

### Solid Axle Conversion Package



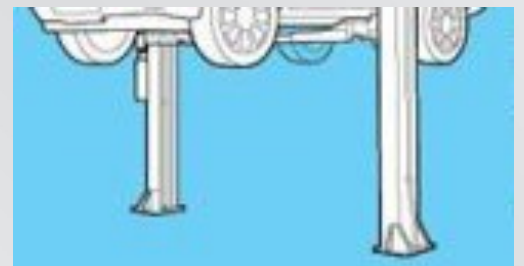
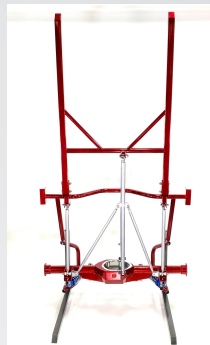
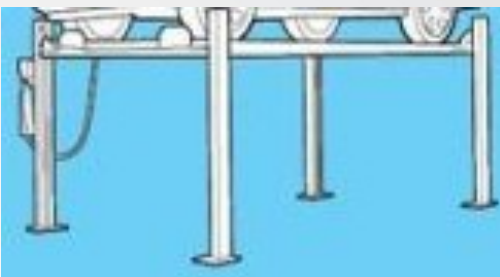
This kit is designed to replace the independent rear end assembly in the Dodge Challenger. It requires removal of some of the suspension mounts and the stock fuel tank. It might also require that some of the original floor be removed, this will be based on your individual needs of this project.

Installation of this kit will require above average skills. There is some welding required to complete this project. You'll need a minimum of a large flat surface and the ability to lift and support the vehicle while performing this swap. First and foremost, follow any safety procedures need to complete this project.

Please understand that returning to stock condition after the completion of this project would be extremely difficult to perform. As stated above, some of the suspension mounts need to be removed as well as the stock gas tank. Our kit includes everything required to complete the suspension swap, the customer will have to supply some sort of an aftermarket fuel system and some re-tuning of the ECU will be required. Any changes made to the ECU might deem it to "off road use only".

The Challenger is equipped with several plastic shroud pieces that need to be removed to enable you to lift and support the vehicle. The front supports need as far forward and as far out the side as possible. The rear supports need to be underneath the rockers, you'll need to make sure it's not where the subframe welds to the inner rockers. You should be OK if you keep them near the original jack points. Make sure you get the vehicle high enough so that you can get the rear cradle assembly out from underneath the vehicle.

Make sure it's level from side to side and front to rear.



Rev. IN20-53

Once the car is properly supported so that it can be worked on safely, start by disconnecting and removing the battery. Then disconnect the electrical connectors associated with the rear cradle assembly. Remove the rear brake assemblies, make sure you plug the lines to prevent brake fluid loss. Remove the emergency brake cable from the cradle. Once everything is disconnected from the cradle, support it with a floor jack in the middle of the cradle. At this point it would be nice to have a helper to remove the cradle and fuel tank. Remove the shocks, springs and anything else that might interfere with the removal of the cradle assembly. Remove the four bolts that attach the cradle to the chassis. Slowly release the jack so that the cradle will separate from the chassis. Have your helper support the cradle so that it won't slip off of the jack.

The fuel tank is next. Remove the filler and vent hoses, fuel supply and vent lines. The fuel and vent lines are connected with quick disconnect fittings. The tools to disconnect these lines can be purchased from auto supply parts stores. The rear seat needs to come out to remove the tank, the electrical connections are located underneath the seats. Once everything is disconnected, depending on the fuel level in the tank, you might want to support the floor jack as well. Remove the mounting straps and lower the tank from the vehicle. Make sure you plug any liquid lines to prevent spillage or any chance of fire.

At this point you'll need to determine how much or how little of the floors you'll want to remove to complete this project.



To install the subframe, you'll need to remove the spring pockets and supporting gussets and anything else that might obstruct the installation of the subframe. This can be accomplished by using a spot weld drill. They can be purchased at most auto supply stores. In our prototype vehicle we removed the floors from the pinch weld on the crossmember just in front of the differential to the tail light panel. We did this for ease of design, it's not necessary to complete this project.

