Product Guide

STEER KING™

Universal Tie Rods Installation Instructions

Instructions and guidelines for selecting, installing, and inspecting Steer King Universal Tie Rods.

Product Overview

The Patent Pending **Steer King Universal Tie Rods** feature an adaptable construction that allows them to fit a wide range of straight tie rod lengths, making them a suitable replacement Tie Rod Assembly for many Class 5 through Class 8 applications.

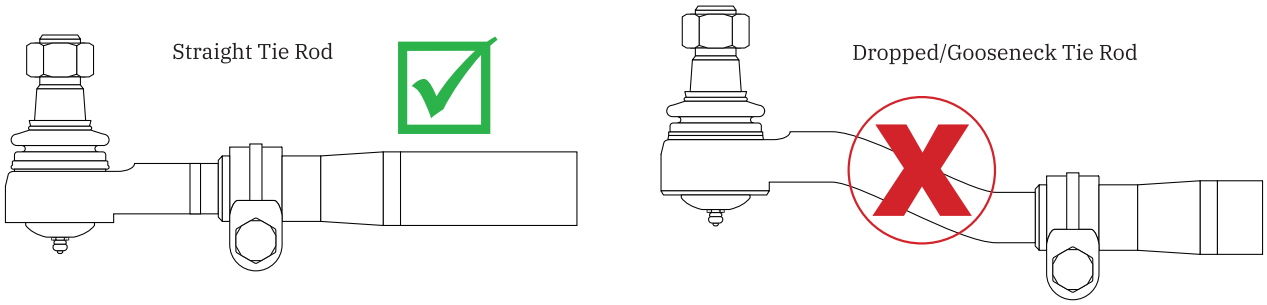
In addition to the universal fit, Steer King Universal Tie Rods also provide these benefits:

1. Maintenance-free tie rod ends with sealed polyurethane dust boot, which eliminates greasing.
2. Hybrid socket containing metal and polymer bearings, which reduce friction, maintain preload, and extend socket life.
3. Fine tie rod threads for more precise alignment than original equipment.
4. Rapid length adjuster integrated into shipping protector makes installation faster.
5. Carriage bolts in clamps allow for one tool clamp tightening.
6. Induction hardened stud provides maximum strength and durability.
7. Electrostatic coating provides long-lasting corrosion resistance.

WARNING: Steer King Universal Tie Rods are approved for interstate, on-highway, and limited off-highway use. ATRO does not approve the use of this product on vehicles that include more than 30% off-highway use and/or vehicles that exceed legal weight limitations.

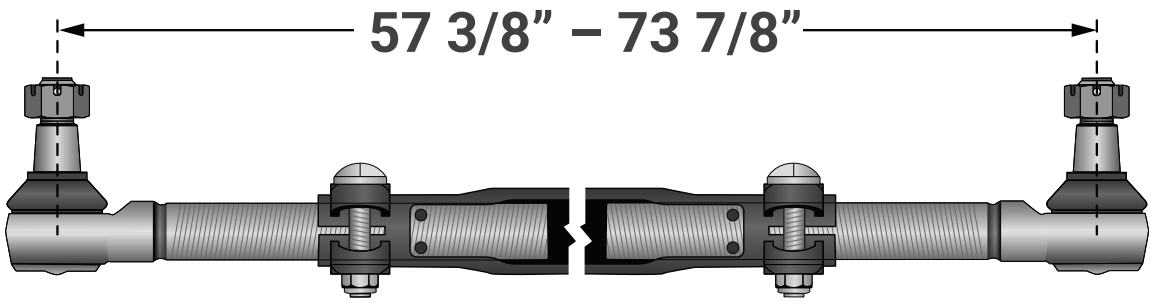
Identification and Selection

1. Steer King Universal Tie Rods are available in two different configurations. Follow this procedure to determine if a Steer King Universal Tie Rod is suitable for your application.
2. Inspect the original equipment Tie Rod Assembly. **The Steer King Universal Tie Rods are only compatible with straight Tie Rod Assemblies.** If the original equipment Tie Rod Ends have a "dropped" (aka "gooseneck") configuration, you must service them with a direct OE replacement.



The Steer King Universal Tie Rod is a replacement for straight tie rods only.

