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**LEVY**RACING

# Street Bump Steer Kit Installation Manual

Thank you for your purchase of this Levy Racing quality product. Like all Levy Racing products, this kit is a fully engineered system. It is not a conglomeration of parts that fit a variety of applications. It is a system that is specific in both design and application. For this reason, please read the manual entirely before attempting installation. Check the parts in the box against the parts list and make sure everything is there. Above all, work safely. Use the proper tools and wear the appropriate clothing and safety attire. Always use jack stands and **NEVER** work on heavy equipment alone.

## Parts list

<b>Part</b>	<b># Pieces</b>
POLY RACK BUSHING	4
TIE ROD END	2
5/8 ID TIE ROD END SPACER	2
RACK MOUNT SPACER	2
STEERING SHAFT	1
RACK BRACKET (RIGHT)	1
RACK BRACKET (LEFT)	1
BOLT 5/8 X 6" NF G8	2
BOLT 1/2 X 4 1/2" NC G8	2
BOLT 1/2 X 4" NC G8	2
BOLT 1/2 X 1 1/2" NC G8	2
WASHER 5/8 HARDEND	2
WASHER 1/2 G8	12
NUT 5/8 NF HARDENED LOCK	2
NUT 1/2 NC NYLOCK	6

## Tools

A good set of hand tools  
A half drive drill  
A pickle fork  
A welder (can be farmed out)  
½ "drill bit  
1/8" drill bit  
5/8" drill bit  
Ball joint removal tool (optional)

## Installation

**Note #1: If you are running a front sway bar you may have to moon or re-locate the frame mounts to clear the rack in its new location. Since you ordered this kit it is assumed this was discussed with Levy Racing at the time of purchase. If it has not, please call 480-446-8442.**

**Note #2: the 2 re-locating rack brackets are coated with ArmerShield prior to leaving the factory. It may be necessary to ream the holes back to ½" before installation.**

- 1) Raise the front of the car off the ground and support with jack stands. Remove the front wheels and set aside. Remove the rack, lower steering shaft, and universal joint. If clearance is an issue, the radiator may need to be removed.
- 2) Using the new hardware and rack bushings, mount the right and left rack brackets (view right and left from sitting in the driver's seat) to the rack first. Leave the nuts and bolts snug, but not tight, so the brackets can be rotated. See figures 1 and 2.
- 3) Install the rack to the original mounting points using the new brackets. This means you will install the rack with the new brackets on the front of the existing mounting ears that are welded onto the frame. Install the new brackets using the top hole on the bracket and the existing rack mounting hole in the frame. Place the supplied anti-crush bushing on the mounting bolt in between the original mounting ears. Tighten the bolts until snug and position the rack so it is centered between the ears. This will place rack approximately ½" to the right and 3 ¼" forward of where it was originally

mounted. Once the rack is positioned, tighten the mounting bolts tight. See figure 2.

