

1955-57 POWER RACK AND PINION STEERING INSTALLATION



Randy Irwin - Technical Writer

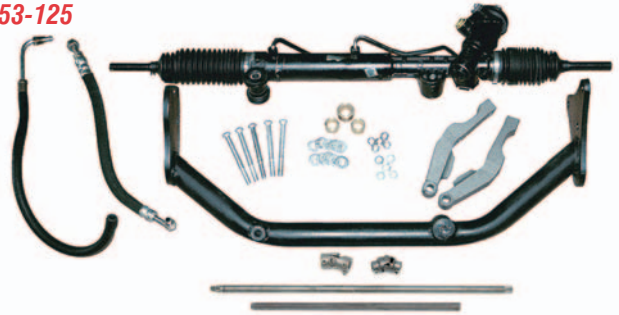
Randy has been involved in the Chevy parts business for over 25 years. He is a wizard at creating, making and modifying custom parts for Chevys.

We've done a few installation articles on our rack and pinion kit in past issues, but never one as comprehensive as this. In this article we actually take a running, driving car equipped with original manual steering and show you step-by-step how to upgrade it with our popular power rack and pinion kit.

Parts List:

- 53-125 Rack & Pinion Deluxe Kit, Small Block, Stock Column
- 53-126 Rack & Pinion Deluxe Kit, Big Block, Stock Column
- 53-225 Rack & Pinion Mega Kit, Small Block, Stock Column
- 53-226 Rack & Pinion Mega Kit, Big Block, Stock Column
- 53-300 Rack & Pinion Deluxe Kit, Small Block, Tilt Column w/ Floor Shift
- 53-301 Rack & Pinion Deluxe Kit, Big Block, Tilt Column w/Floor Shift
- 53-302 Rack & Pinion Deluxe Kit, Small Block, Tilt Column w/Column Shift
- 53-303 Rack & Pinion Deluxe Kit, Big Block, Tilt Column w/Column Shift
- 53-304 Rack & Pinion Mega Kit, Small Block, Tilt Column w/Floor Shift
- 53-305 Rack & Pinion Mega Kit, Big Block, Tilt Column w/Floor Shift
- 53-306 Rack & Pinion Mega Kit, Small Block, Tilt Column w/Column Shift
- 53-307 Rack & Pinion Mega Kit, Big Block, Tilt Column w/Column Shift
- 211-21 Chrome Double Groove Crankshaft Pulley
- 211-19 Chrome Double Groove Small Block Water Pump Pulley
- 51-18 1/2" Fan Spacer
- 41-12 Small Block Power Steering Belt
- 41-17 Big Block Power Steering Belt
- 18-115 Small Block Alternator Bracket
- 21-185 Tubular Upper Control Arms

#53-125



#53-300



#53-307



#51-18



#211-21





Tools Needed:

1/2" Wrench	Ratchet
9/16" Wrench	1/2" Socket
11/16" Wrench	9/16" Socket
3/4" Wrench	1-5/16" Socket & Breaker Bar
Hammer	Tin Snips
Tie Rod End Splitter Tool	Hack Saw
Pitman Arm Puller	1-3/4" Hole Saw

Time Frame:

8 hours



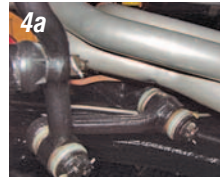
Photo 1: The original steering box mounts to the frame just behind the upper control arm with three carriage bolts. When installing the rack, all the steering linkage should be removed.



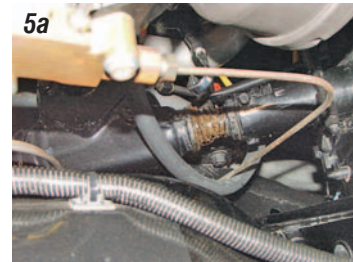
Photos 2a & 2b: First, we will disconnect the outer tie rod ends from the steering knuckles (outer steering arms). Remove the cotter pin and nut from the tie rod end and using a tie rod splitter and disconnect the tie rod ends from the steering arms. If the outer tie rod ends and adjusting sleeve are in good shape, they will be reused with the rack and pinion.



