

## Tech Intro on Bump Steer

Bump Steer is a common phenomenon that can cause a driver to be uncomfortable and quickly lose confidence with his/her vehicle. This explains why, in racing, we strive to minimize bump steer as much as possible. But what is bump steer and what causes it?

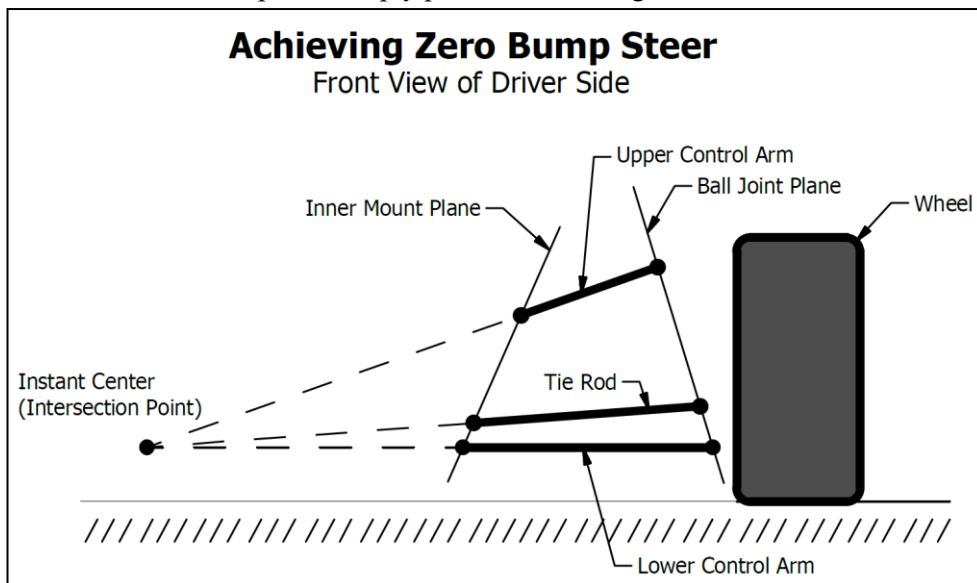
Bump Steer is defined as the tendency of the wheel to steer itself as it moves through suspension travel. In terms of steering geometry, bump steer is caused by the improper length and/or angle of your car's steering linkages.

Refer to the figure below for the zero bump steer scenario. If a line is drawn through the pivot points of the inner mount and the ball joint of the control arms, those lines intersect at a point in space. That intersection point is called the "Instant Center". To achieve zero bump steer, a line extended from the tie rod must also intersect at the "instant center" point. Simply put, the tie rod angle is our main concern.

This kit is designed to work with your car's factory spindle to allow adjustment of the tie rod angle.

It should also be noted that the length and positioning of the tie rod affects bump steer. However, because of its' fixed location and dependence on wheel toe, it will not be explained in detail.

Many vehicles have substantial bump steer from the factory, and it can quickly degrade as changes are made to the ride height, spindle height, and tie rod length. UMI Performance recommends using this bump steer kit and a bump steer gauge to test and modify the tie rod angle. However, if a gauge is not available, bump steer can be minimized by setting the angle of the tie rod to match the angle of the lower control arm. This will not be exact, but it's usually a good estimate.



**IMPORTANT:** The angle of a control arm or tie rod is the angle of a line extending through the centers of rotation of the ball joints and inner mounts.

**IMPORTANT:** All work done to the steering system and alignment should be done in this order: 1) Adjust Caster 2) Adjust Camber 3) Set Wheel Toe 4) Adjust Bump Steer 5) Check Wheel Toe



1972-1981 GM F-body Bump Steer Kit (Race Version)



**\*\*NOTICE\*\***

Drilling of the steering knuckle is required to install this kit.

