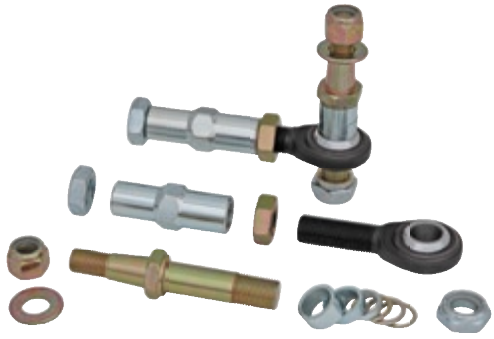
INSTALLATION GUIDE

CHRIS ALSTON'S Chassisworks
THE HOME OF HIGHER TECHNOLOGY



6151

Bump Steer Kit
Adjuster Sleeve and Tapered Outer Stud
(Use with Chassisworks' Rack Tie Rod and Street Machine Spindle)

Description: Billet Adjusting Sleeve, Tapered Stud, and Rod End; creates height adjustable outer pivot point.

Applications: Chassisworks' Street Machine front suspension and steering system, and applications using the Chassisworks' rack and pinion with Street Machine dropped spindle.

Chris Alston's Chassisworks, Inc.
8661 Younger Creek Drive
Sacramento, CA 95828
Phone: 916-388-0288
Technical Support: sales@cachassisworks.com

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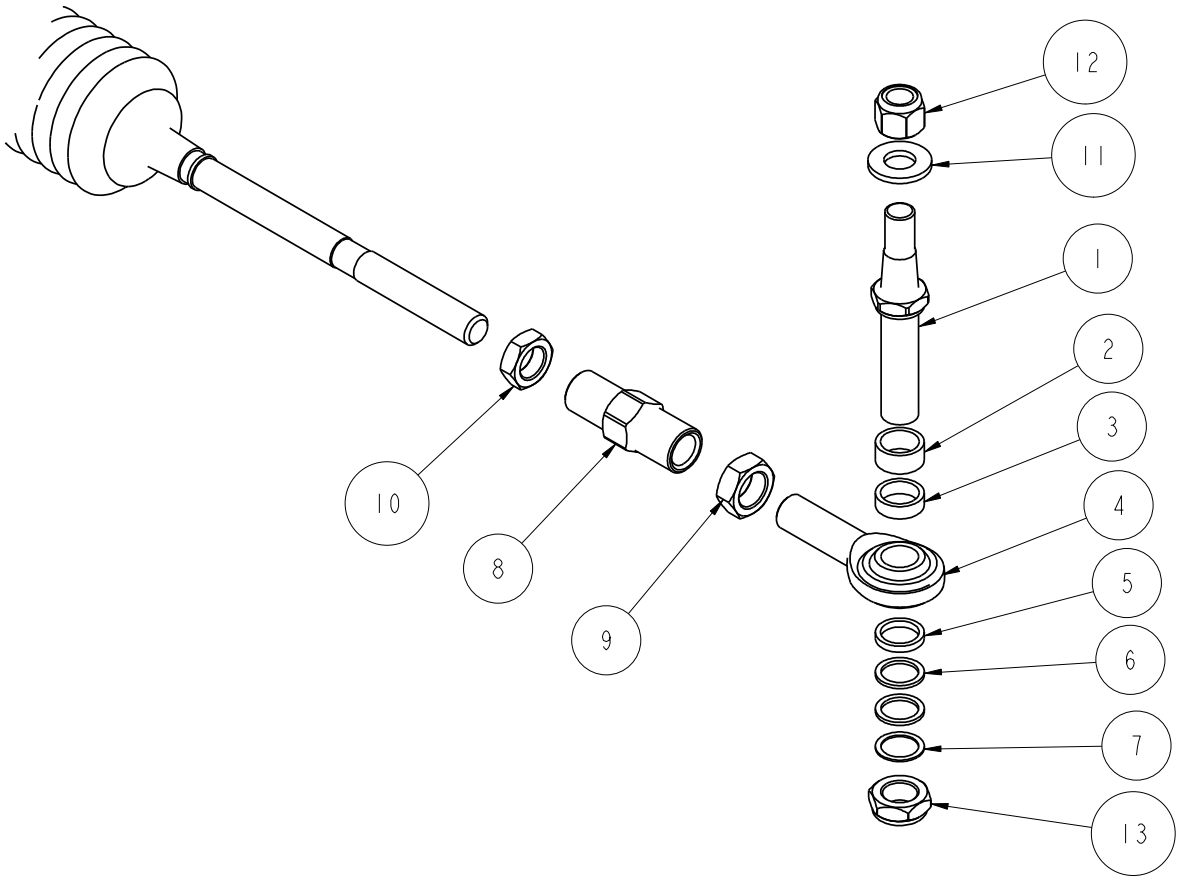
ITEM	QTY	PART NO.	DESCRIPTION
1	2	7900-227-D	TIE ROD STUD D, Ø.532 MINOR, 1/2-20 THREAD,
2	2	7900-226-.375	SPACER, Ø.813 OD x Ø.646 ID x .375 LONG
3	2	7900-226-.250	SPACER, Ø.813 OD x Ø.646 ID x .250 LONG
4	2	3136-063X063-LT	ROD END 5/8 LEFT x 5/8 BORE CMX10T-F1
5	2	7900-226-.125	SPACER, Ø.813 OD x Ø.646 ID x .125 LONG
6	4	7900-226-.063	SPACER, Ø.815 OD x Ø.630 ID x .063
7	2	7900-226-.031	SPACER, Ø.815 OD x Ø.630 ID x .031
8	2	1241	S/M TIE ROD ADAPTER 9/16-18 RH 5/8-18 LH
9	2	3102-063-18LY	JAM NUT, 5/8-18 LEFT, YELLOW ZINC
10	2	3102-056-18RC	JAM NUT, 9/16-18 RIGHT, CLEAR ZINC
11	2	3120-050S-Y	FLAT WASHER, 1/2 SAE, HARDENED
12	2	3131-050-20Y	LOCKNUT 1/2-20, GRADE 8, NYLON INSERT, YELLOW ZINC
13	2	3117-063-18C	LOCKNUT 5/8-18, GRADE 5, HALF HEIGHT, NYLON INSERT, CLEAR ZINC