Photos 3a, 3b & 3c: The pitman arm is held to the steering box with a 1-5/16" right hand thread nut and lock washer. Using a socket and breaker bar or impact wrench, remove the nut and lock washer. Next using a pitman arm puller and a breaker bar or impact, remove the pitman arm from the steering box.



Photos 4a & 4b: The idler arm is located on the passenger side of the car and is held to the frame with two carriage bolts, nuts and lock washers. Remove the two nuts and lock washers and the entire steering linkage can be removed from the car.



Photos 5a & 5b: The steering shaft that connects the steering wheel to the steering box is part of the steering box and not removable. To remove the steering box and shaft, the mast jacket (steering column) must be removed. If you are not planning on saving the old steering box, the shaft can be cut at the steering box to save you from removing the mast jacket from the car. This will save you some time and keep you from possibly scratching the paint in the dash area. With the steering shaft cut, the steering wheel and shaft will slide out the top of the mast jacket.



Photos 6a & 6b: The steering box is removed through the top of the engine compartment. Our project car has the alternator mounted on the front two header bolts on the driver's side and a power brake booster and dual master cylinder – all in the way! We will remove the alternator to make removing the steering box easier. With the alternator out of the way, there is plenty of room to remove the steering box.



Photos 7a & 7b: Remove the three nuts, lock washers and carriage bolts and the steering box can be removed from the car.

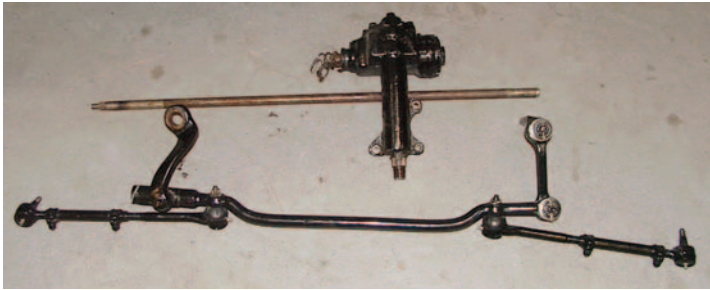


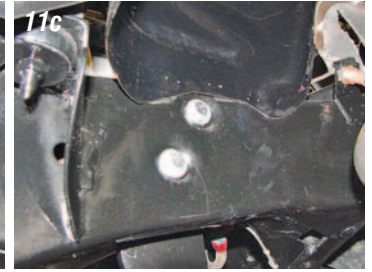
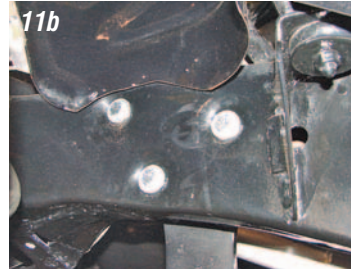
Photo 8: Now that we have all the antiquated steering linkage removed, we can install something that's really going to make this classic drive like a champ!



Photo 9: The Eckler's Classic Chevy rack and pinion crossmember is constructed of 1-5/8" mandrel bent round tubing for superior strength and is a completely bolt-in unit. Our kits include all mounting hardware and instructions.



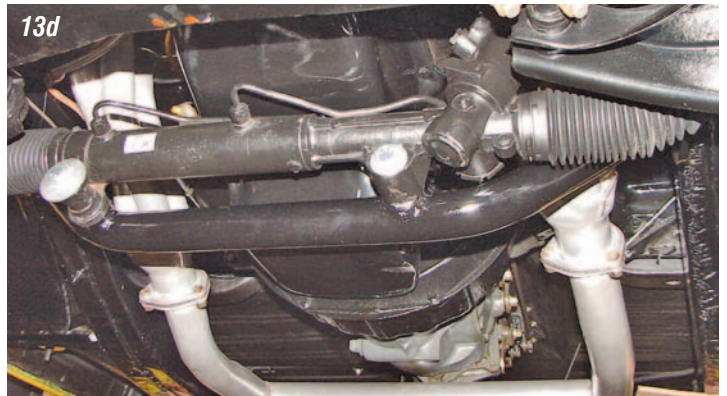
Photos 10a & 10b: The rack and pinion crossmember bolts to the frame on the driver's side using the stock holes for the steering box. On the passenger side, the crossmember bolts to the frame using the original holes for the idler arm.