- 4) The remaining two holes in the new brackets now need to be marked and drilled. This can be done with either a  $\frac{1}{2}$ " locating punch or by placing the  $\frac{1}{2}$ " drill in the hole and spinning it enough with the drill motor to make a mark. Once this is done, remove the rack and use the  $\frac{1}{8}$ " drill to drill a pilot hole. Then use the  $\frac{1}{2}$ " drill to finish the hole. Re-mount the rack using all of the supplied hardware. Torque all fasteners to 40 lb. ft. See figure 2.
- 5) Using a sharp  $\frac{5}{8}$ " drill bit, ream the tapered tie rod mounting holes in the spindle to  $\frac{5}{8}$ " strait holes. This will take some time and patience. Be careful to get the holes as strait as possible. Place the supplied  $\frac{5}{8}$ " bolts into the holes from the top and leave them hanging.
- 6) Center the rack by turning the steering input spline all the way to lock in either direction. Then turn the input spline all the way to lock in the other direction counting the turns. Divide the counted number by two and again turn the input spline back that many turns. The rack is now centered. Once the rack is centered the new lower steering shaft can be installed. Center the steering wheel and insert the new lower steering shaft. The new lower shaft is sent from the factory to fit the longest length needed for this kit. For this reason, it may have to be cut to length for your application. This may be done with a chop saw or hack saw. Be careful to get it only far enough into the universal joints to have enough room to lock it with the Allen lock nuts. This will keep the universal joints from binding through rotation. Lock the shaft in place using the Allen head lock screws and nuts.
- 7) Screw the tie rod ends into the tie rod sleeves. These are left hand threads. Screw the  $\frac{5}{8}$  rod end in as far as it will go. Make sure to install the  $\frac{5}{8}$  left hand thread nut onto the rod end before screwing the rod end into the tie rod sleeve. Now screw the tie rod sleeve onto the tie rod until it stops. Place the  $3 \frac{1}{4}$ " long  $\frac{5}{8}$ " I.D. bushing on the  $\frac{5}{8}$ " bolt in the spindle from the bottom. Holding the bushing in place, slide tie rod end on the  $\frac{5}{8}$ " bolt below the bushing. Then slide on the  $\frac{1}{4}$ " spacer and secure everything with the  $\frac{5}{8}$ " Nylock nut. Torque to 100 lb.ft. do this step for both sides.

- 8) Set the toe as close as you can get it by eye looking down the side of the car. The toe will look slightly out when it is acceptable for this step. With the new tie rod sleeves, the adjustment is as simple as turning the sleeve. Make sure to have someone hold the steering wheel straight while making the adjustments. Just get it close. It will be set correctly when an alignment is performed. There are several different length tie rod sleeves available with this kit. If it looks like you have to turn the tie rod sleeve more than 4-5 threads out to get the toe set, contact us about longer sleeves. This is a very important safety issue. Examine this step carefully.
  
- 9) Re-install the wheels and radiator (if needed). Set the car on the ground and set your ride height.
  
- 10) You are now ready for the alignment. This is best handled by a professional shop with an alignment computer, but you also need a shop that will set to YOUR specs. Not the specs THEY think are correct. For this reason we are listing our initial set-up specs as well as some handling diagnostics here. You will need to read this carefully to actually understand what is going on with the car. The fact that you bought this kit in the first place tells us that you are interested in the material so read on.

### **Set-Up**

Extensive testing with the FFR has taught us that the initial alignment specs for this set-up are as follows.

<b>TOE</b>	<b>0</b>
<b>CASTER</b>	<b>3 TO 4 DEGREES POSITIVE</b>
<b>CAMBER</b>	<b>1 TO 1.5 DEGREES NEGATIVE</b>

These are the initial settings and will give good results if everything else (control arm bushings, tires, tire pressures, shocks, ect.) are in good condition and working correctly. The part of handling that is not constant is the driver. Since you installed the bump steer kit, your front suspension is now far more adjustable. To set the car to your preference you need to do some things that let you know what you need, or don't need for that matter.

## **Toe**

Toe is the one front suspension setting that enjoys complete freedom of adjustment. This means that you can set it were ever you want and it will not affect any other part of the suspension. This is basically the way toe works. If you set toe at zero, the car “should” exhibit fairly good stability on high speed straits, and a fairly good turn in going into corners. If you adjust the toe out in small increments the car will steer into corners quicker with less steering input. The trade off is high speed stability. The car will feel twitchy and wander on high speed straits. The reverse is true if the car is toed in. The obvious issue here is what the driver likes and what type of track conditions exist. The rule of thumb for race set-up goes as follows. If the track is tight and utilizes increasing radius turns, set the toe out and sacrifice the straits. If the track is a big track and has a long strait, set the toe in and sacrifice the corners. These are general rules. There are many track conditions that will over ride the most obvious obstacles. The idea is to set the lowest possible lap time. Street driving is not left out with this kit. In fact, the street is one venue were this kit shines the brightest. The fact that you have virtually zero toe change over varying conditions means you have the freedom to set the car up for a very comfortable ride without sacrificing good handling characteristics. Even when you set the toe for good turn in you won't have to fight the wheel on bumpy roads.

