Doc #780-65549
Rev 2.2013

Steeroids™ INSTALLATION INSTRUCTIONS
1963-1982 Corvette

Verify Kit Contents:

1	RACK AND PINION WITH 2 RUBBER RACK BUSHINGS
2	RACK 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 & NORD LOCK WASHERS
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 manufacturer's 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.

See our website for header clearance details: http://speeddirect.com/index.aspx?nodeID=87
We are constantly updating our instructions, check for the latest version at http://speeddirect.com/index.aspx?nodeID=79

NOTES ON TURNING RADIUS: The turning radius with our kit is slightly increased over stock. Most customers have said it is an insignificant amount, if not unnoticeable. You will still be able to easily whip in and out of parking spots or driveways.

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. Due to the various suppliers we use, any bolts, metal plates and/or washers that are already threaded into the rack unit should be discarded and our included metric rack bolt kit should be used.

BEFORE INSTALLATION you will need to have both high strength thread locker and some anti seize compound available.

1. Begin by performing an inventory of all the components in the kit. Installing the Steeroids kit requires simple hand tools, high strength thread locker and some anti seize compound. A pickle fork will be useful when disassembling the old system.

2. Start 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 (steering arm / spindle) 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

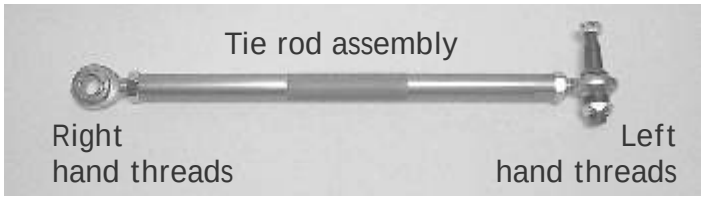
We recommend using red high strength thread lock on all threaded applications except for power steering hose fittings and tie rod sleeves. Be SURE to trial fit first, and read the instructions through before going crazy with the thread lock!

6. Bolt the tie rod bracket to the rack and pinion unit using the supplied metric bolts and Nord lock washers. Install lock washers between the metric bolt head and tie rod bracket. 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 picture below. Use a high-strength thread locker and torque to 80 ft/lbs. It is OK for the bracket to compress the rubber boot.

About Nord-Lock Washers

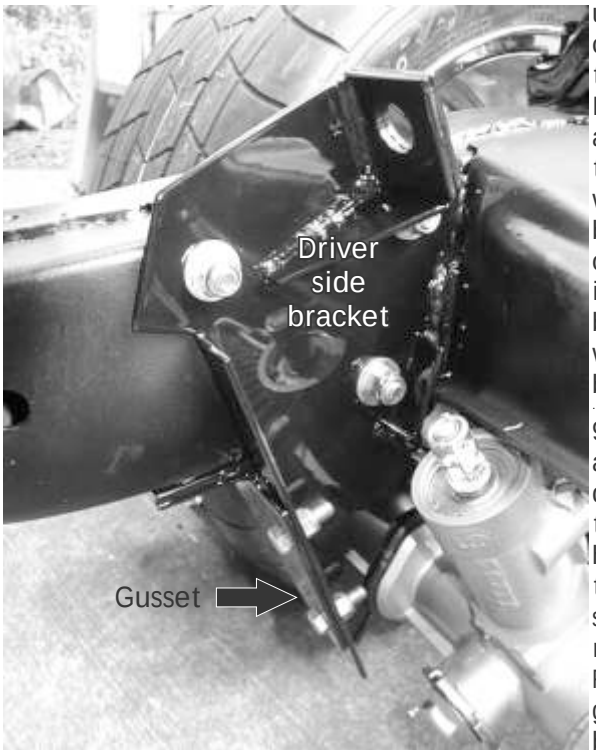
NORD-LOCK is a pair of washers with a wedge-locking action meeting DIN 25201 which is a unique method using tension instead of friction. The rise of the cams between the NORD-LOCK washers is greater than the pitch of the bolt. In addition, there are radial teeth on the opposite side. The washers are installed in pairs, cam face to cam face.

IMPORTANT: To center the rack, use an adjustable wrench and turn the pinion until the rack is at its stop (either direction). Now count the turns as you proceed to the opposite stop. Divide the number you get by 2 and turn the pinion back this amount. The steering rack is now centered. If you do not properly center the rack, the car will turn sharper in one direction than the other.