Once all the miscellaneous parts and pieces are removed, test fit the subframe into the vehicle. There are four metric bolts and washers included in the kit that will be used to attach the sub frame to the rear cradle attachment points. They are 2, M14-2.0x45, 2, M14-2.0x 80 and 4, M14x28 flat washers. Temporarily install the sub frame to determine where the crossmember plates will weld into the inner rockers. You may have to slightly bend the fuel and brake lines to accomplish this. Mark the rockers where you need to weld, then remove the sub frame so that you can thoroughly clean the rockers of paint, undercoat, galvanizing, etc...



Make sure the weld plates on the end of the crossmember are clean as well. Once everything is clean, re install the sub frame. In preparation for welding, it may be necessary to use a jack to push the crossmember weld plate tight against the bottom of the rocker. Be extremely careful doing this, you don't want to knock the car off of the supports! Tack each side in place before completing any welding.

Next step will be pre fitting the sub frame connector assembly. There are 4, ½" 20x 3" bolts. 4 ½" SAE washers and 4, ½" 20 top lock nuts use these where the sub frame connector assembly attaches to the rear sub frame. At this point, use the bolts to locate the sub frame connector assembly. You might want to again use the jack to support the assembly so that you can mark the point that it will need to be welded to the front sub frame rails. Clean any paint or galvanize from the rails, also any powder coating from the connectors where they come in contact with the front rails.



Please note the front torque arm mount needs to point up into the driveshaft tunnel to work properly. At this point you have two options. The attachment point where the rear sub frame bolts to the sub frame connector assembly can either be bolted together as it's only means of attachment or it can also be welded if you so choose. The second option will require the removal of the powder coat on the two assemblies at the point of contact. Once you're happy with the fit and finish, tack the sub frame connector assembly in place. Double check that everything fits as it should, tighten the 4 ½" bolts and finish weld. Clean any heat affected areas and paint to match to prevent any rust.

Start the assembly process by sub assembling all of the suspension components. It's recommended but not necessary that you chase all of the threaded components with a tap with a corresponding thread. If you decide to skip this process, please remember that if you have a difficult time threading any of the heim's into the corresponding links, it's a possibility that it may seize into that link. Each suspension link has a left-hand threaded end and a right-hand threaded end. With the corresponding heim joints installed in their respective ends this allows for adjustment of the links without having to remove the link from the vehicle.

First on the list are the two anti-roll links. There are 2 right-handed heims and jam nuts in the kit, along with 2 left-handed heims and jam nuts. Thread the jam nuts onto each corresponding heim until  $\frac{3}{4}$ " of thread is showing past the nut. Apply an anti-seize lube onto the threads to reduce the possibility of the threads seizing. Thread the corresponding heim into each end of the link until the jam nut just seats against the link.

Next will be the torque arm assembly. The slider assembly for the torque arm consists of the  $1\frac{1}{4}$ "x 5" moly slider, 1,  $\frac{3}{4}$ " x  $\frac{3}{4}$ " moly RH heim and a  $\frac{3}{4}$ " RH jam nut. Thread the jam nut all the way onto the heim. Apply anti seize to the threads and thread the heim all the way into the slider. Tighten securely. For the torque arm there is a  $\frac{3}{4}$ "x  $\frac{3}{4}$ " RH thread solid rod end and a  $\frac{3}{4}$ " RH jam nut. Thread the jam nut onto the solid rod end until  $\frac{7}{8}$ " of the thread is showing past the nut. Apply anti seize to the threads and thread it into the bottom rear of the torque arm until the nut just seats against the threaded insert.

The adjuster link is  $1\frac{1}{4}$ " in diameter by  $7\frac{3}{4}$ " long. The forward end is LH thread. Take a  $\frac{5}{8}$ "x  $\frac{3}{4}$ " LH heim and LH jam nut from the kit and thread the  $\frac{3}{4}$ " jam nut onto the heim until there is  $\frac{7}{8}$ " of thread showing. The rear of the adjuster is RH thread. Take a  $\frac{3}{4}$ "x  $\frac{3}{4}$ " RH solid rod end and  $\frac{3}{4}$ " RH jam nut from the kit, thread the nut onto the rod end until  $\frac{7}{8}$ " of thread is exposed as well. Apply anti-seize to the threads and thread each rod end into the link until the jam nut seats against the threaded tube adapter. There is a  $\frac{5}{8}$ " OD x  $\frac{3}{4}$ " long sleeve in the kit that reduces the ID of the heim to  $\frac{1}{2}$ " along with a  $\frac{1}{2}$ "x20x  $2\frac{1}{4}$ " long bolt, 2  $\frac{1}{2}$ " SAE flat washers and a 1/220 nylock nut. Use to attach the  $\frac{5}{8}$ "x  $\frac{3}{4}$ " heim to the torque arm.