Photos 11a, 11b & 11c: If you measure ten different frames between the frame rails, you will get ten different measurements. The ears on the crossmember are leaned in at the top to accommodate for this variation. When the crossmember is bolted to the frame, the ears will pull into place and the frame will not move. The crossmember is held to the frame with 3/8" X 4" bolts with flat washers and lock nuts.



Photos 12a, 12b & 12c: The rack and pinion unit is bolted to the crossmember with two 1/2" X 3" bolts and washers. The driver's side of the rack and pinion has a cast ear where a 1/2" flat washer is installed on each side of the ear.



Photos 13a, 13b, 13c & 13d: The passenger side of the rack and pinion also has an ear, but this one has a large hole that uses a steel sleeve and two rubber bushings supplied with the kit. A cupped washer is installed on the front side of the ear and a 1/2" flat washer on the back side.



Photo 14: The Eckler's Classic Chevy Rack and Pinion crossmember is so strong you can use it to jack up the front end! Other rack kits on the market use a flimsy lightweight support or braces that do not tie the frame rails together.

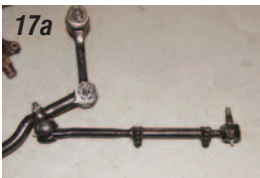


Photos 15a & 15b:

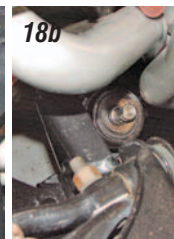
The rack and pinion kit includes new steering knuckles (steering arms) that are 1-5/8" shorter than the original ones. The shorter arms are necessary to maintain the original steering radius.



Photos 16a & 16b: The original steering arms are bolted to the spindles with two 7/16" bolts and nuts. Remove the two nuts and install the new arms.

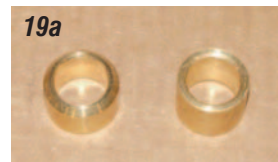


Photos 17a, 17b & 17c: The Eckler's Classic Chevy Rack and Pinion Kit utilizes the original outer tie rod ends and adjusting sleeves so there are no metric parts installed on your Classic! The outer tie rod ends and adjusting sleeves were in perfect shape on our project car so we will reuse them. If they were bad, the adjusting sleeves are available new as **P/N 21-08** and the outer tie rod ends **P/N 21-07**. Install the adjusting sleeves and tie rod ends and set the toe in as close as you can for now. Once the rack and pinion is completely installed, the car will need to be taken to the alignment shop.



Photos 18a, 18b & 18c:

Now we are ready to connect the U-joints and shaft from the rack and pinion to the steering column, but we have a problem. The existing non-CCI headers that are on our project car are right in the way. If we had some side room, we could add the 3rd U-joint support kit **P/N 53-317** and snake the shaft around the header tubes, but there is just no room here to do that. Instead, we will remove the left hand header only and replace it with the Eckler's Classic Chevy 3/4-length left header **P/N 24-53C-LH**.



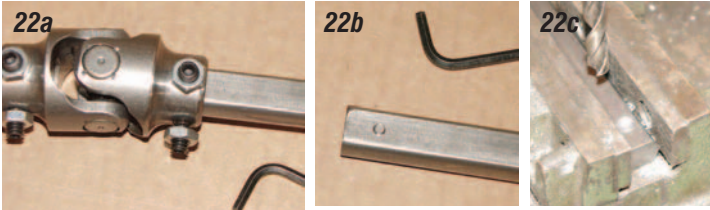
Photos 19a, 19b & 19c: The rack & pinion kit includes two large brass bushings. One of the two bushings will fit into the bottom of the original mast jacket to support the lower end of the new steering shaft. Choose the correct size bushing that will slide up into the bottom of the mast jacket and drive the bushing in so that it is flush with the bottom of the tube.



