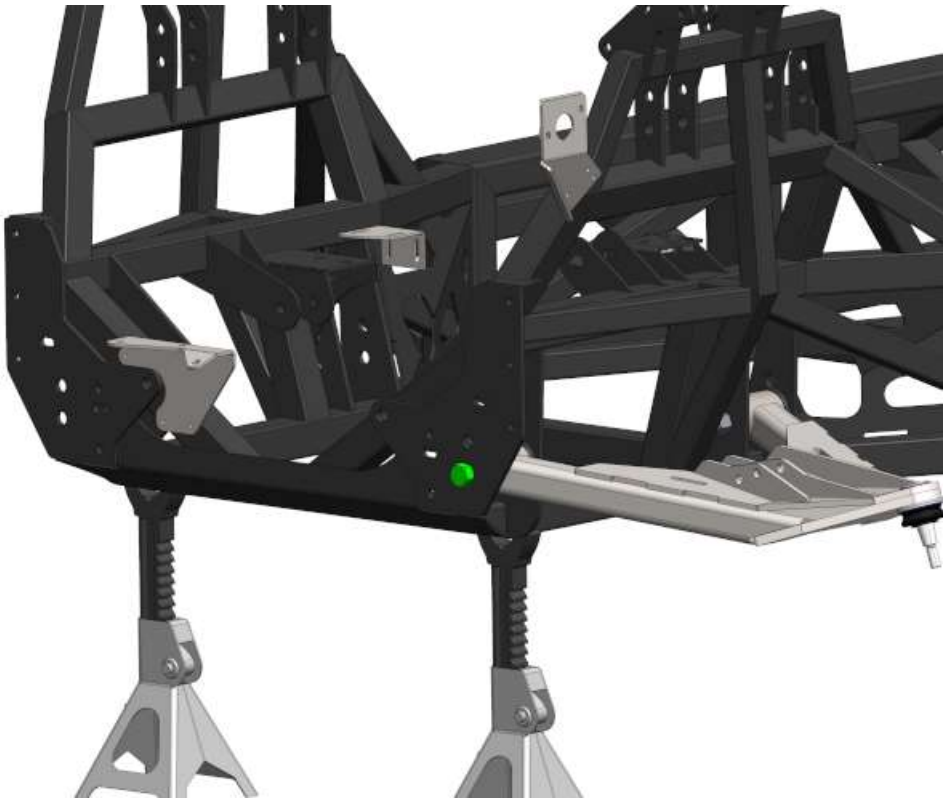
UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
FINISH

PRERUNNER

USED ON

APPLICATION

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 ½”x1.25” bolts from the back forward and the front lower control arm bolts.

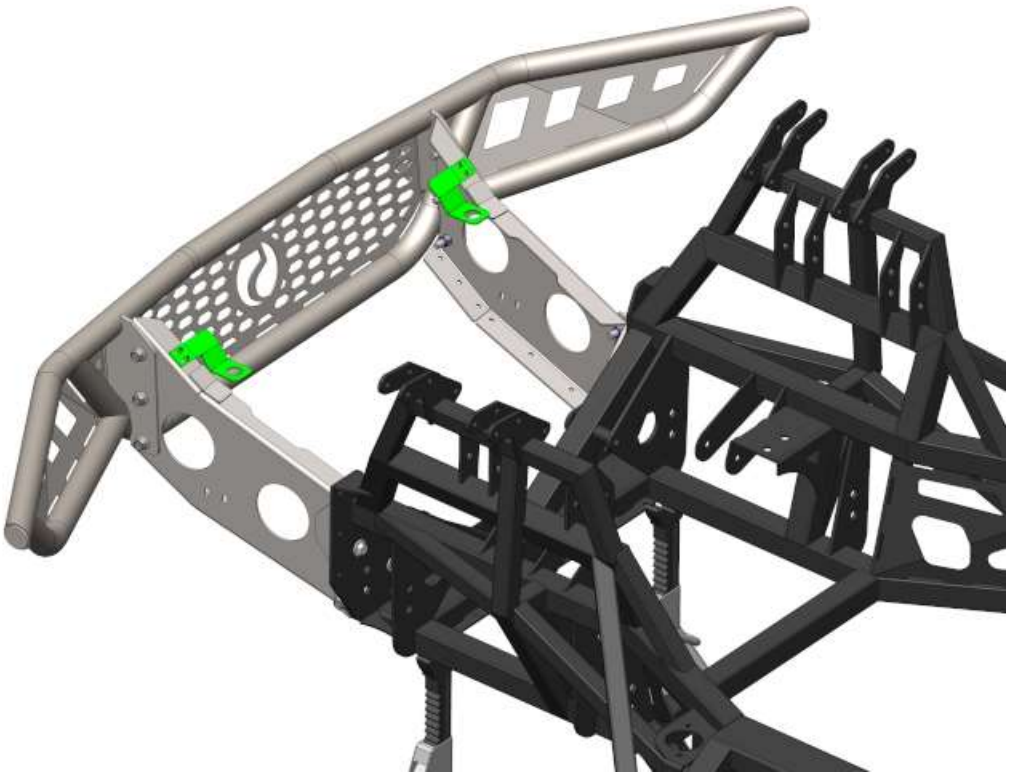
Attach the bumper supports using the ½” x 1.75” flange bolts.

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

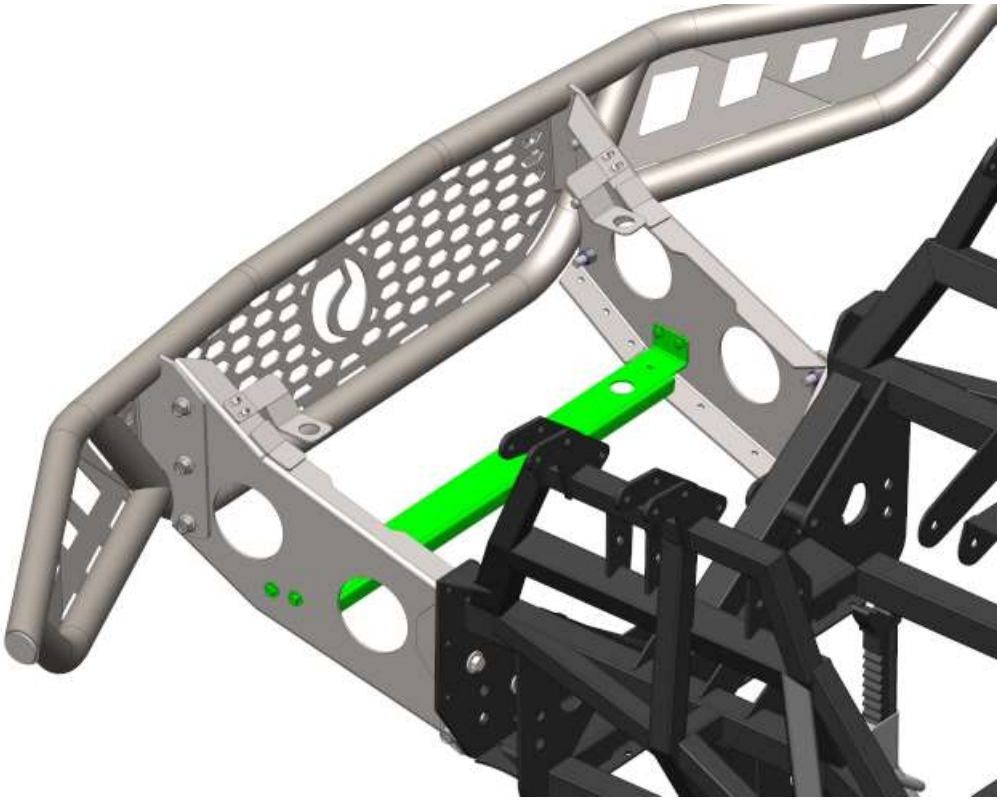
Attach the tubular bumper to the bumper supports using the ½” x 1.75” flange bolts. Position the bumper so that it has an even gap between the bumper and the nose/headlights.

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 5/16" x ¾" bolts and locknuts.

Grill

- Front Grill components (Box 17)
- Razor knife, 3/32" Hex key, 11/32" wrench, clamps, drill, 5/32" drill bit

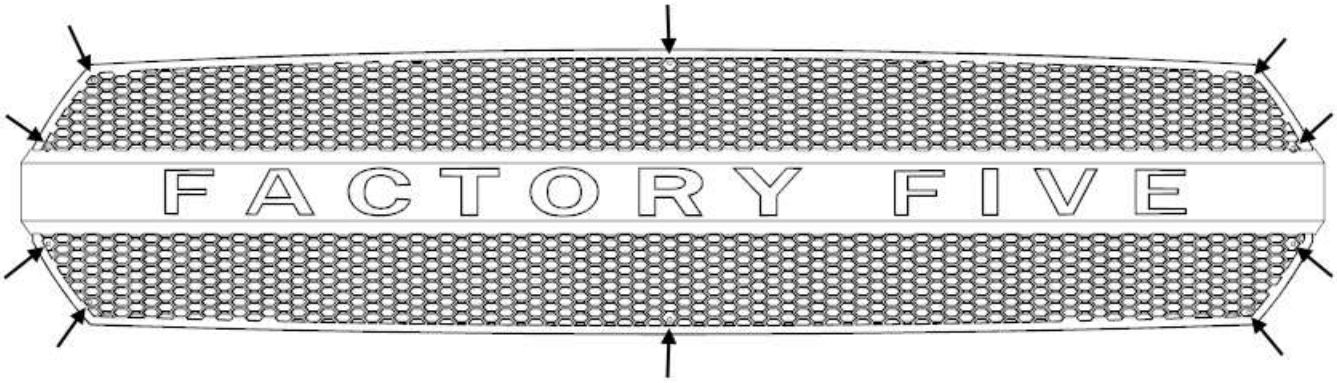
If desired paint the grill.

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.



