Installation Instructions for Stage III and V

Hot Rod Innovators FAT MAN FABRICATION by SOUTHERN Rod Shop

Mustang II IFS Kits

We highly recommend that you FIRST read these directions from beginning to end BEFORE you begin. Many things will become more clear as the work progresses, and much easier to understand when the entire process is considered. We also stand ready to answer any question on the phone at 864-848-0601 or email @ sales@southernrods.com

Step 1

This sheet is used for all our 150+ Mustang II applications, since all kits install in the same basic fashion. Every kit appears just a little different due to a particular frame shape and dimensions, but the installation procedure remains the same. We have written in specific notes where it's needed.

Step 2

Suspension parts based on 74-78 Mustang II or 74-80 Pinto/Bobcat are used including **ALL** attaching bolts and rack & pinion steering. Our hub to hub kits will include all the correct bolts for our own tubular control arms. The details of installing those arms are on a separate instruction sheet specific to them. Our kits will accept either 74-78 or 79-93 Mustang power racks. Be sure your rack is the standard ratio - 3 turns lock to lock. The later racks are far superior, with better road feel, fewer leaking problems, and easier to obtain. U joints are 3/4 - 36 (736) spline for either power rack. Power racks are occasionally used that have an input shaft with two angled flats rather than a spline, and those racks will need a 7V type U joint. 74-78 Mustang II outer tie rod ends are used in all cases.

Modifications to the P/S pump output pressure are seldom necessary, but cutting the pump's pressure relief valve spring (inside the output fitting) length by 1/3 can be helpful. Alignment at 4 degrees positive caster also helps. Good hose numbers are NAPA 7-1874 (with the upper end changed to match your pump) and 7-1880 for return. We have a real nice braided S/S hose kit to make the job even easier. Use only genuine power steering fluid, never automatic transmission fluid! Lucas makes a really good power steering additive that works well for a more quiet steering action.

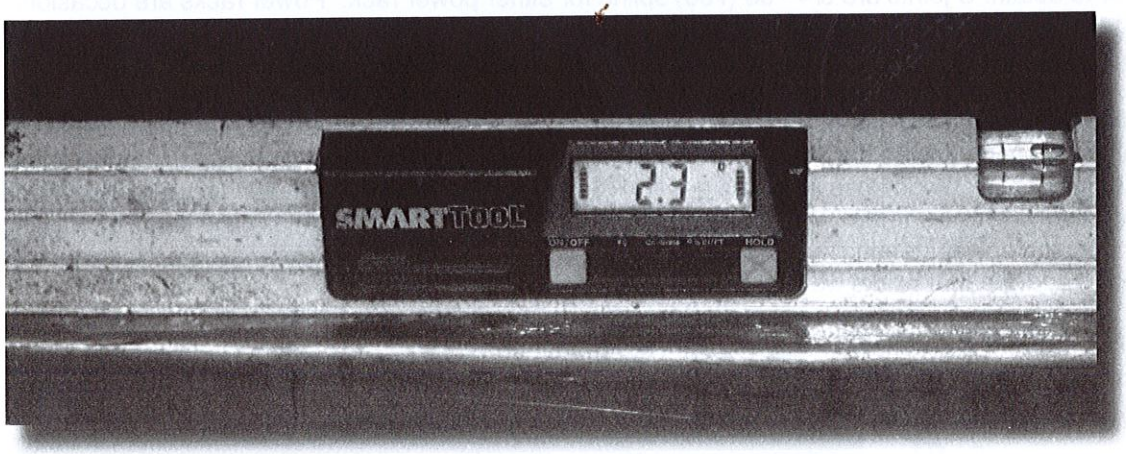
For kits using rack extension, disassemble RH inner tie rod and insert extension between the rack shaft and inner tie rod. A separate instruction sheet is attached for widened kits requiring that extension.

STEP 3

Set your car on jackstands at a point slightly forward of the firewall, or the extreme front. Remove all sheetmetal in the nose, and clean grease & paint, especially 6" ahead & behind the original centerline of the front axle. Check and shim as necessary to get the frame level side to side. **DO NOT SET IT LEVEL FRONT TO BACK!!!**

We've found that most hot rods set on a 2°-3° forward rake when finished, so we set up our frame, crossmember and shock towers based on that 3° rake angle. We've designed that angle into our kit, so you needn't be concerned with rechecking it. Remember that it's not the crossmember angles that determine caster, but rather the position of the upper ball joint over the lower.

Step 3 Shows our Install Shop Foreman and a customer setting the frame on stands, at the 2-3 degree forward rake we suggest. Note that the level is placed in the "belly" of the frame, about where the center post would be on a 4 door sedan.

