



11/28, 2016

**1967-1969 Camaro and 1968-74 Nova**  
**Complete Sub Frame**



## **Installation Instructions**

**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. All products are intended for off road use only and must be installed by qualified professionals only**

Thank you for purchasing your new Speedtech Sub Frame suspension kit. Installing this product will require the removal of your old sub frame, engine and transmission from the car. Take all necessary precautions whenever jacking up your vehicle and use safe and sturdy jack stands to support the vehicle whenever it is off the ground. Be sure to take all other safety precautions required to do the job correctly.

# Sub Frame Hardware Kit Checklist

**A.** Transmission mount spacer plate

**B.** (2) Upper shock mount  $\frac{1}{2}$  x  $1 \frac{3}{4}$  Shoulder bolt, (2)  $\frac{3}{8}$  large flange Nylock nuts, (4)  $\frac{3}{8}$  washers

**C.** (6) Motor mount frame stand  $\frac{7}{16}$  x  $\frac{3}{4}$  NF

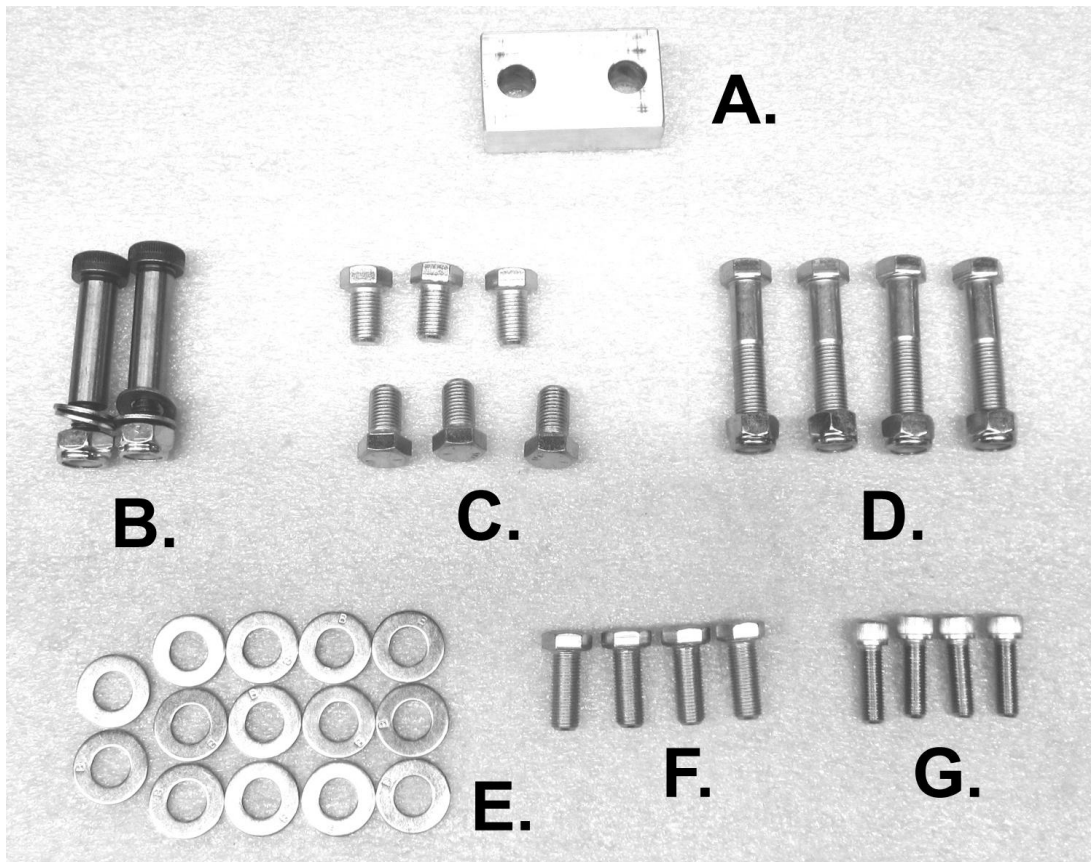
**D.** (4) Upper control arm mount  $\frac{7}{16}$  x  $2 \frac{1}{4}$  NF, (4)  $\frac{7}{16}$  Nylock nuts

**E.** (14)  $\frac{7}{16}$  Washers- (6) for frame stands **C.**, (8) for Upper Control arm **D.**

**F.** (4) Upper Sway bar mounting  $\frac{3}{8}$  x 1 NF

**G.** (4) Transmission mount socket head stainless  $\frac{5}{16}$  x  $1 \frac{1}{4}$  NF

**Sway bar mounting hardware is included with the sway bar and the sway bar end links are included with the High Clearance lower control arms.**