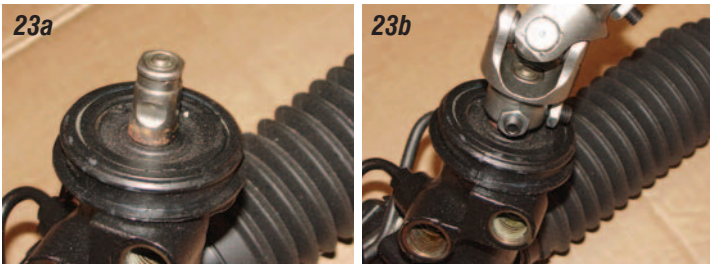
Photo 20: When using an original steering column, a new shaft steering shaft kit is supplied with the rack and pinion kit. This includes the column shaft, the intermediate shaft and upper and lower U-joints.



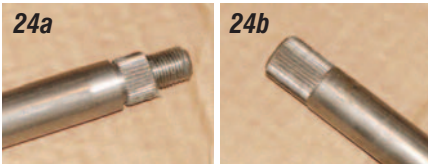
Photos 21a & 21b: The U-joints are held to the intermediate shaft with set screws and jam nuts. Make sure when the shaft is installed in the U-joint that the shaft does not protrude past the inside of the yoke. If it does, the shaft will make contact with the opposing yoke of the U-joint and create a bind.



Photos 22a, 22b & 22c: First, install the lower U-joint onto the double-D shaft. Once the U-joint has been located on the shaft, tighten the one set screw on the flat of the double-D shaft. The set screw will leave a mark on the shaft. Next, using a 5/16" drill bit, drill a dimple in the shaft at the mark. The dimple is used as a seat for the set screw.



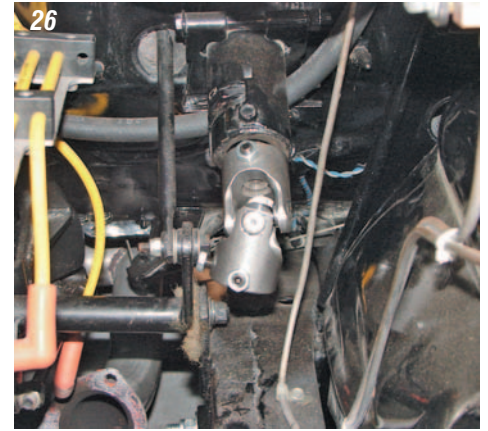
Photos 23a & 23b: The input shaft on the rack and pinion unit has a coped-out area for the set screw. With the set screw seated in the coped out area, the input shaft will be flush with the inside U-joint yoke.



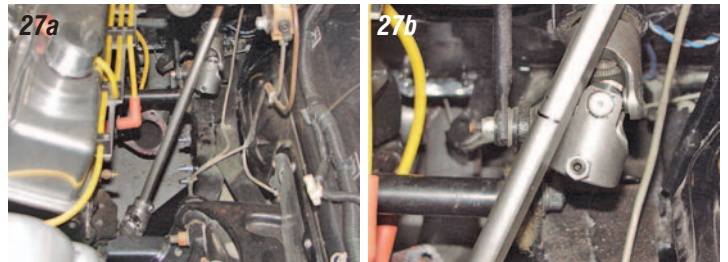
Photos 24a & 24b: The new steering column shaft has 3/4" - 36 splines at the bottom of the shaft and the same splines and threads at the top like the original. The same splines at the top allows you to use the stock steering wheel or any aftermarket steering wheel.



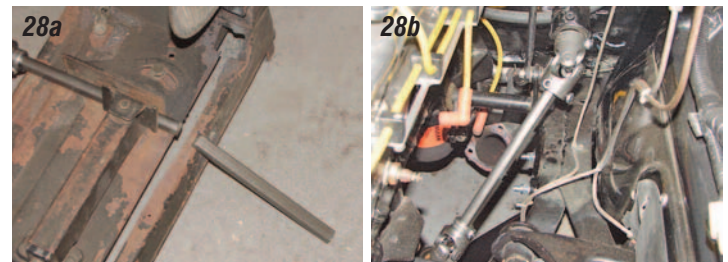
Photos 25: Install the steering wheel or steering wheel adapter on the shaft and slide the shaft down into the steering column. Place a piece of cardboard or folded-over paper between the upper mast jacket and steering wheel or adapter. You want to achieve a 1/16" or so gap between the steering wheel hub and steering column.