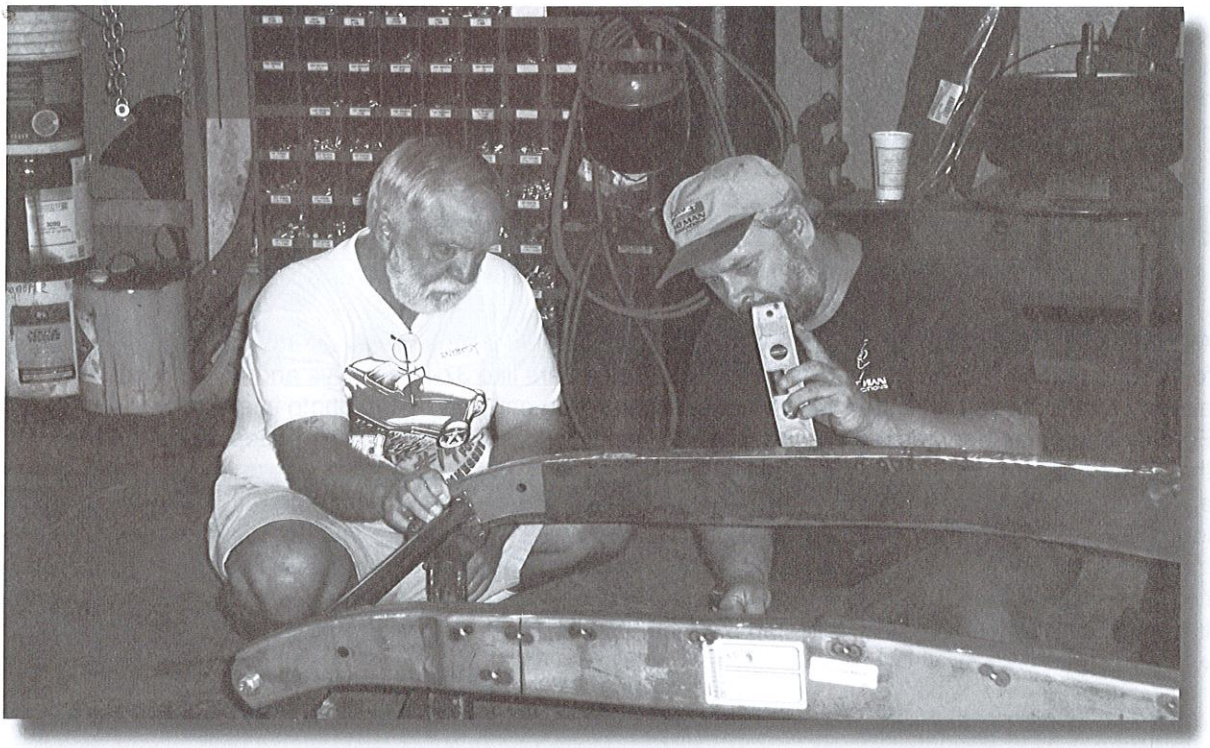


STEP 4

It's important that you establish the front axle centerline while the vehicle is fully assembled and loaded at ride height. Some cars ('36 Chevy Std. and 53-56 F-100 for example) look better with the axle centerline altered from its stock position. The main idea is to have the tire look correct in the fender. Once it is established, use a plub bob to mark the axle centerline on the floor and then transfer it to the frame rails.

Very carefully locate the front axle centerline and deeply punch at the outer, bottom side and top, inside of the frame rails. Be very accurate, as this determines the wheelbase. We provide builder's guides for the more popular vehicles to help you determine this point.

Step 4 *Marking the front axle centerline. In this case, see the vertical line thru the bolt hole.*



STEP 5

Add some temporary frame braces crossways on top & bottom at the front of the frame rail & recheck for level.

STEP 6

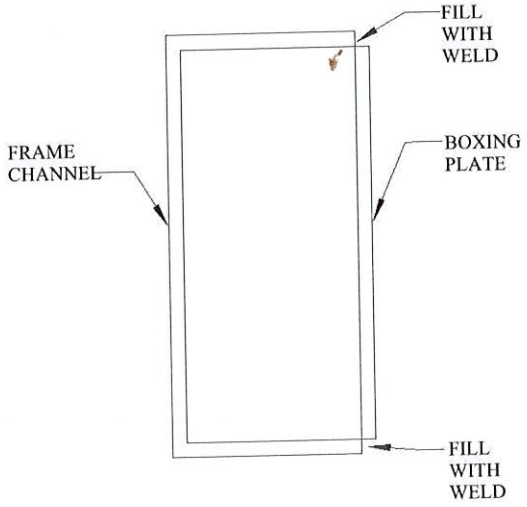
Some vehicles have radiator supports which can remain undisturbed (47-59 Chevy Truck, 42-56 F100, 41-48 Ford, 49-54 Chevy for example). Other cars have radiator mounts which can be trimmed, and remain in place (35-40 Ford, 37-46 Chevy Truck). Some mounts (34-48 Chevy) must be replaced with the mounts supplied in our kits. An exception would be 33-36 Mopar, whose radiator mounts are recreated using a section of 1 x 2 x .120 tubing set across the frame rails. Before remounting any radiator mounts, carefully measure and record their height, center to center distance, position from axle centerline, and angle. Use these dimensions to reset the radiator mounts, since their position directly affects hood fit. If in any doubt, set them a little low to allow more room for shim when refitting the hood. We will show the various types of radiator mounts in Step 11 as we finish the installation of this kit.

STEP 7

If your installation does require the stock front crossmember to be removed, do so carefully, being sure to maintain frame level. Drill the rivets through with drill slightly smaller than the rivet diameter, and the rivet heads will pop right off, and the shanks drive out easily.

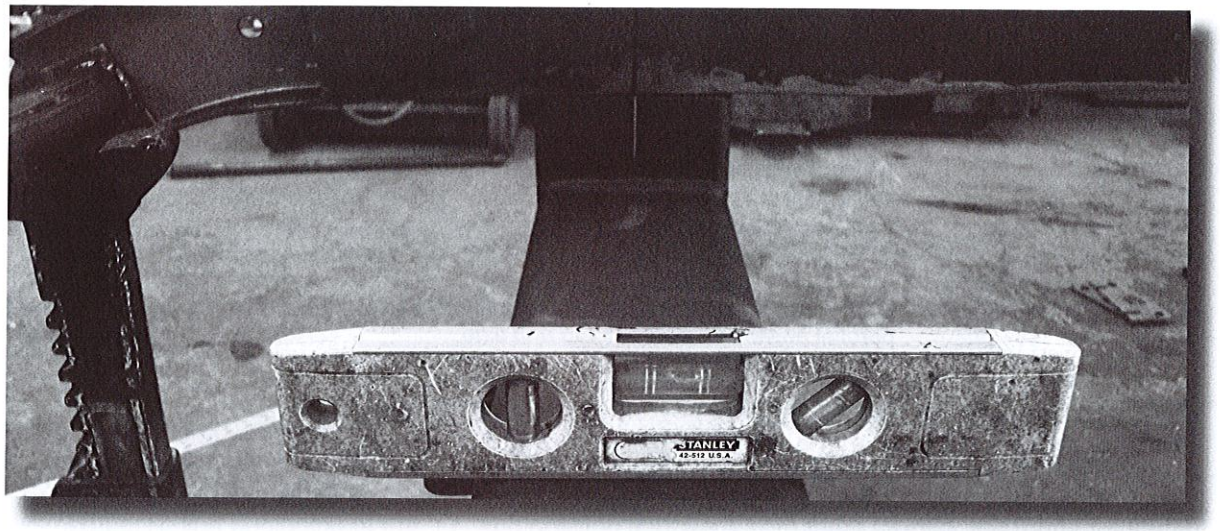
STEP 8

All channel frames (34-35 Chevy and 33-40 Ford for example) must be boxed from 4" inside the firewall forward to point 4" ahead of the axle centerline. Since cars like 37-54 Chevys and 41-48 Fords are already factory boxed, this step will be unnecessary. You can see by the photo in step 6 that the 33-34 Ford example has been boxed per the instructions. We do not supply boxing plates, since the reality is that frames differ enough that no one pattern will fit all frames properly, and we would not want to sell you an ill fitting part. You will want to obtain some 1/8" or 3/16" steel plate, tall enough to cover the frame, and long enough to carry the boxing thru the front radiator mount, and to a point just inside the firewall. An easy way to mark the boxing is to clamp it in place on the frame and then spray a little aerosol paint to mark the frame profile. The drawing below explains that you must construct the joint in a way that allows the weld to fill the corner gaps, allowing the weld to be ground for a nice radius without removing all the weld.