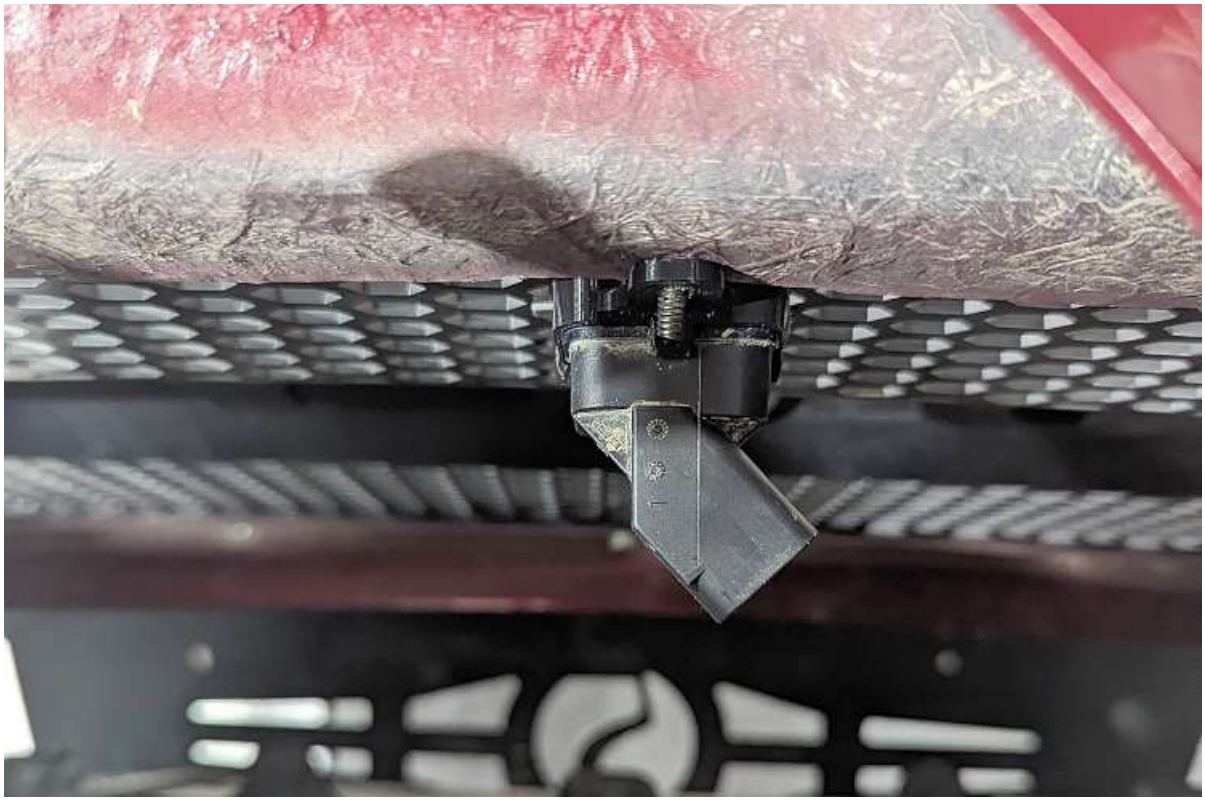
Use the holes in the grill as a guide to drill the mounting holes for the grill in the nose using a $^{5}/_{32}$" drill bit

Front Camera (if applicable)

- Box 17 Grill components, F150 Front Camera (if equipped)
- Air saw or wire snips or similar

Clip the OEM camera into the provided mount. The plug should be on the top, closest to the bolt hole.

Trim the grill in the center between the 2nd and 3rd open hexagon below the screw hole to make room for the camera. The fiberglass behind the grill may also need slight trimming depending on where your grill is mounted to the fiberglass.



Mount the camera using the longer #8 screw included with the grill parts.

Plug in the camera, making sure it “clicks”, and test its operation.

Cruise control front Radar Mount (if applicable)

F150 Front Radar sensor and mounting fasteners. Box 6 Cruise Radar mount parts

Drill, ¼” drill bit, marker, 5/32” hex key, 7/16” socket, ratchet.

Locate the F150 front radar sensor and fasteners.

Attach the sensor studs to the mounting bracket using the M6 locknuts included.

Attach the sensor to the harness and locate the mounting bracket on the nose to the left of the skid plate.

Use the bracket as a template to mark the mounting holes then drill the mounting holes with a ¼” drill bit.

Attach the mounting bracket to the nose using the black ¼” button head screws.

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 ¼” flange head screws with a 5/32” Hex key.

Repeat for the right side.

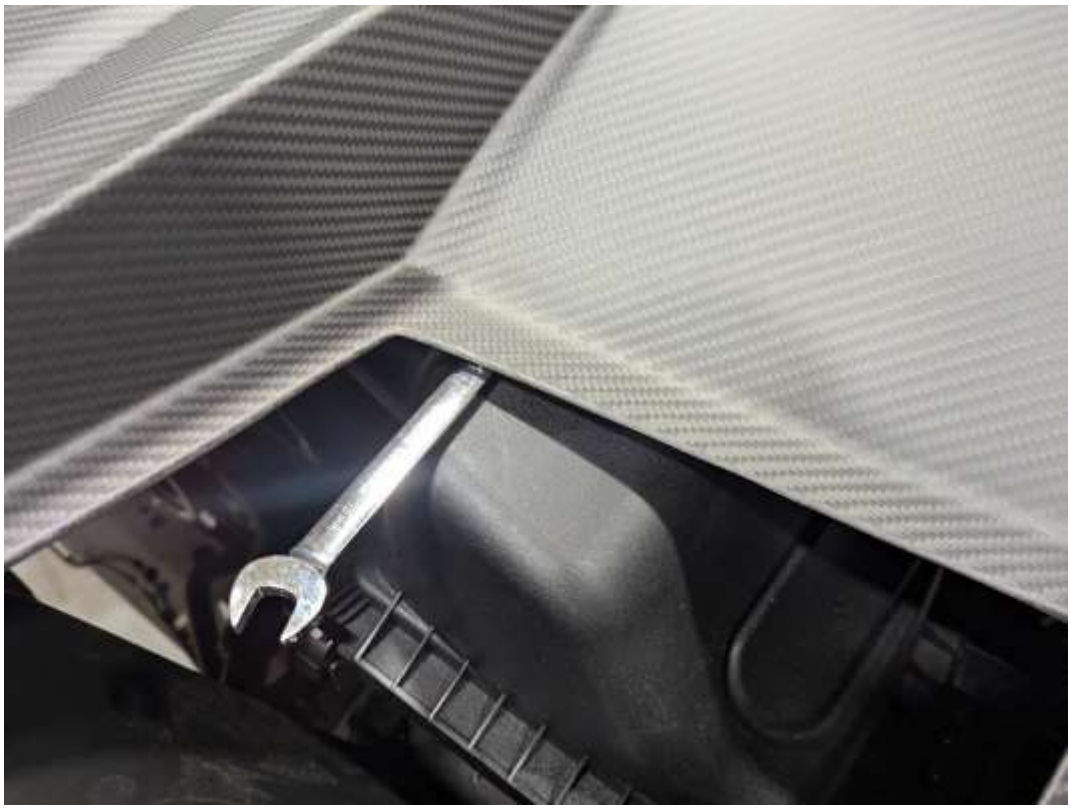
Stock Airbox

If using the stock airbox, it will need to be lowered to avoid hitting the hood.

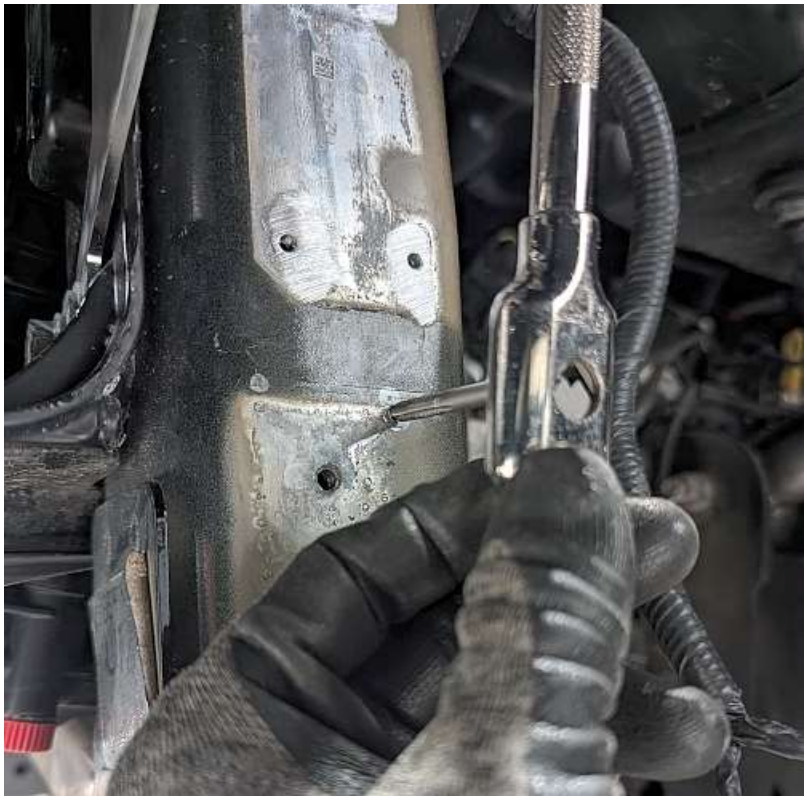
Remove the mount going from the frame horns to the bottom of the air box. Save hardware.

Remove the 4 bolts holding the mount to the front of the frame horns and grind flush.

With the mount off the truck, drill out the rivets holding the two pieces together. Only the front piece is re-used.



Close the hood and make sure there is a gap between the hood and air box. Attach the lower mount you previously removed and mark how much it needs lowered by.



Drill and tap new holes at the marked locations, or use rivets.

Drill and tap a new hole in the side of the frame horn for the side mount. Mount the airbox.

Rear Fenders

🛠 Vise grip clamps, 1/8", ¼" drill bit, drill, tape measure, marker, ¼" Drill tap (included), countersink.

🚘 Rear fenders, front bedrail cover, Box 6 Rear fender mount hardware.

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

✋ If mounting Carbon fiber fenders, do not countersink the mounting holes.

Slide the bedrail front cover in place and use some tape or clamps to hold.

Measure side to side and front to back to be sure this piece is centered and even as it sets the location of the fenders.

Lift the rear fenders into place.

Clamping the fenders in place while doing fitment makes it much easier.

Clamp the front of the fender so it touches the front bed rail cover.

For the rear location, push all the way in until the fender hits the chassis around the tailight area and then pull back out ¼". If you are using a tailgate then double check your clearance with both fenders clamped in place before drilling and adjust if needed.
If the untrimmed fender overhangs into the bed, trim or sand it flush along the inside edge of the tube its sitting on.

Once the fender is fit, drill an 1/8" hole for mounting at the front and rear. The hole should be 9/16" in from the inside of the tube so the weatherstrip will cover the bolt heads when finished.

Remove the fenders and use the included ¼"-20 drill tap provided in the top rail pilot holes just made.

In the fender, drill the pilot holes out using a ¼" drill bit.

Temporarily remount the fenders and screw the fenders in place using the countersunk ¼" screws.

Using a ruler or tape measure mark for the remaining 6 mounting screws evenly spaced between the front and rear screws $^{9}/_{16}$" in from the edge of the tube.

At the points marked, drill tap through the fender into the frame tube.

Slowly and carefully countersink the holes in the bed sides and screw the fender in place.

- The mounting screws should sit flush with the top of the fender to allow the weatherstrip to sit correctly.

The fender mounts to the chassis under the tailight with a threaded bolt into the chassis. Where the flat under the light lines up with the chassis tube drill an 1/8" hole through the fender into the tube.

Drill the fender hole only out to ¼” then use the drill tap to tap the chassis for a ¼”-20 thread.

The fender needs to be spaced out from the chassis to keep the inside edge of the tailight vertical. Tape a ¼” of washers together to help get them in place before the bolt passes through.

With the washers in place and the fitment checked with the tailgate (if using) bolt the fender to the chassis using a ¼" button head screw.

Install the weatherstrip trim covering all the mounting screws.

Tail Lights

In order to mark the fender for the tailight pins, put a dab of teflon paste, anti-seize or silicone on the end of both.

Slide the light into place from the rear to mark the fender for the mounting pins.

Remove the light and drill the locations marked with a 3/16” drill bit.

Using the same technique as the pins, put a dab of anti-seize or silicone the screw mounting bosses to allow them to mark the fender for the mounting screws.

Remove the light and drill the locations marked with a ¼” drill bit.

