

## Steering Shaft Assembly, Power Steering Rack, 1979-93 Mustang (MMST-11)

### Instructions



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

The MM Engineering Team designed a new steering shaft that does not use setscrews. That's right, *no setscrews!* Instead, the U-joints are attached by welding them to the shafts. The steering shaft assembly is attached to the steering rack with a pinch-bolt, just like Ford did with the stock steering shaft assembly. Unlike the stock steering shaft, the MM Steering Shaft also has a telescoping section to allow adjusting its length.

### Preparation

The MM Steering Shaft is manufactured with a bare steel finish. If desired, it can be painted before installation. Please follow these guidelines to avoid damage to the steering shaft:

- Collapse the telescoping section of the shaft approximately half-way, without removing the plastic dust boot.
- Wipe off any grease or oil.
- Mask off the end of the lower u-joint and the last inch of the upper stub shaft so they do not get painted.
- Paint the steering shaft and allow it to fully dry before installation.



**WARNING:** If the steering wheel is rotated too many revolutions in either direction the electrical wires (known as the clock spring) that connect to the airbag, horn, and other electrical controls will be severed. From the factory, the steering wheel is centered within it's rotational range. It is important not to lose this position while the steering wheel is disconnected from the steering rack.

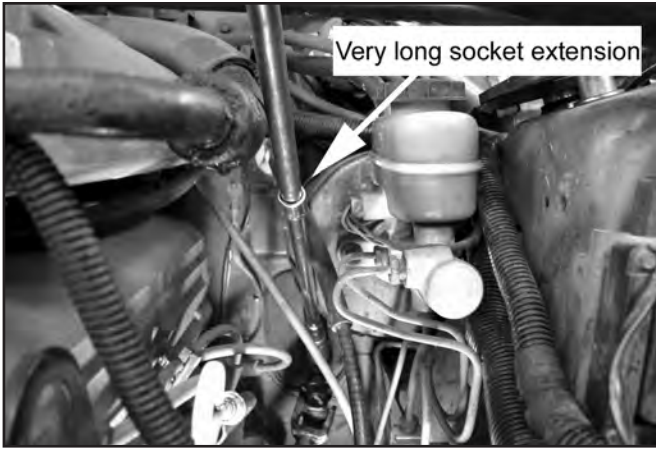
**NOTE:** You must consult a factory manual on the procedure for centering the clock spring should the steering wheel's center position be lost.

1. Raise the front of the car and place it safely on jack stands.
2. Remove the bolt and nut that attaches the steering shaft to the steering column. The attachment bolt is located close to the firewall. The bolt and nut will be reused to attach the MM Steering Shaft.

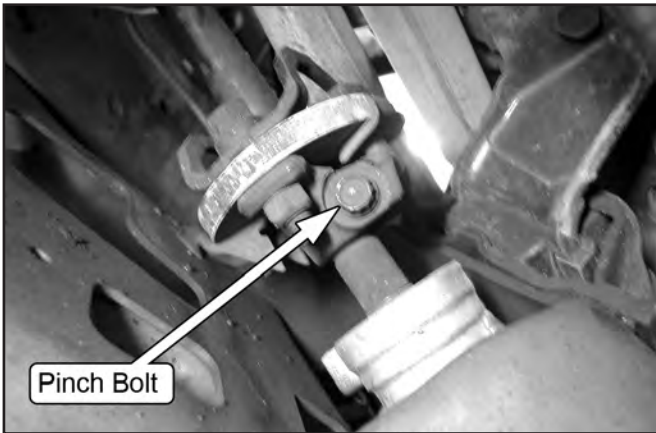


**NOTE:** While it is possible to use two wrenches, it is easier to use a very long extension and a ratchet.





3. Disconnect the steering shaft from the steering rack input shaft by removing the pinch bolt.



*NOTE: Most aftermarket steering shafts are secured to the input shaft with a setscrew and jam nut. Loosen the jam nut, and back out the setscrew.*



4. Rotate the steering wheel so that the front tires are steered straight ahead.

5. Remove the two nuts from the bolts that hold the steering rack to the K-member.



6. Pull the steering rack forward just far enough to allow the steering shaft to slip off of the steering rack input shaft. It is not necessary to disconnect the power steering system hoses.

7. Remove the steering shaft from the car by pulling it out of the steering column.

*NOTE: In some cases it may be necessary to tap on the steering shaft with a hammer to remove it from the column. Make sure that the steering column does not pull out of the firewall.*

8. Prior to installation, remove the pinch-bolt from the lower U-joint of the MM Steering Shaft. The lower U-joint cannot be slipped onto the steering rack input shaft if the pinch-bolt is in place.

9. Collapse the MM Steering Shaft to its shortest length.

10. Begin installation by inserting the upper stub shaft into the steering column. It will only fit in one orientation. Slip the stub up far enough that the bolt holes align with each other.