DESCRIPTION

BUMP STEER SET, S/M RACK, ADJUSTABLE OUTER TIEROD & SLEEVE

Chris Alston's CHASSISWORKS INC.
8661 YOUNGER CREEK DRIVE
SACRAMENTO, CA 95828
(916) 388-0288 FAX 388-0295

PART NO. 6151

11/20/06 | DWG: 916151

PARTS LIST

906151.12 - Hardware Bag 6151 (1 of 2)

Qty	Part Number	Description
2	3117-063-18C	Half Locknut, 5/8-18 Nylon Insert
2	3120-050S-Y	Washer, 1/2 Hardened Flat SAE
2	3131-050-20Y	Locknut, 1/2-20 Nylon Insert
2	7900-226-.031	Spacer, .031 Thick x .815 OD x .630 ID
4	7900-226-.063	Spacer, .063 Thick x .815 OD x .630 ID
2	7900-226-.125	Spacer, .125 Thick x .815 OD x .630 ID
2	7900-226-.250	Spacer, .250 Thick x .815 OD x .630 ID
2	7900-226-.375	Spacer, .375 Thick x .815 OD x .630 ID
2	7900-227-D	Tie Rod Stud D .532 Minor

906151.22 - Hardware Bag 6151 (2 of 2)

Qty	Part Number	Description
2	1241	Street Machine Tie Rod Adjuster 9/16-18 RH to 5/8-18 LH
2	3102-056-18RC	Jam Nut, 9/16-18 Right, Clear Zinc
2	3102-063-18LY	Jam Nut 5/8-18 Left, Yellow Zinc
2	3102-063-18RC	Jam Nut 5/8-18 Right, Clear Zinc
2	3136-063X063-LT	Rod End 5/8-18 LH x 5/8 Bore

What is Bump Steer?

Bump Steer is the change in “toe”, or left to right angle, as the suspension moves through its range of motion. Bump steer is most evident on rough road surfaces, during hard cornering or under heavy braking. With proper installation and settings, the bump steer kit can minimize and in most cases virtually eliminate the bump steer affect, making handling more consistent and predictable. **Toe** is the measured difference in track width of the leading edge and trailing edge of a set of tires.

Toe-Out = Front wider than rear / **Toe-In** = Rear wider than front / **Zero-Toe** = Front equal to rear

Installation/Setup

Installation of this kit requires the suspension to be moved through its range of travel and the toe measured at the extremes of the range and at ride height. This can be accomplished at home using a bump steer gauge but we recommend taking your vehicle to a qualified alignment shop for installation and setup. *Continue with instructions if you plan on performing the installation and setup yourself.*