Photos 26: The upper U-joint is the larger of the two U-joints supplied. The top of the U-joint has 3/4"-36 splines to match the steering column shaft and the bottom of the U-joint has a 3/4" double-D to match the intermediate shaft.



Photos 27a & 27b: Install the lower U-joint and shaft on to the rack and pinion unit making sure the set screw is seated in the coped out area on the input shaft. Lay the 3/4" double-D shaft next to the upper U-joint and mark the shaft where it will need to be cut to properly engage the yoke on the joint. The intermediate shaft is long enough to reach the firewall even if a late model tilt column were installed



Photos 28a & 28b: The shaft can be cut with a hack saw, band saw or chop saw. With the intermediate shaft cut, remove the upper U-joint from the steering shaft, install the now shortened intermediate shaft and lower U-joint to the rack and pinion, install the upper U-joint the intermediate shaft and slide the steering shaft into the upper U-joint.

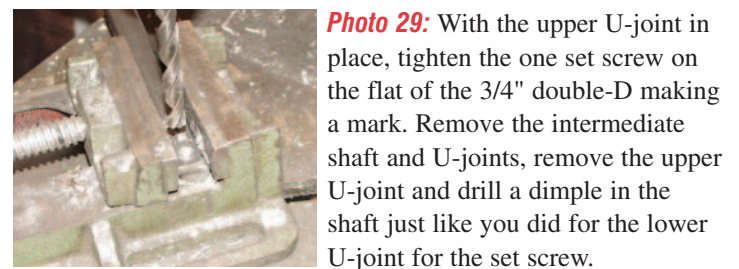
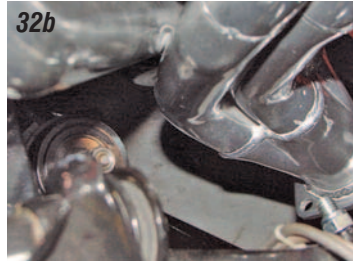


Photo 29: With the upper U-joint in place, tighten the one set screw on the flat of the 3/4" double-D making a mark. Remove the intermediate shaft and U-joints, remove the upper U-joint and drill a dimple in the shaft just like you did for the lower U-joint for the set screw.



Photo 30: With the U-joints located on the intermediate shaft, we gave the shaft and U-joints a shot of gloss black paint.



Photos 32a & 32b: We have removed the left hand header only and replaced it with the Eckler's Classic Chevy 3/4-length header P/N 24-53C-LH. This header can be purchased as a pair P/N 24-53 (uncoated) or P/N 24-53C (coated). The #24-53 headers will work with stock front mounts or any brand side mounts, automatic column shift or manual transmissions, with or without mechanical clutch linkage and with either straight or angle plug heads. With the #24-53 headers there is plenty of room for the lower U-joint and shaft on the driver's side.



Photos 33a, 33b & 33c: The upper bearing in the steering column P/N 53-21 was bad so this was the perfect time to change it before we installed the steering shaft, the steering wheel adapter and the intermediate with U-joints. With everything set and the screws on the U-joints locked down, we had a 1/16" gap between the steering wheel adapter and the top of the steering column. This gap will keep the steering wheel adapter from touching the painted surface of the turn signal housing.

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Photos 34a & 34b: A third track pulley must be added to the crankshaft to drive the power steering pump. By adding a third track pulley to the crankshaft, the fan shroud will need to be notched. Mark the shroud and remove.



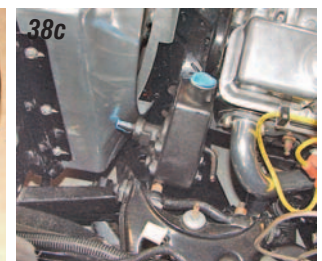
Photos 35a & 35b: Future plans include adding air conditioning, so we will install a double groove pulley along with the third track pulley on the balancer. All three pulleys together measure 1-3/4" deep. Using the marks on the fan shroud as the reference point, cut a 1-3/4" deep notch in the shroud. A fine tooth hack saw or tin snips works great to cut the aluminum shroud.