Screw the tailight to the fender using the OEM hardware.

Tail lights in place on the fender.

Fuel Filler Door

🛠 Countersink, drill, 3/32” drill bit, Philips head screwdriver.
🚘 F150 Fuel filler door, Box 5 Fuel System.

Test fit the cap in the opening, it slides in hinge side first and is easier to get into place if it is slightly opened.

The cap should sit flush in the opening, if it is being held up at any point remove the minimum amount of material to get the door in place.

With the cap held in place, drill a $^{3}/_{32}$" hole above the flat pad under the seal and through the flange and the fender.

Repeat drilling the holes on the bottom side of the flat pad.

Countersink the holes in the flange to allow the cap to still shut flush.

Screw the cap in place into the fender with the #8 oval head screws.

Push the filler neck through the fuel filler cap opening.

Filler neck in the filler cap.

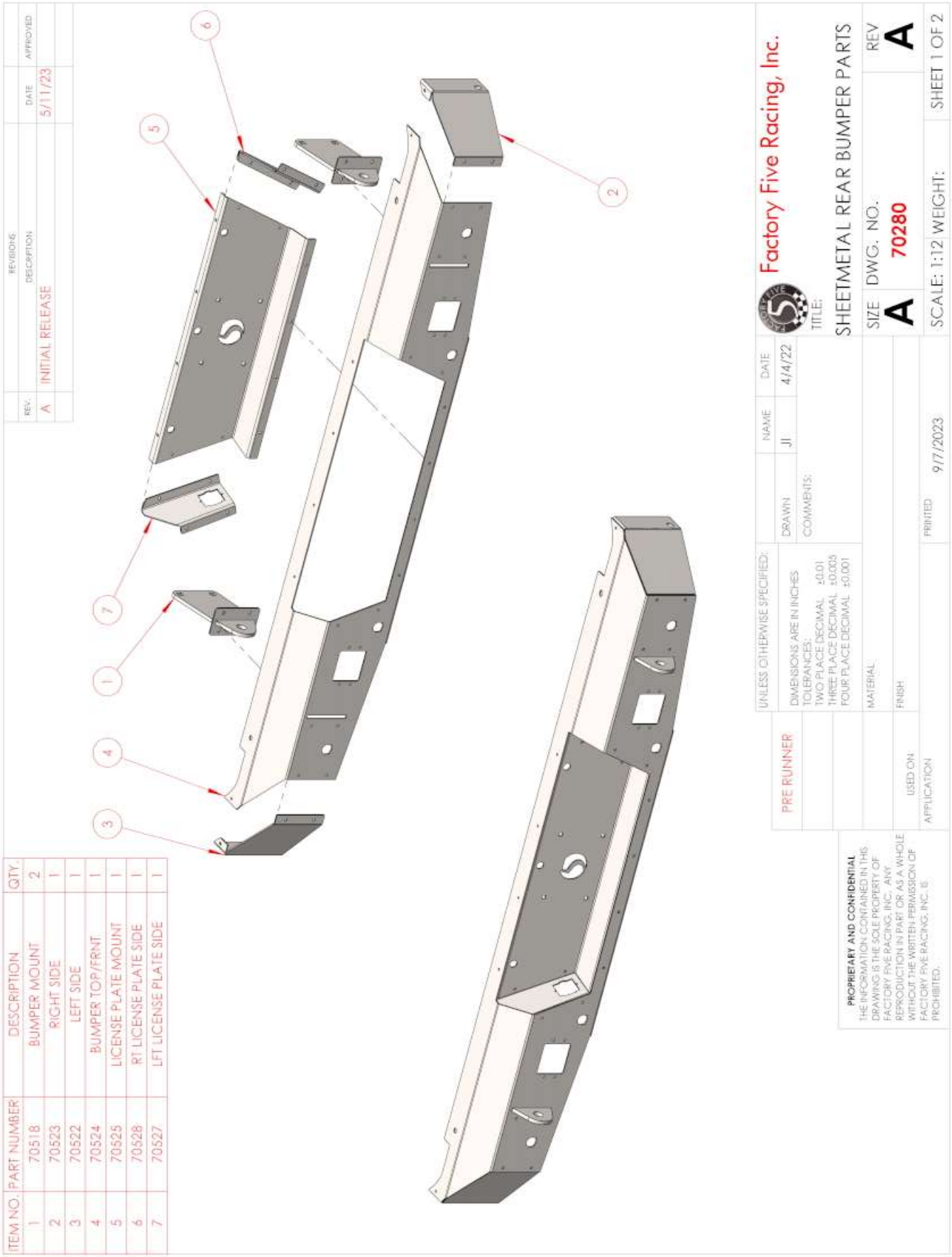
Locate the Fuel filler ring.

Push the filler neck out then install the ring behind the yellow filler end by starting on one side and working around the ring with your finger.

The ring should pop into place behind the yellow filler and will be a slightly loose fit but will prevent the filler neck from pushing through the rubber filler cover opening.

Rear Bumper

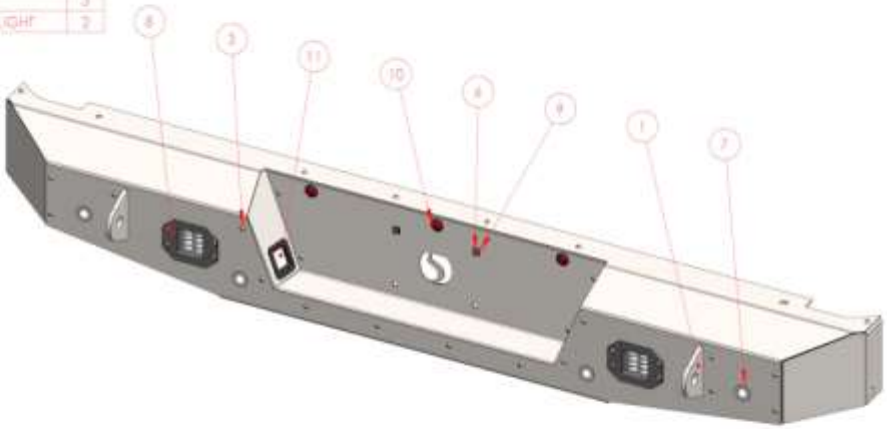
🚘 Box 34 Rear bumper, Box 6 Clearance lights
🛠 $^{7}/_{16}$”, ¾” sockets, $^{5}/_{32}$” hex key, wire crimper, head gun or small torch, wire strippers.



Assemble the bumper except for the bumper mount using the ¼" 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	70318	BUMPER MOUNT	2
2	10802	1/4" NYLON INSERT LOCKNUT	3
3	34364	1/4"-20 x 3/4" 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	70393	BACK-UP SENSOR MOUNT	4
8	70263	REVERSE LIGHT	2
9	13774	LICENSE PLATE 1/4" NUT	2
10	70002	RED MARKER LIGHT	3
11	LICENSE PLATE LIGHT	OEM F150 LICENSE PLATE LIGHT	2

REV	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/11/22	



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FIRE RUNNER	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001	DRAWN: JI	DATE: 4/4/22
	MATERIAL:	COMMENTS:	
USED ON:	FINISH:		
APPLICATION:		PRINTED: 6/29/2023	

Factory Five Racing, Inc.

TITLE: SHEETMETAL REAR BUMPER PARTS

SIZE	DWG. NO.	REV
A	70280	A

SCALE: 1:10 WEIGHT: SHEET 2 OF 2

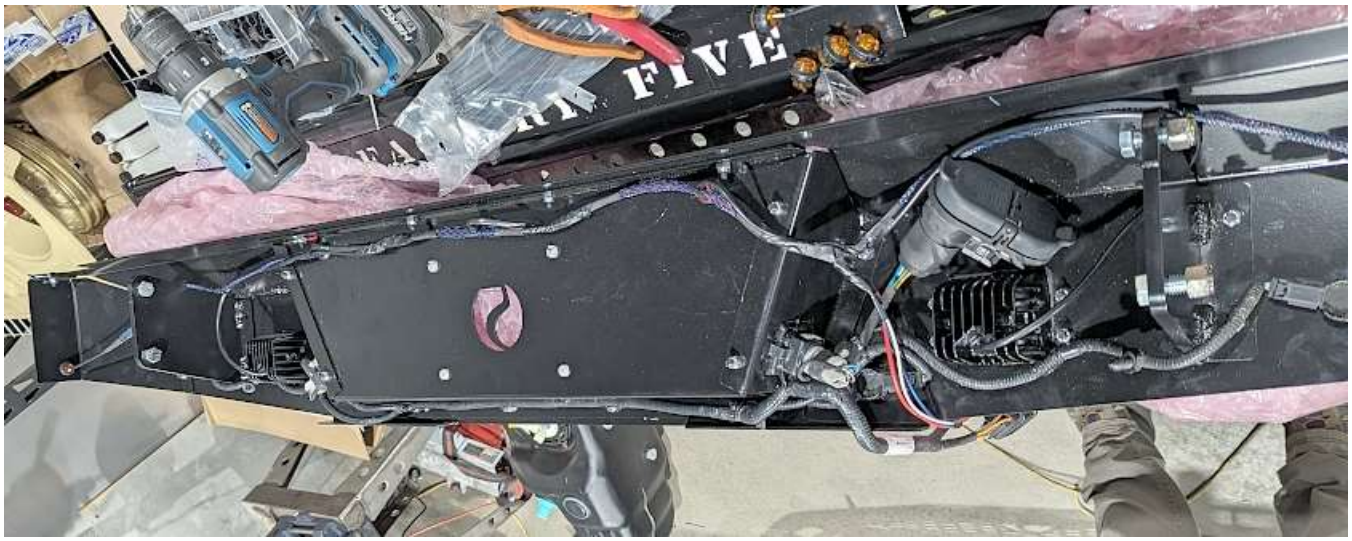
Push the ¾” red lights into the bumper
Push the license plate plastic nuts into the bumper

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

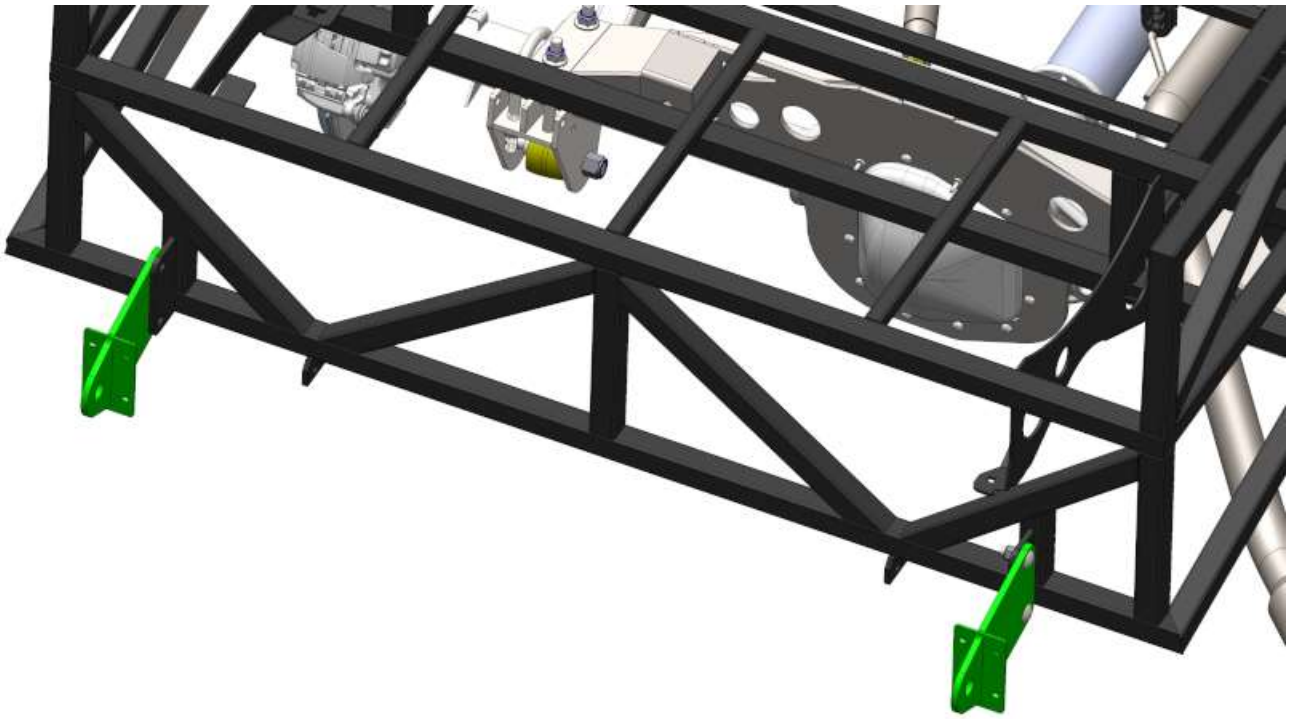
Install the OEM license plate lights.

