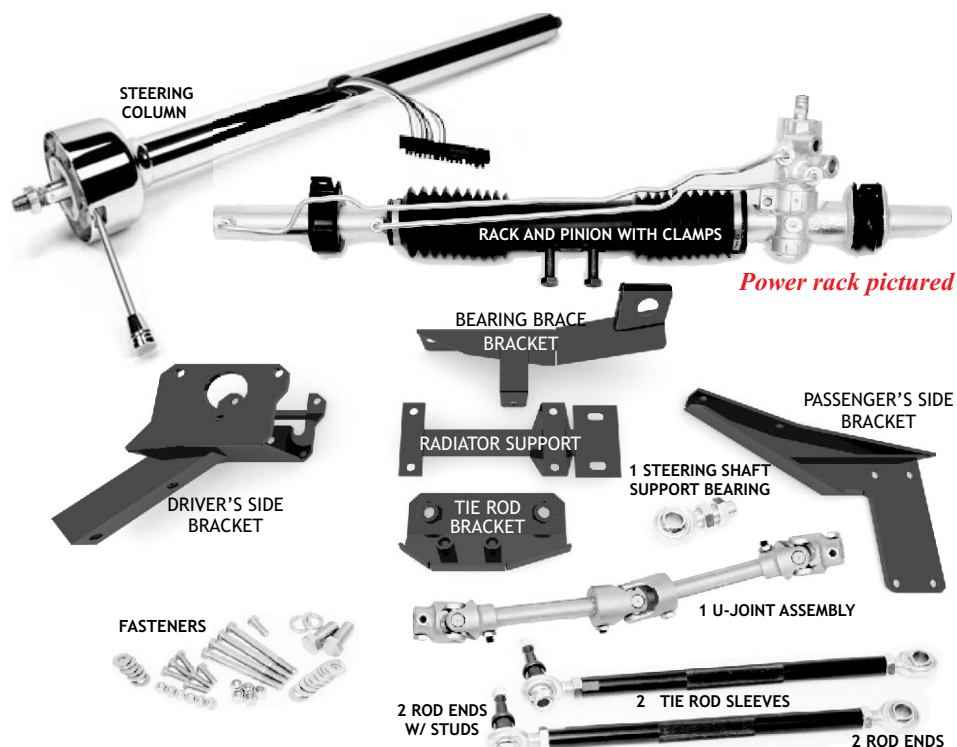


Steeroids® Installation Instructions

Part Number(s): 83800 - 84095

1953 - 1962 Corvette



Parts and finishes may vary from those shown.

Verify Kit Contents:

- 1 RACK AND PINION WITH 2 RUBBER RACK BUSHINGS
- 2 RACK MOUNTING CLAMPS
- 2 TIE ROD ENDS WITH TAPERED STUDS
- 3 ROD ENDS (INCLUDING SUPPORT BEARING)
- 2 ALUMINUM TIE ROD SLEEVES
- 1 U-JOINT ASSEMBLY
- 1 DRIVER'S SIDE BRACKET
- 1 PASSENGER'S SIDE BRACKET
- 1 TIE ROD BRACKET
- 1 RADIATOR SUPPORT BRACKET
- 1 BEARING BRACE BRACKET
- 2 METRIC RACK BOLTS AND NORD-LOCK WASHERS
- 1 FASTENER KIT
- 1 STEERING COLUMN WITH WIRING*
- 1 STEERING WHEEL ADAPTER* (NOT PICTURED)
- 1 FIRE WALL PLATE * (NOT PICTURED)

Additional Parts Included With Power Kits:

- 3 PUMP HOSES (PRESSURE, RETURN, RESERVOIR)
- 1 PULLEY
- 1 PUMP
- 1 PUMP BRACKET
- 1 RESERVOIR WITH MOUNT (NONE PICTURED)

*NOT PROVIDED BY SPEEDDIRECT IF KIT WAS ORDERED FROM CORVETTE CENTRAL, OR IF AN "LC" KIT WAS ORDERED

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 and 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.

