Instruction Guide

Pro Touring Front Subframe
67-69 F-Body / 68-74 X-Body

Speedtech PERFORMANCE

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

435.628.4300 SPEEDTECHPERFORMANCE.COM

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Figure 1: 1968 Camaro, with Speedtech Performance pro touring front subframe

Congratulations on the purchase of your new Speedtech Performance pro touring front subframe (PTFSF). 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 PTFSF can be done in a home garage with hand tools.

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 pro touring front subframe. 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.

The following instructions are intended for professional installers and are guidelines only. Speedtech Performance assumes no responsibility for the installation of any of its products installed by others. All products are intended to be installed by qualified professionals.

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.

1.2 OVERVIEW

These instructions outline the pro touring front subframe assembly process followed by installation into the car. The system can be installed independently, or in connection with Speedtech Performance torque arm rear suspension.

NOTE: Photos in the instruction process may vary slightly from your exact operation.

1.3 TORQUE ARM REAR SUSPENSION TECHNICAL INFORMATION

Wheel Clearance	9” wheel with a 275 tire and full steering
Coilovers	QA1 OAL 12.60” with 3.2” Stroke, 8” Spring
Ride Adjustment	2”
Spring Rate	450lb 2.5” I.D.
Roll Center	6.5-9” Off Ground

1.4 PRO TOURING FRONT SUBFRAME FEATURES

The features are as follows:

- Improved geometry including bump steer
- Increased shock length providing more suspension travel
- Improved motion ratio for faster shock response and more precise control and better comfort
- Fully boxed, welded construction with tabbed through frame crossmembers for added torsion rigidity
- Purpose built upper and lower tubular control arms engineered with geometry corrections built in
- Fully adjustable transmission crossmember accepts all Eng. & Trans. combinations
- Sway bar exclusively designed for the Pro Touring Subframe with high clearance
- Accommodated up to 9” rim and 275 series tire with no rubbing or fender modification
- Lowered ride heights to meet your styling needs can be achieved while maintaining improved geometry

1.5 ADDITIONAL CONSIDERATIONS

The Speedtech Performance pro touring front subframe design may cause some of the following current components to no longer be valid on the car:

- Exhaust
- Brake Lines
- Drive shaft when changing that engine or transmission at the same time
- Wheels and lug nuts (if changing spindles). 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

1.6 TOOLS

Installation of the Speedtech Performance Pro Touring Front Subframe can be done on the floor with simple hand tools and no special tools are required.

Additional things to have before you start:

- Locktite Red
- Antiseize
- Floor jack & stands
- Torque Wrench

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 from your order, call your authorized dealer as soon as possible.

2.2 CHECK IN TABLES

Pro Touring Front Subframe

X	#	Description	Size
	1	Pro Touring Subframe	Welded Unit
	1	Pair of Engine Stands	Welded Units
	1	Transmission Crossmember	2 Sides, 1 Center

Pro Touring Front Subframe Hardware Kit

	2	Shoulder Cap Screw Allen Head	1/2” x 1 3/4”
	2	Nylock	3/8”
	20	Flat Washers	3/8”
	4	Hex Screw	3/8 x 1
	4	Hex Screw	7/16” x 2 1/4”
	4	NF Nylock	7/16”
	14	Flat Washer	7/16”
	6	Cap Screw	7/16” x 3/4”

Transmission Crossmember Hardware Kit

	8	Hex Screw	3/8” x 1 1/4”
	8	Nylock	3/8”
	16	Flat Washer	3/8”

Control Arm Hardware

	2	Cap Screw Hex	GR8 NF 1/2 x 3 1/2
	2	Cap Screw Hex GR8 NF 1/2 x 4 1/2	GR8 NF 1/2 x 4 1/2
	4	Lock Nut Stover NF 1/2	NF 1/2
	2	Regular Nut Hex GR8 NC 3/8	GR8 NC 3/8
	2	Cap Screw Hex GR8 NC 3/8 x 1 1/4	GR8 NC 3/8 x 1 1/4
	2	Regular Nut Hex GR8 NF 3/8	GR8 NF 3/8
	2	Cap Screw Hex GR8 NF 3/8 x 2 1/2	GR8 NF 3/8 x 2 1/2
	4	End Link bushing	
	2	Cap Screw Hex GR8 NF 3/8 x 2	GR8 NF 3/8
	2	3/8 NF Nylock Nut GR 8	Nut GR 8
	4	End Link Washer	
	2	Regular Nut Hex GR8 NF 3/8	GR8 NF 3/8

Figure 2: Check in tables with amounts, descriptions, and sizes

3.0 GETTING STARTED

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3.1 PREPARE

In order to prepare, complete the following:

- Unpack all the components and organize them on a table with their accompanying hardware by using the check list above.
- Level the car above a smooth work surface.
- Prepare for removal of the old subframe, engine, and transmission.
- If the transmission is being updated at the same time as the Speedtech Performance pro touring front subframe is being installed, you may be required to use 11510 or 10510 Tunnel kit.
- Speedtech Performance offers a smooth fire wall kit, 11511, this can only be installed with the engine and transmission removed, so now is a good time to add this.

4.0 ASSEMBLE THE PRO TOURING FRONT SUBFRAME

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4.1 SUPPORT THE SUBFRAME

Support the subframe with jack stands at each corner. Check that it is sturdy and level.

4.2 INSTALL THE ENGINE STANDS AND TRANSMISSION CROSSMEMBER

Install the supplied engine stands onto the frame with the 7/16 x 3/4 bolts. Do not fully tighten at this time to aide engine fitment later.

