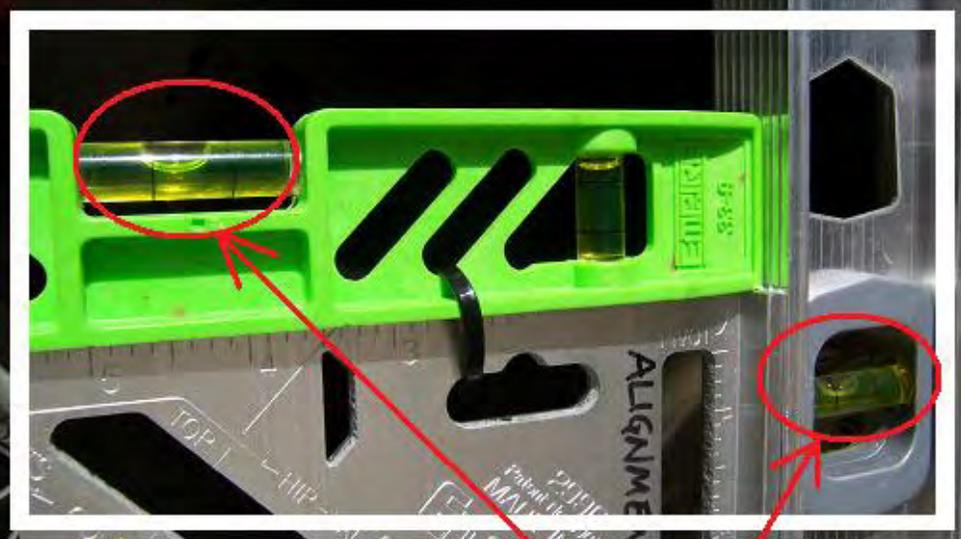


7. Now measure Camber. I have calibrated my device so when the bubble is barely out of the marks, it is roughly 0.50 degrees (or 30 minutes, which is half of a degree). In fact this is -0.50 degrees, so it was good:

Carpenter Square

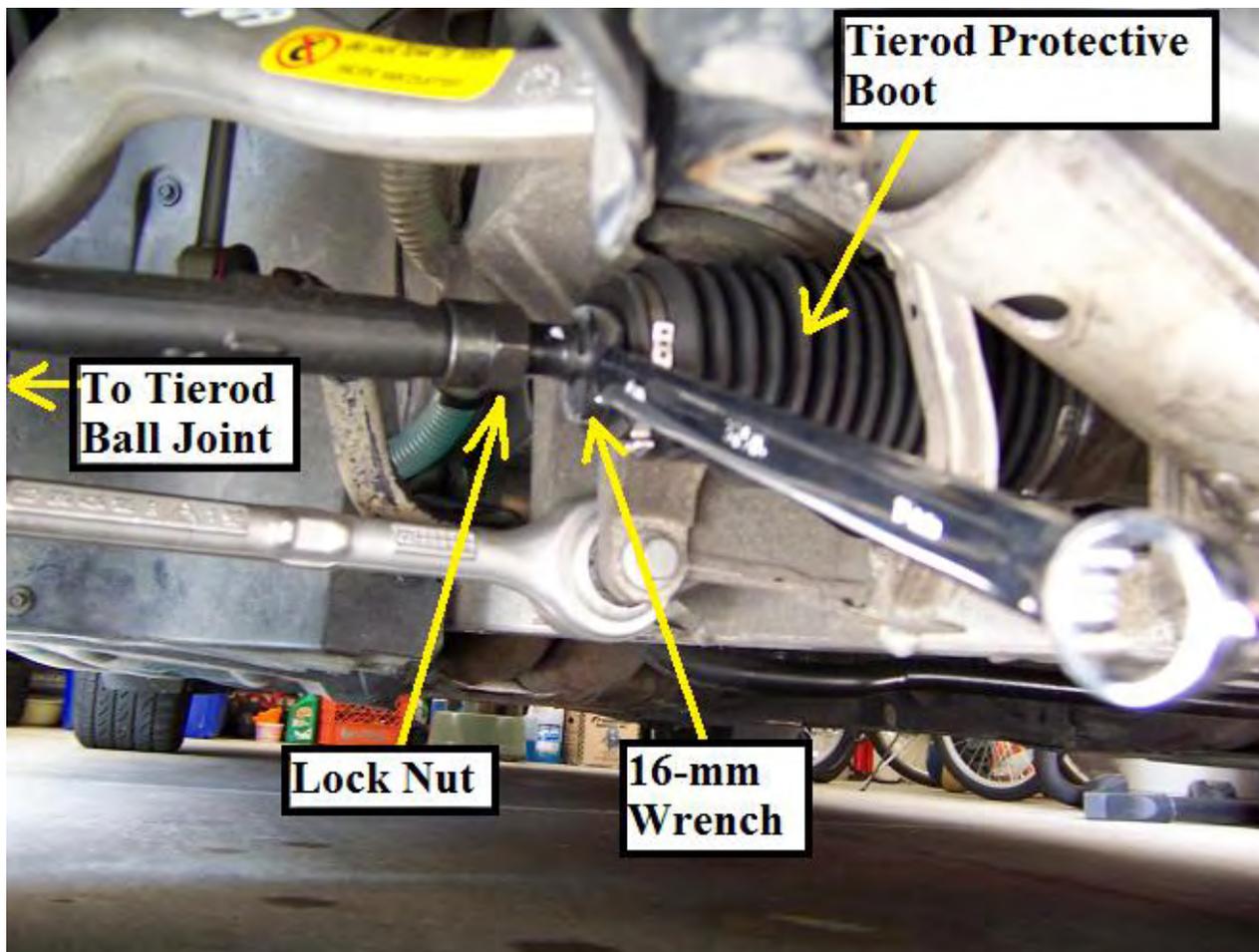


**Air Bubble at Approx.
- 0.5 degrees Camber**

Equal Metal Squares

8. Now measure the toe-in: -0.314 mm (TOE-IN) up to $+0.942$ mm (TOE-OUT). You can actually set it at zero. Some people set it at -1.0 mm, which is very typical of many cars.