3. Inspect the length of the Tie Rod Assembly, measuring from center to center. The Steer King Universal Tie Rods are compatible with assemblies that range from 57-3/8" to 73-7/8". If the measurement is outside of that range, you must service it with a direct OE replacement.



Measure the center to center length from each tie rod end.

4. Follow the procedure in the following section to remove the Tie Rod Assembly
5. Using the Steer King Tie Rod Identification Tool or calipers measure the diameter of the stud threads and minor diameter. Match these measurements to the table below to identify the appropriate Steer King Universal Tie Rod.

ATRO Part # Parte ATRO # Pièce ATRO #	Stud Threads Rosca de vástago Filetages du goujon	Stud Minor OD OD Menor de vástago DÉ Mineur du goujon	Range of Adjustment Rango de Ajuste Plage d'Ajustement
SKT-0967-MF	7/8"	0.967"	57 3/8" – 73 7/8"
SKT-1080-MF	7/8"	1.080"	57 3/8" – 73 7/8"

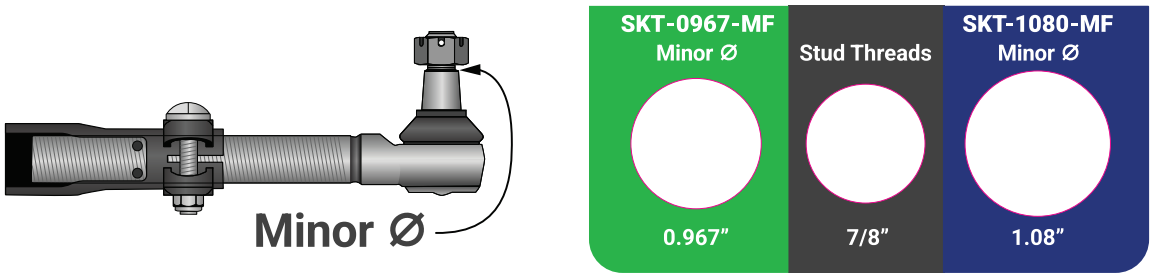
Select the Steer King Tie Rod.

Removal

1. Vehicle must be parked with wheels straight-ahead. Turn the engine off, apply the parking brake, and chock the wheels.
2. Remove the Cotter Pin in the Castle Nut securing the Tie Rod End to the Steering Knuckle.
3. Loosen each Castle Nut, but do not remove it. Position the Castle Nut flush with the tip of the stud. This will prevent the tie rod from falling after the taper breaks free.
4. Using a hammer, strike the tip of the stud to separate the stud from the knuckle. A Pitman arm puller is recommended if the stud will not separate using a hammer.
5. Repeat steps 2 through 4 on each side.
6. With both stud tapers broken free, remove the Castle Nuts to remove the complete Tie Rod Assembly.

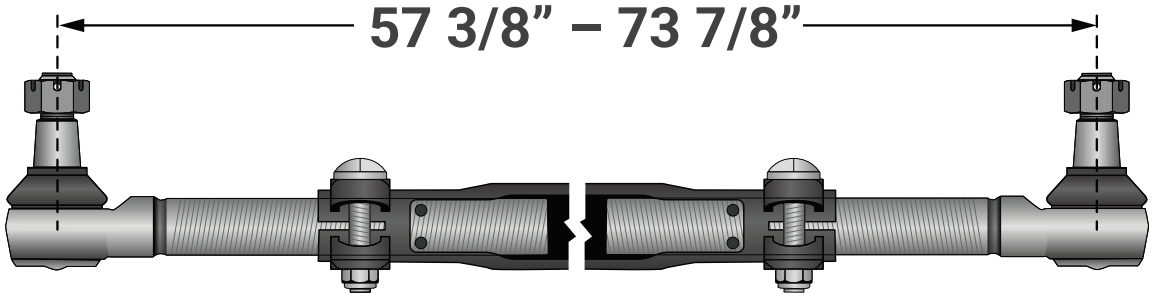
Installation

1. Before installing the new Tie Rod assembly, it is critical to inspect the tapered holes of the Steering Knuckle. The tapered holes must be clean, free of grease, and without damage. If the tapered holes are damaged or oblong/oval, allowing the new stud to rock in the hole, the Steering Knuckle must be replaced. Using a damaged Steering Knuckle may result in a stud fracture and partial loss of steering.
2. Using the Steer King Tie Rod Identification Tool or calipers, take measurements from the Tie Rod Assembly that was removed from the vehicle. Measure the diameter of the stud threads and the minor diameter of the stud.