NOTE: Small block and big block engine stands are equal in height and can be installed on either side. LS Series engines use two different frame stands; the taller stand must be installed on the driver side. This will move the engine over ¾" to clear the oil pan rail. You must also use an LS motor mount adapter such as the ATS 070001.

Install the transmission crossmember. Offset top holes in center box are for LS applications. Small block and big block engines use centered holes. Use side holes as appropriate for your specific engine and transmission application. Do not fully tighten the bolts at this time to allow adjustment later when installing the engine and transmission.

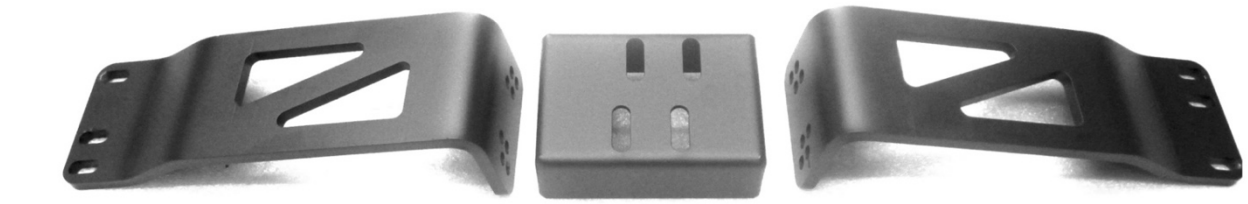
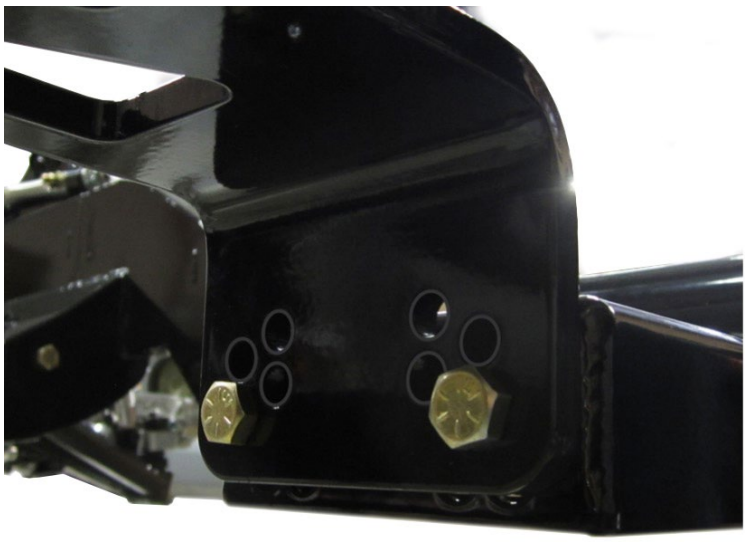


Figure 3: Three images depicting the engine stands and transmission crossmember



4.3 INSTALL THE LOWER CONTROL ARMS AND STEERING RACK

Install the lower control arms by sliding the bushing end up into the frame pockets, the straight arm tube should be located towards the rear.

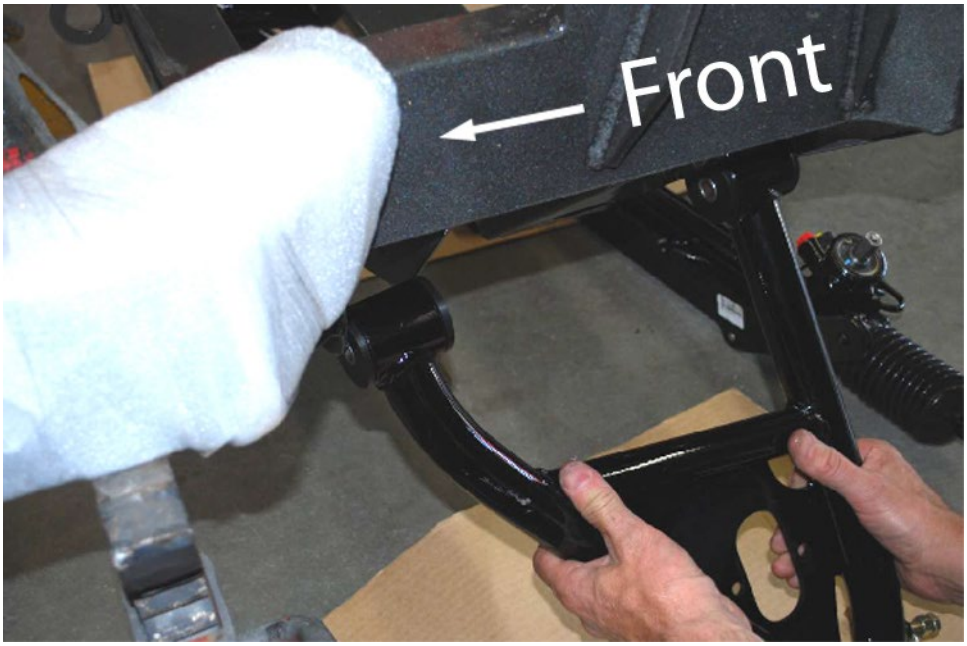


Figure 4: Installing the lower control arms

Install only the front ½" x 3 ½" mounting bolt at this time. Apply anti-seize lubricant to the shank of the bolts. The rear bolt will be installed later along with the rack and pinion.