7. Tie Rod Assembly: Please note there are right hand and left hand threads on the aluminum sleeves. Apply anti-seize compound on all of the tie rod end threads and aluminum tie rod sleeve threads. Thread each outer 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" inner tie rod ends with jam nuts (see photo). Attach them to the tie rod bracket using the 5/8-18 x 1.5" bolts and lock washers but do not tighten at this point and do not thread lock it - this is just for trial fitment. The lock washer is located between the head of the bolt and the inner tie rod bearing. To set an approximate alignment, measure the overall length of the old steering system, measuring it from the center of each outer tie rod end. Adjust the tie rods on the steering rack to match your measurement and tighten the jam nuts against the sleeves.

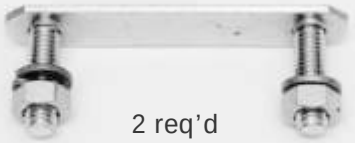
8. Rack Mounting Brackets: NOTE - When installing the rack mounting brackets you may find the holes in the frame do not line up exactly with the holes in our mounting brackets due to very loose tolerances the car had from the factory. If the holes do not line up enough for all bolts to pass through and start threading you will need to clearance the hole(s) in our bracket using a drill bit to elongate the holes in the proper direction. (This is rare, but can happen.)



Install the Driver's Side Mounting Bracket. 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. Torque the 3/8" bolts to 35 ft lbs.

9. The gusset installs using the existing fasteners in the frame for the power assist cylinder. If your car was a manual steering car WITHOUT a steering damper, you will need 2 stud plates that install in the frame. This is rare, so they are sold separately. P/N A7019 has 2 studs on it and it installs through the hole in the frame rail in the driver's side wheel well. Make sure the plates rest evenly on the inside of the frame. Remove any dirt to ensure this. The gusset attaches to the driver's side bracket and to the bottom side of the

Part# 910-A7019 Stud Plate

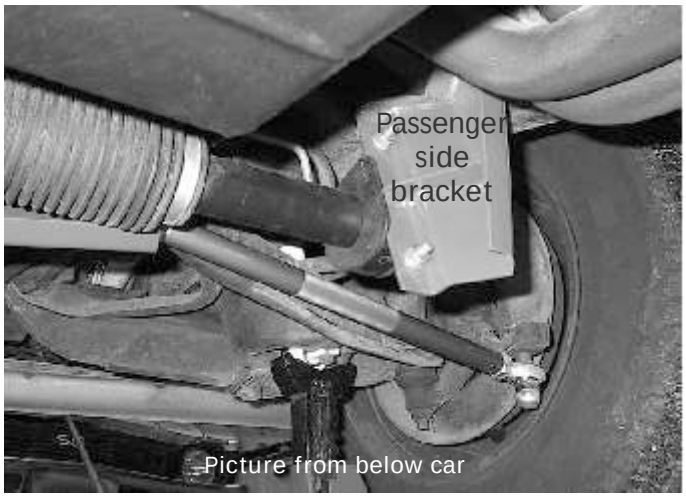


2 req'd
(manual cars w/o damper only)

frame rail. Torque the power assist stud plate bolts to 15 ft lbs. Two 5/16-24 x 1 bolts are used to attach the Steeroids brackets together. Place a flat washer under the nut; torque these fasteners to approximately 30 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.

