Instruction Guide

Torque Arm Rear Suspension
82-92 F-Body

Speedtech PERFORMANCE

CHASSIS - SUSPENSION - PRO TOURING - AUTOCROSS - DRAG RACING - CUSTOM BUILDS

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Figure 1: 1987 Camaro [picture by Jason Smith]

Congratulations on the purchase of your new Speedtech Performance torque arm rear suspension. Use only approved and appropriately rated jack and jack stands, and be sure to take all safety precautions required to complete the job safely and correctly. If you have uncertainties, seek the assistance of a highly qualified workshop to assist you.

Read and understand all instructions thoroughly before you begin. Your main assembly and set up of your new torque arm can be done in a home garage with hand tools and basic welding equipment.

Speedtech enjoys seeing the progress our customers are making as they work through their builds. Join the group, Team Speedtech, on Facebook and share your pictures and your story.

Speedtech Performance sends you best wishes for your project!

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1.0 GENERAL INFORMATION

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1.1 THIS GUIDE

Thank you for purchasing your new Speedtech Performance torque arm rear suspension. Read through all instructions thoroughly before beginning and take all safety precautions required to do the job carefully and correctly. If you have uncertainty, seek the assistance of a highly qualified workshop.

Installing this product will require the removal of your old suspension, axle, and fuel tank. You will need a quality torque wrench, anti-seize lubricant, red and blue Loctite, and suspension grease. Use only approved and appropriately rated jack and jack stands.

To install the torque arm system onto body, some modifications will be required. The rear shock mount will need to be removed and several brackets and braces will be permanently added and welded into the unibody. In some cases, tunnel work also has to take place to allow driveline clearance.

While Speedtech's suspension systems are safer and more comfortable compared to factory suspension on the street, it is also designed to meet the needs of those intending to participate in off highway road races and autocross competitions. To achieve maximum benefit from our system, you should anticipate adjusting and tuning of the suspension to achieve optimum performance specific to the vehicle, driver, and type of racing. Some of this, such as tuning sway bars and shock settings, can be done track side through making adjustments and seeing or feeling how the car reacts to these changes. Speedtech recommends that a tire probe pyrometer and an air pressure gauge be in your track side kit.

Other adjustments, such as tuning a bump steer and caster may require specialized equipment and professional help. Speedtech's technical department can share insight on making these adjustments to help get you started.

WARNING: Once assembled you will need a professional wheel alignment performed. Driving a vehicle without a proper alignment can be dangerous. Towing is recommended to transport the car prior to the alignment being performed. For basic rough alignment settings refer to the ExtReme IFS installation guide. After welding, finish the underside as desired. In some cases, tunnel work also has to take place to allow driveline clearance.

If you have opted to use your current rear axle housing rather than ordering a new Speedtech prepped axle housing, you will need to remove the existing leaf spring axle pad mounts and have the Torque Arm rear axle brackets welded on. A guide for the bracket location is included later in these instructions. We highly recommend you use a professional shop familiar with welding brackets onto rear axles, one who has an axle jig and/or the ability to straighten the axle tubes should they warp during welding.

IMPORTANT: Before you finish welding this guide will take you through a complete mockup of the rear suspension.

NOTE: This kit requires welding to install. The upper rear cross member, lower arm mounted support brackets, torque arm cross member, and sub frame connector are permanently welded to the unibody. We highly recommend after trimming and fitment of the various components and before welding that you protect all surfaces with primer.

1.2 OVERVIEW

These instructions outline the ExtReme torque arm rear suspension assembly. Photos in the instruction process may have subframe component(s) in them.

Take necessary precautions when welding the inside of your vehicle and remove any close-by flammable materials including the seats, carpet, inner heater box, and insulation padding before performing this instruction. Be sure to wear proper protective gear when using power tools and keep sparks away from glass and other interior components when grinding and welding.

1.3 TOOLS

Installation of the Speedtech Performance ExtReme torque arm rear suspension can be done on the floor with a cut off wheel, basic welder, and simple hand tools.

Additional things to have before you start:

- Welder
- Drill
- Grinder
- Floor Stands
- Floor Jack
- Weld Through Primer

1.4 OTHER CONSIDERATIONS

The Speedtech Performance Torque Arm Rear Suspension design may cause some of the current components to no longer be valid on the chassis, these may include:

- Exhaust
- Brake Lines
- Drive shaft (if changing front sub frame, engine and/or transmission)
- Wheels and lug nuts. All our suspension systems where the wheel bearing is replaced will use a double roller sealed bearing with stud spacing of 5 on 4.75 and stud threads are 12X1.5mm

2.0 CHECK IN PARTS AND HARDWARE

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2.1 CHECKING IN THE ORDER

Check in your order as soon as possible. To check in the order, Speedtech has provided tables which can be used as check lists as displayed in figure 2. All bolts and nuts are NF unless otherwise noted. Hardware comes in several boxes. If you discover anything missing form your order, call your authorized dealer as soon as possible.

