

# Heavy Duty Over the Knuckle Steering System Installation Instructions

(Heavy Duty 5/8" Version)



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*Fits: 97-06 Jeep Wrangler TJ with 3-8" of lift height, 84-01 Jeep Cherokee XJ with 3-8" of lift height, and 95-98 Jeep Grand Cherokee ZJ. See step 1 for further fitment requirements.*



## Shipping Checklist:

**\*Box 1 (48x4x4)\***

- Instructions
- Invoice
- Iron Rock Off Road logo decal (2)
- OTK Tie Rod [about 49" long] (1)
- OTK Drag Link [about 33 1/4" long] (1)
- QA1 XMR10-12 Spherical rod end (2)
- QA1 XMR12 Spherical rod end (2)
- IRO HD 7/8" male LH x 3/4" female RH double adjuster (1)

## Hardware Kit 64 (OTK 5/8" version)

- 3/4-16 right hand thread jam nut (2)
- M12 x 100mm hex bolt (1)
- 7/16 USS washer (3)
- 12mm shock sleeve (1)
- 5/8" high misalignment washer (4)
- 5/8" x 5" gr8 hex bolt (1) (at passenger knuckle)
- 5/8" x 4" gr8 hex bolt (1) (at pitman arm)
- 5/8" x 3 1/2" gr8 hex bolt (1) (at driver side knuckle)
- 5/8" gr8 hex nut (3)
- 5/8" gr8 nylock nut (3)
- 5/8" USS washer (4)
- Steering clamps (4)
- M12 x 60 hex bolt (3)
- M12 hex nut (4)

## Before you begin:

1. Read and understand all installation instructions.
2. If you have any questions before, during, or after installation contact Iron Rock Off Road (see contact information above).
3. **\*\*\*Ensure that all parts are present and in good condition\*\*\***

## Prepare the parts for installation:

4. Measure from center of drag link stud to center of tie rod stud (on the top side of each steering knuckle) and record that length here \_\_\_\_\_. You will need this measurement later when adjusting the new tie rod.
5. Apply anti-seize compound to the threads of all spherical rod ends (heim joints) and double adjuster.
6. Install a steering clamp onto the tie rod for the steering stabilizer. Orientation of the clamp is irrelevant.
7. Install jam nuts finger tight onto the two rod ends with the smaller 5/8" through hole. Install these rod ends into the tie rod. Adjust the tie rod to the measurement from step 5 above, taking care to adjust both rod ends equally and that your measurement is from center of bolt hole to center of bolt hole. Do not tighten jam nuts yet.
8. Place a steering clamp onto drag link at axle end, and thread one rod end into that end of drag link. Leave 1/2" to 5/8" of thread exposed.

## Fitment Requirements:

- a. 1 1/4" wheel spacer with OEM wheels, or less than 4 1/2" backspacing for 15" wheels, for wheels over 15", most backspacing amounts will work
- b. 3 to 8" suspension lift height. A drop pitman arm will change this requirement by the amount of drop provided.

9. Assemble double adjuster into other end of drag link and place one steering clamp onto drag link and one onto double adjuster.
10. Thread rod end into double adjuster.
11. Place an M12x60mm bolt in each steering clamp except the one on the tie rod that is for the steering stabilizer.

### **Removal of existing tie rod:**

12. Raise the front end of the vehicle slightly off the ground and secure on jack stands.
13. Remove tires for easiest installation.
14. Remove the factory tie rod and drag link (including tie rod ends and drag link end of steering stabilizer).
15. Remove the stud from the end of the steering stabilizer (it may be necessary to cut the stud to remove it on OEM steering stabilizers).