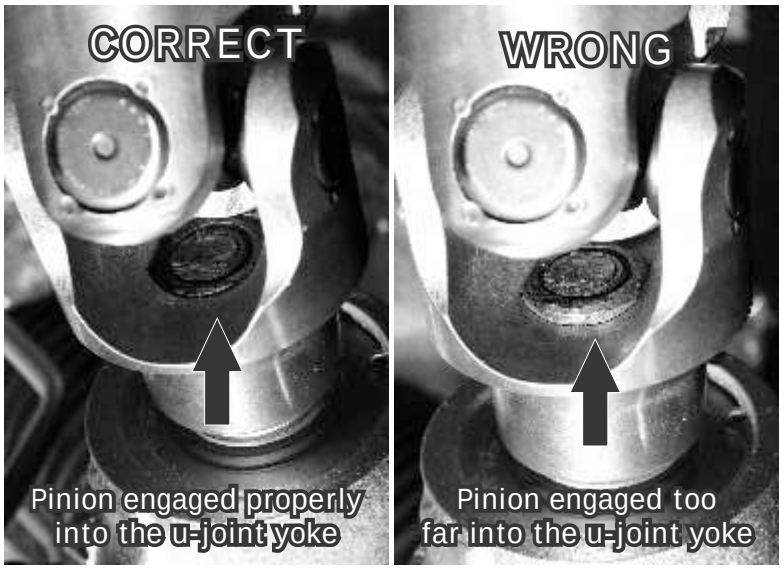


11. Now install the rack and pinion unit on to the brackets using the supplied U-clamps and 5/16 x 1" bolts, washers and nuts. Do not torque or thread lock at this time. Please note the 2 rack U-clamps provided are shaped differently - they must fit properly on the rack. Install and test fit the rack unit to look for clearance problems with the lower A-arm bolts. If you experience clearance issues with the head of the 5/8" bolt at the inner tie rod end you can omit the lock washer but be sure to use a high strength thread locker! If there are no clearance issues, remove the inner tie rod end bolts and reassemble with all lock washers and thread locker. Torque to 50 ft lbs.

Now proceed to attach the outer tie rod ends to the steering arms (spindles).Before torquing, read the following details. NOTE: the flange below the taper may not seat against the steering arm- this is not a problem. 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 increase the steering radius. To properly adjust the outer tie rods, use the included bump steer spacers. Start with half above and half below the tie rod end bearing. As needed, move the spacers above or below the bearing so that the entire length of the tie rod matches the angle of the lower control arm with the vehicle on the ground and the suspension settled (the tie rod sleeve should be parallel with the lower control arm pivot points - not necessarily the ground). You may need to come back and adjust this once installation is complete, especially if no engine is installed.

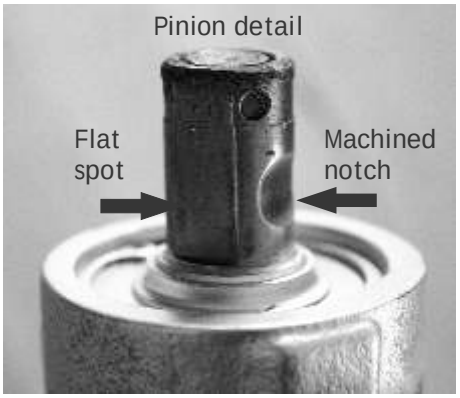
Tie rod end bearings are Teflon lined and are therefore self cleaning and self lubricating. They do not require grease or dust covers. When attaching the tie rod end to the spindle, torque the upper nut (on top of the spindle) to 30 ft-lbs. If castle nuts are provided, continue to tighten the nut to align castellation with the cotter pin hole. Install cotter pin if applicable. Once the bump steer spacers are properly adjusted, torque the lower 15/16" nylock nut to 50 ft lbs.

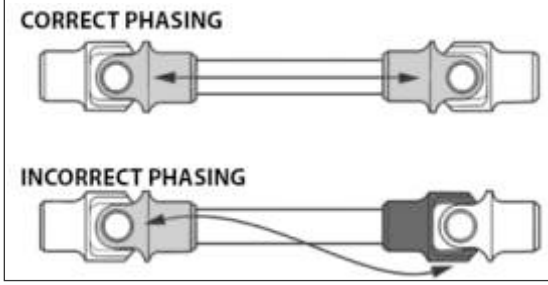
12A. U-Joint Fitment: Before assembling the u-joint assembly, get a small piece of cardboard (about 2" X 2" is big enough). Take the lower, single u-joint and standing it on end on the cardboard, trace around the circumference of the end of the u-joint that will attach to the pinion shaft on the rack unit. Press down on the u-joint hard enough to leave an impression in the cardboard. Now cut out around where you traced and also cut out the inner portion of the cardboard that was not compressed (the area that the pinion shaft of the rack slides into). You should now have a disc shaped piece of cardboard with the center cut out. With the rack unit test-mounted, slide the cardboard disc cutout onto the pinion shaft of the rack and determine if any clearancing will be necessary on the motor mount. If there is a clearance issue, mark the motor mount exactly where you need to grind clearance. Be sure to include room for the set screw & jam nut plus a little extra in case of slight movement. (This is rare, but can happen.) 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. Now, if necessary, remove the rack and grind clearances. Use the single, lower u-joint to double check clearances. Once everything clears reinstall the rack. Torque the passenger side U-clamp bolts to 25 ft-lbs but leave the driver side loose until completing step 14.