There are two track locators included in this kit. They are 1" in diameter. One is 28" long, the other is  $25\frac{1}{2}$ " long. In the kit there is 2,  $\frac{1}{2}$ " RH heims and jam nuts and 2,  $\frac{1}{2}$ " LH heims and jam nuts. Thread the respective jam nuts on each heim until  $\frac{3}{4}$ " of thread shows. Apply never seize to the threads of each heim and thread them into the ends of each bar.

The lower control arms are next to assemble. They are  $22\frac{3}{4}$ " long and  $1\frac{1}{4}$ " in diameter. In the kit there are 2,  $\frac{5}{8}$ "x  $\frac{3}{4}$ " LH heims and jam nuts and 2,  $\frac{5}{8}$ "x  $\frac{3}{4}$ " RH heims and jam nuts. As before, thread each jam nut on the heim  $\frac{7}{8}$ " from the threaded end. Apply anti seize to the threads and thread them into their corresponding ends until the jam nut seats against the tube.

The links that have been pre-assembled at a length that will make initial assembly easy. It will all need to be final adjusted once the vehicle is completely assembled.

### Housing initial assembly

To begin initial assembly, start with the housing, center section and lower shock mounts. The process of installing the center section before the housing is installed in the car makes this whole process a lot easier. Start by thoroughly cleaning the inside of the housing and axle tubes. It will have remnants of sand from sandblasting that will destroy the center section. Once the inside of the housing is cleaned, install the center section studs into the face of the housing. The coarse threaded end threads into the face of the housing, once inserted, install the nylock jam nuts on the inside to prevent the studs from backing out. A gasket is included in the center section box and we recommend that you use a silicone sealant on both sides of the gasket to prevent leakage. Slide the center section over the studs and use the washers and nuts included in the kit to complete the assembly. The shock mounts will install in the midpoint of the adjustment, use the 4, 3/8" 24x 1 1/4" bolts, 4, 3/8" flat washers and 4, 3/8 24 nylock nuts, (the nuts go on the inside of the lower control arm mounts) to complete the assembly.

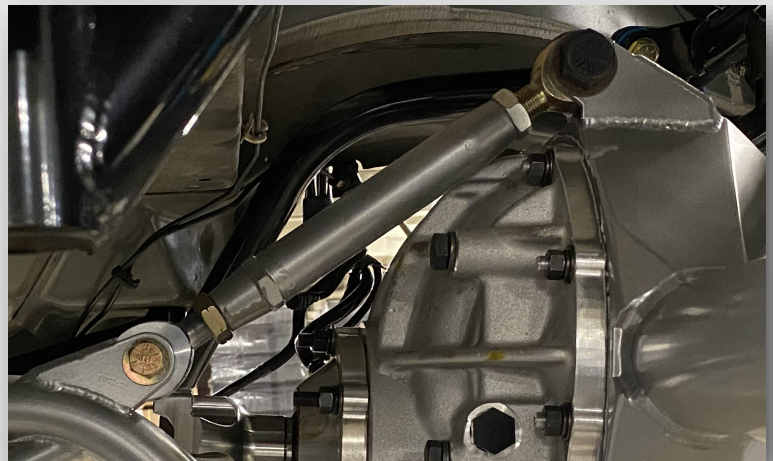


Set the housing on stands under the car as close to its final location under the vehicle as possible. The lower control arms will be installed first. Using the 4, 5/8" to 1/2" reducer bushings, 4, 1/2" 20x 2 3/4" bolts, 4, 1/2" flat washers and 2, 1/2" 20 nylock nuts, attach the left-hand threaded end of the lower control arm to the front control arm mounts on the sub frame assembly. The reducers slip into the heims and then the heims are inserted between the brackets and the bolts, washers and nuts hold the assembly in place. The rear of the control arm installs in a similar fashion. Use the 4 aluminum cone spacers, 2, 1/2" 20x 4 bolts, 4, 1/2" flat washers and 4 1/2" 20 nylock nuts to install the rear of the control arm into the lower control arm mount on the housing. The bolts will go through the track locator clevis's first and they will slide through the lower control arm mounts from the inside so that the track locator links have a place to attach.