We are constantly updating our instructions, so check for the latest version at <http://speeddirect.com/index.aspx?nodeID=79>

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

Steeroids® Installation Instructions

Before beginning: Please note each steering rack is bench tested prior to shipping; fluid from the test occasionally leaks out and may stain the box. This does not indicate damage.

If two small rubber o-rings are attached to the rack with a twist tie, these are extras that can be discarded. The power steering hose adapters or hose ends supplied with the kit should already have o-rings attached, so the extras can be discarded. Any bolts, metal plates and/or washers that are already threaded into the rack unit should be discarded and the included metric rack bolt kit should be used.

If the vehicle requires a new crank pulley with an extra groove for the PS pump, this pulley is not included with the kit. There is no “one-size-fits-all” standard solution for vehicles 50+ years old, with unknown combinations of engines, pulleys and water pumps possible. Please see “C1 Corvette Crank Pulley Information” at the end of these instructions for crank pulley specifications to determine the correct crank pulley for the vehicle. Note that the pump pulley requires a special tool to be mounted to the pump before installation. If you do not have this tool, most auto parts stores can do this for you.

If the Alternator / Generator is located on the driver's side of the car there will be a clearance issue with the power steering pump. It will be necessary to relocate the Alternator / Generator to the passenger's side using Corvette Central brackets part numbers 302015, 401120 and/or 301162 (301162 for use with aftermarket headers). All brackets may not be required, inspect the vehicle to decide which one(s) are required.

BEFORE INSTALLATION: Perform an inventory of all the components in the kit with the packing list, the parts list on Page 1, and/or your Itemized Invoice (if applicable). 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.

1. Support the car securely on jack stands. Never support the car using only a jack. Remove the front wheels and the hood. To relieve stress on the fiberglass, open the doors and release the T-top locks (if applicable) when putting a Corvette on jack stands or a lift.

2. Remove the steering wheel and turn signal lever from the column. The turn signal switch can be detached by removing two screws. The upper, flared housing of the column comes off once a screw is removed from the back side of the housing.

3. There is an additional cover for the wiring that is located midway on the column under the dash. Remove a screw and then the cover. Unplug the wiring harness. Remove the strap that holds the column to the dash.

4. Disconnect the steering arm from the rest of the linkage and unbolt the steering box from the frame. Unbolt the firewall plate and remove the steering column. When pulling the column out of the firewall, orient the wiring to lay flat so it can pass through the firewall opening. Pulling the steering box and column will be a careful balance of rotating and tilting to get it clear of the radiator support. This may also require changing the position of the steering arm by rotating the column shaft.

Step 2



Step 4



Step 3



Steeroids® Installation Instructions

5. Remove the cotter pins and castle nuts from the outer tie rods and remove them from the steering arms. Remove the center pivot/radiator support. It may be necessary to completely unbolt the radiator and raise it two or three inches in order to gain access to the middle two frame bolts. **Caution:** The pivot and steering linkage are very heavy. Be careful to support it as it is unbolted.