12B. Now begin assembly of the U-joints. Slide the support bearing onto the intermediate shaft and attach a u-joint on each end (tolerances are tight, shaft may require sanding to fit, DO NOT HAMMER into bearing). The tolerances between the support bearing and the intermediate shaft are supposed to be tight. Unfortunately some times the tolerances are such that sanding the shaft is not possible. If this is the case we can supply a slightly oversized bearing that is .757" instead of the standard .750" bearing included in the kit. Please contact us if you need one. This is very rare and we do NOT want the shaft to be too loose inside the bearing or it can cause play in the wheel and wear on the U-joints. Do not torque or thread lock at this time. Be sure

they are phased correctly (see diagram below). Read this entire section before installation. Try to have your steering wheel straight when you start. You will start with sliding the upper u-joint onto the steering column, but before doing so make sure the lower u-joint is lined up so that one set screw will align with the flat section on the rack's pinion shaft and the other setscrew will seat in the machined notch (see detail at right). Slide the double u-joint onto the steering column, but do not yet tighten. Also be sure that the end of the pinion is flush with the inside of the u-joint yoke - see photos above (do not rotate the pinion shaft on the rack because it will no longer be centered). You may want to unbolt the driver's side rack clamp in order to install the u-joint on the rack unit. Also make sure that the shaft ends do not protrude into the inside of the u-joints. Tighten them, but do not use thread lock at this time. Be sure to tighten the setscrew that sits on the flat spot of the pinion first, then tighten the setscrew on the notch. The support bearing is installed by sandwiching 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.



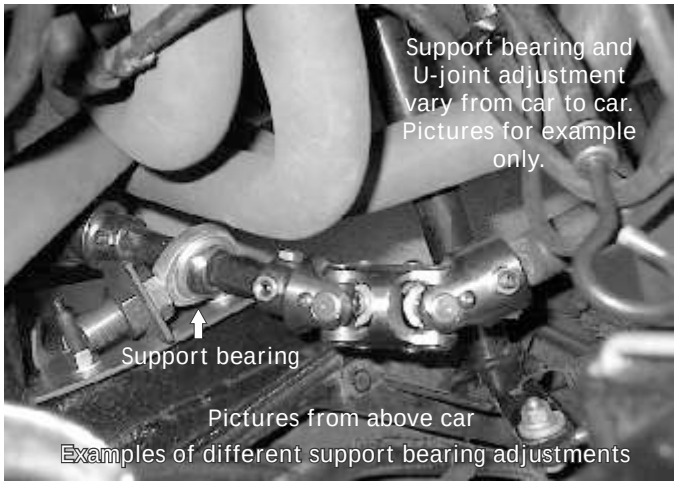


U-Joint Orientation

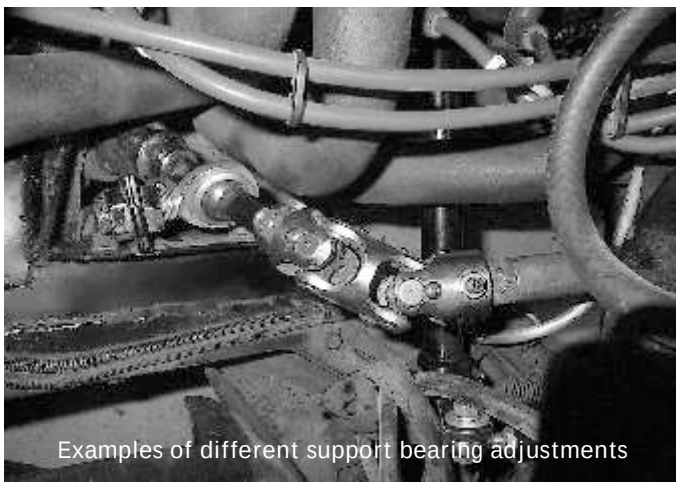
When two joints are used on a shaft, the forks of the yokes closest to each other should be in line, or "in phase." Premature wear or binding can result if the u-joints are not phased properly. Sometimes if the u-joints are at a severe angle, even if they are phased correctly, a hard spot in the steering 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 jam nuts on the u-joint or thread lock any setscrews at this time. Make sure 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. It is essential that all splines are fully engaged into the u-joints (approx 3/4").

