READ ALL INSTRUCTIONS COMPLETELY AND THOROUGHLY UNDERSTAND THEM BEFORE DOING ANYTHING.
CALL CHASSISWORKS TECH SUPPORT (916) 388-0288 IF YOU NEED ASSISTANCE.

INSTALLATION GUIDE

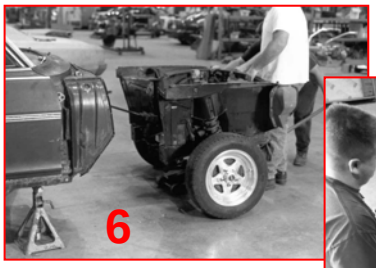
CHRIS ALSTON'S Chassisworks
THE HOME OF HIGHER TECHNOLOGY

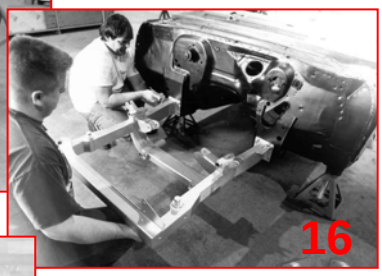
7700
Bolt-On g-Machine Front Clip
1962-67 Chevy II

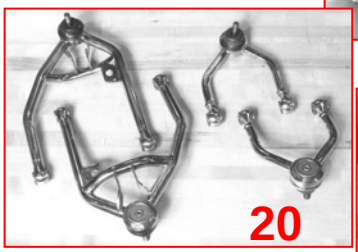
Description: A-arm front clip bolt-on for 1962-67 Chevy II. Includes welded front frame clip, inner fender panels, upper hinge mounts, upper and lower A-arms, spindles, coil-over shock and springs,billet rack and pinion, billet rack and pinion mounts, ties rod ends, disc brake kit, engine mounts, and transmission mount installation instructions.

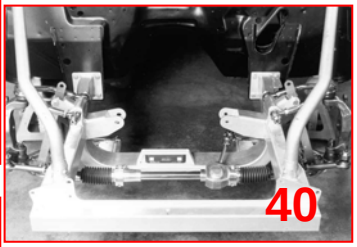
INSTALLATION GUIDE

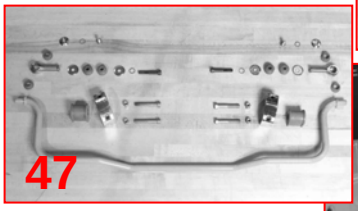
62-67 Chevy II Bolt-On A-Arm Clip

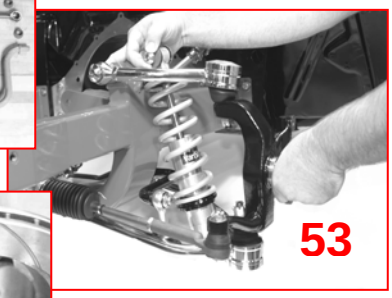


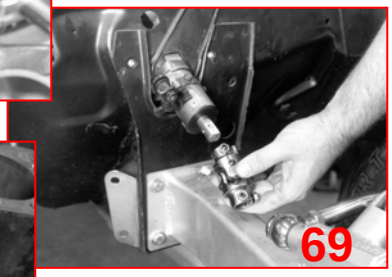


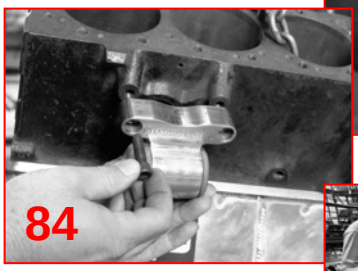


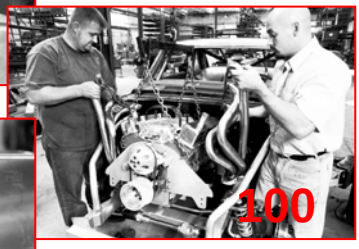












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CONGRATULATIONS

You have purchased the finest bolt-on Chevy II front frame available. We hope you are as excited about installing it as we were about designing it.

This assembly booklet should guide you through a seamless installation. However, if you have any questions please give our tech line a call at (916) 388-0288. Monday through Friday 7:00 a.m. to 5:00 p.m., Saturday 8:00 a.m. to 1:00 p.m. PST.

Every effort has been made to insure that each component has been boxed correctly. However, we urge you to open each box and verify its contents against the enclosed parts list.

We also suggest that you read this entire assembly booklet before you begin. This will help you become familiar with the project.

Please remember that when you modify a vehicle, you assume all risks. You are changing the structural integrity manufactured into the original vehicle. As such, you need to be cognizant of potential failures. Initially you must conduct a series of short tests in a safe location. Test for handling, steering, and braking at slightly increasing speeds.

Once you are confident the vehicle handles and stops properly, take a series of drives with slightly increasing speeds stopping to check all components. Gradually increase the distance of your drives. Once you have confirmed your installation is road-worthy, you must develop a maintenance program. You must check all components for looseness, and wear and tear on a regular schedule. Your schedule must be more intense and frequent than a regular OEM vehicle.

Chris Alston's Chassisworks would appreciate any feedback regarding your experience during installation and use of this frame.

That said, let’s install!

Recommended Equipment List

This list will give you a good idea of the necessary tools required to complete this installation. There will be additional items needed.

Hand Tools

- Adjustable wrench
- Allen wrench set
- Anti-seize compound
- Brakeline wrench
- Center punch
- Clecos & pliers 3/16 size
- Combination wrenches 3/8 to 3/4”
- Dial caliper
- Drill bit size #21(.159)
- Level
- Loctite #242 thread lock
- Philips screwdriver sizes #1 & #2
- Pry bar
- Rotary wire brush
- Socket set 3/8 to 3/4” with 3/8 drive
- Spot weld remover with 7/16” bit
- Steel & plastic head hammers
- Straight blade screwdriver
- Swivel pad vise grip clamps
- Tape measure
- Tap handle small and medium
- Tap sizes: 10-32, 3/8-16, 7/16-14, 1/2-13, 5/8-18

Shop Equipment

- Floor jack
- Jack stands –quantity 5
- **Digital level**
- Steering wheel puller
- 4 1/2” disk grinder
- 3/8” electric drill

Torque Specification Chart

DESCRIPTION	*TORQUE*
A-arm pivot studs	50 lb-ft
Antiroll bar clamp socket head allens 3/8-16 x 2 1/2”	20 lb-ft
Antiroll bar link eyebolt button head allen 3/8-16 x 3/4”	20 lb-ft
Antiroll bar link eyebolt socket head allen 3/8-16 x 2 1/4”	20 lb-ft
Balljoints	150 lb-ft
Balljoint studs	105 lb-ft
Caliper socket head allens 3/8-16 x 1 3/8”	30 lb-ft
Frame mounting bolt 7/16-20x 1 1/2”	45 lb-ft
Forward strut to firewall 3/8 x 2” button head allens	20 lb-ft

DESCRIPTION	*TORQUE*
Gemini connector socket head allen 5/16-24 x 1 1/4”	25 lb-ft
Motor mount spuds	20 lb-ft
Rack clamp socket head allens 1/2-13 x 2”	45 lb-ft
Rack clamp caps socket head allens 5/16-18 x 1”	15 lb-ft
Shock spuds	20 lb-ft
Shock bolts 1/2-20 x 2 1/2”	45 lb-ft
Tie rod stud	60 lb-ft
Wheel studs 1/2-20 x 2 1/4” 12 point	40 lb-ft

We recommend applying a small amount of Loctite™ on all fasteners except the balljoint studs, and the tie rod studs.

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Before any attempt at installation, all drawings and/or instruction sheets must be completely reviewed to determine the suitability of the product for its intended use and that the buyer has the skills required to install and maintain the product. Buyer assumes all responsibility and risk for correct installation. CHRIS ALSTON'S CHASSISWORKS, INC., accepts no responsibility for failure to read, or understand the installation guidelines. All products are intended for racing or off-road use and may not be legal for highway use. The information contained in this *Installation Guide* is correct to the best of our know-ledge and belief, having been compiled from reliable sources. However, CHRIS ALSTON'S CHASSISWORKS, INC., cannot assume responsibility for possible error. BUYER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF ANY AND ALL PRODUCTS PURCHASED FROM CHRIS ALSTON'S CHASSISWORKS, INC.

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Frame and Sheet Metal Hardware List

#3040 (1962-1695) or #3041 (1966-1967) Bolt-On Frame Hardware Box

QTY	PART	DESCRIPTION	WHERE USED
8 8 16	3134 3208 3254	Bolt 7/16-20 x 1½ hex head cap screw Locknut 7/16-20 nylon insert 7/16 washer 1/2 x 1 1/8 stainless	Attaches frame clip to cars lower firewall mount plates. Place flat washer on front and backside of the mounting plates. Do not substitute these fasteners; this is a high stress area!
6 6 6	3436 3249 3253	Button head allen 3/8-16 x 2 stainless Internal tooth lock washer 3/8 stainless 3/8 washer 25/64 x 1 stainless	Attaches the upper strut plate to the firewall. Place the lock washer on the button head allen first and then the flat washer.
8 8	2040 2041	Firewall shim forward strut (1962-1965) Firewall shim forward strut (1966-1967)	Used to shim the upper strut mount the correct distance from the firewall for correct fender alignment.
4	3432	Socket head allen 5/16-24 x 1 ¼	Clamps Gemini connector together. Do not substitute this fastener it is designed for this high stress area.
6 6 6	3413 3250 3212	Button head allen 10-32 x 5/8 stainless #10 washer 7/32 x7/16 stainless Locknut 10/32 stainless steel	Attaches radiator core support to the frame front crossmember at the bottom on the engine side.
9 9 8	3430 3252 3244	Button head allen 5/16-18 x 3/4 stainless 5/16 washer 11/32 x 7/8 stainless Locknut 5/16-18 stainless steel	Use six button head allens, nuts, and washers to attach the radiator core support to the frame crossmember. Two additional button head allens, washers, and locknuts are for the upper radiator mounts. The last button head allen and washer are used to mount the center grille support to the frame crossmember.

6650 (1962-1695) or #6652 (1966-1967) Hinge Mount With Upper Fender Panel

QTY	PART	DESCRIPTION	WHERE USED
14 14	3252 3429	Stainless 5/16 washer 11/32 x 7/8 Button head allen 5/16-18 x 5/8	Front fenders to hinge mounts & hinge mounts to radiator core support upper front corners.

6651 (1962-1965) or #6653 (1966-1967) Aluminum Inner Splash Panels

QTY	PART	DESCRIPTION	WHERE USED
6 12 6	3429 3252 3244	Button head allen 5/16-18 x 5/8 Stainless 5/16 washer 11/32 x 7/8 Locknut 5/16-18 stainless	Attaches the aluminum inner splash panel to the radiator core support. Place one washer under the button head allen, a second goes on before the locknut.
32 50 46	3413 3212 3250	Button head allen 10-32 x 5/8 Locknut 10/32 stainless Stainless #10 washer 7/32 x 7/16	Fifteen 5/8” button head allens, washers, and locknuts attach the rubber splash boot to the aluminum inner splash panel. Place the washer under the nut against the rubber boot when installing. Two spare 5/8” button head allens are in the kit.
34	3400	Button head allen 10-32 x 1/2	Twenty 1/2” button head allens and locknuts attach the aluminum inner splash panel to the hinge mount. The other twelve 1/2” button head allens and washers attach the inner panel to the frame rail. Use #10 washers where the inner panel bolts to the frame rail. Two spare 1/2” button head allens are included.

Removing Stock Front Clip

The first step is to set the car on jack stands making sure it is level front to rear and right to left. Place the jack stands under the rocker panel at the front and rear. *The car must be supported on the rocker panels, not the unibody.* Use the rocker panels as your leveling point.

A fifth jack stand at the rear panel is required to keep the car from tipping back when the front end is removed.

Be sure the car is stable before proceeding.

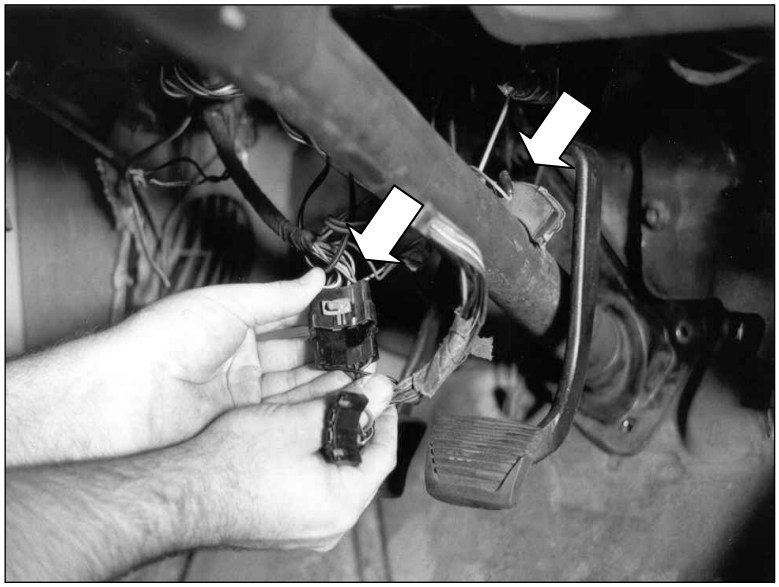
On 1967 models you will not need to remove the column in the car.
Simply disconnect the column from the steering box in the engine compartment.

Next, remove the steering wheel and steering column from the car.

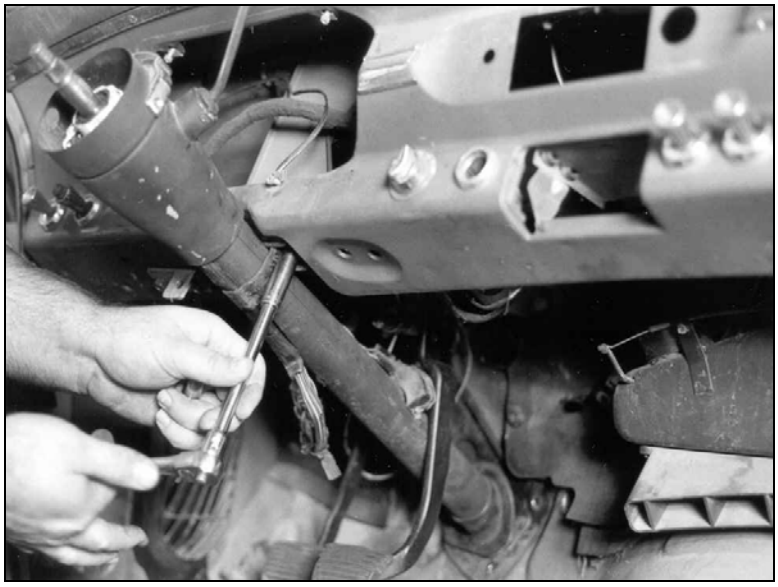
Start by removing the steering wheel. An inexpensive steering wheel puller makes this task easier.

Be careful not to damage any of the column components, you will be reinstalling them later.

There are three bolts holding the lower column-mounting boot to the floor. Remove these bolts and place them in a bag labeled “steering column.”



There are two electrical connectors that need to be unplugged. The first is the turn signal switch (shown in lower part of photo). The second is the neutral safety/back-up light switch (upper part of photo). Once unplugged, the steering column is ready to be removed.



Next, remove the two bolts used to secure the steering column clamp to the underside of the dash. The column should now be loose.

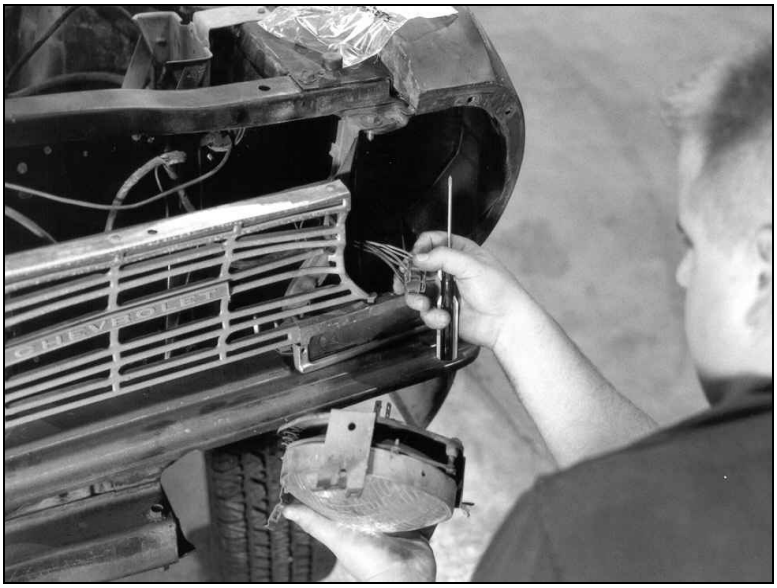
Now the column itself can be removed. Carefully pull it out. Watch to be sure all the wiring is free and it does not get caught on the brake and clutch pedals while removing.

Note that the steering shaft will remain in place; it is attached to the steering box.

Now you will go to the outside and start by removing the hood. A second set of hands will make this easy. It is not important to mark the hinge location on the hood, because it will have to be realigned during reassembly. Once it is removed, set it aside. Put the bolts in a bag labeled "hood hinge bolts."

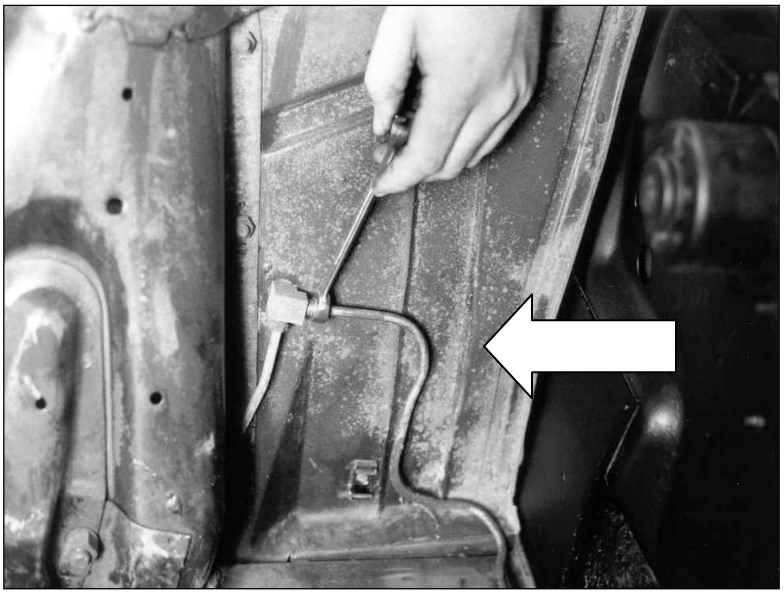
With the hood gone, it is time to remove the hinges. They are attached to the inner fender panel with two bolts on each side. Save these bolts in a bag labeled "hood hinge bolts" for use during reassembly.

Next, drop down under the car and remove the bolts holding the bumper brackets to the frame. There are two on each side. There is no need to remove the bumper brackets from the bumper. Again, put these bolts in a bag labeled “bumper bolts.”



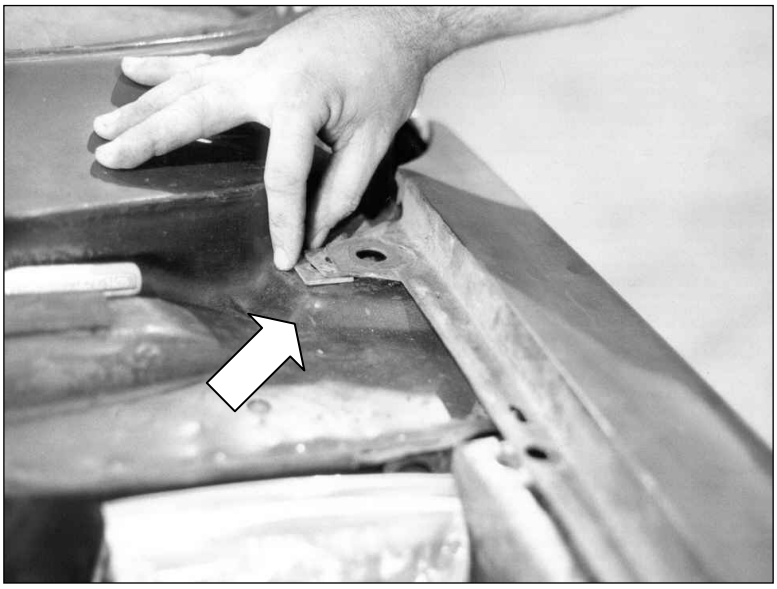
Remove all of the screws holding the headlight assembly in place. Once you have disconnected the wiring, bag the screws and set everything aside for later reuse. Use a bag labeled “headlight fasteners.”

The grille, hood latch, lower pan, and mounting bracket can now be removed as one piece. There are seven bolts holding the assembly on. Two on the hood latch, two at the top front of the fenders, two below the splash pan near the radiator, and one on the lower core support crossmember. All of these fasteners will be reused. Put them in a bag labeled “grille bolts.”



Disconnect the brake lines from the “T” fitting mounted to the inner fender panel. This is an inverted flare fitting. Using a brake line wrench works best to avoid damaging it.

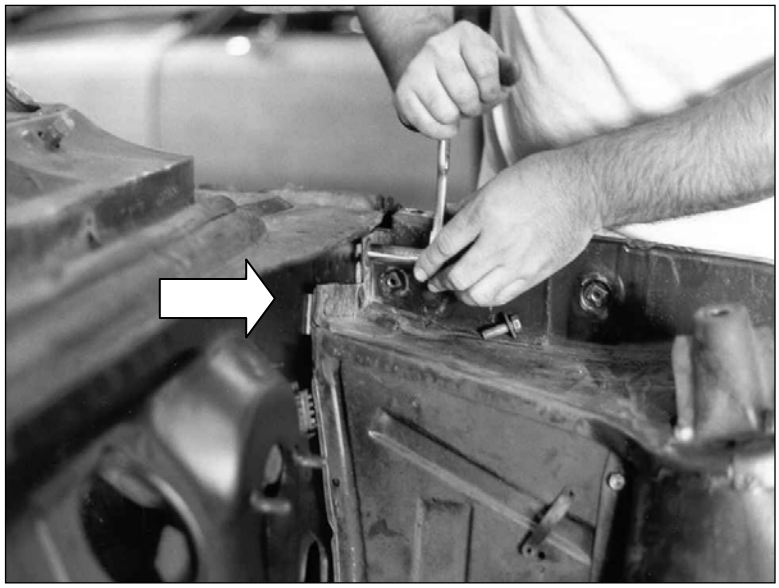
Unplug the electrical wiring harness at the firewall. Once it is unplugged you can remove the entire wiring harness from the front end, set it aside for use later.



Now it's time to remove the outer fender panels. Remove the fender bolts and save the shims under the bolt located closest to the cowl on each side. Place these in a bag labeled “fender bolts.”

One bolt secures the lower front lip of the fender to a strut that is mounted to the radiator core support (visible between the fender and the tire). Another bolt holds the lower rear fender panel just in front of the door. Two more are found underneath the car. Remove these and the fender is free and ready to stack with the other parts.

Now you need to prepare to remove the entire front clip. Start by cutting a piece of wood 4x4 to fit under the frame. With the help of a floor jack, it wedges in place in front of the drag link/tie rod assembly and behind the lower suspension control arms.



There are three bolts securing the top of the front clip to the firewall at each side. After removing these bolts, the shims between the frame and the firewall should slide out fairly easy.

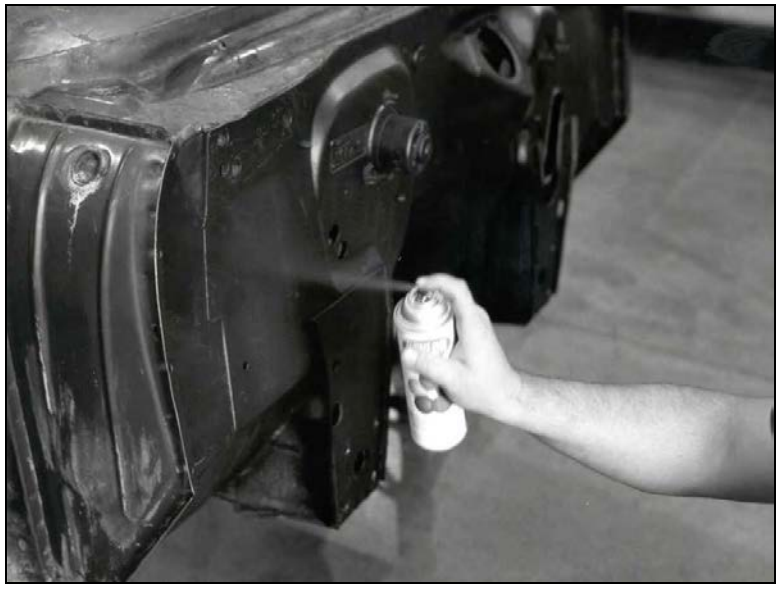
Label these shims to identify which side they were on, then place them in a bag labeled “front clip shims” and set aside. They will <u>not</u> be reused on your new Chassisworks front frame, but will be measured for total thickness and replaced with the custom shims included in the kit.

Removing the four bolts at the bottom of each side of the front clip is all that remains to separate the nose from the car. At this point, have an assistant on hand to keep the front end stable until you can get out of the way.

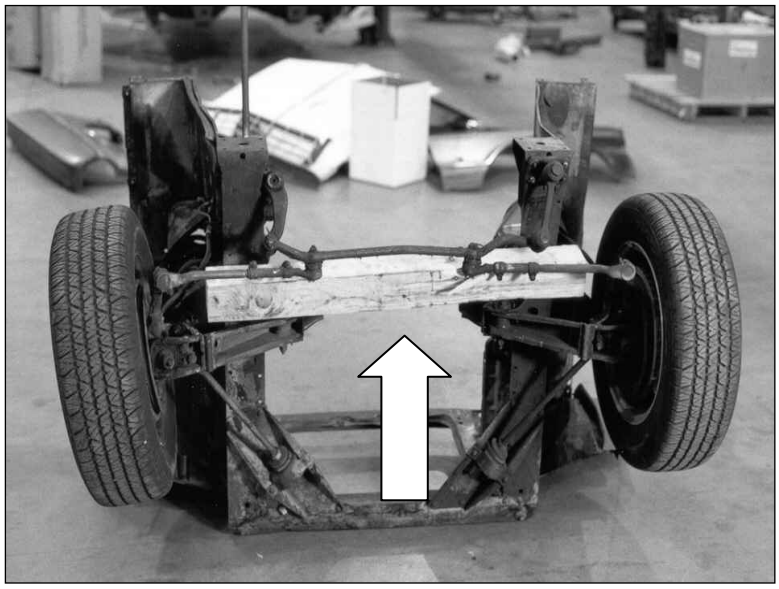
You are now ready to remove the clip from the car. Check to make sure all wiring and lines are disconnected.

Have one person steady the front clip and the other work the jack to make rolling it away from the body simple.

The steering shaft will remain with the nose of the car. Be careful when pulling the front clip away to avoid damaging the shaft, it will be reused with the new front suspension system.



With the front end off, this is a good time to clean up and paint the car's firewall in preparation for installing the new front clip assembly.

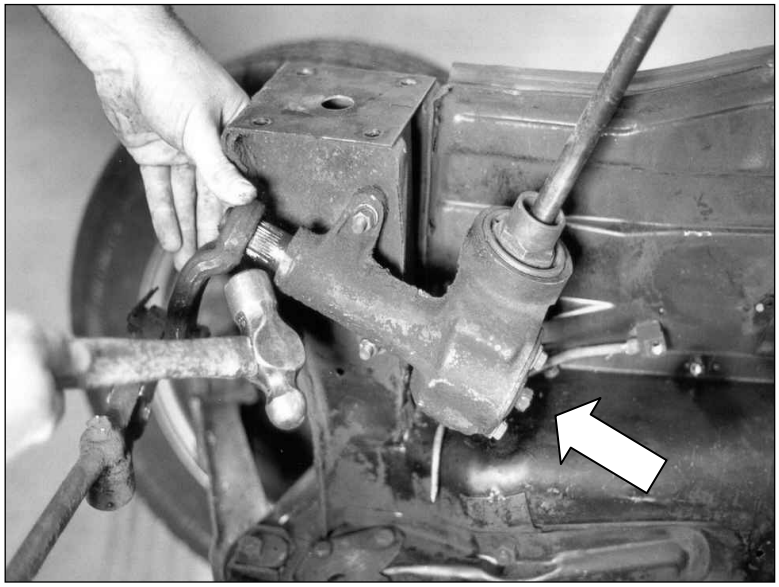


Here is the stock front end set nose-down on the shop floor, with the other pieces that have been removed in the background. The wood 4x4's suggested location is also clearly visible. This position facilitates the removal of the steering shaft.

The steering box has to be disassembled to remove the steering shaft from the steering box.

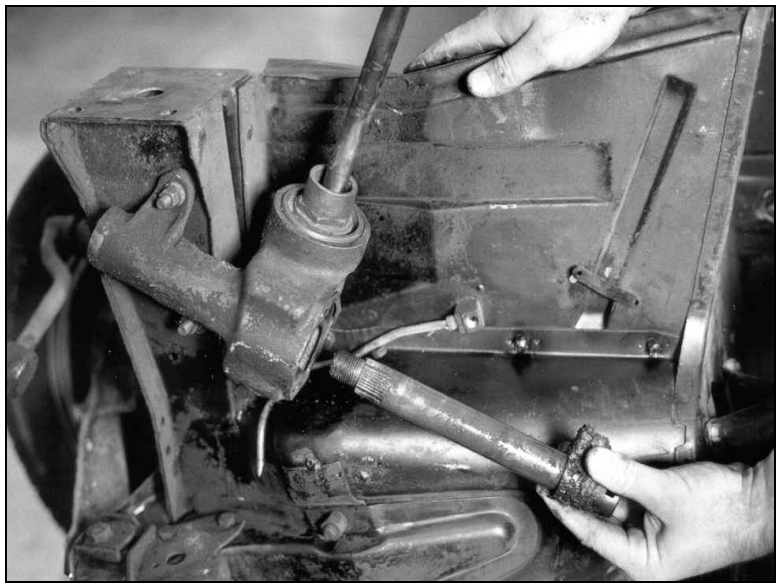
Start by removing the nut securing the Pitman arm to the steering box.

The 4x4 installed earlier will hold the Pitman arm while the nut is loosened.

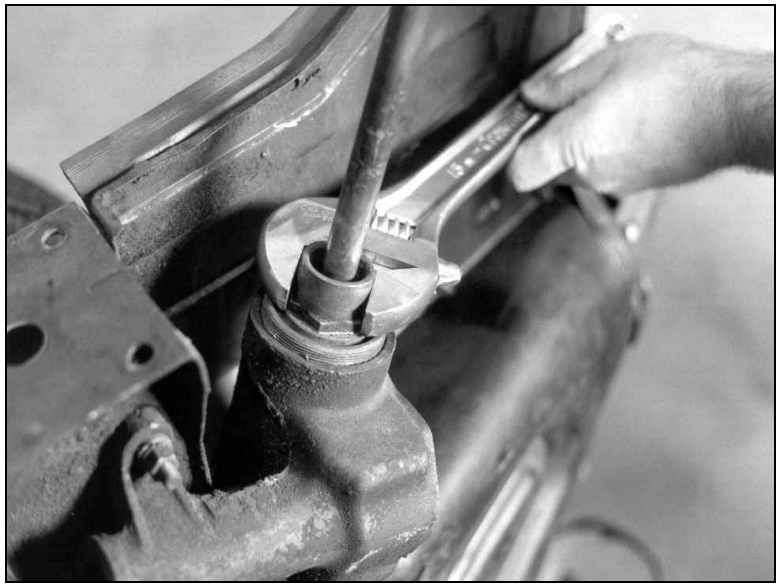


Once the nut is removed, a few taps of a hammer should pop the Pitman arm loose. If it is extremely tight, tapping on the side first will generally loosen it faster.

After removing the three bolts securing the back plate to the steering box, use a hammer to knock the Pitman arm shaft out. The shaft will rotate while it is being removed.



Slide the Pitman arm shaft all the way out of the steering box and discard it.

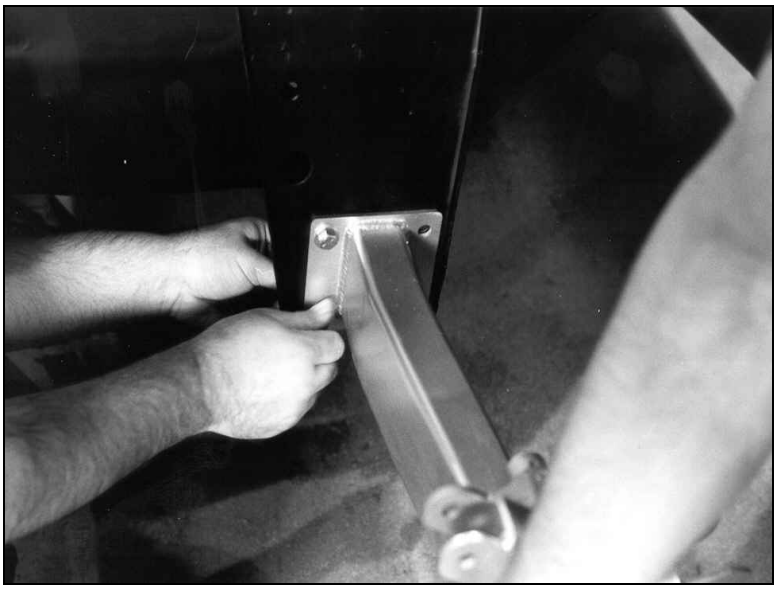


Unscrew the large nut holding the steering shaft itself into the steering box.

Pull the shaft free from the steering box and set it with the hood and fenders for later reuse.

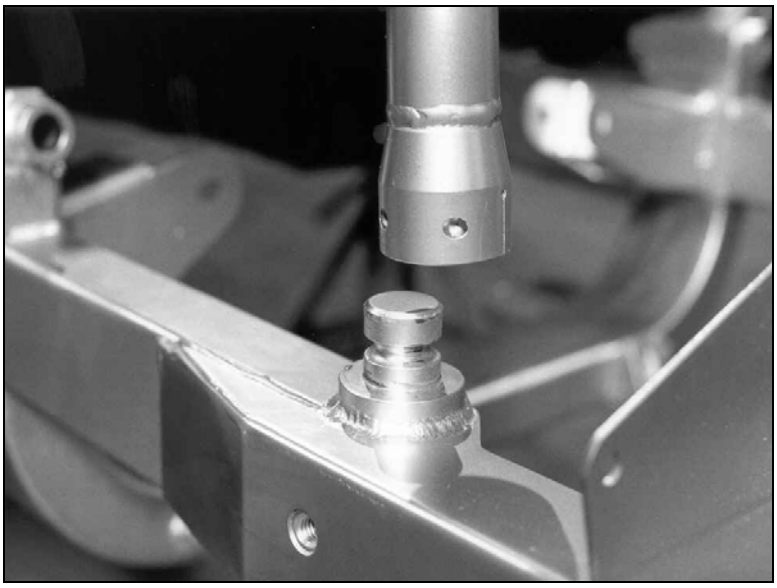
Installing Bolt-On Frame

With all of the stock front-end components removed, it is time to install the new frame. Position it against the lower mounts on the car and bolt the frame in place. As you can see, this is a two-person job.

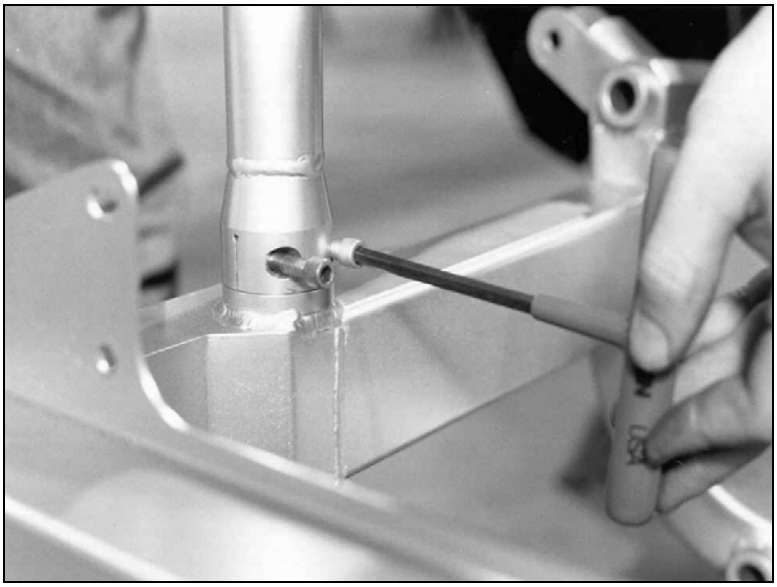


Attach the frame to the lower mounts using the 7/16-20 x 1 1/2 hex head cap screws, washers and locknuts provided. This is a high stress area, do not substitute other hardware. Once you have all the hex head cap screws installed, the front end will hang in place. Due to vehicle age, condition, and factory tolerances, the lower-mount angle will vary up to three degrees.Your new subframe will correct any variance.
Make sure the eight bolts mounting bolts are loose. The nuts should only be threaded so there is at least 1/8” of clearance between the bolt and the frame. These bolts will be tightened after the struts are installed.

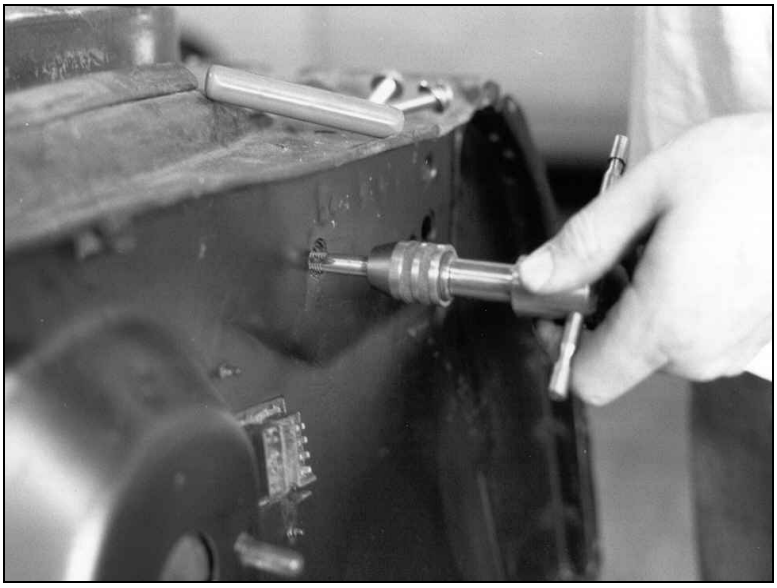
The next step is to install the front struts onto the male Gemini connectors that are factory-welded onto the frame.



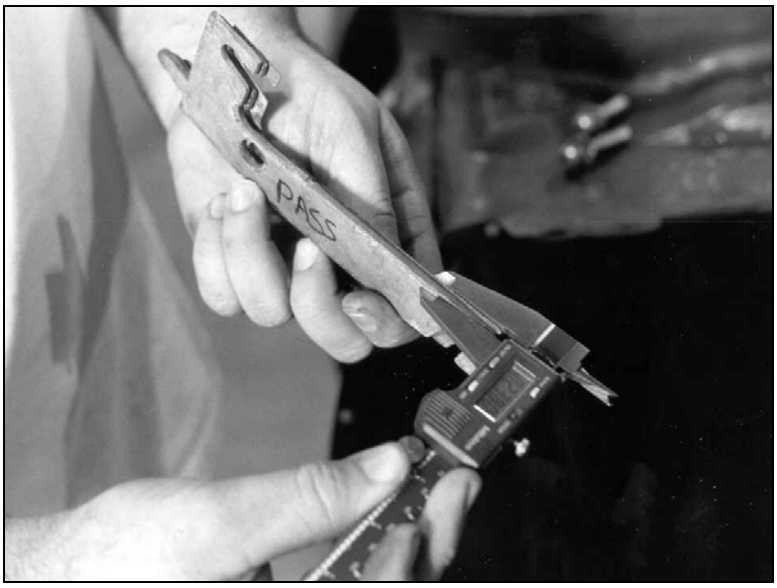
This is a close-up view of the Gemini connector. The female end, which is factory-welded to the strut, simply slips over the frame's male portion.



Two 5/16-24 x 1 1/4 socket head allens are installed to secure the strut to the frame. Do not torque these until we have the upper end attached to the firewall. These high strength alloy steel fasteners are highly stressed; do not substitute any other fastener.



Before installing the upper strut plates, it is a good idea to chase the threads of the factory weld nuts. Make sure they are clear of any dirt or grime.