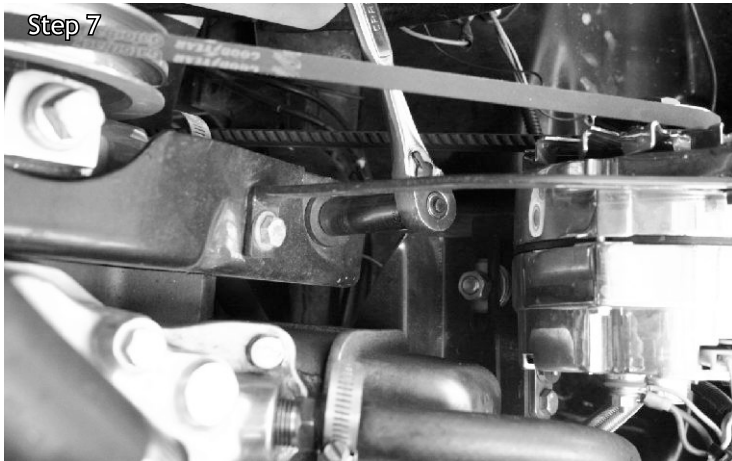
Installation

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. With all the stock steering removed, begin by installing the mounting brackets. The radiator support bracket installs where the center pivot was before. It uses the same holes in the frame and the four supplied 3/8" bolts and nuts.

7. The passenger's side bracket sandwiches between the frame rail and the engine mount. Be sure to support the engine before removing the four bolts (two on top of the frame rail, two on the bottom). Loosen but do not remove the bolt that pinches the rubber mount between the frame bracket and the engine bracket.

8. Slide the Steeroids passenger side bracket in place between the frame and the engine mount bracket and install the four bolts that were removed in the previous step. Tighten to 30 ft/lbs, then re-tighten the rubber mount bolt.



9. The driver's side bracket slides up from the bottom. The lower bolt hole uses a 3/8 x 4" long bolt. Install this bolt now.



10. The bearing support bracket installs over the top of the frame rail and the driver's side bracket. 2 ea.



3/8 x 4 1/2" bolts secure this and the driver's side bracket.

Steeroids® Installation Instructions

Tech Tip: For Power Steering kits, it may be easier to attach the power steering hoses onto the rack before installing the rack.

11. To center the rack unit, use an adjustable wrench and turn the pinion until the rack is at its stop. Count the turns proceeding to the opposite stop. Divide the number of turns by 2 and turn the pinion back this amount. The steering rack is now centered.

12. Bolt the tie rod bracket to the rack and pinion unit using the supplied metric bolts and the Nord-Lock washers. The bracket installs with the outer holes toward the top of the steering rack. It can be installed upside down, be sure it is correctly oriented as shown in the picture below. **NOTE:** If the rack came with bolts, washers and a french lock already threaded into it, discard these items including the washers that may be stuck onto the boot, and use the longer black rack bolt kit #690-50063. Also, the tie rod bracket will compress the black rubber boot, this is normal. Use a high-strength thread locker and torque to 60 ft/lbs.

Step 12

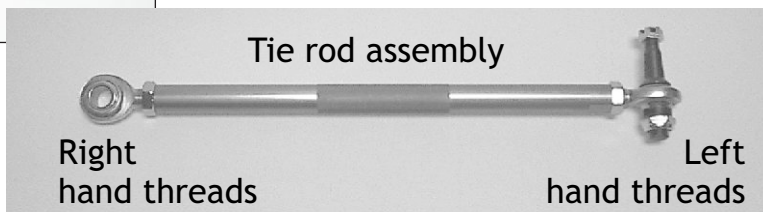


About Nord-Lock Washers



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.

13. **Please note:** There are right hand and left hand threads on the aluminum sleeves. Apply anti-seize compound on the rod end and sleeve threads. 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. Trial fit attaching to the tie rod bracket using the 5/8-18 x 1½" bolts and lock washers. Locate the lock washer between the head of the bolt and the inner tie rod bearing. If clearance issues are experienced with the head of the 5/8" bolt, omit the lock washer. Once trial fit is completed and there are no clearance or fitment issues, use a high strength thread locker and torque to 50 ft/lbs. 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.