STEP 9

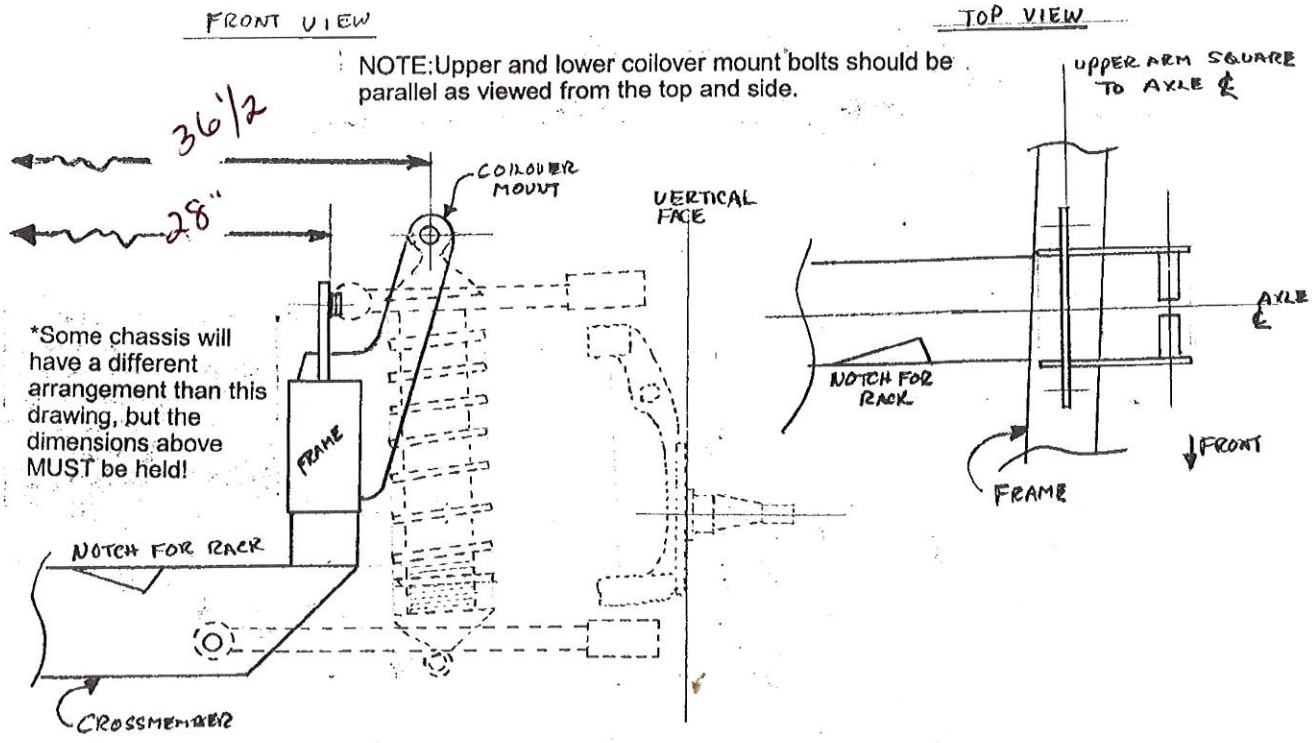
Clamp the new lower crossmember to the bottom of your frame rail, and carefully locate the axle center marks. Level the crossmember top side at this point. Since we are approximating the final chassis rake angle, you are OK if within 1 degree plus or minus of dead level. It's OK if there is a small gap between the crossmember and bottom of the frame rail…it happens with natural variations in frames. Also check for level with respect to the frame width, and check to see that the outer holes which mount the lower a-frame are equal distance from each frame rail. When it's right, weld in place.

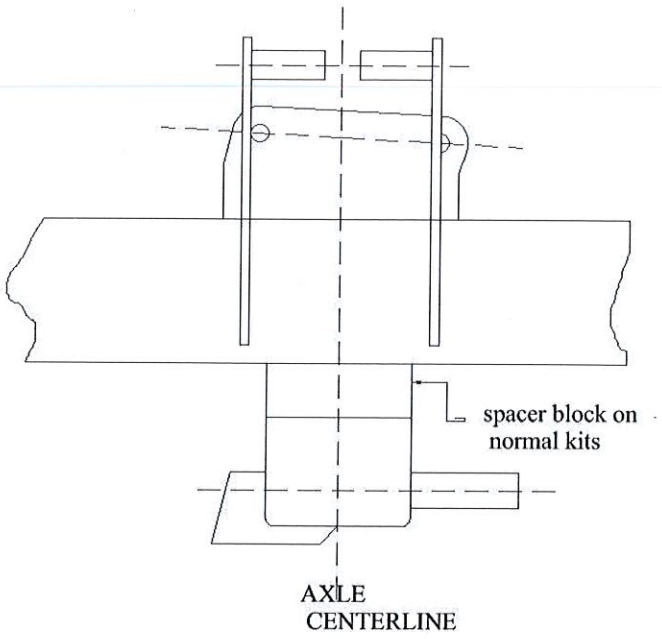


Cross leveling the top of the crossmember

STEP 10

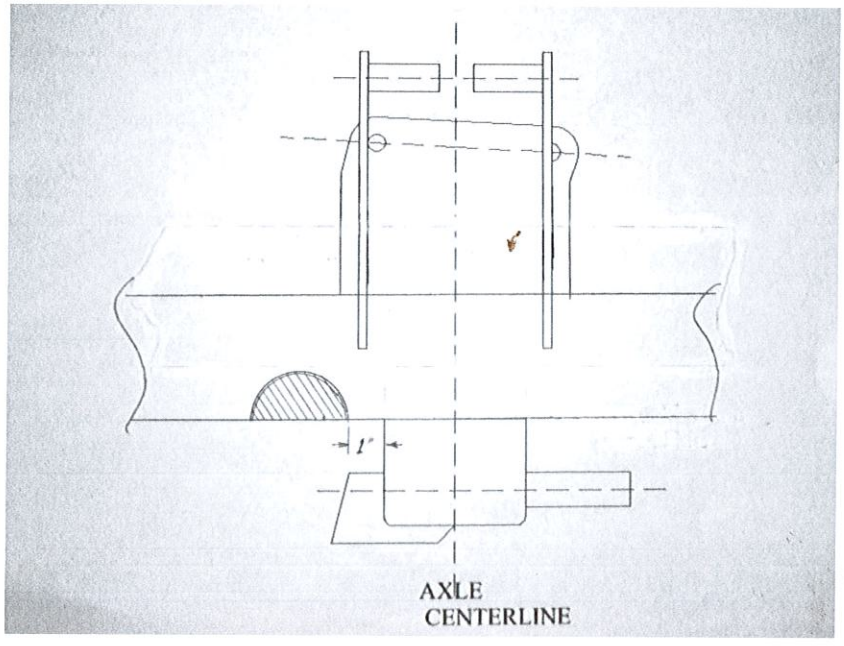
We'll continue with the upper control arm mounts (camber plates) and coilover upper mounts. The drawings below will apply to these next steps. Our example is a '49-'51 Ford frame stub, as assembled in our shop. We do these so often that we made a tool to hold the camber plates at their specified distance, 28" in this case. That dimension will be different for many kits, as written in the drawing below for your specific kit. The tool is simply a tube tapped to accept ½-20 bolts inserted thru the camber plates. You can do this as easily by marking the width on top of the frame rail, and then using a square to ensure that they are set dead vertical.