14. You will most likely have to re-center the steering wheel. There are two ways to do this: 1) Change the phasing of the u-joint by removing the upper u-joint from the intermediate shaft and rotating it a couple of splines until the steering wheel is straight. It is OK for the u-joints to be slightly out of phase. If straightening the wheel using this method makes the u-joints too far out of phase, you will need to remove the upper u-joint from the column, center the wheel and reinstall the u-joint. The steering column splines will then require grinding or drilling an indentation for the setscrew. DO NOT ROTATE THE RACK UNIT. The rack has already been centered and you do not want to move the rack unit from center. Once installed and there are no clearance issues, tighten all setscrews and their jam nuts using a high strength thread locker in the order described at the end of 12B. Torque the driver's side rack U-clamp bolts to 25 ft-lbs once the u-joint assembly is installed. 2) The other option for centering your steering wheel is to remove the steering wheel and re-center it. This may change the turn signal canceling feature. To modify the plastic canceling cam, the plastic cam and head can be cut off the stem and glued into the correct orientation.



15. Adjust the support bearing to minimize binding of the u-joints during rotation by reducing the angle the upper u-joint must make to connect with the lower u-joint. This usually means moving the support bearing toward the engine and the rear of the car. 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 all 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 column 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 forward end of the steering column horizontally toward the engine. This normally relieves any remaining binding. If this adjustment needs to be made, be sure the

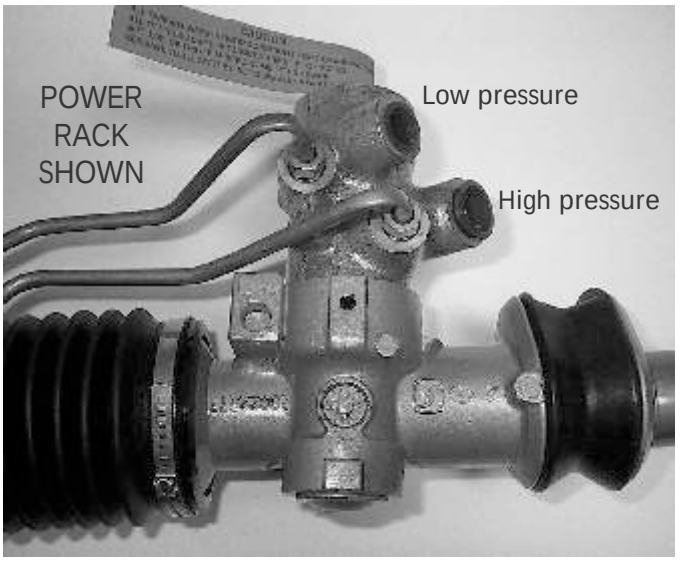


support bearing is loose during adjustment. After all other items are tightened, then re-tighten the jam nuts on the support bearing. Additionally, check the condition of the steering column bearing located at the end of the column tube. If it shows signs of play it is recommended that it be replaced since a loose bearing can cause u-joint binding and 'play' in the steering wheel.

16. Check for any interference between the u-joints and the frame, particularly near the engine mount. On rare occasions, the mount may need to be clearanced with a grinder as mentioned in step 12A. 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.

NOTE: If you are using your existing power steering pump you must drain all remaining fluid and thoroughly clean the pump to remove all dirt and debris from the reservoir. Even the smallest dirt speck can plug a rack valve and cause it to stop working.



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. Make sure the o-rings are on the fittings going into the rack. Tighten to 21 ft-lbs. The return side (upper, inboard fitting) is torqued to 13 ft-lbs. Please see photo: 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 from lock to lock 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 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. Replace cap. "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 with high strength thread locker applied where necessary (especially on the metric, center rack bolts). With the vehicle on a stand run the steering back and forth looking for clearance issues (especially where the lower u-joint is near the motor mount, where the inner tie rod ends are near the lower control arms and where the center tie rod bracket passes near the hard hydraulic lines on the rack occasionally these hard hydraulic lines will need to be hand-bent out of the way to clear the bracket). 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.