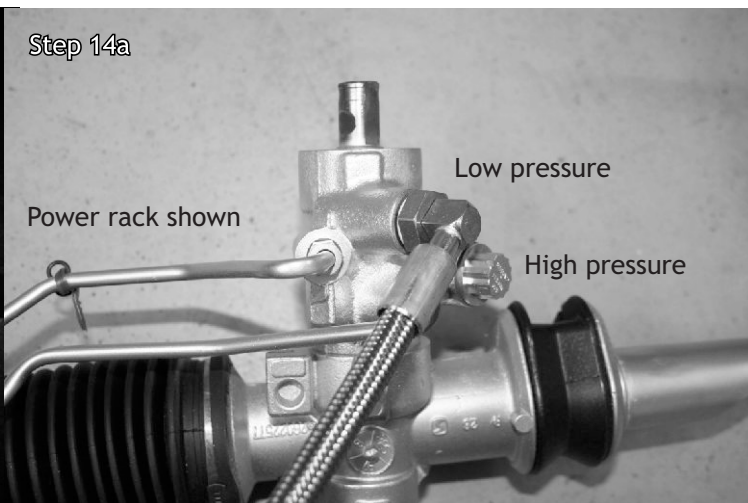


14. Install the rack and pinion on the brackets using the supplied clamps and 5/16 x 1" bolts, washers and nuts. Please note the two rack clamps provided are shaped differently - they must fit properly on the rack. Trial fit the passenger's side bolts, leaving the driver's side loose until completing Step 17. Passenger's side bolts will be torqued to 30 ft/lbs after fitment; read entire step before torquing. Attach the outer tie rod ends to the steering arms (spindles). **NOTE BEFORE TORQUING:** The flange below the taper may not seat against the steering arm; this is not a problem. 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. It may be necessary to come back and adjust this once installation is complete, especially if no engine is installed. Torque the upper nut to 30 ft/lbs and the lower nut to 50 ft/lbs. See illustrations 14, 14a, and 14b on the next page.

Steeroids® Installation Instructions



Step 14



Step 14a



Step 14b

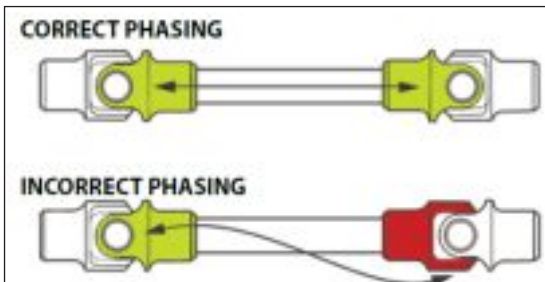


Step 15

15. Install the steering column by sliding the small end through the firewall from the inside of the car. First plug in the supplied wiring harness to the column and the corresponding connectors on the car. Use the original column clamp to secure the column to the dash, but do not completely tighten until the following step. Remove the old firewall bracket and replace it with the supplied bracket. Re-used the original fasteners for this bracket.

16. Install the turn signal lever and hazard button on the column and clock it to the proper orientation. Tighten the column clamp. Install the steering wheel/column adapter so that the horn connections line up and the turn signals cancel equally when the wheel is turned left and right. Do not fully tighten the steering wheel nut until the entire steering system is installed

and the front wheels are pointed straight with the wheel and rack and pinion unit centered (Step 24).

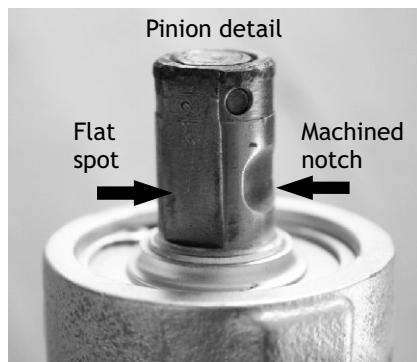


U-Joint Orientation

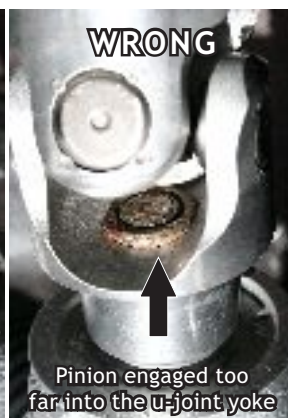
When two u-joints are used on a shaft, the forks of the yokes closest to each other should be in line, or "in phase." Premature wear or binding can result if the u-joints are not phased properly. Sometimes if the u-joints are at a severe angle, even if they are phased correctly, a hard spot in the steering 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.