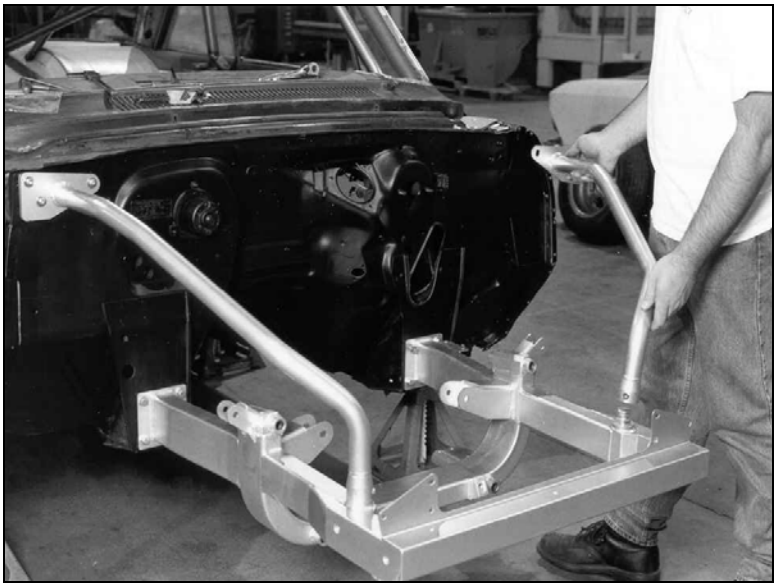


Next, get the stock shims for the passenger side and measure the thickness.

New shims are provided with the front frame kit; use as many as required (maximum of 4 per side) to achieve the same thickness as the factory shim pack measured. You may have to change the number of shims per side if the front fender-to-door gap cannot be adjusted to your satisfaction.

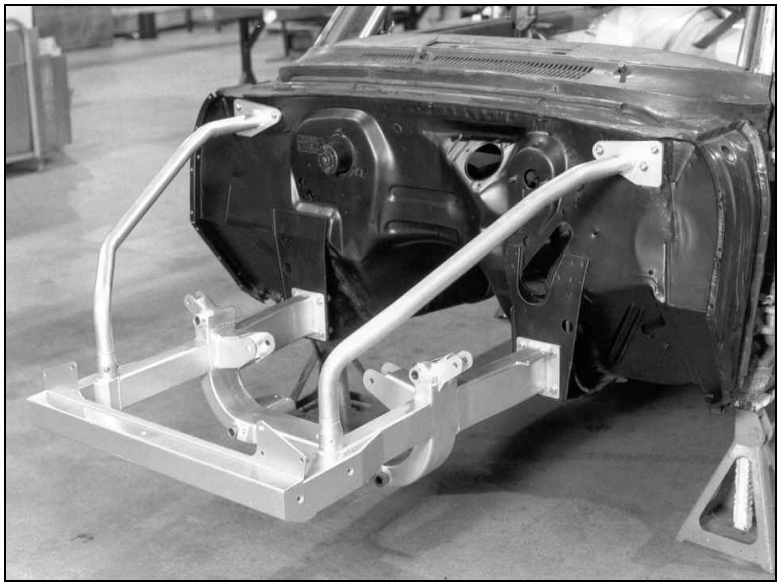
Take the appropriate number of new shims and install them on the backside of the strut mounting plate between the firewall and the plate. This will give you the correct alignment on the clip and the new upper hinge mount.

Use the 3/8-16 x 2” stainless steel button head allens provided to attach the upper strut plate to the firewall. Place the internal tooth lock washer on the button head allen first and then the flat washer. Do not fully tighten these until the driver’s side is in place.



Repeat the process to install the driver’s side strut. Once it is in place, tighten the inboard bolts at the firewall and all bolts on the Gemini connectors. Only snug up the outer bolts on the upper strut plate at the firewall until the hinge mount plates are installed.

In some installations the struts may be difficult to bolt to the upper mounts. Do not modify the frame or struts. Doing so will prevent the fenders from fitting correctly.



Place a floor jack under the subframe crossmember and raise it until the struts can be bolted on. You may need to raise one side more than the other. One person guiding the strut and a second person installing the bolts may help. After both struts are in place, tighten the lower mounting bolts, starting the four top ones first.

Your car should look like this with the frame and forward struts installed.

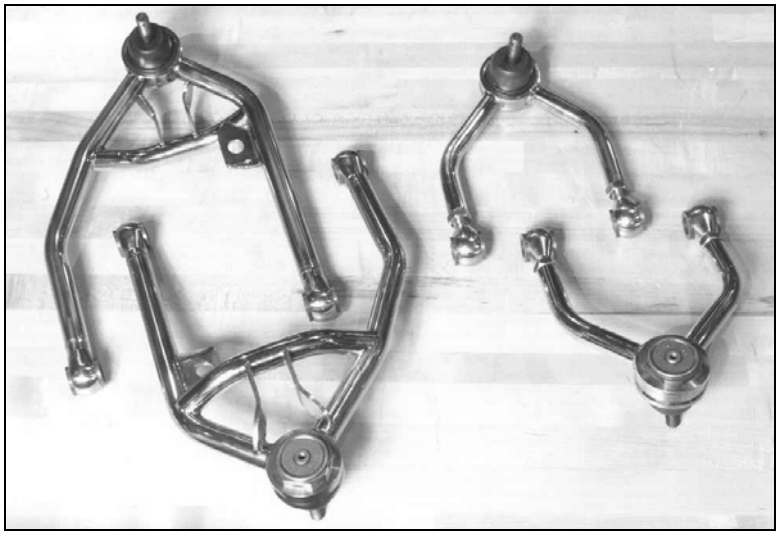
Installing Suspension

In this section you will install all of the front suspension components and align the front-end geometry. It is easier to do this before the engine and front sheet metal are installed.

If you purchased plain steel A-arms, have them painted or powder coated before you assemble them. Do not get paint in the balljoint housing thread bore or in the pivot bushing bores. The balljoint bores are precision machined. Consequently, you cannot install and remove the balljoints multiple times. The self-locking threads on the balljoint will destroy the balljoint housing if it is removed and installed several times. Have your A-arms painted before the balljoint is assembled to minimize this potential problem.

Do not plate or chrome the A-arms. The plating solution can leak into the tubes and cause them to rust from the inside out. If you drill drain holes in the tubes, the A-arm will crack from the holes. If you want a highly polished look, purchase our stainless A-arms.

The mild steel lower A-arms are shipped without their pivot bushings installed to make painting or powder coating easier. Use an arbor press to install the bushings.



Installing Lower & Upper A-arms and Spindles

The first parts installed will be the upper and lower A-arms. The stainless steel lower A-arm comes with all of the bushings installed. You will be installing the bushings and rod ends in the upper A-arms later.

For identification, the driver side A-arm assembly is embossed with a “D” on the balljoint housing.

The passenger side is embossed with a “P” on the balljoint housing.

The balljoint rubber boot is installed in the balljoint housing first. Because the boot fits tight in the housing, installing it before the balljoint is easier. Drop the boot into the machined bore in the balljoint housing.

Work your way around the boot's edge, pushing it down into the bore with your fingers. You can also use a blunt tool to do this.

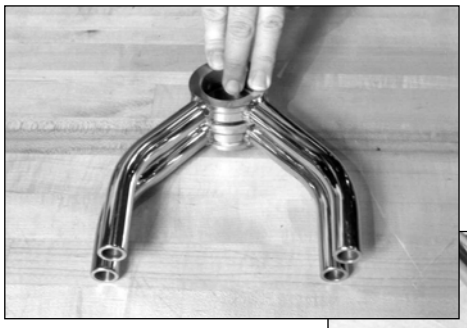
During the assembly process we are going to coat all of the threaded assemblies with an anti-seize compound to prevent the threads from being damaged and aid disassembly in the future.

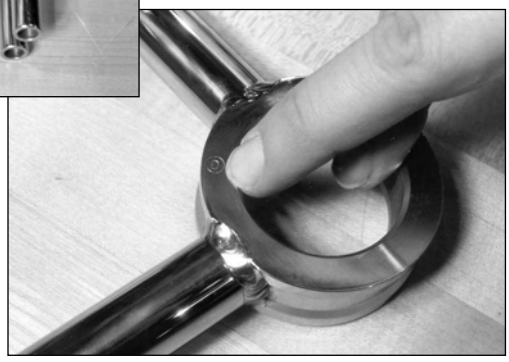
Put a thin layer of anti-seize on the balljoint threads.

The balljoint is then screwed into the balljoint housing as far as possible by hand. Make absolutely sure that the thread starts straight. This is a little tricky. The threads on the balljoint are easy to cross thread.

Use the balljoint wrench included with your kit to tighten the balljoint. Tighten it until it is fully seated against the balljoint housing. The force required can be over 150 lb-ft of torque. Be careful not to scratch the A-arm. Repeat this for the passenger side lower A-arm.

One convenient method for holding the A-arm while installing the balljoint is to temporarily install the A-arm on the frame.





The upper A-arms will be assembled next. Although they are very similar, they are not identical. The letter “D” or “P” on the balljoint housing identifies which side of the car the A-arm installs in.

Use a 5/8-18 tap to chase the threads in the upper A-arm. Clear any debris left in the threads.

Use the same procedure to assemble the upper A-arm as the lower. First, install the balljoint boot into the balljoint housing.

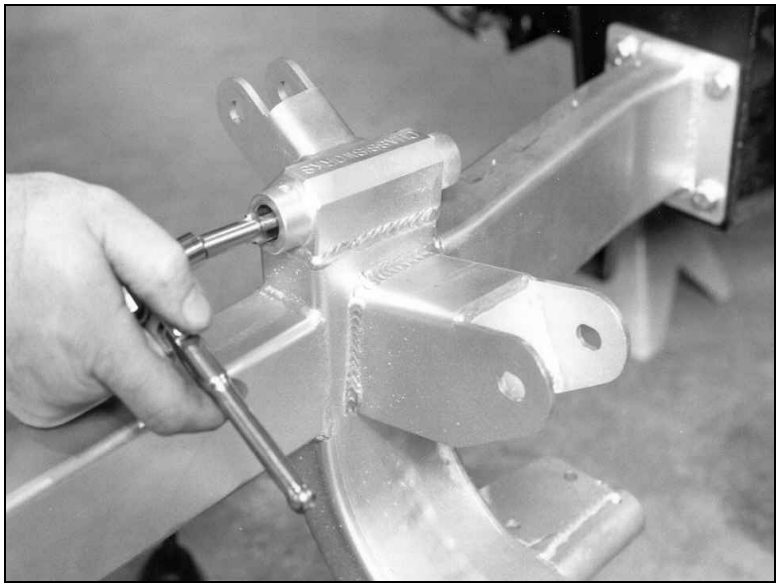
Next, apply a layer of anti-seize to the balljoint threads.

Thread the balljoint in as far as possible by hand.

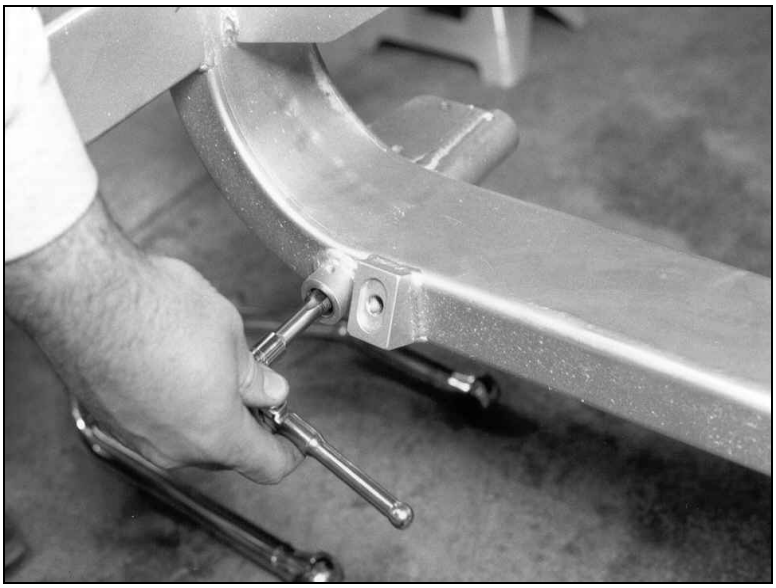
Finish tightening the balljoint with the balljoint wrench until it is seated tight against the balljoint housing. Repeat this for the passenger side upper A-arm.

Install the rod ends into the upper A-arms. To provide an initial alignment baseline, the jam nut should be threaded until there is 1-1/16 inches of thread remaining past the jam nut.

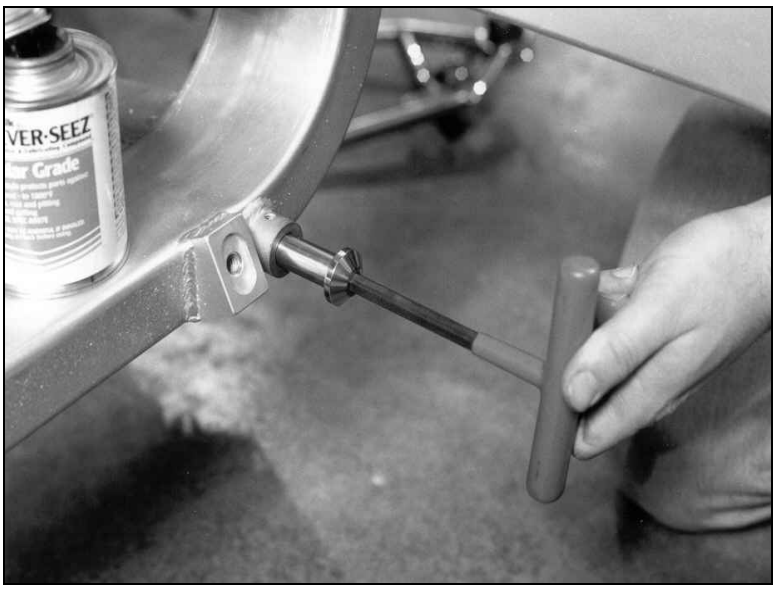
After the application of another dab of anti-seize, the rod ends are threaded into the A-arms, until the jam nuts are snug against the arm itself.



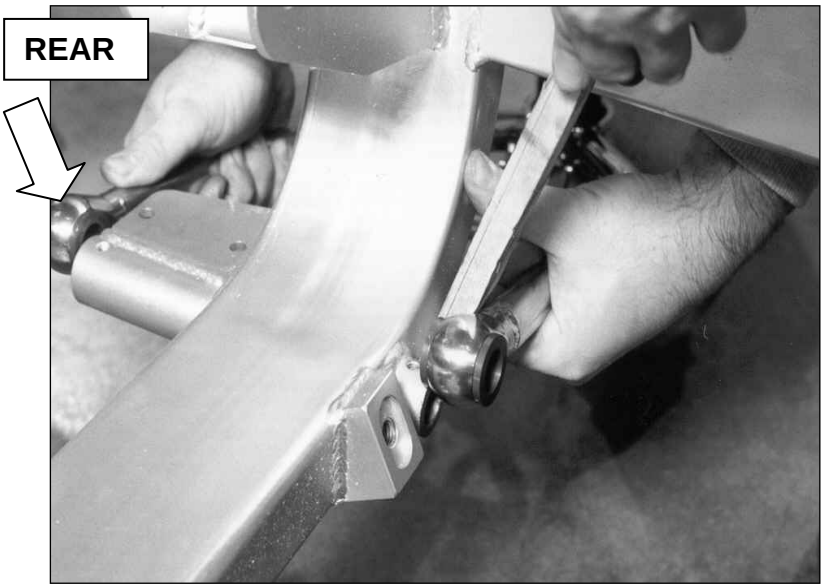
This step must be done carefully because the upper and lower A-arm mounts are threaded and welded to the frame. Use the 5/8-18 tap to chase the threads on the front and backsides of both upper mounts. Blow any remaining particles out of the hole with an air hose.



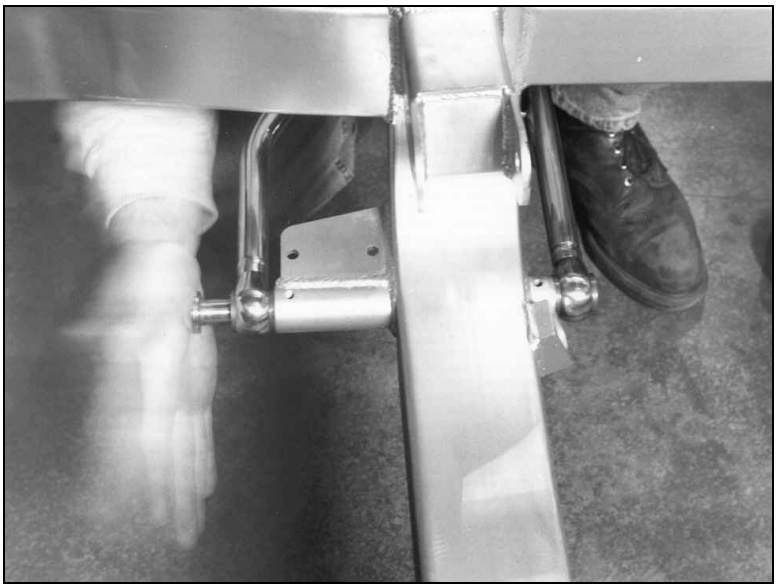
Next, chase the threads in the lower A-arm mounts with the 5/8-18 tap and blowout any remaining particles.



Now, apply some anti-seize to the threads of the pivot stud. Also put anti-seize inside the bore of the A-arm mounts. Insert one of the lower A-arm pivot studs and then run it in all the way to its stop, it should go in easy. Use the same procedure to verify all of the pivot studs will easily thread into their mounting locations.



The lower A-arm fits tight over the mount. Slide the rear of the A-arm onto the mount and then use a piece of wood between the frame and the A-arm to pry it over the mount.



When installing the lower A-arm pivot studs, be careful not to damage the threads. Tap the pivot stud into place with your hand.

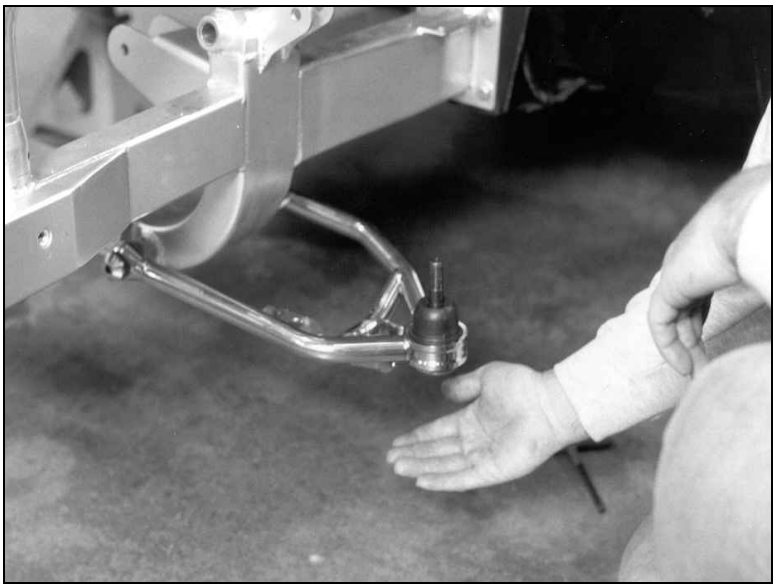
If the hand method does not work, you can use a plastic-tipped hammer to gently install the pivot stud. It is best to move the pivot stud a small amount at a time until the threads make contact.

Do not put grease on the pivot bushings they are self-lubricating.

Once the pivot studs are in place, use an Allen T-wrench to tighten them. The pivot studs should go in easily and should be tightened until they are fully seated. This will give the bushings the proper amount of crush, and allow the lower A-arm to move with a small amount of resistance.

If you have to remove the lower A-arm pivot studs, use a piece of wood and a few taps with a hammer while turning the pivot stud counter-clockwise. The pivot stud will come out easily.

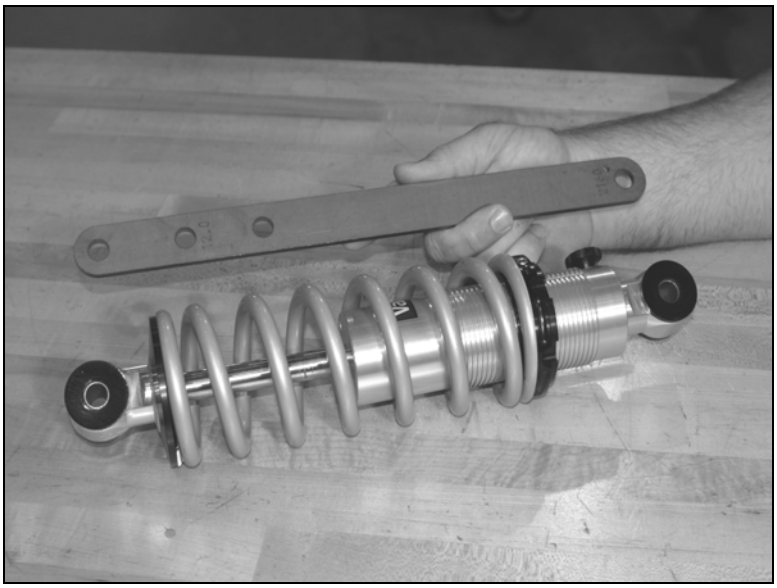
After tightening the lower A-arm pivot studs, check to be sure the A-arm swings freely but snugly throughout its travel.



The lower A-arm should also stay suspended when released. It should take a few pounds of pressure to make it move.

A set screw is used to lock the A-arm pivot studs. The set screw locks on the groove machined into the pivot stud.

Before installing the pivot stud set screws, apply a drop of Loctite™ thread sealing compound to the screws. Be careful not to get excess Loctite™ in the pivot stud bore.



The next step is to install the upper A-arm and spindle. During this step you are going to need the lower A-arm at its ride height position.

Two of these shock simulators are included in the suspension kit. The top hole represents full shock extension, the bottom hole full compression, and the middle hole (at 12 inches) represents the ride height of the shock absorber.

Next, install the shock simulator at the ride height position. Install the lower bolt first and then the upper.

Installing the upper A-arm is similar to installing the lower A-arm. Slide the front rod end over the front mount first and then swivel the rear one into place.

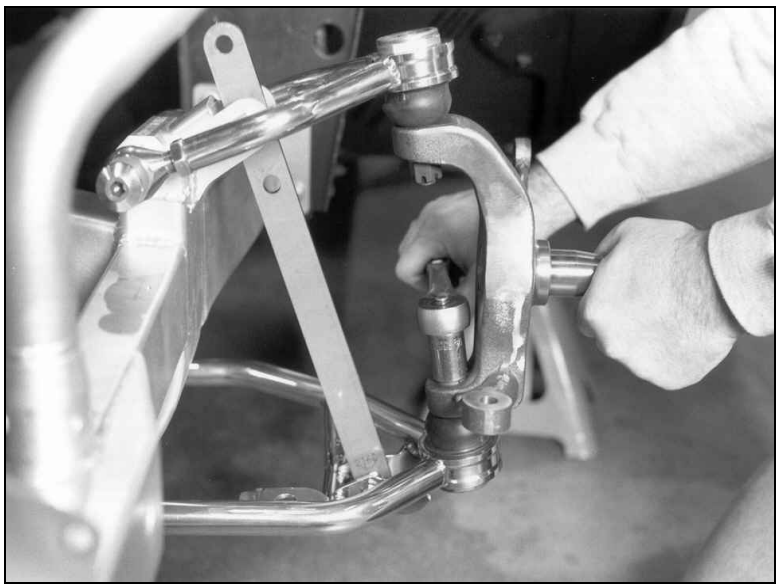
Install the upper mount bolts just like the lower mount bolts. Do not fully tighten them now because they need to be moved when we adjust the front suspension settings later. Repeat the installation of the upper A-arm on the passenger side.

You are now going to install the dropped spindles. The **"L"** cast into the back of the spindles, does not designate "Left," it is the foundry mark. The best way to identify the driver and passenger side spindle is to remember the steering arm (shown with arrow) always goes toward the front of the car.

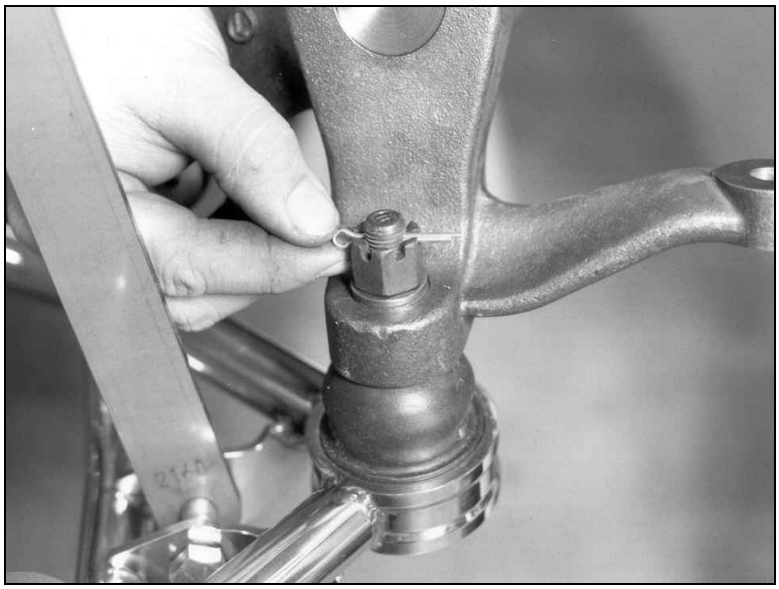
Place the driver side spindle over the balljoint and thread the 9/16-18 castle nut on.

The balljoint castle nut will not thread on easily if the threads are nicked. A thread file can be used to correct the problem. After filing, try the castle nut again before putting the spindle on. Thread files can be found at most auto parts stores.

Place the spindle over the lower balljoint and install the washer and castle nut. The upper A-arm is then lowered into position and secured to the spindle with another washer and castle nut.



Tightened both upper and lower balljoint castle nuts



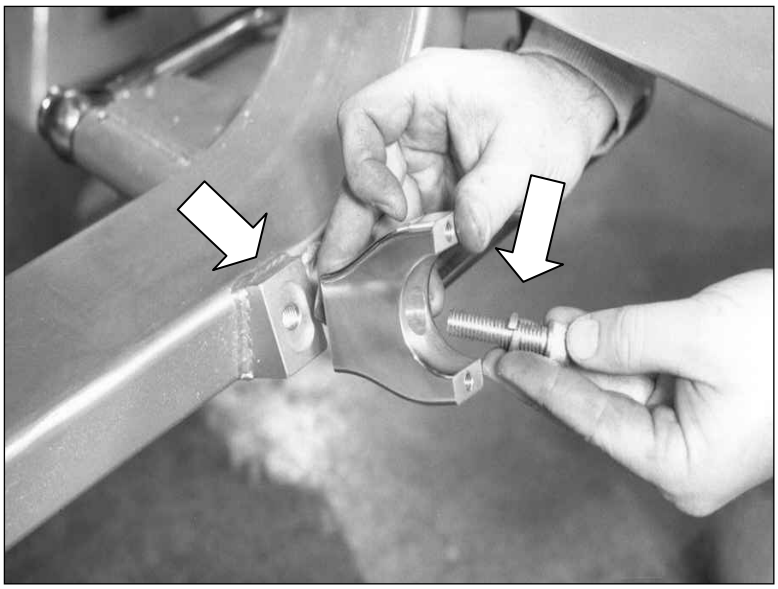
Insert the cotter pin through the hole in the balljoint. You may need to tightened it a small amount until the slots in the castle nut align with the hole.

With the cotter pin installed, use pliers to fold the legs over the castle nut. One leg goes down the other over the top of the balljoint stud.

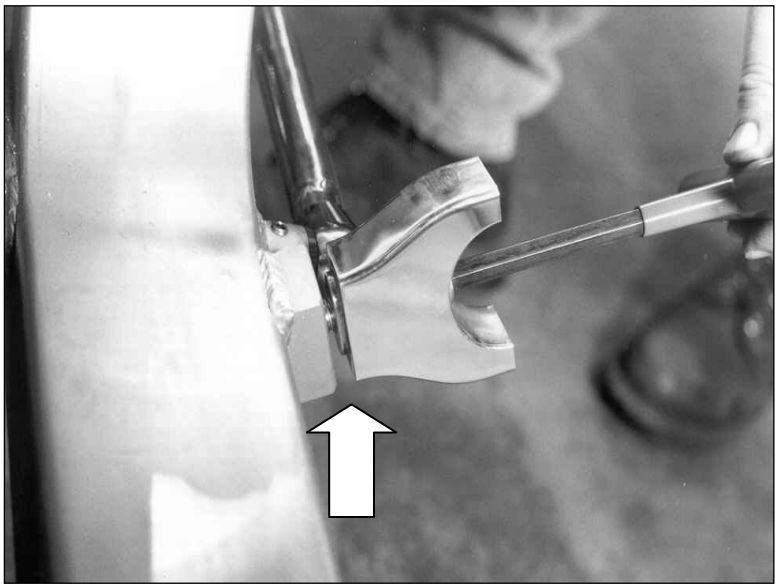
Repeat the procedure for the upper A-arm. First tightening the castle nut.

Install the cotter pin and fold the legs over as we did on the lower one. Repeat this procedure on the passenger side of the car.

Mounting the steering rack is next. Chase the threads in the rack-mounting bosses with a 1/2-13 tap before mounting the billet mounts.

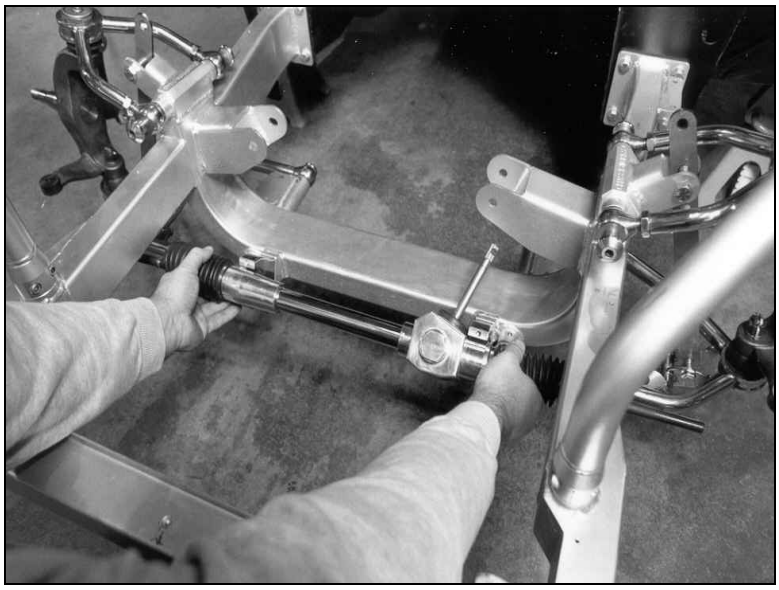


The rack-mounting bosses are factory welded to the frame. Use the 1/2-13 x 2” socket head allen and custom 1/2” lock washer to mount the lower half of the billet rack clamp to the mounting boss. Use a small amount of Loctite™ on the socket head allen.



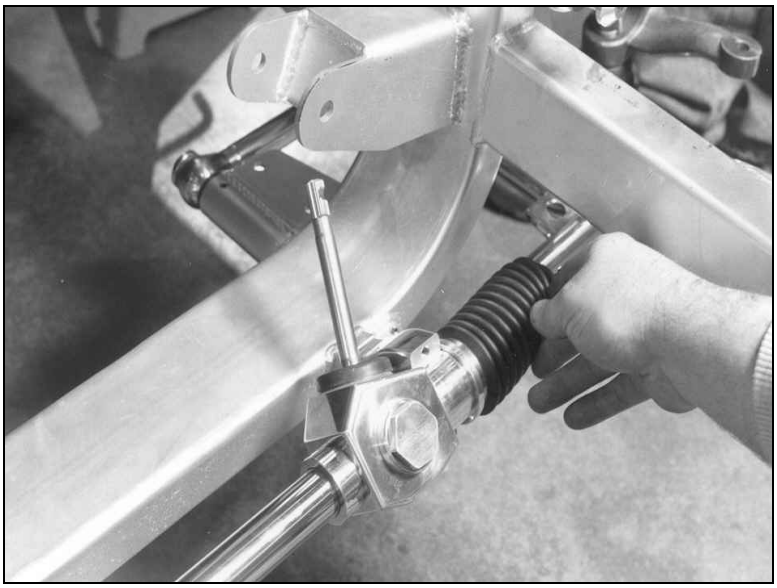
The raised section on the back of the billet clamp matches the milled recess on the mount bosses.

Now repeat the procedure for the other billet rack mount.



With the lower half of both rack mounts installed on the crossmember, the rack itself is set into position.

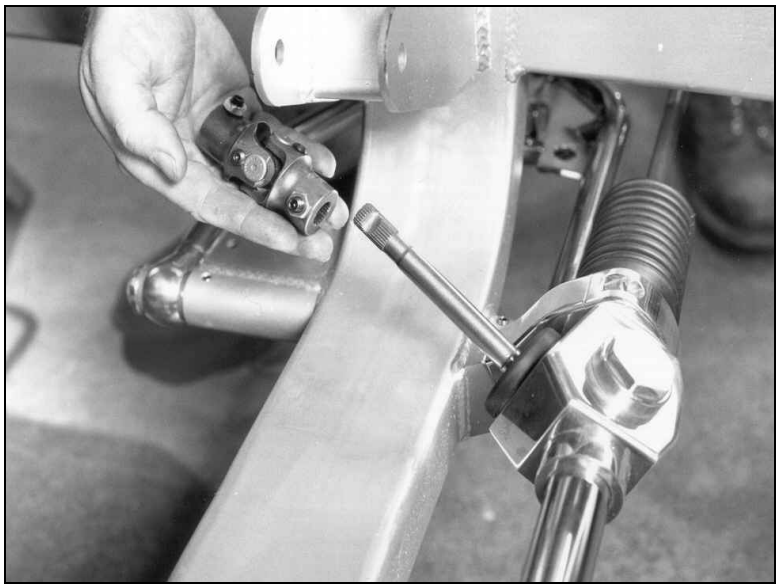
One of the exclusive design features of our rack and mount is the ability to rotate the rack to provide any desired angle from the steering column to the rack input shaft. Here the shaft is laid almost against the crossmember.



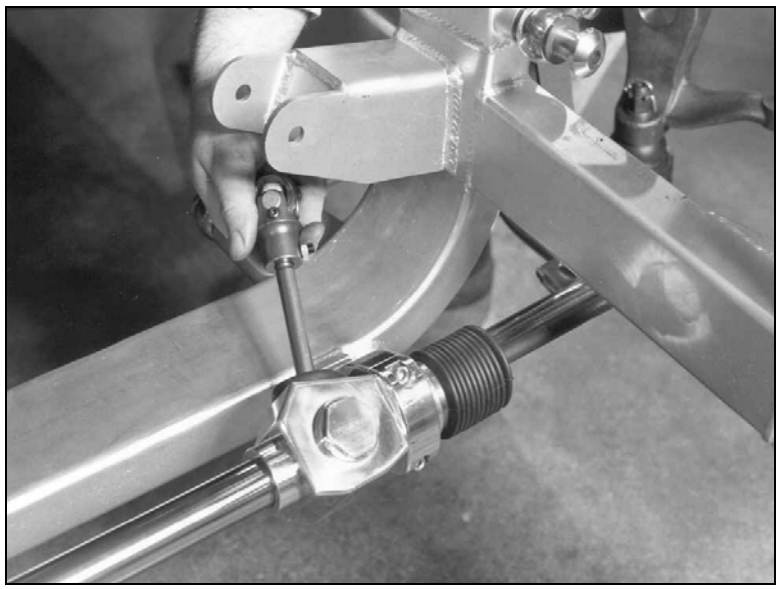
If additional clearance is needed between the pinion and the crossmember, you can raise the pinion up higher. A lower angle will be used to clear the side motor mount bracket. Rotate the rack to minimize the u-joint angle.

Push the rack firmly into each mount. Secure the rack by installing the billet rack clamp caps. Use the provided 5/16-18 x 1” stainless steel socket head allen and custom lock washer. Use a small amount of Loctite™ on the socket head allen.

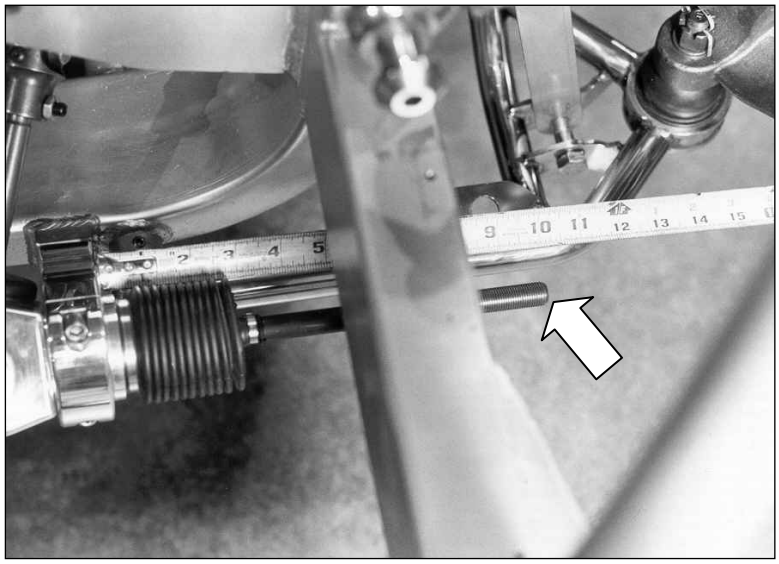
Tighten the cap with your T-Handle Allen wrench. Once you have the cap tight, the next step will be aligning the front end.



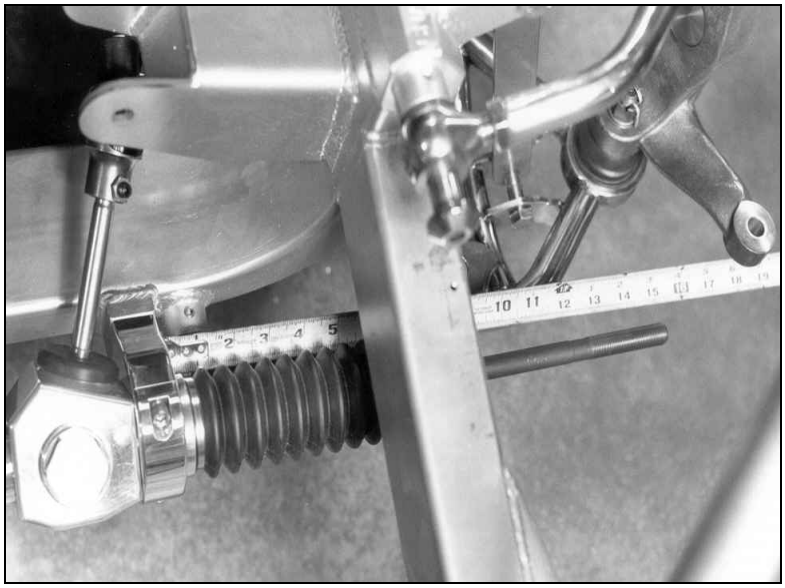
The first step in aligning the new A-arm front suspension is to center the rack in its travel. Placing a U-joint on the rack makes turning it easy.



Turn the rack toward the passenger side of the car until it stops (full lock position).



On the driver side, measure and record the distance from the rack mount to the end of the tie rod end. In our example the length is 9 3/4 inches.



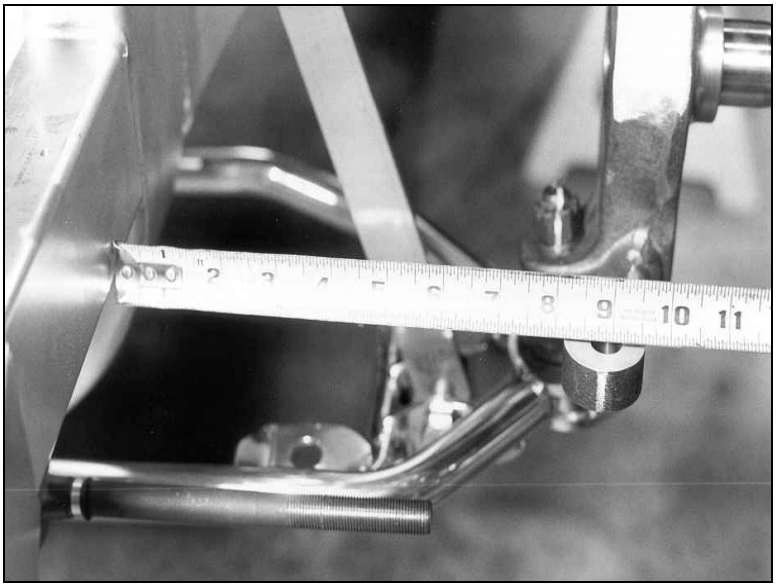
Next, turn the rack all the way to the driver side and record the measurement from the rack clamp to the end of the tie rod. In our example the length is 15 inches.

To calculate how far back to move the rack to center it, use this formula: add the two lengths together and divide by two. This is the distance from the rack clamp on the driver side to the end of the tie rod with the rack centered.

