



Rear Subframe Setup & Installation Instructions

1967-69 Camaro/Firebird

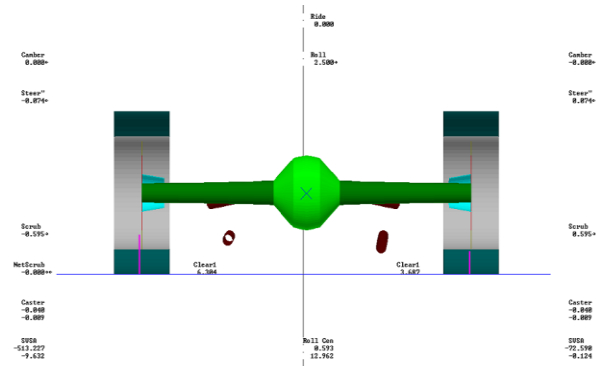


Introduction

Congratulations on the purchase of your Art Morrison Enterprises rear subframe. This subframe is the result of 35+ years of chassis and suspension design experience. In an effort to make your project progress smoothly, we have compiled this booklet containing instructions, notes and tips on removal of your current subframe as well as assembly and installation of your new rear subframe.

Suspension Performance

Art Morrison Enterprises' Engineering department has two solid axle suspension configurations that will compliment most front suspension systems. Both the 3-link and triangulated 4-bar suspensions provide excellent lateral control, roll steer characteristics, and forward bite. Both suspension systems utilize custom valved Strange coilover dampers and $\frac{3}{4}$ " sway bar.



Triangulated 4-Bar Suspension

AME's triangulated four-bar suspension is a proven design used in both the AME 3G Corvette and GT55 project cars, both of which set new records at the time of testing. This suspension combines excellent stability and on-the-edge handling for superb performance, yet is tightly packaged to eliminate floor cutting. Polyurethane-bushed rod ends are used throughout to reduce road noise and vibrations.

3-Link Suspension

AME's new 3-link suspension provides an option for those looking for a dual-purpose road race/street suspension. This design eliminates one upper control arm for bind-free performance, and utilizes a specially designed adjustable watts-link for excellent lateral stability and roll center height tuning. AME's 3-link can be used with polyurethane rod ends or spherical heim joints for precise axle control.

Structural Integrity

Once you remove your stock frame rails, you will instantly realize why AME chose to create an entirely new subframe, instead of just a suspension kit. The OEM rear rails are sheetmetal-thin, and often crack over time (as evident on our R&D vehicle!).

Using mandrel-bent 2x4x0.120 material, AME is able to produce a rear clip that precisely matches the stock floor that increases overall stiffness considerably. This can be further enhanced by the use of AME subframe connectors, which are designed to mate the rear clip to our GT Sport front clip. The driver will notice greatly reduced squeaks and rattles on the road.

Subframe fit and OEM tolerances

Over those years, these vehicles have been subjected to high miles, racing and lastly, time. Many of these vehicles have been in accidents, damage from which are no longer readily evident, however these incidents may have severely

distorted body panels. Even low mileage, pristine “survivor cars” can suffer from body sag due to uneven spring settling.

Art Morrison Enterprises has taken significant steps to accommodate various errors in floor pan shape. While the rear subframe matches the floor pan very closely, some vehicles may show small gaps between frame and floor in a few areas. Suggestions are listed in the “Installation” section to cure these issues.

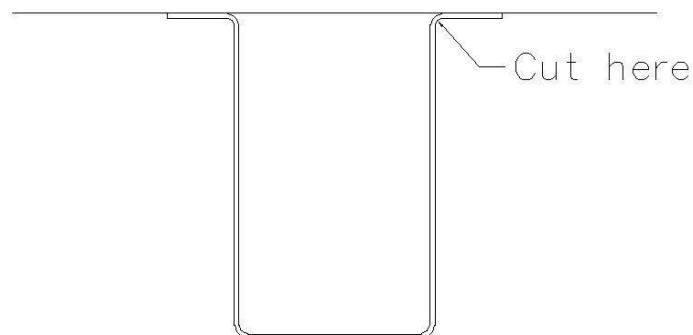
Installation

Note: The following instructions are intended for triangulated 4-bar equipped subframes only. While the 3-link subframe install process is similar, it will require further cutting and fabrication to accommodate the upper control arm hoop.

To begin the installation process, raise the vehicle to a comfortable working height on jack stands or a lift. Shim the jack stands or lift pads such the car level left to right, and front to back. Remove all rear suspension components, including the fuel tank. Now is a great time to clean the underside of dirt, grime, or old undercoating.