17. Slide the support bearing onto the lower intermediate shaft, then slide one u-joint on each end. Tolerances between the support bearing and the intermediate shaft are supposed to be tight, and may be so tight that the shaft requires sanding to fit. **DO NOT HAMMER INTO BEARING.** Sometimes the tolerances are such that sanding the shaft is not possible. If this is the case, please contact us as we can supply a slightly oversized bearing that is .757" instead of the standard .750" bearing included in this kit. This is very rare and we do NOT want the shaft to be too loose inside the bearing or it can cause play in

Steeroids® Installation Instructions



the wheel and wear on the u-joints. Be sure all of the u-joints are phased correctly (see diagram previous page) when sliding the next u-joint onto the steering column, but do not tighten yet. Position the single u-joint on the pinion shaft of the steering rack so that the setscrew will seat in the machine notch. Be sure that the end of the pinion is flush with the inside of the u-joint yoke. Torque the driver's side rack clamp bolts to 30 ft/lbs once the u-joint is installed. Be sure that the u-joint setscrew on the round part of the pinion shaft is lined up with the indent on the pinion shaft. Tighten the setscrew that sits on the flat of the pinion first, then tighten the setscrew on the round portion. Ensure that the shaft ends do not protrude into the inside of any of the u-joints. 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, do not tighten the jam nuts yet.

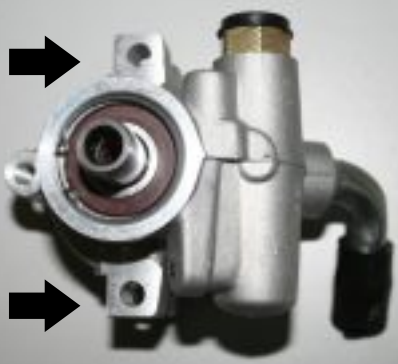


18. Don't tighten any setscrews until all u-joints are installed on the intermediate shafts and the rack and pinion unit is in place. Be sure that the shaft is not protruding into the inner part of either of the u-joints. Two additional shorter setscrews have been supplied in the bag of other hardware 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 (approximately 3/4"). Tighten all setscrews and their jam nuts. Use a high strength thread locker only after all adjustments are final.

19. 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. There should not be ANY binding. The steering shaft should be able to be turned by hand (with the wheels off the ground). After all other items are tightened, then retighten the jam nuts on the support bearing.

20. Install the power steering pump and reservoir. Mount the pump bracket to the front of the engine block using the supplied bolts. Install the pump onto the bracket. There is only a small amount of adjustment; this is OK, it is enough.

Some power steering pumps will need to have the threads drilled out in these locations. Use a 5/16" or 21/64" drill bit so the bolt can slide through.



We recommend Gates 9341 (34 3/8") as a starting point for a pump belt. The actual belt needed will depend on the engine pulley used.

Steeroids® Installation Instructions

This shows how the high pressure hose banjo fitting is installed



Step 21

21. The reservoir mounts to the inner fender well at a level higher than the pump and the return line connects from the bottom of the reservoir to the bottom of the pump (the largest hose). Be sure to lubricate all O-rings with a small amount of power steering fluid before installation. Connect the high pressure line from the top of the pump to the lower, inboard port on the steering rack. See photo at left and supplemental hose instructions in the hose package. Connect the return line from the rack to the reservoir. Torque all hose fittings to 12-14 ft/lbs.

22. Fill the reservoir 2/3 with new power steering fluid and turn the pump pulley by hand a few times to introduce fluid into the pump. 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.