2.2 CHECK IN TABLES

TORQUE ARM

X	#	Description	Size
	1	Torque Arm	Welded Arm
	1	Torque Arm Bow Tie	1/4” Plate
	1	Torque Arm Pin Bushing	Delrin (Plastic)
	1	Pin Bushing Bolt	3/8” x 3/4”
	1	Pin Bushing USS Plate Washer	3/8”
	1	Pin Bushing Lock Washer	3/8”
	2	Axle Housing Collar Bushing	Delrin (Plastic)
	1	Axle Housing Collar Bolt Sleeve	9/16” ID
	1	Axle Housing Bolt	9/16” x 3-1/4”
	1	Axle Housing Stover Lock Nut	9/16”
	2	Axle Housing Washer	9/16”

SHOCKS

	2	Upper Shock Hex Bolts	1/2” x 2-1/2”
	2	Upper Shock Mount Nylocks	1/2”
	2	Upper Shock Mount Washers	1/2”
	2	Lower Shock Mount Standoff	Aluminum
	2	Lower Shock Short Bolts	5/8” x 1”
	2	Lower Shock Hex Bolts	5/8” x 3-1/2”
	2	Lower Shock Nylocks	5/8”
	4	Lower Shock Mount Washers	5/8”

PANHARD BAR

	1	Pan Hard Bar	39” Long
	1	Left Hand Rod End	5/8” LHT
	1	Right Hand Rod End	5/8” RHT
	1	Left Hand Jam Nut	5/8” LHT
	1	Right Hand Jam Nut	5/8” RHT
	2	Panhard Bar Mount Bolts	1/2” x 2-1/2”
	2	Panhard Bar Mount Nylocks Nuts	1/2”
	4	Panhard Bar Mount Washers	1/2”

LOWER TRAILING ARMS

	2	Trailing Arms (Assembled)	19” Eye to Eye
	2	Axle Mounting Bolts	1/2” x 3-1/2”
	2	Axle Mounting Nylocks Nuts	1/2”
	2	Axle Mounting Washers	1/2”
	2	Spring Pocket Mounting Bolts	1/2” x 4-1/2”
	2	Spring Pocket Mounting Nylocks Nuts	1/2”
	2	Spring Pocket Mounting Washers	1/2”
	2	Spring Pocket Mounting Spacer	Plastic Puck

TORQUE ARM FRONT CROSSMEMBER

	1	Crossmember Box Frame	Welded Arm
	2	Solid Body Mounts	Aluminum Puck
	2	Solid Body Mount Cups	Aluminum Cups
	2	Body Mount Bolts	5/8” x 3-1/2”
	2	Body Mount Washers (Large)	5/8”
	2	Body Mount Lock Washers	5/8”

TORQUE ARM REAR CROSSMEMBER

	1	Crossmember Frame	Welded
	4	Through Floor Sandwich Bolts Long	3/8” x 2”
	4	Through Floor Sandwich Bolts Short	3/8” x 1-1/4”
	16	Sandwich Plate Washers	3/8”
	8	Sandwich Plate Nylocks	3/8”

SPRING POCKET ADDITIONAL BOLTS

	10	Spring Pocket Bolts	3/8” x 1-1/4” NC
	14	Spring Pocket Washers	3/8”
	4	Spring Pocket Nylocks	3/8” NC

OPTIONAL CONVERTIBLE FRONT CROSSMEMBER

	4	Crossmember Bridge Bolts	3/8” x 1-1/4” NC
	4	Crossmember Bridge Lage Washers	3/8”

One of the following kits will be included.