Use the Steer King Tie Rod Measurement Tool

3. Using a tape measure, determine the length of the removed Tie Rod Assembly by measuring the length from center-to-center of each stud.



Determine the length of the removed Tie Rod Assembly

4. Select the appropriate Steering King Universal Tie Rod with the measurements obtained in the prior step.

ATRO Part # Parte ATRO # Pièce ATRO #	Stud Threads Rosca de vástago Filetages du goujon	Stud Minor OD OD Menor de vástago DÉ Mineur du goujon	Range of Adjustment Rango de Ajuste Plage d'Ajustement
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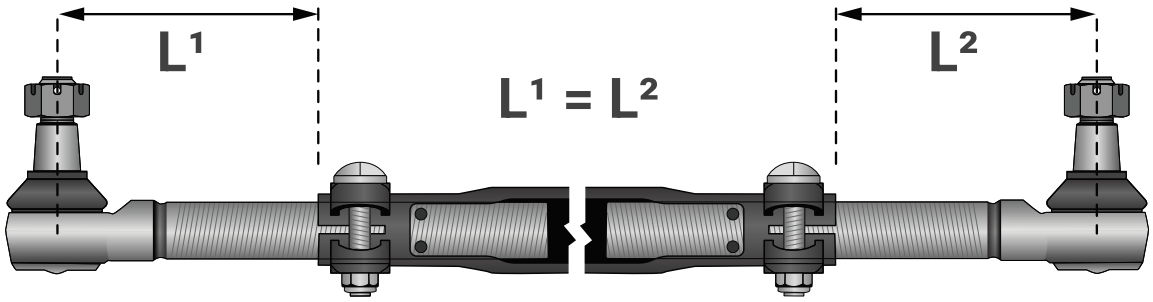
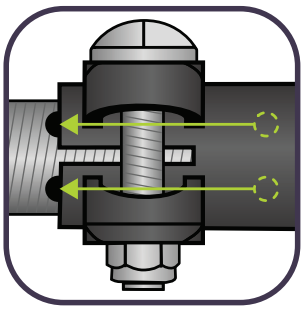
Select the Steer King Tie Rod.

5. Adjust the length of the Steer King Universal Tie Rod to match the desired length.
   a. To use the Steer King Rapid Adjuster, first ensure that the provided Castle Nut is snug to the plastic cover. Using a low-torque electric driver with a ¾" socket, engage the hex on the plastic cover and slowly rotate the Tie Rod End to extend the length.
   b. **CAUTION:** The length of exposed threads must be the same on each side.



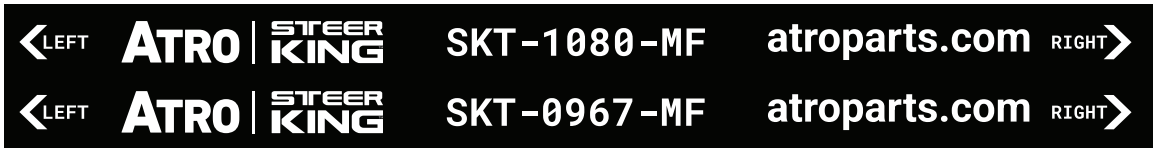
Length of exposed threads. L1 must equal L2

   c. **CAUTION:** Each Tie Rod End has a thread limit indicator. After setting the Tie Rod length, ensure the thread limit indicator is not exposed. If the thread limit indicator is exposed, it indicates that the Cross Tube is not centered or that the Steer King Universal Tie Rod is not suitable for this application. Never install the Tie Rod Assembly to a vehicle with the thread limit indicators exposed.