# Assembling the Sub Frame

1. Support the sub frame with jack stands at each corner, be sure it is sturdy and level.



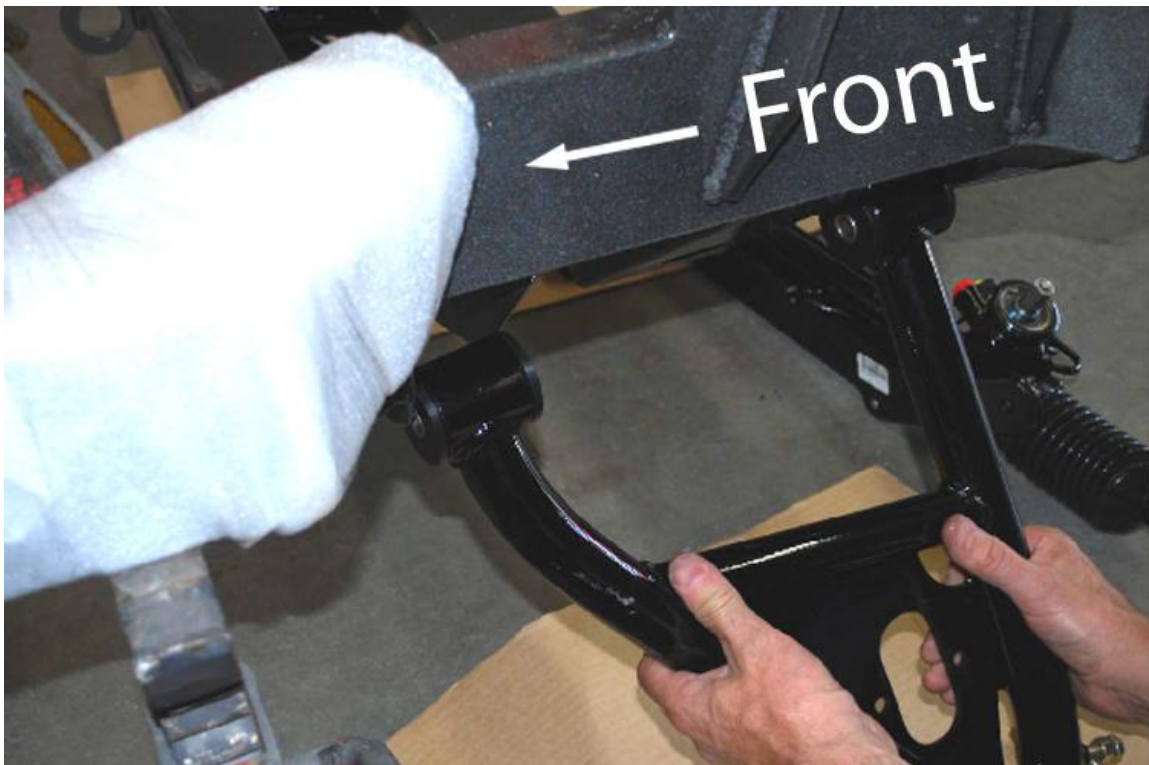
2. Install the supplied motor mounts. Do not fully tighten the bolts at this time to allow adjustment later when installing the engine.

Note: LS Series motors use 2 different length frame pads, ***the Taller Pad must be installed on the Driver Side.*** This will move the motor over  $\frac{3}{4}$ " to clear the oil pan rail. You must also use an LS motor mount adapter such as the ATS # 070001.

Small Block and Big Block engine stands are equal in height and can be installed on either side.



3. Install the transmission cross member. Do not fully tighten the bolts at this time to allow adjustment later when installing the engine and transmission.



4. Install the lower control arms. Begin control arm installation by sliding the frame end up into the frame pockets, the straight tube should be located to the rear.



Install only the  $\frac{1}{2}$ " x  $3 \frac{1}{2}$ " **front** 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 bracket.



5. Remove Steering rack from packaging. 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 it's position in the bracket. Apply anti-seize lubricant to the shank of the bolts, install into bracket, then reinstall bracket onto rack body.

For proper alignment, refer to the installation instructions included with the rack and pinion. The 2 mounting bolts must go in at the same time (see photo above) and the bracket and spacers must end up flush against the frame. It may take 2 people to perform this procedure, it is a tight fit.



The lock nuts that are provided with the lower control arms must be installed through the hole in the bottom of the sub frame, a small amount of red Loctite is suggested. At this time you can torque all 4 lower control arm nuts to 70 ft/ lbs.

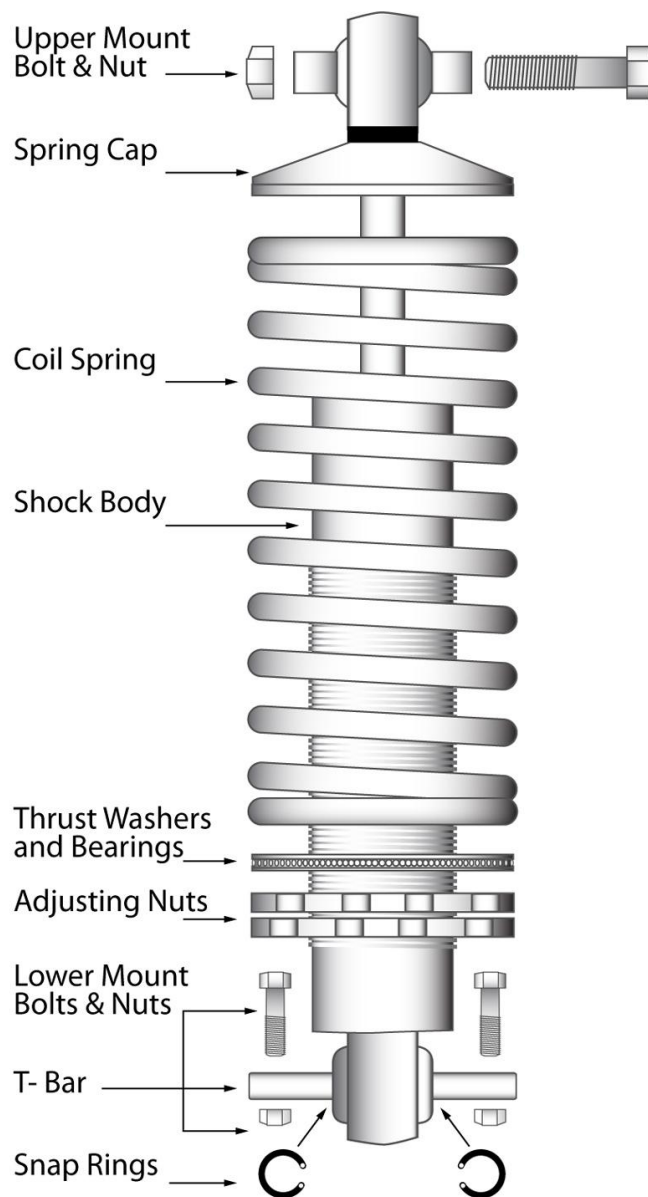
It is recommended you grease the LCA bushings via the grease fittings at this time. We suggest using Permatex Ultra Slick Synthetic Grease but any high quality chassis grease will do.

