

# KARCEPTS

## ENGINEERED SOLUTIONS



### Installation Instructions for Part #: KR5B-ND-XX Karcepts Rear Sway Bar Kit for 2016+ Mazda MX-5 Miata

Specifically for track/autocross use, this sway bar kit offers zero compromises:

- Sway bar rate is adjusted with one wrench, in only a few minutes
- Rate adjustments are made with the vehicle on the ground, even at low ride heights
- 5 adjustment positions per sway bar arm, maximizing tunability and overall range
- Billet aluminum arms optimized for strength and weight utilizing the latest FEA software
- Light weight, zero deflection solid sway bar mounts provided for precise feel
- Low friction, lubrication free, dirt resistant, solid polymer bearings require no maintenance
- Heat treated and plated steel alloy PTFE lined endlinks and all hardware included
- 0.625" diameter high-grade spring steel splined center section for consistent rates
- Center section available in 0.095" or 0.188" wall thickness

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## Parts Included With ND Rear Sway Bar Kit

DESCRIPTION	QTY
LEFT SOLID SWAY BAR MOUNT	1
RIGHT SOLID SWAY BAR MOUNT	1
SPLINED SWAY BAR CENTER SECTION	1
CLAMP COLLAR	2
ANTI-SEIZE	1
LEFT SWAY BAR ARM	1
RIGHT SWAY BAR ARM	1
1/4-28 x 1" SOCKET HEAD CAP SCREW	2
MALE ENDLINK HALF W/ WRENCH FLAT STUD	2
3/8" ENDLINK LOCK NUT	2
FEMALE ENDLINK HALF W/ HEX STUD	2
LCA ENDLINK SPACER	2
3/8" FLANGE NUT	*6
NYLON CABLE TIE	2

\* Only quantity of 4 needed for assembly. Quantity of 2 extra provided as spares.

### Tools Required

Tape Measure

Torque Wrench (6 ft-lb to 28 ft-lb range)