### Torque arm installation

In the kit there are 2,  $\frac{3}{4}$ " 16x 2  $\frac{1}{2}$ " bolts, 4,  $\frac{3}{4}$ " flat washers, 2,  $\frac{3}{4}$ " nylock nuts. Use this hardware to attach the torque arm to the housing. Start by sliding the lower solid rod end between the tabs located near the bottom center of the housing. There will be a washer on each side of the tab with the nylock towards the inside of the tabs. (fig 1) Follow the same procedure at the top of the housing with the solid rod end on the torque arm adjuster. Moving to the front of the torque arm, the previously assembled slider will need to be inserted into the front end of the torque arm. It will need to be liberally greased before it's inserted into the torque arm. There is also a grease zerk that needs to be installed into the fitting on the lower tube on the torque arm. There are 2,  $\frac{3}{4}$ "x 5/8" reducer bushings, 1, 5/8" 18x 2  $\frac{1}{2}$ " bolt, 2, 5/8" washers and 1, 5/8" 18 nylock nut. Insert the reducer bushings into the heim, slide the heim between the forward torque arm brackets and attach with the 5/8" hardware. Use a hole near the middle of the bracket as a starting point. It wouldn't hurt to give the slider a couple squirts of grease just to be safe.



### Track locator installation

These two links control side to side movement of the rear end assembly in the vehicle. By lengthening one and shortening the other, the rear end can be moved from side to side. The determination of which one to lengthen and which one to shorten will be made by the location of the tires in the wheel wells. The track locators attach to the previously installed clevises on the lower control arm mounts to the tabs welded to the lower tube on the torque arm at the midpoint of the torque arm. Mount the links with the left hand threaded heims towards the front of the vehicle. The rear hardware consists of 4, 1/2" to 3/8" reducer bushings, 2, 3/8" 24x 2" bolts, 4, 3/8" flat washers and 2, 3/8" 24 nylock nuts. Insert the reducer bushings, slide the heim and bushings into the clevis and insert a washer and the 2" bolt through the clevis and heim assembly, making sure the bolt goes in from the top side of the clevis. A washer and the nut go on the bottom side. Repeat this procedure on the other side. The forward end of the track locator links attaches to the tabs on the torque arm with 2 1/2" 20x 1 3/4" bolts, 2 1/2" flat washers and 2, 1/2" 20 nylock nuts. Insert the front end of the link between the tabs, slide the bolt through from the top. The washer and nylock nuts go on from the bottom side. The link on the opposite side of the previously installed link may need to be lengthened or shortened to allow the bolt to slip through the assembly. Final adjustments will need to be made to center the housing assembly at the end of this project.



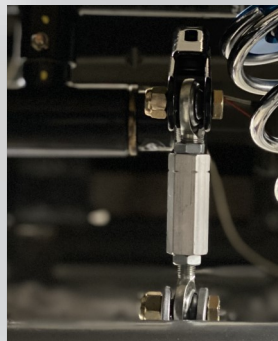
### Shocks

Our kits have AFCO shocks as an option. The instructions for the AFCO shocks but will apply to most coil over shocks. With all of the parts from the shock and spring boxes unpackaged, start by threading the spring seat all the way to the bottom of its adjustment. Install the spring onto the shock. The upper cap has a stainless retaining clip in its retainer groove, remove it from the cap and insert it into the retaining groove on the top of the shock. Slide the top cap over the spring and under the retainer. Once assembled, you'll need to thread the spring seat about half way up the threaded portion of the shock body. Spray some sort of lubricant on the threads to reduce galling of the threads. The final adjustment will be made at the end of the project. In the kit you will find 4, 1/2" 20x 2 1/4" bolts, 8, 1/2" flat washers and 4 nylock nuts. Start at the upper shock mounts. Slide a washer on the bolt, slide the shock between the upper tabs and slide the bolt through the assembly. Install the washer and nut on the bolt. Repeat this process for the opposite side. To attach the bottom of the shock to the lower shock mount you might need to raise or lower the housing, the bolt, washer and nut orientation is the same as the top.



### Anti-roll

The anti-roll bar assembly was installed at the factory. To complete its installation, find the 4, 3/8" 24x 1 1/4" bolts and the 4, 3/8" 24 nylock nuts. Start by attaching the left side anti roll link to the anti-roll arm and then to the tabs on the top of the housing. Repeat this process for the right side. It's a possibility that you might need to either lengthen or shorten the link to accomplish this.