6. Assemble the coilover shocks. Start by installing the adjusting nuts threaded to the extreme bottom of the shock.

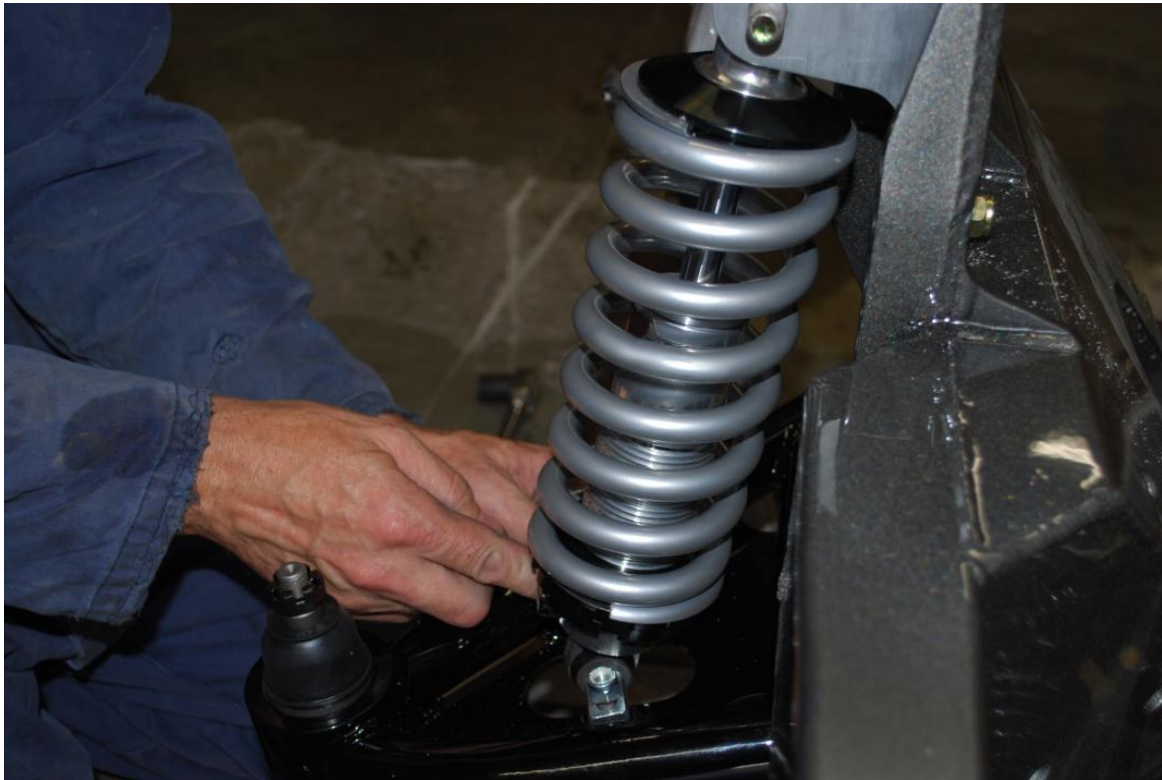
Install the adjusting thrust bearings and washers on top of the nuts prior to the spring.

Install spring and spring cap. The spring may need to be compressed in order to get the cap on correctly.

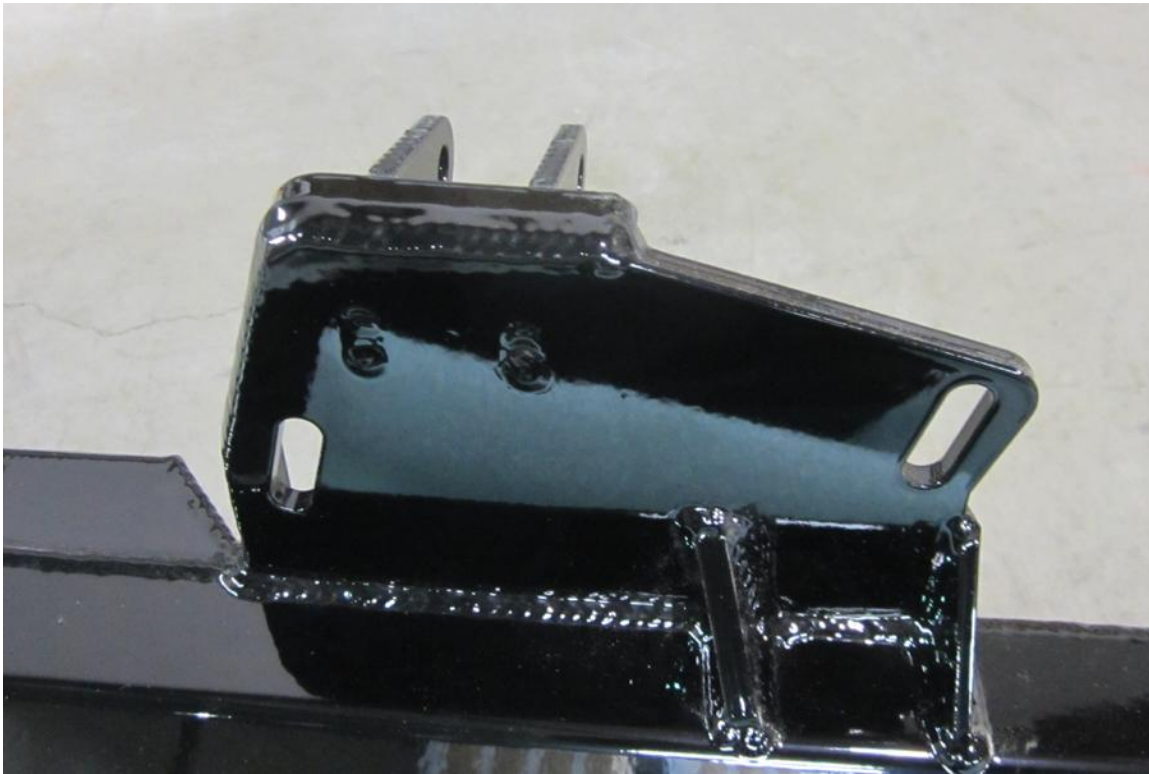
Install the supplied T-bar into the bottom bushing of the shock and install the snap rings.