Figure 5: Installing mounting bolt

Next, install the steering rack. You will not be using the long lower control arm (LCA) mounting bolts that come with the rack hardware. Instead, use the Speedtech grade 8, 4 1/2” long mounting bolts supplied with the control arms.

You must remove the rack from the mounting bracket to get the driver side bolt into its position in the bracket. Apply anti-seize lubricant to the shank of the bolts and put them in the bracket, then reinstall bracket onto rack body.

Figure 6: Two mounting bolts entering the subframe

For proper alignment, refer to the installation instructions included with the rack and pinion. The two mounting bolts must go into the subframe at the same time, refer to figure 6, and the bracket and spacers must end up flush against the frame. It may be helpful to have a second person assist in performing this step.

Figure 7: Where the lock nuts get installed

The lock nuts that are provided with the lower control arms must be installed through the hole in the bottom of the subframe. Then you may torque all four lower control arm nuts to 70 ft/lbs.

It is recommended you grease the LCA bushings via the grease fittings at this time. Permatex Ultra Slick Synthetic Grease is suggested but any high-quality chassis grease will do.

Figure 8: Location of where the sway bars will be bolted

High clearance Speedtech Performance sway bars will bolt to the front vertically orientated mount pads as seen above. The sway bar end links will be installed later in section 9.

5.0 COILOVER SHOCKS

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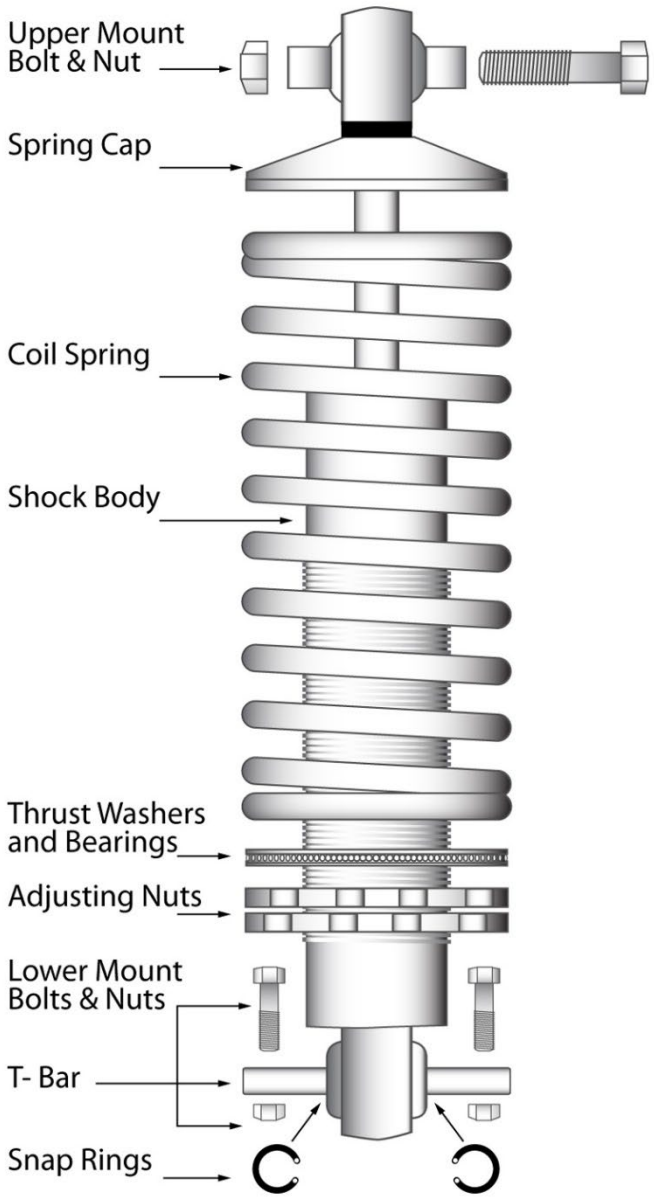
5.1 OVERVIEW

IMPORTANT: Your shocks come from the manufacture with assembly instructions. The manufacture supplied information supersedes the shock information supplied by Speedtech Performance.

Figure 9: Coilover shock diagram



5.2 ASSEMBLE

To assemble the coilover shocks, start by installing the adjusting threaded spring perch and jam nut/locking collar to the bottom of the shock.

Install the adjusting thrust bearings and washers on top of the spring perch prior to the spring.

Install spring over the shock onto the bearing and install the upper spring perch.

NOTE: The spring may need to be compressed in order to get the cap on correctly.

Install the supplied T-bar into the bottom bushing of the shock and install the snap rings.

