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Revisions			
Rev.	Description	Date	Approved
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RAM HD Tie Rod

Installation Instructions



Applications:
 2014+ Ram 2500 4WD
 2013+ Ram 3500 4WD

TITLE:
RAM HD TIE ROD INSTALLATION INSTRUCTIONS

SIZE	DWG NO:	REV
A	8702-11-INST	B
	SCALE: N/A	PAGE 1 OF 8



Thank you for purchasing the best aftermarket products available for your vehicle. We strongly feel that the parts you are about to install should meet or exceed your expectations for performance. Proper assembly is critical to the performance of these components and the vehicle as a whole. Please take the time to carefully read these instructions and familiarize yourself with the installation procedure before working on your vehicle. If you have any questions PLEASE contact Synergy Manufacturing BEFORE beginning installation. Thanks again for supporting Synergy – enjoy the performance benefits of the best aftermarket products available for your vehicle!

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Modifying or otherwise altering vehicle components may cause the vehicle to handle differently than originally designed. It is the driver's responsibility to familiarize themselves with the performance and handling characteristics of the modified vehicle. Vehicles with larger diameter than stock tires must be driven carefully and cannot be expected to perform as stock or meet OEM performance with regard to handling, braking or crash performance. Ensure all replacement components are compatible with vehicle capacities so as not to overload components, especially tires. It is up to the individual to ensure that the vehicle and all components are compatible with the intended vehicle use, including load ratings, road conditions, and driver abilities. Thorough and frequent vehicle inspections are recommended to ensure a safe and reliable state of readiness, especially after off-highway use.



PARTS LIST

8702-11 RAM HD TIE ROD		
QTY	Part Number	Description
1	8702-01	RAM TIE ROD
1	4168-L	RAM 1 ¼-12 LH SHANK, SINGLE PLANE TIE ROD END
1	4138-L	RAM 1 ¼-12 LH SHANK TIE ROD END
1	3622-12-12-PL	DOUBLE ADJUSTER SLEEVE
1	PINCHBOLT-HDW-DOUBLE	PINCH BOLT HARDWARE KIT, DOUBLE
2	WTH-9	9/16" WASHER, EXTRA THICK

GENERAL NOTES

- These instructions are also available on our website; www.synergymfg.com. Check the website before you begin for any updated instructions and additional photos for your reference.
- Replacement tie rod ends and boots are available from Synergy MFG.
- When greasing tie rod ends, typically only one pump of grease is required. DO NOT fill dust boots with grease.
- The Synergy MFG heat treated tie rod replaces the factory tie rod in the factory location. The factory tie rod has an integrated steering stabilizer clamp. In order to use a steering stabilizer a 1 ¾" steering stabilizer clamp is required. We recommend the Synergy 4050-75 stabilizer clamp.
- The included thick washers are not required on all vehicles. Only install washers under the castle nut if the cotter pin does not engage on the castle nut.

TOOLS REQUIRED

- Basic Hand Tools – 22mm or 7/8", 21mm, 19mm or ¾", 18mm wrenches or sockets
- Tape Measure
- Hammer
- Tie Rod Separator tool (optional)

ESTIMATED INSTALLATION TIME

.5 Hour

INSTALLATION

1. The tie rod installation may be done with the truck on the ground. Make sure the vehicle is on level ground with the transmission in gear or in park, the parking brake set and the wheels chocked.
2. Remove steering stabilizer bolt from stock tie rod (18mm) and separate stabilizer from tie rod bracket. See **Figure 1**.



Figure 1. Steering Stabilizer Removed From Stock Tie Rod

3. Loosen tie rod end nuts (21mm) at the knuckle. Back the nuts off until they only have one or two complete turns of engagement. This will prevent the tie rod from falling when the taper separates.
4. Separate the tie rod ends from the steering knuckles by striking the steering arms with a large hammer or by using a tie rod separator tool. If using a hammer, do not strike the tie rod end. **Figure 1** shows the taper separated from the steering knuckle. Completely remove the tie rod from the steering knuckles and remove it from under the vehicle.
5. On the new Synergy tie rod, adjust the tie rod end on the non-double adjuster side (the side without the double adjuster sleeve) so the center of the joint is 2 1/4" from the end of the bar (it is left hand thread). See **Figure 2**. Compare the removed stock tie rod length to the new Synergy tie rod length. Adjust the Synergy tie rod length to match the stock tie rod length using the double adjuster sleeve (the silver hex adjuster), see **Figure 3**. You will need to hold the tie rod end from spinning and only allow the adjuster sleeve to turn. The adjuster is right hand thread into the bar. Turning the adjuster

will screw the adjuster out of the bar and the tie rod end out of the adjuster sleeve at the same time. Once the Synergy tie rod is the same length as the stock tie rod, proceed to the next step.



Figure 2. Tie Rod End Fully Threaded into Tie Rod



Figure 3. Double Adjuster Side of Tie Rod

6. Install the Synergy tie rod. The double adjuster **MUST** be installed on the driver's side of the vehicle (left side). See **Figure 8**. Snug the castle nuts. Check vehicle toe setting (See Step 12).



Figure 8. Double Adjuster on Drivers Side Knuckle

7. If the toe needs to be further adjusted, thread double adjuster assembly (silver nut on drivers side of tie rod) in or out of tie rod bar so that the toe setting is correct. **DO NOT THREAD THE TIE ROD END ON THE DOUBLE ADJUSTER SIDE MORE THAN 3" OUT OF BAR.** **Figure 9** shows the tie rod end adjusted out to approximately 3". The measurement is taken from the zerk fitting to the bar. If the bar must be adjusted longer, remove the tie rod end from the steering knuckle on the non-double adjuster side and thread that tie rod end out to a max of 2.75" (it is left hand thread). See **Figure 10**.



Figure 9. Double Adjuster Tie Rod End Max Extension



Figure 10. Non-Double Adjuster Tie Rod End Max Extension

8. Once the toe has been correctly set, torque tie rod end castle nuts (13/16") to 55 lb-ft and then further tighten a maximum of 1 slot or 60° in order to align the cotter pin hole. Do NOT use an impact gun. Never loosen castle nuts in order to align cotter pin holes. Install cotter pins.
9. If the cotter pin does not engage the castle nut, install one of the included thick washers under the castle nut to raise the slots up to the cotter pin hole. See **Figures 11 and 12**.



Figure 11. Cotter Pin Not Engaged in Castle Nut Slots



Figure 12. Washer Installed to Engage Cotter Pin and Castle Nut Slots

10. Finally, make sure that the tie rod is aligned so that the bends push the bar away from the axle and the pinch bolts are vertical and on the back side of the bar (towards the rear of the truck). See **Figure 13**. Torque both pinch bolts (3/4") to 60 ft-lbs. After tightening pinch bolts, put a wrench on the double adjuster sleeve and try to move the adjuster. Make sure the pinch bolt has adequately clamped onto the tie rod end shank so that the adjuster & tie rod are not movable. Tighten further if needed. Do not exceed 90 ft-lbs.



Figure 13. Tie Rod Aligned with Bend Forward and Pinch Bolts Back

11. Check toe settings again. We recommend about 1/8” of toe in. Toe-in is when the front of the tires are closer together than the rear of the tires.
12. Check all hardware after the first 100 miles of driving. Check all hardware and regrease joints at standard chassis lubrication intervals
13. Make an appointment with an alignment shop if you are not comfortable with self-aligning the truck.

Torque Table	
Castle Nuts	55 lb-ft
Pinch Bolts	60 lb-ft – 90 lb-ft