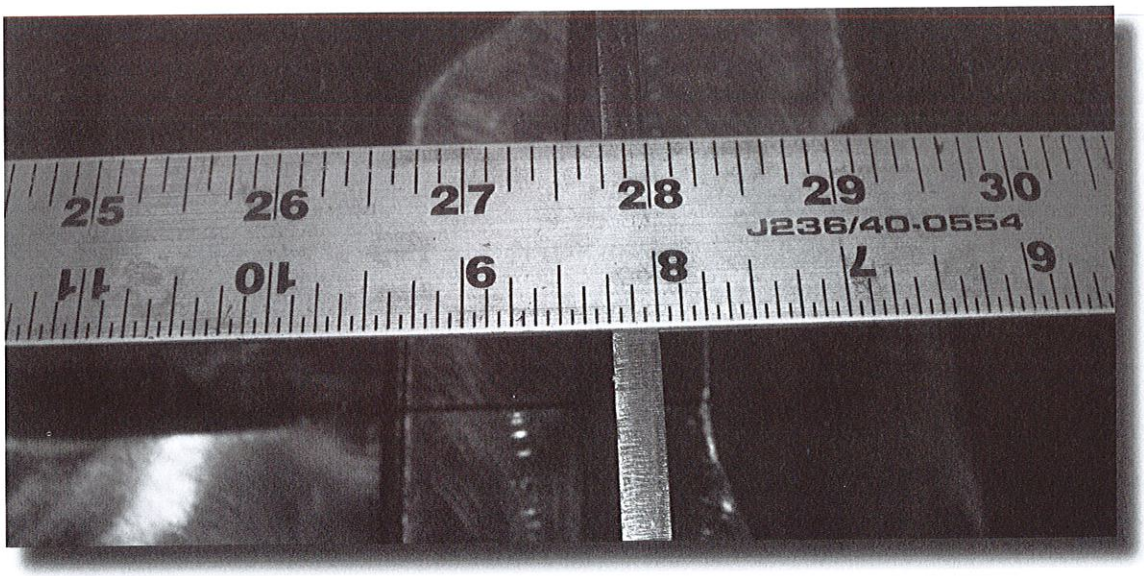




Ultra low kits and those with a crossmember spacer block less than 1 ½" tall will need the supplied "C" sections of tubing installed to clear the rack and pinion. Measure 1" ahead of the front side of our crossmember as the beginning of the "C", and position it forward from there to mark the frame for the cut. Check the position with the rack before cutting, and then make the cut and weld in the "C".