Sockets - 12mm, 9/16", 5/32" hex bit, 3/16" hex bit

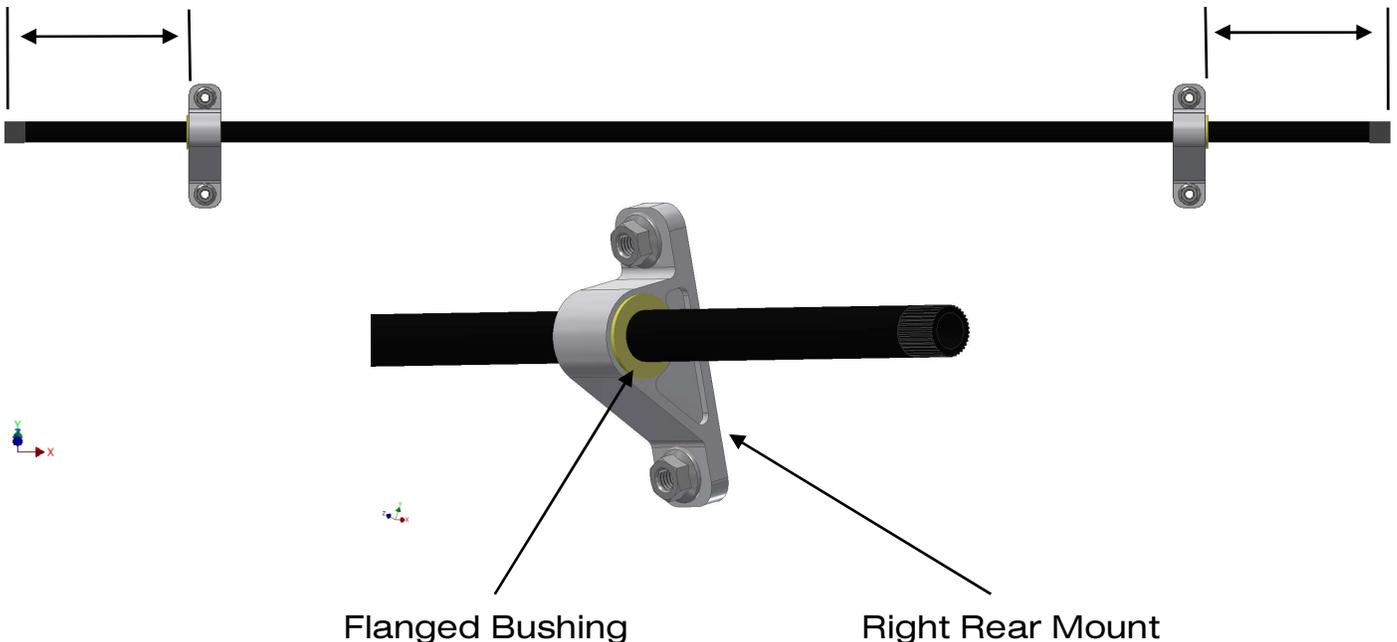
1/2" Open End Wrench

9/16" Ratcheting Combination Wrench

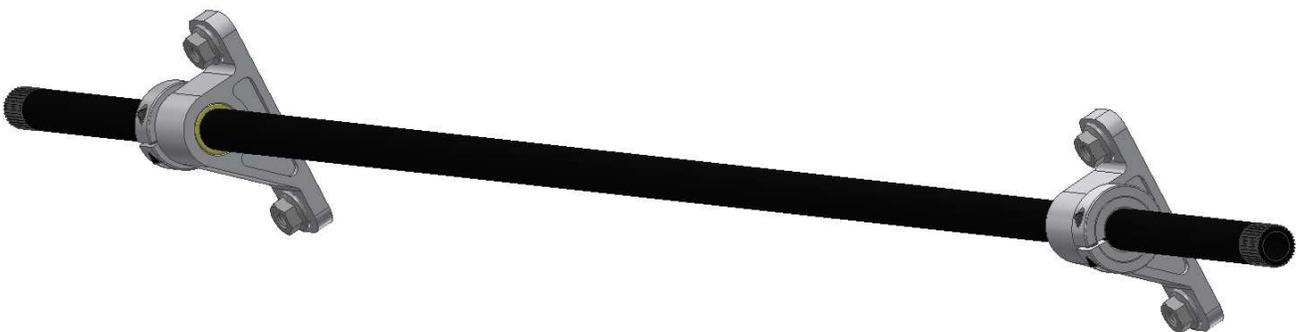
Note: Read all instructions before attempting installation. If you do not believe you are qualified in performing the necessary installation, please find an experienced professional who can.

# 1. Solid Mount/Center Section Installation

- A. Raise and support the rear of the vehicle with either jack stands or a lift.
- B. Remove the factory rear sway bar, sway bar brackets, bushings, and endlinks. Retain the M8 flange nuts used to hold the factory sway bar brackets; they will be re-used.
- C. Slide a solid sway bar mount onto each end of the splined center section. Make certain to note the proper orientation of the sway bar mounts from the images below. The mounts are offset, where the center section will be positioned higher than the midpoint distance between the crossmember mount studs. Additionally, the flanged side of the sway bar mount bushings must face outward. Loosely install the factory M8 flange nuts to hold the sway bar mounts in place on the vehicle's crossmember. With the mount nuts loose, center the sway bar with a tape measure by comparing the splined center section distance protruding from each end of the mounts (~5.4" per side). Once centered, torque the M8 flange nuts with a 12mm socket to 14 ft-lbs.