A bit of TOE-IN is good because the crown of the typical road will have the tendency to bring the [tires](#) out a bit. Some people set TOE-OUT more than spec for aggressive track use:



9. Go for a test drive on a smooth highway.

- The chances are the SW is not dead center. Make a note.
- Let's say car goes straight but the SW points a bit to the Right.
- Bring car back to driveway.
- Now, when SW is turned dead straight, both wheels point a bit to Left.
- Then adjust in equal increments (for example, pull L side in and push R side out **equally**). Again do this in equal increments. One complete turn of the Tierod moves the Tierod by **1 mm** but mathematically it changes the tire difference readings by **2 mm**.
- Use liquid paper to mark Tierod original reference position so you know how many turns you have done.
- Tighten the Lock Nut (do not over-tighten it) to lock the Tierod.

Go for test drive again and adjust the Steering Wheel position as appropriate.

Enjoy your Ultimate Driving Machine!!!

Attached Thumbnails



Last edited by cn90; Today at 05:58 AM.



09-20-2009, 09:29 PM

#3



Jason5driver

BMW CCA member 365108
Location: Wichita, Kansas

Join Date: May 2007
Posts: 1,697
Mein auto: 2001 525i sport w/ step
[View My Garage](#)

Incredible DIY!
Love it!
Incredible job!
It's interesting that you did some things different than I did...
I will be making a DIY for my H&R coil-overs...
Just a tad different, but the same concept.
I mostly used Raj's DIY write-up from www.BeisanSystems.com .
Impressions on how the car rides with the Bilstein HD's?
How did the Harbor Freight ball joint separator work on your thrust arms?
Mine was amazingly easy on my tie rods!
Best \$17.50 I have spent in a while...
LOL!



09-20-2009, 09:42 PM

#5



[bluebee](#)

Ask:Listen;Then ADD VALUE

Location: San Jose, California

Join Date: Mar 2008

Posts: 1,117

Mein auto: 2002 BMW 525i

[View My Garage](#)

Wow! Hats off to you yet again!

[When I searched for a good E39 shock/strut replacement DIY](#), I realized that other steering and suspension components should also be tested and/or replaced if found worn out ...

This includes, potentially:

- front struts
- rear shocks
- rear shock mount
- suspension springs
- [thrust arm](#)
- control arm
- [sway bar](#)
- [thrust arm bushings](#)
- control arm bushings
- The CAB
- strut guide
- [protection cap](#)
- [end links](#)
- [wheel bearing play](#)
- ball joints
- tie rod ends
- control arms

Your DIY above seems to put it all together! Thank you! Let's START with this and add value where needed so we all benefit!



09-20-2009, 09:49 PM

#6

Quote:

Originally Posted by **bluebee** 

Wow! Hats off to you yet again!

This includes, potentially:

- *front struts*
- *suspension springs*
- *strut guide*

- *control arm*
- *thrust arm*
- *tierod*

Your DIY above seems to put it all together! Thank you! Let's START with this and add value where needed so we all benefit!

Hi bluebee,

I edit your questions a bit so I can answer the Front Suspension (I skip the Rear Susp questions for now). I have owned a quite a few cars and have wrenched for 25 years and here is my observations with E39 sharing many of these similarites. However, the E39 has its own problems:

- Struts deteriorates slowly so you hardly notice the gradual deterioration until it is really bad. So my guess is Strut lasts anywhere between: 60K (Boston and NYC potholes!) all the way to 150K 9highway driving). So it is hard to judge a Strut by mileage alone.
- Springs seem to last well beyond 200K (I spoke to my cousin who is bmw indy guru!).
- Strut Guide. This part has the bearing in it. In contrast to the wheel bearing which lasts 150K miles because most of its load exerted on the outer race in a radial manner (along the axis of rotation), the Strut Guide Bearing has 100% of the load exerted in a lateral manner, i.e. the INNER race is constantly pushed UPWARD by the Strut Spring. So even the Strut Guide barely turns much (compared with the wheel bearing), the lateral load kills the bearing. At 80-120K, you will notice some play in the Bearing Guide. Those short of budget may re-grease the Guide and keep it until unbearable but since there is so much labor involved, replace it anyway.
- Control Arm: surprisingly, my CA was still good at 105K, the BJ has some looseness (compared with the new CA) but the bushing is OK.
- The thrust arm: the BJ has some looseness (compared with the new CA) but the bushing is long gone (all oil leaked out, rubber cracked).
- The tierods INNER BJ is still good, the OUTER BJ (this is where most of the wear and tear is) has some looseness but still good.

The BOTTOM LINE for those who are short of budget:

1- If you have shimmy at 50K, then switching to PowerFlex Bushing for the Thrust Arm is probably good enough. Read that post carefully and you may have to shave the bushing a bit to allow the washers to go in.

Best is:

- Using a micrometer and measure the existing Thrust Arm Busing width.
- Measure the PowerFlex Bushing + washers thickness
- Shave the PowerFlex Bushing a bit for ease of installation.

2- If you have more than 120K, do this DIY: Entire Suspension Overhaul.