FORD 9in PINION MOUNT

	1	Pinion Mount	Billet
	5	Pinion Mount Bolts	3/8” x 2-1/4”
	5	Pinion Mount Washers	3/8”
	2	Torque Arm Bolts	1/2” x 2
	2	Torque Arm Lock Washers	1/2”
	2	Torque Arm Washers	1/2”

GM 10 OR 12 BOLT MOUNT

	1	10 Bolt or 12 Bolt Ring	Welded
	1	Pinion Snout Clamp Lower	Billet
	1	Pinion Snout Clamp Upper	Billet
	2	Torque Arm Bolts	1/2” x 2
	2	Torque Arm Lock Washers	1/2”
	2	Torque Arm Washers	1/2”
	2	Clamp Bolts	1/2” x 2” SHCS

Figure 2: Check list that includes all the individual parts ordered

3.0 GETTING STARTED

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3.1 LEVELING AND PREP

- Unpack all the components and organize them on a table with their accompanying hardware. Use the check list above.
- Level the car above a smooth work surface.
- Disassemble the rear of the car. Removing exhaust, driveshaft, axle, suspension, and fuel tank and all fluid lines.
- Prepare the inside of the car and the trunk area for welding on the bottom side for the car as well as installation of the sandwich plates and spring pockets.
- Dry fit the rear crossmember side reinforcement plates, lining the hole up with the bump stop mount, on the inside and bottom of the frame rail.
- Disconnect the battery.

4.0 INSTALLATION

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4.1 UPPER SHOCK MOUNTS

Place the upper shock bracket into the factory spring pocket. There is a cup that the center of the bracket sits over. Drill the appropriate holes and bolt the bracket in.
NOTE: The top side of the bracket faces the front of the vehicle, as presented in figure 3.

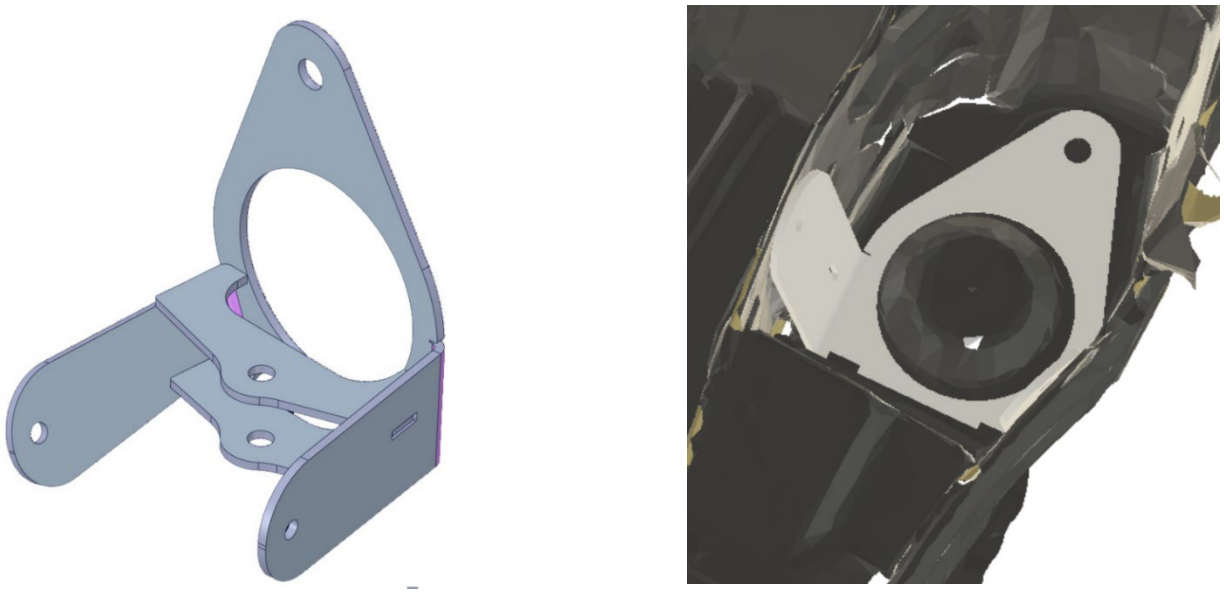

Figure 3: Two images depicting the upper shock bracket

4.2 CROSS MEMBER

Check fitment of the cross member and its position in the factory bracing. Bolt the driver side into place first. The crossmember will be level to the ground.

- **NOTE:** The passenger side of the factory bracket may need to be trimmed to achieve this.

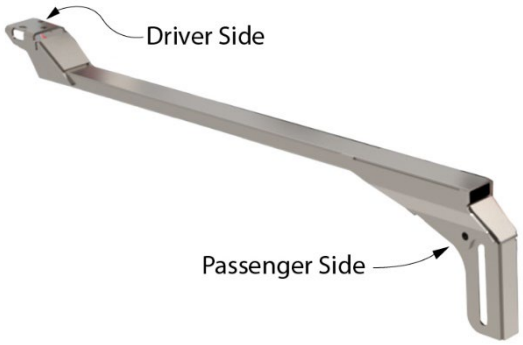

Figure 4: Driver and passenger side of crossmember

When you are happy with the position of the cross member in the chassis, bolt the passenger side to the factory plates.