P/N 2660-1

Box Contents

Qty	Part #	Description
2	4060E	Bump Steer Sleeve
2	XMR10	5/8-18 Rod End
2	1000043	5/8-18 x 4" Bolt
2	1000097	5/8-18 Lock Nut
6	3060B	0.125" Spacer
6	3060C	0.1875" Spacer
6	3060D	0.250" Spacer
2	0030	5/8-18 Jam Nut
2	2104L	11/16"-18 LH Jam Nut
1	Install Instructions	Install Instructions

**Disclaimer:** This product must be installed and adjusted with a bump steer gauge to in order to work safely and correctly. For more information on bump steer and how it works, please visit the links below:

<http://www.hotrod.com/articles/ctrp-1001-bump-steer-explained>  
<http://www.longacracing.com/technical-articles.aspx?item=8162>

**Notes:** Always ensure proper support when working under a vehicle. Use approved jack stands when using a floor jack as well as proper technique for securing your car while on a drive-on lift.

**Tools required:**

SAE wrenches and sockets  
Measuring Tape  
Drill and 5/8" drill bit  
Bump Steer Gauge

**Installation**

1. Make sure the wheels are pointed straight ahead and the steering wheel is centered.
2. Raise car to a comfortable working height using the method of your choice. Follow applicable safety procedures.
3. Remove the driver side wheel to allow easy access to the outer tie-rod end.
4. Measure from the center of the inner tie-rod joint to the center of the outer tie-rod ball joint. When installing the new end, you will want to match this length to keep the toe of the wheel in line (See Figure 1).
5. Locate where the outer tie-rod end meets with the spindle.
6. Remove the cotter pin and loosen the castle nut on the tie-rod ball joint.
7. Using a ball joint separator, pickle fork, or hammer, separate the tie-rod end from its knuckle.
8. Loosen the adjuster sleeve and remove the existing outer tie-rod end and adjusting sleeve.
9. The tapered hole in the spindle steering knuckle must now be drilled out to 5/8". UMI suggests removing the spindle and drilling it out with a drill press.
10. Reinstall the spindle onto the upper and lower A-arms after drilling is complete.
11. Install the new #4060E sleeve to the inner tie-rod, remembering it is left hand thread.
12. Assemble the supplied adjuster sleeve, (2) jam nuts, and the rod end onto the inner tie rod.
13. Install the 5/8" bolt up through OR down through the rod end and steering knuckle. Down through is recommended but up through may be necessary for wheel clearance. Be sure to shim the rod end down with supplied spacers (See Figure 3).
14. Tighten the stud down with the 5/8" lock nut. Torque to 85 ft-lbs.
15. Adjust the tie-rod length with the sleeve until you approximately match the measurement from step 4.
16. To lock the sleeve in place, hold the #4060E sleeve with a 7/8" wrench and tighten both lock nuts against the sleeve.
17. Double-check the measurement from step 4 to ensure toe spec.

18. Reinstall wheel.
19. Check the bump steer characteristics with a bump steer gauge (Generally, zero toe-in and toe out is desired through suspension compression and rebound)
20. Adjust the rod end placement on the stud, as shown in FIGURE 1, until the desired bump steer characteristics are achieved.
21. Repeat steps 3 – 20 for the passenger side of the vehicle.
22. Installation is complete.
23. **VEHICLE SHOULD BE RE-ALIGNED BY AN EXPERT AS SOON AS POSSIBLE TO PREVENT EXCESSIVE TIRE WEAR AND TO ENSURE PROPER HANDLING**



Figure 1:  
Measure initial tie-rod length

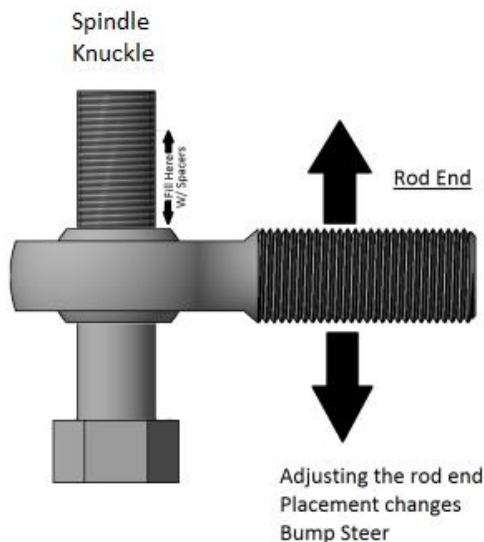


Figure 2:  
Adjusting Bump Steer with spacers



Figure 3:  
Bolt assembled with spacers



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#### Item# 2660-1

72-81 F-Body Bump Steer Kit  
UMI Performance Inc.  
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