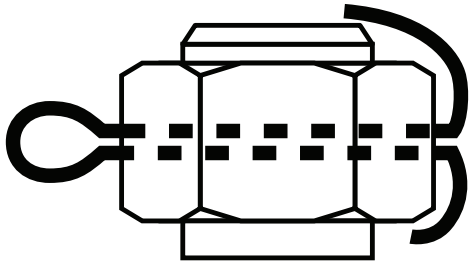
Thread limit indicators

6. Orient the Tie Rod Assembly with the “Right” indicator on the curbside and “Left” indicator on the Driver’s side



Use the markings on the Tie Rod tube to orient left and right.

7. Insert a stud into the tapered hole of the Steering Knuckle. Install the Castle Nut loosely on the thread.
8. Repeat the prior step on the other side to suspend the assembly.
9. Tighten each Castle Nut until snug, then torque each to 250 ft-lbs.
10. If the slot in the Castle Nut is not aligned with the cotter hole of the stud, continue tightening until there is alignment. Never back off the Nut to achieve alignment.
11. Insert the Cotter Pins. Bend them to lock them in place. Cotter pins should not be reused. Contact ATRO Customer Service if replacement Castle Nuts or Cotter Pins are needed.



Properly installed cotter pin with ends bent to lock in place.

12. Perform a wheel alignment to set steer ahead and toe to the manufacturer’s specification.
13. Tighten the nut on both clamps to 60 ft-lbs.
14. Note: The Steer King Universal Tie Rods are pre-lubricated and maintenance-free. Do not attempt to lubricate the socket.

Inspection Procedure

1. Tie Rods are a safety-critical component of the vehicle's system. They must be inspected periodically to confirm their integrity and identify early indications of wear.
2. Prior to inspection, park the vehicle on level ground with wheels straight ahead. Turn the engine off, apply the parking brake, and chock the rear wheels.
3. Raise the axle to be inspected off the ground and support the I-beam or frame rails with stands.
4. Inspect the Castle Nut and Cotter Pin.
    a. The Castle Nuts must be secure with Cotter Pins in place.
    b. If the Cotter Pin is missing, check the torque of the nut before installing a new Cotter Pin.
    c. **CAUTION:** If the Castle Nut was loose, the engagement of the Tie Rod End's stud to the Steering Knuckle's tapered hole must be inspected. If the stud can rock in the tapered hole, the Tie Rod and Steering Knuckle must be replaced. If the engagement of the Tie Rod End stud to the Steering Knuckle has looseness, it may result in stud fracture and partial loss of steering.
5. Inspect the Cross Tube and Clamps.
    a. The Cross Tube and Tie Rod Ends may not have any bends or damage. If any damage is detected, replace the Tie Rod Assembly.
    b. The Cross Tube Clamps must be secure and in good condition. Rotate the Cross Tube by hand or with a pipe wrench, using jaw protectors, towards the front of the vehicle. The socket of each Tie Rod End should allow the unit to rotate forward.
        1. If the Cross Tube will not rotate it is an indication that the sockets of the Tie Rod are locked up. Replace the Tie Rod Assembly.
        2. If the Cross Tube rotates around the Tie Rod End, changing the length of the assembly, the clamps of the Cross Tube are loose or damaged. Inspect the Clamps and replace the Tie Rod Assembly if necessary.
    c. After this inspection, center the Cross Tube to center Tie Rod's studs.
6. Inspect the Tie Rod End Dust Boots
    a. Wipe any dirt, grease, or debris from the dust boots to inspect their condition.
        1. The dust boot must not be cut or torn.
    b. If the dust boot is damaged, replace the Tie Rod End or the complete Tie Rod Assembly.
7. Check the tie rod end socket looseness.
    a. **CAUTION:** Never use a crowbar, pickle fork, pipe, or other means of leverage to check socket looseness. Excessive pressure may damage internal components. Only hand force may be used.
    b. Horizontal looseness
        1. To check for horizontal looseness, use a dial indicator with the base attached to the Steering Knuckle and the pointer on the Tie Rod End housing.
        2. Position yourself at the center of the Cross Tube.
        3. Using hand force, alternate pushing and pulling the Cross Tube to observe the horizontal looseness measured by the dial indicator. The looseness must be less than 0.030".
        4. Repeat this process for the opposite side.

5. If horizontal movement of either side is more than 0.030”, the Tie Rod Assembly should be replaced.
6. If horizontal movement of either side is more than 0.060”, the vehicle should be taken out of service until repaired.

c. Vertical looseness.