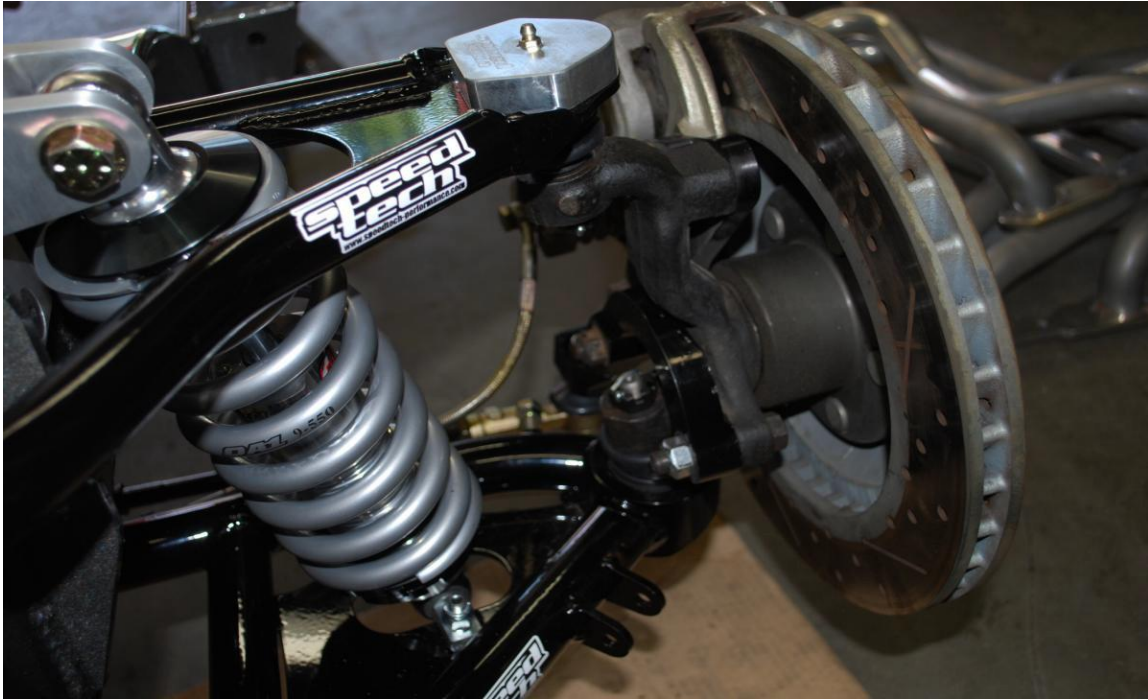


7. Install the lower side of the shock into the lower control arm. You have the option to install the T bar on either the top or the bottom of the mounting pad. Installing it on the bottom will lower the car approximately an additional 1 ¼". Install the top shock eyelet into the frame bracket. Tighten bolts to 20 ft/lbs.

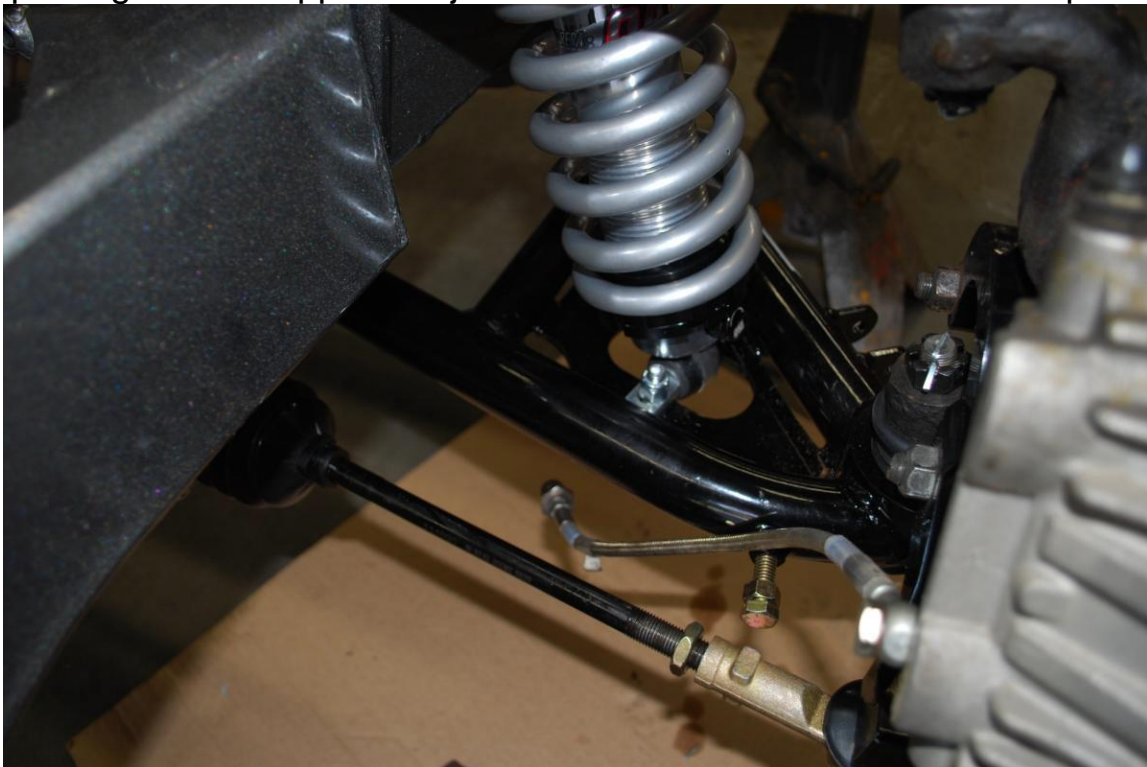


8. Install the Upper Control Arm (UCA) bolts into the slotted mounting holes. The arm's stainless cross shaft mounts on the *inside* of the control arm mount bracket, and the short straight tube on the arm should be towards the rear. These holes in the frame are slotted to allow adjustment of the suspension's camber curve. We recommend starting initially with the arms all the way up in the slot. Tighten these bolts as needed and the alignment shop will torque them to specs.



