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Revisions			
Rev.	Description	Date	Approved
-	Initial Release Per ECO 22-074	10-21-22	MB



Ford Super Duty HD Tie Rod

Installation Instructions

Applications:
 2005+ Ford F250 4WD
 2005+ Ford F350 4WD



TITLE:	FORD SUPER DUTY HD TIE ROD INSTALLATION INSTRUCTIONS	
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SIZE	DWG NO:	REV
A	8602-01-INST	-
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

8602-01 FORD SUPER DUTY HD TIE ROD		
QTY	Part Number	Description
1	860201-W01	FORD SUPER DUTY TIE ROD
1	4150-L	FORD1 1/4-12 LH SHANK TIE ROD END, SINGLE PLANE
1	3622-12-12-PL	DOUBLE ADJUSTER SLEEVE
1	4151-L	FORD1 1/4-12 LH SHANK TIE ROD END, THRU SHAFT
2	N/A	1/2-20X1.75 HEX HEAD BOLT, GR8
2	N/A	1/2-20 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.
- Stock 18 or 17 inch rims have very little clearance to the pinch bolts on the Synergy Tie Rod. To ensure the pinch bolts and hardware do not hit these rims, the fixed Tie Rod End must be threaded out 1-3/4" inches as measured from the end of the tube to the zerk fitting on the Tie Rod End. Larger Diameter rims and rims with less backspacing do not have this problem.
- When greasing tie rod ends, typically only one pump of grease is required. DO NOT fill dust boots with grease.

TOOLS REQUIRED

- Basic Hand Tools – 22mm or 7/8", 21mm, 19mm or 3/4", 18mm wrenches or sockets
- Tape Measure
- Hammer
- Tie Rod Separator tool (optional)

ESTIMATED INSTALLATION TIME

.5 Hour

INSTALLATION

1. Raise and securely support the front of the vehicle.
2. Remove the front wheels.
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, see **Figure 1 and 2**. Completely remove the tie rod from the steering knuckles and remove it from under the vehicle.



Figure 1. Separating Passengers Side



Figure 2. Separating Drivers Side

5. On the new Synergy tie rod, adjust the tie rod end on the side without the double adjuster sleeve to at least 1-3/4 inches out if running stock 18" or 17" rims. See **Figure 3**. 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). 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 counter clockwise 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 3. Passenger Tie Rod at Minimum Length for 17" or 18" Rims.

6. Install the Synergy tie rod. The double adjuster **MUST** be installed on the passenger's side of the vehicle (right side). Torque the castle nuts to 70 lb-ft and then further tighten to align the cotter pin hole. Never loosen castle nuts to align cotter pin holes. Install cotter pins.
7. The tie rod should be rotated to align the bends to push the bar away from the axle and the pinch bolts are vertical and on the front side of the bar (towards the front of the truck). Tighten the Drivers side pinch bolt to 60 lb-ft. This should lock the alignment in place. Tighten further if needed. Do not exceed 90 lb-ft. See **Figure 4**.