Rack "C" for Ultra Low Kits only

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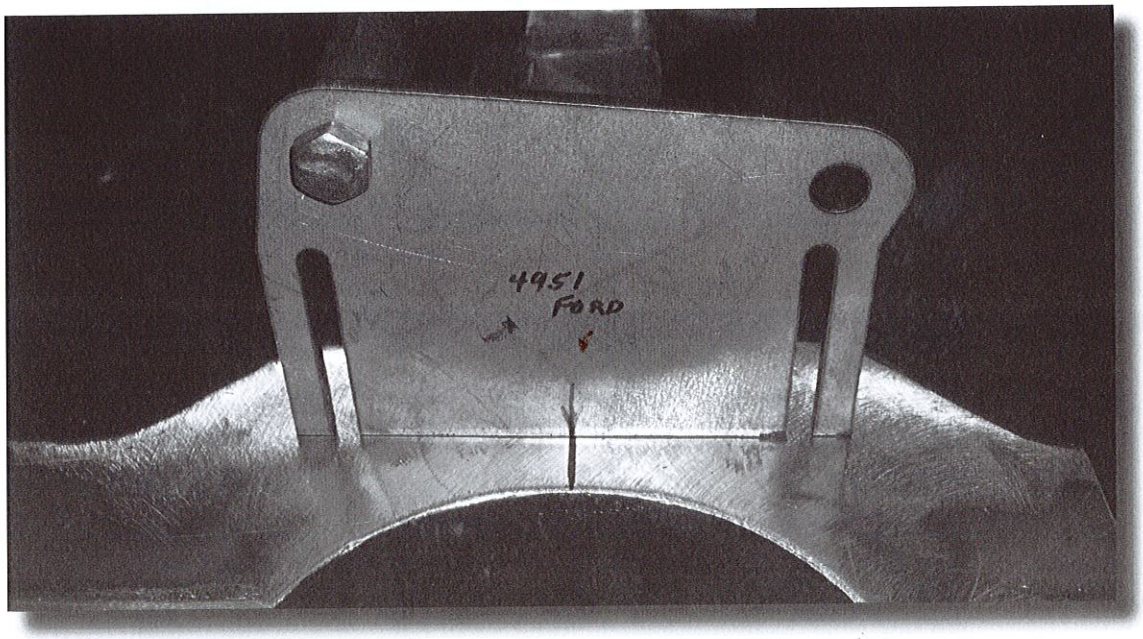
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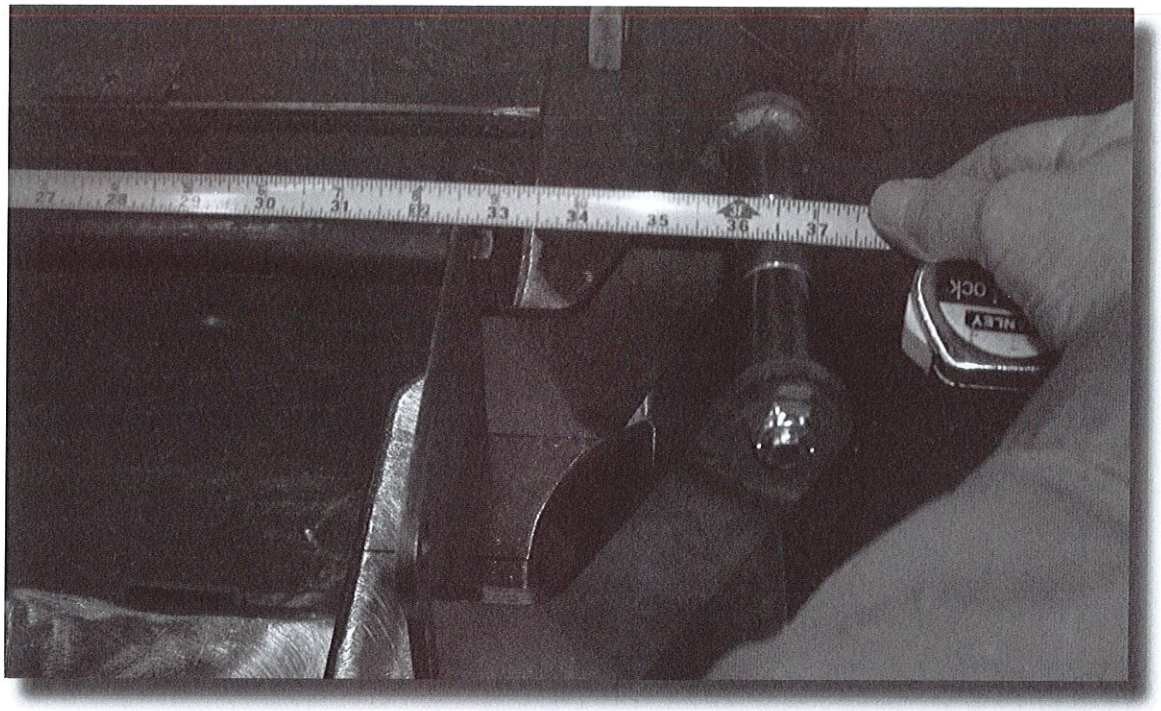
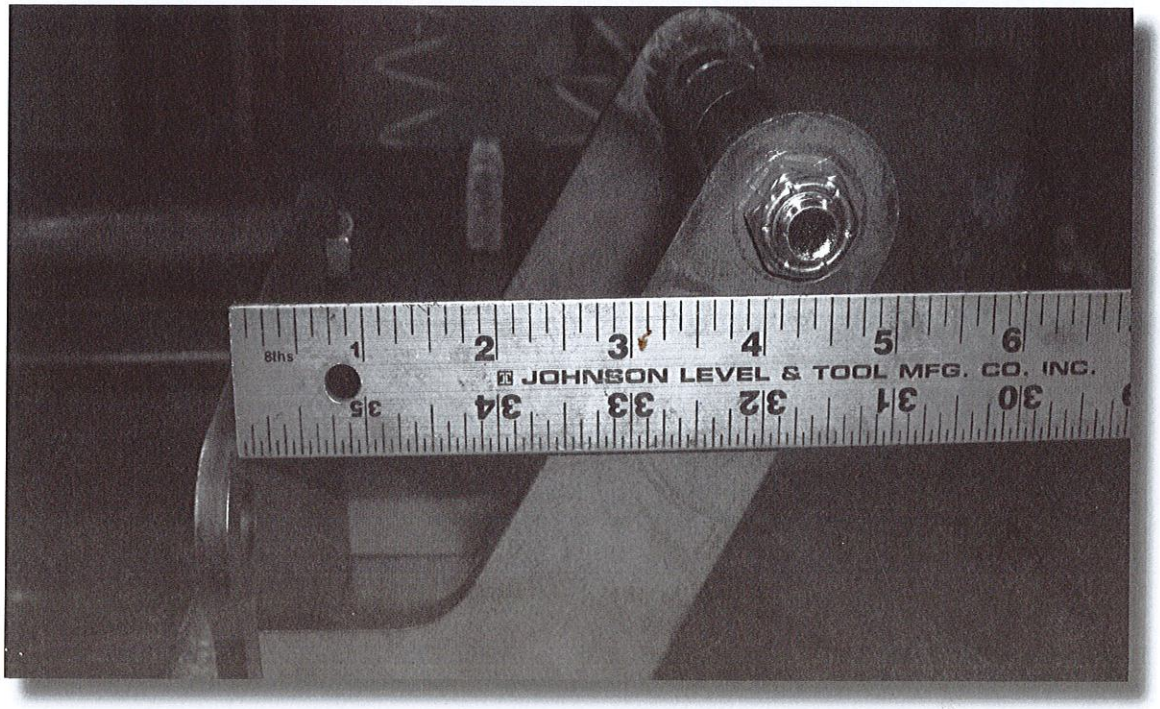
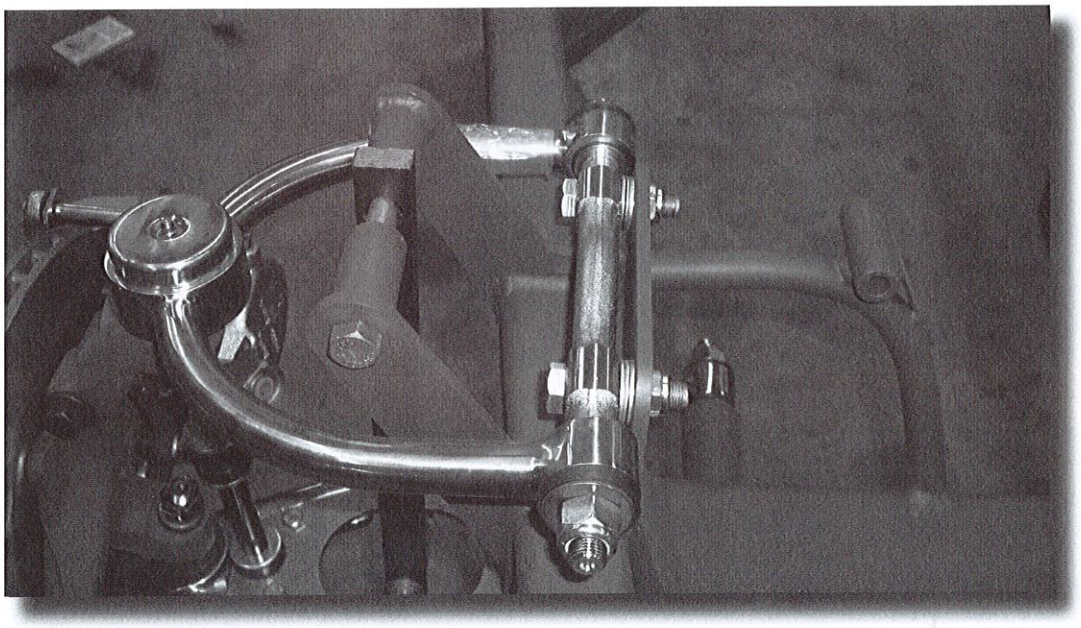
FORD

Now we will set up the upper coilover mounts. Refer to your instruction sheet drawings for the left to right dimension on these tops. Note that it will be 4 ¼" wider than the outside of the camber plates just set up in the last step. The slots in the camber plates will interlock with the tabs on the coilover mount.





Refer to these next photos to see how it should look as tacked up. The upper and lower coilover bolts will be perpendicular to the axle center line, and do not follow the angle of the frame rail. They will also be level (with the frame on the 2-3 degree rake we specified earlier) as viewed from the side. The upper control arm shafts will be raked lower to the rear, which is called the antidive angle. Viewed from overhead, they will be parallel to each other, but not following the taper of the frame. We developed our patterns from actual installations done in our own shop, but frames do vary. The important thing is to hold the dimensions noted in Step 10. If a little trimming of the brackets is necessary to get those dimensions, that's perfectly acceptable for a proper fit to your own frame. When it's right, weld it everywhere you can reach. Weld in short sections to avoid warpage.