1. To check for vertical looseness, use a dial indicator with the base attached to the Steering Knuckle and the pointer on the Tie Rod End housing. Position yourself directly below the Tie Rod socket.
2. Place your hands on the Tie Rod End or Cross Tube nearest the Tie Rod End to be measured. Alternate pushing and pulling vertically up and down with approximately 100 lbs of force. Observe the vertical looseness measured by the dial indicator. The looseness must be less than 0.030”.
3. Repeat this process for the opposite side.
4. If vertical movement of either side is more than 0.030”, the Tie Rod Assembly should be replaced.
5. If vertical movement of either side is more than 0.060”, the vehicle should be taken out of service until repaired.

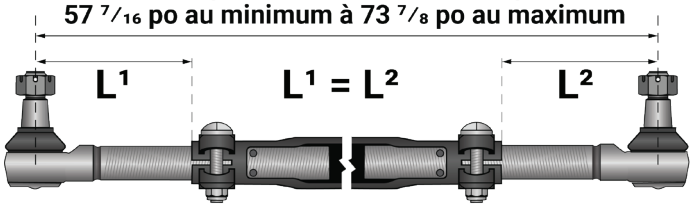
STEER KING™

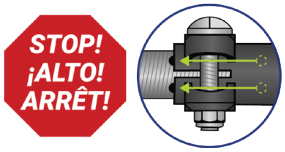
Universal Tie Rod Part Numbers

Brand	Description	Assembly	Left End	Right End
Steer King	Green Cap – Maintenance Free Typical for 12,000# Axles Adjustment Range: 57 3/8" to 73 7/8" C-C 	SKT-0967-MF	SKT-0967-MFL	SKT-0967-MFR
Steer King	Blue Cap – Maintenance Free Typical for 16,000 & 20,000# Axles Adjustment Range: 57 3/8" to 73 7/8" C-C 	SKT-1080-MF	SKT-1080-MFL	SKT-1080-MFR

ATRO Part #	Stud Threads	Stud Minor OD	Range of Adjustment
SKT-0967-MF	7/8"	0.967"	57 3/8" – 73 7/8"
SKT-1080-MF	7/8"	1.080"	57 3/8" – 73 7/8"

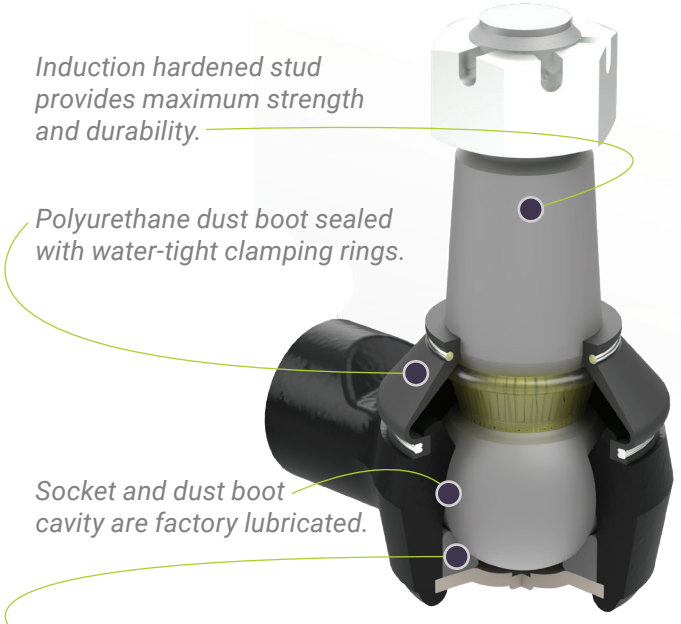
57 $^{7}/_{16}$" min length to 73 $^{7}/_{8}$" max length
57 $^{7}/_{16}$" de largo mínimo a 73 $^{7}/_{8}$" de largo máximo
57 $^{7}/_{16}$ po au minimum à 73 $^{7}/_{8}$ po au maximum





Thread Limit Indicators
Indicador esde Límite de Rosca
Indicateurs de Limite de Filetage

Maintenance-Free Ball Joint (First in Market)



Instructions and vehicle fit information are available at www.atroparts.com or this QR code.

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