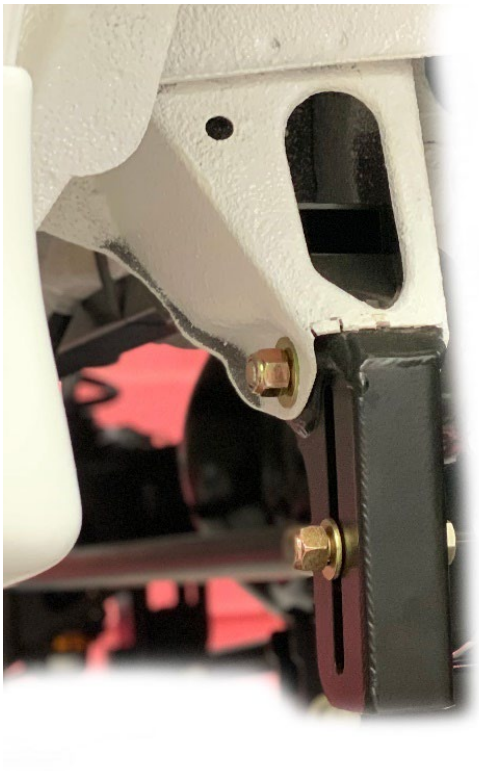

Figure 5: Bolting the passenger side of the crossmember to the factory plates

4.3 REAR AXLE

See Axle Installation Instructions.

4.4 MANUFACTURE INSTRUCTIONS

Follow all 3rd party instruction on assembling the 3rd member (Ford), gearing, axle, pinion, and seals. Use the brake manufactures instructions to Install the brake components and center caliper over the rotor.

4.5 PINION MOUNT

NOTE: The pinion mount is a straight bolt-on over the existing pinion support. This bracket is designed to work with the original Ford pinion mount clocking position. Some aftermarket 9" centers have non-Ford clocking. Non-Ford pinion mount clocking will not work correctly. Please verify that your center is correct. Speedtech has a pinion support specifically for the Moser 9" center section. If you are not sure, please contact your axle manufacturer before beginning the installation.

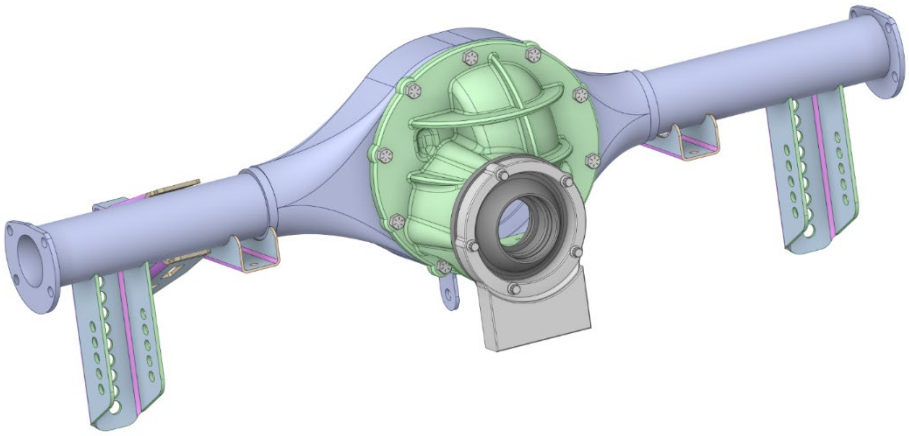

Figure 6: Pinion mount

4.6 LOWER SHOCK MOUNT

NOTE: The lower shock mount location is adjustable to accommodate many different ride heights, wheel sizes, and shock options. Measure and set the standoff location unique to your build on final assembly.

- Locate the billet shock mount standoffs, (2) 5/8" short bolts and washers.
- Bolt the standoffs onto the back side of the shock extenders. Use the 5/8" shoulder bolt to keep the second hole aligned.
- The standoffs can be oriented either way to match your shock length and desired ride height. Ride height can be checked during the mock up.

A good starting point for the Camaro is have the shoulder bolt come through the bottom hole.

- The shoulder bolt will be installed when the shock is installed.
- **IMPORTANT:**

  On final assembly, use red Loctite and torque to 120 ft.lb.