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

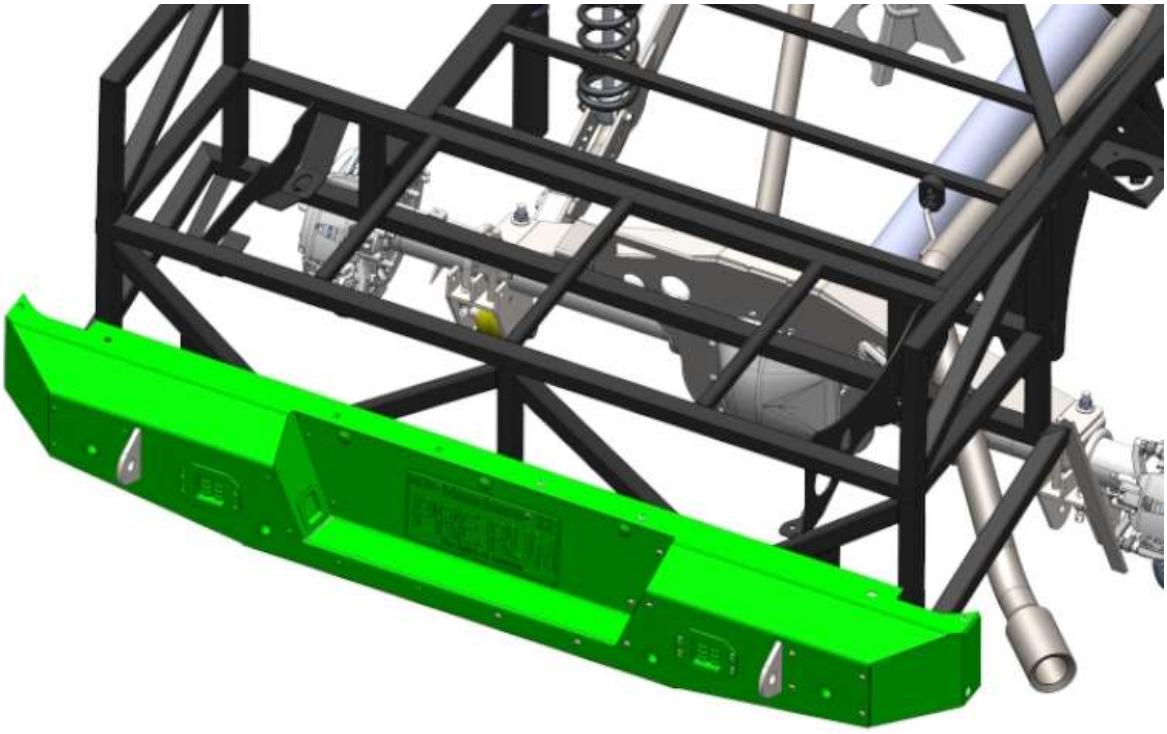
Insert the red clearance lights into the outside and center locations of the bumper.



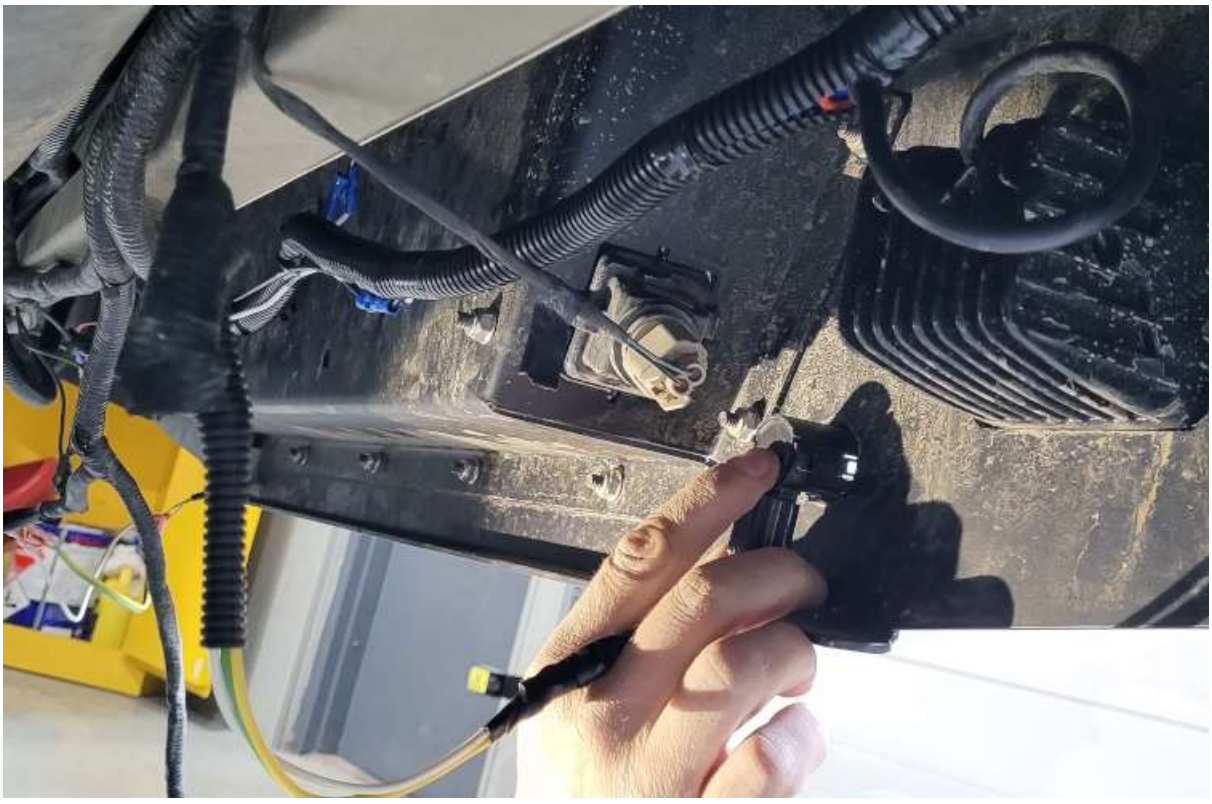
Use half of the wire in the clearance light hardware to make a harness for the lights. Have the harness end at the left (driver side) license plate area.



Attach the bumper mounts to the outside of the frame mount using the ½” carriage bolts and locknuts.



Attach the bumper to the bumper mounts using the ¼” black button head screws and locknuts.



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.

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 1.25" BOLT	2
5	10834	1/2-13 NYLON INSERT LOCKNUT	2

REV	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/10/23	

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
DRAWN	JI	5/10/23

COMMENTS:

MATERIAL:
FINISH:
USED ON:
APPLICATION:
PRINTED: 6/29/2023

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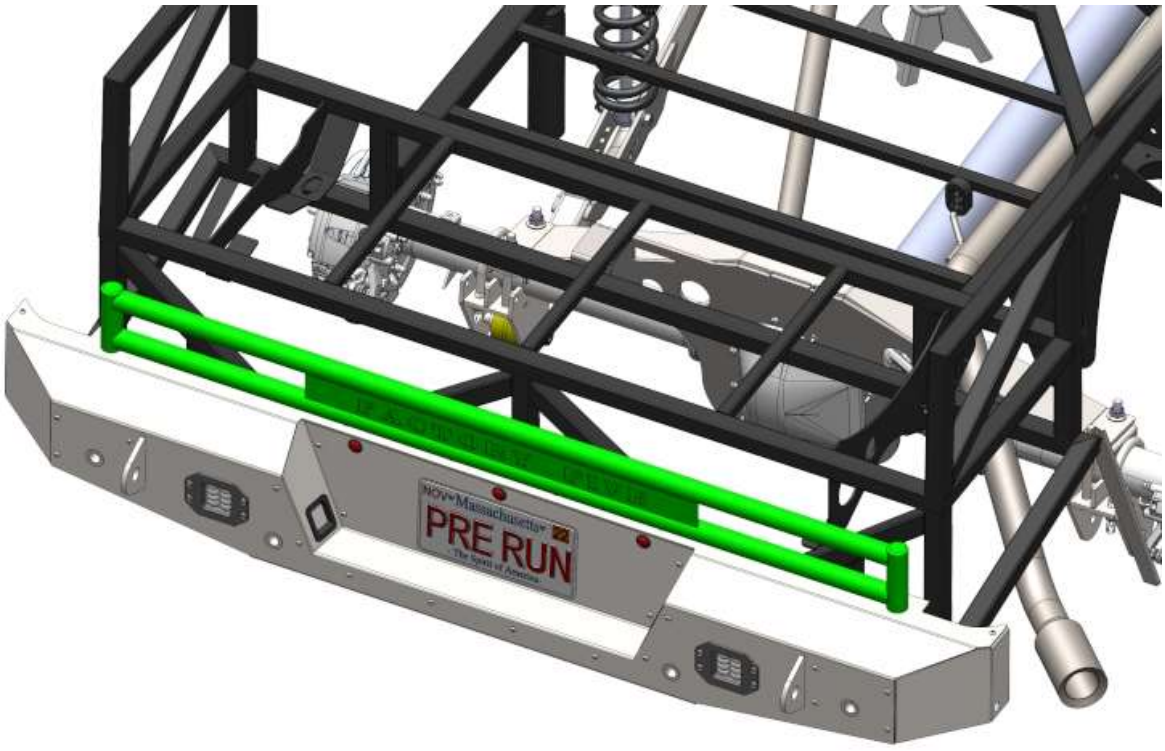
Factory Five Racing, Inc.

TITLE:
TAILGATE BAR PARTS

SIZE	DWG. NO.	REV
A	70542	A

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.