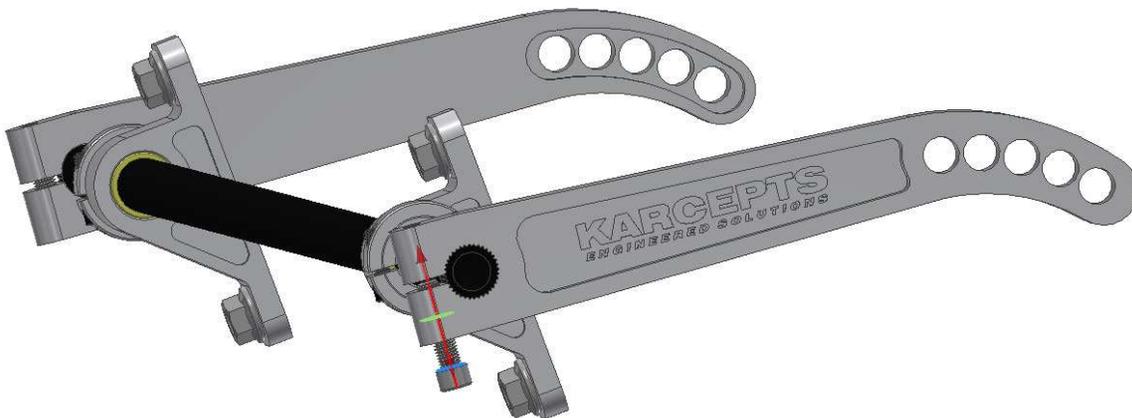


- D. Slide the clamp collars over each end of the splined center section and torque clamp collar set screws to 6 ft-lbs (72 in-lbs) with a 5/32" hex bit socket. Make certain there is no clearance between the bushings of the solid mounts and the collars once torqued. Do not be alarmed if observing high friction levels when trying to rotate the center section at this time. With use, the bushings will break-in and free up quickly.



## 2. Sway Bar Arm Installation

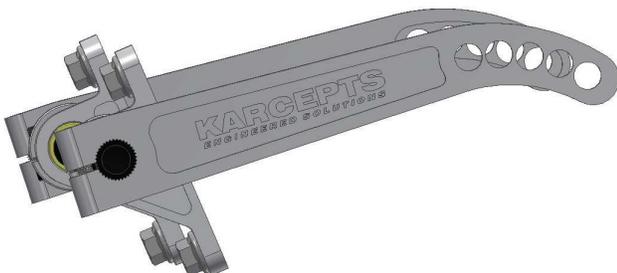
- A. Apply the provided anti-seize onto the splines of the sway bar arms. Coat every tooth of the splines liberally; any excess can be wiped away after install.
- B. Slide the right sway bar arm over the splined end of the center section and set the arm to be flush with the end of the splined shaft. This is the optimal arm installation position. Thread the 1/4-28 x 1" socket head cap screw through the arm, and with a 1/4" hex bit socket, torque to no more than 11 ft-lbs (132 in-lbs).



- C. Repeat the above for the left sway bar arm, making certain to clock the left arm onto the shaft splines to an exact mirror image as the right arm.

Arms clocked properly

Arms clocked incorrectly (off one tooth)



### 3. Endlink Length Setup

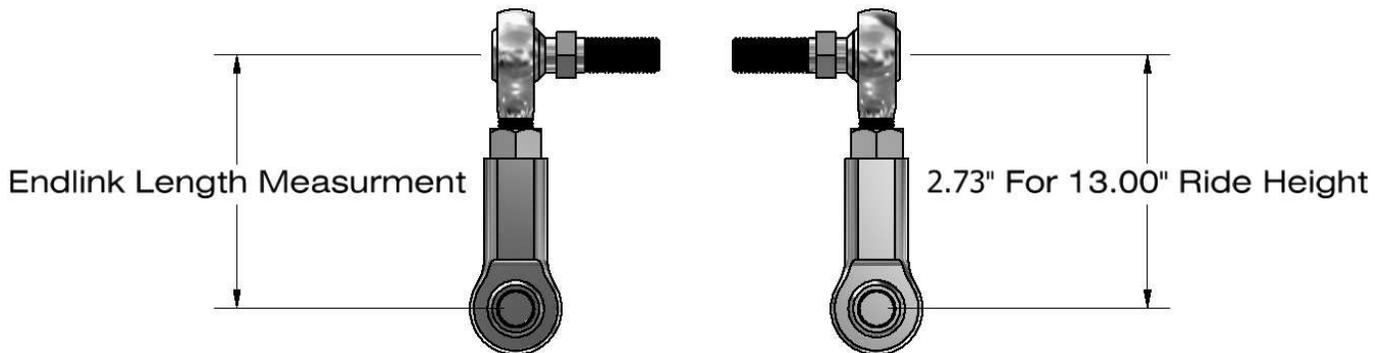
It is critical to set endlink lengths specific to the vehicle's ride height. If ride heights are changed, always re-adjust endlink lengths per the table below. Interpolate endlink lengths if necessary. Potential damage to the sway bar arms or endlinks may occur if endlink length is not set correctly. Additionally, proper endlink length guarantees full functionality of the quick adjustment feature of this sway bar kit.