CAUTION: The steering ratio of this kit is significantly faster than the stock steering. Exercise caution when first driving with the new system. The vehicle will respond quicker and turn more from the same amount of steering input. This might take some time to get used to.

20. The final step is to have the front end aligned to the specs below and re-check all bolts for tightness after the first 100 miles. If the person installing the kit ignores these recommendations and it is aligned to factory specs, the car will handle very poorly. This is VERY important.

DETAILS FOR ALIGNMENT:

	Camber	Caster	Toe
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 toe 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 / LUMPINESS / HARDNESS IN THE STEERING WHEEL WHILE TURNING, ADJUSTMENT IS STILL REQUIRED AS DETAILED IN STEP 15.
Additional tech support and info can be found online at speeddirect.com

STEEROIDS WARRANTY

All Steeroids Rack & Pinion Conversion Kits (the Kit) purchased from Class M Corporation, DBA SpeedDirect, hereafter SpeedDirect or an authorized reseller are warranted, subject to limitations and exceptions defined herein, against defects in materials and workmanship for a period of five years from the date of shipment from the SpeedDirect warehouse. During this five-year period, SpeedDirect will repair or replace any covered component found to be defective at no charge to the purchaser except freight costs which will be assessed for any claim made after 30 days from to original purchase date. All claims shall be sent to and from the nearest SpeedDirect office. Any and all costs for inspection, removal or replacement of the Kit or its constituent parts or assemblies under this warranty are the responsibility of the original purchaser.

This warranty does not apply to equipment which in the judgment of SpeedDirect was used in racing or has been subjected to misuse, accidental or intentional damage, or has been installed in a manner or under conditions other than those expected in a normal driving. This warranty is also void if the equipment has been modified (unless such modification has been expressly approved in writing by SpeedDirect).

Warranty applies only to the original purchaser. Purchaser is responsible for retaining the original Sales Invoice for the Kit as proof of purchase which shall be presented to SpeedDirect in order to receive any consideration of repair or replacement as defined within this warranty.

Exceptions & limitations to this warranty are: SpeedDirect may, at its sole discretion, extend warranty coverage on any product or assembly item beyond these stated limits on a case-by-case basis. This warranty is in lieu of all others expressed or implied, and no representative or person other than a corporate officer of Class M Corporation is authorized to assume any liability other than that expressed herein on behalf of Class M Corporation, DBA SpeedDirect.

SpeedDirect accepts no liability for loss of service, loss of revenue, or any special or consequential damages that may arise from the failure or malfunctions of its products. Defective products or components shall only be returned to the SpeedDirect repair facility after receiving a written Return Authorization and shipping instructions.

STEEROIDS REPLACEMENT POLICY

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. Any and all costs for inspection, removal or replacement of the kit or its constituent parts or assemblies under this warranty are the responsibility of the original purchaser.

SpeedDirect
1901 S. FM 129, Santo, TX 76472, Tech Line (970) 731-1381 dept. 2
www.speeddirect.com

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. You can fax it back to us 940-769-2940 or 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: C2/C3 Corvette Steeroids

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

_____
_____
_____
_____
_____

5) Did you have any trouble understanding any of the photographs? If yes, please explain.
- ❑ Yes
- ❑ No

_____
_____
_____
_____
_____

6) Was any of the installation difficult for you? If yes, please explain.
- ❑ Yes
- ❑ No

_____
_____
_____
_____
_____

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:

_____
_____
_____

10) What did you like least about this kit?
- ❑ Instructions
- ❑ Hardware Supplied
- ❑ Ease of Install
- ❑ Price
- ❑ Final Performance
- ❑ Other:

_____
_____
_____

11) Have you driven/used the product and are you satisfied with the final installation? Please explain:
- ❑ Yes
- ❑ No

_____
_____
_____
_____
_____

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?

_____
_____
_____
_____

Fold here

Fold here

PLACE
STAMP
HERE

Speed Direct
1901 S FM 129
Santo TX 76472