Next is removing the old frame rails. We suggest three methods:

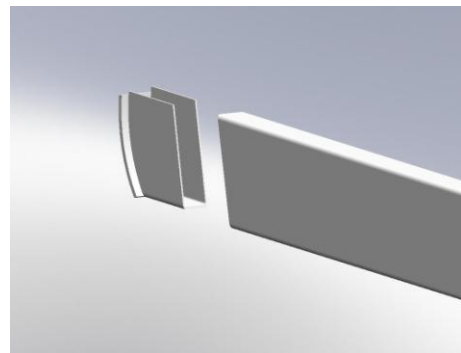
1. Removing spot welds: This is a time consuming process, as there are many spot welds that would need to be removed. This method is the cleanest, although it still requires grinding the spot welds off the floor pan once the rail is removed.
2. Plasma cutter: Using a plasma cutter to remove the rail takes much less time. This involves removing the “U”-shaped section, and grinding the remainder flush to the spot welded strip. The spot welds can be left intact or removed. *See photo 1.*
3. Air chisel: This method is basically the same as using a plasma cutter. The “U”-shaped section is removed, and the spot welded strip is ground flush or removed completely.





When the rails are removed, take a minute to make sure the floor is clean. Again, the spot welded strips from the frame rails can remain on the vehicle, but take some time to make sure they are ground flush. The strips can also remain on the rear valence as well. *See photo 2 for an illustration.*

Before setting the clip into place, first place the rear caps into the frame rails as shown on right.



With the clip fully assembled, raise it into place using floor jacks starting at the rear. When the frame contacts the floor pan, continue to raise the jacks until *most* of the vehicles weight is on the subframe. In most cases, the clip fits to the floor without much room for movement. Check to make sure the frame rail does not hang up on the seat belt nut attached to the floorpan. If contact does occur, lightly grind the edges of the nut until clearance is made.

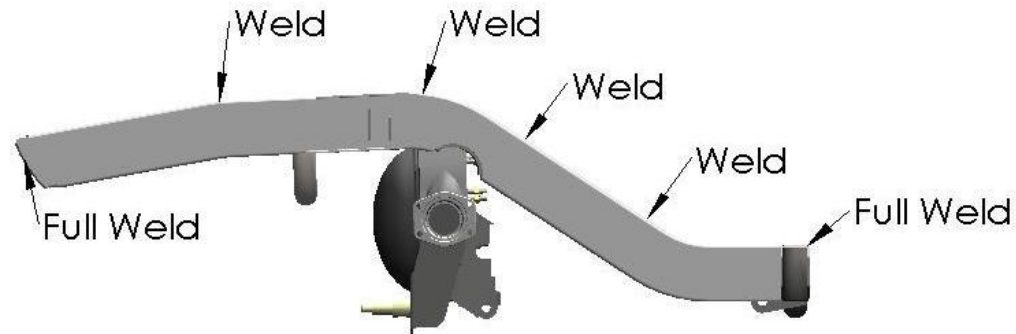
Double-check the wheelbase (small adjustments can be made by the links) and side-to-side measurements to verify the clip is centered in the vehicle. If bulkhead fittings will be used for brake and fuel lines, mark those locations for drilling. Next, slide the rear end caps out until they reach the rear valence panel and check for proper fit. If this looks satisfactory, place a few tack welds on the end cap to the frame rail to hold it in place. If holes need to be drilled for lines, bulkheads, etc., remove the clip and do so now; when finished, re-install the clip and re-check for correct wheelbase and centering dimensions prior to welding.

Access Holes & UCA Clearance (Triangulated 4-bar only)

To gain access to the upper control arm bolts, 1-1/2" access holes need to be drilled. To do so, drill a 1/8" pilot hole to mark the hole center. Remove the interior rear seat and proceed to drill with a 1-1/2" hole saw. Remove and re-install the upper control arm bolt to confirm sufficient clearance has been made. When the suspension has been installed, use the included 1-1/2" black plugs to close the hole. 3M Strip-Calk or equivalent may be used with the plug for a better seal. *See photo 3.*

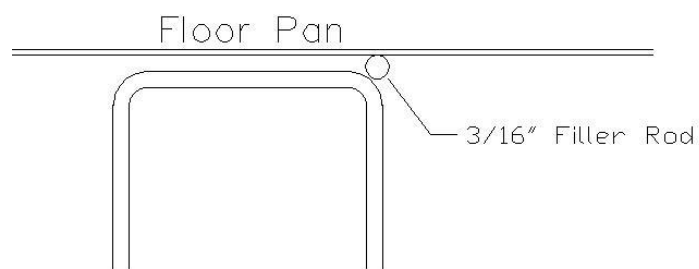
Some vehicles may have insufficient clearance between upper control arm tube (triangulated 4-bar only) and floor pan at full bump (*photo 5*). If this occurs, the floor can be massaged using a 1.5" or 2" tube until sufficient clearance is made.