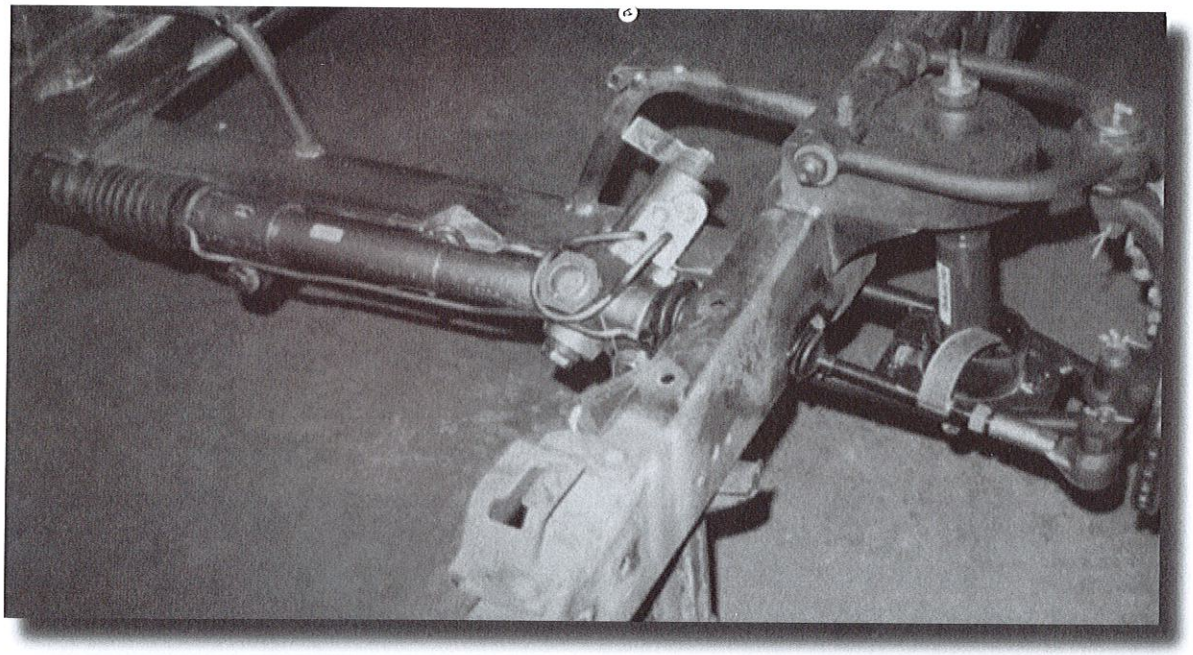


STEP 11

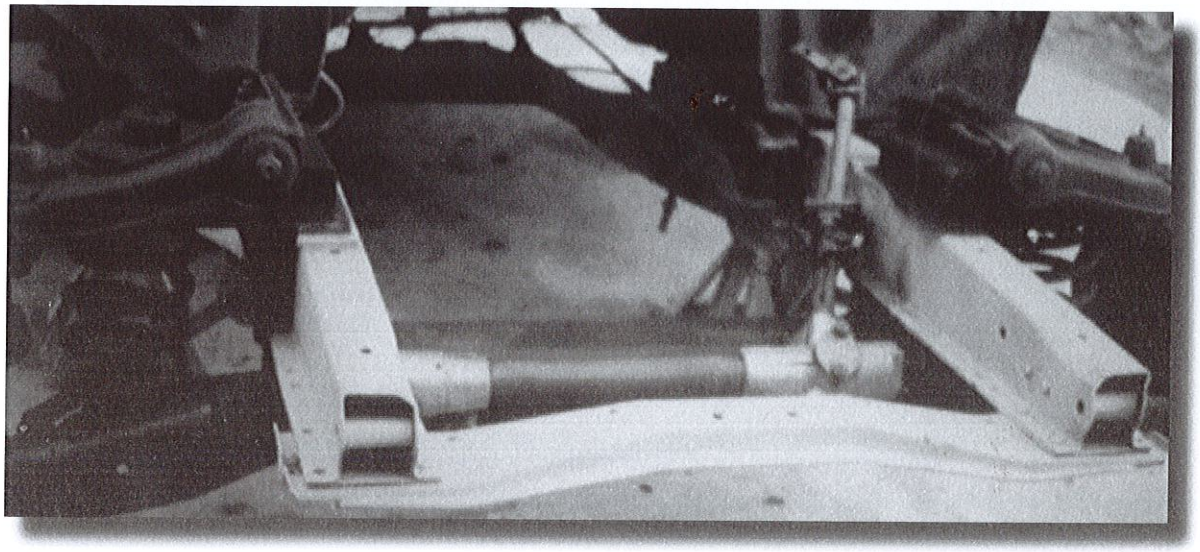
Step 11 deals with the different radiator mount arrangements. Below is a sampling of the different types. Cars which have their original radiator mounts removed will now have the mounts included in the kit installed per your measurements from step#6. Some Mopars (33PD, 34, 35, 36 all models) must use a piece of 1x2 box tubing set across the frame rails to duplicate their radiator mounts. We usually set our mounts 1/4" low as it's easier to add a shim than to remake a bracket.

These next five photos illustrate the easiest ones, where the stock radiator support is completely undisturbed by adding the Mustang II IFS kit. The mount is in a position where nothing interferes with using the stock mount.

55-59 Chevy Pick Up



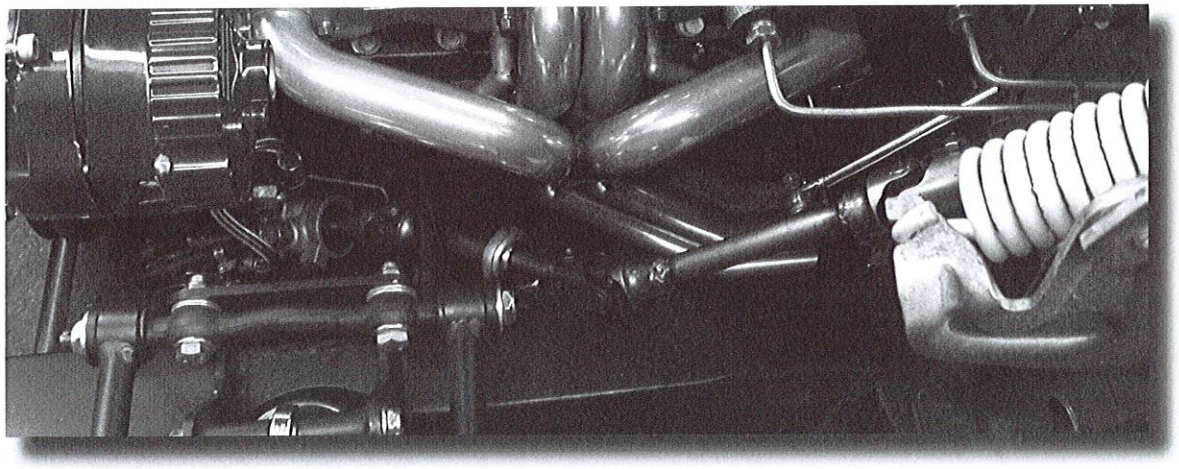
49-54 Chevy passenger



STEP 12

Some cars can have the steering connected by using just 2 U-joints. Most vehicles will require 3 U-joints, with a center bearing to get around the exhaust manifolds. We offer a nice kit with all the Borgeson Joints, shafts, and bearing to make it easy. Most pickup truck installations work well with block hugger headers or Ram's Horn manifolds. Most street rod applications do best with either Sanderson's block Huggers which keep the exhaust near from the block, and away the frame rail, or Hedmans ultra close block hugger headers,