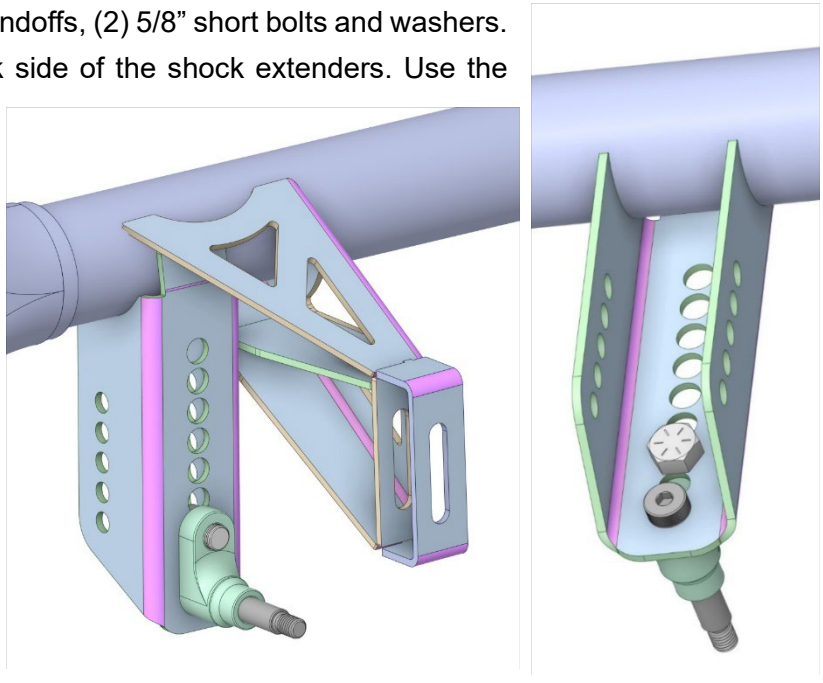

Figure 7: Lower shock mount

5.0 TRAILING ARMS AND FRONT SPRING POCKETS

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5.1 TRAILING ARMS

Prepare the lower trailing arms. Set the arm's length by screwing in or out the two halves to 19" collar center to center.

When installing the trailing arms, ensure the grease zerk tips are oriented down.

Figure 8: Trailing arm

NOTE: The bolt sleeves and bushings will already be installed in the trailing arms when you receive them. Locate the ½"x 4.5" bolts, ½" nylock nuts, and the black Delrin spacer. Install the lower trailing arms into the factory trailing arm pockets with the small sticker indicating D (driver) or P (passenger) at the front. Do not completely tighten the bolts at this time as they use nylock lock nuts and you will be removing them again later in the installation. The spacers should be installed towards the outside of the car and grease fittings should point downward. Later you will torque the 1/2" bolt to 90 lbs.

NOTE: (See step 6.3) When installing the trailing arm to the axle there are multiple mounting locations. You will want these arms to sit parallel to the ground at ride height and may need adjusted during final alignment of the car.

6.0 TORQUE ARM INSTALLATION

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NOTE: Support the torque arm after installed to the axle, as front crossmember is not yet installed. Final installation will take place after the front crossmember installation.

- Install the torque arm Delrin bushing on the front pin.
  - Slide on the bushing onto the pin.
  - Apply blue Loctite on the 3/8 bolt.
  - Bolt into the front pin ushing a washer, and the lock washer.
  - Torque to 35 ft.lb.

- Assemble the rear pivot collar.
  - Press in the (2) bushings and the 9/16” x 2” sleeve into the rear mount.
    IMPORTANT: Do not insert bolt yet.

NOTE: Speedtech offers a shim kit that is sent for easier centering on the torque arm.

Figure 9: Torque arm installation tools

- Attach the torque arm to the axle housing.
  - Apply anti-seize to the 9/16” x 3-1/4”.
  - Slide in the rear collar into the lower tabs connected to the prepared axle housing. This can only fit one way having the “Speedtech” face down away from the housing.
  - Bolt on using the prepared 9/16” x 3-1/4” bolt, 2 washers, and 9/16 stover lock nut.
  - Torque to 130 ft.lb (after front pinion mount in place).

- Attach the torque arm to the pinion mount.
  - Preinstall the (2) 1/2” bolts and washers into the “dog bone” plate.
  - Rotate the torque arm until it is in contact with the billet pinion mount.
  - Loosely bolt the “dog bone” assembly through the torque arm into the pinion mount.

NOTE: The pinion angle is adjustable by adding shim spacers in between the torque arm and the pinion mount. This final angle adjustment should be set after the total rear suspension is installed and set to ride height. Refer to the pinion angle section at the end of these instructions.