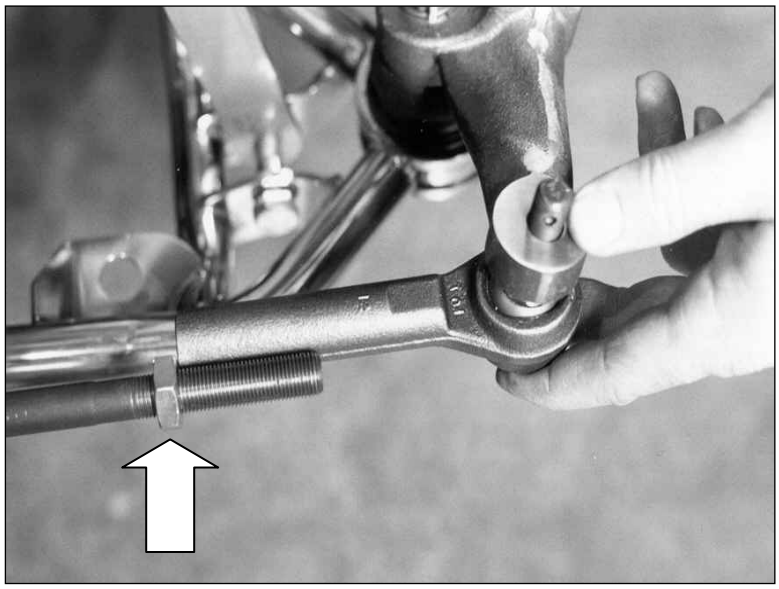
Example: Driver side length equals 15”
Passenger side length equals 9 3/4”

15” plus 9 3/4” equals 24 3/4” divided by 2 equals 12 3/8.

Turn the rack back toward the passenger side until the length is 12 3/8 inches. Check your rack; do not assume our dimension is correct for your rack.

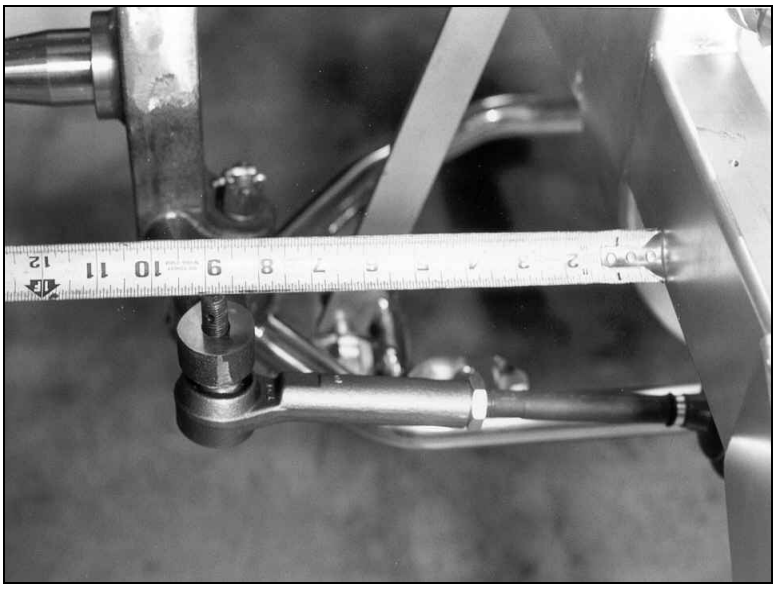


With the rack & pinion centered, you can set the spindle alignment. Measure from the outside of the frame to the inner edge of the tie rod hole in the steering arm. Set this dimension to 8 5/8 inches. This will make the spindle straight forward while you adjust the tie rod length.

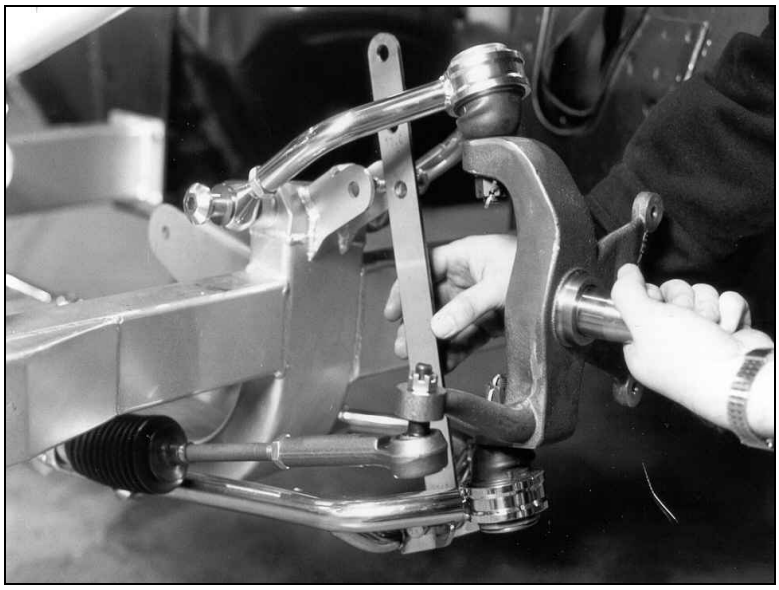


Install the tie rod end in the steering arm. Hold it in place next to the tie rod and adjust the jam nut until it is against the tie rod end.

Remove the tie rod end from the steering arm and thread it onto the tie rod until it contacts the jam nut. Next, reinstall the tie rod end into the steering arm. Verify the distance from the frame to the inside of the tie rod end; this should be 8 5/8 inches as measured earlier.

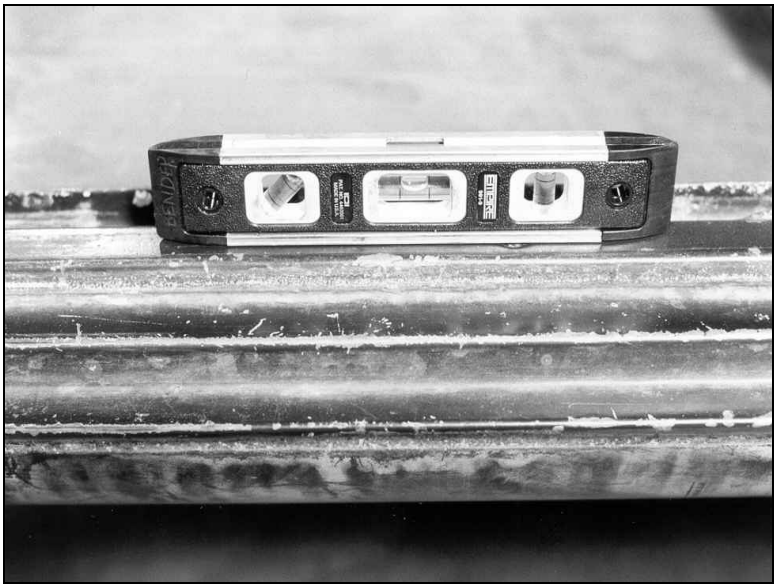


Repeat this procedure for the passenger side. The measurements are the same as the driver side.



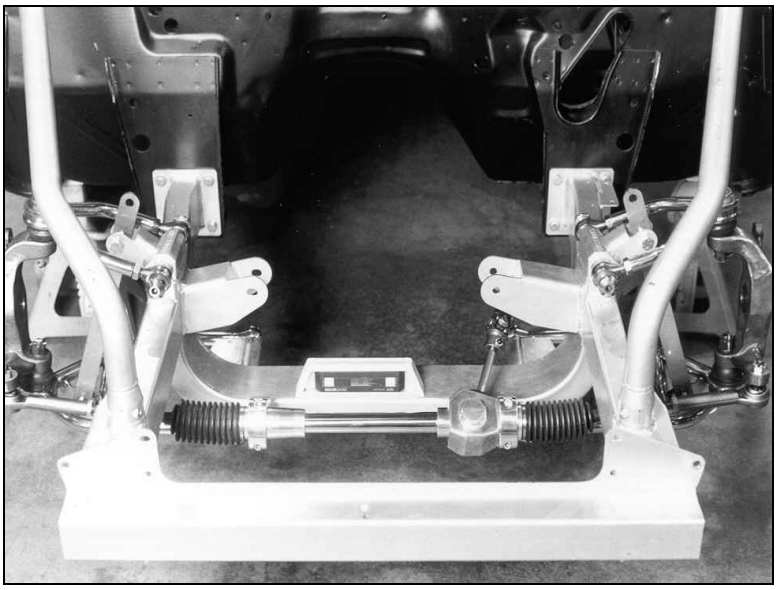
Loosely install the castle nut on the tie rod end. Make sure the spindle moves smoothly from full shock extension to full compression, as indicated by the holes in the shock simulator.

Now, set the shock simulator in the ride height position before you start to check the suspension settings. Do this on the driver and passenger sides.



Front Suspension **Alignment**

Before checking the front-end alignment, check to be sure the car is still level. Put a level on the rocker panel, just inside the door, and adjust the jack stands until the car is level front to rear



A readout from a digital level is preferred for accuracy when setting the front-end alignment. Level the crossmember and if needed, adjust the height by placing shims under one of the jack stands.

First, check and record the camber and caster readings, they will be adjusted later.

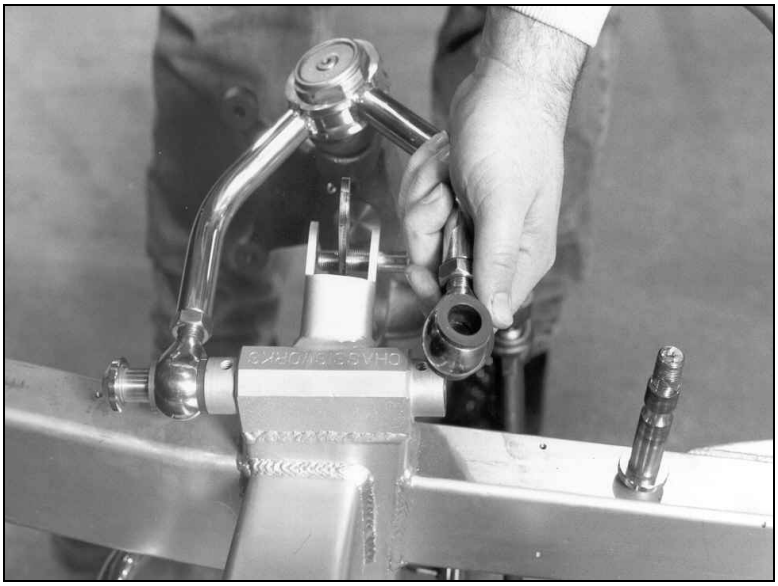
The caliper-mounting bosses are machined perpendicular to the spindle so they are an excellent place for the level.

To check the camber, hold the level against the machined caliper mounting pads on the spindle. Record the reading.

Next, check the caster by installing the 3/8-16 x 1 3/8” caliper mounting socket head allens (supplied in your brake kit) into the threaded bosses on the spindle.

Set the digital level against the caliper mounting bolts. Record the caster reading. Positive caster is when the spindle top is tipped toward the rear of the car when viewed from the side.

We will now fine-tune the camber and caster settings.

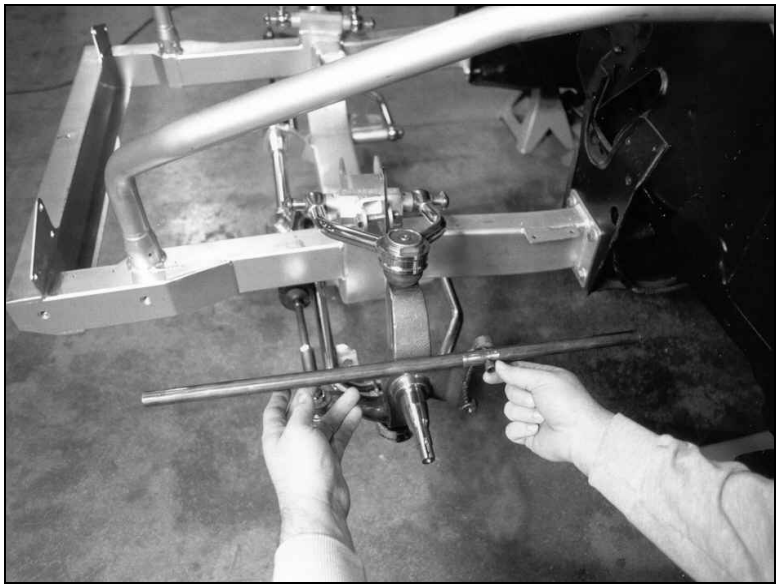


The adjustment for both caster and camber is made through the adjustable rod ends on the upper A-arms. Moving both rod ends out increases positive camber.

To adjust caster, move the forward rod end out further than the rear. This increases positive caster.

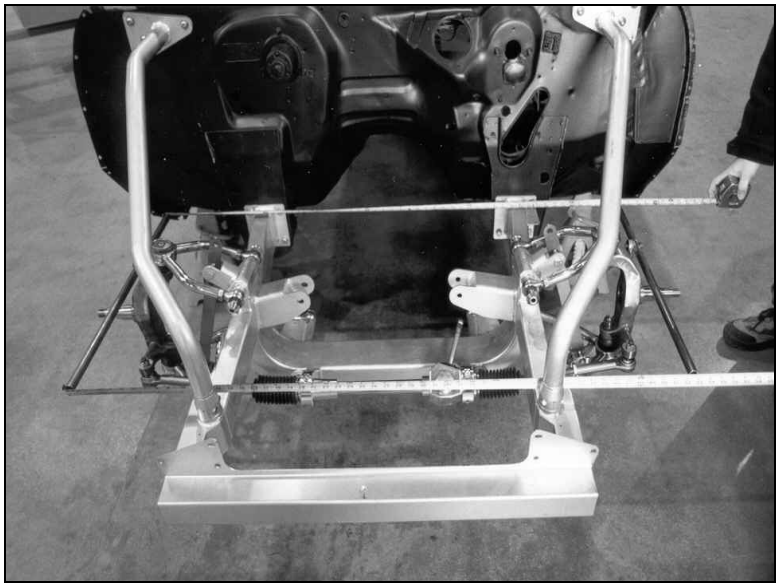
Adjust the upper A-arm rod ends until you have the camber set at zero, or 90 degrees on the **digital level** and the caster set at 1 to 5 degrees positive. Both sides must be the same. Remember, if your car has a forward rake when sitting on the ground the positive caster will be decreased by the angle of the bodies rake. Three degrees of positive caster with the body level will only be 1 degree of positive caster with a 2-degree body rake. Adjust one rod end at a time one-half turn until you have the correct setting. Repeat for the passenger side before going to the next step.

The next step is setting the toe-in. Cut two pieces of 3/4 inch tubing or electrical conduit, 26 inches long. Drill a 3/8-inch hole through each tube 9 inches from one end. These tubes will assist in setting the toe-in.



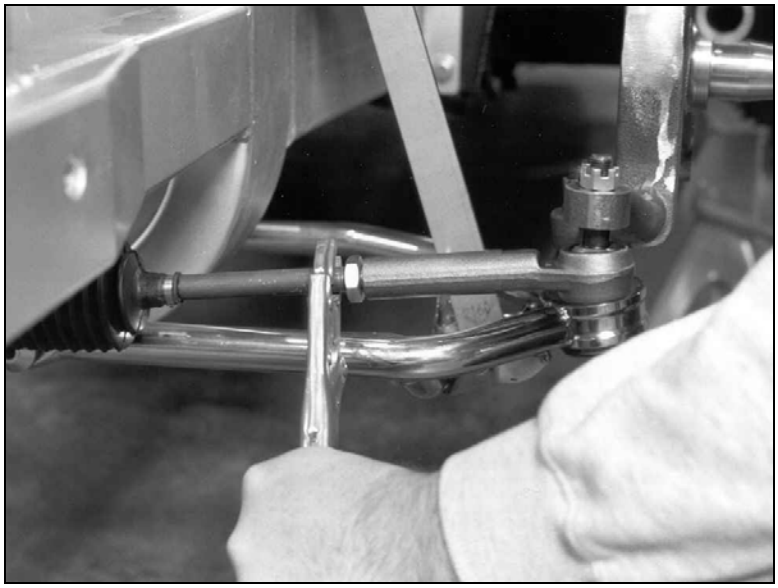
Bolt the tube to the upper caliper-mounting boss with the long end to the front of the car. The 26-inch length simulates the tire diameter and drilling the hole 9 inches from the end centers the bar over the spindle.

Next, set the bar level and tighten it down. Do this on both the driver and passenger sides.

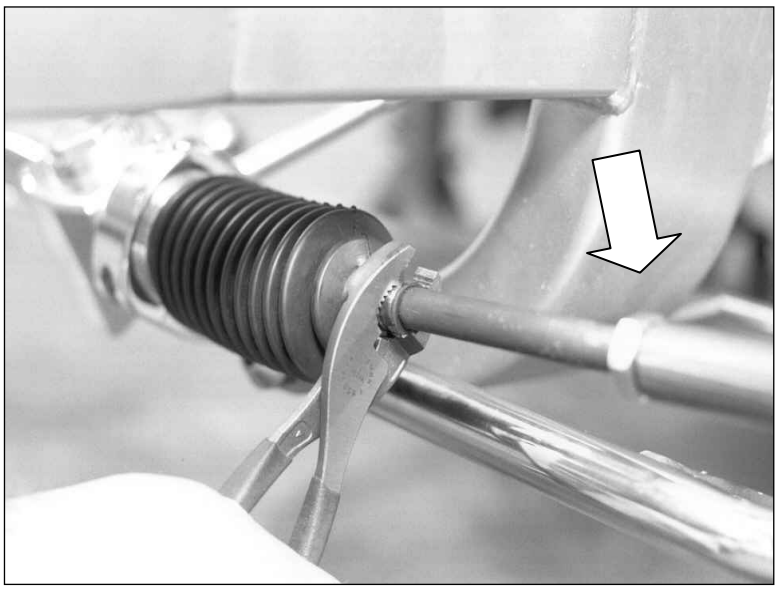


Using two tape measures, measure the outside width at the front and the rear of the tubes. The front dimension should be 1/8 to 3/16 less than the rear; this is the total amount of toe-in. Record the front and rear dimensions and calculate the amount of toe-in by subtracting the front measurement from the rear.

To adjust the toe-in, rotate the tie rod ends to move the spindle in or out as required. Make sure to rotate both the driver and passenger side the same amount. One-half revolution of both tie rod ends will change the toe-in by approximately ¼ inch, front to back.

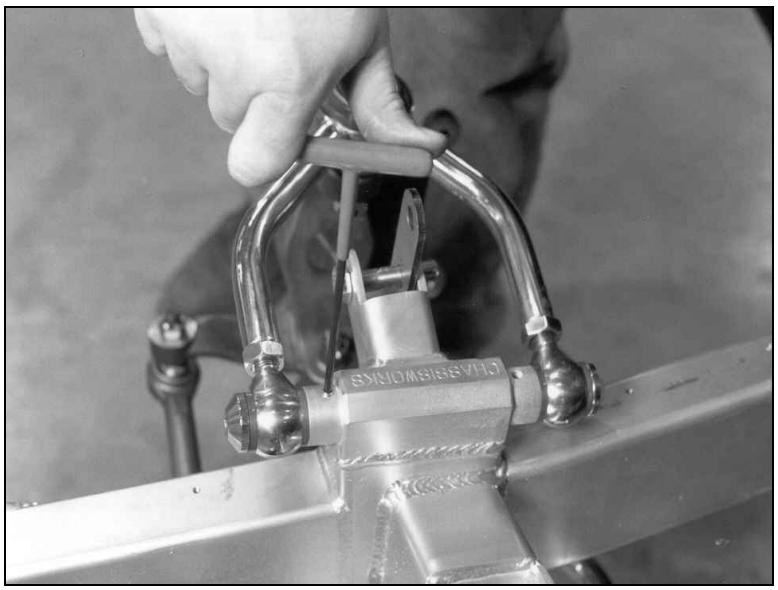


If rotating the tie rod end 360 degrees changes the toe-in too much, use the rack tie rod to make smaller adjustments. Put the tie rod end in the steering arm and snug the castle nut before adjusting. Use vise-grips to grab onto the tie rod and rotate it to adjust the length. Be careful to turn both tie rods the same amount.



When turning the tie rods, the rubber boot will “wind up" on the tie rod. Once the toe-in is adjusted, use pliers to “unwind” the boot around the tie rod. Gently grab onto the outer boot clamp and twist it back around until the boots are straight. The jam nuts can now be tighten against the tie rod ends.

Verify caster, camber and toe-in are correct before proceeding.

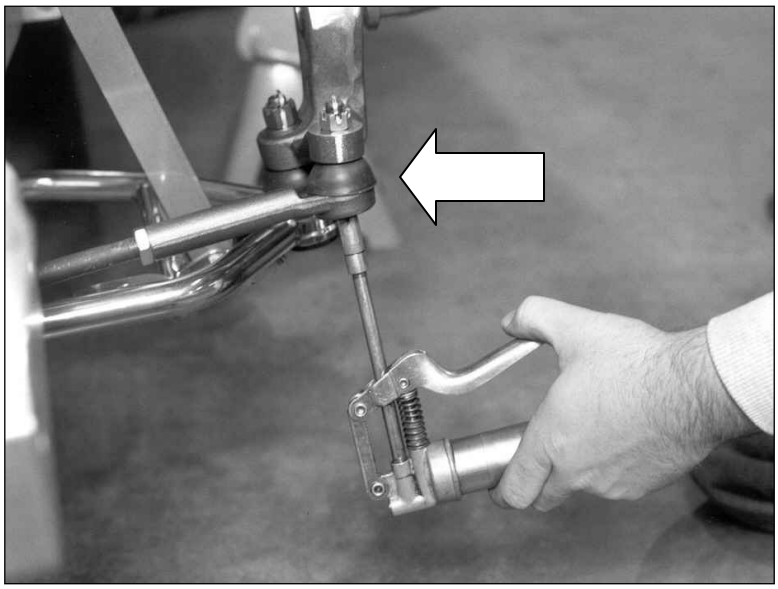


Once the camber, caster, and toe-in are set, tighten down the A-arm bolts and jam nuts, and install the set screws with a drop of Loctite™.

Next, you can final assemble the tie rod ends. Start by installing the grease zerk fitting in the hole at the bottom.

Install the rubber boot.

Put the tie rod ends back into the steering arm. Tighten the castle nut and, install and bend the cotter pin like you did on the balljoints.

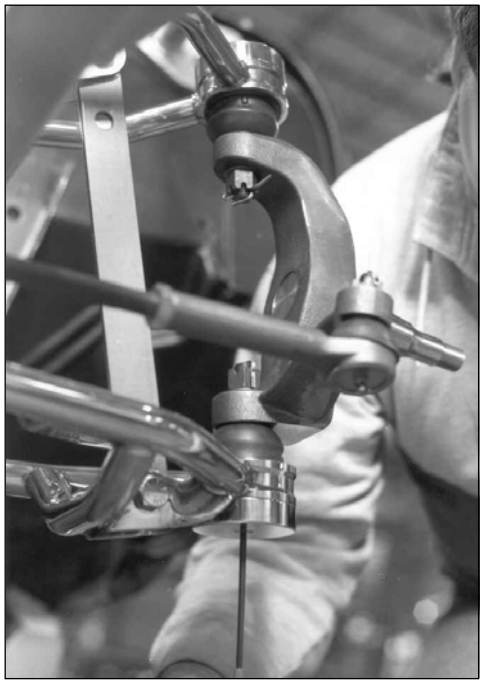


Grease the tie rod end with a small grease gun. Add only enough grease until a small amount starts to come out from under the rubber boot.

Grease the upper and lower balljoints. Install the zerk fittings and inject grease with a grease gun. Put only enough grease in to make the balljoint rubber boot bulge out on the side. If you are installing the balljoint caps, remove the zerk fitting.

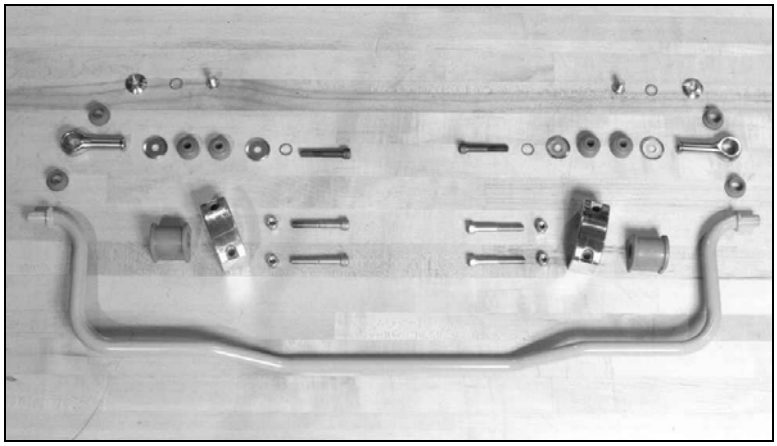
Set the stainless steel cap over the balljoint.

The caps are held in place with the countersunk stainless steel allen screws provided. They screw into the hole where the grease zerk was just removed. Be sure to remove all grease from the threads in the balljoint and Loctite™ the countersunk allen head screw in place.



Use the same procedure to install the lower balljoint caps.

Installing Antiroll Bar



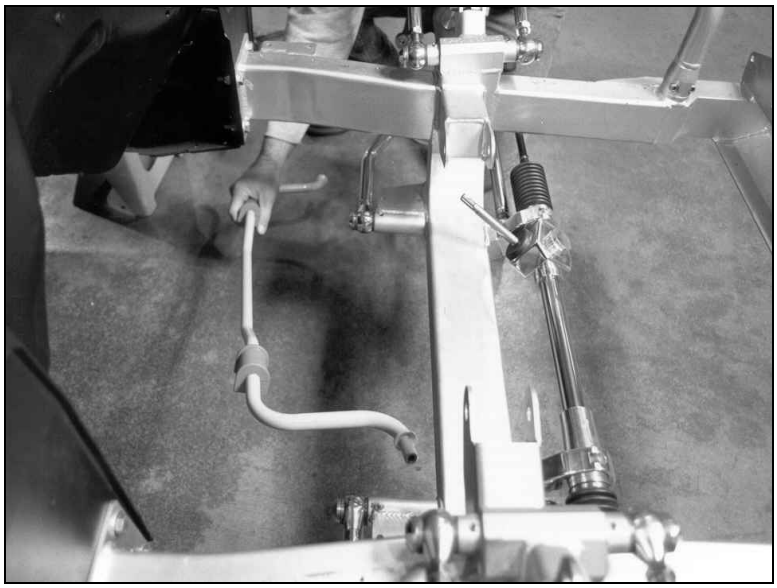
Next, install the antiroll bar.

These are the components of the antiroll bar kit.

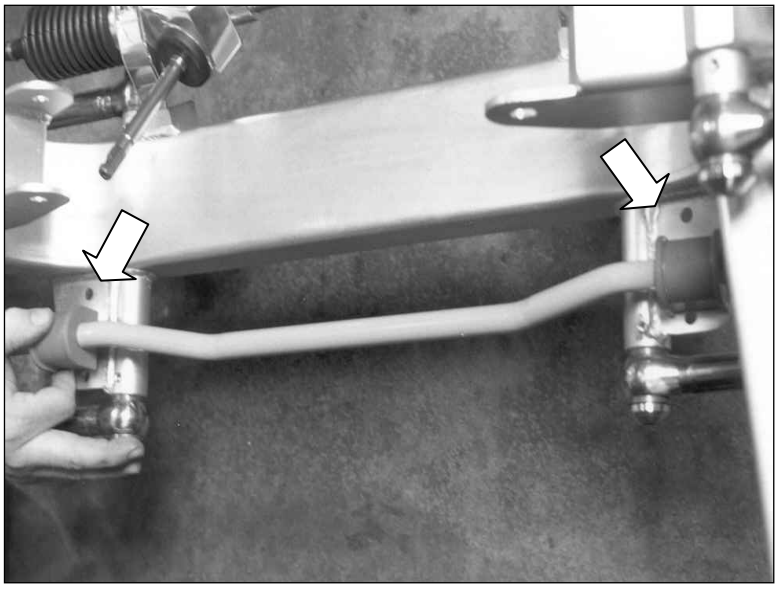
To prevent the urethane bushings from squeaking in action, use the supplied silicone grease to coat all sides of the urethane bushing that contact a metal surface. A thin screwdriver can be used to smear it around inside the bushing. Take extra care not to get this grease all over, it's very sticky.

To open up the bushings, use the handle end of the balljoint wrench that is included in the suspension kit.

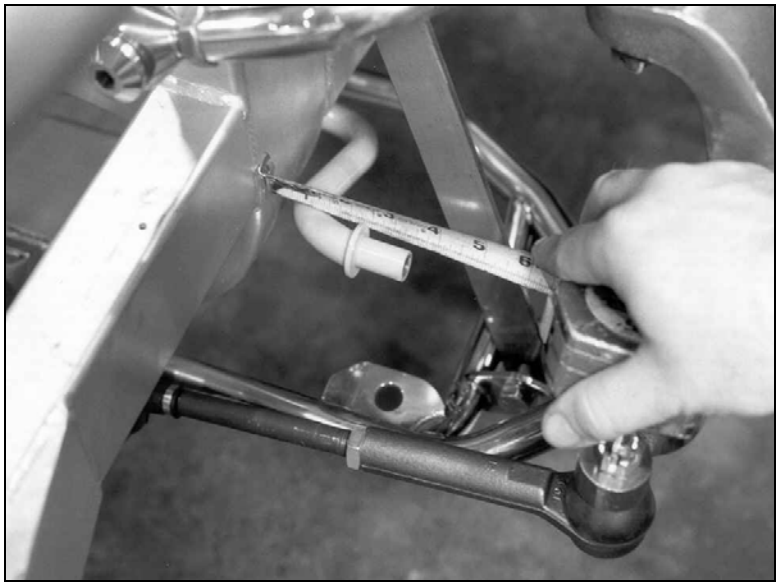
Once the slot in the bushing is opened, slide it over the antiroll bar near the 90-degree bend.



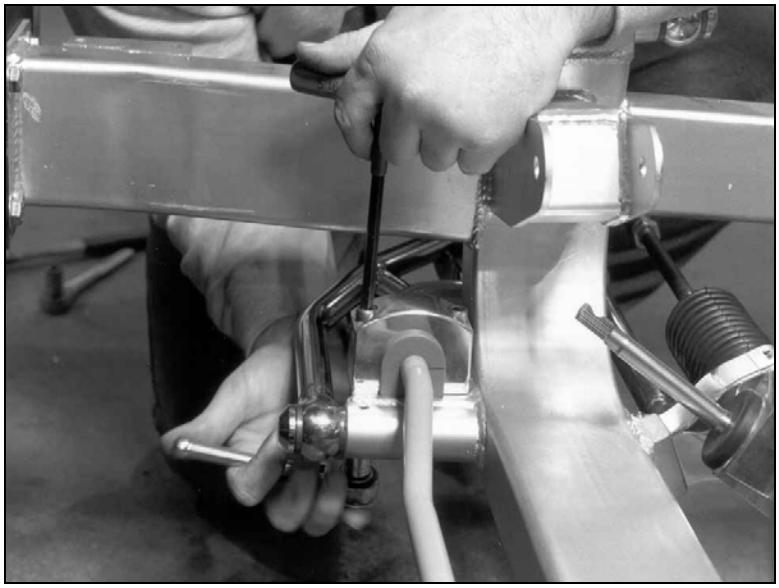
With both bushings on the bar, bring it up from under the car and set it in position.



Center the bushings on the mounting pads welded to your frame.

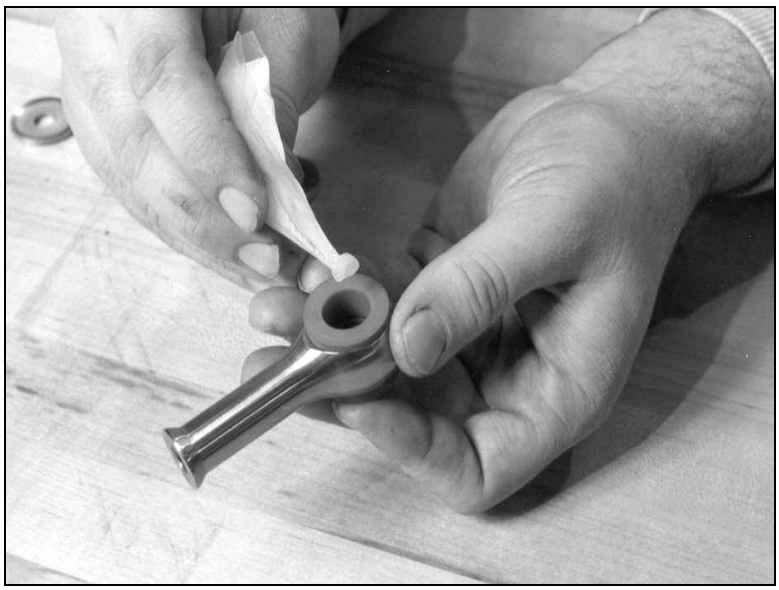


Center the antiroll bar in the frame by measuring from the side of the frame to the end of the bar on the driver and passenger sides.



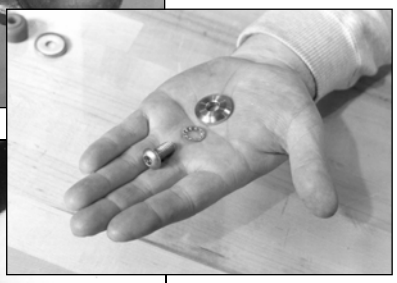
Slide the billet aluminum cap over the bushing and secure with the 3/8-16 x 2 1/2” socket head allen and locknuts provided.

Put the urethane bushings into the upper antiroll-bar-link eyebolt.



Coat the bushings with the silicone grease.

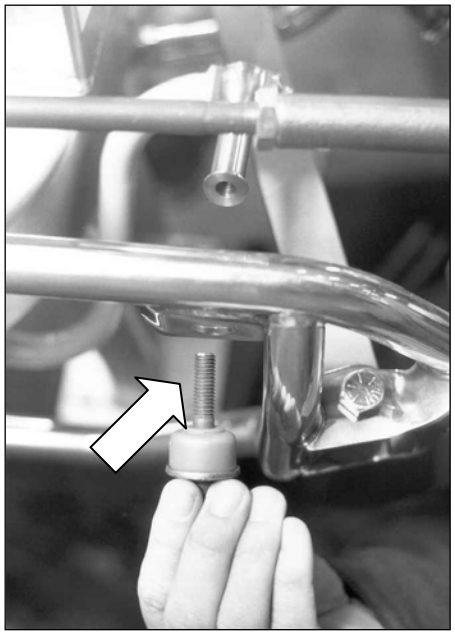
Next, slide the link eyebolt onto the end of the antiroll bar.



Shown here is the hardware used to attach the link eyebolt to the antiroll bar.

Attach the link eyebolt to the antiroll bar. Place the internal tooth lock washer next to the head of the 3/8-16 x 3/4” button head allen and the beveled stainless steel washer. Apply Loctite™ to the button head allen and tighten.

Put the star lock washer, bushing washer and one urethane bushing on the 3/8-16 x 2 1/4 socket head allen. This attaches the link eyebolt to the lower A-arm. Apply silicone grease to the bushing on all surfaces.

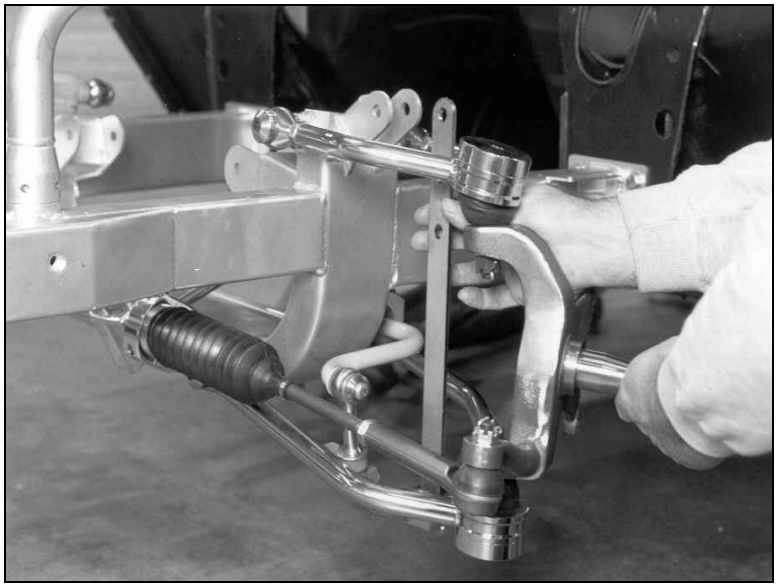


Insert the lower bushing assembly into the lower A-arm mount bracket.

Grease the upper bushing and slide it and the other bushing washer over the bolt.

Apply Loctite™ to the bolt. Push down on the antiroll bar and thread the bolt into the end of the link eyebolt.

Use the T-handle Allen wrench to tighten the bolt from under the lower A-arm. Tighten only until the urethane bushing begins to crush.

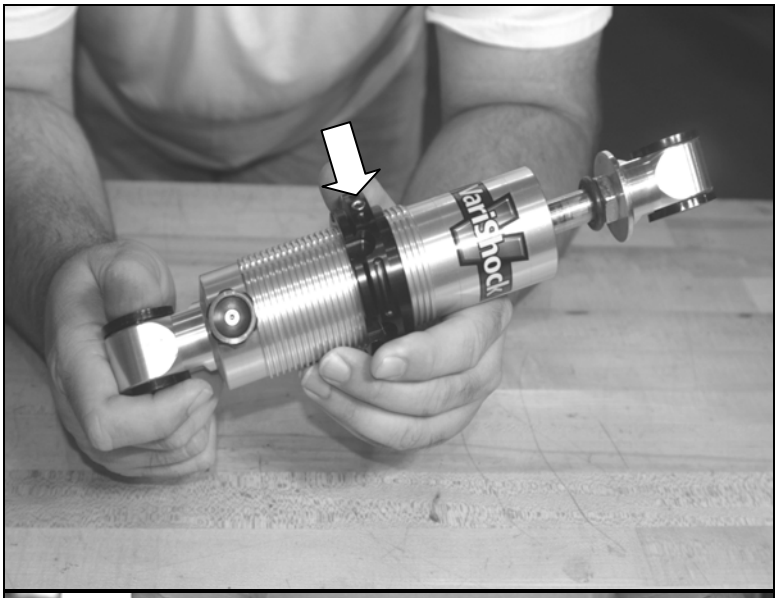


After finishing the antiroll bar installation, run the suspension through its travel full shock extension to full shock compression. Do this with the spindle turned full left, full right, and centered. Everything should move without binding. Because the antiroll bar makes independent installation difficult, you will have to do the driver and passenger sides at the same time.

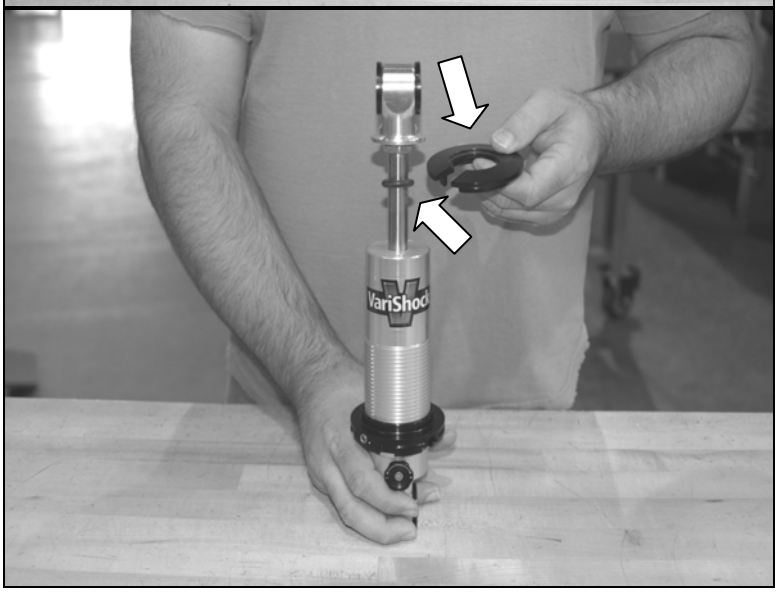
Installing Shocks & Springs

The front suspension kit includes the VariShock Quickset 1 externally adjustable coilover shocks with urethane bushings. The knob on the bottom is used to change the ride quality and handling of the vehicle.

Optionally available is a VariShock Quickset 2 double adjustable coilover.

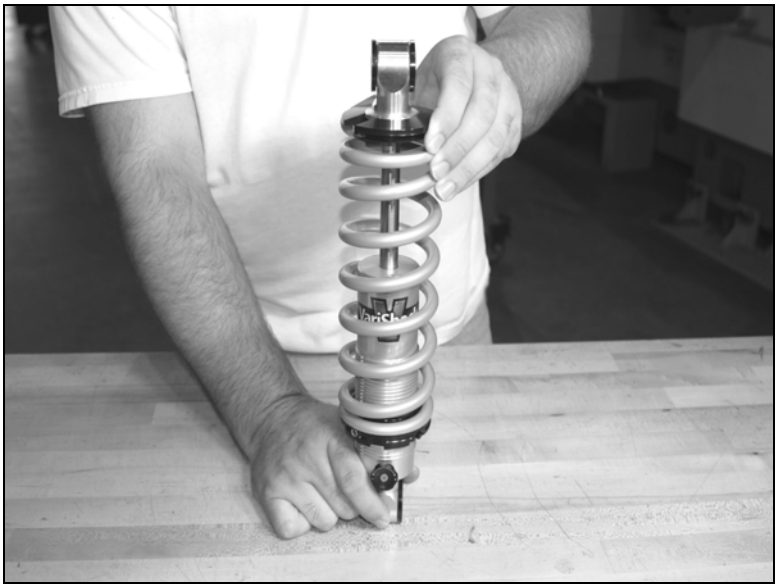


Screw the spring seat adjuster onto the shock. The set screw locking ball allows the spring seat height to be adjusted in ½ turn increments and then locked once the desired spring height is set.