5.3 INSTALL SHOCKS

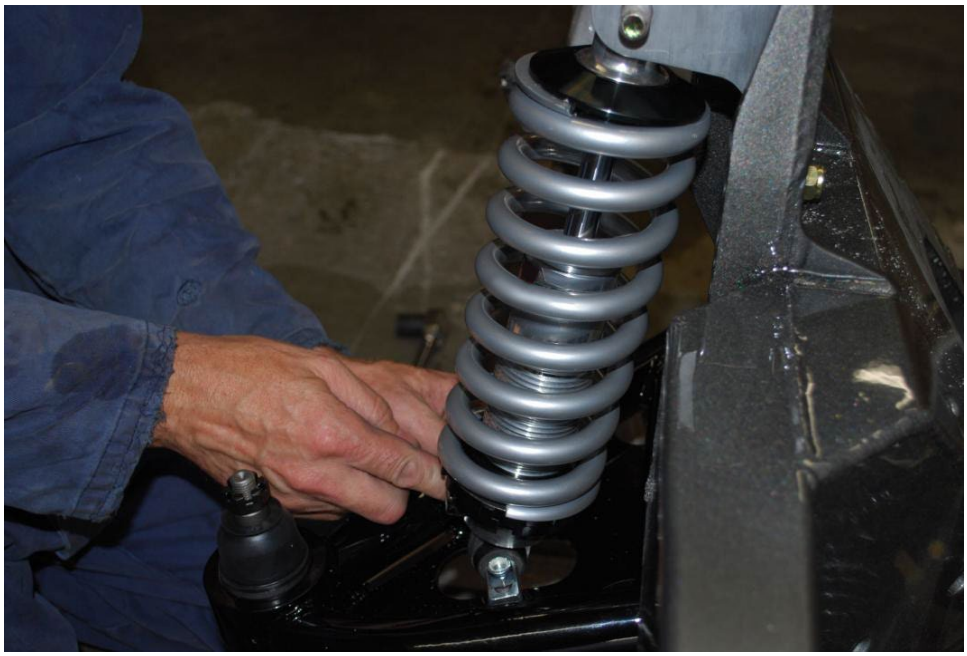


Figure 10: Installing shocks

Install the lower side of the shock into the lower control arm. You have the option to install the T bar on either the top or the bottom of the mounting pad.

NOTE: Installing it on the bottom will lower the car approximately 1 additional inch.

Install the top shock eyelet into the frame bracket. Tighten bolts to 20 ft/lbs.

6.0 INSTALL UPPER CONTROL ARMS

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6.1 INSTALL UPPER CONTROL ARMS

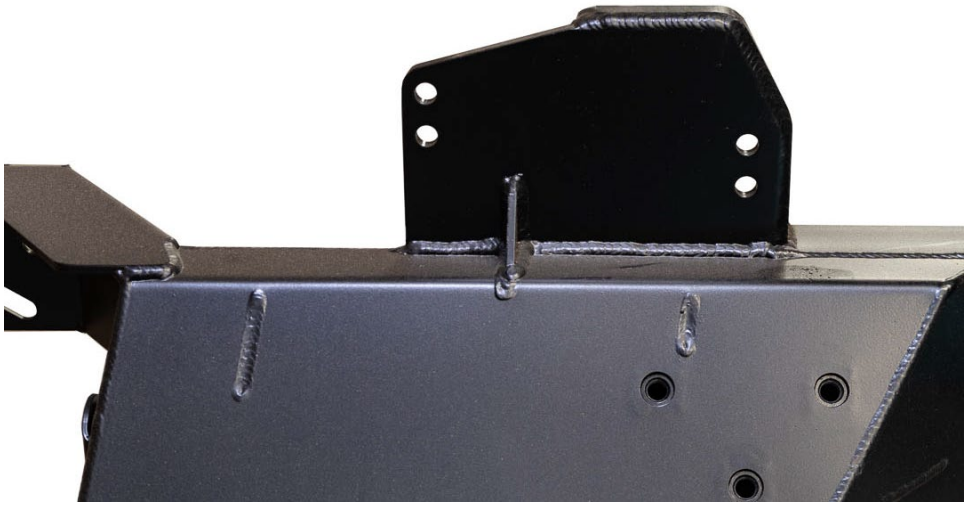

Figure 11: Installing the upper control arms

NOTE: Use the upper holes with the Speedtech Performance forged spindle and the lower holes with an OE style spindle.

Install the Upper Control Arm (UCA) bolts into the mounting holes by placing the arm's stainless cross shaft mounts on the inside of the control arm mount bracket. Once this is complete the short straight tube on the arm should be towards the rear.

Figure 12: UCA bolts

7.0 INSTALL SPINDLE

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7.1 SPINDLE

Factory spindles can be reinstalled. For optimum performance we recommend using our optional Speedtech Performance forged spindles, part number 30001.