A steering hookup example is shown below. It shows a 69 Camaro stub with our Stage III coilover suspension, but again, the basic design is pretty universal. We have this as a kit, supplying the proper U joints, shafts, and center bearing.

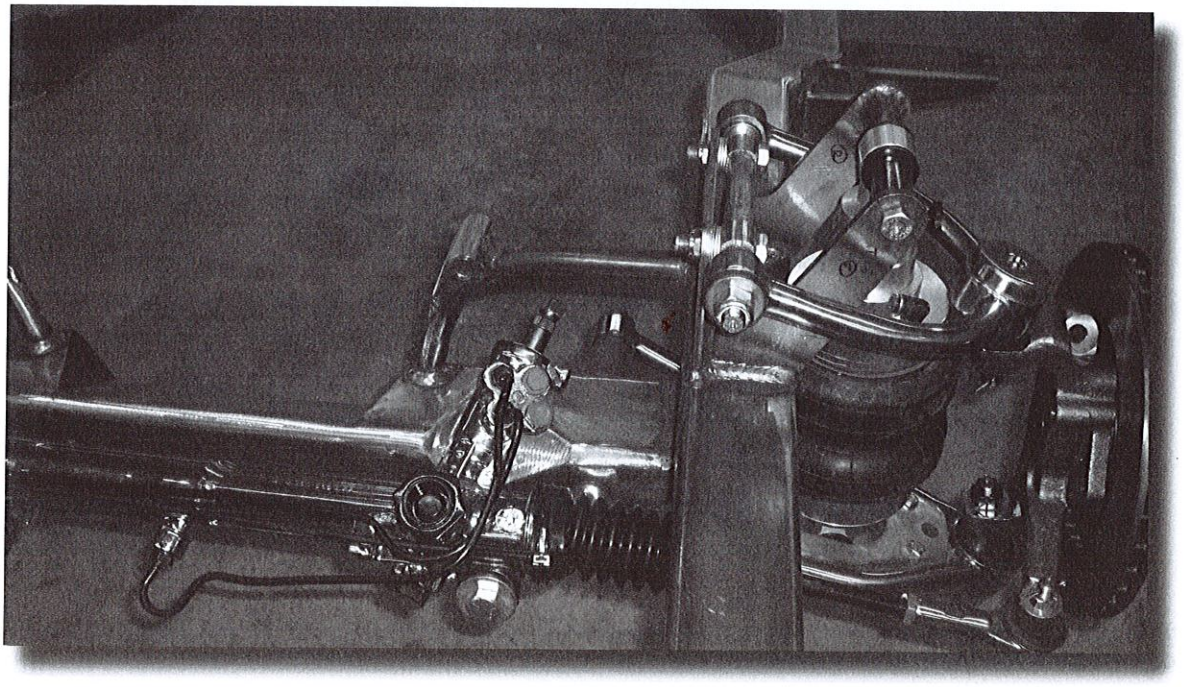


STEP 13

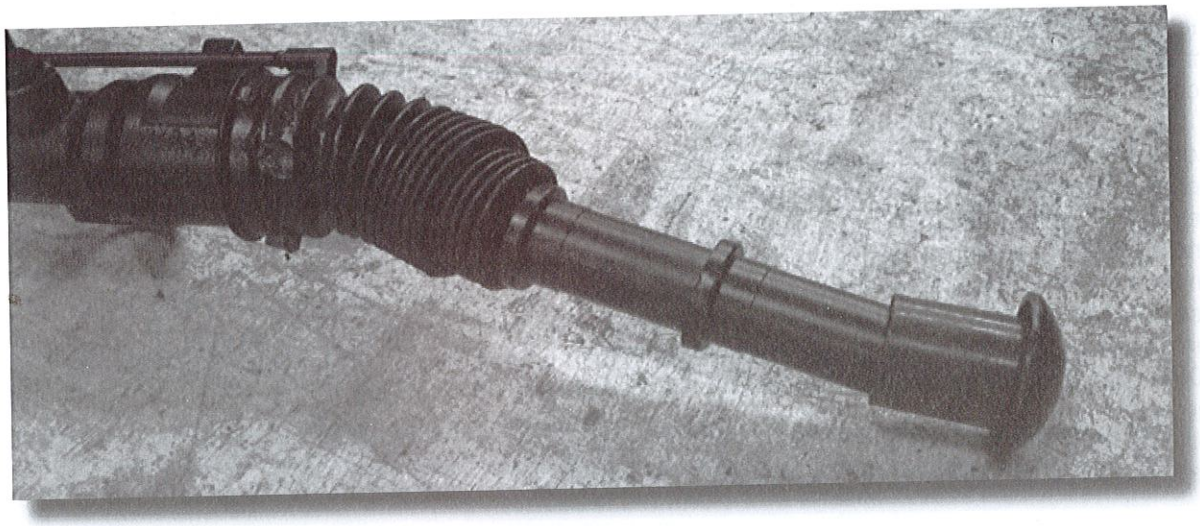
Now we are ready to mount the suspension components. Please accept our advice to use antisieze on all the bolts. Stainless steel has a great tendency to sieze, even when lightly assembled in mock up stages. The special instruction sheet for the stainless control arms goes into great detail for this part of the process. A little tip that aids installation of the upper control arms is to first insert the ½" x 2" bolts in the holes in the upper arm cross shaft, pointing in toward the center of the car. Three washers per bolt are then added to the shaft, spacing the cross shaft away from the camber plate. Then insert the bolts thru the camber plate, rotating the cross shaft to ease them in. The washers are supplied as a starting point for alignment. The drawings and the photo in #10 show the arms in place and will help clarify their proper position.