IMPORTANT: Do not torque before front crossmember install.

NOTE: For GM axle projects, with the torque arm on, the pinion clamp should be squared up to the torque arm and finally fitted to the snout. Use red Loctite and torque bolts to 40 ft.lb. Then, re-torque after first 500 miles.

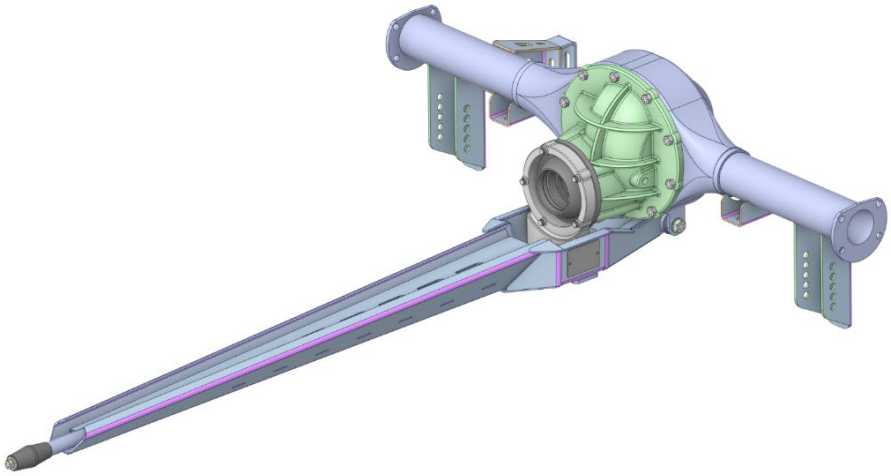

Figure 10: Pinion angle

7.0 COILOVER INSTALLATION

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NOTE: General guidance on shock installation is superseded by information provided by the shock manufacture.

7.1 UPPER SHOCK MOUNT

Hang the shock from the upper shock mount bracket. It is not necessary to torque the fasteners during mockup but you should at least use the nut to ensure the bolt cannot fall out.

7.2 LOWER SHOCK MOUNT

Lift the assembled axle into position, securing it on jack stands at the approximate height.
Bolt the shock to the installed lower standoffs using the (2) 5/8” x 3-1/2” bolts and nylocks.
Slide in the bolt from the bracket on the rear end into the shock standoff and into the lower shock mount. Hold everything in place using the bolt and nylock nut. Repeat on the other side.

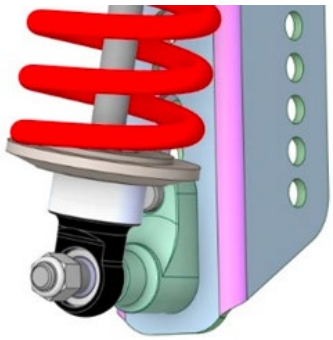

Figure 11: Lower shock mount

7.3 TRAILING ARMS

Bolt the rear of the trailing arms to the axle lower bracket. Make any minor adjustments to the spring pockets so there is not any preload in the lower arm and so that it can easily swing in and out of the bracket. Loosely bolt in place. On final assembly, use anti-seize and torque to 90 ft.lb.

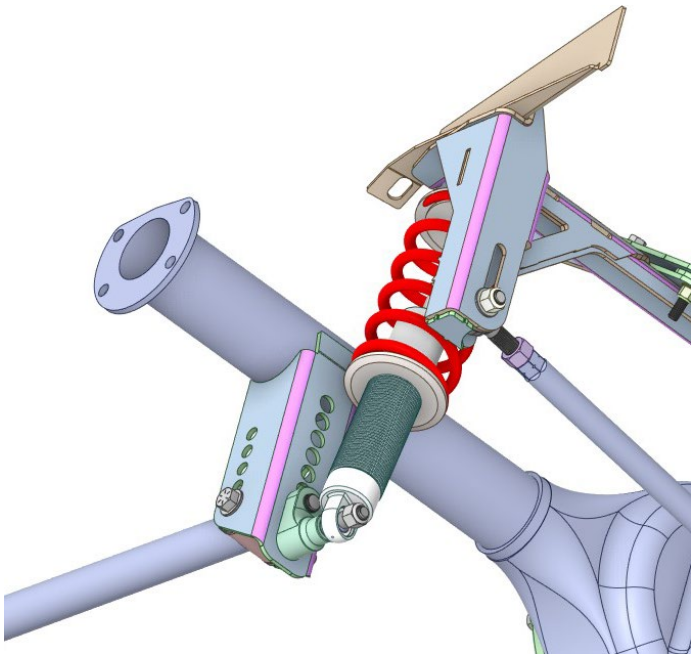

Figure 12: Trailing arms

TIP: It may be helpful to use a ratchet strap anchored at the rear of the chassis to hold the rear axle from rotating forward as you lower the jack.