### **Driveshaft**

The factory driveshaft will not work with this package. We can supply a driveshaft from the Driveshaft Shop at an additional fee. It includes an aluminum adapter that eliminates the rubber flex joint and also allows the high velocity CV joint a proper mounting point. At this time, you should consider a driveshaft safety loop as a safety precaution. The shaft has a 1350 heavy duty U-joint at the rear. Bolt the driveshaft adapter to the output yoke on the transmission with the supplied hardware then the CV joint attaches to the adapter with its supplied hardware. The U-joint in the rear attaches to the pinion yoke with the u-joint straps that are supplied with the center section. Once the vehicle is completely assembled, the pinion angle will need to be set in relationship to the engine/ transmission angle.

### **Final assembly**

Install the inner axle seals if applicable. Axles and brakes are next. No detail provided on brakes because of the different amount of brake kits available. If the original hard brake lines are able to be reused, a kit is available at an additional fee. At this point, the fuel system, plumbing, battery, wiring, ECT can be completed. Once this is done, bleed the brakes and top all of the fluids off. At this point the vehicle is ready for all of the final adjustments. The vehicle must have the weight on the suspension to complete this process. Jack stands under the axle housing and the front control arms will work, or a wheel lift will work as well.



### Setup

With some sort of support under the suspension or the tires, taking into consideration that the car should be level side to side and front to rear, also allowing clearance to work on the rear suspension. When making final adjustments you might need to repeat some of these processes throughout this process. The first thing that needs to be done is set the rear axle so that it's square in the vehicle. To complete this procedure, you'll need 2 plumb bobs, 24" or longer level, Sharpie marker, 8' of string and /or an 8' long straight edge and an inclinometer. The simplest way to do this is use a point on the body fairly close to the ground, we typically use the bottom of the "B" pillar where it intersects with the rocker (PIC). Holding the plumb bob into this intersect point, make a mark on the floor at this point, repeat this on the other side of the car as well. Once you've got your marks on both sides of the car, pull your string or straight edge across the lines, this will give you a point to measure to when squaring the rear axle assembly. (find some sort of weight to set on each end of the string to keep it in position during this process). Drop the plumb bobs over each end of the housing assembly, as close as possible to the wheel as you can get. Measure from the line to the plumb bob. This measurement needs to be exactly the same on both sides. To adjust this dimension either lengthen or shorten the lower control arms. When you're doing this step, remember the tires/wheels need to be centered in the wheel openings. Next step is ride height. Start by measuring the length of the coil over shocks at their mounting points. When finished, this dimension should be 13  $\frac{3}{4}$ " to 14  $\frac{1}{4}$ " from center to center of the  $\frac{1}{2}$ " bolts. You may need to raise or lower the adjustable spring to seat to achieve this dimension. You'll need to take the weight off of the rear suspension to accomplish this. The lower shock mounts that attach the bottom of the shock to the lower control arm mount may need to be moved up or down, this would be determined by the tire/wheel clearance with the body. The valving adjustments are included in the shock instructions. Set them according to the manufacturer's recommendations. Set the track locators next. Use the level on the outside of the tire to help measure to the wheel lip on the body, this measurement needs to be the same on both sides. To adjust the housing from side to side, lengthen one bar and shorten the other. Once these dimensions are equal, lock all four jam nuts. Pinion angle adjustment is next. The pinion should point down 1 to 2 degrees down from the engine/transmission angle. There is an APP online called the Tremec Toolbox. It is downloadable for free and will greatly simplify this procedure. First you measure the engine angle, next the driveshaft and then the pinion angle, it will tell you each angle and what one you'll need to adjust to complete this process. Once you've completed the pinion angle adjustment, re-check that the tire/wheel is still centered in the wheel opening. If not, readjust this accordingly. The last adjustment will be the anti-roll. This adjustment should be made with the driver in the vehicle. Turn the right-side anti-roll link either clock wise or counterclockwise to release the tension in the link. You can tell when it's slack when the heim bodies will move side to side when you turn the link. Once slack, lengthen the anti-roll to take the slack out of the joints. Double check that all of the nuts and bolts have been tightened and that the jam nuts on all of the suspension links have been tightened. At this point the suspension preliminary adjustments are complete. Any future adjustments will be determined by vehicle performance and track testing.(PIC)