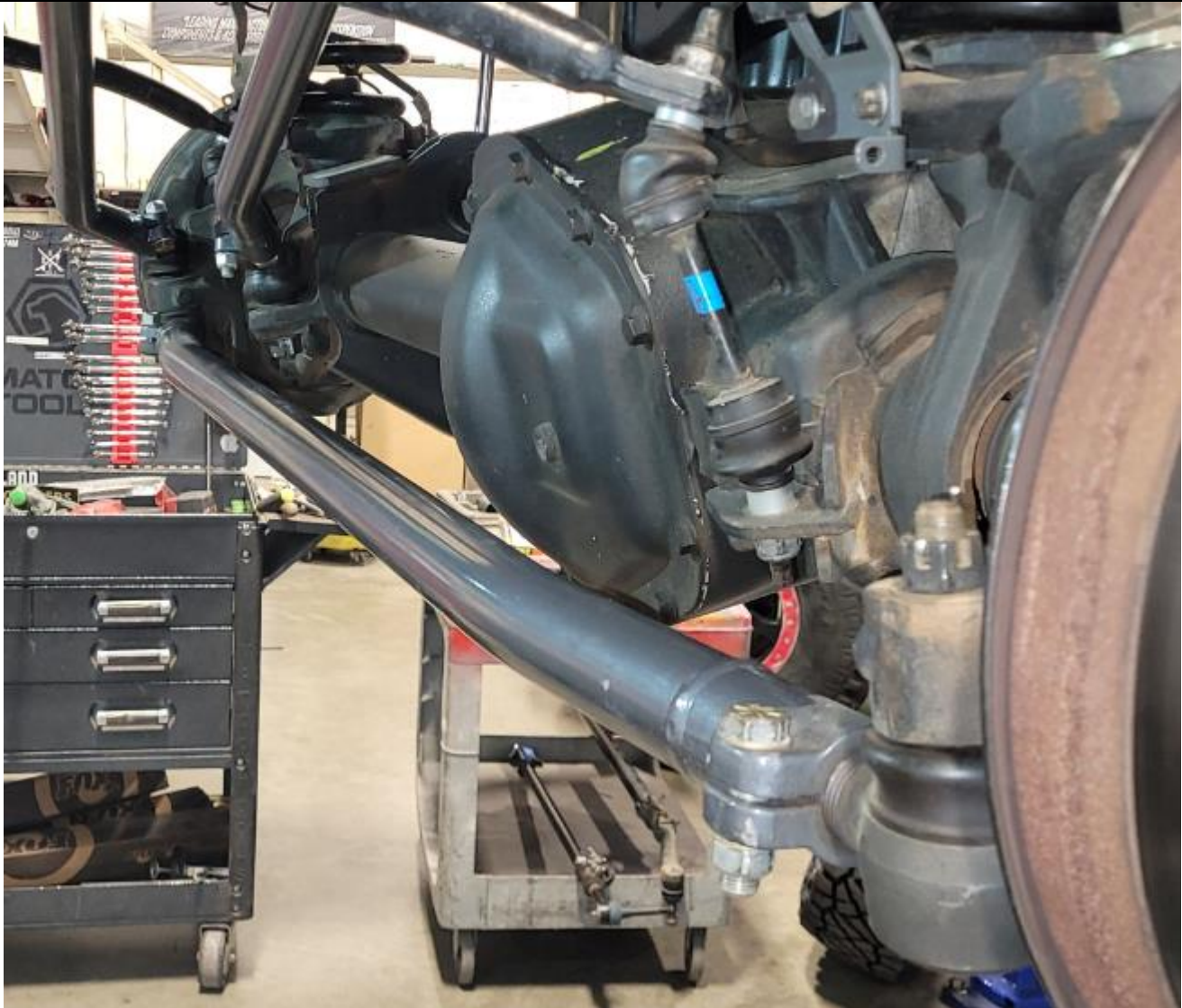


Figure 4. Aligned Tie Rod with Drivers Side Pinch Bolt Tight.

8. Adjust the toe by turning the double adjuster assembly (silver nut on passengers 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 2-5/8" out of bar. **Figure 5** shows the double adjuster side tie rod end adjusted out to maximum safe limit. 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). Do not thread the tie rod end on the non-double adjuster side more than 2-3/4" out of bar. **Figure 6** shows the non-double adjuster side tie rod end adjusted out to maximum safe limit.



Figure 5. Double Adjuster Tie Rod End Maximum Extension.