This upper spring seat holds the spring in place at the top of the shock. The slot allows the spring seat to be inserted after the spring is in place.

Slide the rubber bumper down the shock shaft before installing the spring.

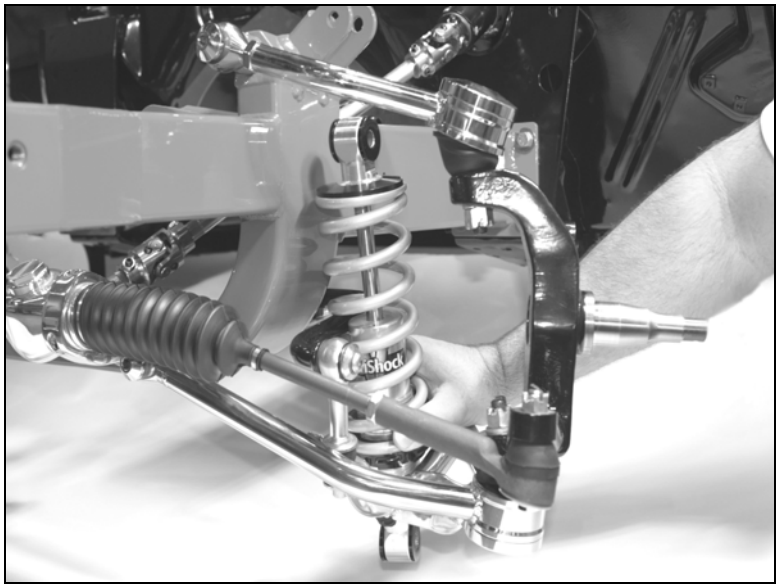


After dropping the spring over the shock, slide the upper spring seat over the shaft.

Next, turn the shock over and tighten the spring seat against the spring. After the spring seat makes contact with the spring, turn it one-half of a revolution. This will add a small amount of preload to the coil spring. Tighten the set screw locking ball with an allen wrench. With the spring seat at this position, adjusting the spring seat up or down 1/2-inch can make small changes in the vehicle ride height.

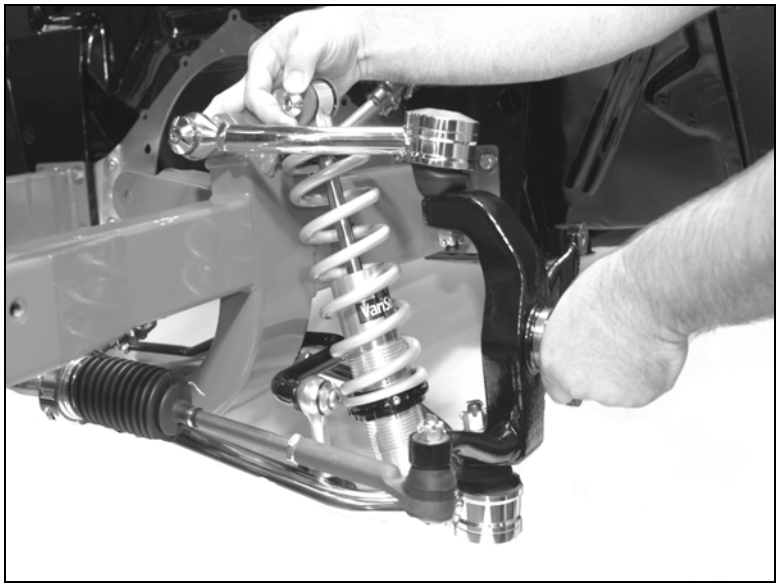
The designed ride height of the suspension has the compressed coilover at 12” eye to eye. If you install a 195/65-15 tire on a 6” wide 15” diameter 3 1/2” backspace wheel, the tire will have 6 1/2” of thread width be 8” wide at the section, have a mounted diameter of 25” and a rolling radius of 12”. This will hold the bottom of the crossmember 4 1/2” off the ground. The tire will hold the spindle centerline 12” off the ground. If you use a larger or smaller diameter tire, the crossmember clearance will change accordingly

These are the stainless steel shock mounting spuds used at the top and bottom of the shocks. If you did not purchase these, use the 1/2 x 2-1/2 bolts and locknuts provided with your suspension kit.



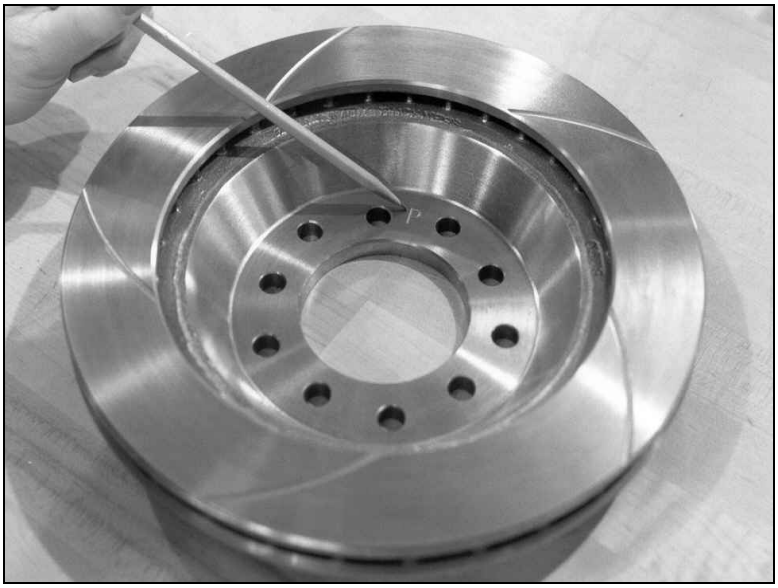
Insert the shock from the bottom. It will fit between the antiroll bar and the lower A-arm shock mount cross tube.

Install the lower shock spud first. Insert the male shock spud from the front of the car into the lower A-arm. Insert the female part of the spud from the back, it acts as the nut. Use Loctite™ to secure threads.



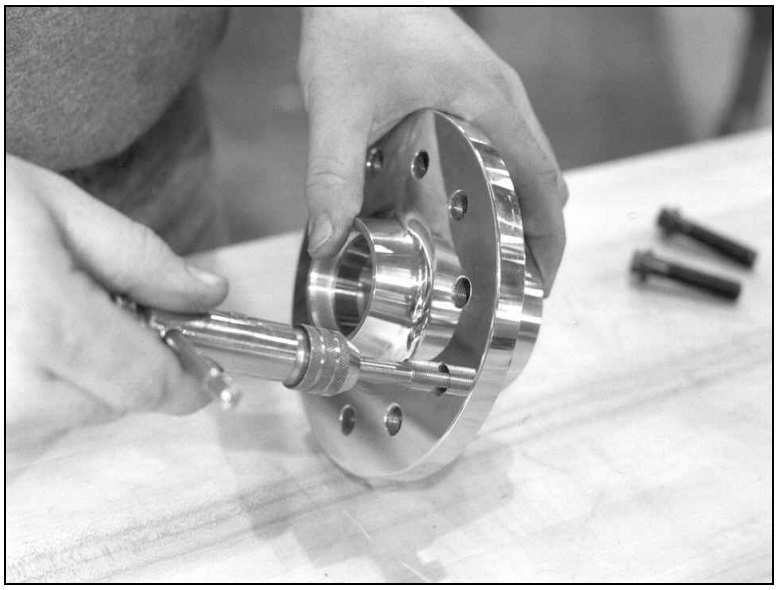
Using the spindle shaft as a handle, line up the top eye of the shock in the upper mount and slide the male spud in. Insert the female part of the spud from the back, it acts as the nut. Use Loctite™ to secure threads.

With both halves in place, use two Allen wrenches to tighten the spud together. Tighten them until they stop, the correct amount of crush is calculated into their length.



The 11 3/4 inch vented rotors are directional. The “P” machined on the inside identifies the passenger side rotor. There is a "D" on the driver side rotor.

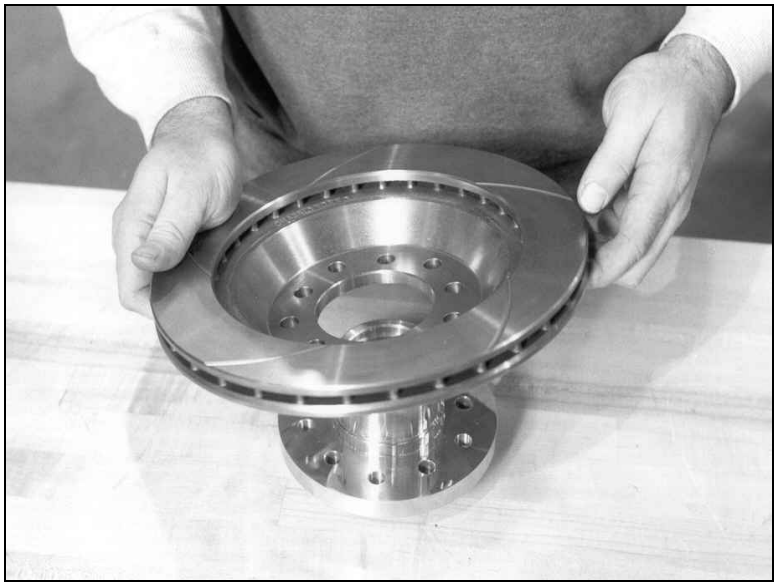
These brakes require at least a 15” diameter wheel; however, even some 15” wheels may not clear. Verify you have at least 1/4” of wheel clearance from all brake components.



The billet aluminum hubs have threaded stud-mounting holes for both 4 1/2 and 4 3/4 inch bolt circles.

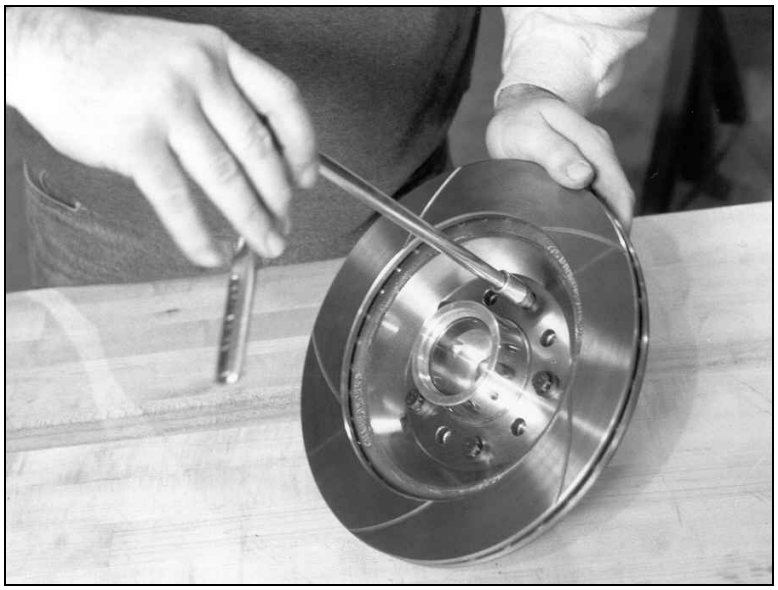
Choose the bolt circle that matches your wheels and chase the threads with a 1/2-20 tap.

After chasing the threads, it is a good idea to blow them out with an air hose making sure no debris remains in the holes.



Set the rotor over the backside of the billet hub. The larger bearing race snout on the hub is the backside. Line up the bolt circles on the hub and the rotor.

Add a drop of Loctite™ to the threads, up near the shoulder and insert the studs through the proper series of holes. The provided 12-point bolts are 2 1/4 inches long. If you need a longer wheel stud for thicker wheels, 3-inch long studs are available from Chassisworks.

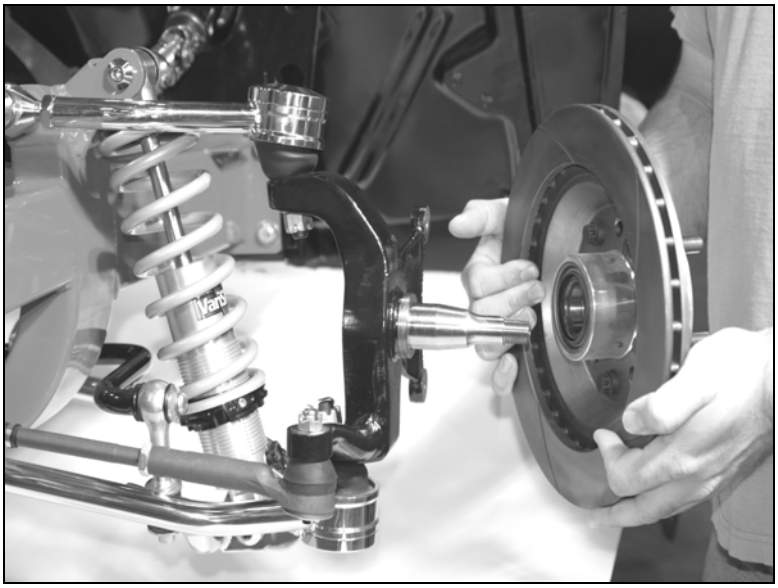


Tighten the studs from the backside of the assembly. You're ready to install the inner wheel bearing and seal.

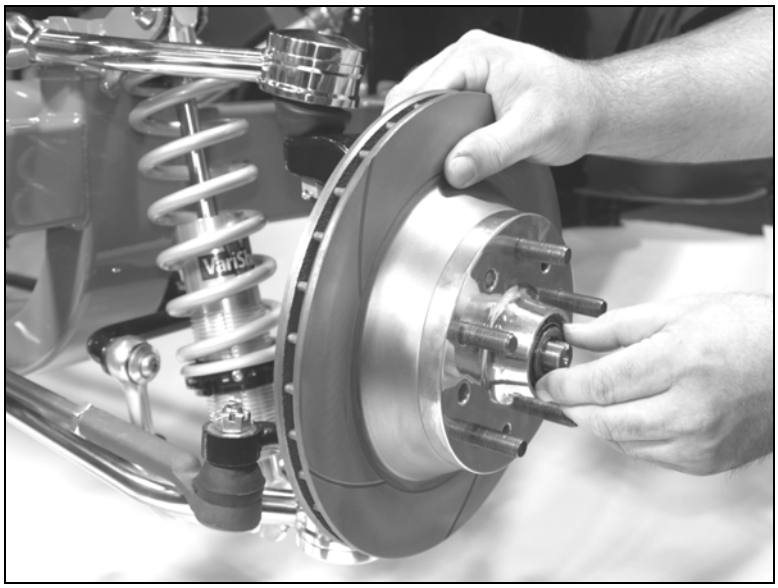
The bearing races are pressed in the billet hub from the factory. You must pack the wheel bearing before installing it. In the photo, a wheel-bearing packer is shown. If you do not have one available, hand packing the bearing is okay. If you are unsure how to pack the bearing, refer to an auto repair manual for assistance.

After the bearing is packed, drop it in the bearing race. The inner wheel bearing seal is then positioned on the hub.

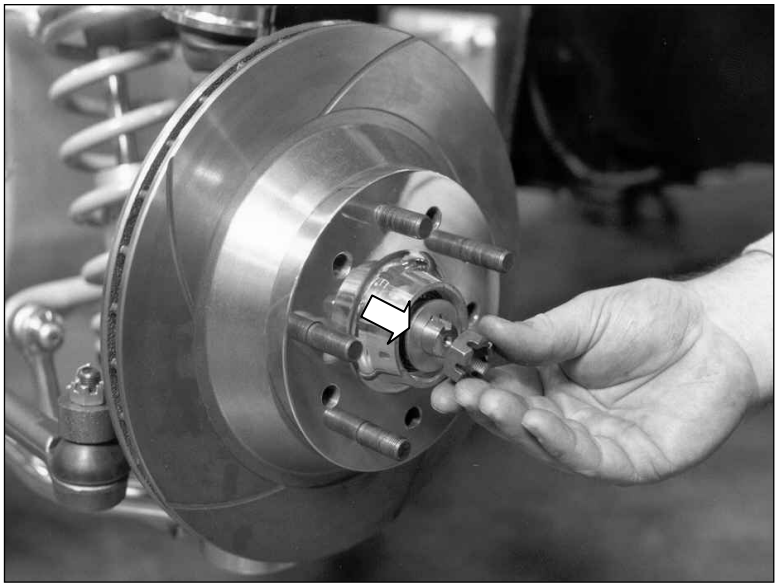
Place the hub on a wood surface before installing the seal. Using a hammer and seal installer, drive the seal into the hub making sure it's fully seated.



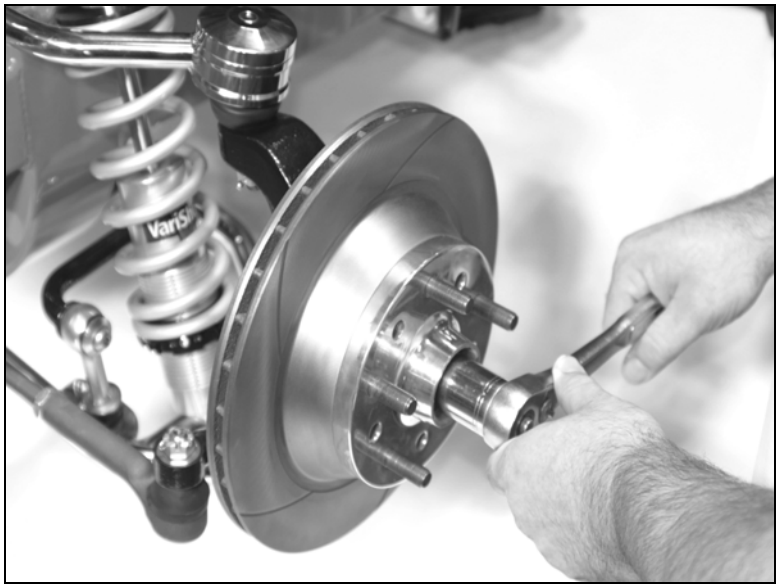
With the inner bearing and seal in place, slide the hub and rotor assembly onto the correct spindle (remember, the rotors are directional).



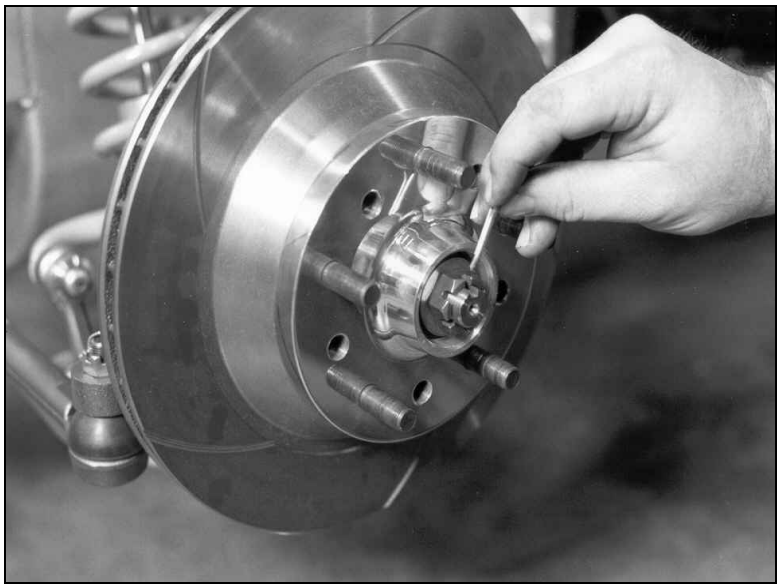
Pack the outer wheel bearing as you did the inner one. Slide the bearing into the race.



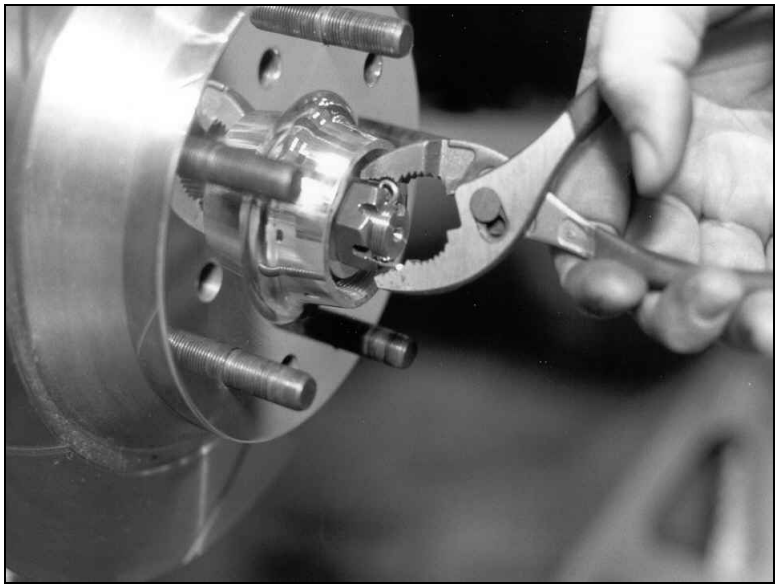
Slide the washer over the spindle shaft and install the castle nut.



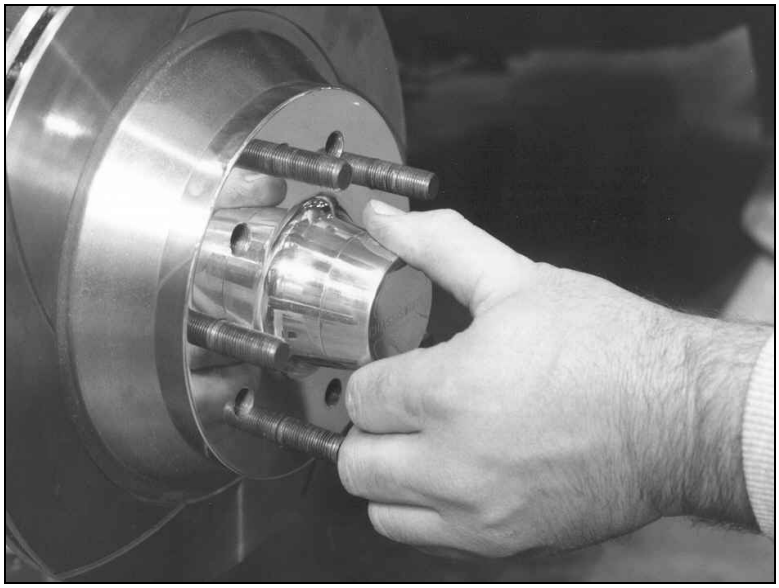
To fully seat the bearings, tighten the castle nut to 12 lb-ft while turning the rotor assembly forward by hand. This will remove any grease that could cause excessive wheel bearing play. Back off the castle nut to the "just loose" position and then hand tighten. There will be .001 to .005 inches of end play when the wheel bearings are properly adjusted.



After the wheel bearings are tight, insert the cotter pin through the castle nut and the hole in the end of the spindle shaft. Do not tighten the castle nut when aligning the cotter pin; only loosen it.

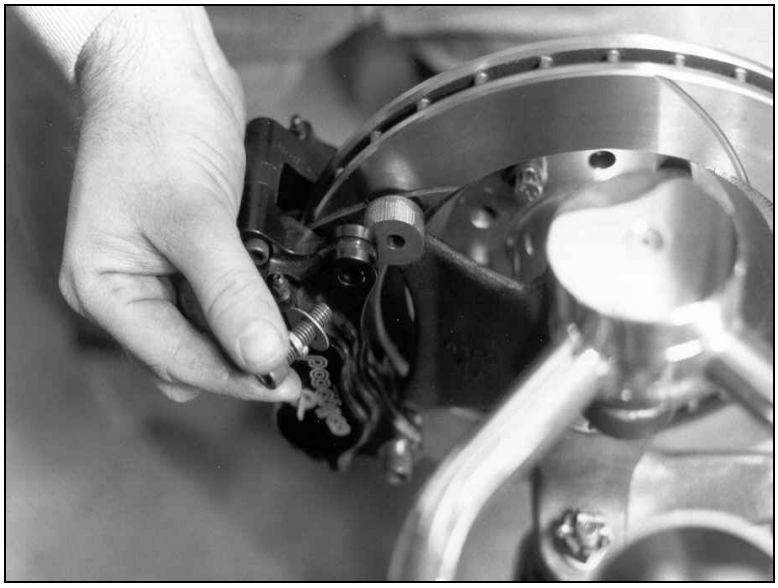


Use the same procedure you used on the balljoints to fold the cotter pin legs.

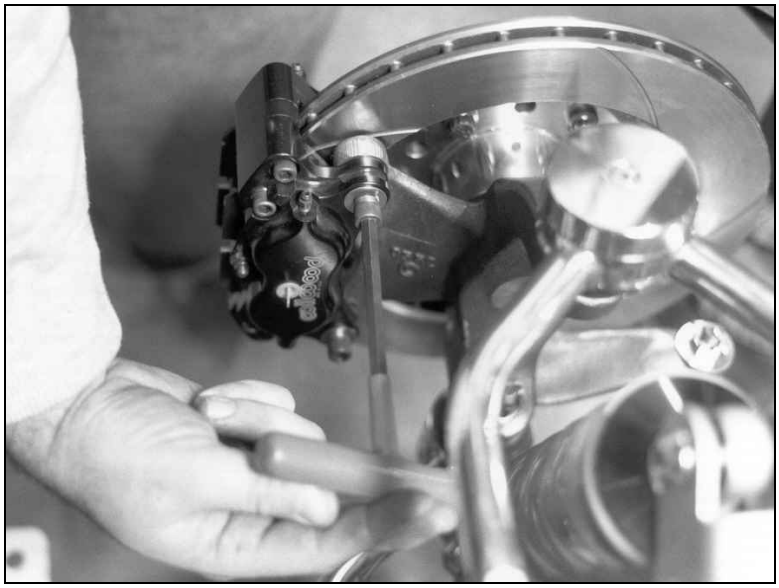


Apply anti-seize to the threads of the screw-on dust cap. Screw the dust cap onto the hub. It only needs to be hand tightened, the o-ring inside will keep it from coming loose.

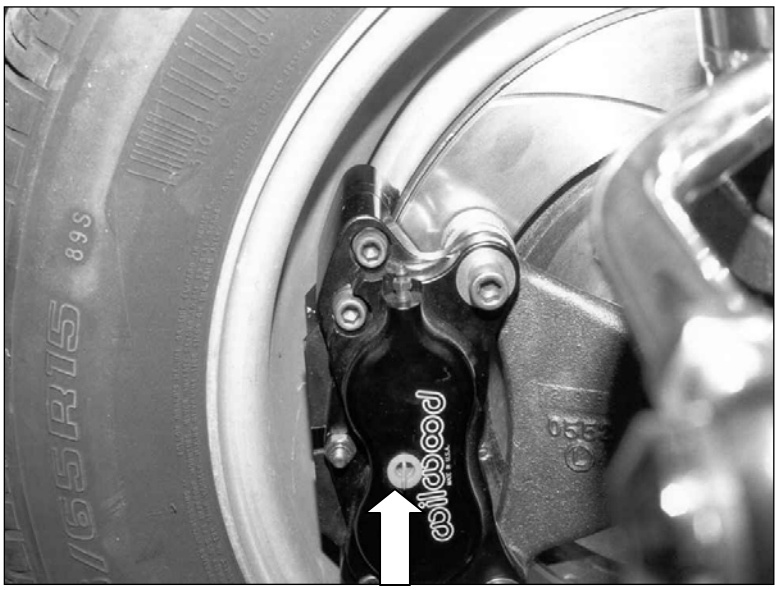
Next, install the Wilwood brake calipers. Start by inserting the brake pads into the caliper, one on each side of the rotor slot with the metal backing toward the pistons.



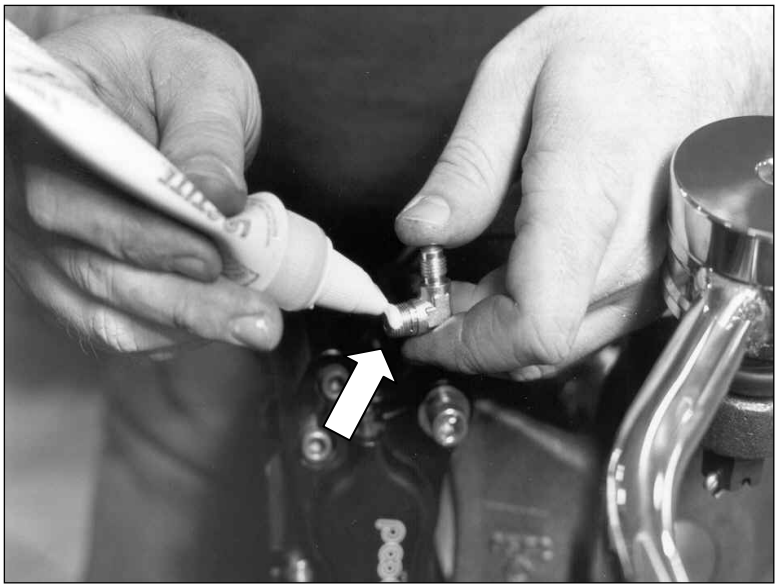
Slide the caliper with the pads installed over the rotor and the caliper mounting pads on the spindle. Use the 3/8-16 x 1 3/8 socket head allens, lock washers, and flat washers provided in your brake kit to mount the calipers. The lock washer goes against the head of the fastener.



Use the T-handle Allen wrench to tighten the mounting bolts. Rotate the rotor assembly slowly to check for any clearance problems between the rotor and the caliper.



Finally, bolt your wheel and tire on the hub and check again to be sure there is at least 1/4” clearance between the caliper and the wheel. There are differences in wheel manufacturer’s tolerances. Make sure your wheel turns freely. **Do not** use positive offset wheels with this suspension system.



Next, remove the plastic plug protecting the inlet port of the Wilwood caliper to start the installation of the stainless steel brake lines.

Coat the 1/8-pipe threads of the 90-degree brake line adapter fitting with Loctite™ teflon sealing compound.

Thread the fitting into the caliper. Be sure to start it straight so you do not cross thread it. If the threads in the caliper get damaged you will have to replace the caliper.

Use a 3/8” wrench to tighten the brake line adapter fitting. The hose end of the fitting should point toward the lower caliper-mounting bolt when tight.

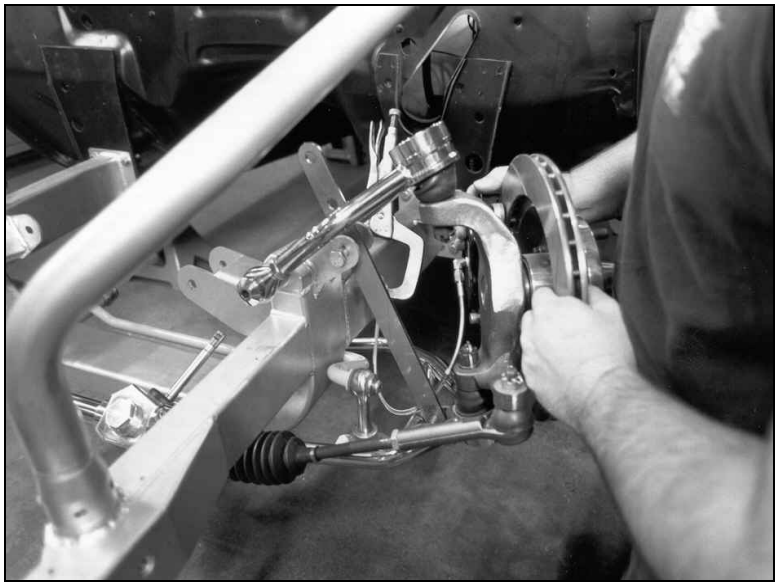
Remember, the caliper is aluminum and the fitting is steel. Do not over tighten and strip the threads in the caliper.

Thread the swivel end of the stainless steel brake line onto the adapter fitting until it is finger tight.

Slide the brake line frame tab over the other end of the stainless steel brake line.

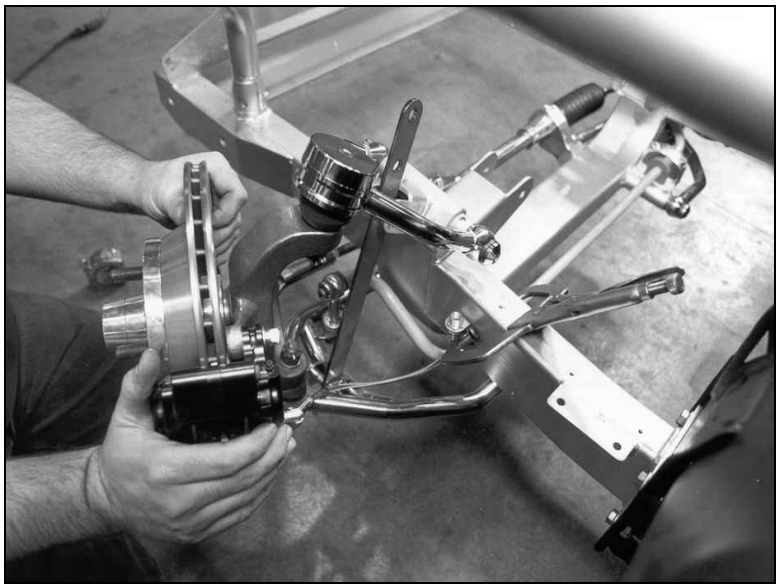
Install the jam nut and just finger tighten for now.

Clamp the brake line frame tab to the frame rail, centered directly under the head of the upper A-arm mounting stud and 11/2 inches down from the top of the frame rail.

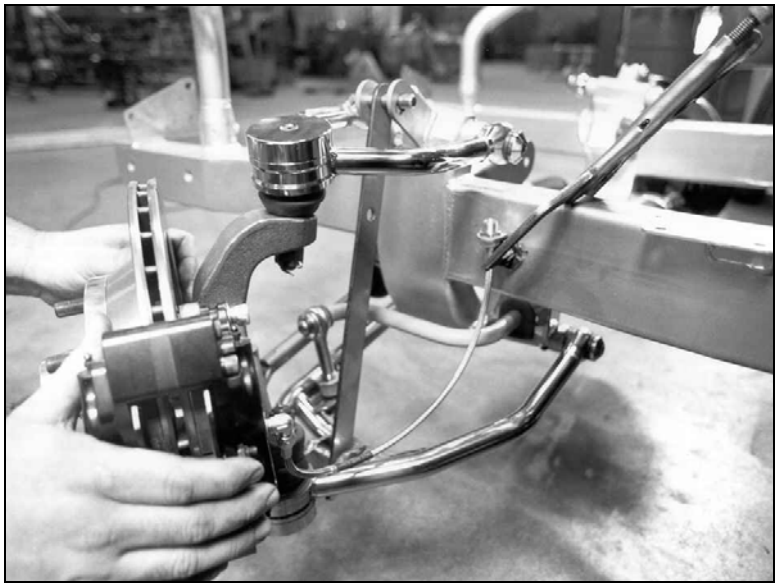


Next, check the brake line for clearance to all suspension parts. Also, be sure the brake line is not stretching or binding while the suspension goes through its full travel and its lock-to-lock turning radius.

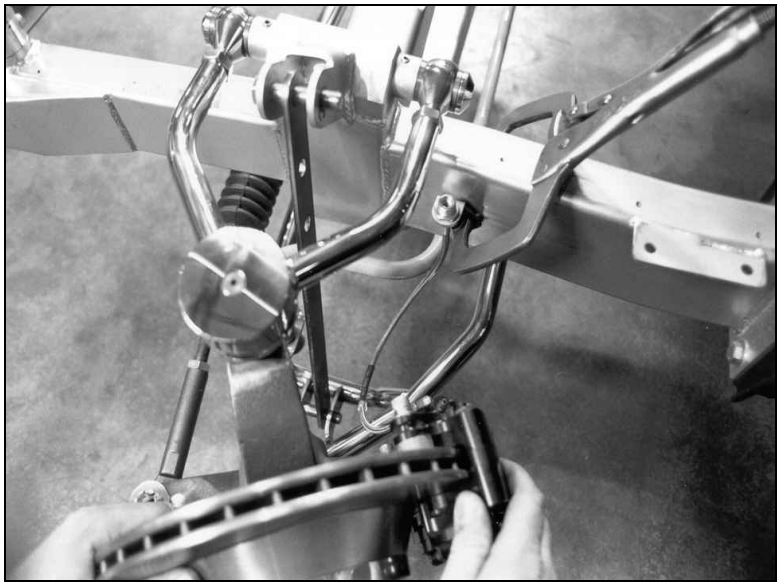
Unbolt the passenger side end of the anti-roll bar, remove the driver side coil-over shock and install the shock simulator in the fully compressed position. Turn the spindle to the full left lock position; check the brake line for binding.



Move the spindle to full right lock, check the brake line for any binding.



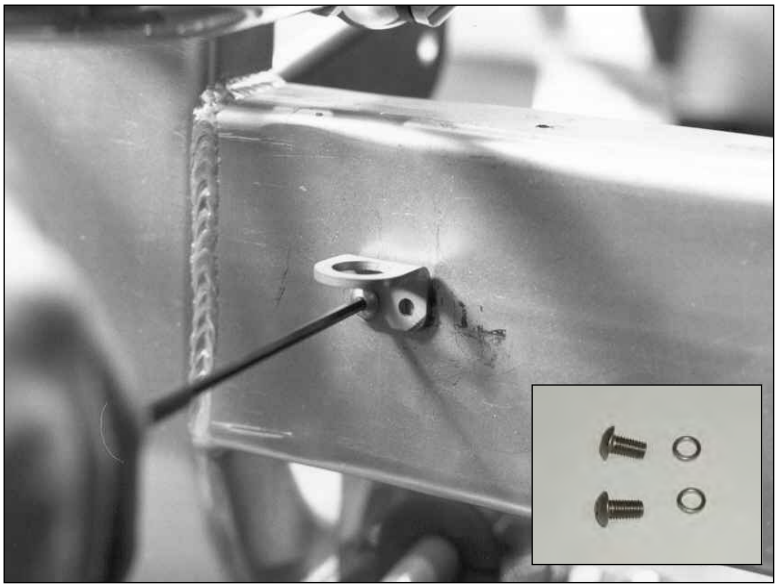
Move the shock simulator to the full extension setting, turn the spindle to full right lock position. Check the brake to be sure it is not stretched.



Turn the spindle to the full left lock position; check the brake line for binding.

Use a center punch to mark the forward hole location needed to mount the brake line frame tabs.

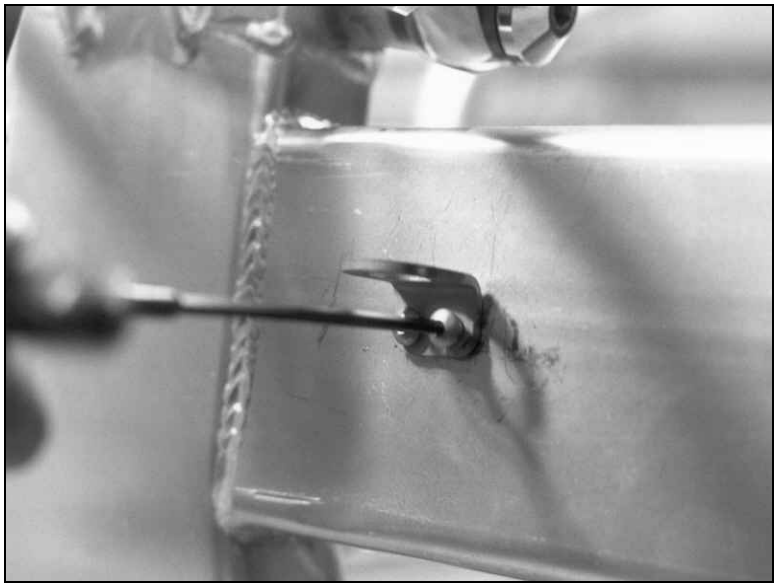
Drill one hole in the frame rail using a No. 21 drill bit (.159 diameter). Tap this hole with a 10-32 tap for the 10-32 x 3/8” stainless steel button head allens used to mount the brake line frame tab.



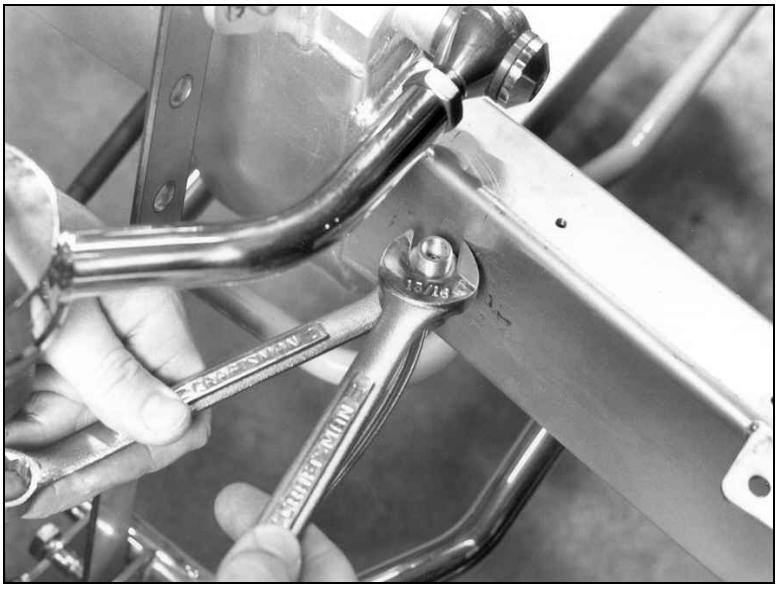
Remove the brake line frame tab from the end of the brake line.