Weld Locations



The clip only needs to be stitch welded (approx. 1-1/2" long) along the frame rail in a minimum of four locations as shown above. The end cap must be fully welded along the bottom and sides to both the frame rail and rear valence. The front crossmember also needs to be fully welded, but only at the ends where it meets the pinch weld (*photo 4*). Due to the air space between the rear valence panels, the painted exterior surface should only be warm to the touch during welding and should not cause paint blistering or peeling. If a concern still exists, have a helper hold a wet rag against the surface while the end cap is welded in place.

If the areas shown above cannot be welded due to excessive gaps between frame and floor, filler rod may need to be used to fill the gap. For instance, if a gap measures 1/8" wide, use a small piece of 3/16" rod to bridge the gap.



Painting, Coating and Sealing

The subframe may be coated with a weld-through primer before installation to provide better rust protection. The subframe may also be installed bare with use of autobody seam sealer between the floor pan and top of frame rail to prevent rusting.

Links and axle housings may be powdercoated for a durable finish. If this is done, be sure to prevent the powder from reaching inside link tubes, axle bearing

surfaces, etc. Also, remove powdercoat from bolt hole surfaces; the thickness of the coating will often prevent bolts from passing through holes.

Alignment

After the clip has been installed, the axle housing should be aligned temporarily until it can be taken to an alignment shop. Before making adjustments, be sure the vehicle is at its final ride height. AME designed ride height is obtained by adjusting the shock length until it reaches 13" between bolt centers.

Check to make sure the housing is centered in the vehicle and wheelbase is correct, then verify the pinion angle. To make changes, follow these simple rules:

3-Link Suspension Adjustments

Wheelbase: Adjust both upper and lower links simultaneously.

Squaring housing to vehicle: Adjust lower tubes individually until housing is square.

Centering housing in vehicle: Side-to-side adjustments are performed by adjusting the watts link tubes. However, be aware the Watts links should be of the same length for best performance, within 1/16".

Pinion angle: Adjust upper link.

Triangulated 4-Bar Suspension Adjustments

Wheelbase: Adjust both upper control arms simultaneously.

Squaring housing to vehicle: Adjust upper and lower control arm on one side to adjust square.

Centering housing in vehicle: Adjust upper control arms individually.

Pinion angle: Adjust lower links simultaneously.

Torque Specifications

<i>Location</i>	<i>Size</i>	<i>Torque lb-ft (Dry)</i>
Links	5/8" NF	42
Upper Coilover Mount	1/2" NF	22
Lower Coilover Stud to Housing	5/8" NF	79
Lower Coilover Stud Nut	1/2" NF	22
3 rd Member to Housing	3/8" NF	30

100-Mile Checkup

After the first 100 miles, please check these items:

1. All fasteners (including wheel lugs)
2. Brake fluid
3. Fuel lines
4. Brake Lines
5. Brake flex hoses
6. Battery cables (if applicable)
7. Exhaust system

The coil springs should also be checked and readjusted if necessary. New springs will typically settle once after several miles and typically do not require a second adjustment.



(Photo 1) Rail Removal: In this example, the frame rail is cut at the top radius using a plasma cutter. The remaining vertical section of the rail is then ground flush to the spot-welded strip using a 36-grit disc.



(Photo 2) Rail has been fully removed, but the spot-welded strips remain on the vehicle to save time. They may be removed if desired. This vehicle has had the factory inner wheeltubs removed at the same time in preparation to install Detroit Speed's wheeltubs.



(Photo 3) Access Holes: On triangulated 4-bar suspensions, 1.5" holes need to be drilled to gain access to the upper control arm bolt. Use the provided plastic plugs to seal the hole after the suspension has been installed.



(Photo 4) Preparation for Welding: Here the crossmember-to-pinchweld weld area is being cleaned with a fine disc.



(Photo 5) UCA Tube Clearance: If more clearance is needed, use a section of 1.5" or 2" tube to dent the area. Simply rotate the link until contact is made, then draw an outline of the tube to serve as a guide.