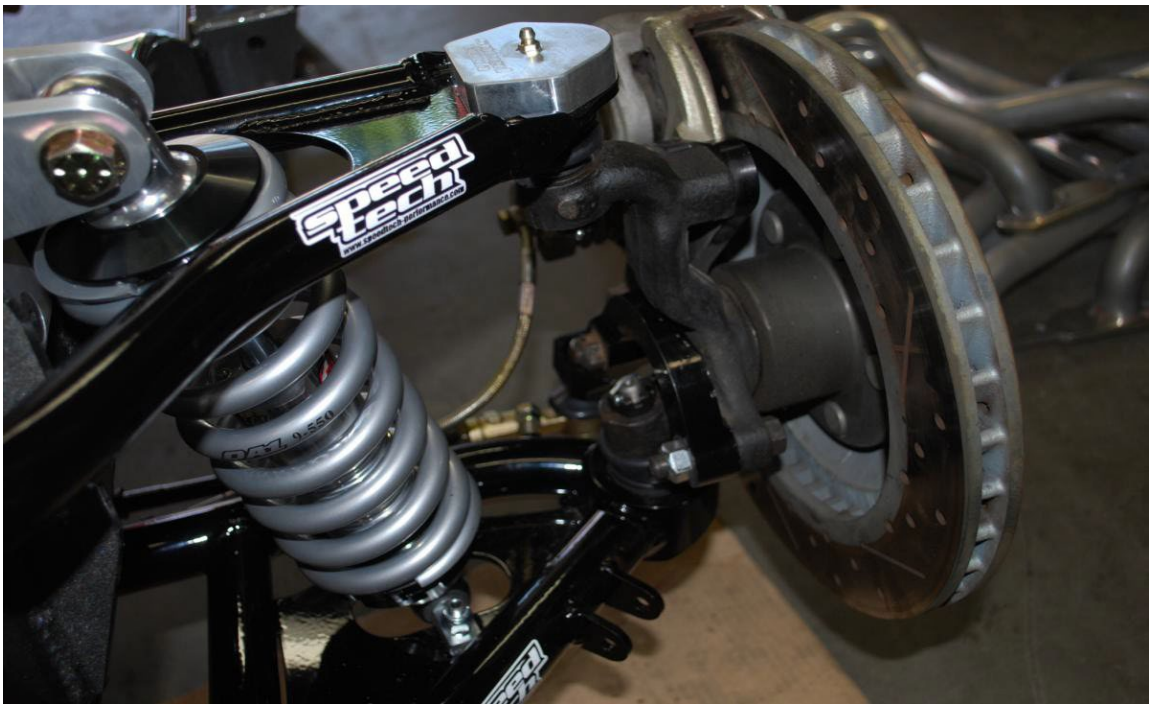

Figure 13: Spindle

Tighten the lower ball joint to 60 ft/lbs and install the cotter pin. Tighten the upper ball joint to 40 ft/lbs. and install the cotter pin.

8.0 STEERING ARMS

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8.1 INSTALLATION

NOTE: If you are using the Speedtech Performance's forged spindles on your installation, you must clearance the new steering arms to clear the Speedtech Performance spindle. Clear both arms as presented in figure 14.

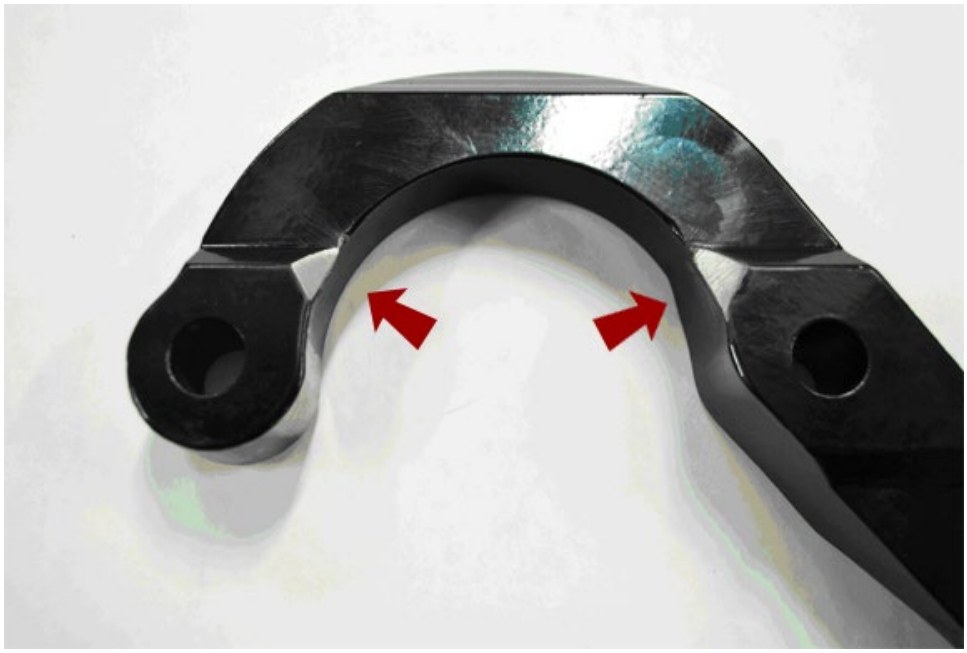

Figure 14: Clearance of the steering arm

WARNING: The steering arm must sit flush against the spindle with no interference.

Install the new steering arms using either your original hardware or new grade 8 hardware.

Next, install the outer tie rod ends into the steering arms, torque to rack and pinion manufacturer specs.

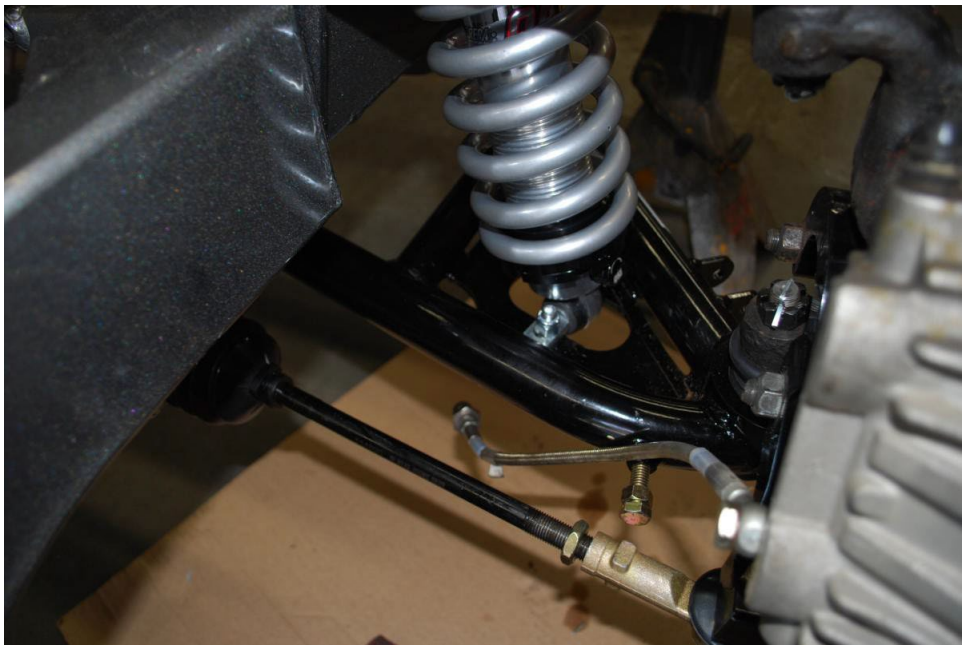

Figure 15: Finished installation of spindle and steering arm

9.0 SWAYBAR

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9.1 SPEEDTECH SWAY BAR INSTALL

