

Steering Shaft Assembly, Manual Steering Rack, 1979-93 Mustang (MMST-12.1)

Instructions



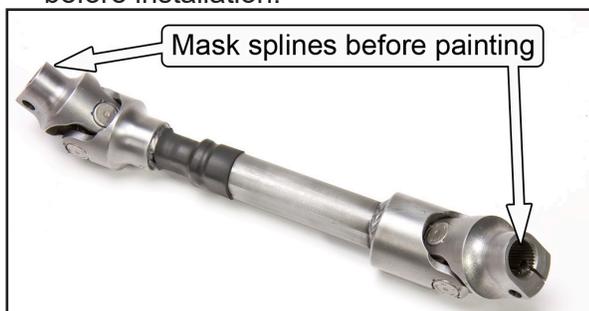
Read all instructions before beginning work. Following instructions in the proper sequence will ensure the best and easiest installation.

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 splined sections of the upper and lower u-joints 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.

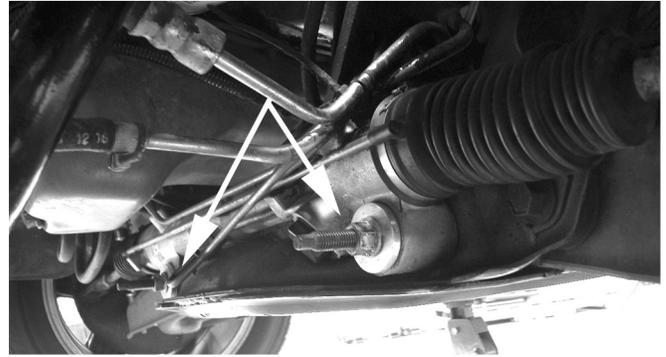
1. Raise the front of the car and place it safely on jack stands.
2. Remove the bolt and nut that attaches the steering shaft to the steering column. The attachment bolt is located close to the firewall. The bolt and nut will be reused to attach the MM Steering Shaft.



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



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

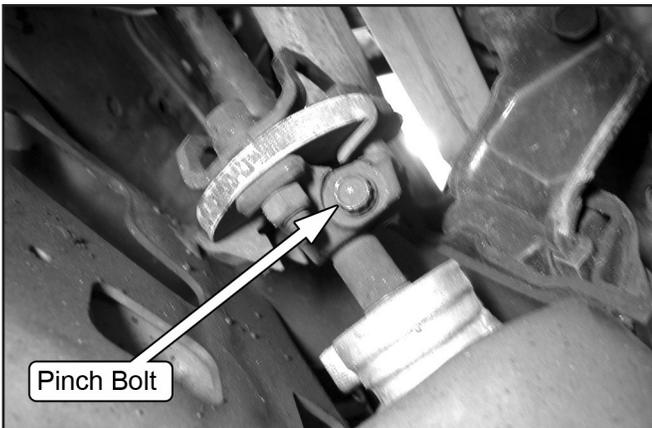


- Pull the steering rack slightly forward to disengage the steering shaft from the steering rack.
- Remove the steering shaft from the car by pulling it out of the steering column.



NOTE: In some cases it may be necessary to tap on the steering shaft with a hammer to pull the upper stub out of the steering column. Do NOT hammer directly on the U-joint cross bearings as damage may occur. Take note of the position of the bolt hole in the upper tube relative to the firewall before trying to pull the shaft out of the column. If the steering column pulls forward from the firewall you must tap it back into position.

- Remove the pinch bolt securing the stock steering shaft to the the steering rack input shaft.



Warning! The stock steering column in all 1979-93 Mustangs is collapsible for crash protection. The tube protruding out from the firewall into the engine compartment, which the upper stub end of the steering shaft slips into, slides inside another tube located inside the steering column, under the dashboard. That telescoping section inside the steering column may be inadvertently compressed or extended during removal of the stock steering shaft and the installation of the MM steering shaft, therefore preventing proper fitment of the MM steering shaft because it may not be able to be adjusted short or long enough.

- Rotate the steering wheel so that the wheels are pointed straight and engage the steering lock so that the steering wheel can't turn.