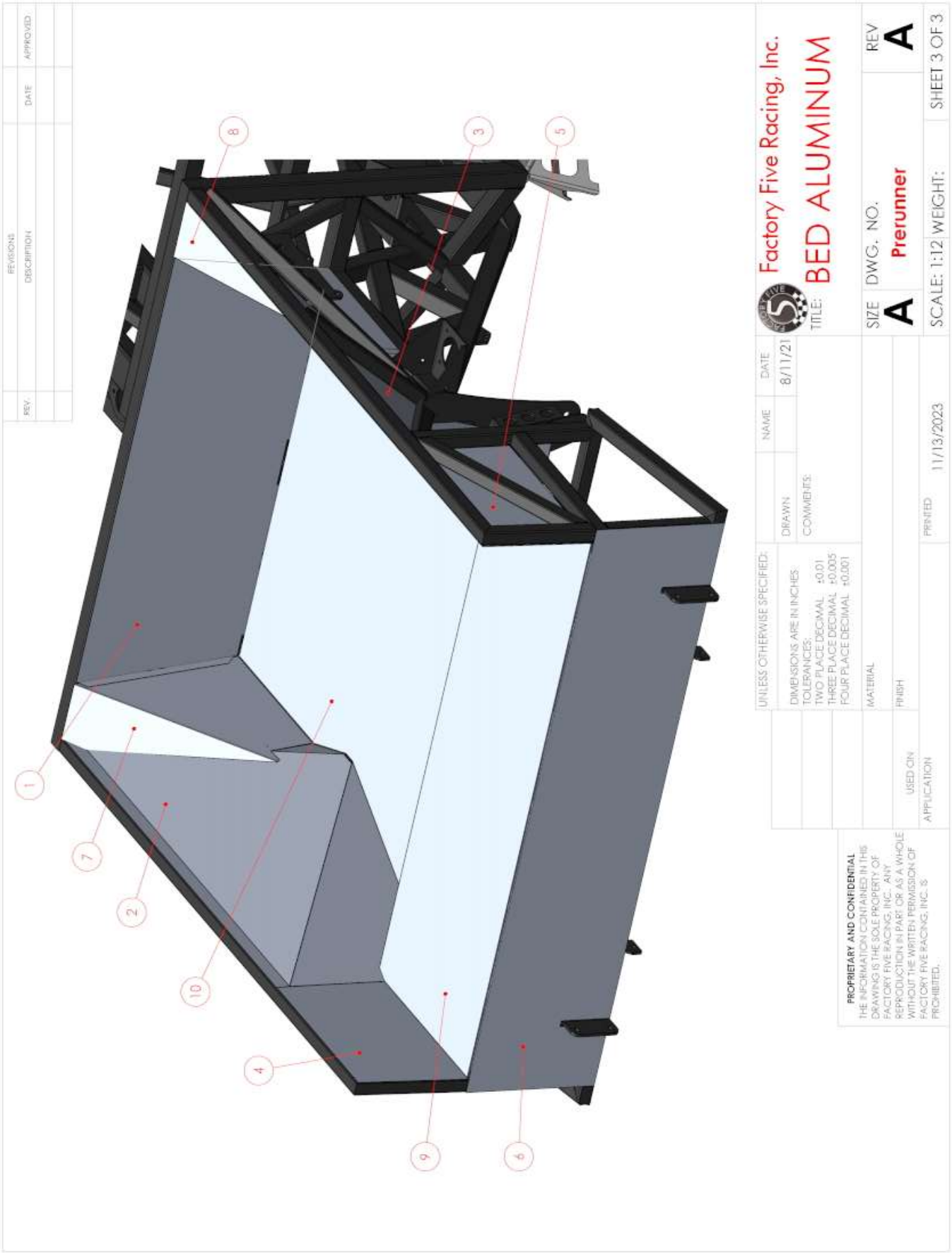
Bed Aluminum

- 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.

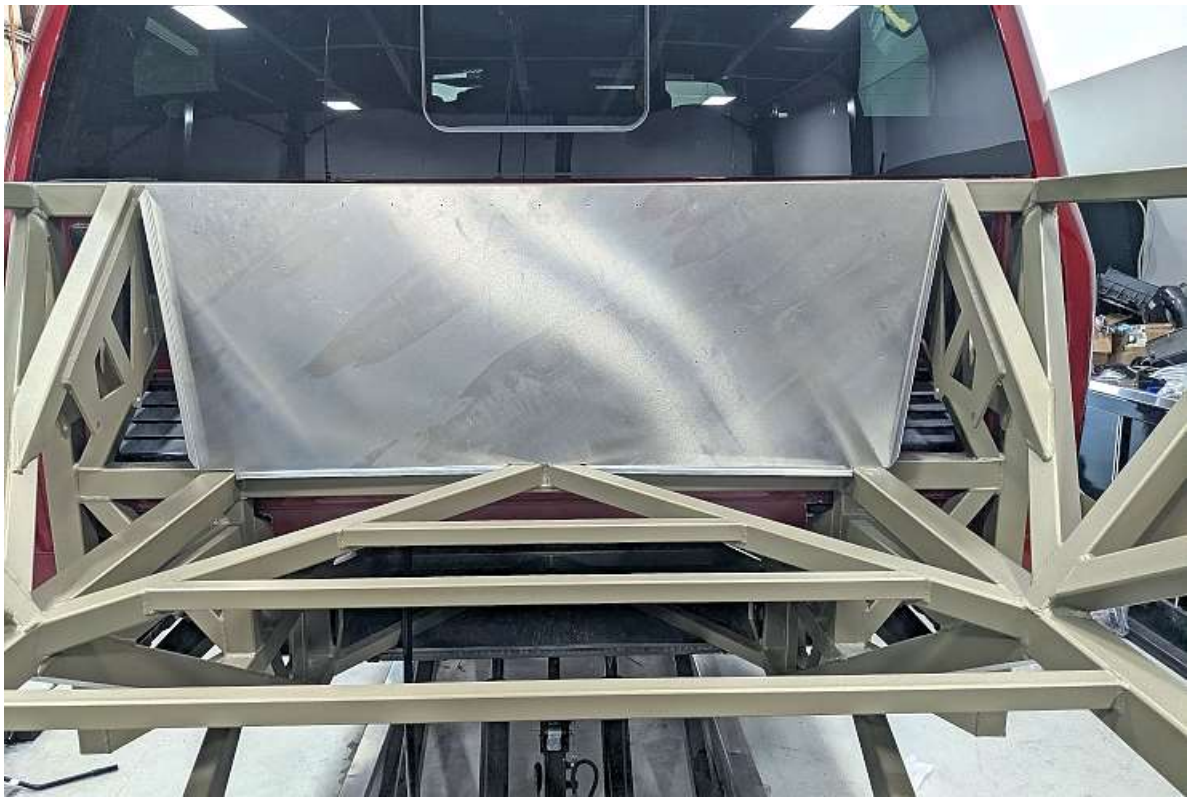
The panels should all be marked where the frame tubes touch during kit disassembly.
Mark the 3” rivet spacing on the panel where the tubes will sit.

Drill the panel where marked. Keep your rivet spacing even by marking with a ruler or tape measure ahead of time.

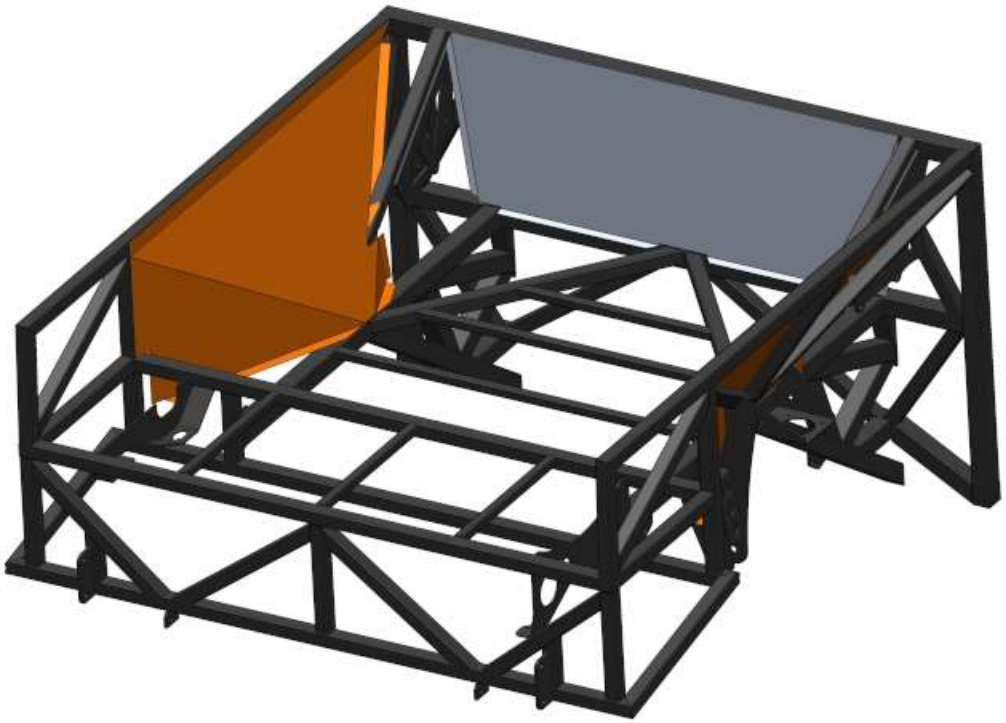
Order of installation



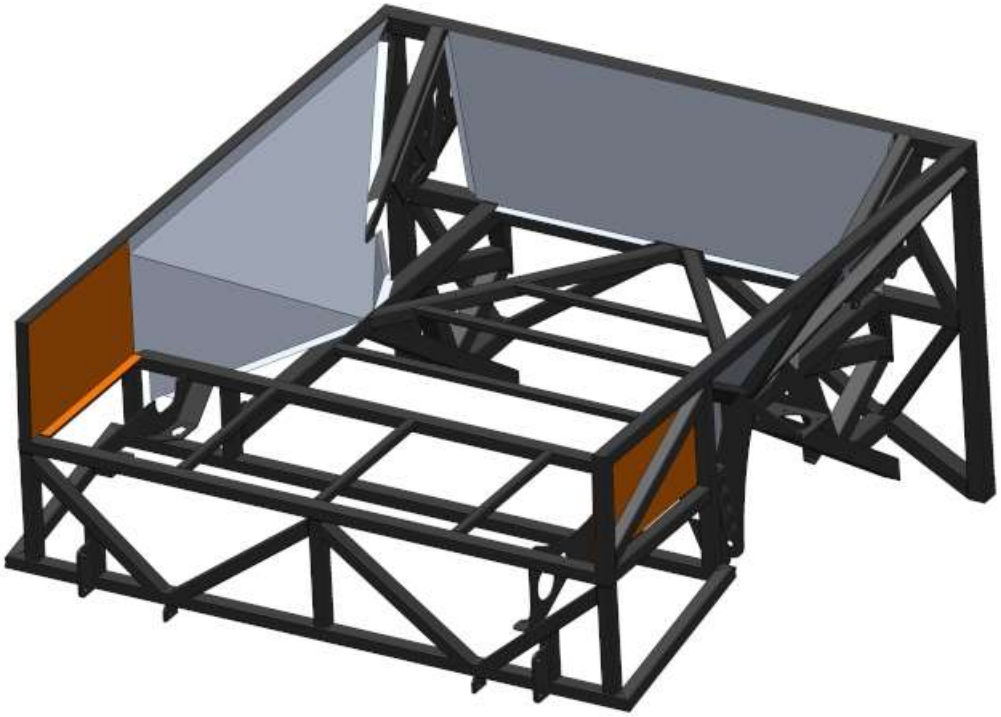
Silicone the frame where each bed panel will attach just before setting it in place. This is an important step both to prevent corrosion and rattles.


