



S&W Race Cars and Components, Inc.

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CAUTION!!! - The most important requirement for a successful installation of this, or any, S&W chassis component is that you take your time and use good common sense. Check & recheck all measurements before cutting or welding. If you have any questions, before or during the installation - STOP - and call our tech line at 610-948-7303 and we will gladly explain in more detail any step in the installation.

Please read complete instructions thoroughly before beginning!

Installation Instructions for Strut Front Frame Package

(For Strange Eye Mount Struts)



Please read all instructions in full before beginning installation.

Preparation:

Installing S & W RACE CARS frame rails and front suspension into a clean car is a relatively easy job, although there are certain precautions that should be taken for your safety and to insure that the finished product is aligned properly. It is recommended that you wear eye protection during the removal of the stock floor, suspension and other components, and during welding and fabrication. Proper supports and jack stands must be used, not only for construction purposes (such as keeping the chassis level), but also for safety reasons. This work should be performed in a dry, well lit shop with a level or near-level floor.

While installing your frame rails and front suspension, remember that the quality of your workmanship will directly affect the ultimate strength of the entire race car structure. It is important that all areas to be welded are clean, free of oil, slag, paint, undercoating and of course rust.

Quality work requires the proper tools. Here is a list of some of the tools you will need.

- A. Common hand tools - for removing the stock suspension components and car interior.
- B. Jack stands - for supporting the car and new frame rails.
- C. Floor jack - for raising the car, removing the frame section.
- D. Measuring tools - 12' tape measure, level, inclinometer, plumb bob, string, builders square, large square felt tip pen or soap stone.
- E. Cleaning tools - gasket scraper and wire brush to remove undercoating.
- F. Cutting tools - oxyacetylene torches, hand-held reciprocating saw or rotary grinder with a cutting disc.
- G. Welding equipment - a MIG welder is recommended. TIG welding is acceptable, but is unnecessary for this type of work.

Warning: Effective Jan. 1, 1995 stick welding will be prohibited by NHRA.

S&W Race Cars strongly suggests that these components not be stick welded!

- 1) With all the stock components still in the car and the car sitting on the floor at ride height measure and record the wheel base .
- 2) Raise the car to a comfortable working height and level it from front to back and side to side. This can be done front to back by placing the level on the rocker panel. Leveling the car side to side by placing the level on the front crossmember and on a horizontal floor panel at the rear of the car.

Note: from this step to the final step always be aware and maintain the car's level condition!

- 3) With all the weight on the factory suspension, measure the ride height of the front spindle by measuring from the floor to the center line of the front spindles. **Note: if you would like the car to sit lower or higher, when you install the frame you can move the spindle centerline up or down as per your application.**
- 4) Install the front wheels and tires that will be used on your existing front suspension, then measure and record the front track width (the measurement from center to center of your tires).

- 5) In order to insure that your frame rails are centered in the car properly, you must find the chassis centerline (C/L). The chassis C/L is the midpoint line that runs the length of the car. To find the C/L, drop a plumb line from the same two points on the opposite side of the car to the shop floor and make a mark on the floor at these locations. Do this at the front and rear of the car, then measure half the distance between each set of plumb line marks on the floor. Each of these half distances can be connected and a straight line can be drawn on the floor running from front to back, which represents the center line of the car. It is a good idea to drop a plumb line to the C/L on the ground and transfer it onto the car by punching marks on a few crossmembers. Now if you have to move the car or when you do future work, the C/L can be quickly re-established. The C/L can also be used for suspension alignment work.

Disassembly:

- 6) Remove all existing front sheet metal (hood, fenders, grill, etc.) and front seats and carpet.
- 7) If your engine and transmission will stay in the same location measure and record the front to rear and side to side location. Then remove engine and transmission, fuel line, electrical wiring, battery, etc..
- 8) Determining the mounting and cut off location for your application:
A) Unibody cars; On these cars, the existing front suspension can usually be removed in one piece by unbolting the subframe from the body, then connect the front frame to the back frame by using 2" x 3" box tubing.
B) Full frame car; On these cars, so you can reduce the total weight of the car we recommend that you remove as much of the stock frame as possible and replace and connect the front frame with 2" x 3" box tubing.
C) 2" x 3" box tube chassis; On these cars, cut the rear frame so you can butt the front frame to the rear frame so it will place the front spindle at the correct wheelbase.

Note: for some applications and rear frame rail widths and heights you may have to connect the front frame to the rear frame using out riggers or a dropped crossmember.

Remove front frame section as per your application.