Attach the tab to the frame rail with the stainless steel 10-32 x 3/8” button head and 3/16 high collar lockwasher provided. Use an allen wrench to tighten the button head.

Level the tab and use the rear hole as a guide to drill the frame rail. Use the 10-32 tap to thread the frame rail.



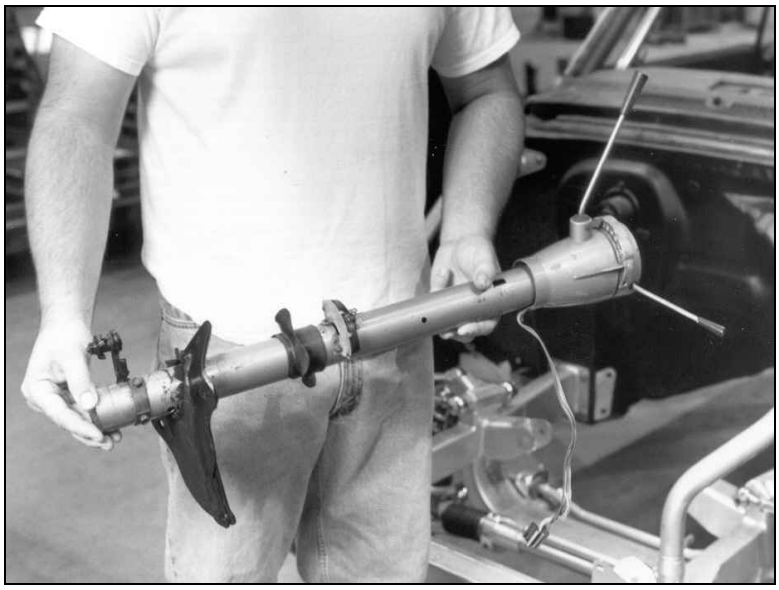
Again use the stainless steel 10-32 x 3/8 button head allen and high collar lockwasher to finish attaching the tab to the frame rail.



Insert the brake line through the tab and tighten using one wrench to hold the brake line and another to tighten the jam nut.

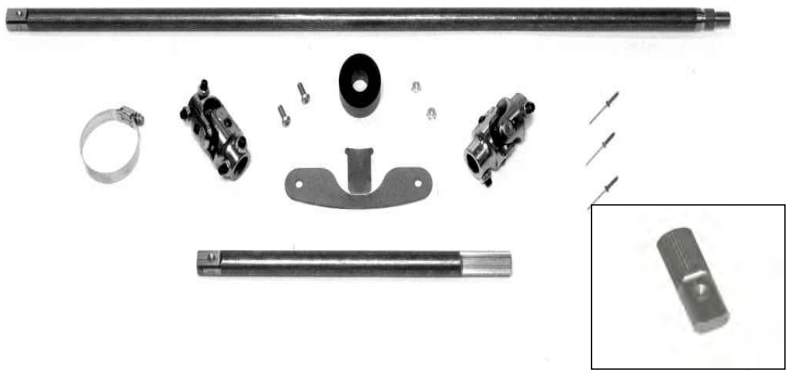
You can now final tighten the brake line at the caliper adapter.

Repeat this procedure for the passenger side brake line assembly.



Installing Steering Shaft & Column

In this section you will be reinstalling the steering column removed earlier.

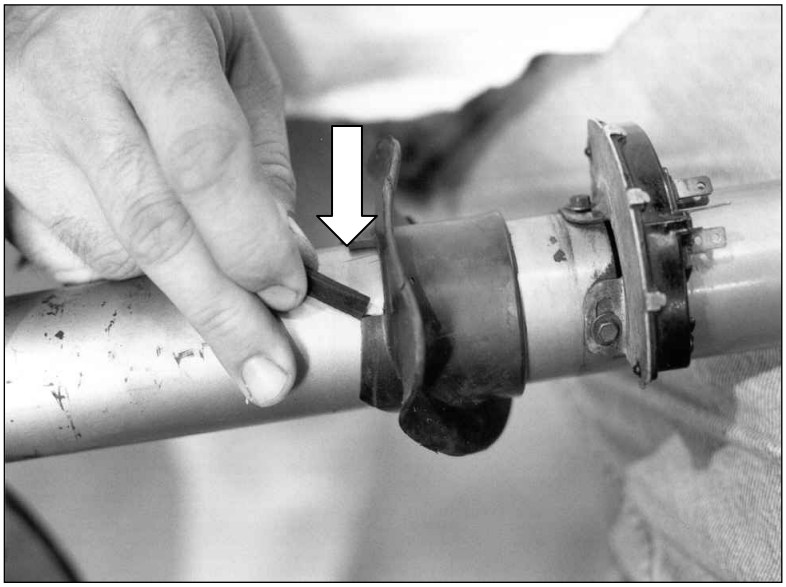


The 1962-1966 Chevy II steering column kit is shown here. The 1967 Chevy II has a different steering column and the column adapter is shown below.

For 1967 models advance to page 76, installation from that point on is the same for all models.

The firewall column mount will hold the lower end of the steering column in place at the firewall. You must trim the rubber column seal so the mount tab will contact the steering column for a secure attachment point.

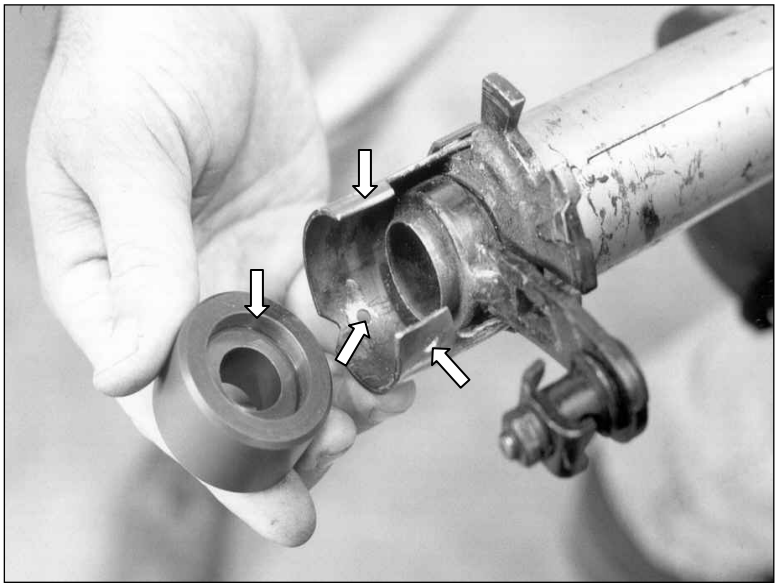
Hold the bracket against the steering column seal and trim it with a sharp knife.



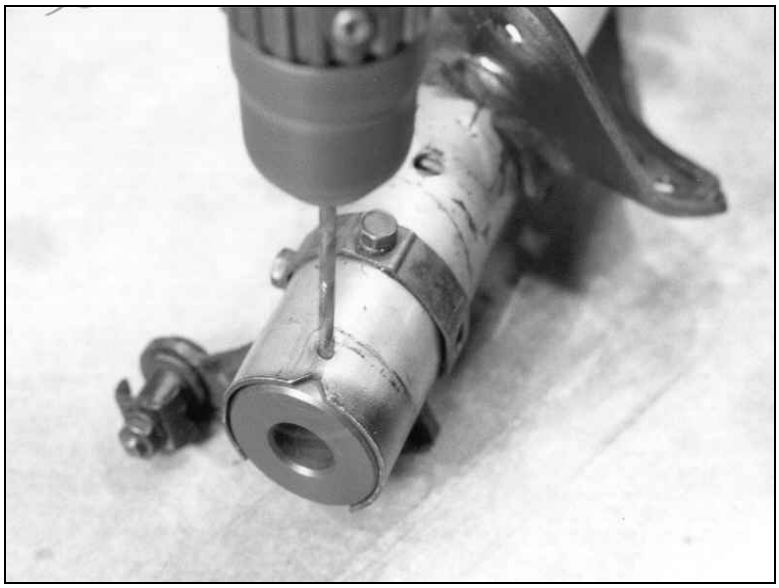
This makes a notch in the seal for the firewall column mount tab.

Check the fit making sure there is enough clearance for the tab.

Using a 3/16-inch drill bit, drill three holes to attach the column lower bushing to the steering column tube. Drill two of the holes 3/8 of an inch from the end of the column tube and 1/2 of an inch from the side of the shifter lever notch. Drill the third hole centered between them. The holes are easy to see in the photo below.

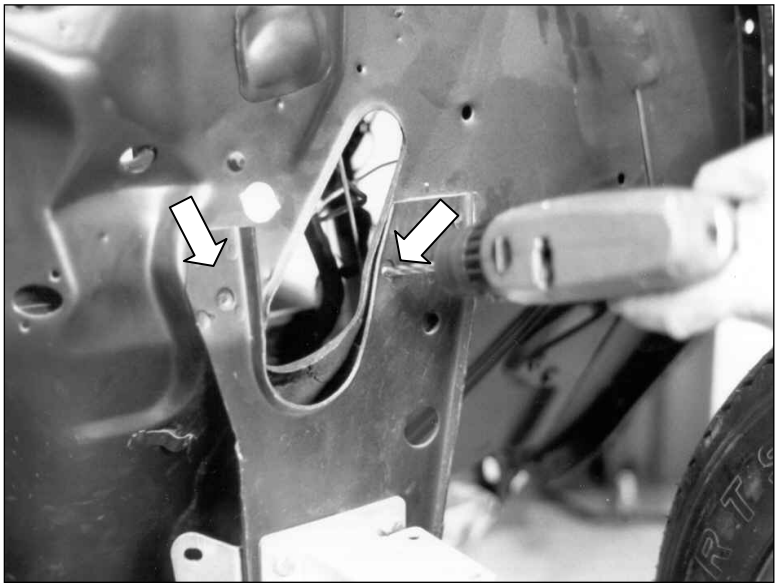


Insert the column lower bushing into the end of the steering column with the counter bore toward the shift linkage.



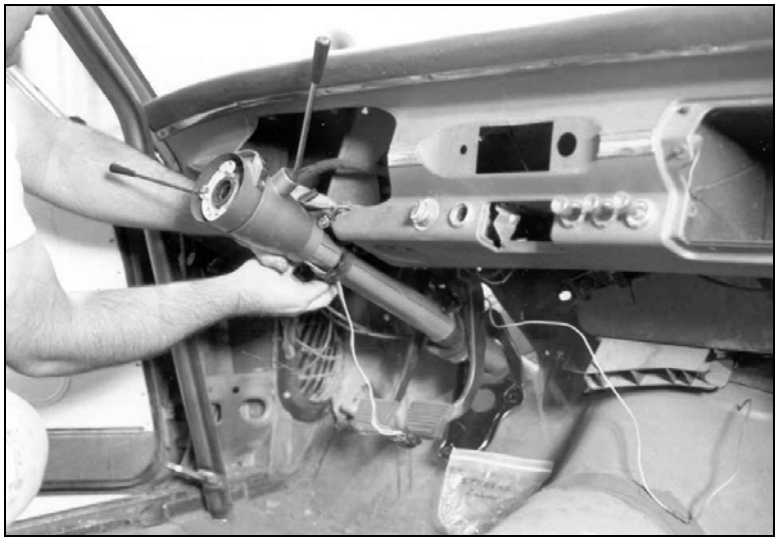
Push the column lower bushing into the steering column until it is flush with the end. Using the three holes drilled in the column as a guide, drill the bushing 3/8 inch deep, just enough for the blind rivets. Do not drill all the way through the bushing.

Install the 3/16-inch blind rivets to secure the column lower bushing to the steering column.



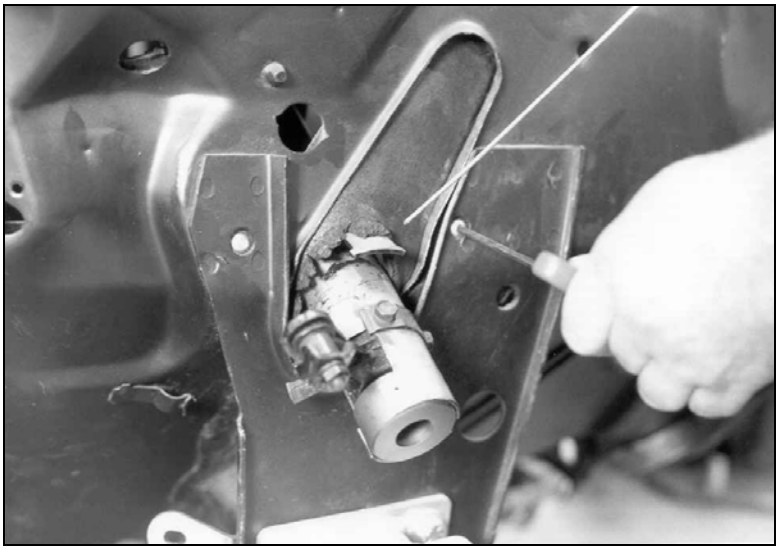
Use a 1/4-inch drill bit to enlarge the two holes on the firewall located on each side of the steering column opening. These holes will be used to attach the firewall column mount to the firewall.

Reinstall the steering column through the hole in firewall.

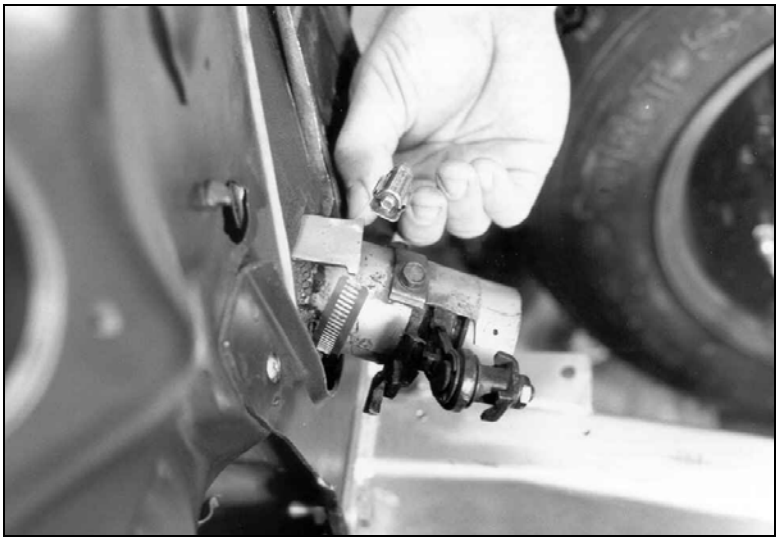


Raise the steering column up and attach it to the dash-mounting bracket. Use the hardware in the bag labeled “steering column,” do not fully tighten the column at this time, you will need to move it around when installing the firewall column mount.

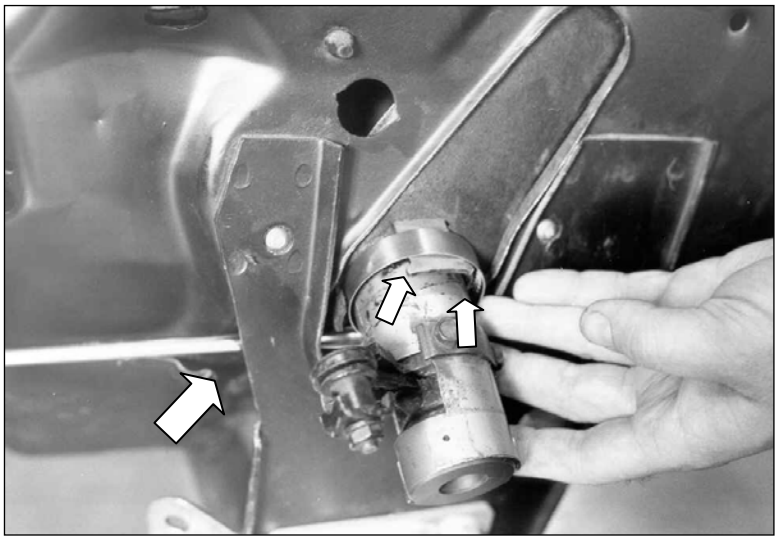
Set the firewall column mount on the steering column and against the firewall.



Use the 1/4-28 x 3/4 inch stainless steel button heads to attach the firewall column mount to the firewall. Insert the button heads from the engine compartment side and secure with the locknuts.

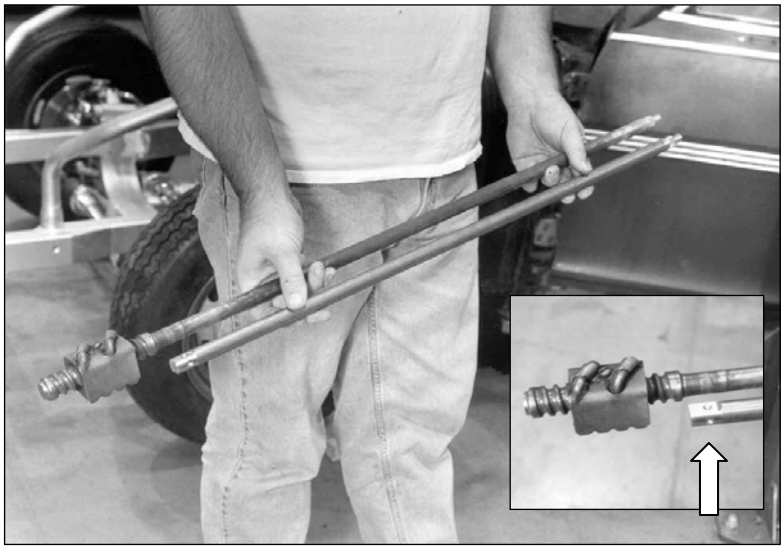


A hose clamp is used to secure the steering column to the firewall column mount.



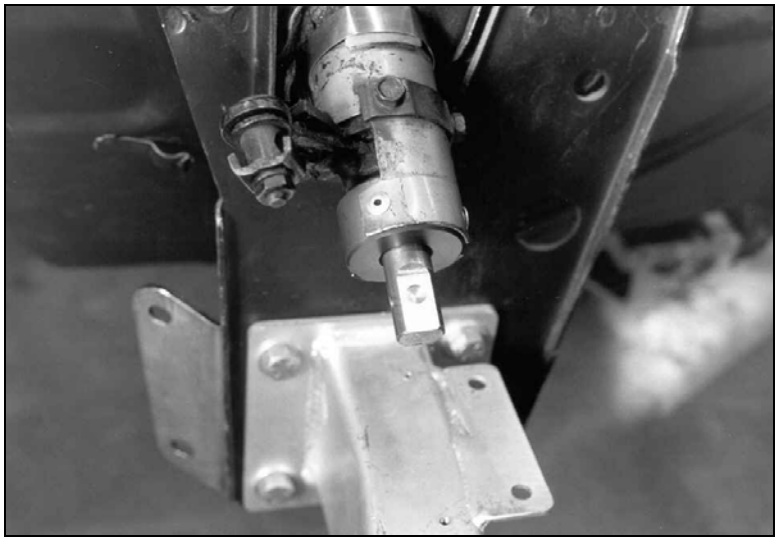
Position the hose clamp so it is behind the ears of the firewall column mount and the tightening screw is on the bottom. This gives you a clean look in the engine compartment. Tighten the hose clamp with a screwdriver from behind the frame firewall mounts.

You can now final tighten the steering column under the dash.



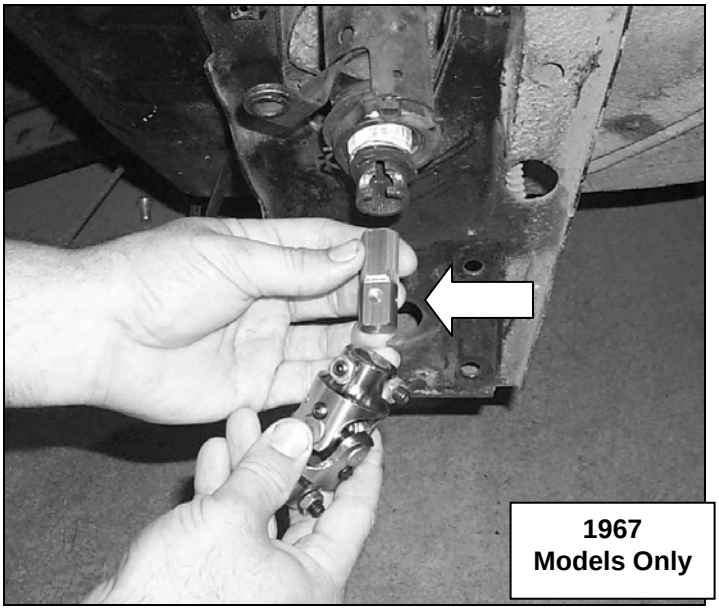
Your steering column kit includes a new column shaft, it will replace the stock one and is factory machined to accept the steering U-joint.

Slide the new steering column shaft through the steering column from the driver compartment.

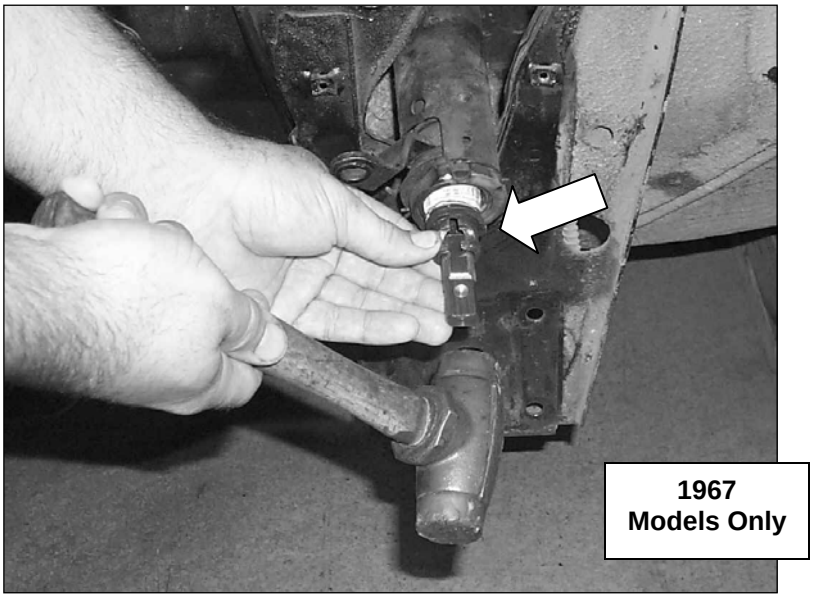


Push the column shaft through the steering column until the machined end is out past the column lower bushing.

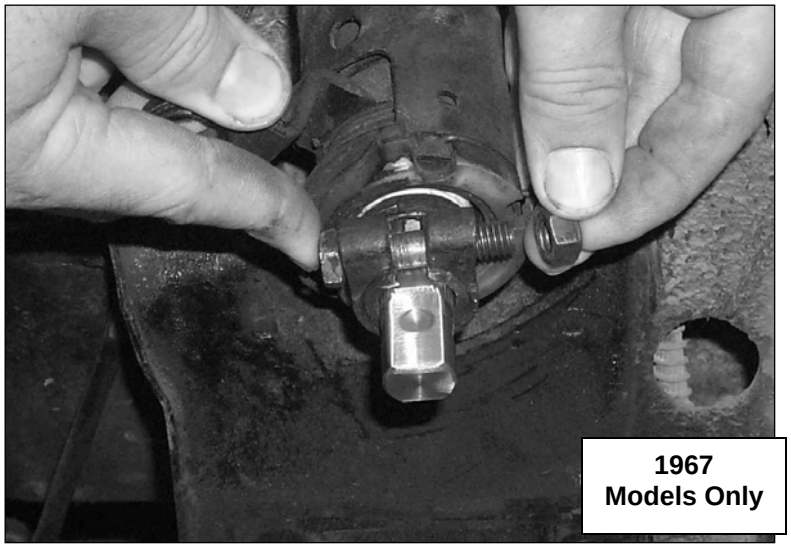
For installations on 1962-1966 models, advance to Page 77 lower photo.



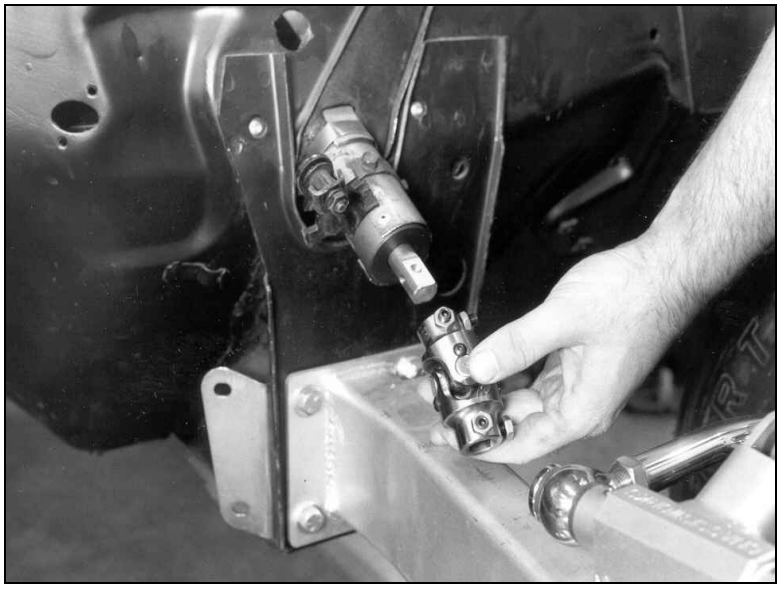
For the 1967 models you will be using the steering column adapter and U-joint included in your kit. Insert the steering column shaft adapter into the steering column shaft making sure the machined flat is parallel to the clamp bolt groove in the column.



Use a plastic hammer to install the steering column adapter shaft. Tap it in until the splined portion of the adapter is even with the end on the stock shaft.

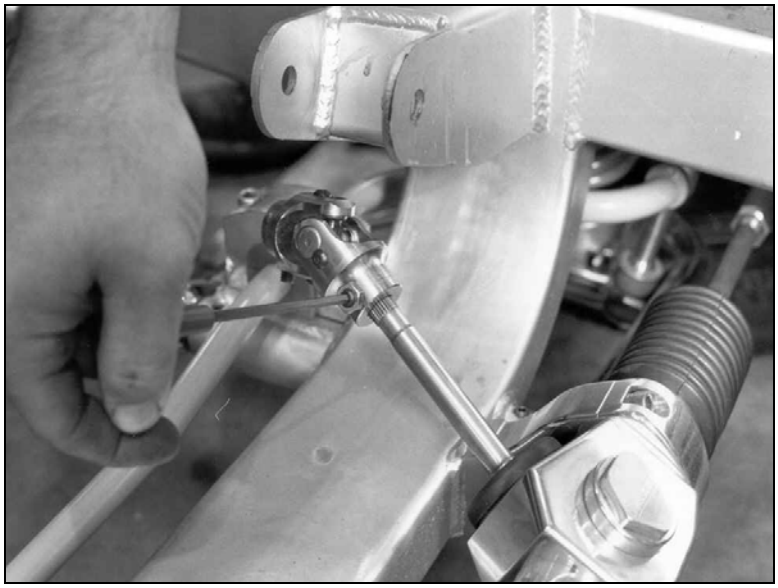


Slide the column shaft clamp into place and insert the original bolt and locknut. Tighten the clamp.

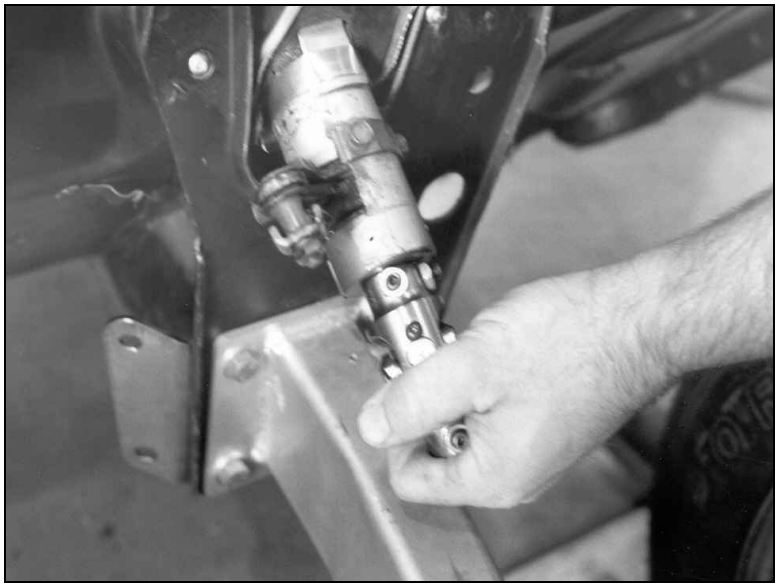


From this point on the installation is the same for 1962-1967 models.

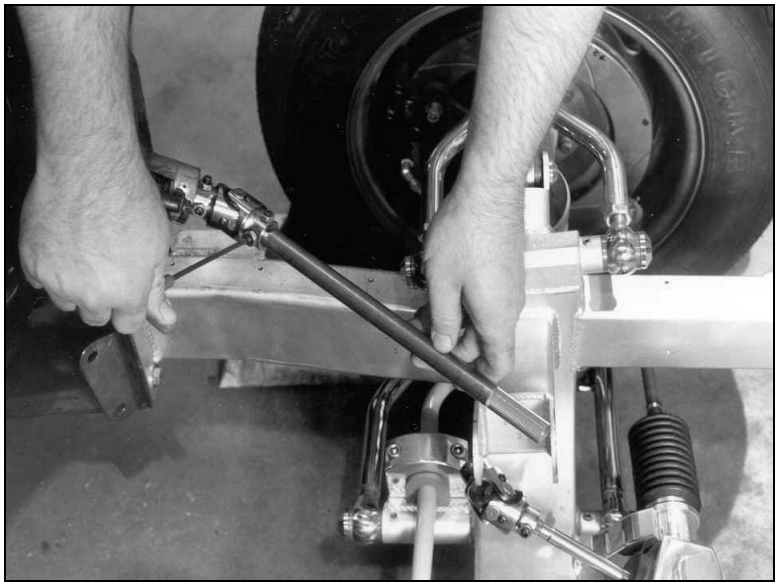
Slide one end of the Double-D U-joint onto the new steering column shaft. The set screws will line up with the indentations spot drilled in the shaft.



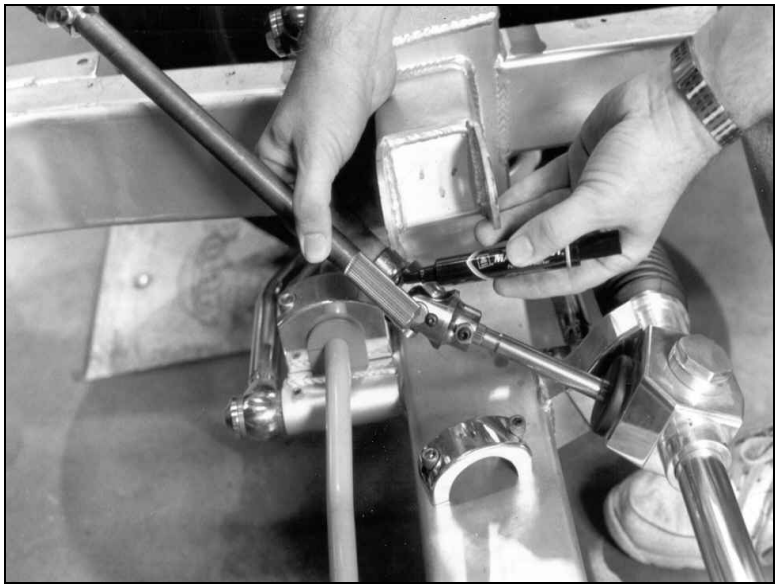
Install the splined U-joint onto the rack & pinion shaft, line the set screw up with the notch in the shaft, then tighten the set screw and jam nut.



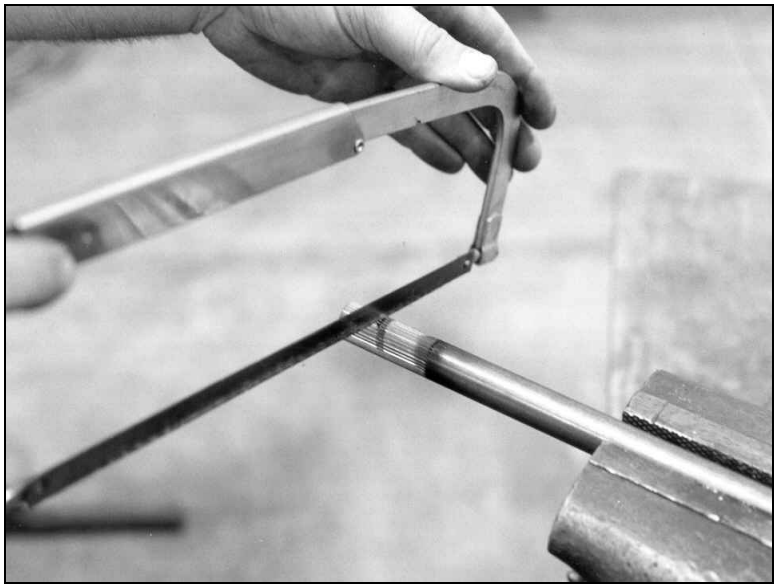
Before installing the intermediate shaft, push the U-Joint on the end of the steering column shaft as far upward as possible, the U-joint should contact the bushing on the 1962-1966 cars. This will put the shaft in the proper location.



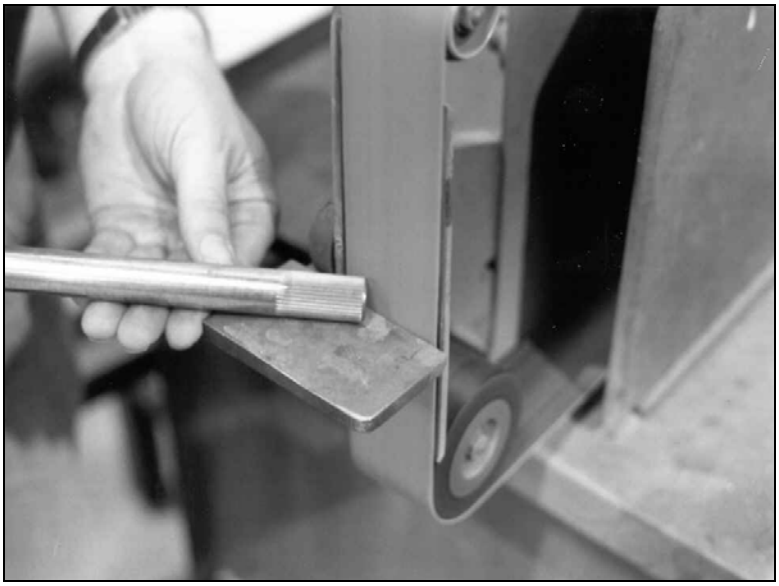
Slide the Double-D end of the intermediate shaft into the U-joint on the steering column.



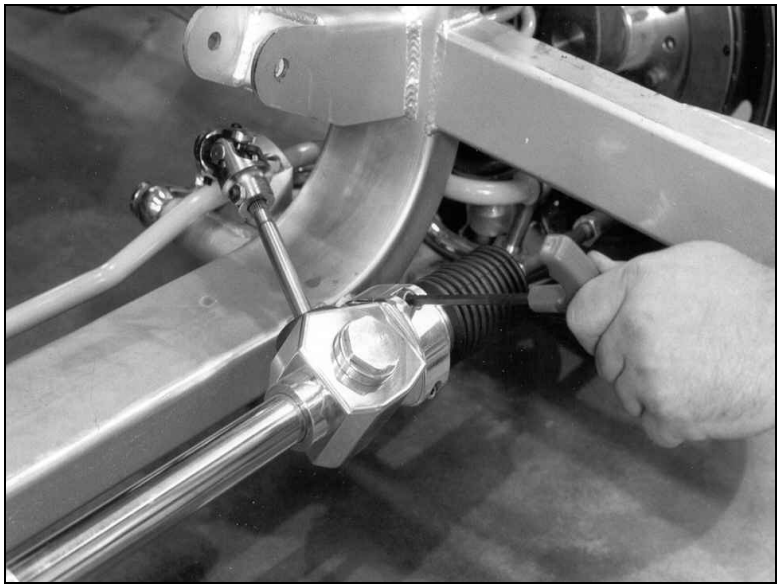
Rotate the rack up until the U-joint is 1/2 inch below the motor mount bracket on the frame. The intermediate shaft is made long so it can be fit in the car. The shaft should just come through the U-joint, mark it to be trimmed.



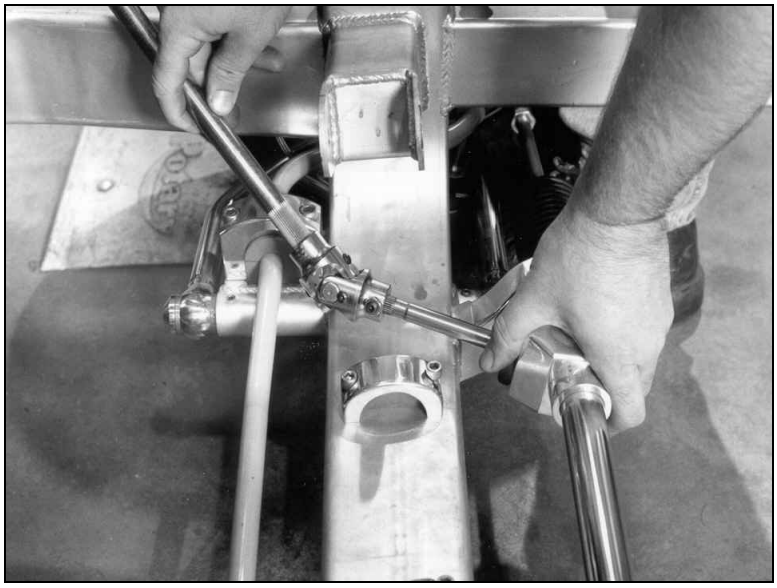
Clamp the intermediate shaft in a vise, and use a hack saw to cut it to length.



Use a sander to chamfer the end of the shaft before installing it. Also check the splines to be sure they are burr free.

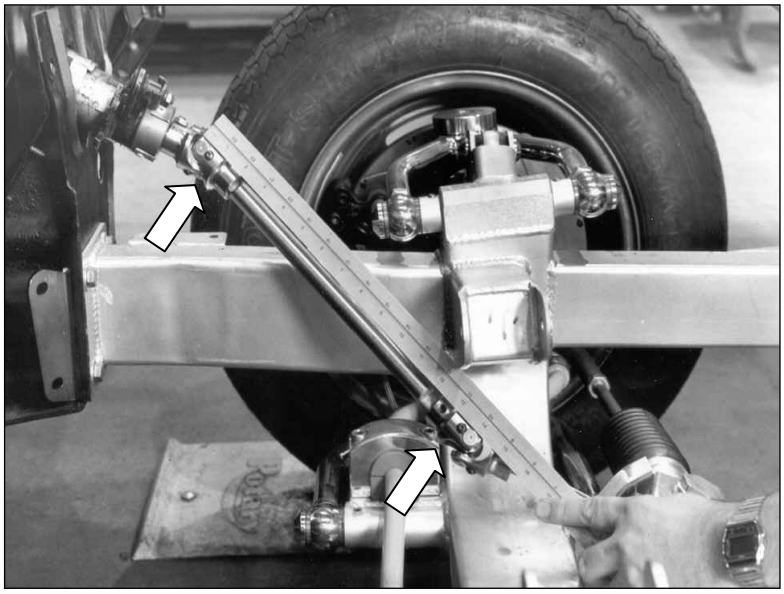


It will be necessary to move the steering rack forward to install the intermediate shaft. Remove both rack clamp caps.



Reinstall the intermediate shaft into the steering column U-joint. Rotate the rack down and move it forward until you can slide the intermediate shaft into the lower U-joint.