Use the below table to determine ideal endlink length for your ride height:

RIDE HEIGHT <sup>*1</sup>	ENDLINK LENGTH <sup>*2</sup>
12.50"	2.63"
12.75"	2.68"
13.00"	2.73"
13.25"	2.79"
13.50"	2.84"
13.75"	2.90"
14.00"	2.95"
14.25"	3.01"
14.50"	3.06"

<sup>\*1</sup> Ride height is measured from the center of the hub to the bottom edge of the fender.

<sup>\*2</sup> Endlink length is measured from center of ball to center of ball.

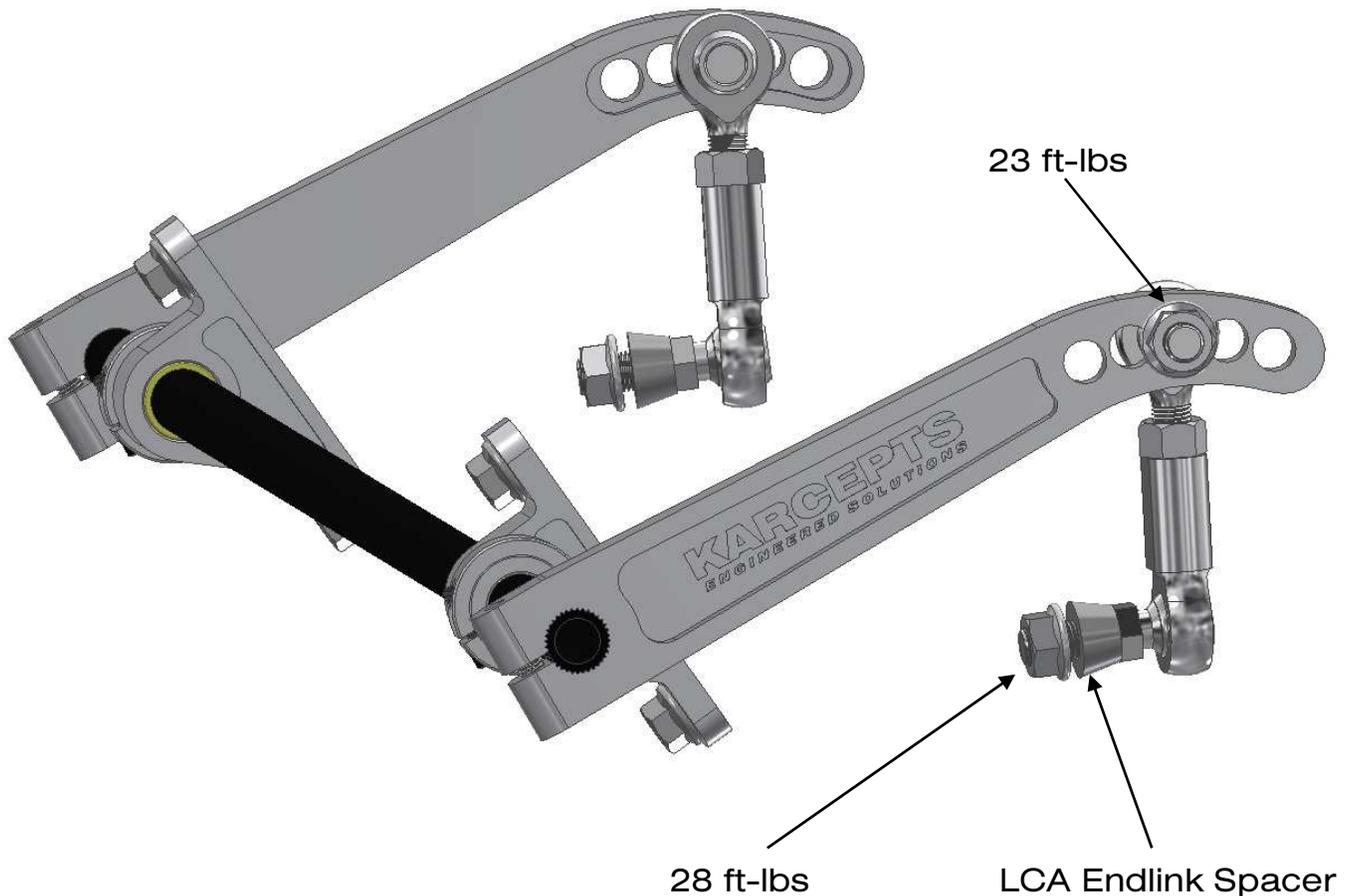


Assemble left and right endlink assemblies with the provided male and female endlink halves and 3/8" endlink lock nuts. The endlink studs that fit into the sway bar arms have two wrench flats on them (male endlink halves). The endlink studs that install into the lower control arms use a standard hex (female endlink halves).

For proper quick adjustment functionality, the endlinks should have zero preload when the car is at rest without a driver. If the chassis has been corner balanced, you may observe left and right side ride heights may differ without driver weight. If this is the case, set endlink lengths specific to each side of the vehicle's ride height. These endlink lengths will be the initial setup point; however, other factors may dictate adjustments to endlink length for ideal quick adjustment functionality. Secondary adjustments to endlink lengths are covered in Section 7 (Quick Adjustment Troubleshooting).

## 4. Endlink Installation

Slip the LCA endlink spacers over the studs of the female endlink halves and insert into the front side of the rear lower control arms. Use a 1/2" open end wrench (to hold the endlink studs from spinning) along with a 9/16" socket to secure the lower 3/8" flange nuts, and torque to 28 ft-lbs. Now insert the male half of the endlinks into your desired hole position on each sway bar arm