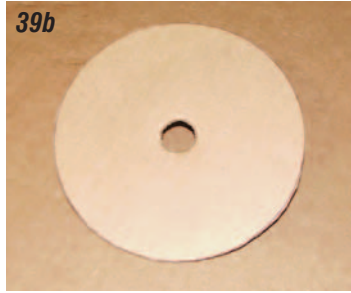
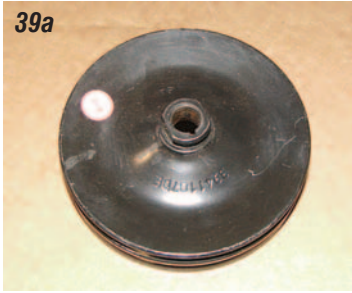
Photos 36a & 36b: The power steering pump mounts to the front of the engine down low on the driver's side. The pump mounting bracket P/N 53-27 or 53-27C can be used as the power steering pump mounting bracket on cars with side engine mounts or as a combination front engine mounting bracket and pump mounting bracket on engines with front mounts.



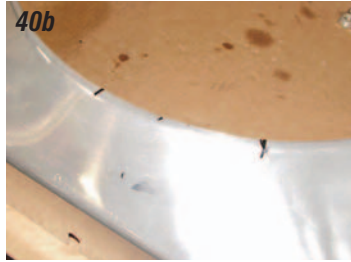
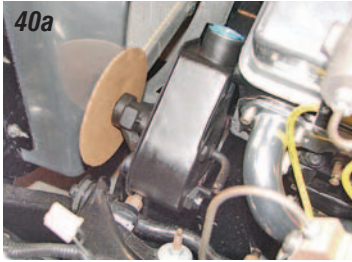
Photos 37a & 37b: The pump bracket P/N 53-27 (small block short water pump) is held to the front of the engine with two 3/8" X 3/4" bolt and lock washers provided.



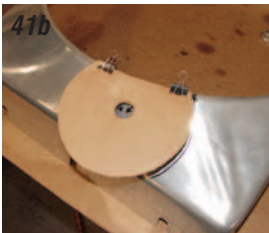
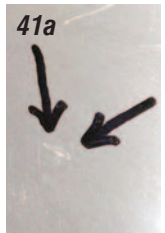
Photos 38a, 38b & 38c: The power steering pump P/N 53-28 is held to the bracket with a 3/8" X 3/4" bolt and lock washer in front and a stud at the rear that uses a 3/8" flat washer, lock washer and nut provided with the bracket. With the pump in place, we now see that the shroud will need to be trimmed for the power steering pump pulley. This would be true with a big block or small block engine.



Photos 39a & 39b: Using the power steering pump pulley P/N 53-50 as a pattern, cut a template of the pulley.



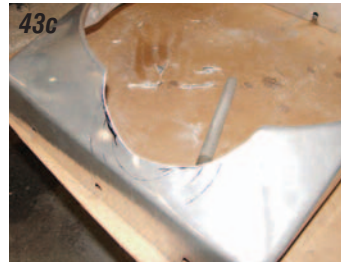
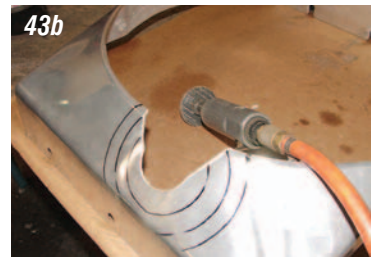
Photos 40a & 40b: With the power steering pump reservoir touching the upper control arm stud, place the cardboard pulley template on the power steering pump shaft and mark the fan shroud at the fan blade opening where it will need to be trimmed.



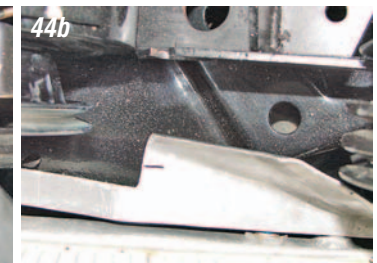
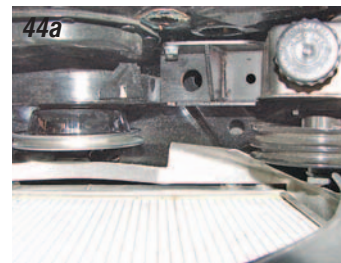
Photos 41a, 41b & 41c: When the power steering pump was installed, the shaft made a mark on the shroud. Using the two marks that were made with the pulley template, center the template on the scratch that the pump shaft made and mark the outer circumference of the template. Next, make several small diameter marks on the shroud to be used as reference points when trimming the shroud.