Position the front bed panel.

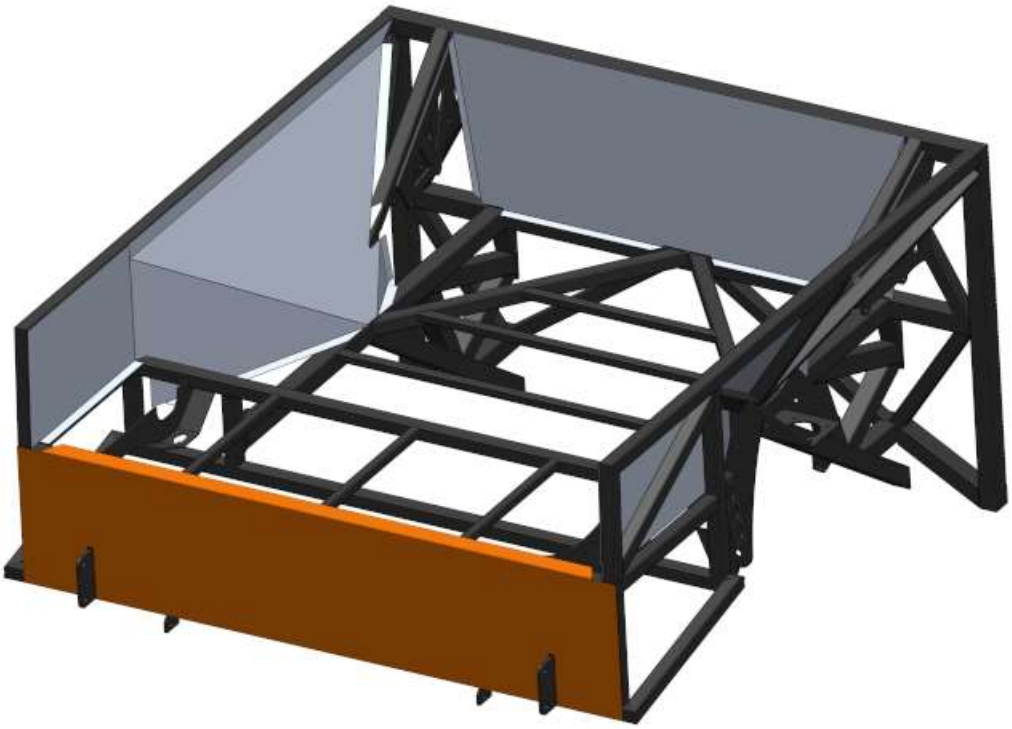
Drill and rivet the panel in place using ⅛” rivets.



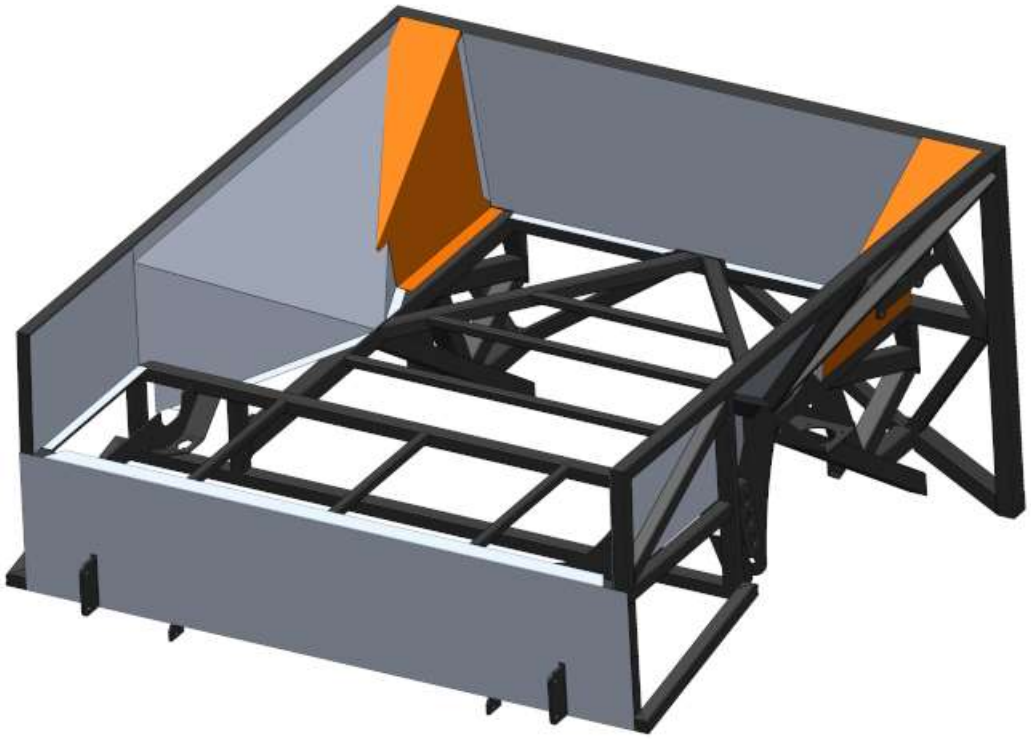
Attach the Bed sides.



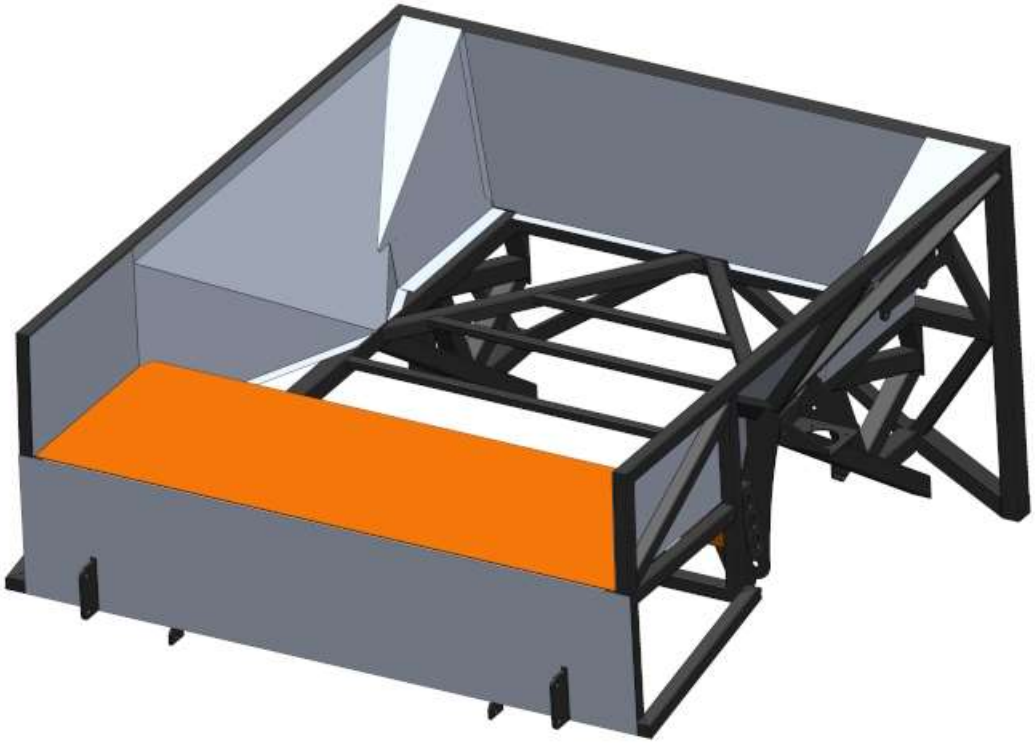
Attach the rear bed sides.



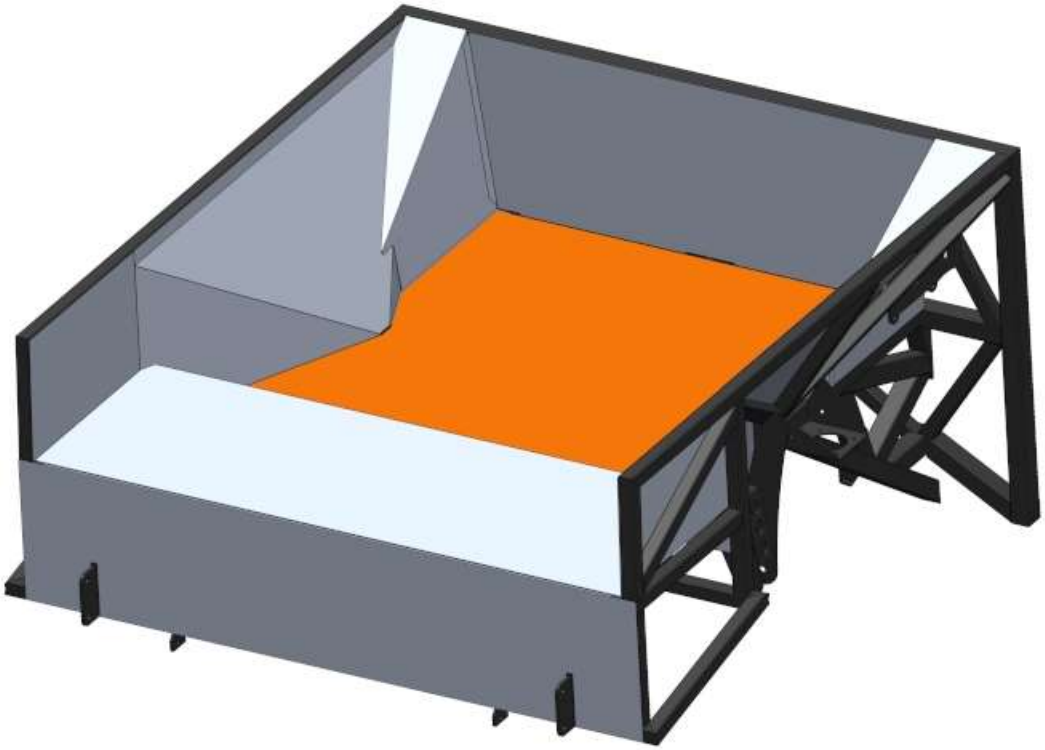
Attach the Bed/Fuel tank rear cover.



Attach the Rear shock covers.



Attach the rear bed floor.



Attach the bed floor.