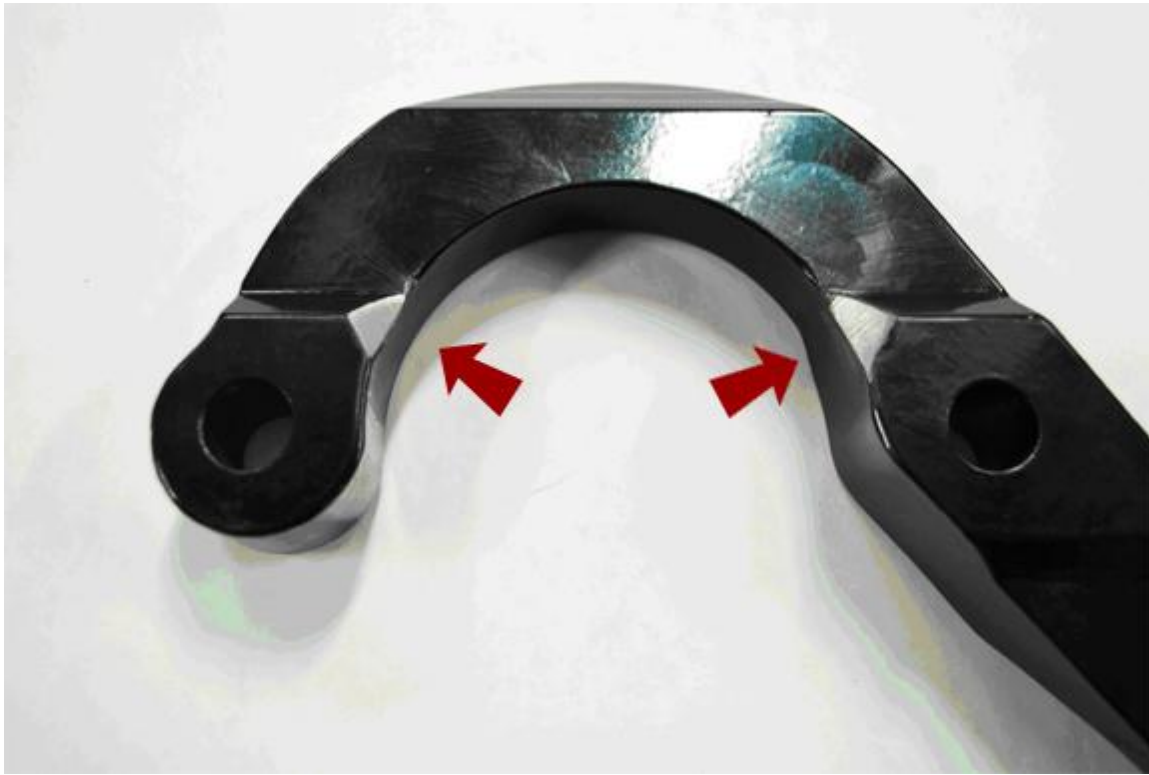


9. Factory spindles can be reinstalled. For optimum performance we recommend using ATS AFX tall spindles. Tighten the lower ball joint to 60 ft/lbs and install the cotter pin. Tighten the upper ball joint to 40 ft/lbs. and install the cotter pin.



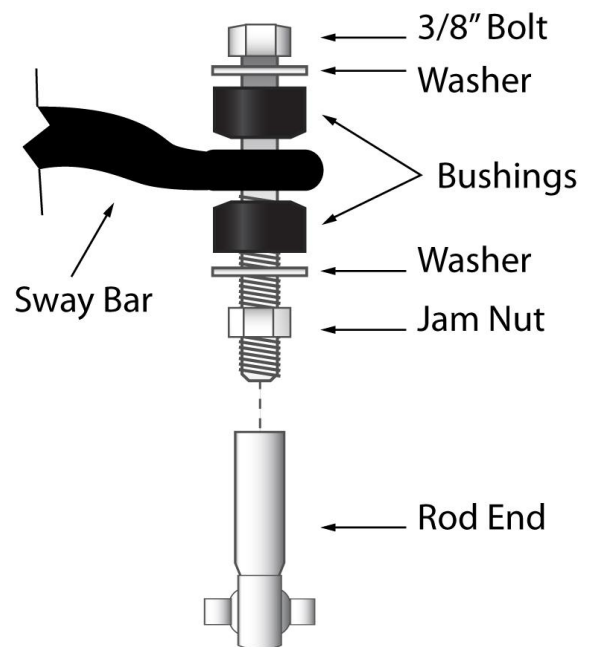
10. Install the new steering arms using either your original hardware or new grade 8 hardware. Install the outer tie rod ends into the steering arms, torque to rack and pinion manufacturer specs.

If you are using the AFX Spindles on your installation you **MUST** clearance the new steering arms to clear the Aluminum forging. Clearance both arms as shown below. **THE STEERING ARM MUST SIT FLUSH ON THE SPINDLE WITH NO INTERFIERANCE.**



### Speedtech Sway Bar Install

11. Installation of the sway bar is basically the same as 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 sub frame first, bolting the pivot bushing brackets to the vertical pads welded to the front cross member. 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.



That completes the assembly of the sub frame. You now have the choice to either install the sub frame into the car or continue to install the motor and transmission into the sub frame, then install the entire assembly into the car.



12. Before any removal of the old sub frame begins, disconnect and remove the battery, but you knew that.



13. Mark all hoses, lines and cables that pertain to engine, transmission and sub frame removal and disconnect and/ or remove them.





14. Once you have removed your original sub frame there are a couple of ways to proceed. If you are using a two post hoist, we recommend you install the motor and transmission into the Speedtech sub frame and then install the completed unit into the car. This allows more room to perform some detail work on the entire assembly without the car's front clip in the way.

