

MM K-Member Spherical Rack Bushings (MMST-6)



Read all instructions before beginning work. Following instructions in the proper sequence will ensure the best and easiest installation.

Thank you for purchasing the Maximum Motorsports Spherical Rack Bushing Kit (MMST-6). The MMST-6 kit is specifically designed for use with Maximum Motorsports Tubular K-members (MMKM-1, 1.1, 2, 2.1, 3, 3.1) purchased after 3/11/2008. If you purchased your k-member before this date, please consult the latest installation instructions for your K-member available online at www.maximummotorsports.com.

NOTE: If you are using a manual steering rack, you **MUST** also install the MMST-8 spacer kit to increase clearance between the steering rack and K-member.

Solidly mounting the steering rack with aluminum bushings eliminates rack movement relative to the K-member. This improves the steering response, and the car will maintain a more precise line through a corner, requiring fewer steering corrections.

In some instances, along with the improvement in steering response, comes an unwanted side effect—steering chatter at low speeds. Chatter can be caused if the steel steering rack binds up inside of the cast aluminum steering rack housing. This binding (meaning a resistance to moving freely) can happen if the rack housing is twisted when the rack is solidly attached to the K-member through solid aluminum bushings. Twisting can occur if there are irregularities in the steering rack housing. MM designed these new steering rack bushings to retain the benefits of a solidly mounted steering rack, while also preventing the twisting that can cause chatter. The MM Engineering Team's new design includes spherical bushing sets to accommodate irregularities in the steering rack housing.

This all-new steering rack bushing design allows the steering rack to be installed in any one of five possible vertical locations. The center position places the steering

rack in the stock location. Two different offset positions are possible: 1/4" offset and 3/8" offset. The offset positions can be used to either raise the steering rack, reducing the height of bumpsteer spacers used at the steering arms; or to lower the rack, providing clearance for oversized oil pans. These bushings are also designed to give the proper amount of Ackerman geometry when used with a MM K-member.

While offset steering rack bushings are not recommended for use on vehicles with stock k-members, they do provide a benefit when installed with a Maximum Motorsports K-member because of its major changes to the suspension geometry. Offset steering rack bushings are to be used along with Adjustable Tie-Rod Ends (MMTR-1 to 4). By raising the steering rack with offset steering rack bushings, the amount of spacers used between the spherical rod-end and the spindle steering arm is minimized.

REMEMBER: Each car's bumpsteer must be measured and adjusted. The MM Bumpsteer Gauge (MMT-4) includes our copyrighted instructions for measuring and adjusting bumpsteer.

NOTE: Steps 2 through 6 do not apply when the MMST-6 bushings are being installed as part of the initial installation of an MM K-member that was purchased after 3/11/2008. Steps 2 through 6 apply when replacing previously installed aluminum steering rack bushings with the new MMST-6 bushings.

Installation

1. Raise and support the vehicle safely on jack stands.
2. Disconnect the steering shaft from the input shaft of the steering rack. The stock steering shaft, as well as MM's latest design shaft, has one pinch-bolt retaining the coupler to the steering rack input shaft. The pinch-bolt must be completely removed to disconnect the steering shaft. Most aftermarket steering shafts have a setscrew to retain the coupler, instead of one pinch bolt. Loosen the setscrew to disconnect the steering shaft.
3. Loosen and remove the two nuts holding the steering rack to the k-member.
4. Remove the two bolts holding the steering rack to the k-member.

NOTE: On some vehicles it may be necessary to move the swaybar in order to remove the steering rack mounting bolts. If necessary, disconnect the swaybar end links and rotate the bar away from the steering rack.

5. Remove and discard the old aluminum rack bushings from the front of the rack.
6. Remove and discard any old spacers and washers used between the k-member and the rack mounting faces.

Offset-Hole Selection Procedure

We recommend mounting the steering rack as high as possible, relative to the K-member. This will reduce the height of the spacers used at the steering arm. If there is a problem with clearing the oil pan, the steering rack may need to be located at the stock location, or even offset downwards.

5.0L Engines- In general, 5.0L engines equipped with a factory oil pan have adequate clearance to offset the rack upwards, using the 3/8" offset-holes. Some aftermarket oil pans may not allow enough clearance. Follow the procedure listed below to determine how high the rack can be offset.

4.6L Modular Engines- In most cases, the oil pan of a 4.6L Modular Engine is closer to the steering rack housing than a 5.0L Engine oil pan. We DO NOT recommend beginning with the 3/8" offset-hole, as described below, to determine how high the steering rack can be offset. Instead, start by using the 1/4" offset-holes in the bushings to check for clearance. Once the steering rack is positioned using the 1/4" offset-holes, you can determine if there is enough room to offset the steering rack upwards using the 3/8" offset holes. We recommend at least a 1/4" between the lowest part of the oil pan and the top of the steering rack to accommodate engine movement.

7. Install the three-hole aluminum rack bushings with the smaller O.D. in the front mounting holes of the steering rack. The bushings must be oriented so that all three holes lie in a vertical line. 5.0L Engine cars: Start by positioning the 3/8" offset-hole as the lowest hole in the vertical orientation. This will result in the largest upward offset of the steering rack possible. 4.6L Modular Engine cars: Start by positioning the 1/4" offset-hole as the lowest hole in the vertical orientation.