and secure with the 3/8" flange nuts. Proper torque on this nut is 23 ft-lbs, but since this is the adjustment nut, it's impractical to assume you'll be using a torque wrench every time you make a sway bar change. Just tighten these nuts by feel approximately close to 23 ft-lbs. Plan to use a 9/16" ratcheting combination wrench on this nut for quickest adjustments when the vehicle is on the ground. Two extra 3/8" flange nuts are included as spares in case any get lost during adjustment.



## 5. ABS Wheel Speed Sensor Wire Harness

With rear sway bar installation complete, you will notice the wire harnesses for the rear wheel speed sensors will be resting on top of the rear sway bar arms. To minimize risk of having a wire get caught up in the arm or during an adjustment process, simply use the provided nylon cable ties to secure the wires to the upper control arms. When securing with the ties, it's best not to set the ties too tight. Allow the wires some ability to slide during suspension articulation.

## Installation Pictures For Reference:



## 6. Quick Adjustment Procedure

Reinstall the wheels/tires, and get the car back on the ground. Drive the vehicle for 500 miles (or one race event) to allow the bushings and endlinks time to free up. The car is now ready to test the Quick Adjustment Procedure.

The adjustment procedure of this sway bar kit should take no longer than 3 minutes to complete with adequate practice and knowledge of the product. Before attempting to make a sway bar adjustment quickly at the track or between autocross runs, we highly recommend spending a good hour practicing and gaining familiarity with the product/procedure. Follow the below steps exactly as provided. If trying to take any short-cuts with the procedure, you may cause yourself excess time or frustration.