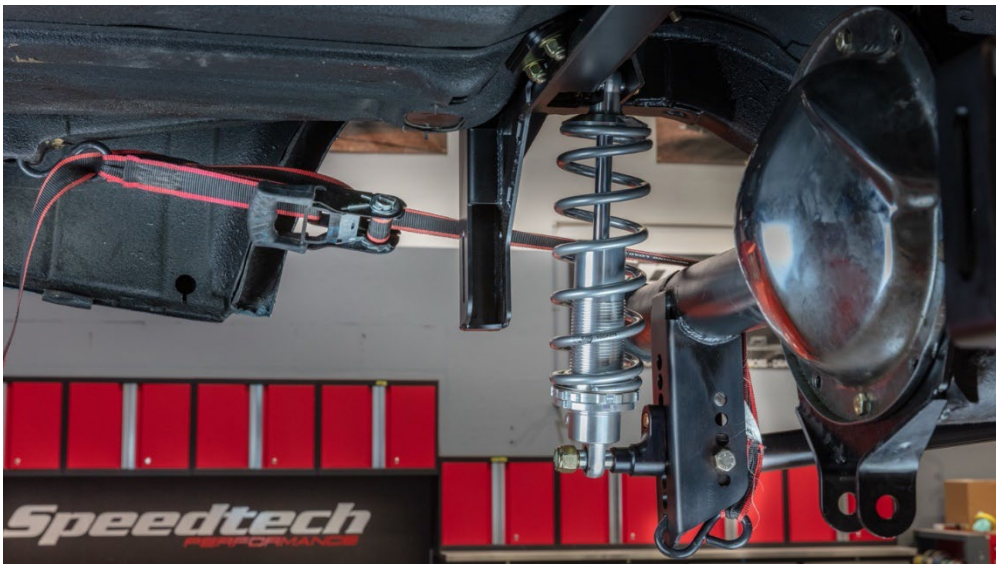

Figure 13: Use of a ratchet strap

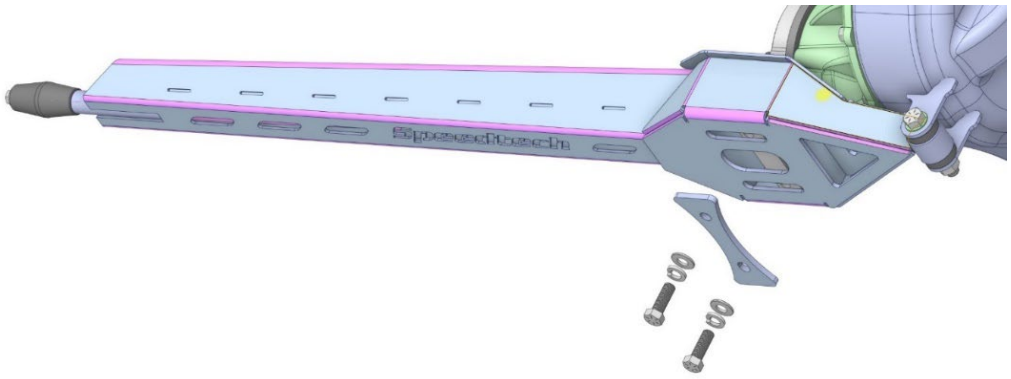

Figure 14: Screws in the correct order

8.0 FRONT CROSSMEMBER

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Pre-assemble the three piece front crossmember.

Figure 15: Three piece front crossmember

8.1 MOCK UP

From the center of the factory front leaf spring pocket, measure forward 24”. With the torque arm supported and in place, slide the pre-assembled crossmember in place to mark where the floor needs to be cut.

NOTE: The side pieces of the crossmember are designed to fit inside the seat hat channel.

8.2 FLOOR CUTTING

Remove the mocked up crossmember and cut the floor where previously marked.

8.3 WELDING

- Paint the side pieces with weld-through primer.
- Place the assembled crossmember back on the torque arm and put back into place.
- Weld the side pieces into place.

9.0 PANHARD BAR

Assemble the Panhard bar.

- Apply anti-seize onto the rod end threads.
- Thread the jam nuts onto the rod ends.
- Install the rod ends onto the Panhard bar. Double-check that the rod ends have equal engagement into the bar.