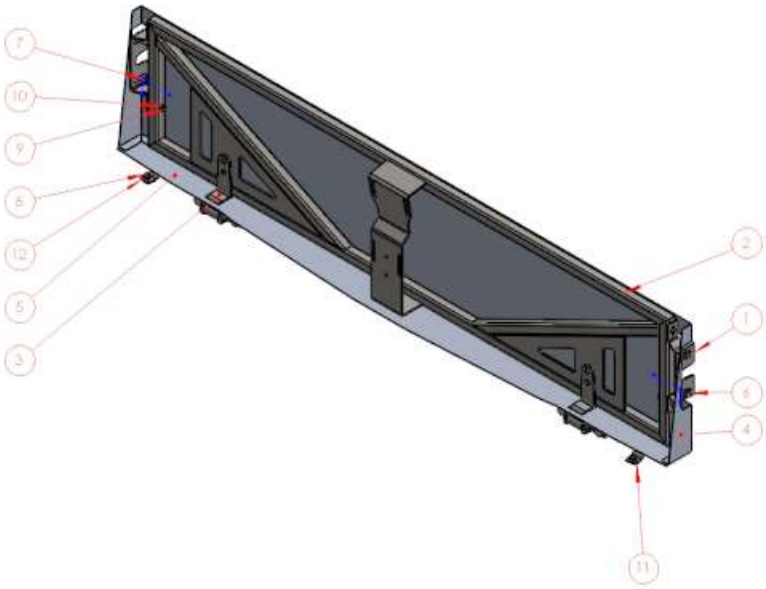
If the bed is going to get a spray-in bedliner or similar, we recommend cleaning/etching the aluminum for a good bond. Bonderite C-IC 33 is an aluminum cleaner/etcher designed for aircraft that get painted. You will only use half of a 1 quart bottle.

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.

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

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	70565	LATCH BRACKET	2
2	70560	TAILGATE FRAME	1
3	70547	TAILGATE HINGE PARTS	2
4	70568	TAILGATE INSIDE COVER	1
5	70569	TAILGATE BOTTOM COVER	1
6	70571	M8-1.25 x 25MM SS FLNG HEAD	4
7	70572	M8-1.25 LOCKNUT	2
8	34364	1/4"-20 x 3/4" BLACK BUTTON HEAD BOLT	6
9	25862	1/4"-20 X 1.5" BUTTON HEAD BOLT	2
10	10802	1/4" NYLON INSERT LOCKNUT	2
11	70576	TAILGATE CORNER BRACKET	2
12	34986	1/4"-20 FLANGED NYLON LOCK NUT	2



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

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
DRAWN	OP	1/10/23
COMMENTS		

MATERIAL
FINISH
USED ON
APPLICATION
PRINTED 12/20/2023

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Factory Five Racing, Inc.

TITLE: TAILGATE PARTS

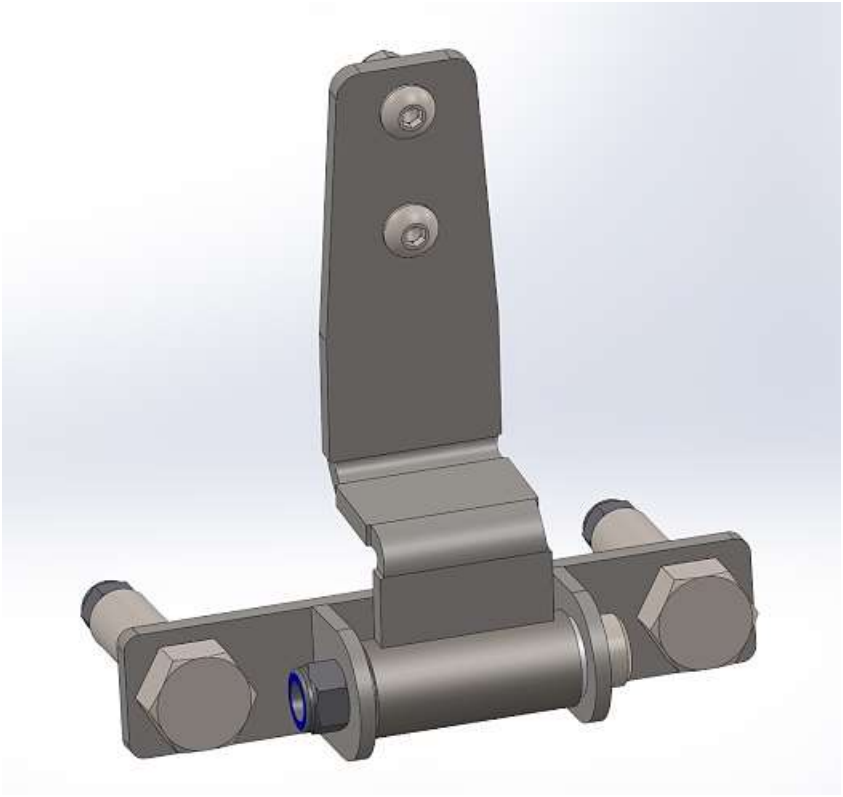
SIZE	DWG. NO.	REV
A	70559	A

SCALE: 1:10 WEIGHT: SHEET 1 OF 1

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, 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. Set the handle height to make the tailgate fit well on the truck and then the actuator will be located by the rod.

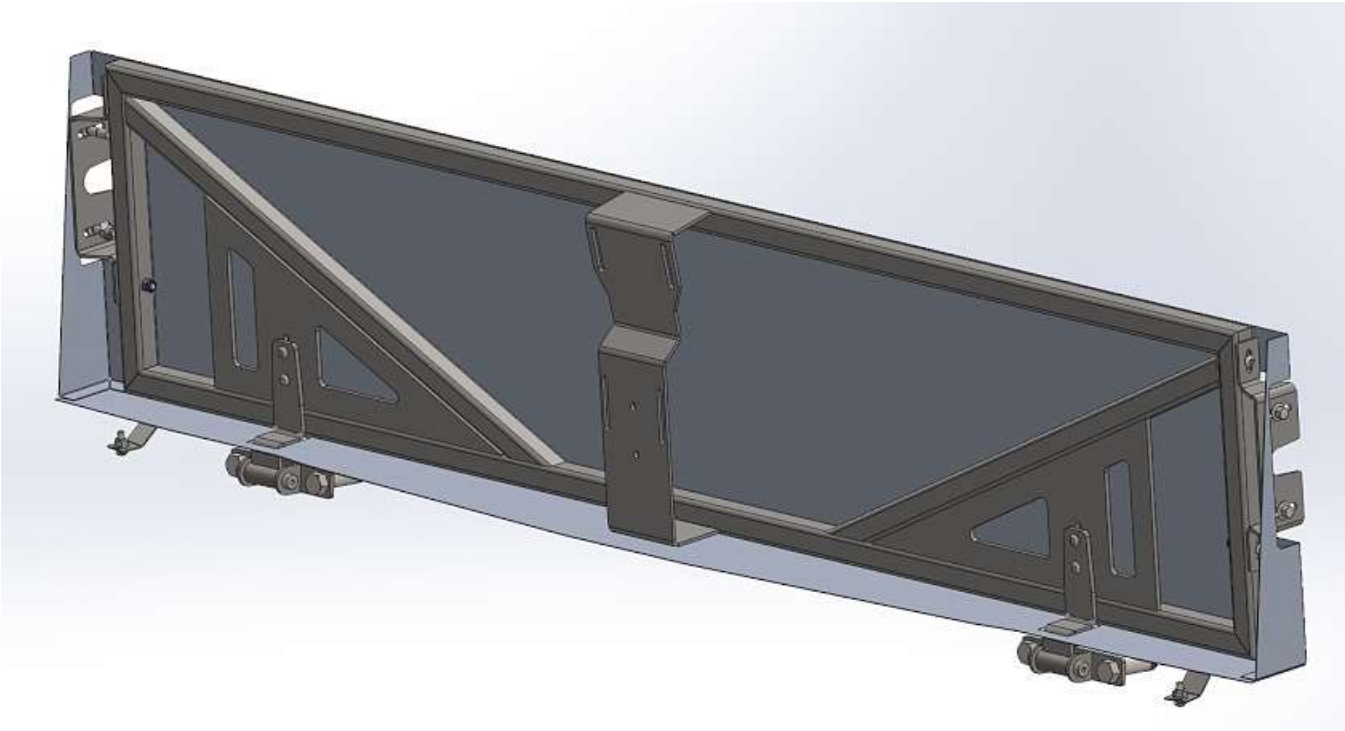
The OEM latches need trimmed to avoid sticking up past the inside surface of the tailgate.



Assemble the whole hinge assembly, it 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 aluminum cover to the inside of the tailgate and bottom edge. Rivet it to the tailgate frame.

- Once the covers are in place, you will lose access to the handle and actuator adjustment, so make sure everything functions as desired.

Add the bottom tabs to pull the bottom fiberglass corners to your desired look.

Attach one end of the lanyard to the back of the bottom bolt holding the latch to the tailgate.

Attach the provided lanyards by holding the tailgate parallel to the ground (90º from fully closed), and hold it in place using a 2x4, metal, etc. while you drill and tap a hole for the lanyard bolt in the 2”x 2” metal tube at the top of the bed side, NOT to the sheet metal only.

Repeat on the other side so both lanyards are equally supporting the tailgate when fully opened.

For power tailgates drill a grommet hole for the harness to pass through.

Front Wheel well Aluminum

🚘 Box 10 Packaged Aluminum, #8 Screws, Box 6 Body Finish components
🛠 Drill, ¼” nut driver

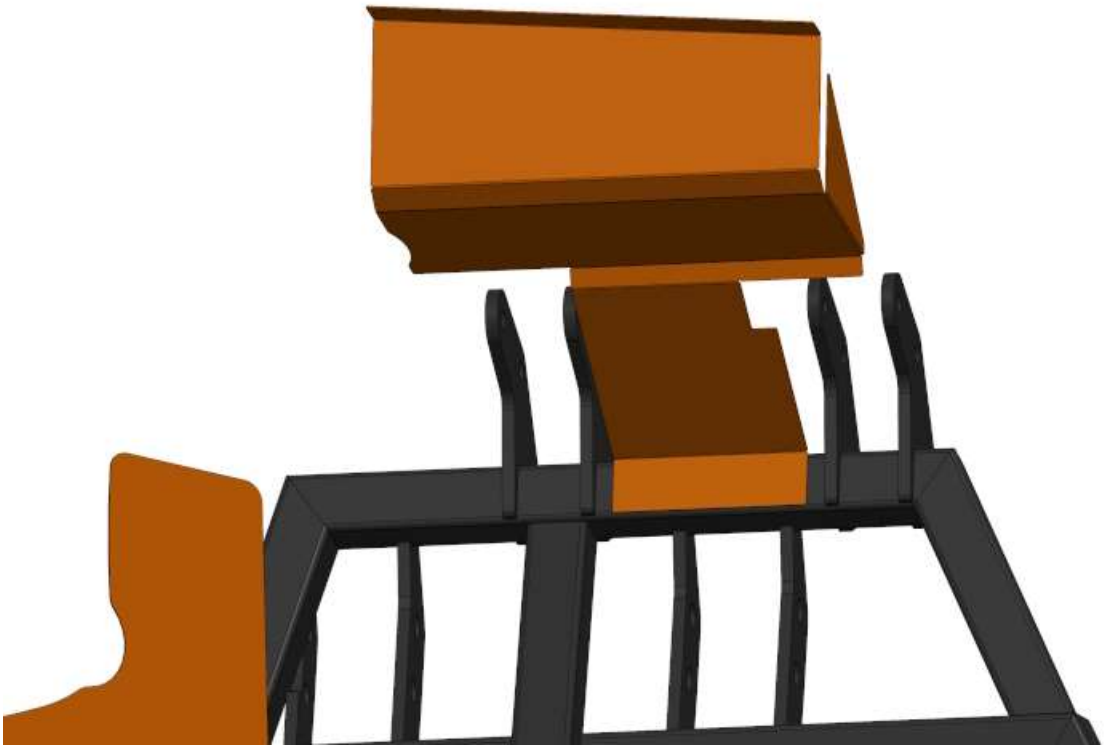
Left Side

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 ¼” black button head screw and locknut.

