

# Steeroids™ INSTALLATION INSTRUCTIONS

## 1963-1982 Corvette



### Verify Kit Contents:

- 1 RACK AND PINION WITH MOUNTING CLAMPS
- 2 ROD ENDS W/ TAPERED STUDS
- 3 ROD ENDS (INCL. SUPPORT BEARING)
- 2 TIE ROD SLEEVES
- 2 PUMP HOSES (power kits only)
- 2 U-JOINTS AND SHAFT
- 1 DRIVER'S SIDE BRACKET
- 1 PASS. SIDE BRACKET
- 1 TIEROD BRACKET
- 1 GUSSET FOR DRIVER'S SIDE BRACKET
- 2 METRIC RACK BOLTS W/ WASHERS & FRENCH LOCK
- 4 3/8- 24 x 4 GRADE 8 BOLTS
- 5 3/8- 24 ELASTIC NUTS
- 9 3/8 FLAT WASHERS
- 1 3/8- 24 x 1 GRADE 8 BOLT
- 6 5/16-24 x 1 GRADE 8 BOLTS
- 6 5/16-24 ELASTIC NUTS
- 6 5/16 FLAT WASHERS
- 2 5/8- 18 X 1.5 GRADE 8 BOLTS
- 2 5/8- 18 RIGHT HAND JAM NUTS
- 2 3/4-16 RIGHT HAND JAM NUTS
- 2 5/8-18 LEFT HAND JAM NUTS
- 2 5/8 SPLIT WASHERS
- 2 EXTRA SET SCREWS (if needed for u-joint clearance)

**PLEASE NOTE:** These components are tested and engineered to meet loads equal to what the stock steering system is exposed to during normal operation. If you or the person or firm you hire to install your Steeroids rack & pinion kit believes it is necessary to "modify" any components to make them fit and /or adjust properly PLEASE note that this is extremely dangerous. We offer free technical phone support to assist with installation should you encounter a problem. Modifications may include cutting or welding support brackets, sawing or hammering on u-joints, or any revision, deletion or addition to the product as delivered, and should NEVER be required. Any such modifications void the manufacturers warranty. Our knowledgeable staff will gladly assist you with any questions you may have during installation. In addition Class M Corporation, DBA SpeedDirect is not responsible or liable for any damages or injury resulting from any modification to the components as delivered.

Before beginning: Please note each steering rack is bench tested prior to shipping therefore some of the fluid from the test occasionally leaks out and may stain the box. This does not mean the rack has been damaged if fluid has leaked out. You may also find two small rubber o-rings attached to your rack with a twist tie, these are merely extras that are sometimes supplied with our steering racks. The power steering hose adapters or hose ends supplied with your kit should already have o-rings attached, so the extras can be discarded.

1. Begin by performing an inventory of all the components in the kit. Installing the Steeroids kit requires simple hand tools. A pickle fork will be useful when disassembling the old system.
2. Begin by supporting the car securely on jack stands. Never support the car using only a jack.
3. Removing the entire steering system as a unit is the most effective way. The outer tie rods require removal of a cotter pin and nut before separating from the steering knuckle using a pickle fork. Once both tie rods are separated from their respective steering knuckles, remove the two bolts attaching the steering column to the rag joint. Also, remove the two cross bolts that hold the rag joint to the steering column and the steering box. The steering box is attached with 3 bolts that extend through the frame from the driver's side wheel well. Remove two of the bolts. Leave the last bolt installed until you are ready to remove the entire system.
4. If you have tubular headers you will most likely need to remove the driver's side header to facilitate removal of the steering box. Unbolt the power assist cylinder and support bracket from the frame rail. Disconnect the power steering hoses from the pump.
5. Now remove the two bolts and nuts that attach the idler arm to the passenger side frame rail. The final bolt holding the steering box can be removed now, but **BE PREPARED TO SUPPORT THE STEERING BOX WHEN IT COMES LOOSE**. Lower the steering system out of the car. You might have to work the bolts and rag joint loose from the steering column.