Installation of the sway bar is similar to installing any standard sway bar. The polyurethane pivot bushings/mounting hardware are included in the sway bar package. The end link hardware is included with the high clearance lower control arms. Mount the bar to the subframe first, bolting the pivot bushing brackets to the vertical pads that are welded to the front crossmember. Then install the end links with the supplied 3/8 hardware, inserting the bolt through the washer, poly bushing, sway bar, poly bushing, and washer. Now add the 3/8 jam nut, then thread it into the rod end.

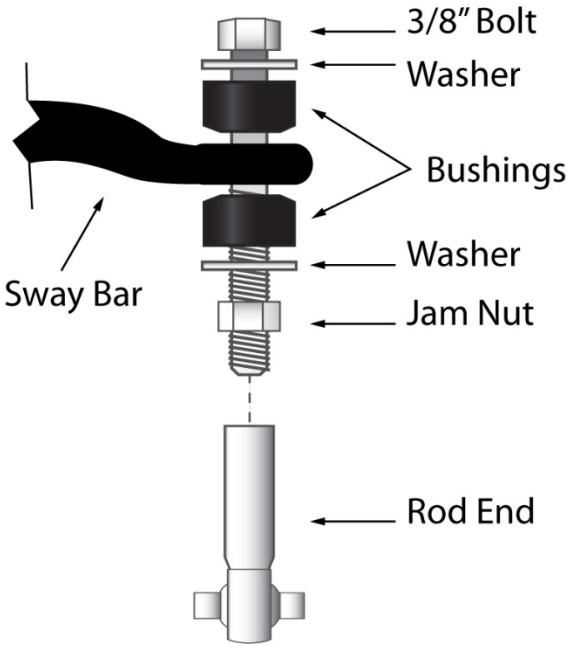

Figure 16: Sway bar install

10.0 INSTALLING THE PRO TOURING FRONT SUBFRAME

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10.1 REMOVE THE OLD SUBFRAME

If you haven't done so already, disconnect and remove the battery before any removal of the old subframe begins. Next, mark all hoses, lines, and cables that pertain to engine, transmission, and subframe removal and disconnect and/or remove them.

Lastly, lower the subframe, engine, and transmission assemble from the body.

10.2 INSTALL THE PRO TOURING SUBFRAME

Once you have removed your original subframe there are a couple of ways to proceed. If you are using a two-post hoist, Speedtech recommends you install the motor and transmission into the Speedtech pro touring front subframe and then install the completed unit into the car. This allows more room to perform some detail work on the entire assembly. Alternatively, you would raise the subframe up to the body and can install the engine transmission later.

When installing a LSx engine on the subframe use Energy Suspension mount 31114 and transmission mount 31108 or equivalent. You will also need an LSX engine mount adapter plate, ATS 070001.

small block and big block Chevrolet engines should fit the subframe with a stock style oil pan. Factory LS oil pans will have clearance issues and will not work. Speedtech recommends the internally baffled ATS #70003 road race pan for standard LS motors and the ATS #70004 for LS7 and LS9 dry sump systems.

If you are using the original clutch “Z” bar, Speedtech Performance offers a bracket that is installed on the front of the driver side mid body mount. Please specify what clutch you are using when ordering.

IMPORTANT: LS Series motors use 2 different length frame stands. The longer of the 2 must be installed on the driver side. This will move the motor over ¾” to clear the oil pan rail. Small block and big block stands are the same height.

Before you are ready to mate the subframe up to the car install the body mounts. Speedtech recommends the solid body mount kit 220508.

Mate the subframe to the body and install the bolts but do not torque them down until you are certain the subframe alignment is correct.

10.3 ALIGN THE SUBFRAME

The subframe has alignment holes located in the mid body mounts to facilitate alignment of the subframe once it is installed in the car. Refer to position “D” in the figure 17. You must move the assembly to square and align the subframe so that the measurements on the “F” lines and on line the “G” lines are equal. Squaring it this way, using both the front-to-back “G” and diagonal “F” methods, will provide the best possible subframe to body alignment.