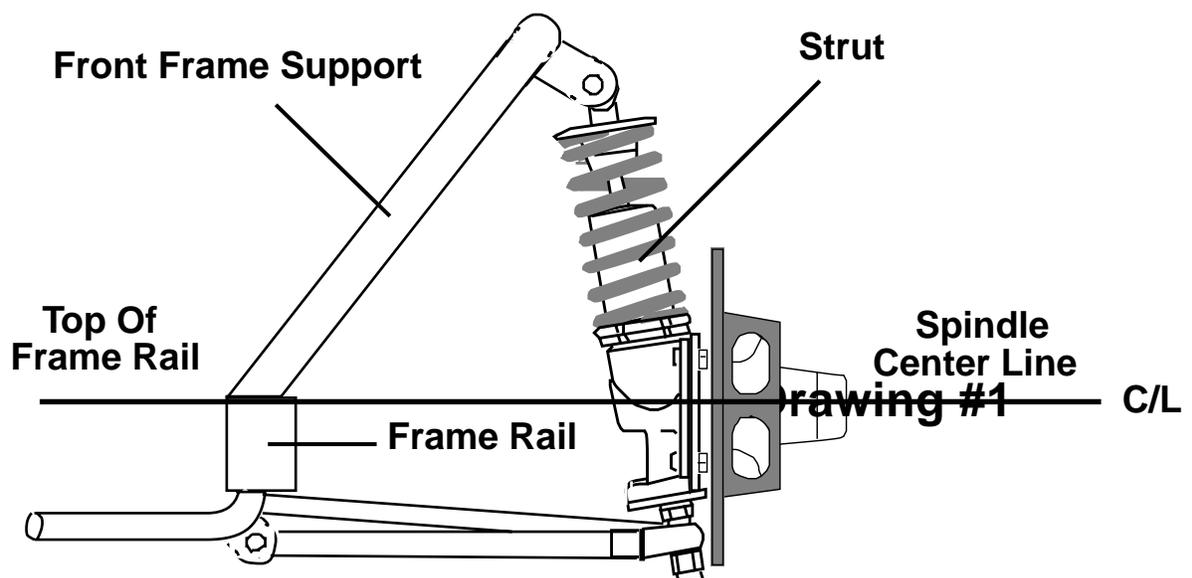
- 9) Remove the stock floor and replace it with steel or aluminum floor panels. This step is recommended if you want to reduce the total weight of the car, but not necessary.

Assembly:

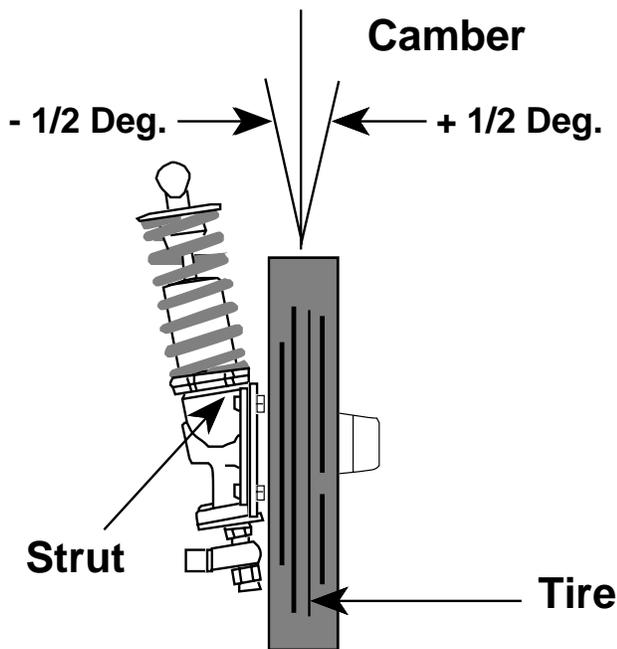
- 10) Position each frame rail under the car aligning the crease in the frame rail with the front edge of the fire wall and the top of the frame rail with the spindle center line measurement that you found in step #3, see drawing #1. With the frame rail in position, mark and cut the rear portion of the new frame rails as needed for mounting them in the car for your application that you found in step #7.
- 11) Remove the frame rails and tack weld two scrap pieces of tubing between the frame rails, to position the frame rails 26" apart outside to outside and parallel to each other.
Note: these pieces of tubing are for set up only, so you should not fully weld them in place.

- 12) Tack weld the new front frame rails in place to the back frame section. **Note: make sure the frame rails are supported with plenty of jack stands, so the frame rails will not move or drop during welding.**
- 13) Position the front edge of the crossmember 14 1/2" forward of the spindle centerline and tack weld it in place. **Note: the centerline of the spindle will be determined by the wheelbase of the car that you measured in step #1.**
- 14) Tack weld 2 pieces of 2"x 3" tube for outriggers, from the outer front frame rails to the rocker panels, at the front edge of the door jam.
- 15) Assemble the tube end and rod end of the front lower control arm (7/8" x .058cm tube) and install it to the front mounting brackets on the crossmember. **Note: tack weld the tube end only, do not finish weld at this time.**
- 16) With the lower ball joint installed on the strut, slide the strut onto the front lower control arm (do not weld yet). **Note: see your strut instructions for assembly of the lower ball joint to the strut and lower control arm.**
- 17) Assemble the tube end and rod end of the back lower control arm (1" x .058cm tube). **Note: tack weld the tube end only, do not finish weld at this time.** Install 2 of the frame mounting brackets and 4 half moons on the rod end (the brackets that have been cut off flat for square tube, not the brackets for round tube).
- 18) Slide the assembled back control arm onto the lower ball joint of the strut (do not weld yet). After the back control arm is in place on the ball joint, position it under the frame rail, keeping it in line with the spindle, if the spindle is pointing straight out. Tack weld the frame brackets to the under side of the frame.
- 19) Install 2 upper frame brackets and 4 half moons on the upper rod end of the strut (the frame brackets that are rounded on the end), securing them in place with a 2 1/4" x 1/2" bolt and nylock nut.