### Engine Install

15. When installing your engine you must use Energy Suspension mount # 3.1114 and transmission mount # 3.1108 or equivalent. You must also use an LS motor mount adapter plate, we recommend the ATS # 070001

Small Block and Big Block Chevrolet engines should fit the sub frame with a stock style oil pan. Factory LS oil pans will have clearance issues and will not work. We recommend 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 offers a bracket available that is installed on the front of the driver side mid body mount. Please specify what clutch you are using when ordering.

**Reminder:** 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  $\frac{3}{4}$ " to clear the oil pan rail. Small Block and Big Block stands are the same height.

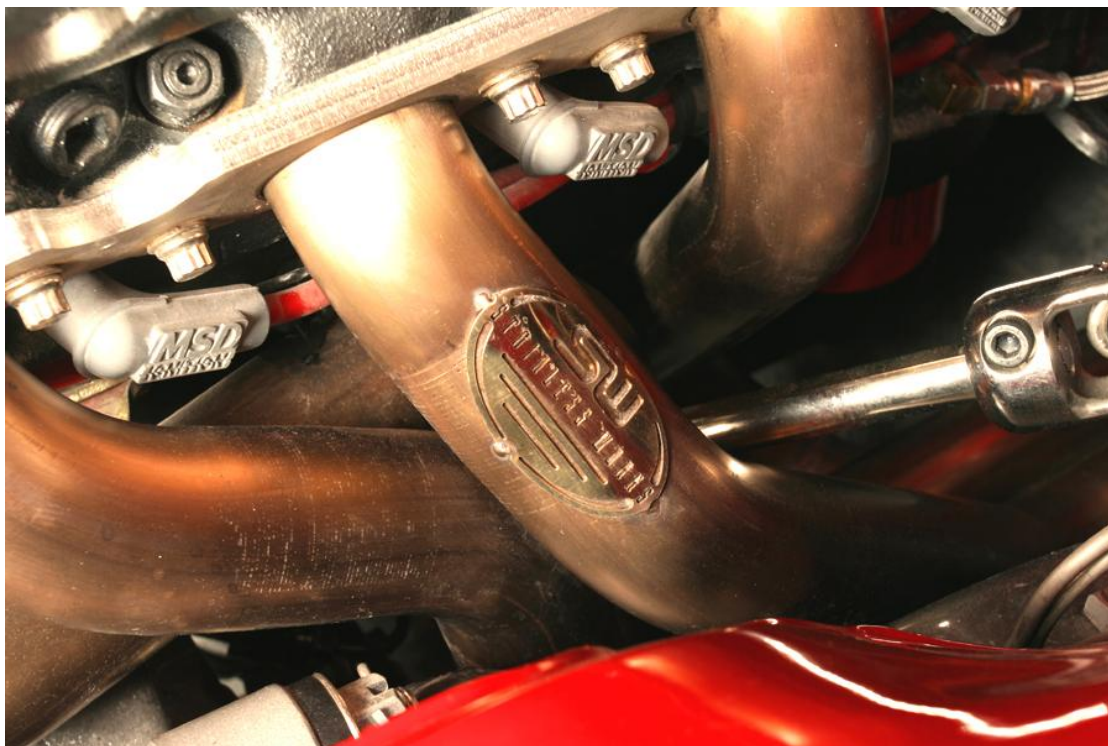


Speedtech offers two types of LSx oil pans for use with our sub frames. Pictured above is the ATS # 70003 LSx Road Race oil pan. It features internal baffling, trap doors and a windage tray. It also features bungs and fittings for remote oil filter mount, oil pressure and temp gauges, and turbo oil line. Pictured below is the ATS # 70004 LS7 and LS9 dry sump oil pans. These pans feature internal passages that maintain the use of a dry sump style oiling system. It also features fittings for remote oil filter and cooler lines.



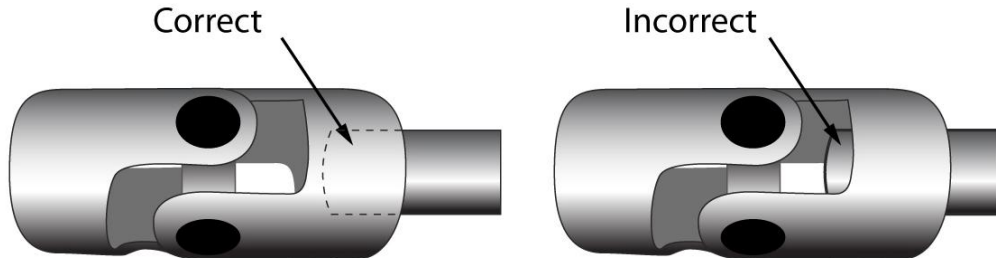


If you have not already purchased headers, Speedtech has developed headers specifically for our sub frame that fit Chevrolet LSx, small block and big block series engines. These headers allow the use of a 2 joint rather than a 3 joint steering shaft which improves the responsiveness and overall feel of the steering system. They are also designed to optimize ground clearance for lowered vehicles.



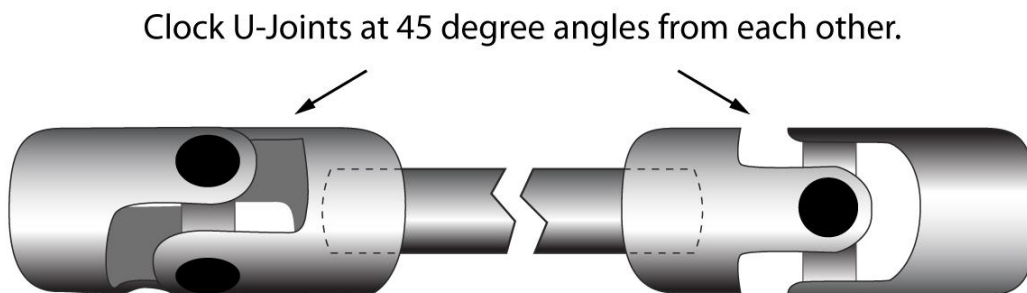
16. Your steering shaft connection will need to be assembled and installed. If you have not already purchased a steering shaft kit, Speedtech offers several different configurations depending on what steering column and headers you are using.