## Testing

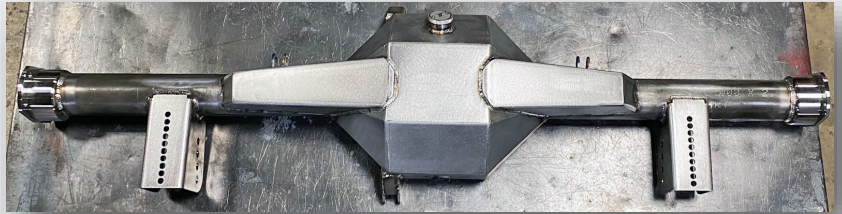
Once you're at the track and know that all the little bugs have been ironed out, determine what if any adjustments your car might need. Moving the torque arm down will increase squat, up will increase separation. Use the shock valving to determine what your car may want. If your car likes the shocks looser in extension, the car could possibly want more separation. Tighter and it will want more squat. This can be fine tuned with the control arms as well. Bar angle up in the front causes separation, down causes squat. If you move the torque arm up or down, the pinion angle will need to be re-set.

Anti-roll is determined by body roll. Have someone watch the front of the vehicle, you're looking for the front end to stay level from side to side during launch. If the left wheel seems to come up higher than the right, lengthen the right link. Make sure when you're adjusting the anti-roll that you don't over adjust and cause the car to turn left or right during launch.



**New Challenger BOM**
**Housing**

parts description	part #	Qty.
55 3/4" with Torino ends	7H9FDR	1


**Anti Roll Assembly**

parts description	part #	Qty.
Anti Roll Link	72310032	2
3/8" RH heim	72310033	2
3/8" RH Jam Nut	72310035	2
3/8" LH heim	72310034	2
3/8" LH Jam Nut	72310036	2
3/8" 24 x 1 1/4" bolt	718836XX	4
3/8" 24 Nylock Nut	737082XX	4
1/4" 28 x 2" bolt	70118761	2
1/4"x 28 Nylock Nut	71133004	2
3/8" Washer	838FW	4



**Torque Arm**

parts description	part #	Qty.
Torque arm assembly	737500C	1
3/4"x 3/4" solid rod end	73416SRE	1
3/4"x 3/4" moly heim	73416HJR	2
5/8"x 3/4" moly heim	33415MHJR	1
3/4"x 5/8" Heim Adapter	PT0774	2
3/4" RH jam nuts	73416JNR	3
3/4" LH jam nut	73416JNL	1
5/8"x .750 sleeve spacer	C1000051	1
1 1/4"x .120x 5" moly tube (adjuster tube)		1
3/4"x 16x 2 1/2" bolts	718363XX	2
3/4"x 16 Nylock nut	737570XX	2
5/8"x 16x 2 1/2" GR. 8 bolt	718314XX	1
5/8"x 16 nylock nut	737569XX	1
1/2"x 20x 2 1/4" GR. 8 bolt	718915XX	1
1/2"x 20 nylock nut	71337084	1
3/4" SAE flat washers	733803XX	4
1/2" SAE flat washers	733187XX	2



### Track Locators

parts description	part #	Qty.
1/2" to 3/8" reducer bushings	72310024	4
1/2"x 1/2" RH heim	71220HJR	2
1/2"x 1/2" LH heim	71220HJL	2
1/2" RH jam nut	71220JNR	2
1/2" LH jam nut	71220JNL	2
3/8"x 24x 2" bolt	6118840X	2
1/2"x 20 THDx 2" bolt		2
1/2"x 20 THD nylock	71137084	2
3/8"x 24 THD nylock nut	71137082XX	2
1/2" SAE flat washer	733187XX	2



**Lower Control Arm**

parts description	part #	Qty.
5/8"x 18 THDx 1 1/4"x .120 RH tube adapter		2
5/8"x 18 THDx 1 1/4"x .120 LH tube adapter		2
1 1/4"x .120x 20 1/4" chrome moly tube		2
Lower rear cone spacers	C1000046	4
5/8" to 1/2" Heim Adapter	72310023	4
5/8"x 3/4" RH heims	33415MHJR	2
5/8x 3/4" LH heims	33415MHJL	2
3/4" RH jam nuts	73416JNR	2
3/4" LH jam nuts	73416JNL	2
1/2"x 20x 2 3/4" bolt	718917XX	2
1/2"x 20x 4" bolt	718922XX	2
1/2" SAE flat washers	733187XX	2
1/2" X 20 THD Nylock Nut	71137084	4