Rear Wheel well Aluminum

🚘 Box 10 Packaged Aluminum, #8 Screws, Box 6 Body Finish components
🛠 Drill, ¼” nut driver

Push weatherstripping around the outside edge of the splash guards.

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

Speedometer

Your truck now has 37's on it, but the computer thinks it still has the stock tires. Therefore, you will be going faster than your speedometer says. This difference increases the faster you go. For example, when you are going 30 mph your speedo may say 28, but when you are going 80 your speedo may read 70. FORSCAN is a ford software that you can download for free and change the tire diameter in the ECU. Other scanning tools and tuning software usually have this capability too. Consult web forums, your local tuners and truck shops to decide how you would like to adjust this. Or, use a phone GPS to determine your actual speed vs speedometer speed and adjust accordingly.

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:

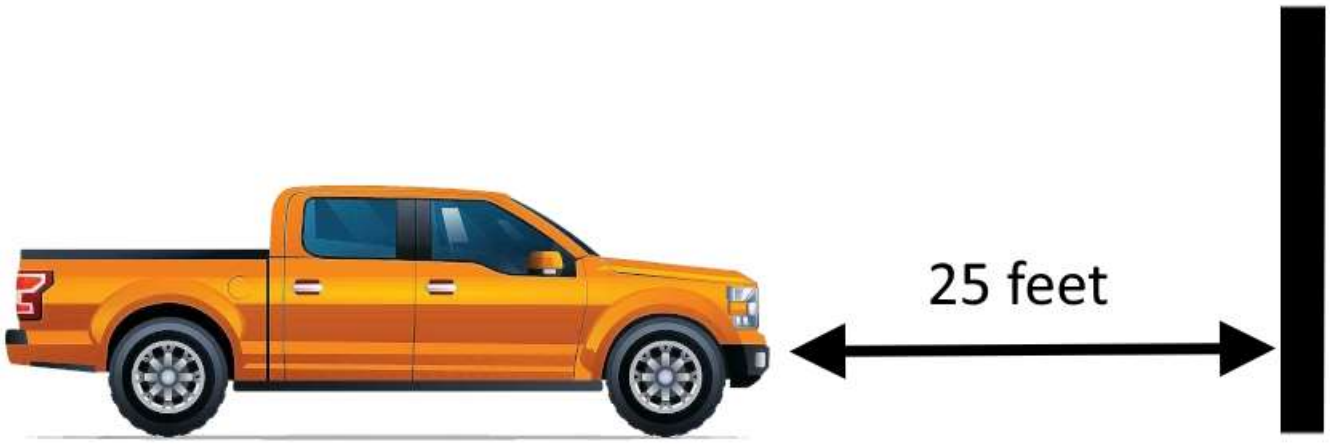
Caster 4.50° to 5.00°
Camber -0.50° to -0.75°
Total Toe $-{}^{3}/_{16}$"

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.

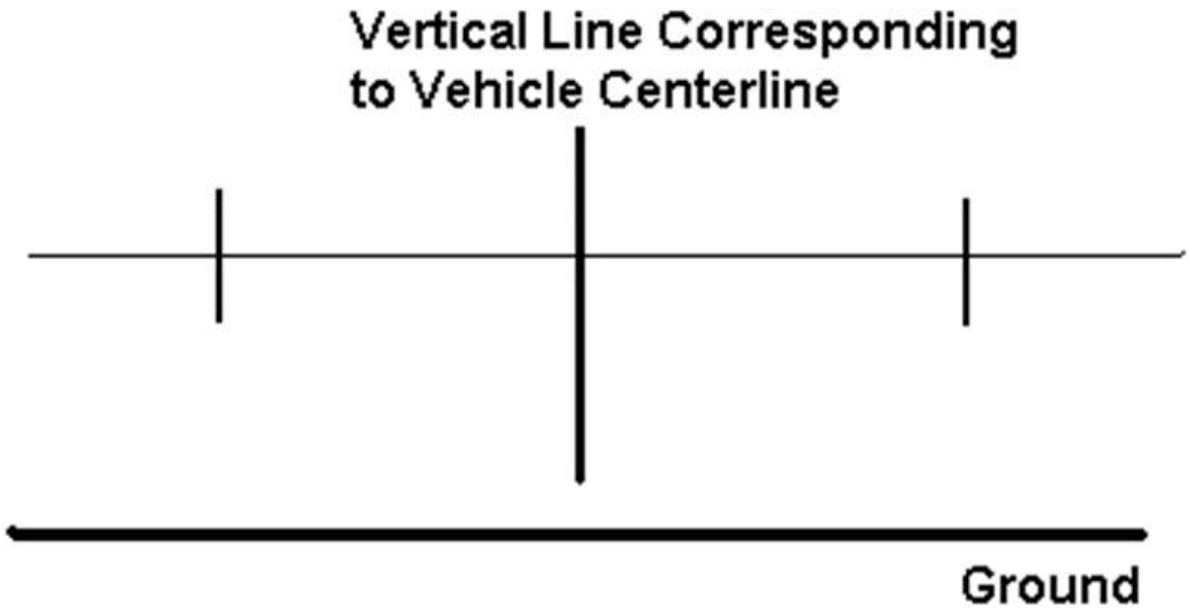
Find a flat, level surface next to a vertical white wall where the car can be parked (a garage door is an ideal location at home).
Pull the car straight up to the wall as close as possible.
Using masking tape and a marker, draw a vertical line on the wall corresponding to the centerline of the vehicle.



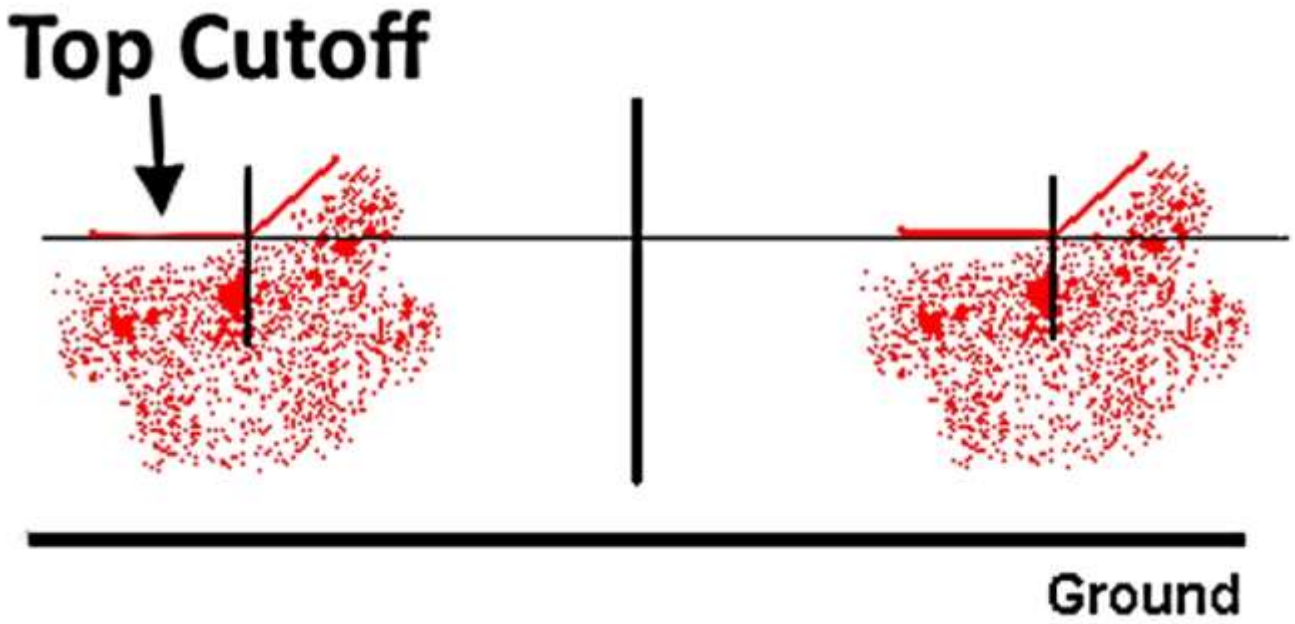
Pull the truck straight back until the headlights are 25 feet from the wall.

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.



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 (JL3Z-9002-H), 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 _____
- Tailgate _____

Save all fasteners removed.

If installing a new tank, the correct sending unit is Motorcraft **PFS-1229** and O-ring **CG-807**

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*-Mercron LV	13.1 qt (12.4 L)
Transfer case fluid Four-wheel drive (Electronic Shift-on-the-Fly) - XL-12	1.5 qt (1.4 L)
Transfer case fluid Automatic four-wheel drive (Torque on demand) - Mercron LV XT-10-QLVC	1.5 qt (1.4 L)
Windshield washer fluid	Fill as required
Fuel tank	23.0 gal (87.1 L)
A/C Refrigerant - R-134a	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*-Mercron LV	13.1 qt (12.4 L)
Transfer case fluid Four-wheel drive (Electronic Shift-on-the-Fly) - XL-12	1.5 qt (1.4 L)
Transfer case fluid Automatic four-wheel drive (Torque on demand) - Mercron LV XT-10-QLVC	1.5 qt (1.4 L)
Windshield washer fluid	Fill as required
Fuel tank	23.0 gal (87.1 L)
A/C Refrigerant - R-134a	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° ± 0.25°	-0.50° ± 0.25°	
Caster	4.75° ± 0.25°	4.75° ± 0.25°	
Total Toe	-	-	0.20° ± 0.20°
Rear Thrust angle	-	-	0° ± 0.50°

Appendix G – Torque Specifications

General Bolt torque specifications*

Thread	SAE English
Zinc Plated	Ft-Lb.
¼”-20	8
5/16”-18	17
⅜”-16	30
7/16”-14	48
½”-13	75
½”-20	83
⅝”-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)
⅜”	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 approximately .25 inch
- Gen 14 Evap canister changed requires different mounts
- Fuel system plumbing requires ⅝ ID hose
- New ABS housing interferes with driver shock tower
- Cowl plastic needs retrofitting from older gen: (FL3Z-1532284-C) cowl insulator, FL3Z-15021A36-A extension panel, FL3Z-15021A37-A extension panel, (FL3Z-15022A69-C) grille cowl top
- 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 driver’s 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 driver’s 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.
- Pro Power - This 110 Ac plug and housing must be connected to the truck electrical system or the truck will not shift into drive if you wait too long. Meaning the computer realized the pro power isn’t there and it blocks shifting into drive and says go get ford service on the display.
- Without the grill shutters attached to the motor the computer complains about the grill shutter motor out of range. Adding a limiting stop, the computer thinks the grill shutters are attached.
- The hard lines for the transmission cooler touch the steering rack. I simply padded them with a section of hose. The cooler lines also want to be in the same place as the front ARB. Removing the brackets and adding padding made from hoses should be fine.