23. Install the V-belt and bleed the system by turning the wheels all the way to the left. Turn the wheel back and forth three or four times. Start the car and allow it to idle. (A) Turn the wheels side to side (nearly to the steering stops) 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 until the reservoir is filled 2/3 of the way. 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.

hose routing example



top view of hose routing



24. Re-check every bolt and nut to be sure all are tight and torqued properly. 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.

25. Finally, have the front end aligned to the specs below and re-check all bolts for tightness after the first 100 miles. Ignoring these recommendations and aligning to factory specs will make the car handle very poorly. This is VERY important.

DETAILS FOR ALIGNMENT:

	Camber	Caster	Toe
Street	0 -.25 negative camber	1.5 - 3 positive	1/16" (0.131 deg) to 1/8" (0.264 deg) total toe in

NOTE: for bias ply tires total toe should be between 1/8" (0.264 deg) and 1/4" (0.529 deg) total toe. Do not stack more than two wedge shims when attempting to gain more positive caster.

C1 Corvette crank pulley information

The power steering pump and bracket supplied with the kit is designed to work with a crank pulley that has a second groove that measures between 1.3" and 1.5" from the face of the harmonic balancer. A pulley diameter ranging from 5" to 6.75" will work. Important information to know:

- The pulley needs to be for a short style water pump
- It needs to be a 2 groove crank pulley
- Does not need a 2 groove water pump pulley but will work with one
- May require water pump pulley shims
- May require crank pulley shims

Suggestions for crank pulleys include:

Trans Dapt 9481 aluminum



Mr. Gasket 4973 steel (chrome)
This has a 7.375" diameter and may work depending on the diameter of the water pump pulley.



Moroso 64060 cast aluminum



Billet Specialties 81320 aluminum 3 groove pulley for 1960-62 Corvette



Spectre 4399 aluminum



Moroso #710-64061 aluminum



Billet Specialties 81220 aluminum

Chevrolet Performance Crankshaft Pulley 3858533 (steel)
Photo not available

Steeroids® Installation Instructions

CRANK PULLEY SHIM KITS:

Shims are available to change the dimension of the crank pulley. Shims or a single washer thickness can be placed between the pump mount and the engine block.

Canton 74-900 crank pulley shim kit.
1/16", 1/8", and 3/16"



JEGS #555-50400 crank shim kit.
1/16", 5/64" and 1/8"



WATER PUMP SHIM KITS:

Spectre 4480 1/16", 1/8" or 3/16"



JEGS #555-51106 two 1/16" and one 1/8"



PUMP PULLEY:

If a 2 groove power steering pump pulley is needed due to running A/C

SUM-340108 or SUM-340108BLK



Steeroids® Installation Instructions



C1 Corvette Header steering shaft installation

Use the 5.5" bolt in the back hole and the 5" bolt in the forward mounting hole. Install support bearings as shown.

The longer intermediate shaft installs near the rack unit and the shorter intermediate shaft installs near the steering column.

Headers used are Hooker part number 2456 (painted) or part number 2456-1 (coated)



WARNING: FAILURE TO ADJUST THE UPPER U-JOINT SO THAT THERE IS NO BINDING WILL RESULT IN PREMATURE WEAR AND FAILURE! IF THERE IS ANY BINDING / LUMPINESS / HARDNESS IN THE STEERING WHEEL WHILE TURNING, ADJUSTMENT IS STILL REQUIRED AS DETAILED IN STEP 15. ADDITIONAL TECH SUPPORT AND INFORMATION IS AVAILABLE ONLINE AT www.speeddirect.com

STEERORDS FIVE YEAR WARRANTY TERMS

Our warranty can be found at www.speeddirect.com/fiveyearwarranty. It is your responsibility to understand what Class M Corporation DBA: SpeedDirect is warranting on the components you have purchased. Be advised that our warranties change from time to time and it is our exclusive right to change the terms of the warranty at any time and for any reason.

STEERORDS 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 the warranty are the responsibility of the original purchaser.