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Revisions			
Rev.	Description	Date	Approved
A	Initial Release Per ECO 18-046	5/29/18	A.S.



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	8702-01-INST	A
SCALE: N/A		PAGE 1 OF 7



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!

Synergy Manufacturing
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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

8702-01 RAM HD TIE ROD		
QTY	Part Number	Description
1	8702-01	RAM TIE ROD
2	4138-L	RAM 1 ¼-12 LH SHANK TIE ROD END
1	3622-12-12-PL	DOUBLE ADJUSTER SLEEVE
2	4134-02	LOW MISALIGNMENT TIE ROD END DUST BOOT AND CAP
2	N/A	½-20X1.75 HEX HEAD BOLT, GR8
2	N/A	½-20 TOP LOCK NUT

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 a integrated steering stabilizer clamp. In order to use a steering stabilizer a 1 ¾" steering stabilizer clamp is required. We recommend the Synergy 8703-01 stabilizer clamp.

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) all the way in (it is left hand thread). There will still be threads showing when the tie rod end shank bottoms out. **Figure 2** shows the tie rod fully threaded in. 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 tie rod end dust boots. Install the rubber cap first. Press down until it snaps into place. Coat the top of the boots and inside of the metal caps with grease and install the metal caps on top of the rubber caps. See **Figures 5 and 6**.



Figures 5 and 6. Dust Boots With Rubber and Metal Caps Installed

- Next, ensure that the bottom of the steering knuckle where the tie rod end bolts to is smooth and flat. Any burrs or deformation of the knuckle will prevent the tie rod end from seating properly. Lightly sand smooth if any irregularities are present.



Figure 7. Steering Knuckle Arm Sanded Flat

- Install the Synergy tie rod. It is recommended to install the double adjuster side of the tie rod on the driver's side of the vehicle (left side). Snug the castle nuts. Check vehicle toe setting (See Step 12).
- 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 3.5" OUT OF BAR.** **Figure 8** shows the tie rod end adjusted out to approximately 3 3/8". 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 (it is left hand thread).



Figure 8. Double Adjuster Tie Rod End Max Extension

- Once the toe has been correctly set, torque tie rod end castle nuts to 70 ft-lbs and then further tighten in order to align the cotter pin hole. Never loosen castle nuts in order to align cotter pin holes. Install cotter pins.

11. 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 9**. Torque both pinch bolts 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 9. Tie Rod Aligned with Bend Forward and Pinch Bolts Back

12. 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. The best way to measure toe is to mark a vertical line in the center of the tire tread on both front tires with a paint pen or silver sharpie. Measure the distance in between the lines. Jack up the front of the truck and rotate the tires 180 degrees, so the lines are facing the rear of the truck. Measure the distance between the lines again. The rear measurement should be approximately 1/8" more than the front. If you have any doubt, go have your truck aligned by a competent shop. Tires can wear very quickly and the truck can steer very poorly if the toe settings are not right. If the toe does need adjusting, loosen the double adjuster side pinch bolt and adjust the double adjuster sleeve. Once the toe is correct, re-torque the pinch bolt.

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A	Initial Release Per ECO 18-046	5/29/18	A.S.
B	Updated Image	10/9/2018	CS



RAM HD Steering Stabilizer Clamp

Installation Instructions

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



TITLE:
**RAM HD STEERING STABILIZER CLAMP
 INSTALLATION INSTRUCTIONS**

SIZE	DWG NO:	REV
A	8703-01-INST	B
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RAM HD STEERING STABILIZER CLAMP INSTALLATION INSTRUCTIONS

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PARTS LIST

8703-01 RAM HD STEERING STABILIZER CLAMP		
QTY	Part Number	Description
1	8703-01	RAM STEERING STABILIZER CLAMP
2	UB-5C-1813-0200	TIE ROD U-BOLTS
4	N/A	5/16-18 NYLOCK NUT
2	N/A	5/16 FLAT WASHER
2	N/A	1/2-20X2.5 HEX HEAD BOLT, GR8
2	N/A	1/2-20 TOP LOCK NUT
2	N/A	1/2 FLAT WASHER

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.
- This clamp is designed for use with the OEM stabilizer. Other stabilizers may also work, however fitment cannot be guaranteed.
- This clamp is designed to be used in conjunction with the Synergy 8702-01 Tie Rod.

TOOLS REQUIRED

- Basic Hand Tools –18mm, 19mm or 3/4”, 1/2” wrenches or sockets
- Painters Tape
- Sharpie or other pen
- Assistant

ESTIMATED INSTALLATION TIME

.5 Hour

INSTALLATION

1. These instructions assume that the vehicle already has a aftermarket 1.75" OD tie rod installed.
2. The steering stabilizer clamp 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.
3. Fully collapse the stock steering stabilizer. Turn the truck full lock to the driver side and have a assistant hold the wheel at full lock.
4. Place a strip of painters tape on the tie rod. Use a pen to mark the tape at the approximate centerline of the steering stabilizer mounting hole. See **Figure 1**.



Figure 1. Steering Stabilizer Fully Collapsed, Steering Full Lock Driver

5. Turn the truck full lock to the passenger side and fully extend the steering stabilizer. Place a mark on the tape at the approximate centerline of the stabilizer mounting hole. See **Figure 2**.



Figure 2. Steering Stabilizer Fully Extended, Steering Full Lock Passenger

6. Install the steering stabilizer clamp on to the stabilizer. Install the 1/2" bolt with a washer under the head as shown in **Figure 3**. The stabilizer will be offset towards the ground, with the bent side of the bracket pointing upwards.



Figure 3. Correct Orientation of Steering Stabilizer Clamp

7. Place the clamp against the tie rod, in between the tie rod and the axle housing. Loosely install the u-bolts and nuts with washers. Slightly compress the steering stabilizer so that the 1/2" mounting bolt is

centered between the marks on the tape. See **Figure 4**. The u-bolts should approximately line up with the lines on the tape.



Figure 4. Clamp Centered on Tie Rod

8. Remove the tape without moving the position of the clamp. Make sure the clamp is oriented so that the bolt is perpendicular to the ground. See **Figure 5**. Tighten the u-bolt hardware to 20lb-ft of torque. Tighten the ½” hardware to 80lb-ft.



Figure 5. Clamp Installed with Bolt Perpendicular to Ground

9. Installation is complete. Recheck all hardware after approximately 100 miles, or after each off-road trip.