Add the coilovers (or Shockwaves) next, if the car is together. If the chassis will remain incomplete for a period of time, we find it helpful to leave the coilovers off for now. You won't be able to adjust your ride height until all the weight is on the car. This includes sheetmetal, radiator, bumpers, body, glass, interior and a complete engine. They just cannot be properly adjusted without ALL- ALL- ALL the weight in place on the car! Plus, they will be protected from weld spatter and overspray as you continue the build. We use a 14" length of ½" thick flat stock, with 5/8" holes drilled at 12 " centers to serve as a strut, supporting the chassis during the mock up stage, as shown in the photo at the end of step #10. When the car is 100% complete, we expect the coilovers (or Shockwaves) to have around 1 ½" of threads showing under the adjuster nut, and be 12" to 12 ½" tall, measured center to center of the eyes. That will put the lower control arm about level. That is critical so that the coilover shocks will neither bottom or top out in their travel. If allowed to run out of travel, parts will be damaged with handling and ride quality reduced greatly!

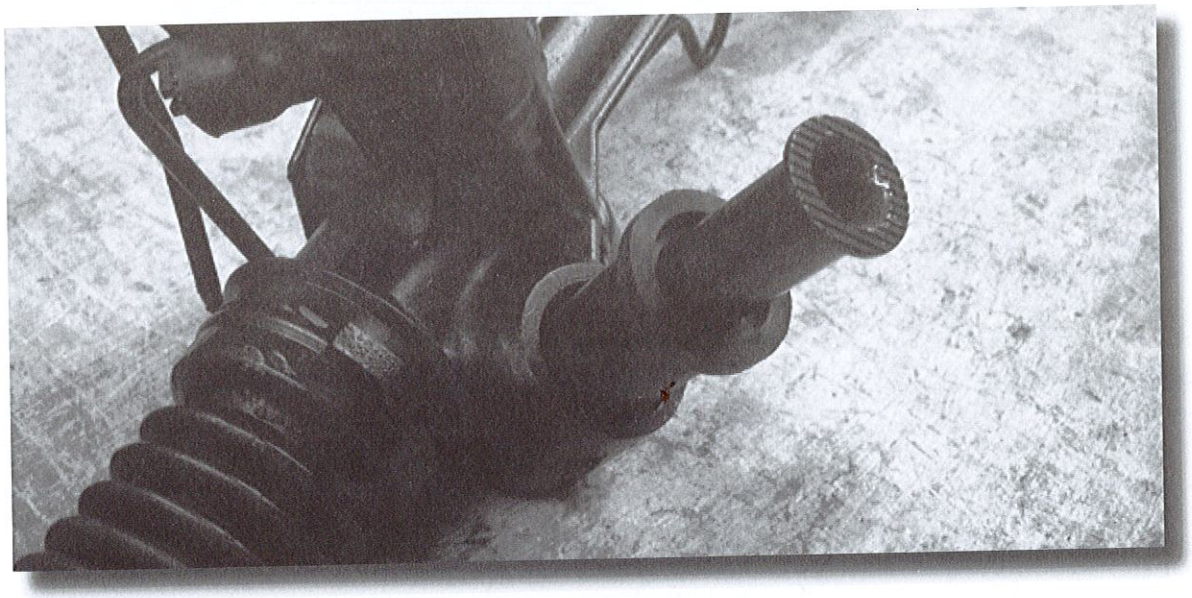
Shockwaves must be mounted with the air spring on the bottom, and the fittings on top, as shown in the photo below.



The rack and pinion will have its mounting bushings inside the rack box, with those bushings on the tie rods. The bushings install with the flange to the rear, against the crossmember. The easiest way to get them in place is to pull out the inner steel sleeve from the rubber bushing first. Then tap the rubber into the rack body, finally tapping the steel sleeve into place. If you are installing a widened kit, be sure to look at the enclosed instructions which explain how to install the rack extension.



Rack bushings shipped on the tie rod.



Pull out the steel sleeve out of the bushing, push the rubber bushing into the rack, with the flange in the rear side, facing the crossmember, then tap in the steel sleeve.

There are a couple other things installers often seem to miss when reading the instructions. With Chevy pattern disc brake kits, the instructions tell you that the GM bearing races must be removed, and the races packed with the supplied A-12 and A-13 bearings installed. If you don't, the rotor will sit too far out on the spindle, and the cotter pin hole will not be accessible.

The control arm instructions explain that the lower ball joint requires a spacer we supply to raise the castle nut enough so that the nut can be securely tightened against the ball joint boss on the spindle.

The additional 5/8 hole you see on the plate is for the sway bar link, if used.

STEP 14

Remount the front sheet metal, cutting out the inner splash shields to 1" clearance around your new suspension. It's often easier and prettier to make new inner splash shields from steel or aluminum, with a few louvers for style.

STEP 15

Bleed the brakes, check the steering for strength and smoothness, and enjoy a low, smooth ride!

The basic in-shop alignment spec. is 1/8" toe-in, 1/2° positive camber, and 1° caster for manual racks. Use 3°- 4° positive caster with power racks. Again, use only genuine power steering fluid.

Here's Some Handy Part Numbers

Brake Hoses

NAPA #36959 fits '85 Buick Riviera front, and accepts 3/16" hard line. This hose is 17" long, and works well on almost any front disc setup. Discard the steel bracket on the hose. It accepts a metric banjo (hollow) bolt at the caliper, and fits non-metric calipers by simply passing a 7/16" drill thru the caliper end block. An excellent rear hose is NAPA #36799 which comes from '75 Jeep CJ-5. It is 17" long, and accepts 3/16" hard lines. Metric Banjo bolt is NAPA #82703, while the 7/16" - 20 thread version is #82698.

Mustang II Power Steering Hoses

The smaller line is the pressure side. Both O-ring and flare fittings are used, and most rebuilt racks include adapters to use flare fittings, which we prefer. With a standard GM P/S pump, use NAPA 7-1874 pressure and 7-1880 return lines for rack using O-Ring fittings. See the notes in the back of our catalog regarding swivel O-Ring fittings. For 74-48 style flare fittings, use Gates pressure hose #35637 and #35287 return.

Mustang II Springs

NAPA #277-3039 ('74 MII 4 cyl. w/o air) 33-34 Fords, 33-35 Chevy. NAPA #277-3036 ('78 MII 6 cyl. w/air) 34-48 Fat Fender Cars. NAPA #277-3038 ('78 MII 8 cyl.) 50's cars and pickups. NAPA #277-3060 ('84 Mustang 5.0) Very Heavy Engines in 50's & 60's pickups - 460, 454, HEMI. (Above assumes small block engines, go up one step for any big blocks.)

Motor and Trans Mounts

Small black Chevys use NAPA #602-1054 motor mounts. Big Block Chevys use #602-1127, with all GM trans using mount #620-1031. That GM trans mount is easily adapted to Chrysler transmissions. Ford Small blocks use #602-1152 motor mounts and #620-1040 trans mount. Cleveland engines can use NAPA #602-1151. The 429-460 work well with #602-1694/1695 and a #620-1058 trans mount for the C-6.