## ASSEMBLY AND INSTALLATION

We recommend using red high strength thread lock on all threaded applications except for power steering hose fittings.

6. Bolt the tie rod bracket to the rack and pinion unit using the supplied bolts (metric), flat washer and French lock plate. Place the flat washers between the R & P unit and the bracket, which may compress the rubber boot-this is normal. Place the French lock under the bolt heads. Use a flat blade screw driver to slightly bend the tabs toward the head of the bolts before you tighten the bolts.



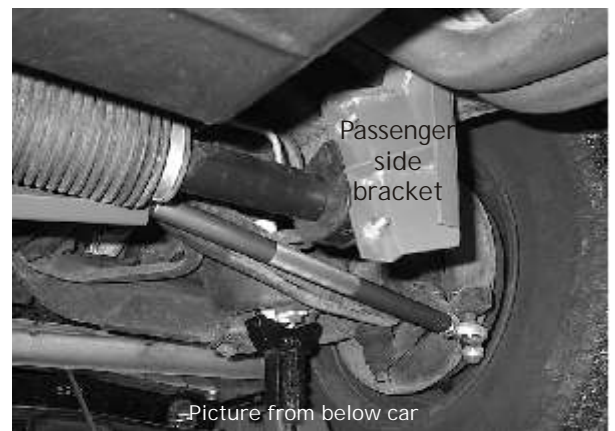
Once the bolts are tightened you can bend the tabs so they contact the hex flats. This provides a mechanical lock so the bolts will not loosen. The bracket installs with the outer holes toward the top of the steering rack. It can be installed upside down, so be sure you have the correct orientation as shown in the picture at right. Use a high-strength thread locker and torque to 60 ft/lbs.



7. Thread each tie rod end with jam nut onto the tie rod sleeves an equal amount. On the other end of each sleeve, thread the remaining 5/8" rod ends with jam nuts. Attach them to the tie rod bracket using the 5/8-18 x 1.5 bolts and lock washers. The lock washer is located between the head of the bolt and the inner tie rod bearing. Use a high strength thread locker and torque to 50 ft/lbs. If you experience clearance issues with the head of the 5/8 bolt, you can omit the lock washer but be sure to use high strength thread locker. To set an approximate alignment, measure the overall length of the old steering system. Measure from the center of each outer tie rod. Adjust the tie rods on the steering rack to match your measurement and tighten the jam nuts against the sleeves. To center the rack, use an adjustable wrench and turn the pinion until the rack is at its stop. Now count the turns as you proceed to the opposite stop. Divide the number you get by 2 and turn the pinion this amount. The steering rack is now centered.



8. The driver's side mounting bracket attaches to the frame at the same location as the steering box. You can use the bolts supplied (be sure to place a washer under the head of the bolt, as well as under the nut) or the existing steering box bolts. The factory original bolts will be a bit longer than needed but they won't interfere with the operation of the system. Use a lock washer under standard nuts or use nylon insert lock nuts (whichever provided). When using the original bolts, check to be certain that there are enough exposed threads to properly tighten the nut without it bottoming on the bolt. Add a flat washer if needed.

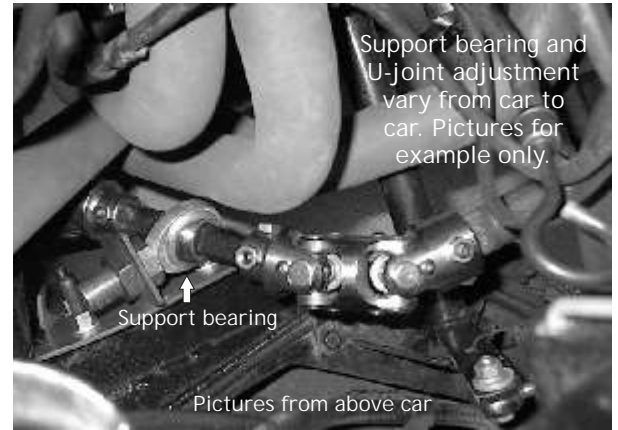


9. The gusset installs using the existing fasteners in the frame for the power assist cylinder. It attaches to the drivers side bracket and to the bottom side of the frame rail. Two 5/16-24 x 1 bolts are used to attach the brackets together. Place flat washer under nut, torque all fasteners to approximately 10 ft/lbs.