## **Camber**

For the street, camber is primarily a tire wear issue. For the track, static caber and camber curves play a large roll in traction and linear tire temperatures. The settings listed above are good starting points for street driving. They offer a good combination of tire traction and wear longevity. Experimentation is the best teacher for finding the best camber setting for your car.

## **Caster**

Caster is directly related to stability and should be set as high as possible without sacrificing turning ease. Only you can decide where this point is. Obviously, this setting would be different for Arnold Schwarzenegger than it would be for Rod Stewart. The idea is to get as much stability as can be useful.

If you need more help or have any concerns on installation please call Levy Racing at 480-446-8442.

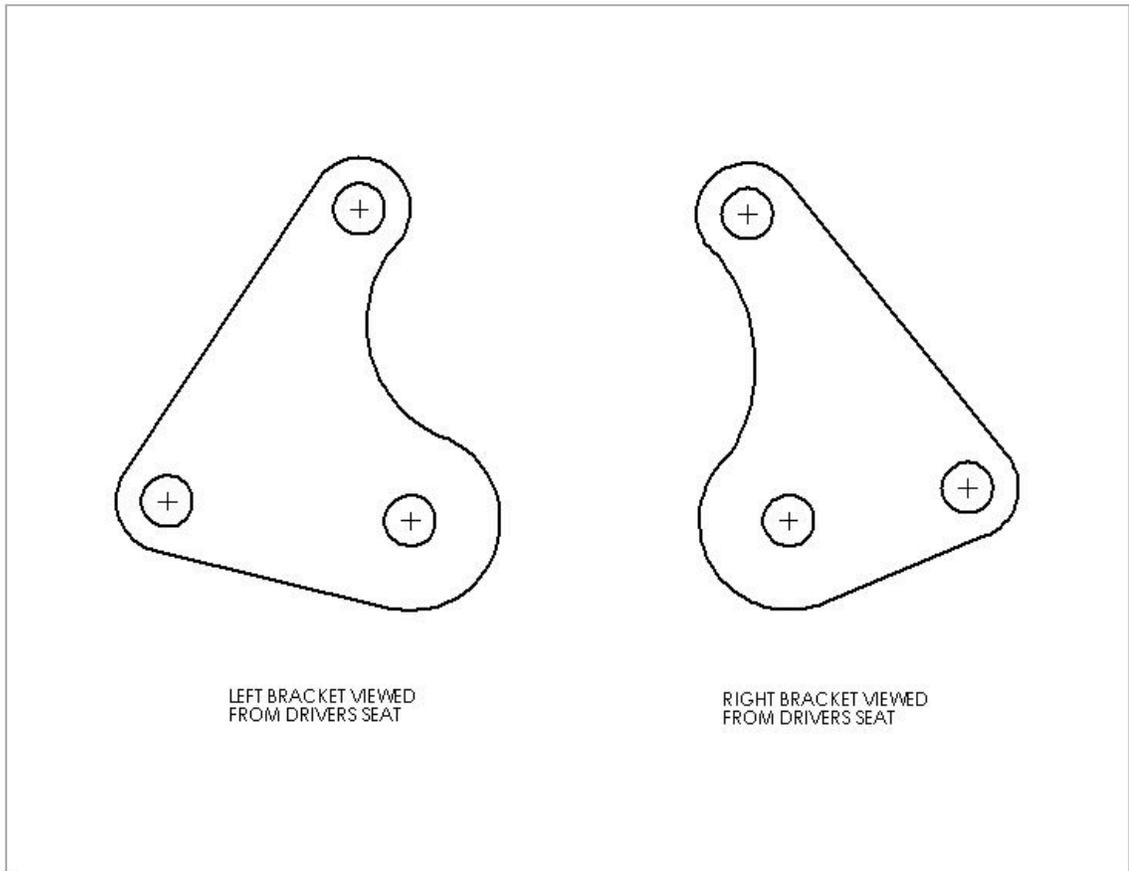


Figure 1. Bracket layout.