**Shock Mounts**

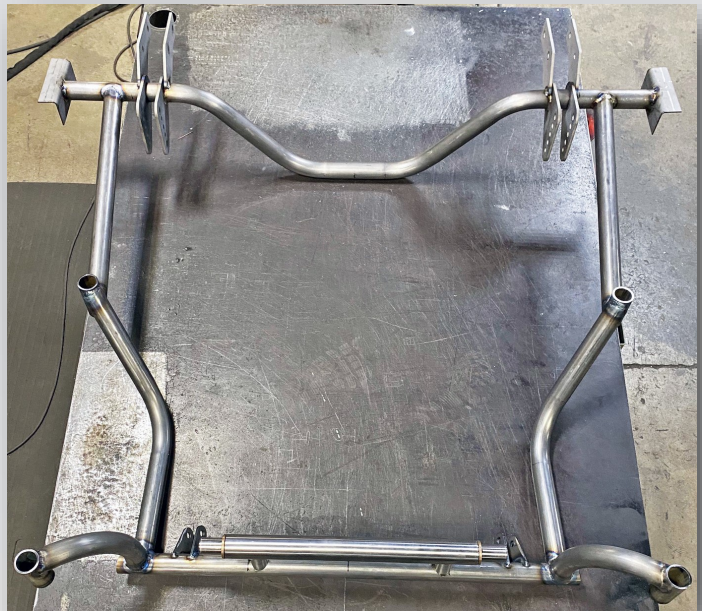
parts description	part #	Qty.
A/G lower shock mounts		2
1/2"20 THDx 2 1/4" bolts	718915XX	4
1/2"x 20 THD nylock nut	71137084	4
1/2" SAE flat washer	733817XX	4
3/8"x 24 Thdx 1 1/4' bolt	711836XX	4
3/8"x 24 THD nylock nut	7137082XX	4
3/8" SAE flat washer	838FW	4


**Subframe Bolts**

parts description	part #	Qty.
Front subframe bolts M14-2.00x 60		2
Rear Subframe Bolts M14-2.00x 75		2
Washers M14x 28OD		4

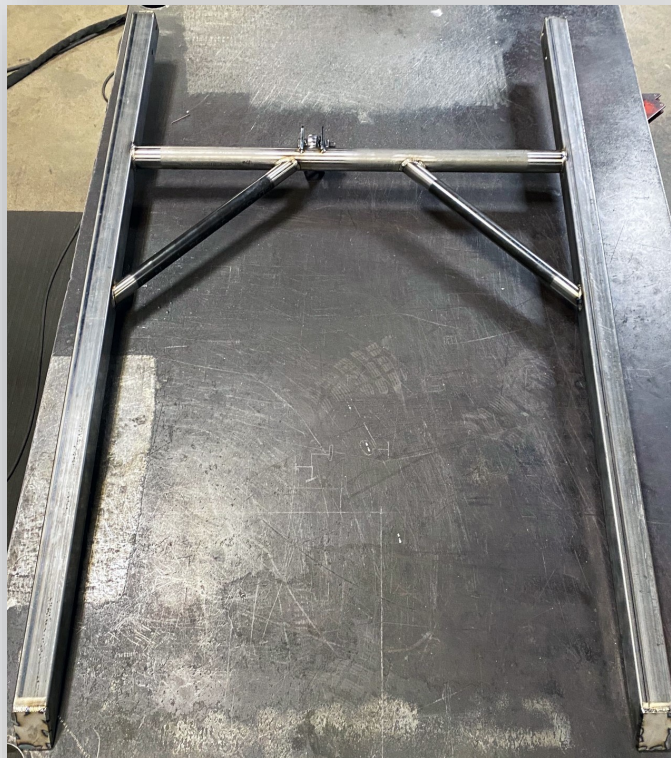

**Subframe Assembly**

parts description	part #	Qty.
Subframe (Challenger)		1
Subframe Mount Washer	C1000014	4



### Subframe Connector Parts

parts description	part #	Qty.
1/2" 20x 3 1/2" GR 8 bolts	70118920	4
1/2" 20 top lock nuts	737308XX	4
1/2" SAE flat washers	733817XX	8







**MOSER**  
ENGINEERING

Rear Ends | Suspensions | Axles | Brakes

Notes