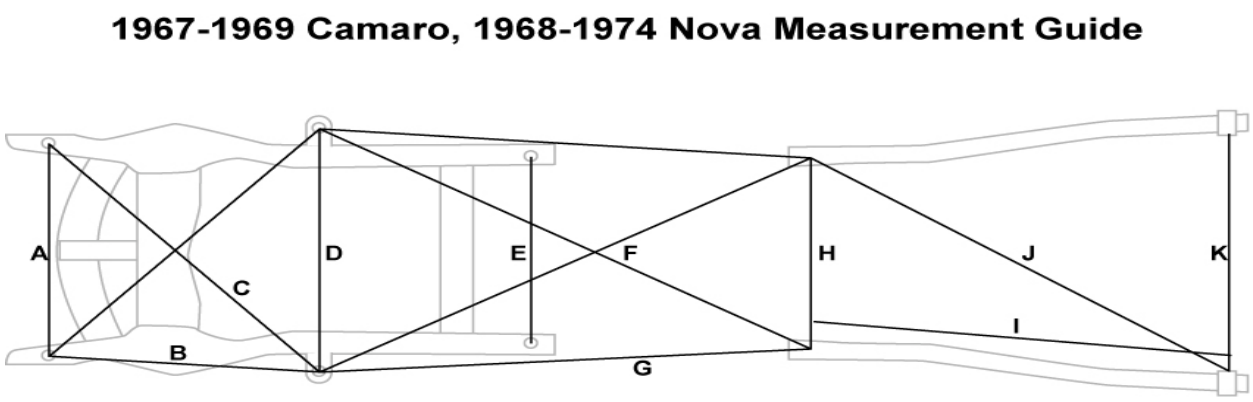

Figure 17: Aligning the subframe

Once you have the frame squared, the body mount bolts can be tightened.

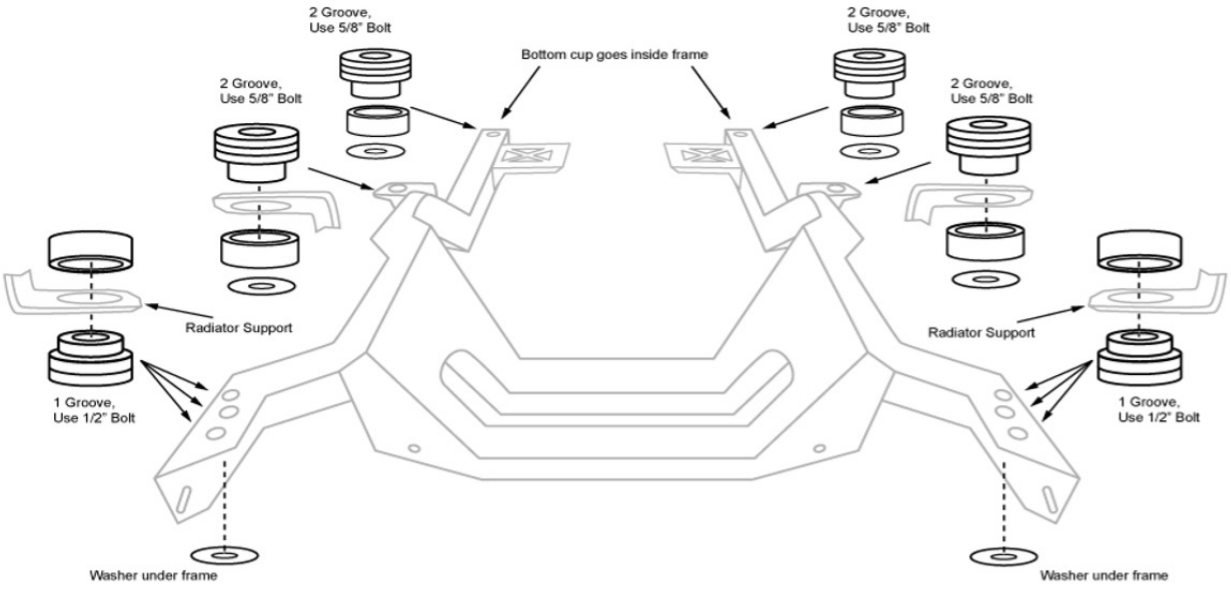

Figure 18: Tightening the body mounts

Final Torque Values:
5/8 Bolts – 140ft/lbs
¼ Bolts – 40ft/lbs

10.4 STEERING SHAFT

Your steering shaft connection will need to be assembled and installed. If you have not already purchased a steering shaft kit, Speedtech Performance offers several different configurations depending on what steering column and headers you are using.

NOTE: It is imperative when setting up and installing the steering shaft that the shaft does not protrude beyond the end of the u-joint housing. Damage to the joints and binding will occur if this is not installed properly.

The steering shaft is typically left long to allow for trimming. Mockup the shaft assembly in place and trim as needed to ensure that the correct length is achieved.

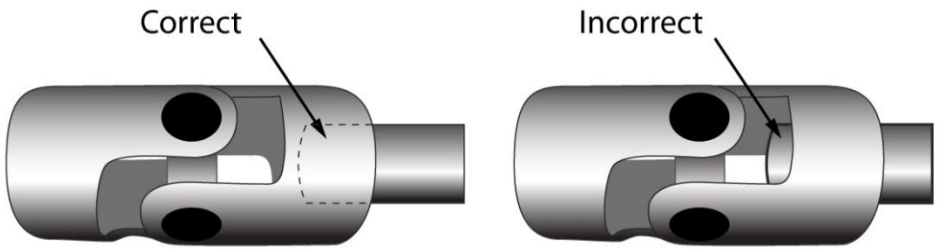

Figure 19: Correct placement

WARNING: When installing the shaft you must offset the u-joints by approximately 45 degrees. You will find one end is splined to allow the shaft to be rotated and "phased" to eliminate any binding. You may have to adjust the phasing slightly from this 45 degree starting position to get a smooth feeling in the steering wheel when turning. Speedtech recommends rotating the u-joint one spline at a time or until it feels right while turning from lock to lock.