Photos 42a & 42b: First, drill a 1-3/4" hole at the center of the markings to line up with the power steering pump shaft when the pump is adjusted as far out as it will go.



Photos 43a, 43b & 43c: Starting slow, trim the shroud with a cut-off wheel or tin snips until the pulley will clear the fan shroud with the pump adjusted all the way out. This will require the fan shroud to be installed and removed several times.



Photos 44a, 44b, 44c & 44d: With the pump and the single groove power steering pump crankshaft pulley P/N 53-34 installed, you can see that the fan shroud is in the way of the belt. Mark the shroud where the fan belt is going to travel and once again remove the shroud and trim it for the power steering pump belt.

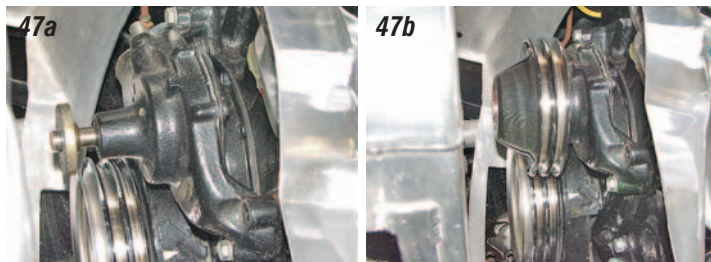


Photo 45: Before we installed the fan shroud for the last time, we made a template of the cut-outs on the shroud. If you go to our website www.classicchevy.com and pull up either P/N 18-306 or P/N 18-307 fan shroud, you can download the template. Or if you wish you can send a self-addressed envelope attn: CCI Tech Dept Fan Shroud Template and we will be glad to send you a copy.

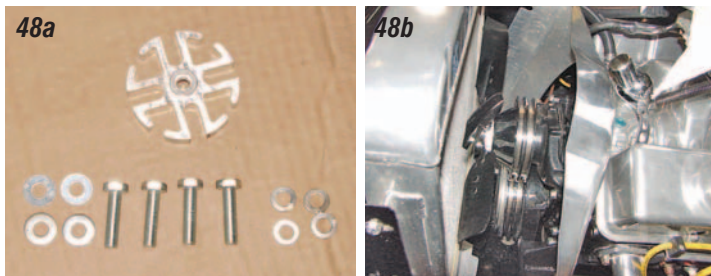


Photos 46a, 46b, 46c & 46d: The first groove on our balancer pulleys closest to the harmonic balancer will drive the water pump and alternator. The second groove is for the water pump and air conditioning compressor and the third groove runs the power

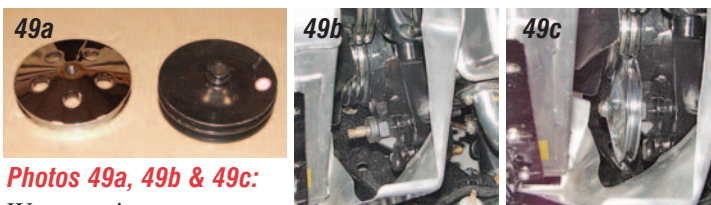
steering. The single groove, chrome, power steering pump pulley **P/N 53-34C** fits inside the double groove, chrome pulley **P/N 211-19**. The pulleys are held to the harmonic balancer with three 3/8" X 3/4" bolts. Lower the fan shroud down in the engine compartment and lean it back on the engine and install the crankshaft pulleys.



Photos 47a & 47b: Next, install the water pump and water pump pulley. A chrome double groove pulley **P/N 211-19** will be used.



Photos 48a & 48b: A 1/2" fan spacer **P/N 51-18** is installed between the fan blade and water pump pulley so that the tips of the fan blade will clear the third track pulley on the crankshaft.