**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 and binding will occur if this is not installed properly.**



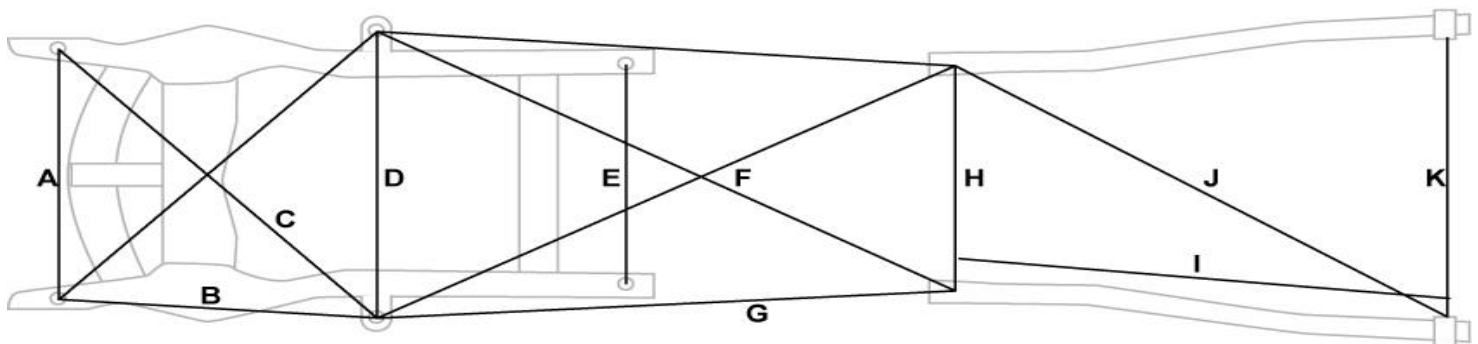
The steering shaft is typically left long to allow for trimming. Mock up the shaft assembly in place and trim as needed to ensure that the correct length is achieved.

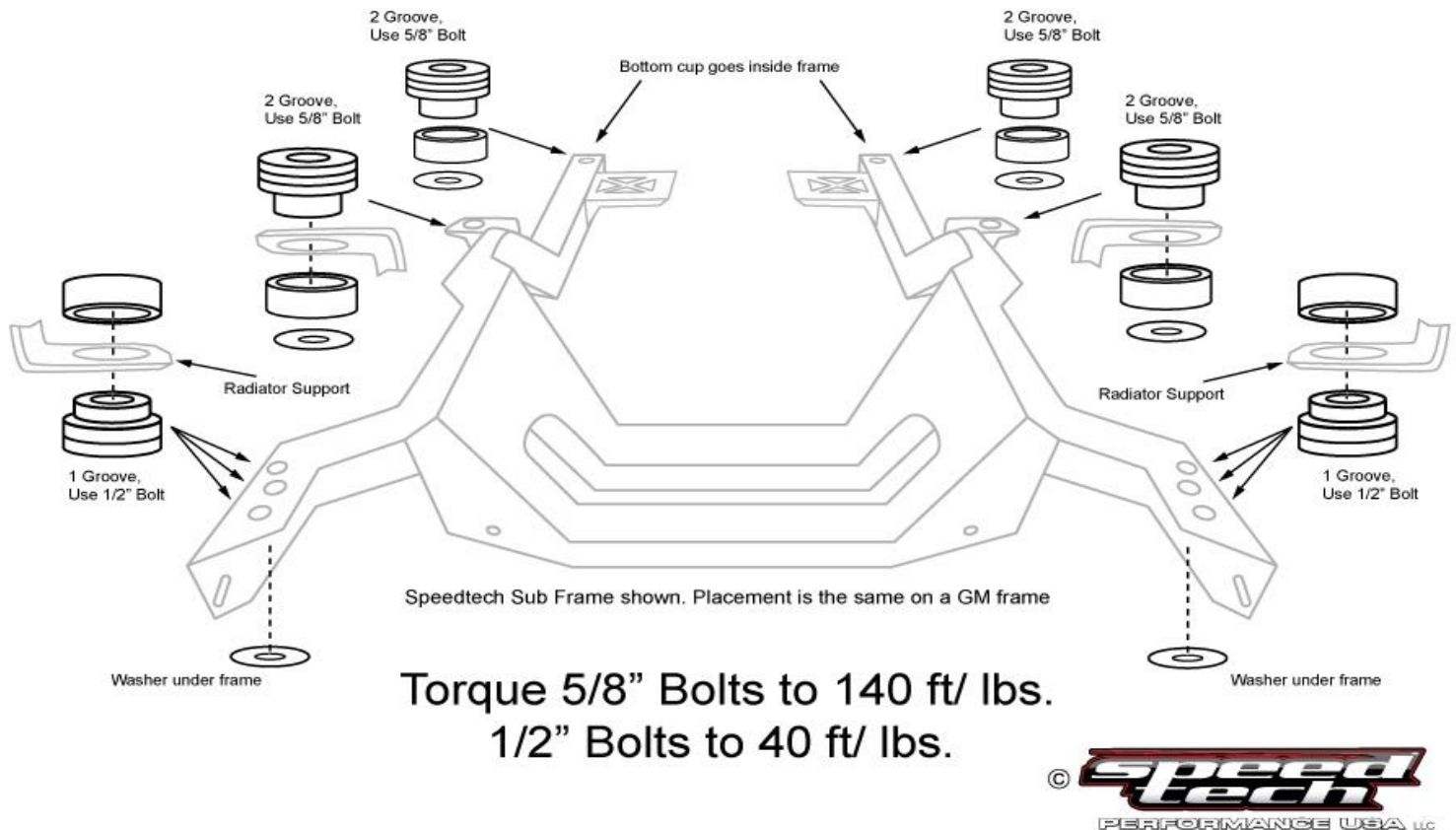
When installing the shaft you **MUST** offset the u-joints by approximately 45 degrees. You will find one end is splined to allow the shaft to be rotated and “phased” to eliminate any binding. You may have to adjust the phasing slightly from this 45 degree starting position to completely eliminate any binding.