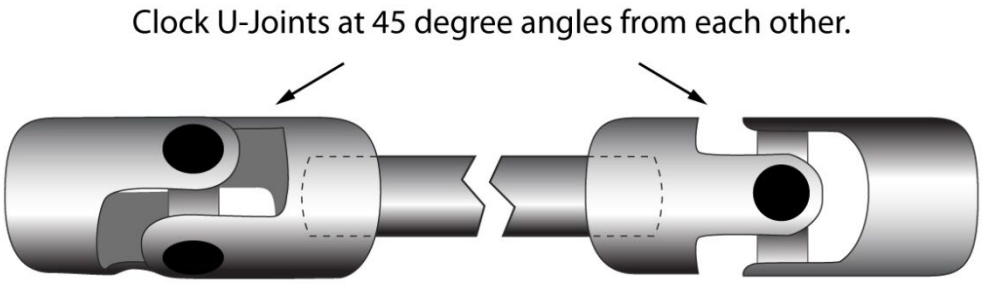

Figure 20: Angles of u-joints

11.0 ADDITIONAL INFORMATION

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11.1 CHECK YOUR WORK

Check you work by reviewing each step and ensuring you are happy it is complete. Double-check all fasteners are torqued.

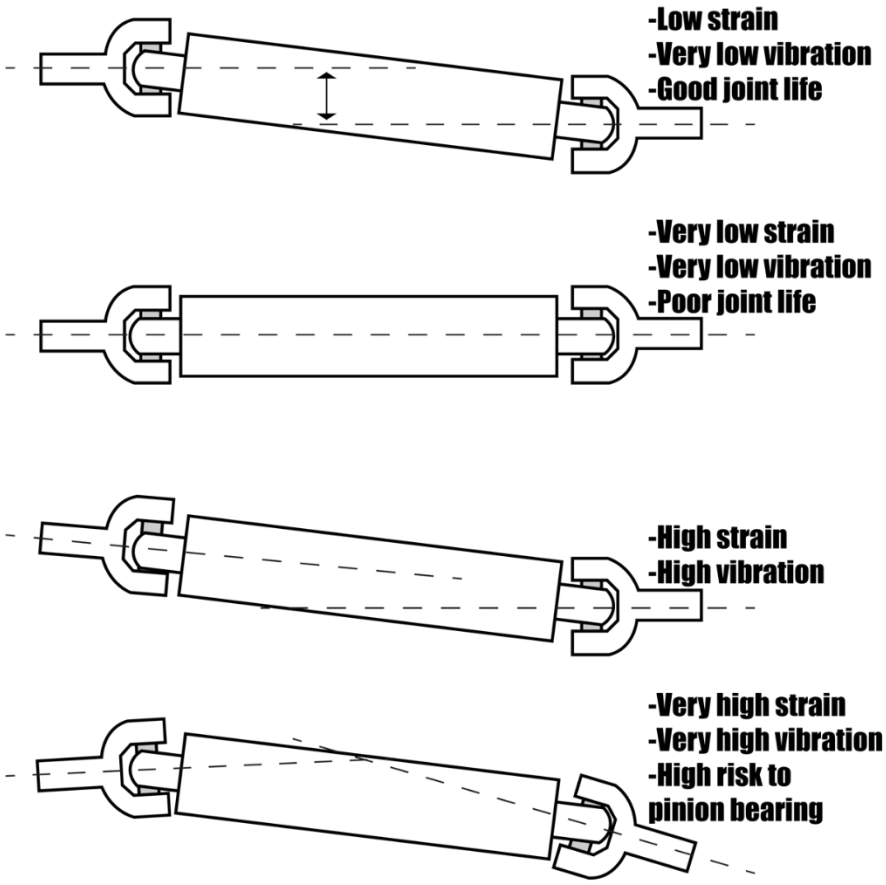
11.2 ADDITIONAL INFORMATION

If you have not already purchased headers, Speedtech Performance has developed headers specifically for our subframe that fit the Chevrolet LSX, small block and big block series engines. These headers allow the use of a two joint rather than a three joint steering shaft which improves the responsiveness and overall feel of the steering system. Our headers are designed to optimize clearance around the steering shaft and ground clearance for lowered vehicles.

11.3 PINION ANGLE

Pinion angle should be within the target range at the ride height. If you feel a drive shaft vibration at speed, you may need to adjust your driveline working angle. We have found this to be at optimum between 1.5-2 degrees.

Figure 21: Pinion angles



11.4 WHEEL ALIGNMENT

WARNING: Do not drive the car until it has had a proper wheel alignment.

Once you have completed the subframe installation, have the vehicle towed to a competent professional alignment shop to have the alignment performed.

NOTE: Use alignment specifications below, not OE alignment factory specs!

Alignment Specifications 67-69 Camaro 68-74 Nova

IMPORTANT: These are only suggestions and may need additional changes to achieve the optimum settings for your driving style or use of the car.

Daily Driving, Street Performance Specifications

Driver Side	Passenger Side
4 Degrees positive Caster	4 ½ Degrees positive Caster
0 to ½ Degree negative Camber	0 to ½ Degree negative Camber
3/ 32 Total Toe-in	3/ 32 Total Toe-in

Aggressive Track Alignment Specifications

Driver Side	Passenger Side
5 ½ Degrees positive Caster	6 Degrees positive Caster
½ to 1 Degree negative Camber	½ to 1 Degree negative Camber
0 Total Toe-in	0 Total Toe-in

Figure 22: Alignment Specifications

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 pro touring front subframe for your custom muscle car.

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