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Hybrid Steering Shaft, SN95 Rack in Fox Chassis (MMST-13)

Read all instructions before beginning work. Following instructions in the proper sequence will ensure the best and easiest installation.

With this MM Hybrid Steering Shaft Assembly, a steering rack from a 1994-2004 Mustang can now be easily installed in a Fox chassis (1979-1993) Mustang. The MM hybrid shaft assembly has the correct lower U-joint to connect to the unique triangular-shaped input shaft of the 1994-2004 steering racks. This MM hybrid assembly also features a splined shaft to allow the steering wheel to be clocked correctly. This feature is required to properly center the steering wheel when a 1994-2004 steering rack is installed in a Fox chassis Mustang. The stock steering wheel and airbag (if so equipped) are not disturbed.

The MM Hybrid Steering Shaft Assembly is constructed with all of the great features of our other high performance steering shaft assemblies. It eliminates the troublesome setscrews used by all other aftermarket steering shaft assemblies. That's right, *no setscrews!* Instead, we secure the U-joints by welding them to the shafts. We attach the steering shaft assembly to the steering rack with a pinch-bolt, just like Ford did with the stock steering shaft assembly.

An added bonus with the MM Steering Shaft is the addition of a telescoping center section. This collapsible section eases installation, improves fitment with aftermarket k-members, and improves safety in the event of an accident.

Improving Performance Over the Stock Steering Shaft

The stock Mustang steering shaft has a rubber rag joint that flexes, giving the steering wheel a vague and imprecise feeling. On many cars it causes enough play that the steering wheel can be moved an uncomfortable amount before causing the tires to change direction. Replacing the rubber rag-joint with a race-quality needle-bearing U-joint sharpens steering response. The car will respond much more quickly to the driver's steering inputs.

Required Parts

Fox chassis tie-rods are required for use with Fox length control arms because the SN95 (1994-2004) tie-rods are too long. The correct length tie-rods can be easily swapped into place because the inner threaded connection, where the tie-rod attaches to the steering rack, is the same.

The threads on the tie-rods, where the outer tie-rod ends attach, are different between the SN95 tie-rods and the Fox tie-rods. The choice of tie-rod will dictate which outer tie-rod ends must be used.

For those using the longer SN95 front control arms on their Fox Mustang, and who will be using an adjustable outer tie-rod end bumpsteer kit, there are two options to choose among for tie-rods and outer tie-rod ends. The longer SN95 tie-rods can be used, which will require an SN95 adjustable outer tie-rod end kit. Or, the shorter Fox tie-rods can be used, along with our MMTR-6 Tie-Rod End Kit. This kit has a longer aluminum adapter sleeve that allows the shorter Fox tie-rod to work with the longer SN95 front control arms.

Rack Centering

For high performance driving it is important that the steering rack be centered. "Centered" means that the rack has equal amounts of travel in both directions. If the steering wheel is not centered when the car is driven in a straight line (on a flat, uncrowned road surface) then the rack is not centered. Another symptom of an un-centered rack is a difference in

the amount of turns of the steering wheel required to turn to full lock in each direction (assuming the tires are not hitting part of the chassis as full steering lock is approached). Besides causing the minimum turning radius to be different in each direction, an un-centered steering rack will also cause the bumpsteer to be different from side to side. This will result in asymmetrical handling characteristics.

NOTE: It is possible for the rack to be un-centered, yet still have the correct toe setting.

After centering the steering rack, we recommend that the toe setting be adjusted upon completion of the steering shaft installation. With the rack properly centered, and the toe correctly adjusted, the steering wheel will be centered when driving in a straight line (on a flat, uncrowned road surface). The steering wheel will also have the same number of turns to full lock, in each direction.

NOTE: This steering shaft is only intended for installation on 1979-93 Mustangs using a 1994-04 steering rack.

1. Raise the front of the car and place it safely on jack stands.

2. Remove the front wheels from the vehicle.

3. Remove the nut and bolt that connects the upper stub of the stock steering shaft to the steering column. Be sure to retain the factory nut and bolt for later use.

NOTE: While it is possible to use two wrenches, it is easier to use a very long extension and a ratchet. If necessary, rotate the steering wheel to orient the bolt for the best access. Completely remove the bolt and nut. Set them aside, as they will be reused to attach the new MM Steering Shaft.