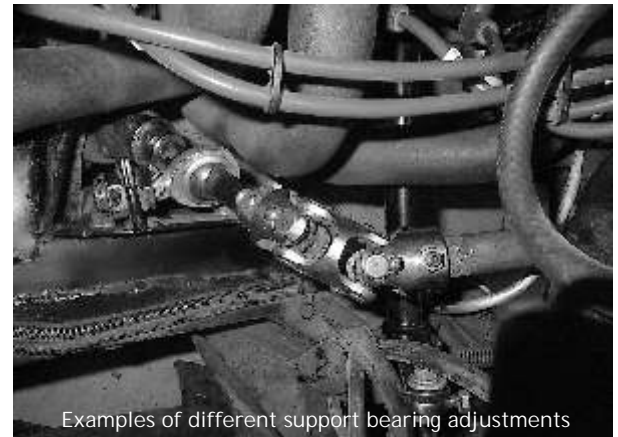
10. The passenger side bracket attaches in the same manner as the idler arm. Place flat washers under bolt head AND under nut. Torque to 35 ft/lbs.

11. Now install the rack and pinion on the brackets using the supplied clamps, bolts, washers and nuts. Please note the rack clamps provided are different - they must fit properly on the rack. Torque to 30 ft-lbs. Attach the tie rod ends to the steering knuckles and torque to 30 ft-lbs. If castle nuts provided, continue to tighten the nut to align castellation with the cotter pin hole. Install cotter pin. When attaching the tie rod end to the spindle, torque the 15/16" nylock nut to 50 ft lbs. Note that the flange above the taper may not seat against the spindle - this is not a problem. NOTE: If your car has two holes in the steering arm install the tie rod end in the hole closest to the front of the car. Using the hole towards the rear will reduce the steering radius.

Spacers have been provided to adjust bumpsteer. Stock ride height setting has been preassembled. To adjust, match the tie rod angle to parallel the lower control arm when vehicle is on the ground.



12. Slide the support bearing onto the intermediate shaft and attach a u-joint on each end. Be sure they are phased correctly (see diagram below). Slide the double u-joint onto the steering column, but do not yet tighten. Position the single u-joint on the pinion shaft of the steering rack so that the setscrew will seat against the flat, machined surface. Be sure that the setscrew on the round part of the shaft is lined up with the indent on the pinion shaft. Also make sure that the shaft ends do not protrude into the inside of the u-joints. Be sure to tighten the setscrew that sits on the flat of the pinion first, then tighten the setscrew on the round portion. The support bearing is installed on the bracket with two jam nuts. During installation it may be easiest to allow the bearing to float between the upper and lower u-joints, so don't tighten the jam nuts yet.



**CORRECT PHASING**

**INCORRECT PHASING**

### U-Joint Orientation

When two joints are used on a shaft, the forks of the yokes closest to each other should be in line, or "in phase." Premature wear or binding can result if the u-joints are not phased properly. Sometimes if the u-joints are at a severe angle, even if they are phased correctly, a hard spot in the steering may occur for no apparent reason. If this happens, index the u-joints two or three splines in one direction. The hard spot should disappear or be minimized.

13. Don't tighten any setscrews until both u-joints are installed on the intermediate shaft and the rack and pinion unit is in place. Be sure that the shaft is not protruding into the inner part of either of the u-joints. Two additional shorter set screws have been supplied in the bag of other hardware in the event of any clearance issues when the u-joints rotate. It is essential that all splines are fully engaged into the u-joints (approx 3/4"). Tighten all setscrews and their jam nuts using a high strength thread locker.