17. The sub frame has alignment holes located in the mid body mounts to facilitate alignment of the sub frame once it is installed in the car, see position D in the figure below. Use a long alignment punch to move the sub assembly around and square and align to the body. You must square and align the sub frame in the equalizing the measurements on line "F" and then on line "G". Squaring it this way using both the front to back (G) and diagonal (F) methods will endure the best possible frame to body alignment.

### 1967-1969 Camaro, 1968-1974 Nova Measurement Guide





18. Once you have the frame squared and all body mount bolts tightened to 140 ft/lbs, reinstall and reconnect all accessories as they were before.

## **Do not drive the car until it has had a proper suspension alignment.**

Once you have completed the sub frame install, have the vehicle towed to a competent professional alignment shop to have the alignment performed.

**Note: Use alignment specifications on next page, not alignment shop pre-programmed factory specs!**

# Alignment Specifications 67-69 Camaro 68-74 Nova

**Note:** These are only suggestions and may need additional changes to achieve the optimum settings for your driving style or situation.

## 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
3/ 32 Total Toe-in	3/ 32 Total Toe-in

## Original Alignment Specifications

\*\*For reference purposes only. **Do Not** use these specs.

Driver Side	Passenger Side
½ Degree positive Caster	½ Degree positive Caster
¼ to ½ Degree negative Camber	¼ to ½ Degree negative Camber
1/8 Total Toe-in	1/8 Total Toe-in

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### **Terms and Conditions of Sale**

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2. Speed Tech Performance Ltd. does not endorse, nor recommend modification of vehicles for use on public highways, since warranty or government regulations may be violated. As an express condition of sale of any performance part, the buyer acknowledges and agrees to use the performance parts for the modification of vehicles in sanctioned OFF-ROAD competitive events and show purposes only. Customers should exercise their discretion on matters with regards to the purchase and installation of these products.
3. Speed Tech Performance Ltd. does not ensure the legal use of these products. We do not guarantee the fitment of these products for anything other than their intended application nor do we assume any responsibilities what so ever for the misuse or losses incurred by the use of any of these components. While every effort is made to provide technical information and assistance, we have no control over owner installation, modification, and unusual stress that performance parts are subject to.
4. The customer acknowledges that Speed Tech Performance Ltd. and its employees are not responsible for any mechanical failures due to the use of parts sold, supplied or installed not for their intended application. Speed Tech Performance Ltd will not be held liable for any damages which are incurred directly or indirectly on the vehicles or operators or passengers of the vehicle
5. Please consult your sales agent and/or technician prior to purchase of any of Speed Tech Performance Ltd. Products to ensure proper fit. The buyer assumes all responsibilities for determining the suitability of the product. All aftermarket products should always be installed by professionals only.

### **Warranty Claim:**

1. Speed tech Performance Ltd. Warrants its products against materials and workmanship failure for the term of 12 months (1 year) from the date of purchase and only up to the amount paid with proof of purchase.
2. Seller's liability shall as limited to repairing or replacing, at its option, any defective product which is returned, freight prepaid to Seller, according to the Merchandise Return Procedure set forth in Section 3 below. Buyer shall bear all responsibility for shipping charges and risk of loss or damage during transit to Seller. Products which have been subjected to abuse, misuse, alteration, neglect or unauthorized repair or installation, as determined solely by Seller, are not covered by this warranty. Any alterations, addition, improvements or attachments to the product(s) not authorized in writing by the Seller shall be deemed to be a waiver of this warranty by Buyer and shall render this warranty null and void. Seller shall return repaired or replaced product(s) to Buyer, at its expense via regular ground service in Canada. Shipping charges by all other methods and to all other destinations shall be borne by Buyer.
3. Merchandise return procedure
  - A. If you purchased your Speed tech performance ltd product from us or from an authorized dealer, you are covered by the terms of this policy. All claims however, must be submitted directly to Speed tech performance Ltd.
  - B. Call the customer service representative at 1-888-467-1625.
  - C. Provide the invoice number, date of purchase and reason for return
  - D. You will be assigned a Returned Goods Authorization Number (RGA). The package you return must show the RGA on the outside of the package, include the original invoice and be shipped prepaid to our facility. The part has to be in its original packaging materials and be in a sellable condition. For parts presenting signs of use, only warranty claims will be accepted.
  - E. Ship to seller, freight pre-paid and insured for replacement cost in original packaging.
  - F. Replacement or repair decision will be made when merchandise is received by seller. No advance replacement is available.

### **How to File a Warranty Claim:**

The answer to ALL the following questions should be YES before contacting our Customer Service Department.

Is the part appropriate to your application?

Did you carefully and thoroughly read the instructions provided along with the part?

Do you have the proof of purchase?

Are you the original purchaser?

Is the part unmodified and clean?

Is the return date within 3 months from the purchase date?

Is the reason for return a legitimate product defect?

If the answer to all these questions is YES, please contact our Customer Service Department at 1-888-467-1625. You will be given a Returned Goods Authorization Number (RGA) valid for 30 days. You will also be asked to ship the part prepaid to our facility. All shipments MUST be prepaid, include the original invoice and show the RGA on the outside of the package, otherwise it will be refused. Please include a brief explanation letter in order to expedite the warranty analysis process.

### **What doesn't this Warranty Cover?**

The costs not covered by this warranty include but are not limited to:

- Removal, installation, shipment and insurance costs.
- Improper installation or maintenance
- Misuse or abuse, negligence
- Damage to related components
- Normal wear and tear.
- Costs incurred due to down time of vehicle
- Alterations on the original design or unauthorized repairs.

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## Notes

## Notes