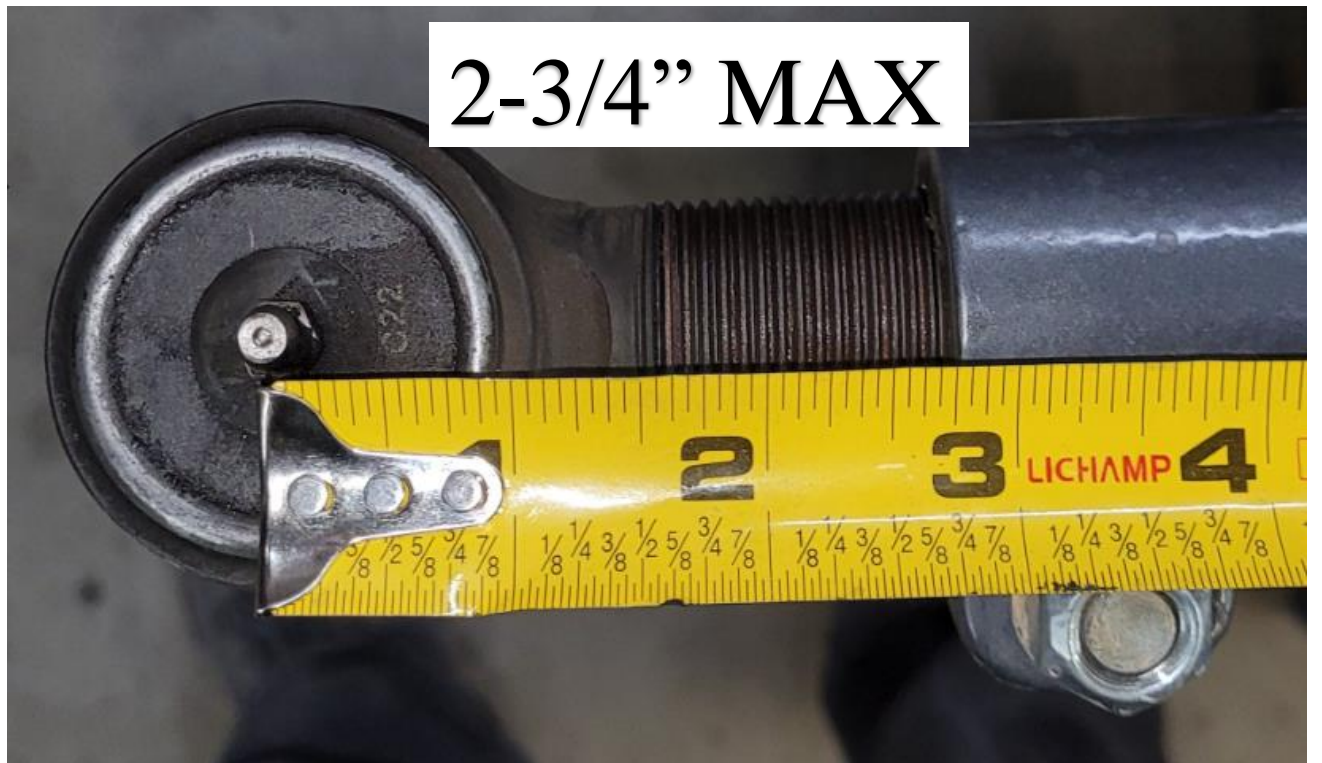


Figure 6. NON-Double Adjuster Tie Rod End Maximum Extension



FORD SUPER DUTY HD TIE ROD INSTALLATION INSTRUCTIONS

9. Once alignment has been set, tighten the passenger's side pinch bolt to 60 lb-ft. This should lock the double adjuster in place. Tighten further if needed. Do not exceed 90 lb-ft.
10. Reinstall the wheels, snug the lug nuts.
11. Turn the wheels to full lock passenger side and spin the front wheels. Verify that the pinch bolts and forgings do not interfere with the rim or rim weights. If there is interference remove the tie rod and adjust out the driver's side tie rod end. Re-set the toe alignment and reperform the test. Perform the same test with the wheels turned full lock to the driver's side.
12. Set the truck on the ground and torque the lug nuts to the factory spec of 165 lb-ft or if the wheels are aftermarket, to the aftermarket specification.
13. Re-check all hardware after approximately 100 miles of driving. Re-check again after each off-road trip.

Installation is complete!

Table 1. Ford Super Tie Rod Bolt Torques

Bolted Joint Location	Wrench Size	Torque
Passenger Side Tie Rod End	22mm	70lb-ft.
Driver Side Tie Rod End	21mm	70lb-ft.
Adjuster Pinch Bolt	3/4"	60 to 90 lb-ft