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Revisions

Rev.	Description	Date	Approved
-	Initial Release Per ECO 24-056	8/15/24	MB
A	Updated per ECO24-061	8/30/24	MB



Ford Super Duty F-250 and F-350

HD Tie Rod

Installation Instructions

Applications:

1999-2004 Ford F-250 4WD

1999-2004 Ford F-350 4WD



TITLE:

**FSD F-250 AND F-350 HD TIE ROD
INSTALLATION INSTRUCTIONS**

SIZE

DWG NO:

REV

A

7502-01-INST

A

SCALE: N/A

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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

7502-01 FSD 99-04 F-250 AND F-350 HD TIE ROD		
QTY	Part Number	Description
1	750201-W01	FORD, SUPER DUTY, 99-04, HD TIE ROD
1	4163-L	JEEP JL STEERING KNUCKLE TRE
1	3622-10-14-PL	DOUBLE ADJUSTER SLEEVE
1	4167-L	JEEP JL TIE ROD SINGLE PLANE TRE CAM FOLLOWER STYLE
2	N/A	1/2-20X1.75 HEX HEAD BOLT, GR8
2	N/A	1/2-20 TOP LOCK NUT
4	N/A	1/2 WASHER NAS1149-F0863P
1	7502-00	FORD, SUPER DUTY, 99-04, HD TIE ROD, TRE WASHER .300 THICK, PAIR

GENERAL NOTES

- These instructions are also available on our website; www.synergymfg.com. Check the website before you begin for any updated instructions, additional photos for your reference and installation videos.
- The Synergy Tie Rod is compatible with the stock drag link
- 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: Socket set and Wrench Set
- Tape Measure
- Hammer
- Torque Wrench
- Tie Rod Separator tool (optional)

ESTIMATED INSTALLATION TIME

1 Hour

INSTALLATION

1. Raise and securely support the front of the vehicle.
2. Remove the front wheels.
3. Loosen the rod end castle nuts on the drag link, leave a few threads engaged so the drag link will not fall when the taper is separated.
4. Separate the rod end taper from the tie rod by striking the tie rod close to the taper with a large hammer or by using a tie rod separator tool. If using a hammer, do not strike the rod end. Completely remove the rod end from the tie rod and hang it out of the way.
5. Remove the factory steering stabilizer by removing the nut from the plate on the axle side only, the axle side steering stabilizer mount will not be reused.
6. Loosen the rod end castle nuts on the tie rod, leave a few threads engaged so the tie rod will not fall when the taper is separated.
7. Separate the 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,
8. Completely remove the tie rod from the steering knuckles and remove it from under the vehicle.
9. On the new Synergy tie rod, adjust the rod end on the side without the double adjuster sleeve in as far as it will go.
10. Compare the 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 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.
11. Install the Synergy tie rod. Use a .3" thick washer under each castle nut. The double adjuster **MUST** be installed on the driver'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.
12. The tie rod should be rotated to align the bends to facing down and the taper for the drag link facing forward. Tighten the passenger 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 1**.



Figure 1. Aligned Tie Rod with Passenger Side Pinch Bolt Tight.

13. Turn the steering to full lock drivers' side and hold it in place. A strap around a lug nut can be used if help is not available.
14. Fully extend the steering stabilizer.
15. Install the 4050-50 clamp on the axle using the supplied socket head cap screws with the 1/2" hole on the passenger side . Leave the bolts loose enough to easily slide the clamp on the bar.
16. Slide the 4050-50 clamp to the fully extended steering stabilizer and line up the 1/2 hole.
17. Tighten the socket head cap screws to 15 lb-ft to lock the clamp in place.
18. Install the steering stabilizer to the clamp using the the supplied 1/2" bolt, tighten to 50 lb-ft.
19. 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 rod end on the double adjuster side more than 3-1/8" out of bar. **Figure 2** 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 passenger side 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 3** shows the non-double adjuster side tie rod end adjusted out to maximum safe limit.



Figure 2. Double Adjuster Tie Rod End Maximum Extension.



Figure 3. NON-Double Adjuster Tie Rod End Maximum Extension

20. 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.
21. Reinstall the drag link rod end into the taper in the tie rod. Torque the castle nuts to 70 lb-ft and then further tighten to align the cotter pin hole. Install cotter pins.
22. Reinstall the wheels, snug the lug nuts.
23. **(OPTIONAL for 4050-50 Clamp)** 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.
24. Set the truck on the ground and torque the lug nuts to the factory spec of 165 lb-ft.
25. Take the truck on a test drive. If the wheel is not straight, and you are using a synergy drag link, loosen the pinch bolt at the pitman arm and use the double adjuster to correct. If the steering wheel needs to turn to the right, turn the double adjuster to the right, or clockwise. If it needs to go left, then turn the adjuster left, or counter clockwise. Ensure the bar is oriented correctly before re-tightening the pinch bolt. If the factory drag link is being used, follow the factory wheel straightening procedure.
26. 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	Torque
Passenger Side Tie Rod End	70lb-ft.
Driver Side Tie Rod End	70lb-ft.
Adjuster Pinch Bolt	60 to 90 lb-ft
5/16-18 x 1.0" Socket Head Cap Screw	15 lb-ft
1/2 – 20 x 2.0 Steering Stabilizer Bolt	50 lb-ft