NOTE: The 3/8" offset-hole is the hole machined closest to the edge of the steering rack bushing.



8. Using a marker, or other marking device, make an indicator line across the edges of the steering rack bushings and the steering rack housing. These lines can be used to determine if the rack bushings have rotated out of their position during later steps.



9. Place the female half of the rear Spherical Rack Bushings into the rear of the rack mounting holes. The concave portion of the bushings should face rearward in the vehicle. Orient the three holes so that they match the orientation of the holes in the front aluminum rack bushings.



10. Place one of the supplied 7/16" G8 washers under the head of each rack mounting bolt.
11. Slide the two rack mounting bolts through your chosen offset-holes of the aluminum steering rack bushings. Slide the bolts through until each one just protrudes through the rear face of the female Spherical Rack Bushings.
12. Place a male Spherical Rack Bushing behind one of the female Spherical Rack Bushings, so that the convex face is oriented towards the front of the vehicle. Slide the rack mounting bolt on through the slot of the male Spherical Rack Bushing, and into the mounting hole in the k-member. Install the other male Spherical Rack Bushing using the same procedure.

NOTE: Orient the slot in the male Spherical Rack Bushing vertically. When doing so, the slot will be offset towards one edge of the bushing. Make sure that the slot is offset towards the ground if the rack is being offset upwards. If the rack is being offset downwards, the slot would then be positioned to be offset upwards.



13. Fully insert the bolt into the k-member rack mounting holes. Make sure the bolt is passing through the correct offset-holes in the rack bushings.

NOTE: K-members prior to 3/11/2008 were supplied with thick and thin aluminum spacers to move the rack further forward in the vehicle. If installing the MMST-6 kit with an older MM K-member (purchased before 3/11/2008), DO NOT use the aluminum spacers that originally came with the k-member UNLESS required for clearance when using a manual steering rack.

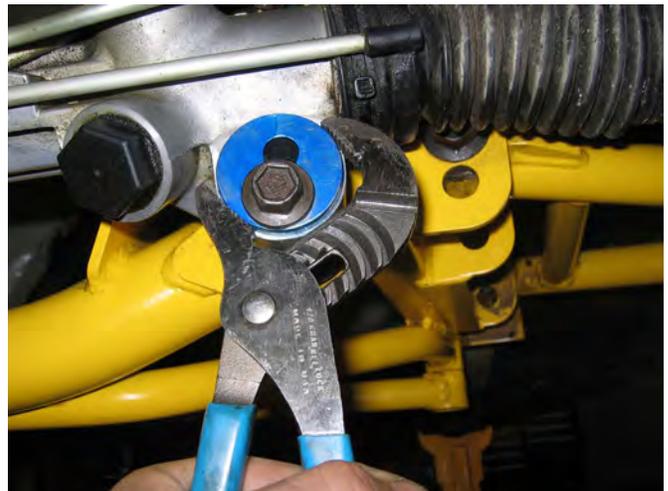
14. Press the rack rearwards until the rear rack bushings are fully resting against the k-member. Check to see if there is any interference between the rack housing and the oil pan. If the rack housing is touching the oil pan, repeat Steps 7-14 using the next smallest offset in the rack bushings. Repeat until the steering rack has the proper clearance to the oil pan.

NOTE: On some 5.0L applications, the hard line that enters the center of the rack housing may interfere with the oil pan. If this occurs, refer to the MM K-member instructions for information about how to bend the line for more clearance. MM instructions are available on our website, maximummotorsports.com

15. Once it has been determined that the rack clears the oil pan, reconnect the steering shaft to the input shaft of the steering rack. It may be necessary to pull the rack slightly forward to slip the steering shaft over the rack input shaft.

16. Install the nuts on the rack mounting bolts and snug them up equally on each bolt. NOTE: It is *very important* to make sure that *all* of the rack bushings are in alignment as the steering rack mounting bolts are tightened. Use the marks made in Step 8 as a guide.

NOTE: As the rack bolts are tightened, it may be necessary to use a large set of pliers to rotate the rack bushings into proper alignment. With a little experimentation, just the right amount of snugness on the rack bolt tightening can be found to keep the steering rack bushings from rotating too freely, yet allowing them to be repositioned by rotating them with a set of pliers. The slot in the male Spherical Rack Bushings, as well as the three holes in each steering rack bushing, should be in a vertical line. If everything is not properly aligned, not only is it possible to induce binding of the steering rack, the rack bushings may be damaged, and the rack may not be centered in the chassis. An un-centered steering rack will cause the car to have an asymmetrical turning radius in each direction, as well as asymmetrical bumpsteer.



17. When all of the bushings are properly aligned, torque the steering rack mounting bolts to 55 ft-lbs.



This kit includes:

- 2 Multiple Offset Rack Bushing
- 2 Male Spherical Washer
- 2 Female Spherical Washer
- 2 7/16" G8 washer

18. If using the stock steering shaft, torque the factory pinch bolt to 25 ft-lbs. If using an aftermarket steering shaft, refer to the manufacturers instructions for the correct torque specifications.
19. If the swaybar end links were detached in Step 4, reconnect them at this time.
20. Safely lower the vehicle to the ground.

NOTE: It will be necessary to measure and adjust the bumpsteer of the vehicle if the vertical position of the steering rack was changed. If the fore-aft location of the rack was changed, the toe setting must be adjusted.