1. Loosen and remove the adjustment nut on the left sway bar arm with a 9/16" ratcheting combination wrench. Set the nut aside and remove the stud of the endlink from the arm. If there is any difficulty removing the stud, skip to Step 2. Articulate the endlink around as required, and insert the stud of the endlink into the new desired hole position. Pay attention to the wrench flats on the endlink stud as well as the machined slot of the sway bar arm. The flats will need to lie within the slot of the sway bar arm. At this initial stage it can be common for the endlink stud to not want to install completely within the slot of a new hole location (pushing up or down on the sway bar arm itself can help seat the stud). If there is any difficulty seating the stud fully within the arm, just leave the stud sitting partially inserted into the new hole position. If able to seat the stud fully into the new hole/slot (1/2" of thread will protrude from the front of the arm), thread back on the adjustment nut, but leave the nut a few turns loose.
2. Loosen and remove the adjustment nut on the right sway bar arm. Since the left adjustment nut is loose, it should be extremely easy to remove and reposition the right endlink. If any difficulties, simply push up or down on the sway bar arm, and all should be free to reposition. If there are still problems removing the stud, skip to the Quick Adjustment Troubleshooting on the following page. Affix the right endlink stud into the new desired adjustment hole by making certain the wrench flats of the stud are seated fully into the machined slot of the arm. Reinstall the adjustment nut. If you were able to seat the left stud fully into the hole/slot of the left arm from Step 1, you may tighten the right adjustment nut completely; otherwise, leave the right nut a few turns loose.
3. If you were able to seat the left stud fully from Step 1, then your final step is to simply tighten down the left adjustment nut completely and you are done with the quick adjustment. Otherwise, you now need to complete the adjustment and seating of the left endlink stud into the new desired hole position (while the right nut is still loose). Reinstall the left adjustment nut and tighten completely. Now go back to tighten the right adjustment nut and you are done with the quick adjustment.

## 7. Quick Adjustment Troubleshooting

If following the Quick Adjustment Procedure, there should be no issues completing all 3 steps. If any difficulty with the procedure, this can mean one of a few things:

1. If the vehicle is sitting on extremely un-even pavement, there could be difficulties due to additional preload. It is very possible to perform the procedure on a sloped or inconsistent surface; but when too extreme, issues removing and installing the endlinks can occur. Reposition the vehicle on a more level surface and retry the procedure.
2. Double check to make certain left and right sway bar arms are clocked in sync with each other.
3. Double check to make certain the sway bar is centered properly.
4. Double check to make certain proper endlink lengths are used (Section 3).
5. If none of the above issues are at fault, then an additional endlink adjustment will be necessary. This can be due to differences in the suspension's eccentric alignment bolt positions between sides or can also be caused by an angular deviation tolerance between splined ends of the center section. To begin, first determine which endlink would need to be lengthened and which side would need to be shortened in order to remove the preload. On the link that would need to be shortened, crack loose on its middle lock nut and shorten the link one full turn. Re-test the Procedure. If still difficult, move to the other side of the vehicle and lengthen that side's endlink one full turn. Re-test the Procedure. Keep adjusting and re-testing the Quick Adjustment Procedure until you are able to remove and reposition the links freely into and out of the arm holes. Alternate sides when adjusting the links in order to keep both links as close to the Section 3 table values as possible. To test thoroughly, it's best to make an adjustment, then test drive the vehicle briefly, stop the vehicle on a new area of pavement, and try again. It should not be necessary to deviate from the endlink length table values by more than 1/8" per side. Additionally, do not allow endlink lengths to pass the extremes of the table values (i.e. no endlink should be shorter than 2.63" or longer than 3.06"). It is highly recommended to perform endlink length adjustments with the vehicle on the ground in order to observe the corrections without unsettling the suspension.

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