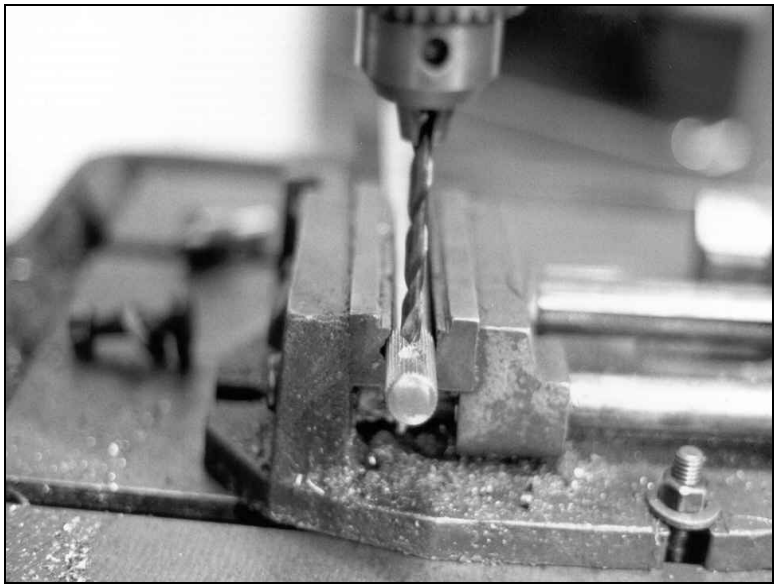
The intermediate shaft should be flush with the U-joint bore. If it protrudes more than the pointer shows, it will bind. Use a sander to shorten it for proper fit.



The intermediate shaft must be installed so the two U-joints are properly phased, with the pins inline with each other. Use a straight edge to verify their locations.

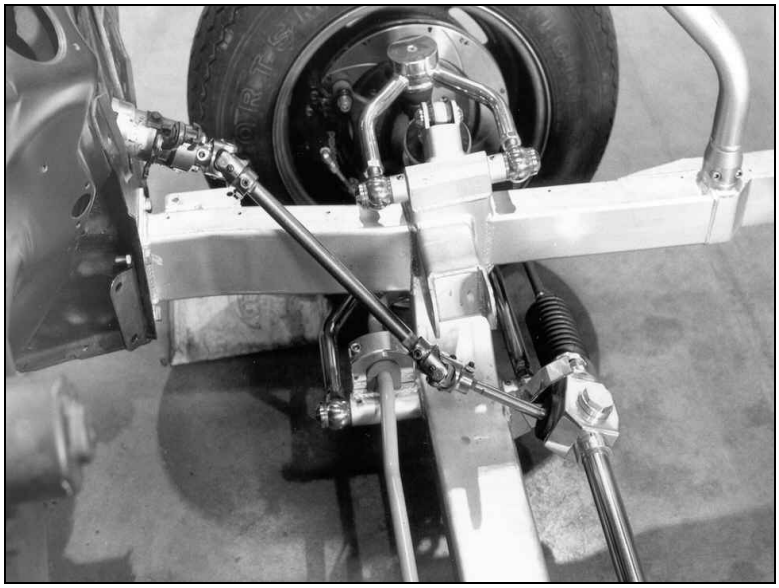
After you have the U-joints phased properly, use a felt tip marker to mark the location where the U-joint set screw contacts the intermediate shaft.

This mark shows the location the set screw contacts the intermediate shaft.

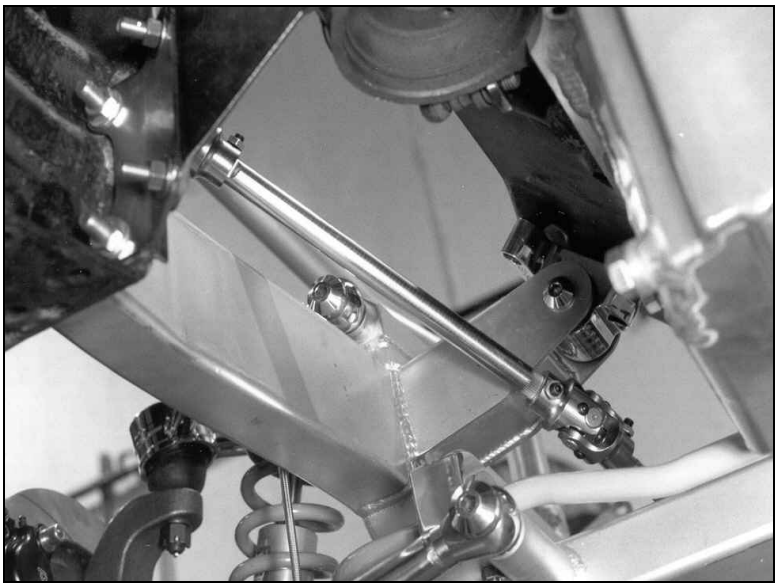


Use a 5/16 inch drill bit to spot-drill the intermediate shaft for the set screw. A drill press and vise work best for this procedure.

Reinstall the intermediate shaft. Apply a drop of Loctite™ to the U-joint set screws and tighten. Thread the jam nuts on the set screws and tighten also.



Reinstall the rack & pinion clamp caps. Your steering shaft installation should look like this.



With the engine installed, you can see steering shaft allows plenty of room for the exhaust. Paint the U-joints and steering column shaft to prevent rusting.

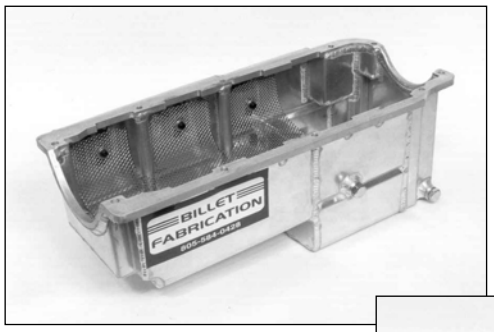
Before installing the steering wheel, slide the column tension spring over the shaft.

Make sure the rack is centered before positioning the steering wheel. With the rack centered your wheels should be straight forward.

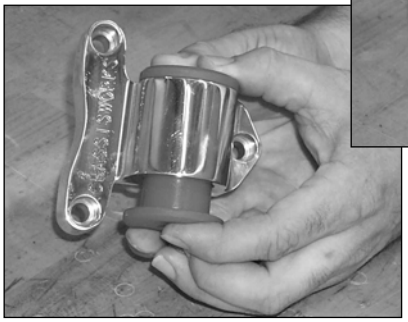
Once the rack and wheels are correct, center the steering wheel and tighten with the factory locknut.

Installing Billet Engine Mounts & Automatic Transmission Mid Plate

Before you install the engine we will need an oil pan that will clear the front suspension. Most rear sump pans will fit fine. Bolt the oil pan on the block before starting the installation.



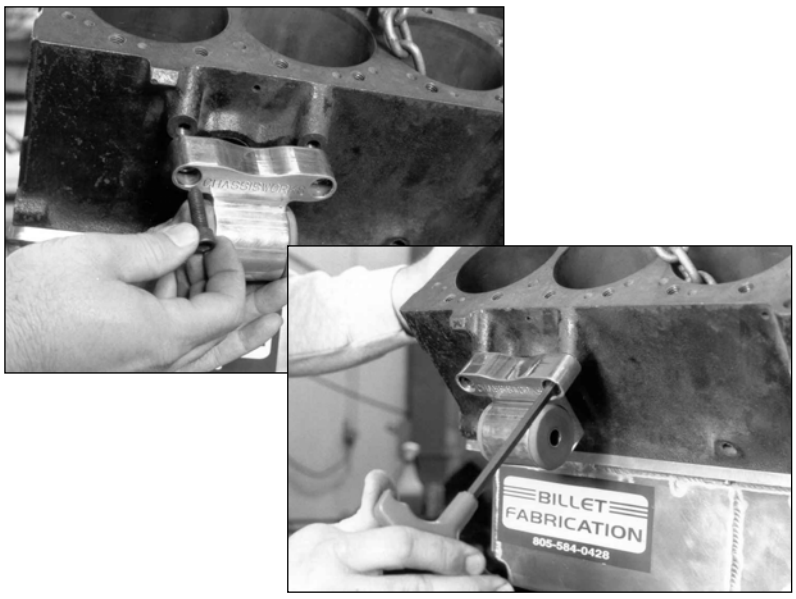
Here is a close-up look at the Billet Fabrication oil pan designed for the Chevy II front frame clip. This high tech oil pan is available for small block engines.



Insert one urethane bushing into each side of the billet mount. Install the steel sleeve into the bushings.

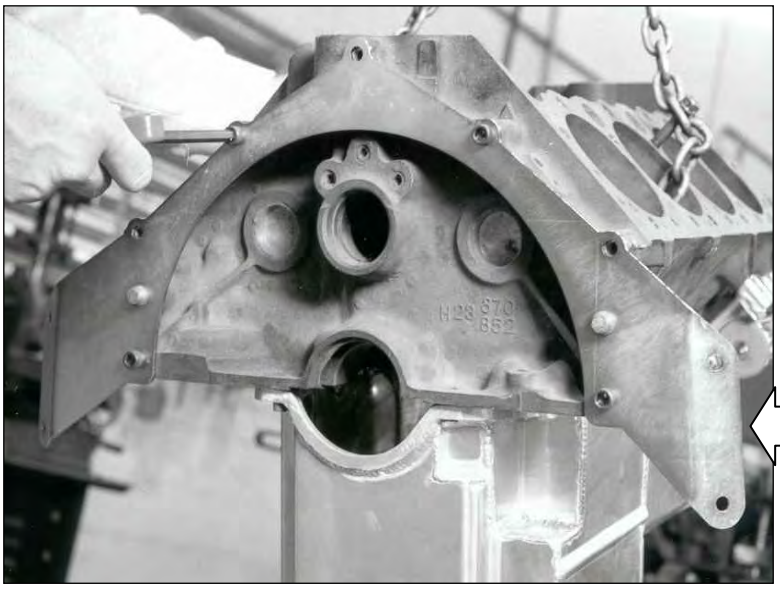
There is no need to lubricate the urethane bushing assembly, it does not rotate.

Repeat the bushing and sleeve installation for the other billet side mount.

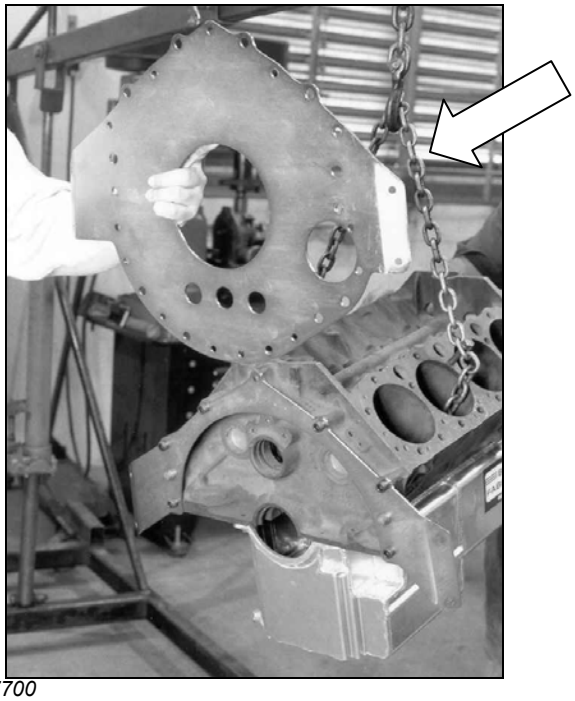


Install the assembled billet mount to the engine block with the stainless steel 3/8-16 x 1 1/2 inch socket head allens and 3/8-inch high collar lockwashers provided. It is best to start all three fasteners before final tightening the billet mount to the block.

Once both billet mounts are installed, you can install the mid plate.

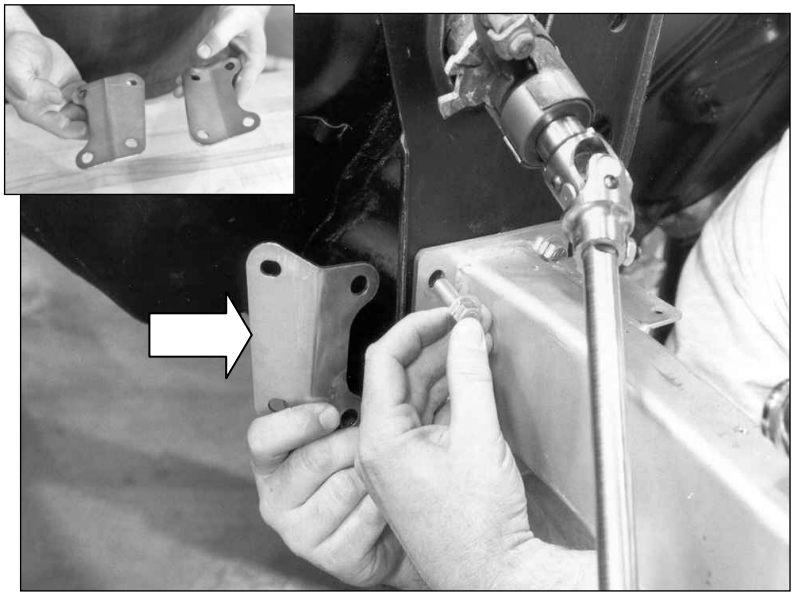


Bolt the automatic transmission mid plate to the back of the engine block with the bent ends facing the front of the engine.

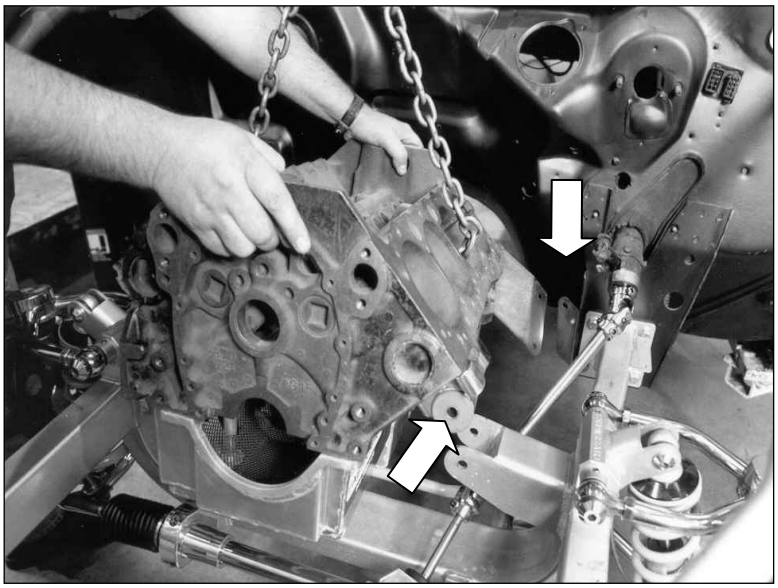


Installation of a manual transmission and Lakewood bell housing will require the mid plate shown here.

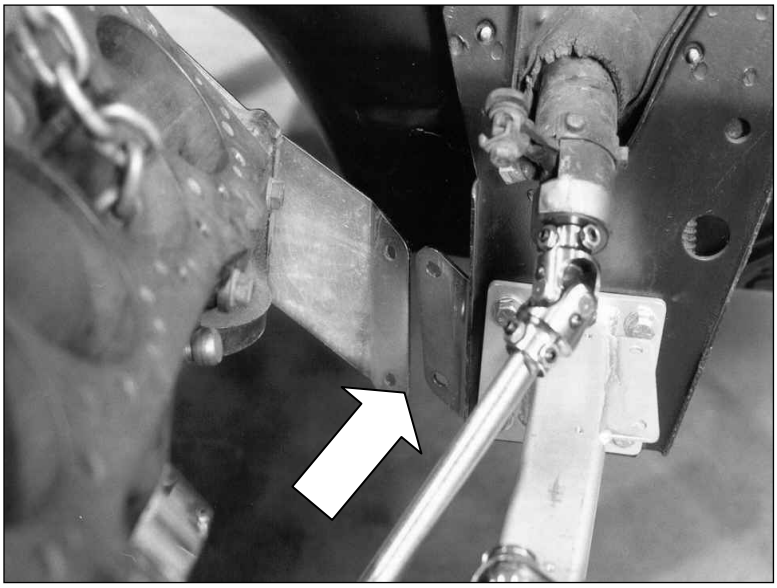
For detailed installation procedure advance to page 90.



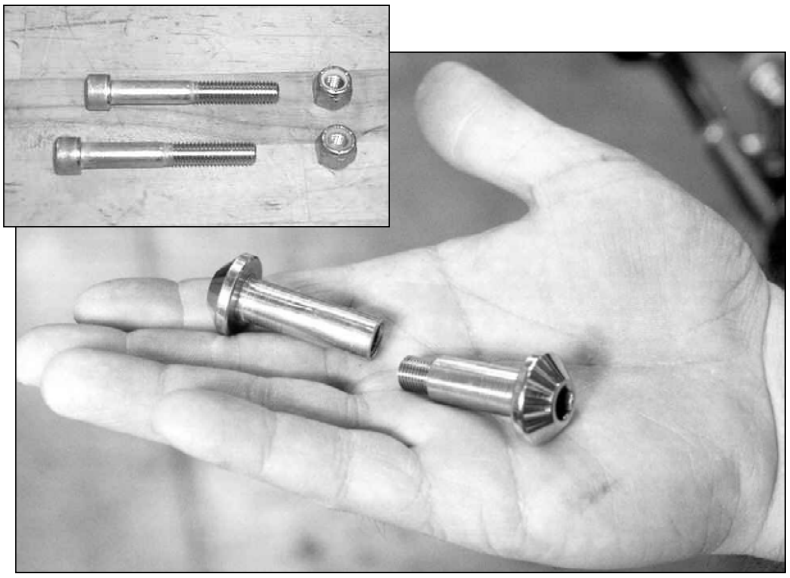
The mid plate mounting brackets (shown far left) attach on the back side of the car's lower frame mounts using the inner bolts that attach the frame clip to the car. Remove the inner bolts to install the driver mid plate mount bracket. Note the bent portion of the bracket faces the rear of the car. With the bolts in place, torque them to 45 lb-ft. Repeat this for the passenger side bracket.



Set the engine in place lining up the billet motor mounts with the frame motor mount brackets. Maneuver the engine into place carefully checking that all parts have sufficient clearance.

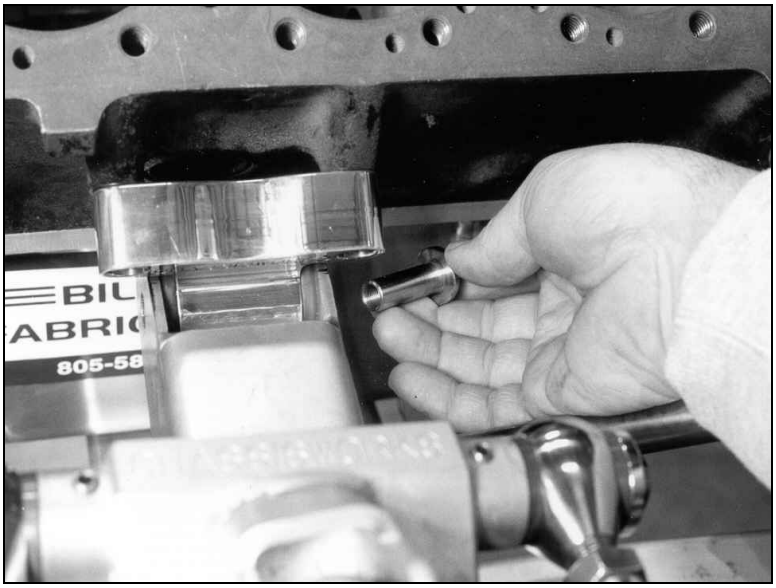


Make sure the mid plate is on the front side on the mounting bracket when setting the engine in place.



These optional stainless steel "spuds" will be used to fasten the billet motor mount to the frame.

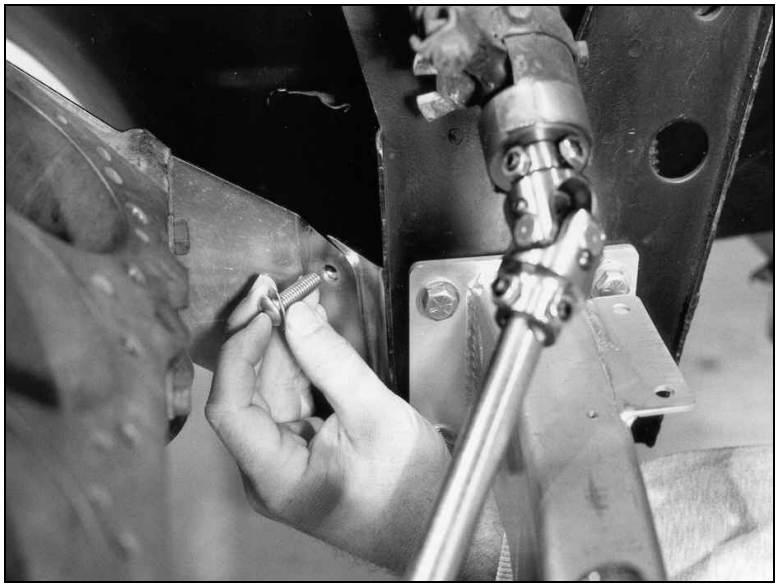
If you did not purchase the spuds, use the stainless steel 1/2-13 x 3 1/2 inch socket head allens and locknuts provided in the billet motor mount kit (shown in upper left).



Insert the female spud through the frame mount into the billet motor mount assembly from the rear.

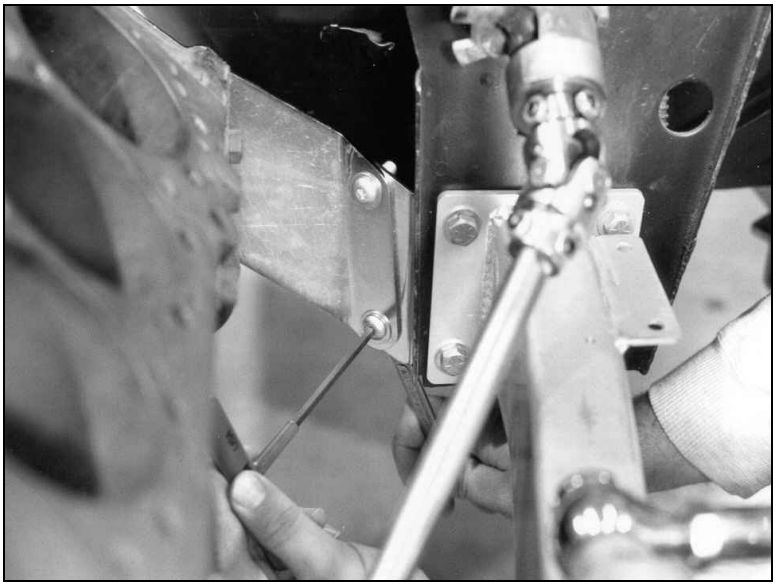
Apply a small amount of Loctite™ and insert the male portion of the spud through the motor mount bracket and into the billet motor mount assembly. Thread the male and female spuds together and just finger tighten for now.

Repeat this on the passenger side before going to the next step.

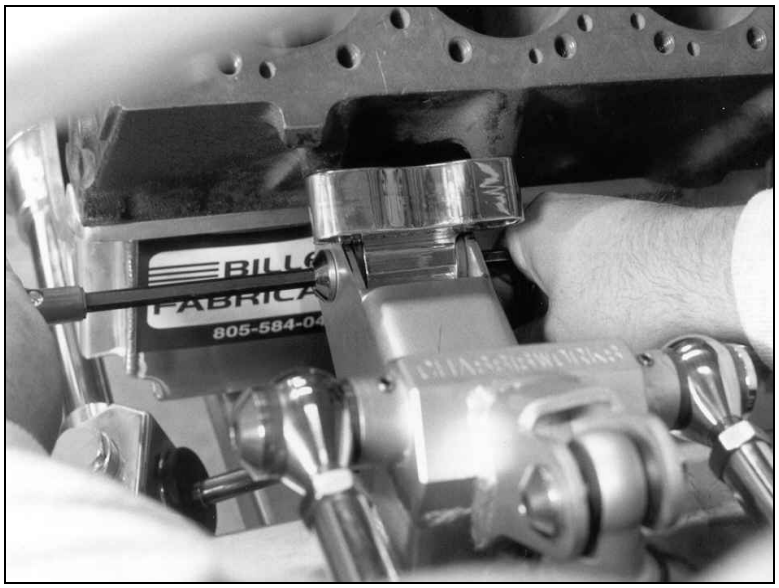


Use the stainless steel 3/8-16 x 1 1/4 inch button head allens, flat washers and locknuts to attach the mid plate to the mid plate mount brackets. Put a flat washer against the button head and another one on before the locknut.

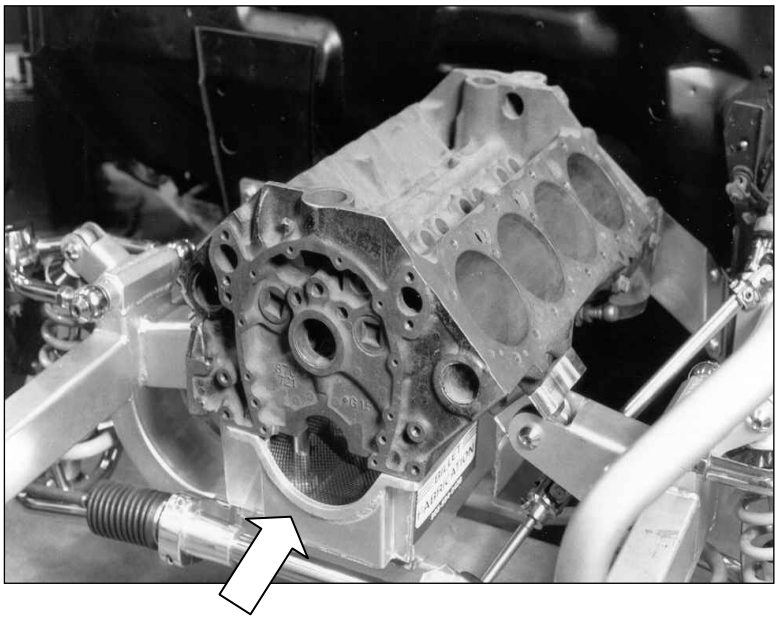
Do not final tighten these until you have the driver and passenger side button head allens installed.



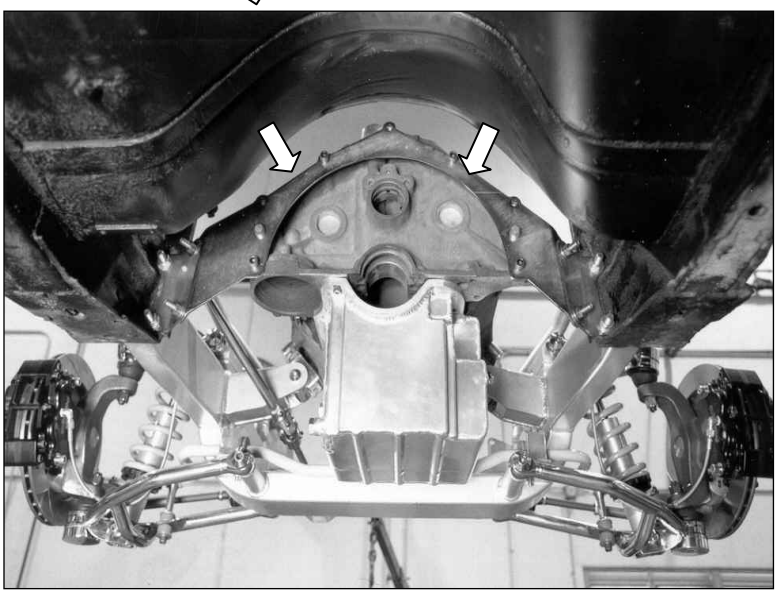
Use an allen wrench and a 9/16 inch wrench to final tighten the mid plate button heads allens.



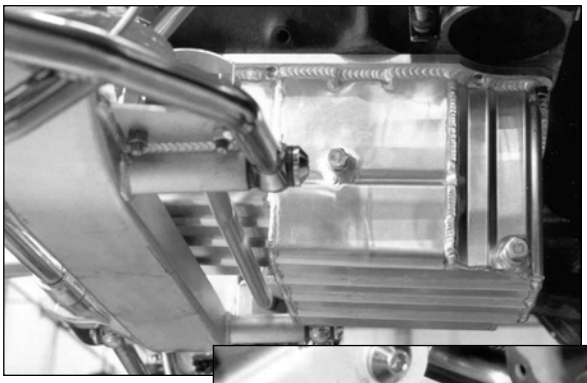
Final tighten the motor mount spuds using two allen wrenches. Torque them to 20 lb-ft.

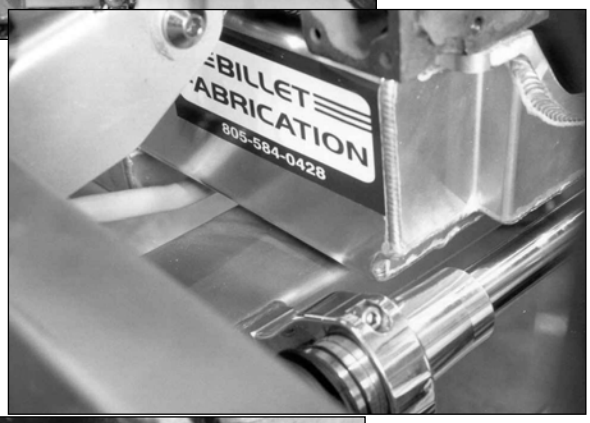


The engine is now mounted. Notice that the Billet Specialties oil pan has plenty of clearance for the rack & pinion.

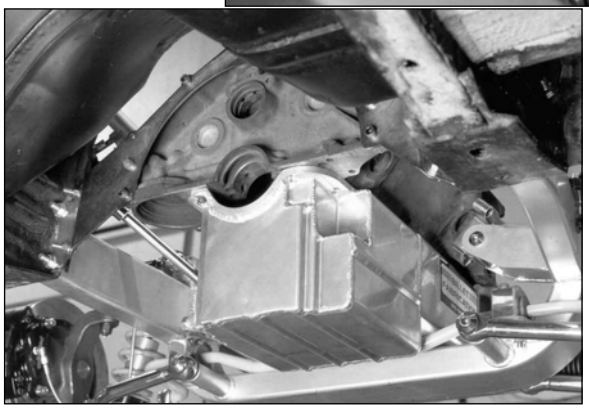


With the engine supported by the mid plate, installing the transmission is easy. Notice the firewall to mid plate clearance.

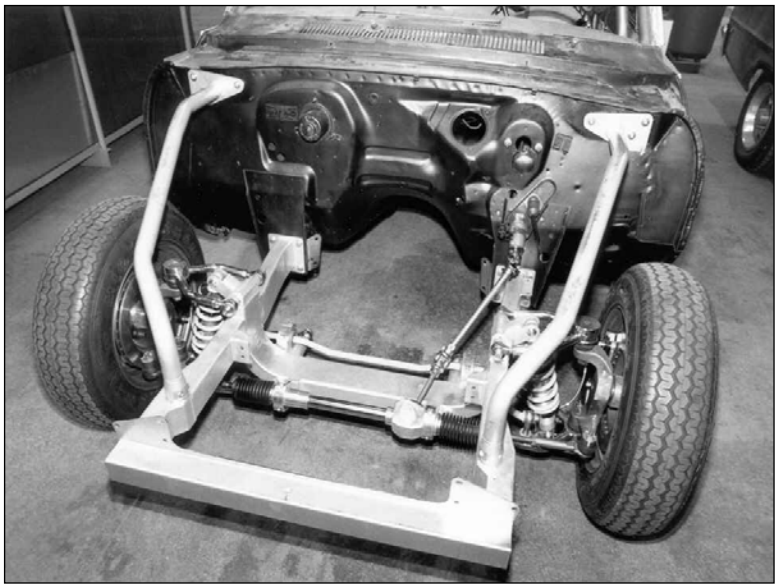




The Billet Specialties oil pan gives you needed clearance for the antiroll bar and crossmember. It is a large capacity oil pan hat fits without modification.

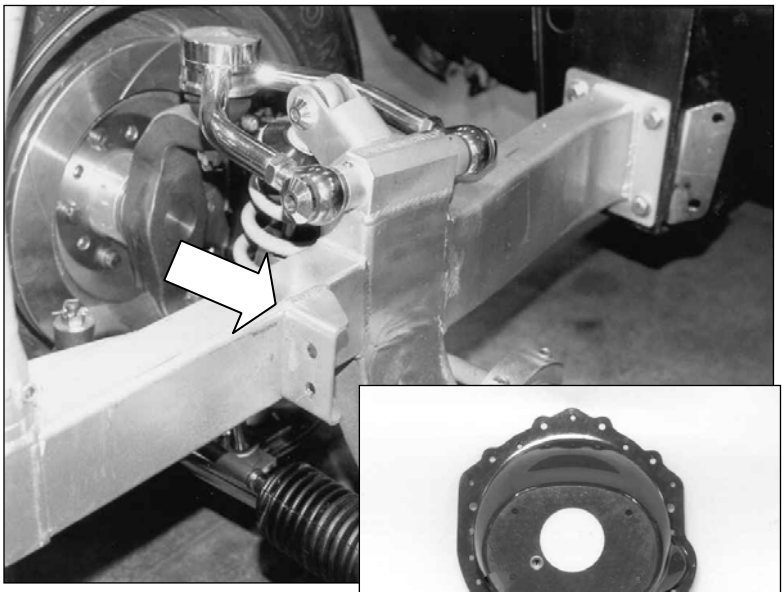


Installing Motor Plate, Manual Transmission Bell Housing & Mid Plate

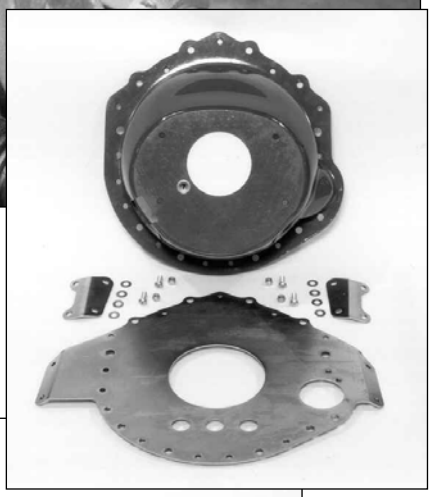


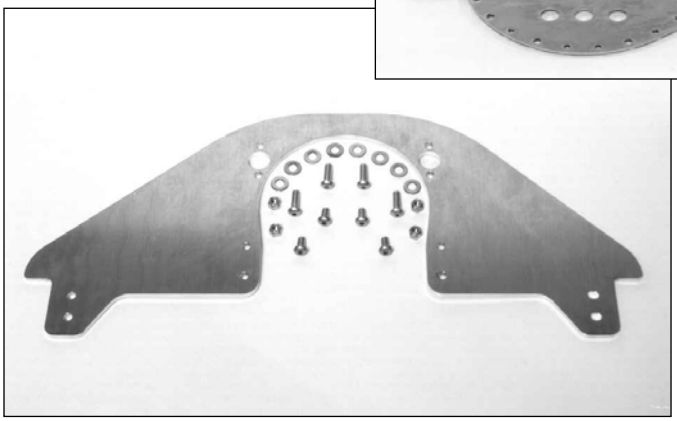
In this section we will be installing the engine with motor plate, mid plate and Lakewood bell housing.

This is the front frame with the motor plate engine mounts.



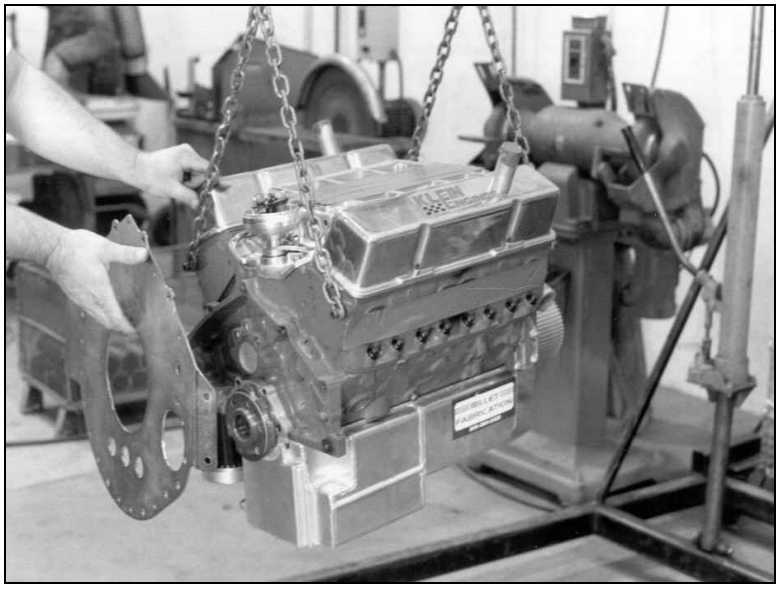
The motor plate mounting brackets are prewelded to the frame.



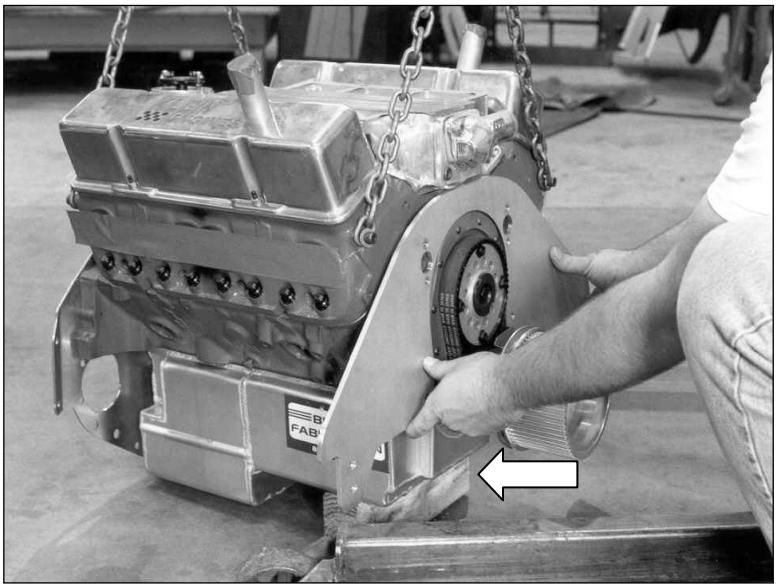


This is the bolt in mid plate kit. The mid plate will go between the engine block and the Lakewood bell housing.

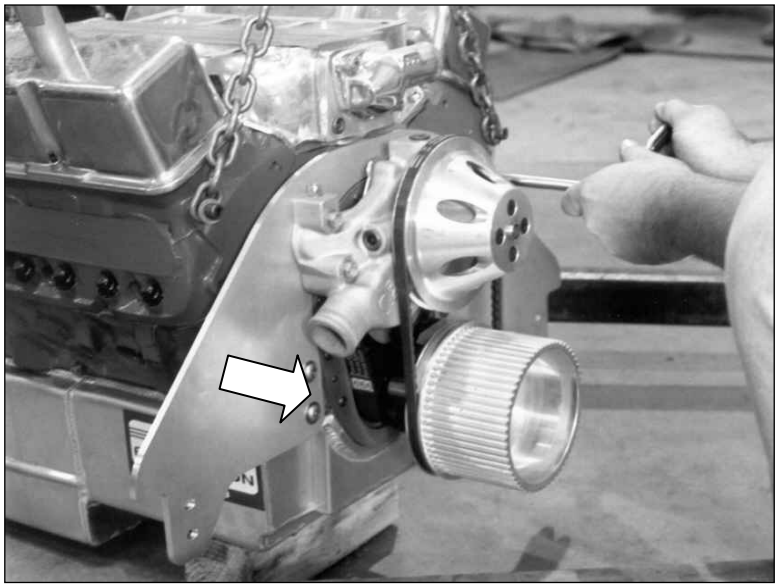
The profile milled billet front motor plate bolts directly onto your front frame. The engine will be in the stock location.



Start by bolting the mid plate to the engine block with the 6 bolts included with the Lakewood bell housing. This will keep the mid plate in place while the flywheel and clutch assembly is installed.

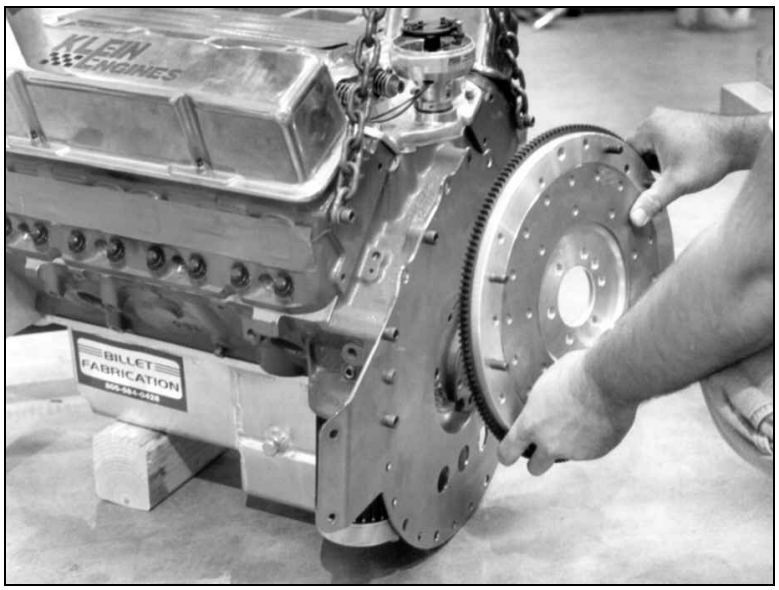


A piece of wood is used to support the engine under the oil pan while installing the profile milled front motor plate.