4. Remove the pinch-bolt that connects the stock steering shaft to the rack input shaft.

5. Remove the stock steering rack from the vehicle. For guidance, refer to a shop manual. Cap the exposed fluid lines.

NOTE: Be sure to retain the factory nuts and bolts that retain the steering rack to the k-member.

6. Remove the stock steering shaft from the vehicle.

NOTE: This may be difficult, as the upper stub of the steering shaft is clamped inside of the hollow steering column. The tight fit of the stub shaft in the steering column can make it difficult to pull the shaft out of the column. In some cases it may be necessary to use a hammer to tap on the steering shaft to remove the shaft from the column.

7. Begin installing your 1994-04 steering rack by connecting the fluid lines.

NOTE: MM highly recommends that new Teflon® seals be placed on the power steering hydraulic line fittings. If new seals did not come with your steering rack, purchase them from your local Ford dealer. Note that there are two sizes, to fit the two different rack fittings.

8. Install your 1994-04 rack onto the vehicle using the factory bolts retained in Step 5. Torque the mounting bolts to 40 ft-lbs. If using aluminum or urethane rack bushings, follow the manufacturer's installation instructions.

NOTE: Due to the collapsible feature of the MM Hybrid Steering Shaft, the steering shaft can be installed after the rack has been properly positioned.

9. Prior to installation of the MM Hybrid Steering Shaft, collapse the shaft by firmly pushing the two U-joints towards each other. Remove the pinch-bolts from both the upper and lower U-joints of the MM Hybrid Steering Shaft.

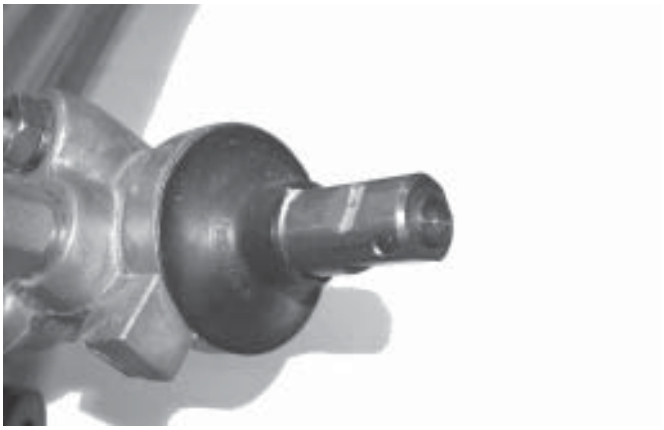
NOTE: The lower U-joint cannot be slipped onto the steering rack input shaft if the pinch-bolt is in place.

10. Remove the splined upper stub shaft from the upper U-joint. It will be installed next, separately from the lower portion of the steering shaft assembly.

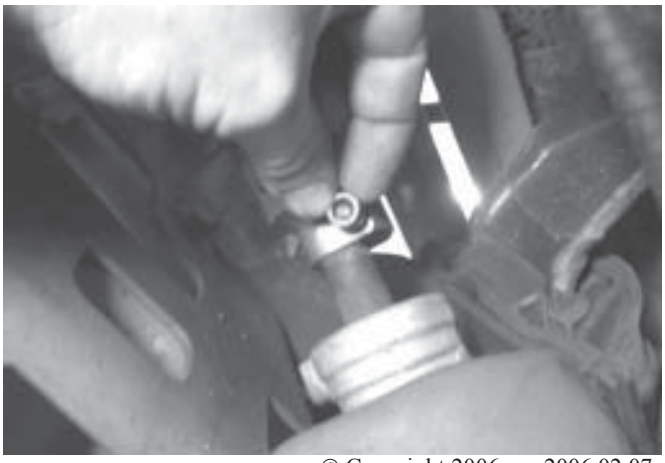
11. Install the splined upper stub shaft into the steering column. It will only fit in one orientation.

12. Install the retaining bolt and nut (removed in Step 3) onto the steering column and hand tighten.

13. Install the lower portion of the MM Hybrid Steering Shaft assembly onto the input shaft of the steering rack. It will only fit in one orientation.