14. Adjust the support bearing to minimize binding of the u-joints during rotation. There should not be ANY binding. The steering shaft should be able to be turned by hand (with the wheels off the ground). If the bearing cannot be adjusted to completely remove any binding then the steering column should be moved towards the rear of the car. Adjust the column by loosening the nuts under the dash and at the firewall, and pulling the entire unit back. The most common binding is found when the double u-joint starts to form an "S" shape. This is caused by misalignment of the intermediate shaft and steering column. If sliding the steering column all the way back does not remove the binding, you can also slide the end of the steering column toward the engine. This normally relieves any remaining binding. If this adjustment needs to be made, be sure the support bearing is loose during adjustment. After all other items are tightened, then re-tighten the jam nuts on the support bearing. 15. You will most likely have to re-center the steering wheel by removing it from the column, centering and reinstalling. This may change the turn signal canceling feature. There are two ways to correct this. Either modify the plastic canceling cam or change the phasing of the u-joint. The plastic cam and head can be cut off the stem and glued into the correct orientation. Moving the u-joint on the steering column splines will require grinding or drilling an indentation for the setscrew.

16. Check for any interference between the u-joints and the frame, particularly near the engine mount. Be sure the setscrews clear when the u-joint rotates. A variety of set screw lengths have been included, however be sure when the set screws are fully tightened down, they still have enough protruding to get full thread bite on the jam nut.

Note: If you are installing a manual kit, skip to step 19.

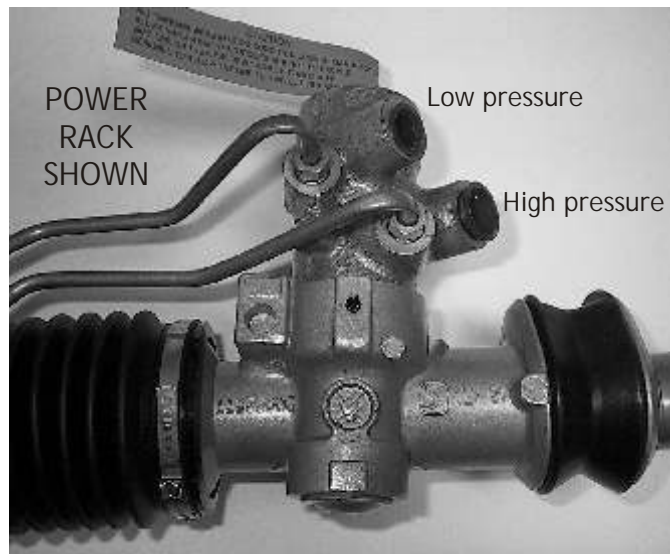
17. Next, attach the power steering hoses. The large hose (the lower outboard) fitting on the rack is the high pressure side. This connects to the threaded fitting on your pump. The high pressure hose has fittings on both ends. Tighten to 21 ft-lbs. The return side (upper, inboard fitting) is torqued to 13 ft-lbs. It is very important to connect these hoses to their proper locations. Reversing the hoses will destroy seals and cause the rack to operate inconsistently and uncontrollably. Depending on the hose kit supplied, there may be hose adapters included to match the hoses to the rack. Other hose kits do not require the adapters.

18. Power steering fluid recommendations: Run standard GM Power Steering Fluid. For those who prefer synthetic fluids you may switch to Royal Purple Synthetic after 1000 miles, but it is not required.

Bleed the system by turning the wheels all the way to the left. Add fluid to the "cold" mark on the dipstick. Turn the wheel back and forth 3 or 4 times. Start the car and allow it to idle. Fill to the "cold" mark as needed. (A) Now turn the wheels side to side until there are no more bubbles. Check the fluid level frequently while proceeding. Allow the engine to run for a few minutes. Add fluid as needed. Replace cap and shut off engine. If the fluid level rises after the engine is shut off, there is still air in the system. Repeat (A) until all air is out of the system. "Flushing" the system is not necessary, you are only bleeding it of air.

19. Now re-check every bolt and nut to be sure all are tight and torqued. Test-drive the car at low speed for a brief period. Check every bolt for tightness again. For power kits only: If the engine is at operating temperature, check the power steering fluid level. Fill to the "hot" mark as needed.