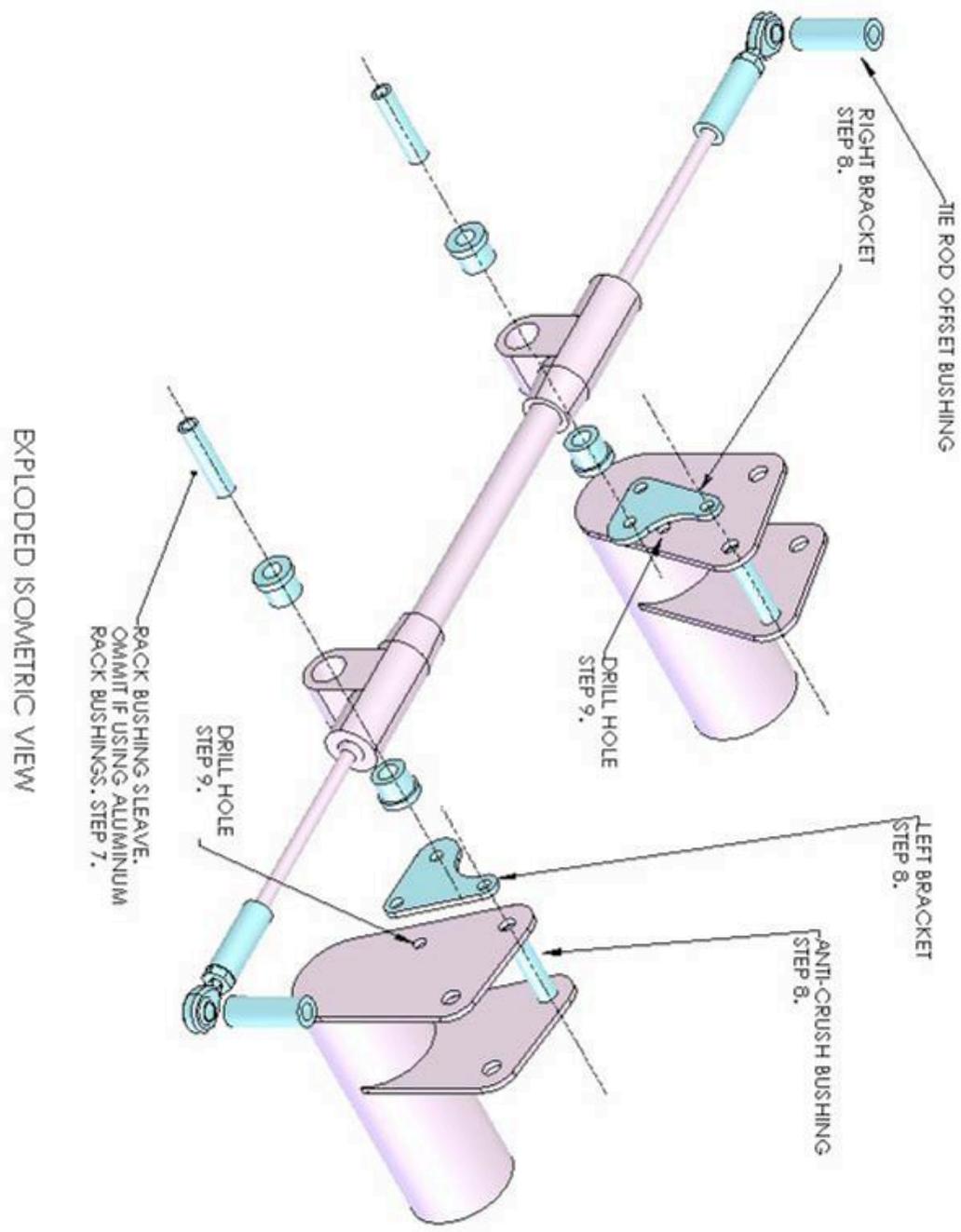


Figure 2.