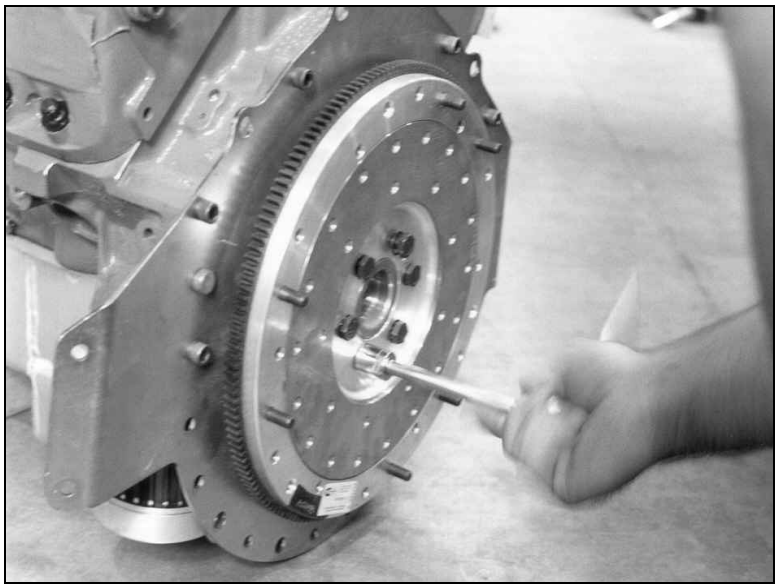


The plate attaches to the engine block with the four 3/8-16 x 3/4-inch stainless steel button head allens, and flat washers. Apply anti seize to the bolts before installation.

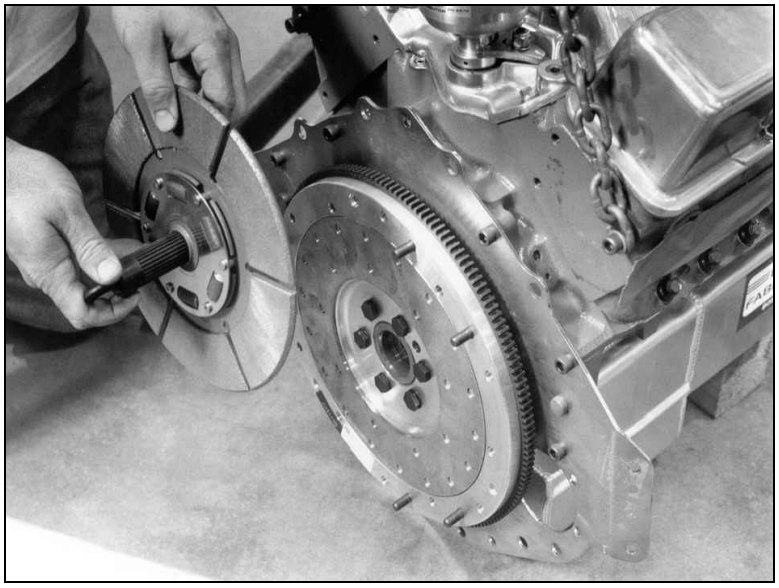
Install the water pump with the fasteners included with the pump. It is also a good idea to put a bead of silicone sealant on the block around the water pump holes and on the water pump for a water tight seal.



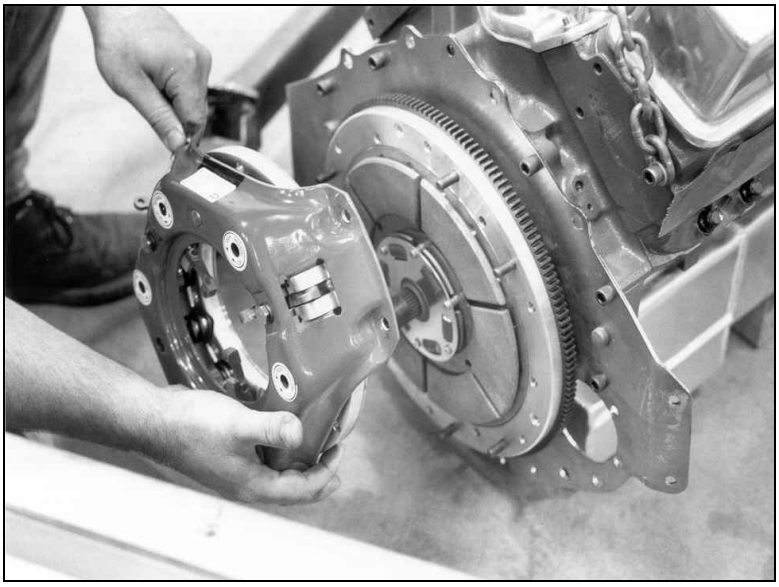
To install the flywheel, align it with the bolt pattern on the engine crankshaft.



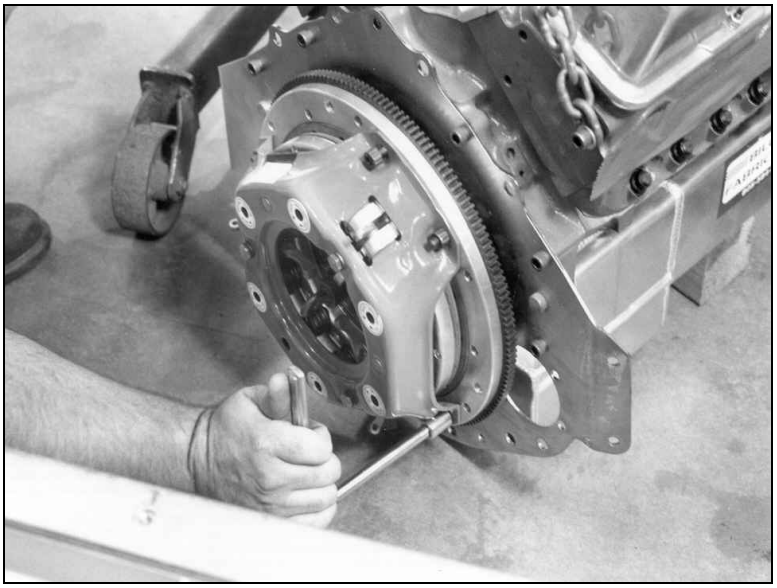
Slide the GM locking star washers onto the flywheel bolts and apply Loctite™ before tightening. Torque the fly wheel bolts to 75 lb-ft.



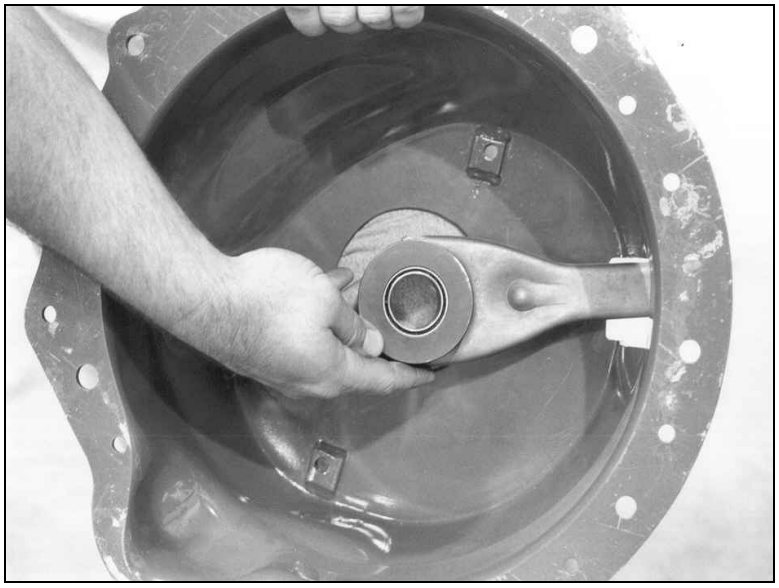
Insert a pilot bearing alignment tool into the clutch disk. Slide the assembly into the end of the crankshaft, the clutch disk is marked “engine side” make sure it on correctly. This will assure the clutch disk is properly aligned while the pressure plate is installed.



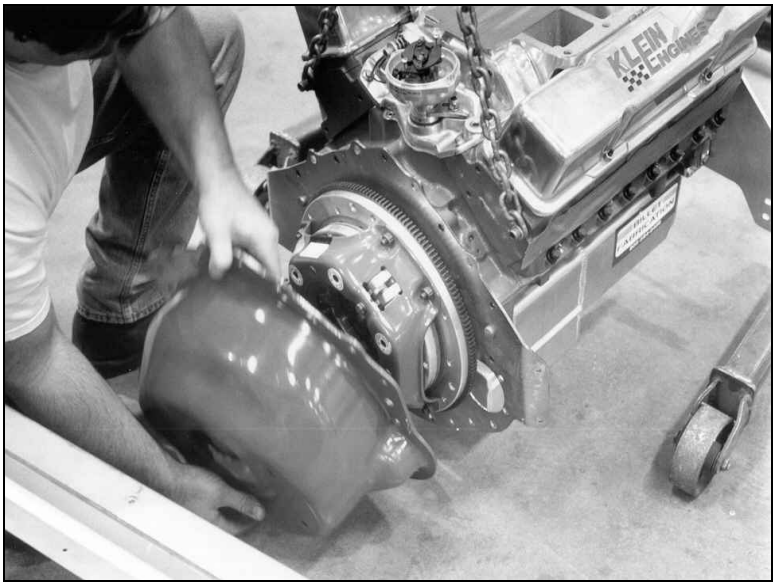
Install the pressure plate over the studs on the flywheel.



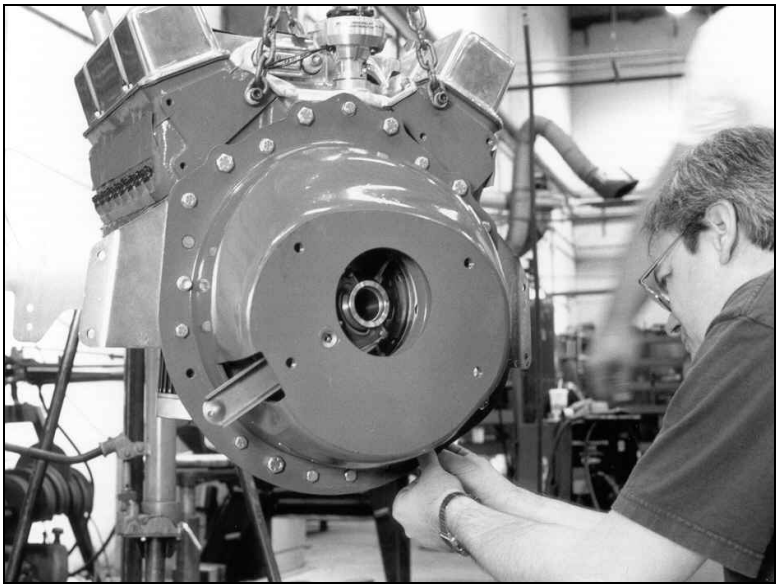
Apply Loctite™ to the pressure plate nuts and torque to 45 lb-ft.



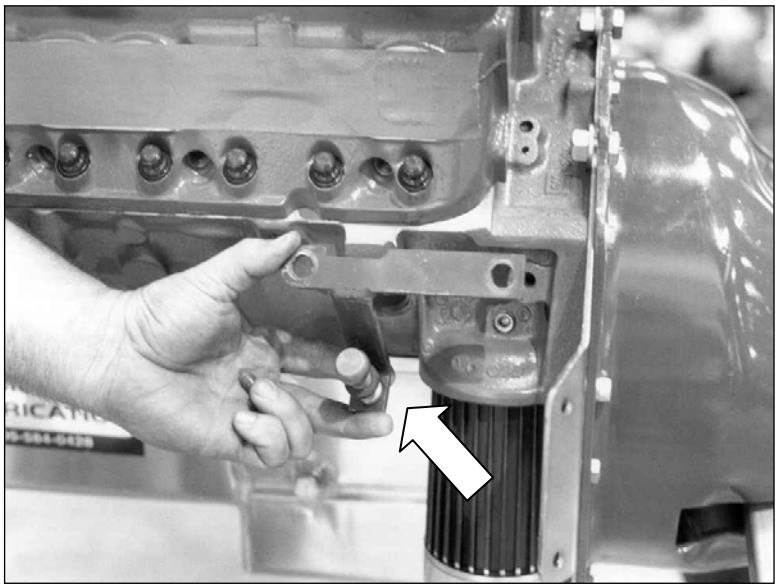
Install the throw-out bearing and clutch fork onto the pivot stud in the bell housing.



Remove the bolts holding the mid plate to the engine block. Set the bell housing in place. Make sure the throw-out bearing is centered on the pressure plate release arms.



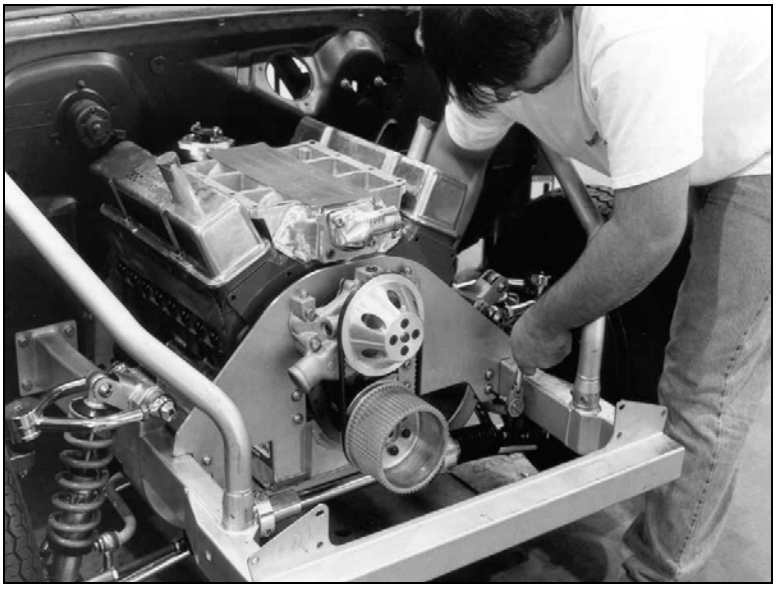
Install all the bolts surrounding the bell housing. There is a combination of 3/8 inch and 1/2 inch bolts attaching the bell housing to the engine block and mid plate.



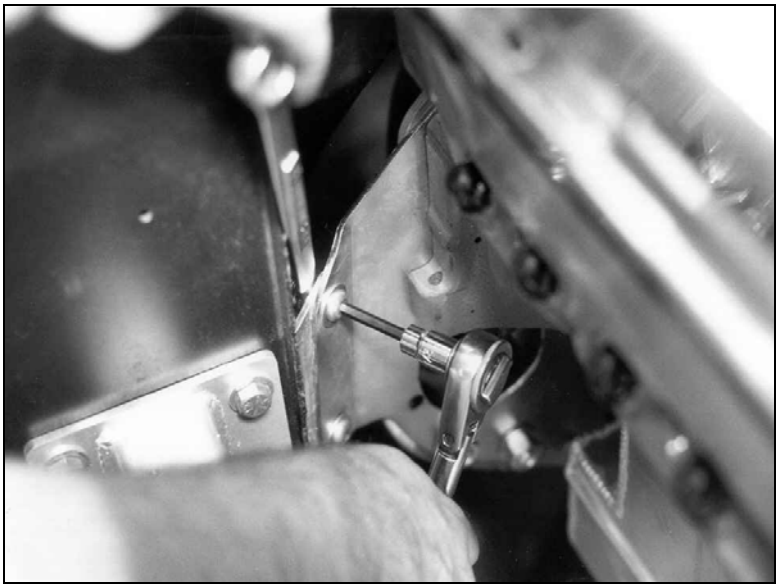
Bolt the inner clutch bell crank pivot ball and mount to the engine block.

Lower the engine into the frame, the motor plate and mid plate both set in front of their mounting brackets.

Use the stainless steel 3/8-16 x 3/4 inch button head allens, flat washers, and locknuts to attach the mid plate to the mount brackets. Do not final tighten these until the motor plate bolts are installed.



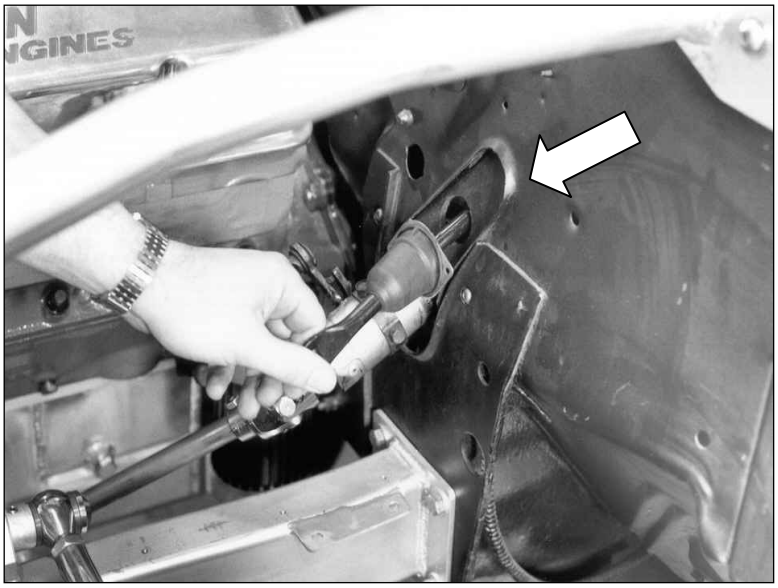
The front motor plate will set on the frame rails. Use the stainless steel 3/8-16 x 1 1/4 inch button head allens, flat washers, and locknuts to attach the motor plate to the frame mount brackets. Tighten the driver side first, then the passenger side.



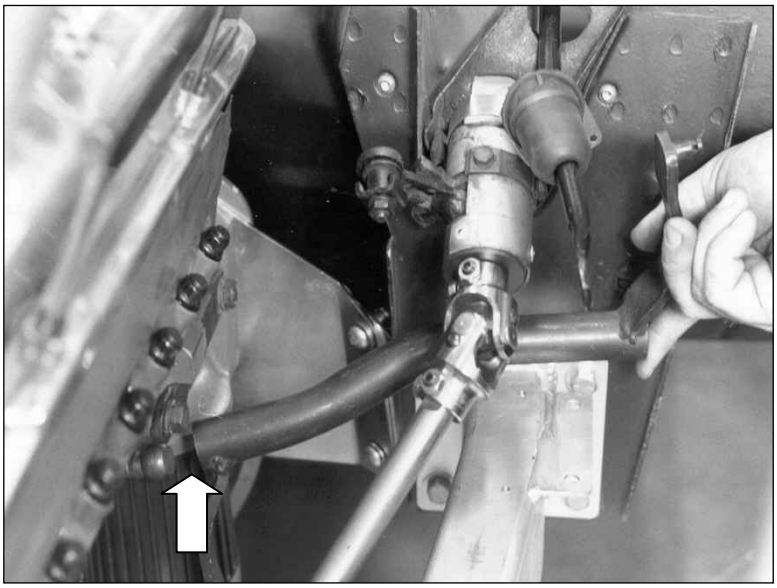
You can now tighten the mid plate on the driver and passenger sides.

On cars originally equipped with an automatic transmission, cut the clutch linkage hole outlined on the factory steering column firewall seal with a sharp knife.

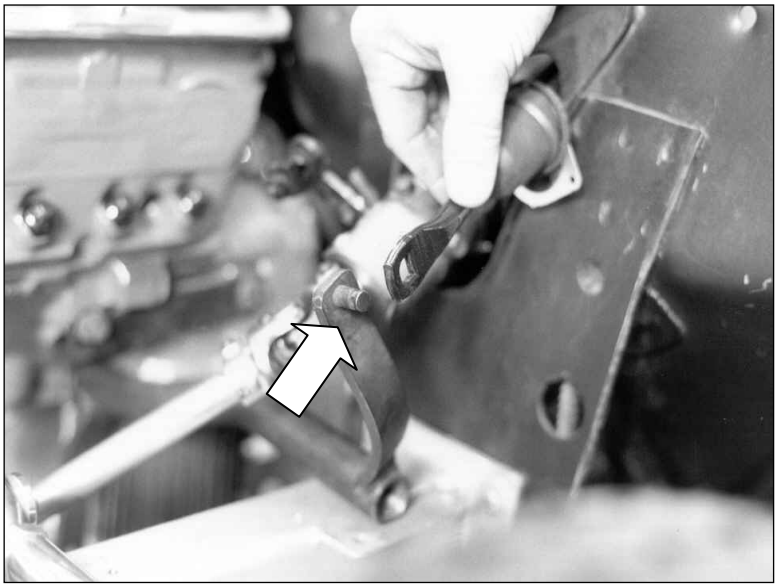
Before installing the clutch linkage rod, slide the boot over the rod. Now install the linkage through the firewall and attach it to the clutch pedal. The arrow shows the clutch pedal end of the linkage.



The boot covers the hole in the firewall seal.



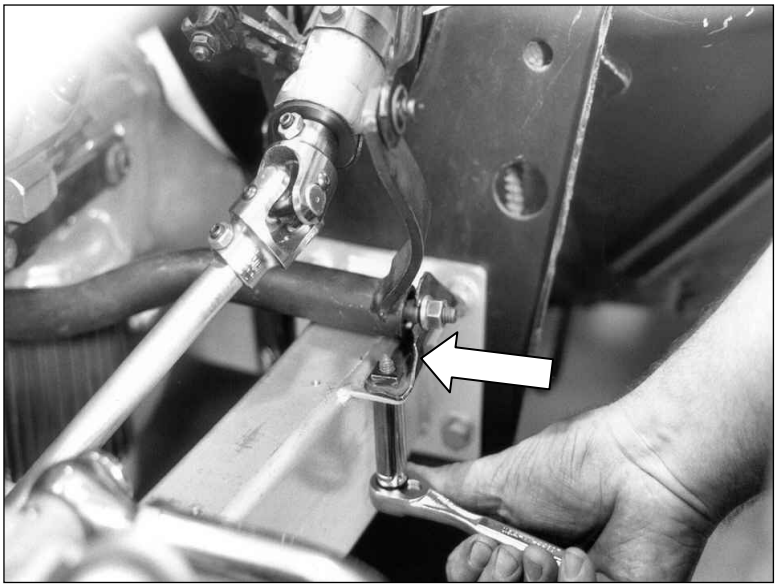
Place the clutch bell crank over the pivot ball mounted to the engine.



Slide the linkage rod over the pin on the bell crank arm.

Secure with the spring retainer clip.

Attach the outer pivot ball to the mount bracket and insert the ball into the clutch bell crankshaft.



Bolt the outer pivot ball bracket to the mount welded to the frame.

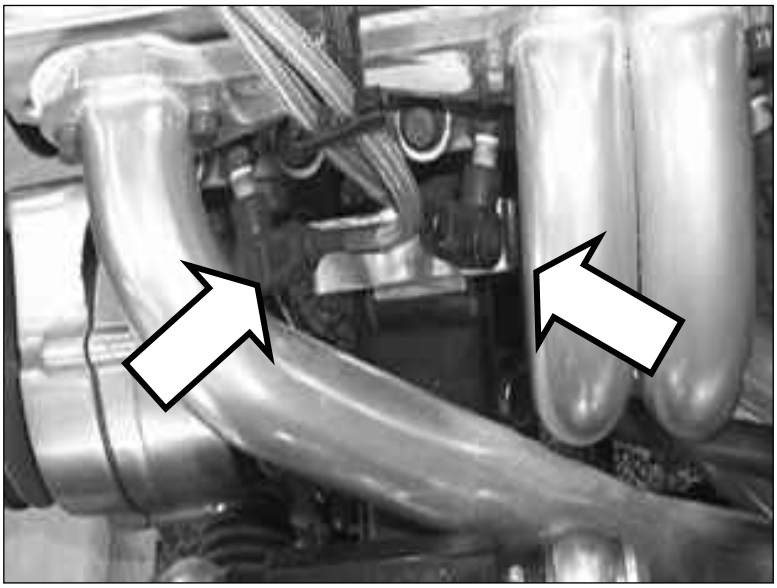
Slide the clutch linkage boot up against the steering column firewall seal and secure with sheet metal screws.

Installing Headers

Special Note: We suggest leaving the headers in their plastic bag during the initial fit. If the headers do not fit your application, you can return them within 30 days of the purchase date for credit of the purchase price only. The returned parts must be in new condition (no scratches, dents or dings). Chassisworks reserves the right to return to the customer any header kit that is returned in substandard condition.

There are many manufactures of cylinder heads and several of them have made changes to the basic dimensions of the stock head. These changes will affect how our headers fit because we have built our headers to a close tolerance. Below are suggestions of modifications that can be made during your installation to insure the best fit.

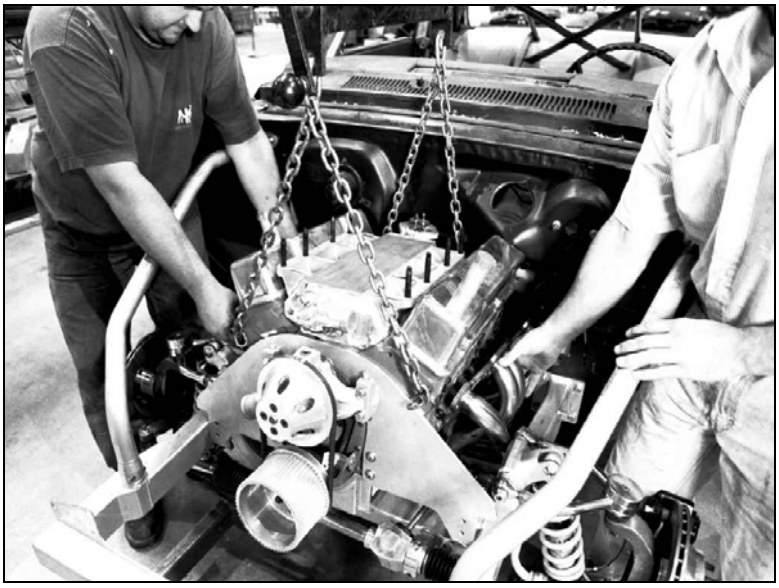
1. Bolt hole resizing of the header flanges.
2. Different spark plugs to gain clearance for spark plug wires.
3. Different spark plug boots or wires to clear the header tubes.
4. Shimming the transmission mount up or down for additional tube clearance to the frame. If the transmission has been relocated from the stock location or replaced with a different model, the header fit may be affected.
5. Minor dimpling or denting of the header tubes.
6. Minor grinding of the header flange around the head bolts.
7. Changing the cylinder head fastener style for more clearance (i.e. 12 point bolts or nuts, no washer or head studs).
8. The shape of the exhaust port may require a gasket change or modification for best seal.
9. Not all cylinder head manufactures use the same specifications on the width, height, and angle of the exhaust ports. If the ports are changed from the stock location in any way, the headers will be too wide to fit between the frame rails.
10. It is a good idea to test fit the headers on the engine prior to installing them. Make changes before you have the headers in the car.



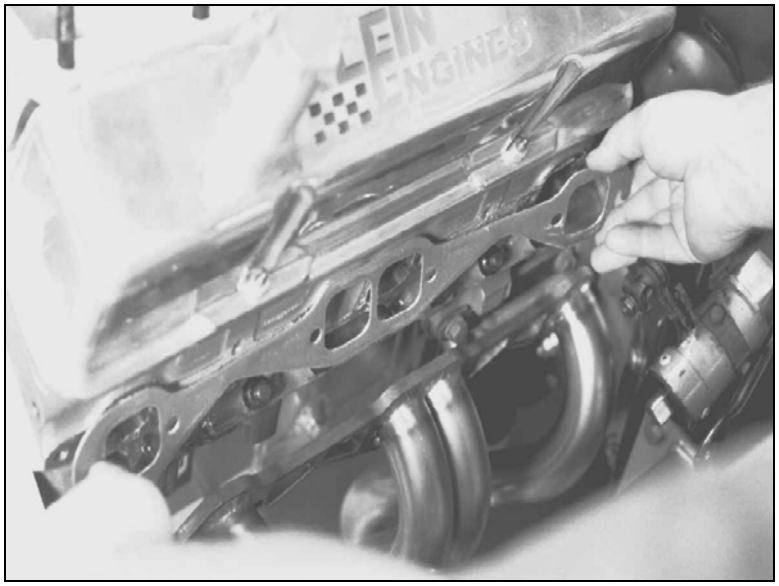
We suggest angle plug heads for better fit. The spark plug clearance will be very tight on the straight plug heads. A shorter length spark plug is available from most vendors. Champion C63YC is a good starting point for a street small block with straight plugs. However, even this spark plug will come very close to some tubes. MSD makes a heat shield material that should be wrapped around the tubes that have spark plug boot interference.

The first series of photos show the installation of the headers with the motor plate engine mounts. If you are installing headers using billet side mounts refer to Page 103.

Unbolt the motor plate and mid plate so the engine can be raised. Remove the steering linkage before moving the engine. Once the engine is raised, slide the headers in along side the engine. This works best with three people, one raising the engine, and two positioning the headers.



Slowly lower the engine into place holding the headers toward the outside of the frame. Check to make sure nothing is obstructing the engine while lowering it.



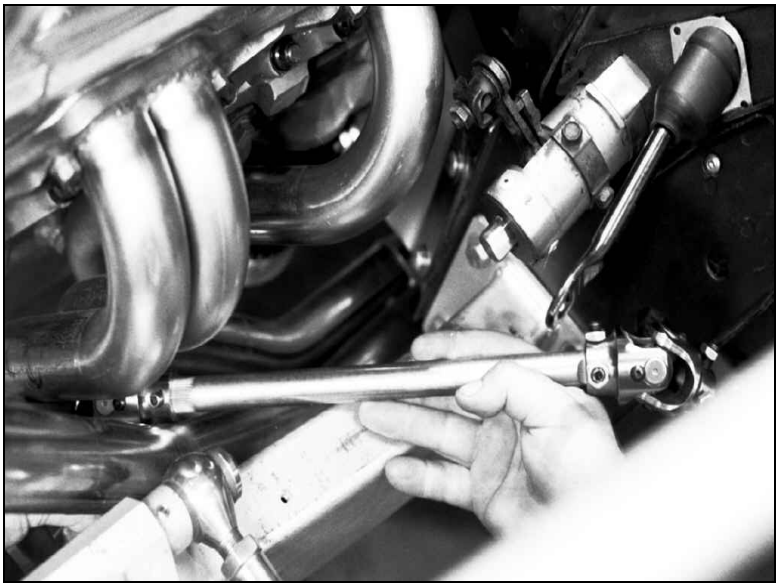
After the engine is in place, put the bolts back in the motor and mid plates, only hand tighten them for now.

Start on the driver's side by setting the header gaskets in place. Raise the header up and thread the six 12 point 3/8-16 bolts through the header and into the cylinder head. Do not tighten any bolts until you have all of them started.

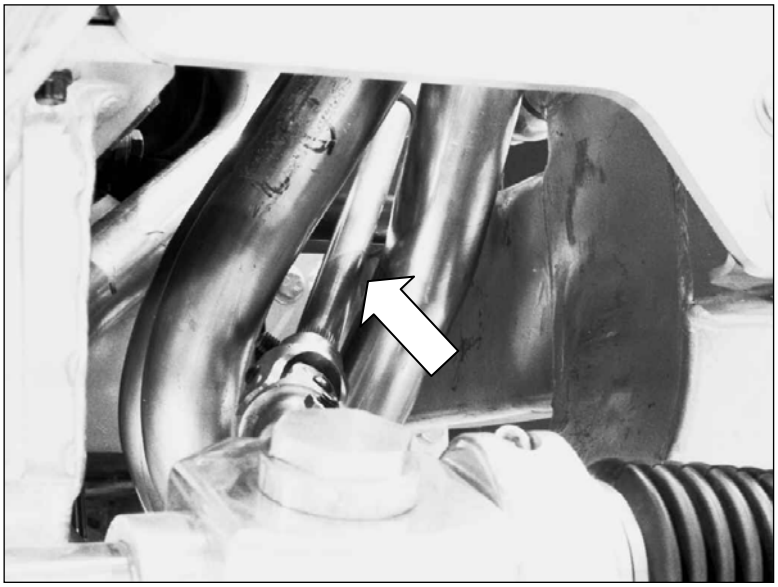
After all six bolts are started; use a 5/16-12 point wrench or a 1/4-inch drive socket to tighten them to 30 lb-ft of torque.

Repeat this for the passenger side of the car.

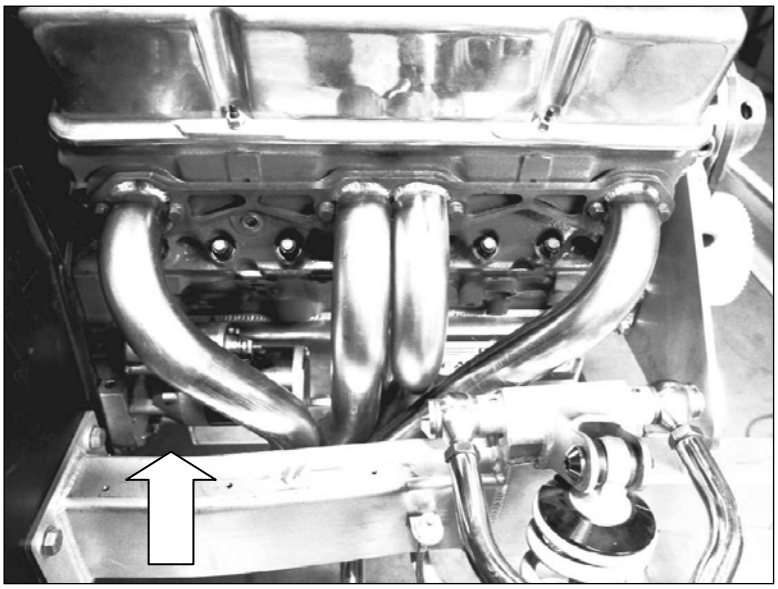
You can now tighten the bolts in the motor plate and mid plate.



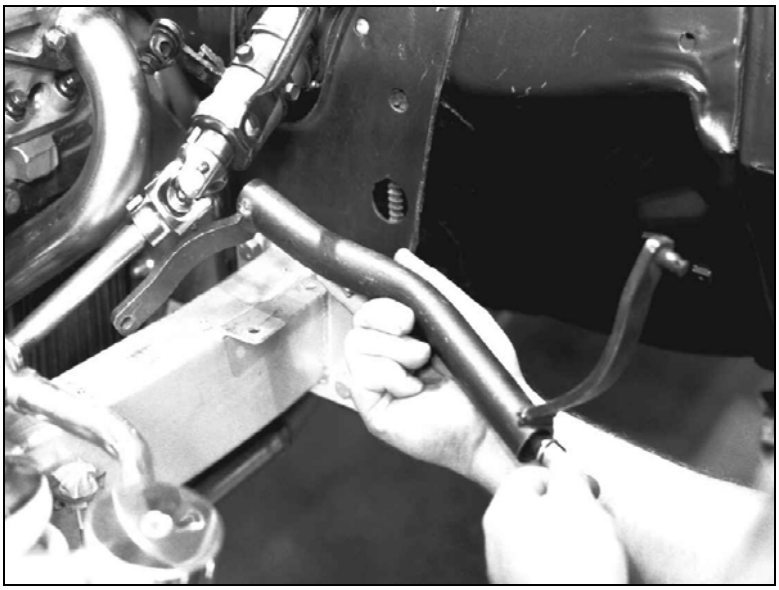
Reinstall the steering shaft from the top toward the rack & pinion. It goes between the two header tubes.



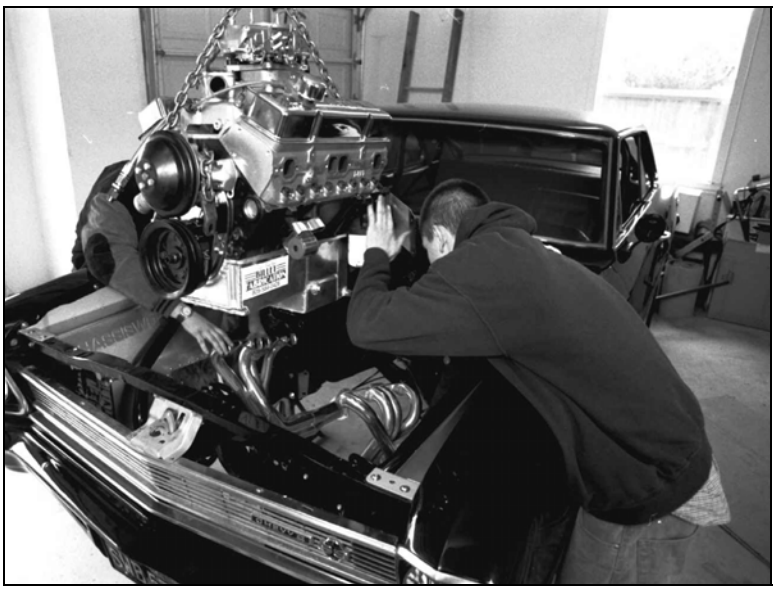
Looking from the rack & pinion, notice that there is just enough room for the shaft. You may need to rotate your rack slightly for maximum clearance between the shaft and the header tubes on the small block headers.



You will need to use a high torque mini-starter for maximum clearance on the small and big block headers. This is available from most high-performance parts suppliers.



If you are using a manual transmission, you can install the clutch cross-shaft now. Move the clutch linkage through its travel making sure it does not contact the header at any point.



The next series of photos show the headers being installed with the billet side engine mounts.

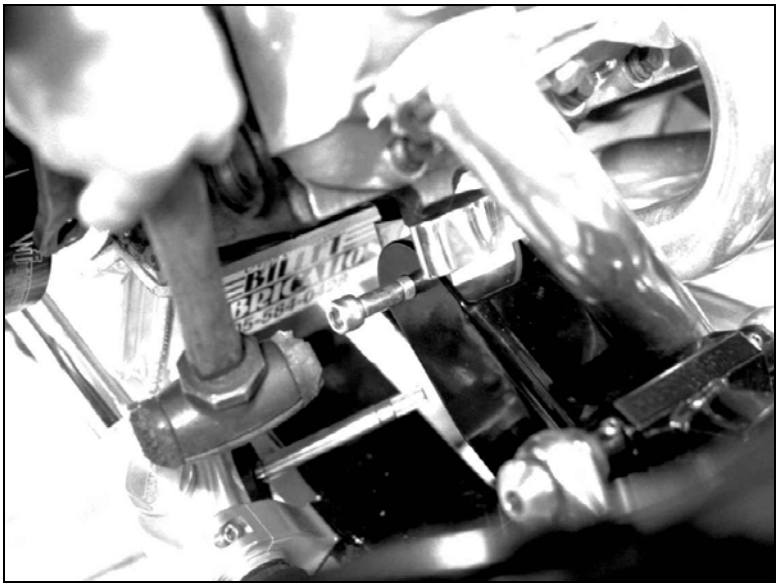
Start by removing the steering shaft and U-joints from the steering column to the rack & pinion. It works best to install the headers and the engine at the same time. This is a three person job, two aligning the headers and the third operating the engine hoist. First, set both headers in place and as far to the outside of the frame as possible.

Slowly lower the engine into position. Watch both sides for clearance until you have the engine sitting down with the billet side mounts in the frame brackets.

When you have the engine in position, use the engine hoist to hold it while you get the headers in place to be bolted on.

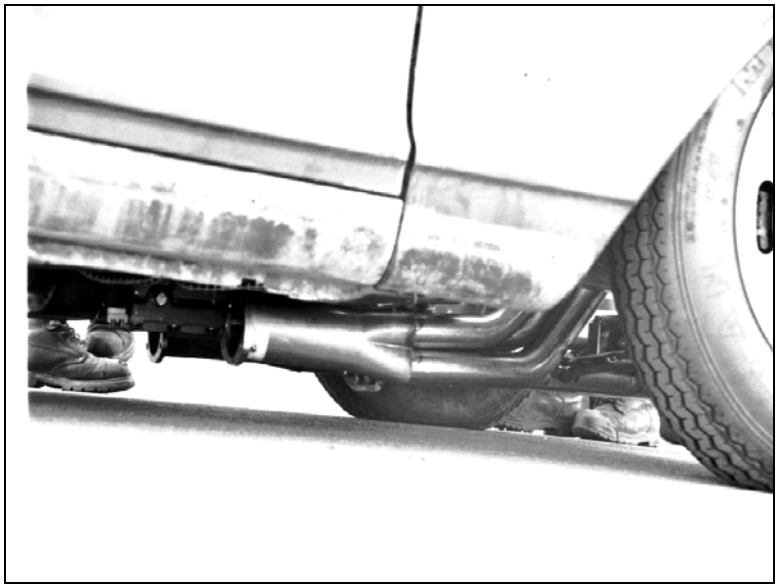
Do not put the engine mount bolt in place until after you have the header bolts started into the heads. Raise the header up and start the front and rear 12 point 3/8-16 bolts first this will hold the header gaskets in place.

Set the header gasket in place over the front and rear bolts. Next, thread the rest of the bolts while holding the header to the cylinder head. Do not tighten until you have all of them started.