20. The final step is to have the front end aligned and re-check all bolts for tightness after the first 100 miles.



#### DETAILS FOR ALIGNMENT:

Alignment recommendations for spirited driving:

	<u>Camber</u>	<u>Caster</u>	<u>Toe</u>
Street	0 -.25 negative camber	2.5 - 5 positive	0 to 1/8" toe in

\*\*\*Please Note: The rack unit that we are using for this kit has some movement built into the rack. When the vehicle goes in for alignment, you may notice the center tie rod bracket can move up and down a slight amount, affecting the tow of the vehicle. THIS IS NORMAL. The GM rack we are using had this movement built into it from the factory. Do not try to move the bracket all the way to one side or the other of this movement when aligning the vehicle. Leave the bracket in the location it was at when the vehicle was pulled forward onto the lift and adjust it from there.



**WARNING:** FAILURE TO ADJUST THE UPPER U-JOINT SO THAT THERE IS NO BINDING WILL RESULT IN PREMATURE WEAR AND FAILURE! IF YOU FEEL ANY BINDING IN THE STEERING WHEEL, ADJUSTMENT IS STILL REQUIRED AS DETAILED IN STEP 14.

#### WARRANTY DISCLAIMER

Seller disclaims any express or implied warranty of merchantability with respect to the goods sold. Seller disclaims any warranty of fitness for any particular purposes whatsoever with respect to the goods being sold.

Seller disclaims all liability for any personal injury or damage which may result from the sale, installation, or use of any product sold. Labor charges, and/or damage incurred in installation, repair or replacement as well as incidental and consequential damages connected therewith are excluded and will not be paid by seller. The installation of this product may adversely affect a manufacturer's warranty with respect to certain vehicles and/or manufactured goods. Improper installation, modification and/or abuse voids any warranty.

This warranty is the only express warranty made by seller. Seller will repair or replace any product which proves to be defective in material and/or workmanship under normal installation, use and service.

This disclaimer is limited only by applicable state laws.



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# PRODUCT EVALUATION SHEET

Telling us what you like and don't like determines what we make and how we make it. We would appreciate it if you would take just a few minutes of your time to answer the following questions about the parts you ordered from us. Simply fold this form on the dotted lines, seal with tape and mail it to us. *Do not use staples and make sure our address faces out.* SpeedDirect will not disclose the information it collects to outside parties. SpeedDirect does not sell, trade or rent your personal information to others. Your privacy is important to us.

1) Kit: Corvette Steroids

2) Where did you learn about this kit?

- Magazine Ad       Friend
- Internet Search       Forum
- Mechanic       Catalog
- Car Show
- Other (specify) \_\_\_\_\_

3) What influenced you the most to buy this kit?

- Magazine Ad       Price
- Recommendation       Testimonials
- Internet       Forum
- Other (specify) \_\_\_\_\_

4) Did you have any trouble understanding the written instructions? If yes, please explain.

- Yes       No

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5) Did you have any trouble understanding any of the photographs? If yes, please explain.

- Yes       No

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6) Was any of the installation difficult for you? If yes, please explain.

- Yes       No

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7) Were any of the kit parts:

- Damaged       Missing

If you checked any of the above boxes, did you contact our customer service department to resolve the problem?

- Yes       No

8) Were they helpful in resolving the problem?

- Yes       No

9) What did you like most about this kit?

- Instructions       Hardware Supplied
- Ease of Install       Price
- Final Performance       Other:

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10) What did you like least about this kit?

- Instructions       Hardware Supplied
- Ease of Install       Price
- Final Performance       Other:

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11) Have you driven/used the product and are you satisfied with the final installation?

Please explain:

- Yes       No

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12) What is your age group?

- 18-29       30-39       40-49
- 50-59       60-69       70+

We care about what you think. Is there anything else you would like to tell us or any products you would like to see us make in the future?

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Fold here

Fold here

PLACE  
STAMP  
HERE

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