14. Install the pinch bolt removed in Step 9 into the lower U-joint and torque to 24 ft-lbs. The pinch bolt can only be inserted when the lower U-joint is properly positioned on the rack input shaft.



Centering the Steering Rack

The following step-by-step procedure details how to ensure that the steering rack is centered.

15. Orient the steering wheel so it is pointed in the "straight-ahead" position.

16. Extend the MM hybrid steering shaft's telescoping section enough to allow the upper U-joint to slip over the splines of the upper stub shaft.

NOTE: When connecting the upper U-joint to the upper stub shaft, it is not necessary for the splines to be fully engaged at this time. They must only be engaged enough to allow the steering wheel turn the steering rack from full-lock to full-lock, as part of the procedure for centering the rack. The upper U-joint pinch-bolt does not need to be installed at this time.

17. Rotate the steering wheel clockwise until full lock is reached.

18. Place a piece of tape on the current twelve o'clock position of the steering wheel and mark the letter "A" on the tape.

19. Rotate the steering wheel counter-clockwise until full lock is reached. For future reference (in Step 20), count the number of turns required to turn the steering wheel from full lock to full lock.

20. While holding the wheel at full-lock in the counter-clockwise direction, place a piece of tape on the steering wheel in its current twelve o'clock position. Mark the letter "B" on the tape.

21. Divide the number of turns required to go from full lock to full lock in Step 19 by 2.

22. From the counter-clockwise full lock position, turn the steering wheel clockwise the amount calculated in Step 21.

23. Double-check: If you have done this correctly, the "A" and "B" tape marks on the steering wheel will now be an equal distance away from the twelve o'clock position. If not, repeat the centering procedure, and determine where you made an error.

NOTE: The previously described procedure will center the steering rack. It does NOT correctly clock the steering wheel. The following procedure details how to properly clock the steering wheel.

24. Remove the tape from the steering wheel.

25. After Step 23 the steering rack will be centered. Without rotating the input shaft of the steering rack, disconnect the upper U-joint from the splined upper stub shaft, by collapsing the telescoping section.

26. Rotate the steering wheel so that it is centered in the “straight-ahead” position.

27. Reconnect the upper U-joint to the upper stub shaft by extending the telescoping steering shaft enough to slip the splines together. Make sure that the splined upper stub shaft is completely inserted into the splined upper U-joint. If not fully inserted, the pinch-bolt cannot be inserted into the U-joint.

NOTE: The hollow shaft of the steering column is designed to be collapsible and sometimes gets extended or compressed from its stock location during removal of the stock steering shaft. If you find that it is impossible to fully insert the splined upper stub into the splined upper U-joint, you will have to extend the hollow shaft of the steering column by pulling it forward, out of the firewall. It is easiest to accomplish this by grabbing the shaft with a set of pliers and gently tapping the pliers with a hammer until the shaft has been extended the required distance.

28. Insert the pinch-bolt into the upper U-joint to secure it to the upper stub shaft. The pinch-bolt can only be inserted when the upper U-joint is properly positioned on the upper stub shaft. Torque the pinch-bolt to 24 ft-lbs.

29. Torque the bolt clamping the steering column to the splined upper stub shaft to 54 ft-lbs.

NOTE: Be sure the bolt is properly tightened: Tightening this bolt can be difficult because it squeezes the steering column onto the steering shaft inside. That squeezing action can mislead the torque wrench into “clicking” early, before the bolt is actually tightened enough. If the bolt is not properly tightened it will cause some looseness in the steering feel. It can also cause some noise, as the steering shaft will essentially be rattling around inside the steering column.

30. Complete the installation of the steering rack by filling the system with power steering fluid, and bleeding it of air, as per the shop manual.

31. If not already done, install the chosen inner and outer tie-rod ends as per the manufacturer’s installation instructions.

32. Reinstall the front wheels, and torque the lug nuts.

33. Safely lower the car to the ground.

34. Reset the front toe of the vehicle and test drive on a flat, uncrowned road to ensure that the steering wheel is centered.

NOTE: To prevent corrosion, either paint the MM Steering Shaft, or periodically spray it with rust-inhibiting oil.

<u>This kit includes:</u>

1 MM Hybrid Steering Shaft