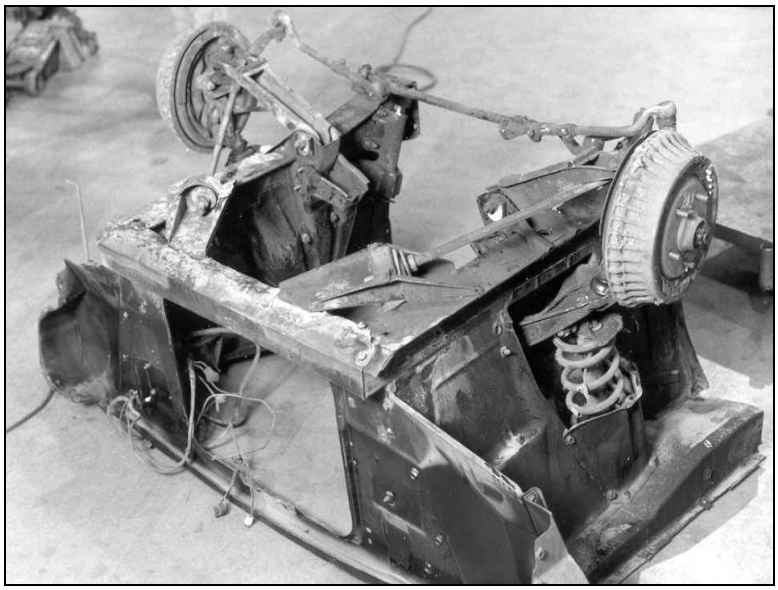


Once all the bolts are started, install the engine mount bolts through the frame brackets and the billet mounts. After both bolts are in place, tighten them to 45 lb-ft of torque. Now you can final tighten all of the header bolts.

Reinstall the steering shaft from the top toward the rack & pinion. It goes between the two header tubes. You may need to rotate the rack & pinion to get clearance for the steering shaft. Turn the steering wheel lock to lock and check for any clearance problems, adjust as needed.

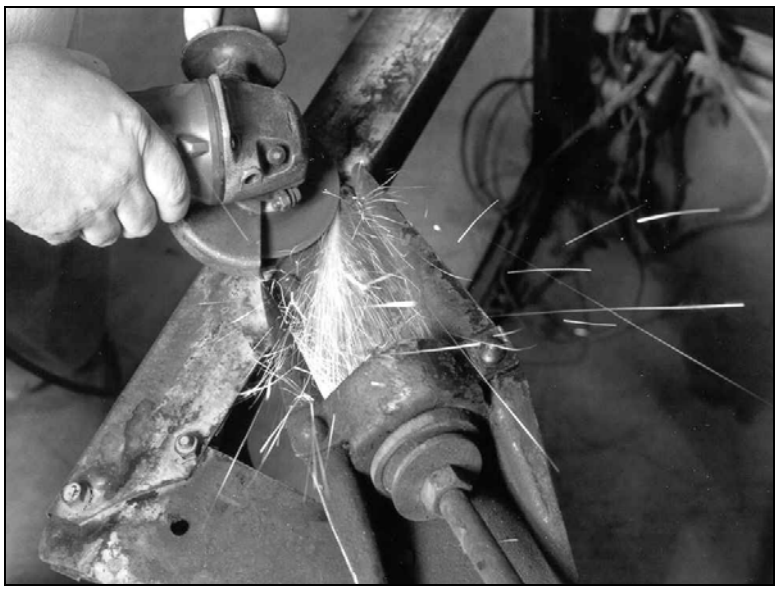


With the headers installed there is plenty of ground clearance and room for the exhaust system.



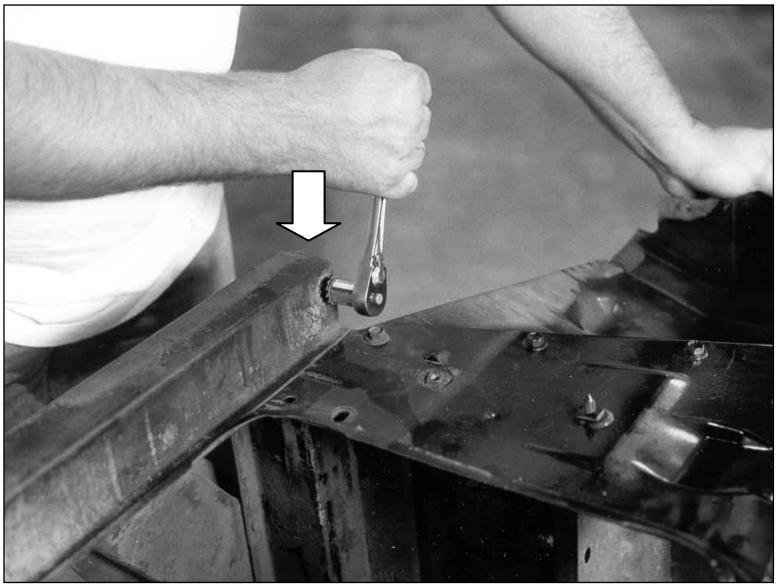
Installing Front Sheet Metal

Next, you will need to remove the radiator core support mounted to the original front end. Set the factory nose you removed upside down on the shop floor.

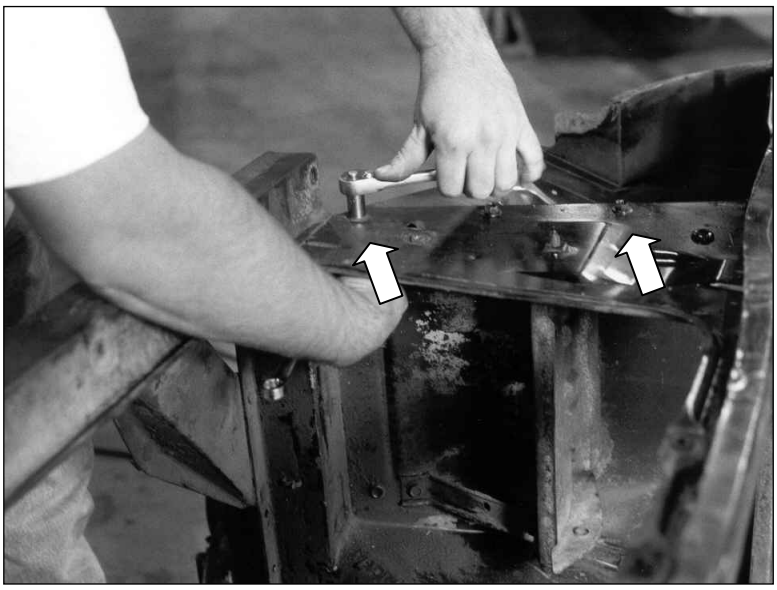


If no work has previously taken place on the front end, chances are the factory rivets are still in place where the lower A-arm strut mounting pad attaches to the core support. Use a grinder to remove the rivet heads.

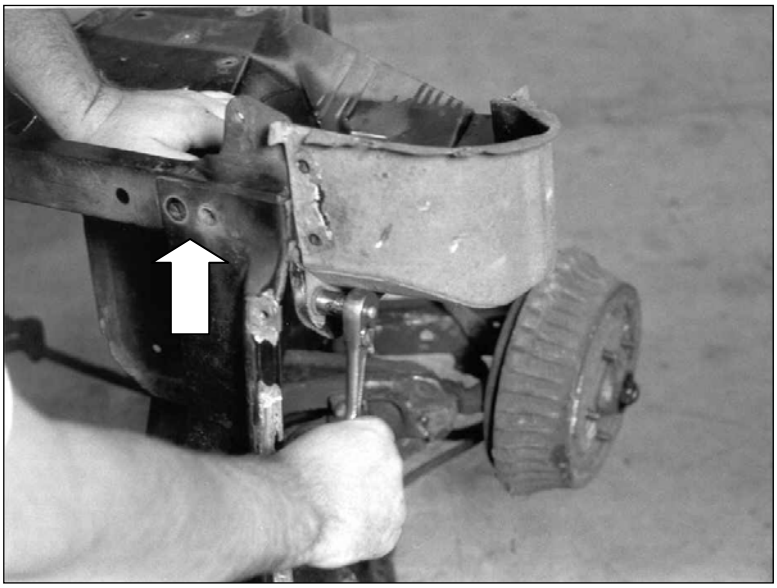
Use a large punch and hammer to drive the rivets out once the heads are removed. Repeat this on the other side.



With all the rivets removed, start unbolting the radiator core support. There are three bolts on each side connecting it to the end of the stock frame rail.



There are four bolts on each side of the front attaching the radiator core support to the inner fender panels.



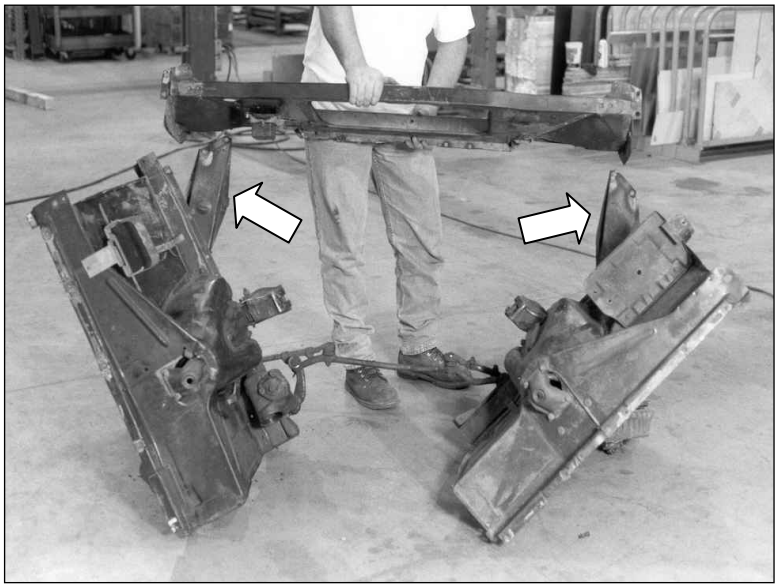
The last two bolts are on the top of the radiator core support. On each one of those, there is a hood adjuster.

This is also a good time to unbolt the inner headlight buckets from the radiator core support. They will also be reused.

On the 62-65's the headlight buckets are made of stamped steel, the 66-67's are plastic.

Once all the bolts are removed, you can pry the radiator core support away from the inner fenders.

A large screwdriver or pry bar works well for this.



Safety tip: Don't stand next to the front end when you remove the core support, it's all that keeps the two sides from flopping over, as seen here.

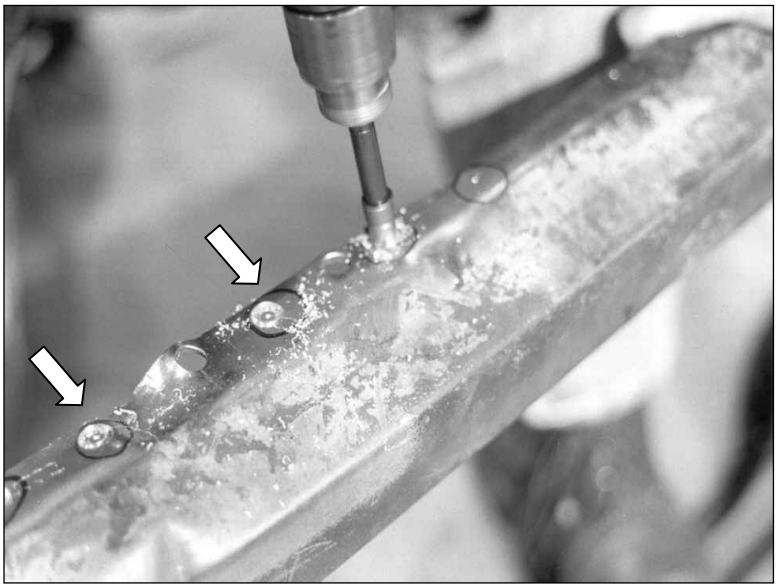
The lower crossmember of the radiator core support is spot-welded in place, and the welds must be drilled out. A new lower cross-member is welded to your frame. You will use only the outer part of the radiator core support.

Start by using a wire brush to whisk away all the grime and paint.

Carefully inspect the rail to locate the spot welds. Use a marker to indicate their locations.

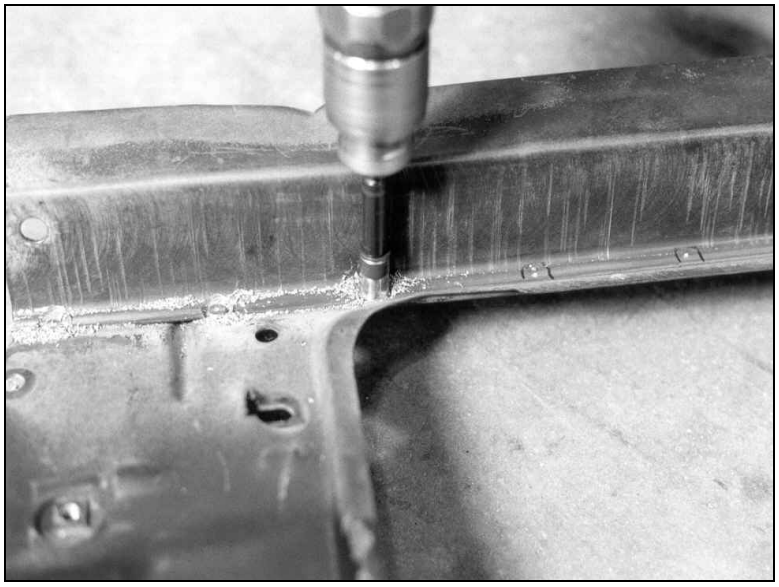
Then, use a center punch to provide a pilot point for the spot weld remover.

This spot weld remover is designed specifically for this job. It has a spring-loaded pilot pin and is available in various diameters. The 7/16-inch size works the best. This tool can be purchased at most auto parts and welding supply stores.



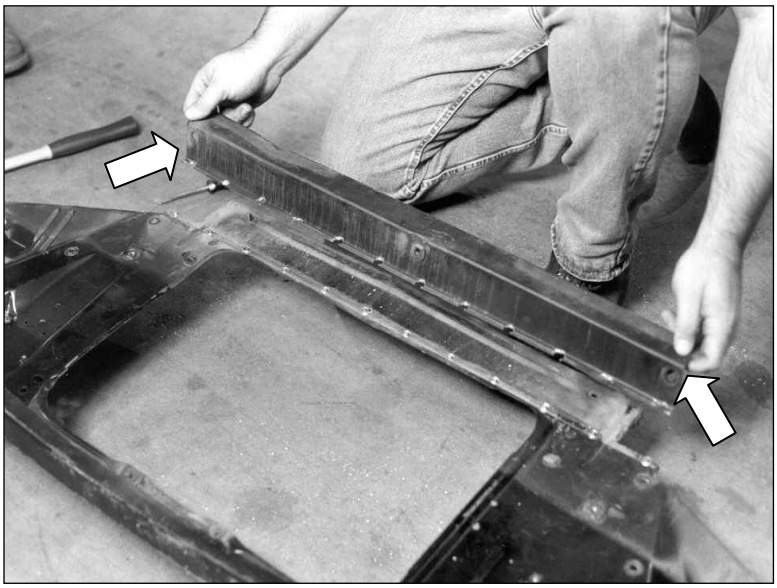
Locate the pilot pin on the point marked by the center punch and begin drilling. Check the cut often to make sure you don't drill through both layers of material. You only want to remove the outer layer of the lower crossmember.

Once you have all the spot welds on the bottom drilled, flip the radiator core support over and find the other set of spot welds. A narrow wire brush was mounted to a cordless drill to clean out this channel.



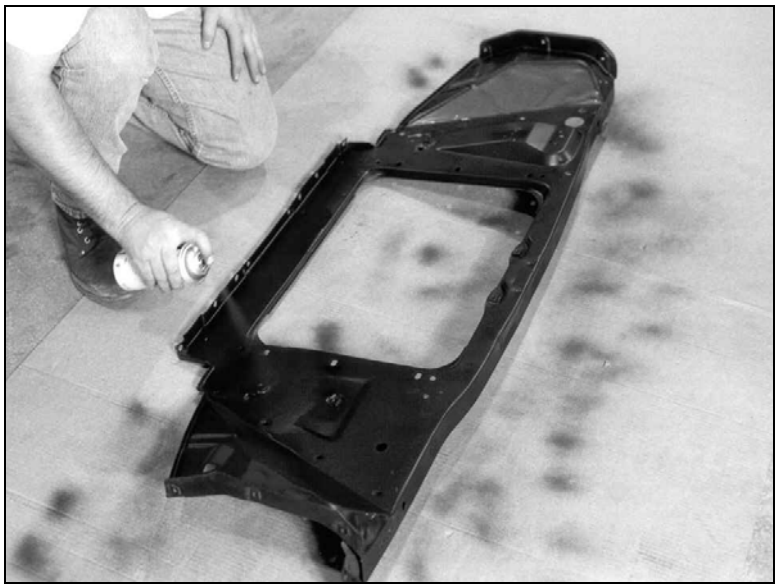
Again, mark the spot welds, center punch, and drill only through the outer panel to remove them.

Next, carefully pry the lower cross-member from the radiator core support with the use of a screwdriver. Be careful because there are a lot of sharp edges created when drilling out the spot welds.



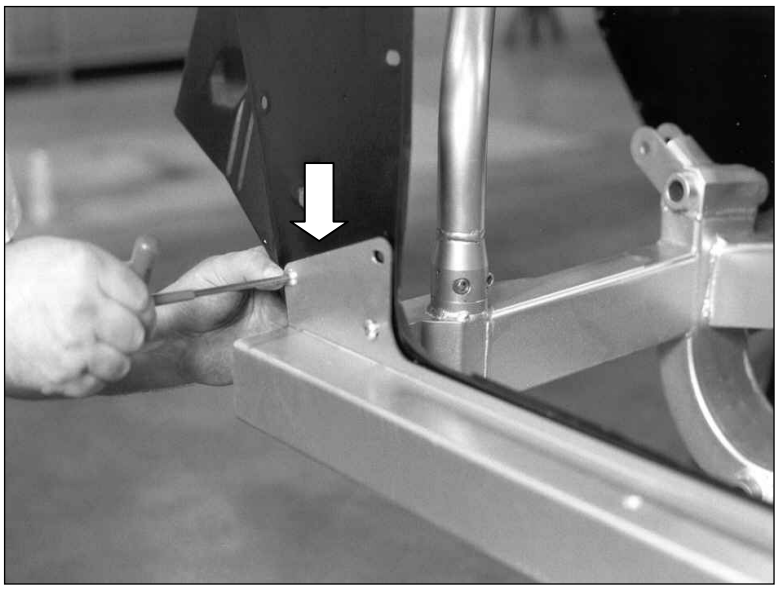
After you have two separate parts, the radiator core support cross-member (highlighted with arrows in photo) can then be discarded.

Use a grinding wheel to clean up the remains of the spot welds.

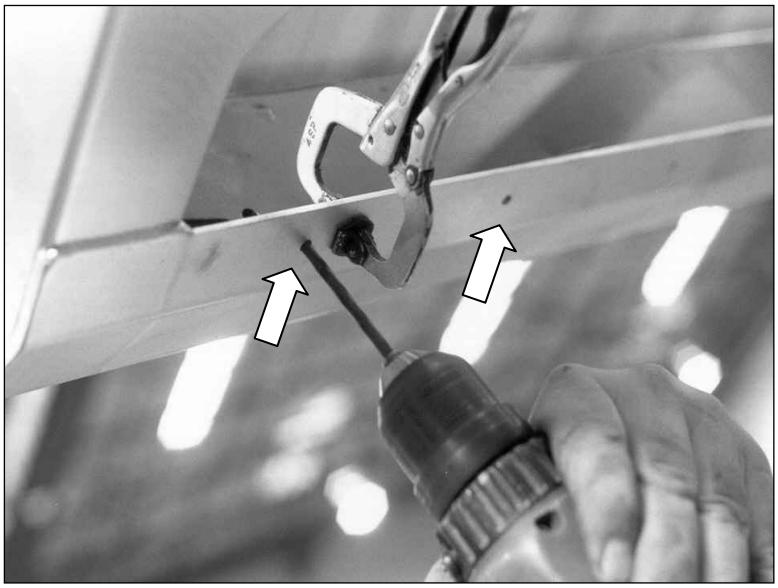


Now is a good time to improve the final appearance of the radiator core support by thoroughly cleaning and then painting it.

Once the paint is dry, the radiator core support can be installed on the new front frame. Simply set it in place behind the mount tabs on each side of the front frame crossmember.

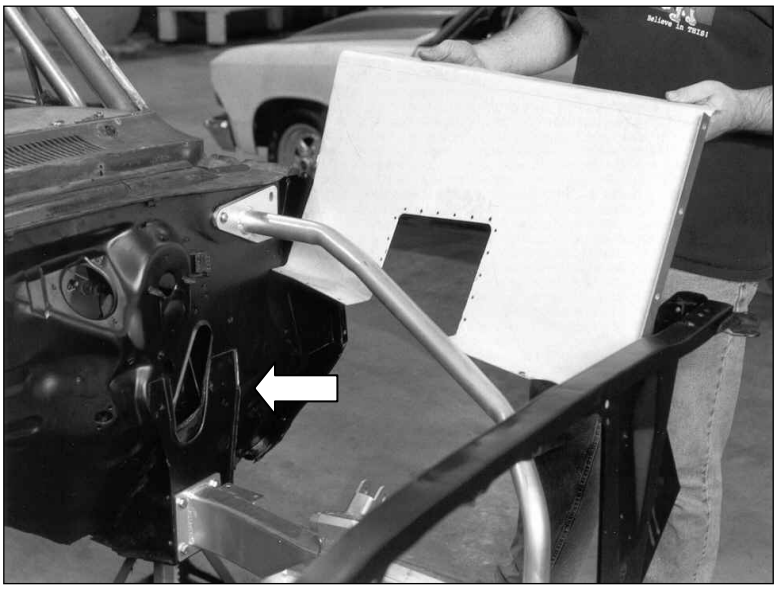


Using the 5/16-18 x 3/4” stainless steel button head allens, washers and locknuts provided, bolt the radiator core support to the front crossmember welded to your frame. The flat washer goes under the locknut when installed.



Clamp the bottom lip of the radiator core support to the frame cross-member. Drill 3/16” holes through the radiator core support using the holes in the frame’s front cross-member as a guide.

Use the 10/32 x 5/8 button head allens, washers and locknuts provided to attach the radiator core support to the inner lip of the frame’s crossmember. The flat washer goes under the nut when installed.

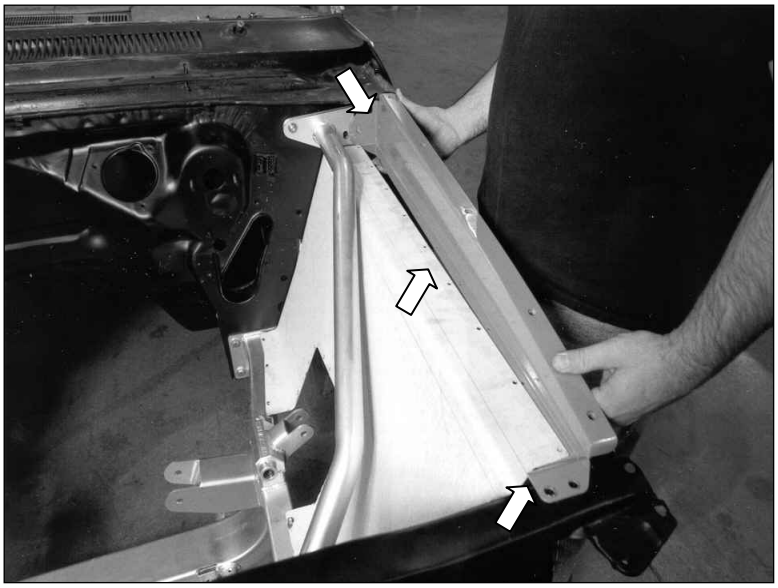


It’s time to install the inner splash panels and hinge mount plates.

Before installing the inner splash panel, the outer lip on the firewall (see arrow) must be ground for clearance. Grind away 2/3rds of the lip 3 1/2 inches down from the top on the driver and passenger sides.

Slide the panel in between the firewall and the core support resting the lower lip on the frame rail.

If you are not installing the inner fender panels, skip to the next photo.

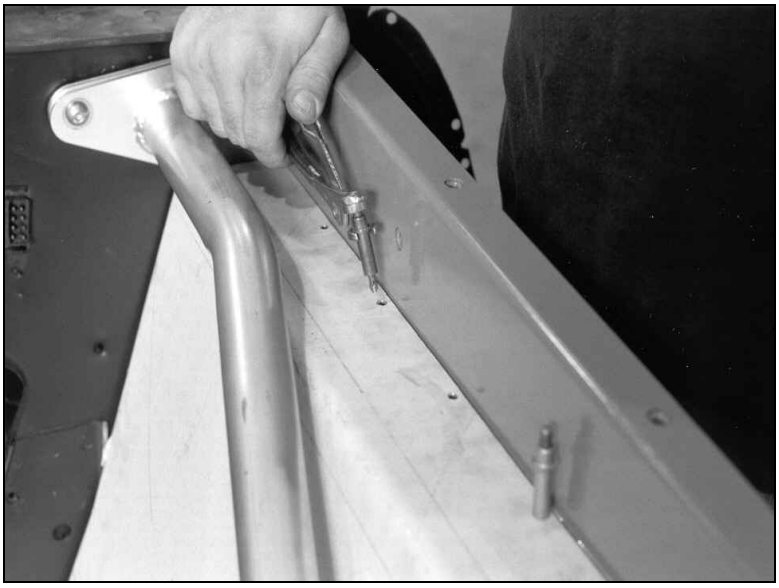


Remove the two outer bolts through the strut mounting plate.

The fender/hood-hinge mount slides under the top lip of the inner splash panel, in front of the strut mount and over the top of the core support at the front.

Install the bolts supplied at the strut and the 5/16-18 x 3/4” button head allens and flat washers at the core support. After tightening the button head allen at the front of the radiator core support, tighten the ones at the strut mount plate.

Do not final tighten the two outer bolts on the strut mount until after the fender is aligned.



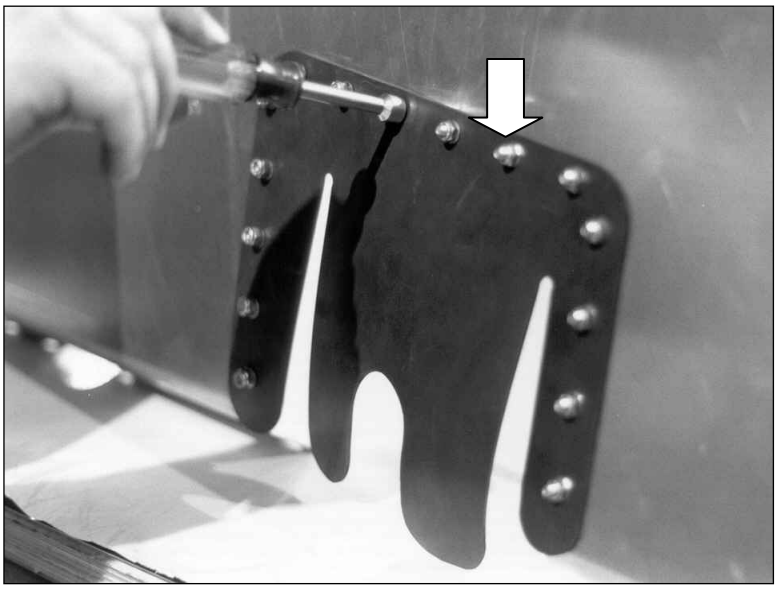
Both the fender mounts and the aluminum inner splash panels are predrilled, and the stainless steel hardware to attach them is in the kit. But for now, removable cleco clips should be used to hold things in place.

The bottom of the inner splash panel is clamped to the frame rail. Use a center punch to mark the holes you will be drilling to attach the inner panel to the frame rail.

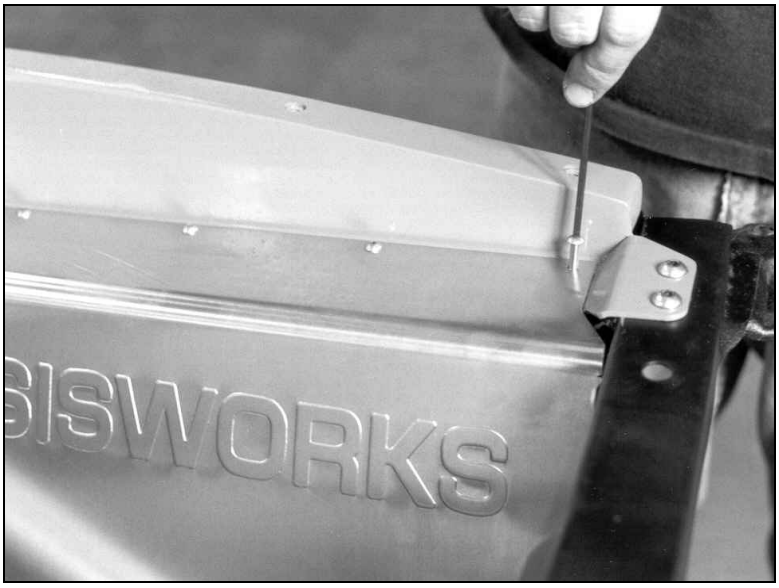
Drill the holes into the frame and tap them for the stainless 10-32 x 1/2 button head allens that are supplied. You will need a No. 21 drill bit (.159 diameter) and a 10-32 tap; both are easy to find at most hardware stores.

Remove the inner splash panels from the car, and peal off the protective PVC coating before the installation of the rubber splash panel boots.

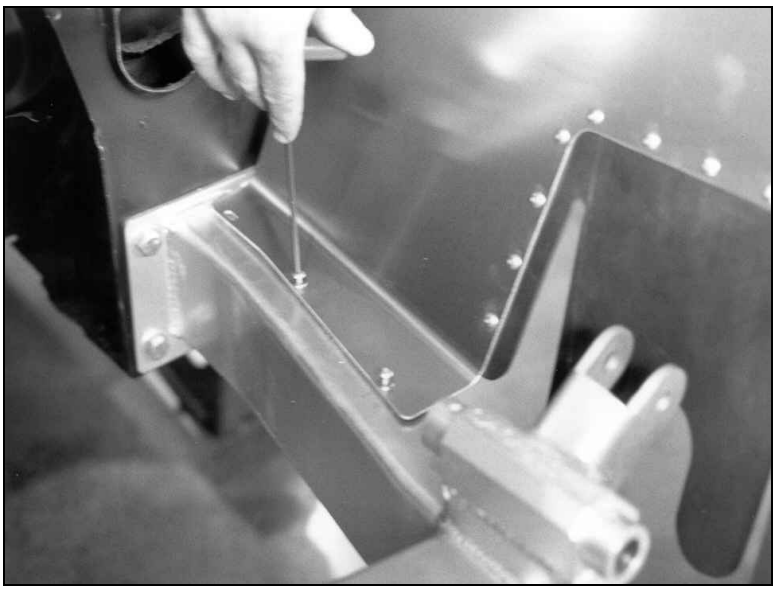
Pre-cut rubber splash panel boots are custom formed to fit around the suspension pieces. They will be installed on the wheel side of the panel.



Use the fifteen 10-32 x 5/8” button head allens, washers, and locknuts to attach the splash panel boots to the inner fender panels. Put a washer under each locknut. Hold the panel evenly and securely during this installation.

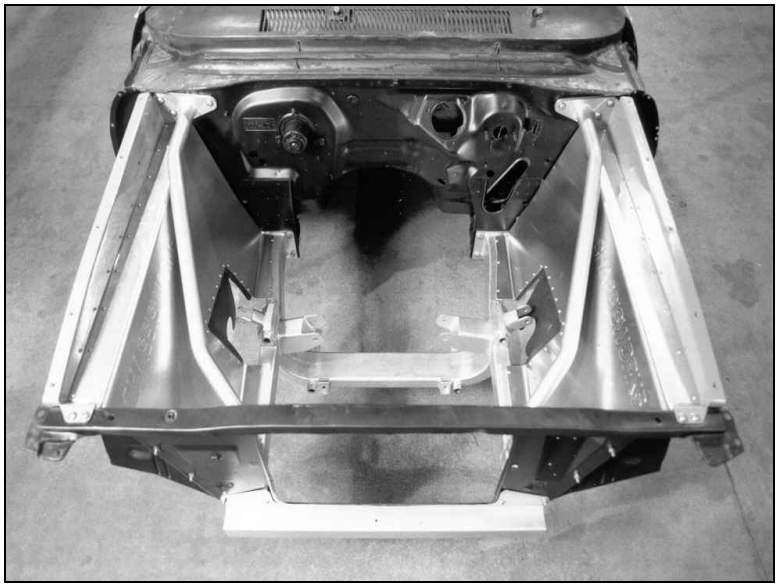


Set the panels back in place and attach them with the 10-32 x 1/2” stainless steel button head allens and locknuts provided.



The holes on the lower edge of the inner panel are slotted if minor adjustments are required. Complete the installation of the panel by tightening all of the fasteners. Put a washer on each button head allen.

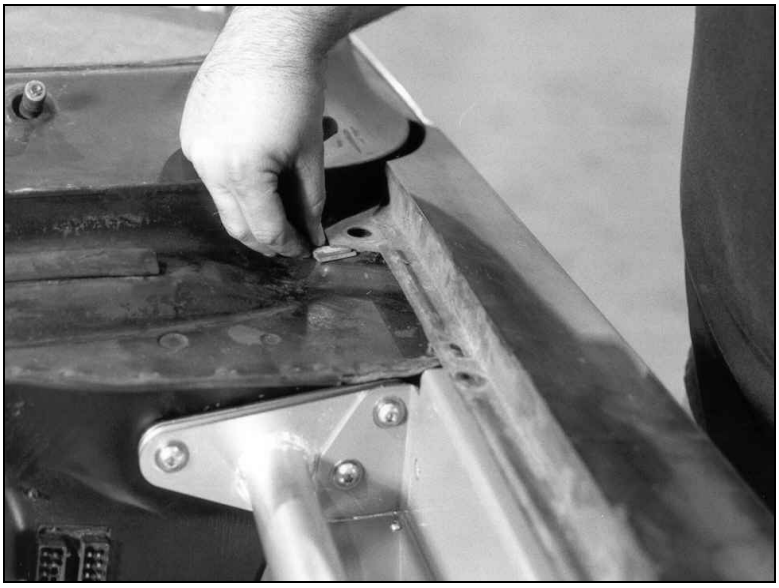
The row of bolt holes at the front of the panel match the OEM locations and spacing. Attach with the 5/16-18 x 3/4 button head allens. Put a washer under the button head and secure with locknuts.



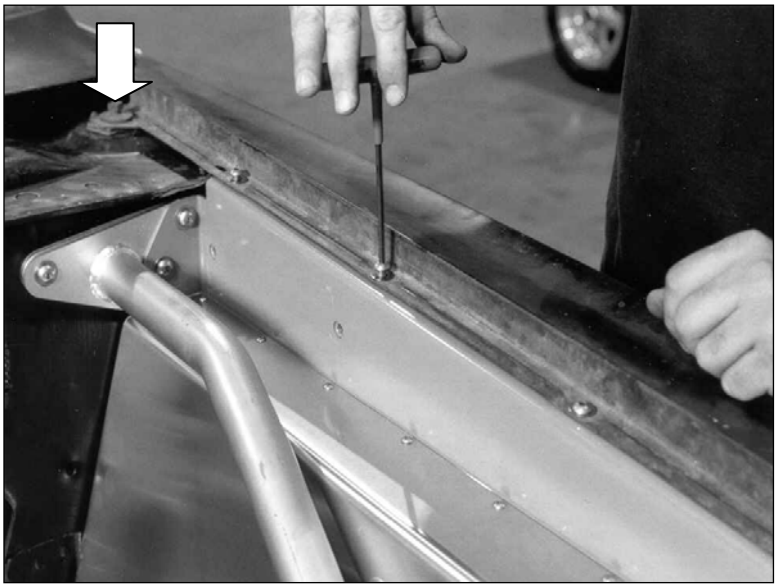
Your project should now look like this.

You are now ready to reinstall the front fenders and hood to complete your bolt on frame clip.

Start by installing the inner headlight buckets to the radiator core support. Then, slide the front fender into place over the hinge mount plate.



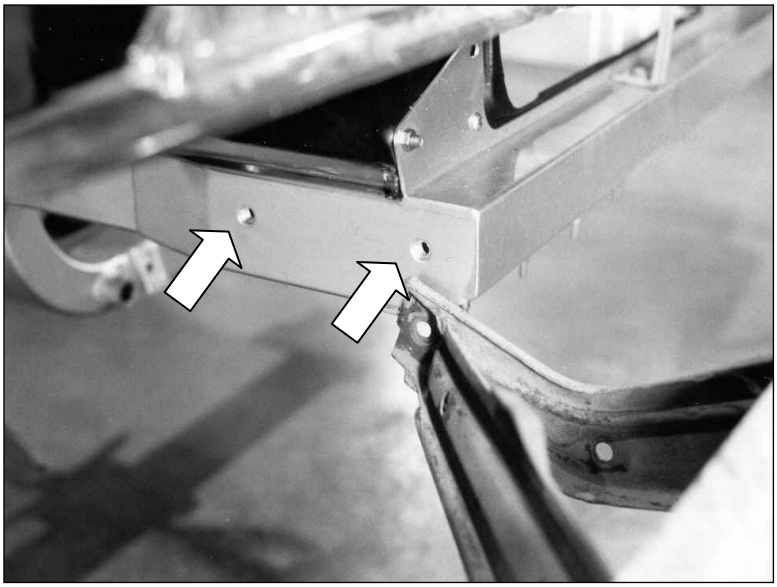
Retrieve the original fender shims from the plastic bag and put them back in position.



Use the original bolts to mount the fender at the top.

New 5/16-18 x 3/4” stainless steel button head allens and washers are used to secure the fender along the hood-hinge/fender mount panel. Tighten the firewall strut’s outer button head allens after the fender is installed and aligned.

The grille is the next thing that goes back on. A threaded boss is provided for the grille's center mounting bolt. Use the 5/16-18 x 3/4” button head allen and washer provided at the center support. Use the fasteners in the bag marked “grille bolts” to complete the installation of the grille.



Bolt the bumper back on using the factory bolts. Threaded bosses are on the frame for this purpose. Chase the threads with a 7/16-14 tap before installing the bolts.

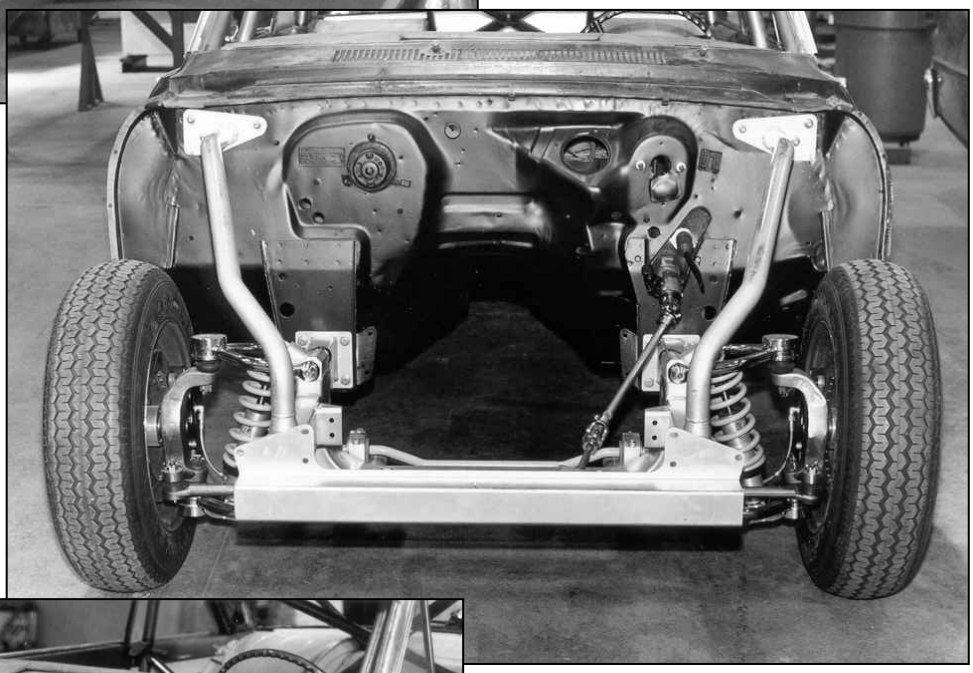
Next, bolt the hood hinges to the hinge mount plate. Use your original bolts in the “hood hinge bolts” bag. You will need a U-joint socket adapter to install the bolts closest to the firewall.

Putting the hood back onto the hinges is definitely a two-person operation. After you have the hood bolted on, carefully close it to check alignment with the front fenders.

With the hood closed, make sure the gap between the fenders and the hood are even on both sides. If they are not, move the fenders to change the gap. The fenders are slotted for this purpose.

You may also need to move the hood up or down at the cowl. Loosen the bolts holding the hinge to the hinge-mount-panels to make any corrections needed. The fenders should be 1/16 of an inch wider than the door to minimize wind noise.

Finally, adjust the front hood stops, making sure the hood latch works easily.



Congratulations, you have now completed your installation.

Your project should look like this.

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