Install the Panhard bar onto the car using (2) 1/2” x 2-1/2” bolts, nylocks, and (4) washers.

Bolt the Panhard bar into the slot on the frame and the slot on the prepared axle.
The rod ends fit inside the two slots. The bar should be level at ride height. Use the washers on the outside of both slots.

On final assembly, torque to 90 ft.lb.

Center the axle inside the frame by taking measurements between the rotor and the frame. Spin the Panhard bar, lengthening or shortening the bar assembly as needed to center the axle. Tighten the jam nuts.

Figure 16: Panhard bar

NOTE: The axle centering will have to be measured again during the final alignment of the car. The finished weight needs to be sitting on the frame for an accurate alignment. Details are described under the finalization section.

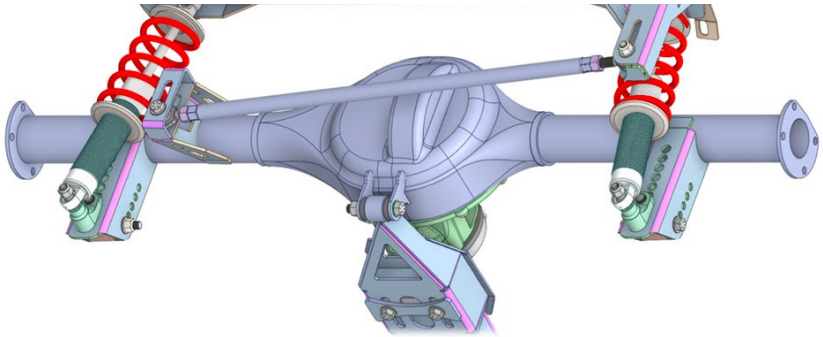

Figure 17: Finished Assembly

9.1 FINAL CHECKS

NOTE: Now that all the components are mocked up into the car, general measurements can be made to ensure alignments and wheel placement is satisfactory. Make any minor adjustments to the attachment components as needed. Final alignment will be done after the components are welded and the weight of the car is on the system.

While the system is mocked up, you can check for:

- Tighten all loose bolts snuggly so there is no slop in the between the components.
- Set up your lower shock mounting position to target shock travel being centered at ride height.
- Set up the trailing arms to be level at ride height.
- Set up the Panhard to be level at ride height.
- Measure and check fitment of all components.
- Check that there is proper clearance for all the suspension components.
- Make sure they will not hit each other throughout the motion of the system.
- Fit the wheels on the axle and check the location of the wheel in the wheel well.
- Make sure it is centered and even from front to back.
- Measure that the rear axle is square with the front axle.
- Check that there is no side load on the trailing arms.
    - Unbolt them one side at a time and see if they easily swing out and back into their locations.
- Check the heights of all the key areas that they are all level side to side.
- If you discover any issues that require moving the upper main cross member to address you will have to cut your tack welds, reposition it, and mockup the system again.

Without disturbing the position of the front spring pockets, torque the three factory bolts for the front spring pockets.

10.0 FINAL STEPS

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10.1 FINALIZATION

Finish/refinish the welds and any bare metal to your specification to mitigate corrosion. Speedtech recommends painting or using an insulating bed-liner.

Be sure that all measurements are correct and double-check that all components have proper clearance throughout your suspension's travel range. Install chassis into the vehicle. Torque all bolts to speck. Tighten all loose suspension bolts and double-check all bolts to ensure they are all tight. Follow the torque checklist found in the instructions.) It is recommended you fill all grease fittings at this time. Speedtech suggests using Permatex Ultra Slick Synthetic Grease, but any high-quality chassis grease will do. For your Sweet power rack and pinion we recommend using Sweet or Jones brand full synthetic power steering fluid for best performance and to avoid overheating standard type fluids during performance driving situations.

This concludes the torque arm suspension installation.

11.0 FINAL ASSEMBLY

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Refer to the TORQUE ARM INSTRUCTION GUIDE.

12.0 CONGRATULATIONS

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Congratulations on completing your project! We know you will get many years of enjoyment from your project. Please join the group, Team Speedtech, on Facebook. Team Speedtech is a community of customers, dealers, and factory employers that have a passion for pro touring muscle cars and are using Speedtech Performance products. You can ask questions and get advice from the group members and share your experience. Everyone enjoys seeing the videos and pictures during the progress of your project and Speedtech encourages you to share them!

Thank you for choosing Speedtech Performance and entrusting us with your torque arm needs for your custom muscle cars.

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