### **Installation:**

16. Drill all three mounting holes using a 5/8" drill bit. Peck drill and use plenty of oil. Be sure to drill the holes straight in both directions.
17. Clean up mounting surfaces for all spherical rod ends using a file. Mounting surfaces must be flat and free of high spots. Be sure to include the bottom of the pitman arm, the top of the driver's side knuckle, and the top and bottom of the passenger side knuckle.
18. Install the driver's side of the tie rod first. Use the following procedure:
  - a. Locate the 5/8 x 3-1/2" bolt, two 5/8" flat washers, and one 5/8" hex nut.
  - b. Place the bolt through the knuckle from the bottom.
  - c. Place a washer over the bolt on top of the knuckle
  - d. Place the spherical rod end onto the bolt.
  - e. Place another 5/8" washer onto the bolt.
  - f. Install the 5/8" hex nut and tighten firmly (will be re-torqued later).
19. Locate the drag link and ensure that all three clamps are in place. Ensure that rod end at axle side (axle side has no double adjuster) has 1/2" to 5/8" of rod end threads exposed.
20. Install passenger side of tie rod and drag link using the following procedure:
  - a. Locate the 5/8 x 5" bolt, two 5/8" flat washers, one 5/8" hex nut, one 5/8" nylock nut, and two high misalignment washers.
  - b. Place a high misalignment washer onto the bolt.
  - c. Place the bolt into the drag link rod end.
  - d. Place another high misalignment washer onto the bolt.
  - e. Place the bolt through the knuckle from the bottom.
  - f. Place a washer over the bolt on top of the knuckle.
  - g. Place the spherical rod end of the tie rod onto the bolt.
  - h. Place another 5/8" washer onto the bolt.
  - i. Apply high strength threadlocker to the bolt such as lock-tite red.
  - j. Install the 5/8" hex nut and torque to 140 ft/lbs.
  - k. Install the 5/8" nylock nut and torque to 140 ft/lbs.
21. Install drag link at pitman arm using the following procedure:
  - a. Locate the 5/8 x 4" bolt, one 5/8" hex nut, one 5/8" nylock nut, and two high misalignment washers.
  - b. Install the second clamp on the drag link.
  - c. Place a high misalignment washer onto the bolt.
  - d. Place the bolt into the drag link rod end.
  - e. Place another high misalignment washer onto the bolt.
  - f. Place the bolt through the pitman arm from the bottom.
  - g. Apply high strength threadlocker to the bolt such as Lock-tite red.
  - h. Install the 5/8" hex nut and torque to 140 ft/lbs.
  - i. Install the 5/8" nylock nut and torque to 140 ft/lbs.
22. Tighten steering clamp on passenger side drag link end with the drag link at a 5 degree upward angle on the drag link where it meets the rod end. Meaning the drag link angles only up and forward from the rod end, not down then back up. The rod end should be pivoted so that the drag link can never drop below this 5 degree angle.
23. Torque steering clamp to 70 ft/lbs.
24. Install wheels and tighten firmly (they will likely need to be removed).

### **Alignment Procedure:**

\*\*\*A professional alignment is recommended and will result in the safest handling and minimized tire wear. As a temporary solution, with careful measurements you can set your toe-in fairly accurately using a tape measure.\*\*\*

25. Make sure the vehicle is on a level surface and the front tires are raised slightly off the ground.
26. Make a mark anywhere on the tread area of each front tire. The marks do not have to be in the same spot on each tire. This method insures that your measurements are accurate regardless of rim and tire run-out, even bent rims or untrue tires will not affect the measurement.
27. Measure from one mark to the other making sure your measurement is parallel to the axle housing and your marks are facing exactly forward. This is your front measurement.
28. Rotate tires so the marks are facing exactly backward. Measure from one mark to the other making sure your measurement is parallel to the front axle housing. This is your rear measurement.
29. **For 29-32" tire diameter** (measured): adjust your tie rod until the front measurement is 1/16" less than your rear measurement. Adjustment can be done by removing only the driver's side bolt and you can turn the whole tie rod if needed to adjust both sides equally.



**For 33-36" tire diameter** (measured): adjust your tie rod until the front measurement is 1/8" less than your rear measurement. Adjustment can be done by removing only the driver's side bolt and you can turn the whole tie rod if needed to adjust both sides equally.

**30. Ensure that both spherical rod ends are parallel to each other (both should be rotated down against the hard stop).**

31. Tighten both jam nuts very tightly on the tie rod (do not tighten drag link clamps at this time).

32. Re-check your measurements.

33. Remove the 5/8" nut from the driver's side rod end mounting bolt.

34. Apply high strength threadlocker.

35. Install 5/8" hex nut and torque to 140 ft./lbs.

36. Install 5/8" nylock nut and torque to 140 ft./lbs.

37. Lower your vehicle from the jack stands.

38. Ensure that tires are facing exactly forward (not turned left or right).

39. Adjust drag link double adjuster until steering wheel is centered.

**40. Ensure that both drag link spherical rod ends are parallel to each other (both should be rotated down against the hard stop).**

41. Torque clamps on double adjuster to 70 ft/lbs.

**Install Steering Stabilizer:**

42. Lubricate steering stabilizer bushing with multi-purpose grease and insert provided m12 shock bushing sleeve.

43. Adjust steering stabilizer to the exact center of its travel range.

44. Ensure tires face straight forward (not turned either direction).

45. Move clamp to meet steering stabilizer. Bolt together using m12 x 100 hex bolt with a washer on each side of the rubber steering stabilizer bushing and a washer between the clamp and the bolt head.

46. Torque nut to 80ft/lbs.

47. Torque wheel lug nuts to spec.

48. Ensure that all bolts and jam nuts have been tightened to their proper torque specs.

**\*\*\*!!! Important Safety Warning!!!\*\*\***

Always ensure that rod end and double adjuster threads have adequate thread engagement for strength. Thread engagement must be greater than the diameter of the threads. Before driving vehicle check for clearance between steering components and wheels or any other objects at all steering positions including lock to lock steering in both directions.