INSTRUCTIONS

1. Measure from top of fender well to center of wheel on each side of vehicle to establish a ride height dimension from which to work. Record results.
2. If replacing an existing tie rod end, measure length from closest rack bracket to outer pivot point to establish an adjustment starting point. Record results.
3. Raise the front end of car and secure with jack stands. Wheels must not be in contact with ground.
4. Remove wheels, making note of which side of vehicle they were removed from.
5. Unbolt stabilizer bar from lower control arms.
6. Enable free manual movement of the suspension by removing springs from coil-over shocks or unscrewing airlines from air spring if so equipped.
7. Reinstall shocks or use Chassisworks shock simulator (PN 6712-12) to limit suspension travel during bump steer measurement process and position suspension at ride height.
8. Remove cotter pin and castle nut of tie rod end and separate from steering arm. A balljoint fork or similar tool may be required for separation.
9. Loosen jam nut at tie rod end, then unscrew from rack tie rod.
10. Inspect condition of rack tie rods, replace if necessary.
11. Apply anti-sieze or similar thread lubricant to internal threads at each end of adjusting sleeve (1241)

12. Thread left hand jam nut (3102-063-18LY, yellow zinc) onto rod end until 1” of thread is past nut.
13. Screw rod end (3136-063X063-LT) into billet adjusting sleeve until jam nut contacts sleeve.
14. Thread right hand jam nut (3102-056-18RC, clear zinc) onto rack tie rod to end of threads.
15. Screw adjusting sleeve onto rack tie rod until adjusted length matches the original assembly.
16. Tighten adjuster sleeve jam nuts.
17. Install tapered stud (7900-227-D) (7/8” hex) into steering arm and secure with 1/2” washer (3120-050S-Y) and 1/2-20 lock nut (3131-050-20Y) (3/4” hex).
18. Verify tapered stud fits correctly before proceeding. Stud taper should match existing tie rod end.
19. Torque to 50 lb. ft.
20. Place largest adjustment shim, 3/8” thick, (7900-226-.380) onto stud at steering arm.
21. Place rod end onto stud against 3/8” thick shim.
22. Place remaining shims onto stud against rod end.
23. Thread 5/8-18 jam nut (3102-063-18RC) onto stud to secure shim stack and rod end. The jam nut is used temporarily during setup and will be replaced by a locknut after final adjustment. Jam nut should be snug to prevent any free play of the shims during bump steer setup. If the vehicle will be moved before final adjustment install lock nuts (3117-063-18C) in place of jam nuts for safety purposes.
    Springs must be removed from suspension system before proceeding.
24. Toe measurement and shim adjustment can now be done to make any bump steer corrections. A dual dial indicator bump steer gauge is highly recommended for this procedure. Gauges can be purchased through many high performance racing parts distributors.

Bump Steer Gauge

Adjustment Notes:

At least one 1/16” shim must remain below rod end to prevent binding.
A minimum of 3/4” thread engagement is required at the rod end and inner tie rod.
The inner tie rod will typically have more thread engagement than the rod end.
To maintain minimum thread engagement at rod end, inner tie rod can be unscrewed from adjusting sleeve up to the point of minimum thread engagement.

General Adjustment Rules:

If compression travel toes-out and extension travel toes-in, then the outer tie rod is too high.
If compression travel toes-in and extension travel toes-out, then the outer tie rod is too low.
If compression travel toes-out and extension travel toes-out, then the tie rod assembly is too short.
If compression travel toes-in and extension travel toes-in, then the tie rod assembly is too long.

25. Once final adjustments have been made verify that minimum thread engagement has been maintained.
26. Tighten all jam nuts and install 5/8-18 locknuts onto stud. Torque to 60 lb. ft.
27. Reinstall springs, stabilizer bar and wheels.
28. Verify all mounting hardware is correctly torqued.

ALIGNMENT

The vehicle must be professionally inspected and aligned prior to regular use.
If a trailer is not available, your alignment will need to be somewhat close to final specs in order to safely drive your vehicle to the alignment shop. Visually determine if the front wheels look straight. They should not appear to “toe” (left to right) -in or -out. The outside of the wheels should be very close to vertical. A few degrees of negative camber (leaning in) is acceptable.

	Street Performance		Road Course		Drag Strip	
	Manual	**Power**	**Manual**	**Power**	**Manual**	**Power**
Caster	2-1/2° to 3° pos.	3-1/2° to 4° pos.	2-1/2° to 3° pos	3-1/2° to 4° pos	4° to 5° pos	4° to 5° pos
Camber	0° to 1/2° neg	0° to 1/2° neg	1-1/2° to 2° neg	1-1/2° to 2° neg	0°	0°
Toe (total)	1/16” to 1/8” in	1/16” to 1/8” in	1/16” out to 1/16” in	1/16” out to 1/16” in	1/16” to 1/8” in	1/16” to 1/8” in

Our recommended alignment specs serve as a starting point for your particular application. Installed components, driver preference, and specific application will have a great affect on the correct settings for your vehicle.