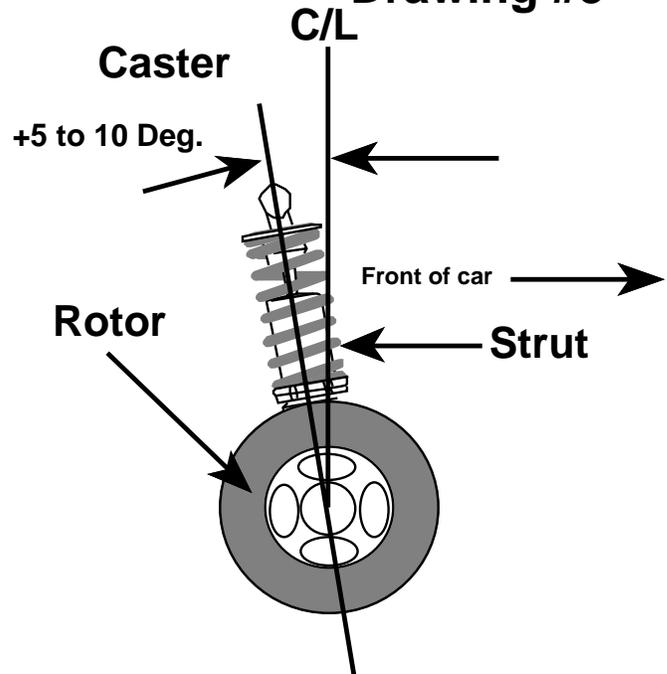
***Align the center line of spindles
with the top of the frame rails.***



Drawing #2



Drawing #3



- 20) Assemble the wheel hub, studs and brake rotor on the strut. **Note: see strut instructions for assembly.**
- 21) Install the wheel and tire.
- 22) Repeat steps 15 to 21 for the opposite side of the car.
- 23) Position the strut so it has + or - 1/2 degree of camber, **see drawing number 2.** Then measure your tracking width. Adjust your tracking width as per your application. **Note: refer to the measurement you found in step #4 for your tracking width, S & W Race Cars recommends that you set your tracking width about 2 or 3 inches narrower than the factory width, so when the suspension moves through its travel or you lower the car, you have plenty of room to turn the wheels.**
- 24) Reposition the strut so it has + or - 1/2 degree of camber and set the caster at +5 to +10 degrees. **See drawings # 2 and 3.**
- 25) With the struts in position at the correct ride height, caster, camber and the shocks at the correct install height for your application, locate where the front frame supports will be, running from the roll cage through the fire wall to the front frame. Tack weld the front frame supports in place and the upper strut mounting brackets to the front frame supports.
- 26) Install the rack & pinion to the crossmember, mounting the splined shaft on the drivers side of the car. Secure the driver side with 2 bolts and nylock nuts, and the passenger side with a polyurethane bushed clamp with 2 bolts and nylock nuts.
- 27) Install the steering shafts with 2 rod ends and jam nuts installed on to each strut steering arm.
- 28) Move the front suspension and steering through its travel, checking all clearances.
- 29) If all clearances are okay, remove the struts and steering components and finish welding all connecting points, lower control arms and supports for the front frame.

Install your motor and transmission

30) When installing the motor S & W Race Cars recommends that you use a motor plate and mid-mount to keep the motor and transmission from moving side to side and lateral engine limiters on each side of the motor to keep the motor and transmission from moving front to back.

S & W Race Cars has a complete inventory of motor plates, mid-mounts and engine limiters for most engine and transmission combinations.

31) Install your front body sheet metal or fiberglass using an S & W Race Cars front body mounting kit, part # 95-500.

32) Reinstall the front struts (with springs), steering components, tires and wheels.

33) Adjust the toe of the front end to 1/16" to 1/8" of toe-in.

If you have any questions during or after the installation of this front suspension package, please contact an S & W Race Cars' tech. representative at 610/948-7303.

Related components available from S & W Race Cars.

Part#	Description
20-607	Lateral engine limiters
35-372	Steering column kit
35-042	Wilwood Pinto rack & pinion
35-381	Cable type suspension limiters
95-500	Front end body mounting kit
95-1000	DOORSLAMMERS- The Chassis Book
HP573	Welder's Handbook
per/ application	Front motor plate
per/ application	Mid-mount