*NOTE: Lightly tapping on the top half of the upper U-joint with a hammer may be required. Do not tap anywhere below cross-axis joint as impact loads from the hammer will damage the needle bearings.*

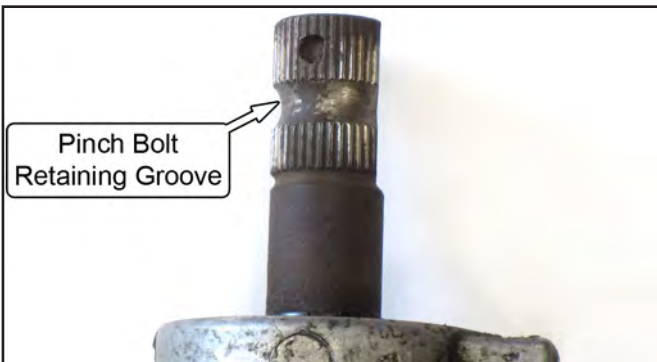
*NOTE: Sometimes the force of inserting the stub shaft into the steering column will shorten the steering column. This can occur because the steering column itself contains a collapsible section. If the column shortens excessively, it can be pulled out of the firewall after the steering shaft is secured.*



11. Once the bolt holes are aligned, insert the original retaining bolt and nut. The bolt will be torqued at a later step.
12. While placing the steering rack back into position against the k-member, simultaneously guide the lower U-joint of the MM Steering Shaft onto the input shaft of the steering rack. Try not to rotate the shaft, as that will disturb the orientation of the steering wheel. Once the steering rack is in position against the k-member, secure it with its mounting bolts and nuts.



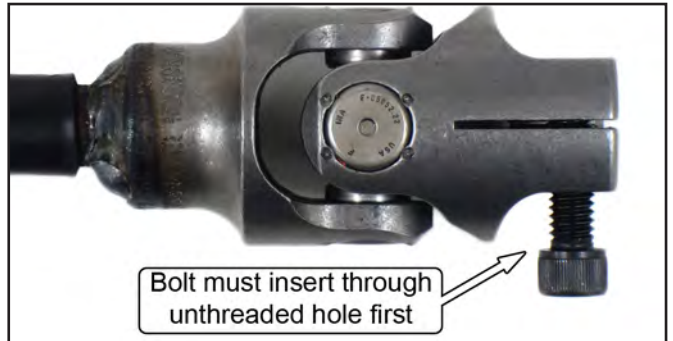
*NOTE: The groove is a safety feature that prevents the U-joint from pulling off the steering rack input shaft in the event of the installed pinch bolt coming loose.*



13. Pull the MM Steering Shaft to extend it until the bottom U-joint is correctly positioned on the steering rack input shaft.
14. Insert the pinch-bolt and hand tighten it. Be sure the lower U-joint is placed far enough over the input shaft that the pinch-bolt will pass across the groove in the input shaft. If the coupling is slid too far onto the input shaft, the pinch-bolt cannot be inserted.



*NOTE: Make sure the Lower U-joint pinch bolt is inserted through the unthreaded side of the U-joint first and then into the threaded side. This will allow the U-joint to clamp onto the threaded shaft when the bolt is tightened.*



15. If MM steering rack bushings are being used, be sure that they are installed correctly, and have not moved out of position. Torque the steering rack mounting bolts to 40 ft-lbs.
16. Torque the pinch-bolt securing the steering shaft to the rack input shaft to 25 ft-lbs.
17. Torque the bolt that secures the MM Steering Shaft to the steering column 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. If there is still play between the two shafts, increase the torque to 60 ft-lbs.*

### **Centering the Steering Rack**

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

18. Rotate the steering wheel clockwise until full lock is reached.
19. Place a piece of tape on the current twelve o'clock position of the steering wheel and mark the letter “A” on the tape.



20. Rotate the steering wheel counter-clockwise until full lock is reached. For future reference (in Step 21), count the number of turns required to turn the steering wheel from full lock to full lock.
21. 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.



22. Divide the number of turns required to go from full lock to full lock in Step 20, by 2.
23. From the counter-clockwise full lock position, turn the steering wheel clockwise the amount calculated in Step 22. The steering rack will now be centered. Note that the steering wheel may not be clocked (centered) correctly even when the rack itself is centered. Proper clocking of the steering wheel is covered in later steps.
24. If the steering rack was correctly centered in Step 23, the “A” and “B” tape marks on the steering wheel will now be an equal distance away from the twelve o'clock position. If the tape marks are at unequal distances from twelve o'clock, the rack is not centered. Repeat “Centering the Steering Rack” until the tape marks are positioned as shown below.



### **Clocking the Steering Wheel**

The previously described procedure will center the steering rack. It does NOT correctly clock the steering wheel.

25. Remove the tape from the steering wheel.
26. After Step 23, the steering rack will be centered. Without rotating the input shaft of the steering rack, disconnect the lower U-joint from the steering rack by removing the pinch bolt and collapsing the lower telescoping section. If necessary, unbolt the rack to disconnect the steering shaft from the input shaft.
27. Rotate the steering wheel so that it is centered in the “straight-ahead” position.

***WARNING: Do NOT rotate the steering wheel more than one rotation in either direction or damage to the air bag clockspring can occur.***



29. Install and torque the lower U-joint pinch bolt to 24
30. Safely lower the car to the ground.
31. If the steering rack was replaced during this installation, readjust the toe setting according to the vehicle manufacturer specifications.

This kit includes:

- 1 Steering Shaft

28. Reconnect the lower U-joint to the steering rack input shaft by extending the telescoping steering shaft enough to slip the splines together. If loosened, torque the steering rack mounting bolts to 40 ft-lbs.

**WARNING:** *The top of the steering rack input shaft should be flush with the top of the lower U-joint splined section. If the input shaft protrudes past the lower U-joint's splined section interference within the U-joint will occur as it is rotated. Also, if the input shaft is not fully inserted into the lower U-joint's splined section, it will not be securely attached, and may work itself loose over time.*