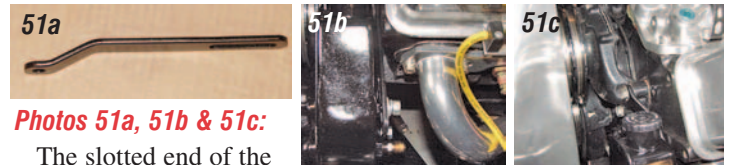


Photos 49a, 49b & 49c:

We are going to swap out the black double groove pulley **P/N 53-30** on the power steering pump for the billet aluminum chrome single groove pulley **P/N 53-311** for a more custom look. The pulley is keyed to the pump shaft and is held in place with a nut supplied with the pump.



Photo 50: Now you may install the fan shroud for the last time. The legs on the shroud get trapped between the core support and the radiator to finish things off.



Photos 51a, 51b & 51c:

The slotted end of the pump adjusting arm **P/N 53-29** or **53-29C** anchors to the back of the power steering pump with a 3/8" flat washer, lock washer and nut. The other end of the adjusting arm attaches to the upper water pump bolt.

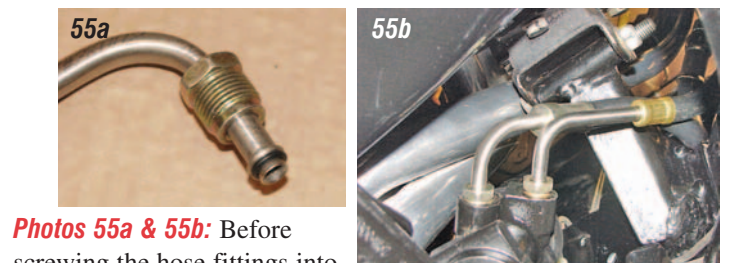


Photos 52a & 52b: The pressure hose **P/N 53-38** (small block) or **P/N 53-74** (big block) has a brass fitting on the end where it attaches to the pump and an 18 millimeter male O-ring fitting where it attaches to the rack and pinion. The brass fitting screws into the female inverted hole in the back of the pump.



Photo 53: The return hose uses a hose clamp at the power steering pump and has a 16 millimeter male O-ring fitting where it attaches to the rack and pinion.

Photo 54: The 18 millimeter pressure port on the rack and pinion is to the left of the input shaft while the 16 millimeter return port is to the right of the input shaft.



Photos 55a & 55b: Before screwing the hose fittings into the rack and pinion, make sure you lubricate the O-rings with a light coat of power steering fluid. When routing the hoses, make sure they are well away from the hot exhaust and the harmonic balancer. We routed our hoses under the side engine mount.

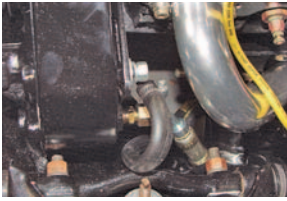


Photo 56: The return hose will need to be cut to length and attached to the power steering pump with the supplied hose clamp. The pressure hose screws onto the new brass fitting on the back of the pump.

Photo 57: Install the power steering pump belt P/N 41-12 (small block) or P/N 41-17 (big block) and adjust.



Photo 58: Our project car had the alternator mounted to the outboard side of the driver's valve cover. This will no longer work with the pump mounted down low on the driver's side of the

engine. Our **P/N 18-115** alternator bracket will mount the alternator on the inboard side of the driver's valve cover allowing the belt to clear properly.

With the front wheels off the ground, fill the power steering pump with power steering fluid and start the engine. With the engine running, turn the wheels all the way to the left and then to the right ten or 15 times to work the air out of the system. Put the car back on the ground, top off the power steering fluid and take it for a test drive. Remember the toe-in setting is only close and the car will need to be aligned. Below are the correct alignment specifications that must be used to make the car drive properly. Do not use original alignment specs printed in the Shop Manuals! If proper caster specifications cannot be achieved, upper tubular control arms with offset shafts and ball joints **P/N 21-185** will need to be installed.

	Driver's Side	Passenger Side
Caster	2-1/2 to 3-1/2 Degrees Positive	2-1/2 to 3-1/2 Degrees Positive
Camber	0-Degrees	1/4-Degree Negative
Toe In	1/8" to 3/16"	

Good Luck! 