When installing the MM stub shaft into the bottom of the steering column, be very careful to not drive the tube up and collapse the telescoping section under the dash. If the telescoping section is collapsed, the bottom of the MM steering shaft will not extend to reach to the steering rack. If this happens, the best solution is to use a slide hammer with a hook, which is placed through the bolt hole in the protruding tube, to pull it out from the firewall and back into place.

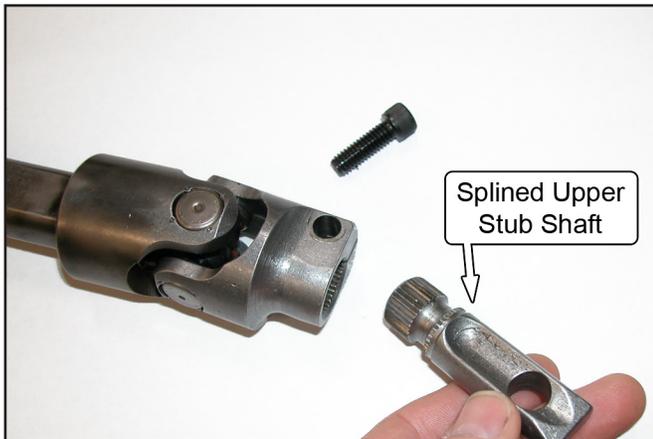
8. Reinstall the the steering rack mounting hardware removed in Step 5 and torque the factory bolts to 45 ft-lbs.

NOTE: If installing a new manual steering rack, do so at this time, following the manufacturer's instructions.

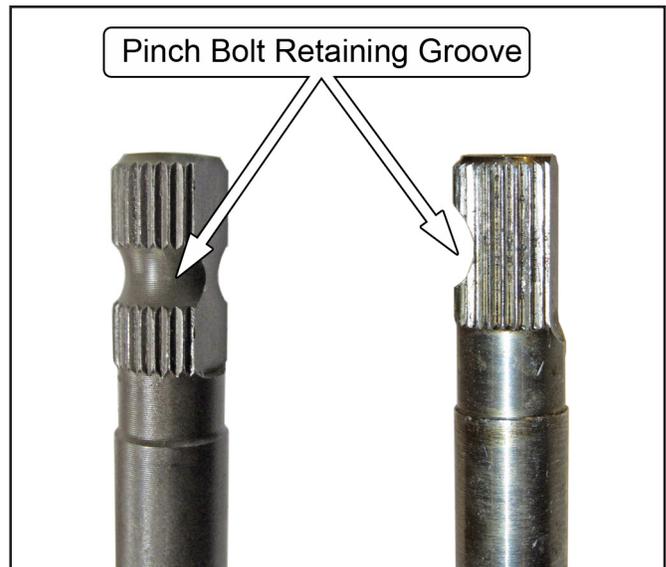
NOTE: If using aluminum or urethane rack bushings, follow the manufacturer's installation instructions. When installing a manual rack on an MM k-member, the MMST-8 steering rack spacers are required.

NOTE: Visually check that the rack is roughly centered in its travel range before installing it. One of the dust boots extended further than the other is a good indication that the rack is not centered. Rotate the input shaft by hand to center the rack if necessary.

9. Prior to installation of the MM 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 Steering Shaft.
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.



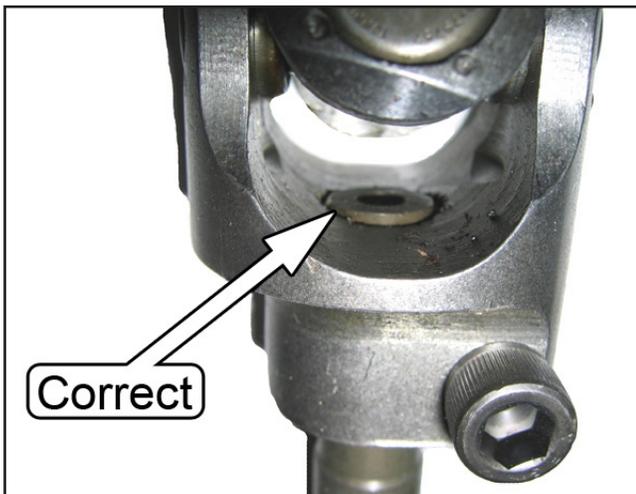
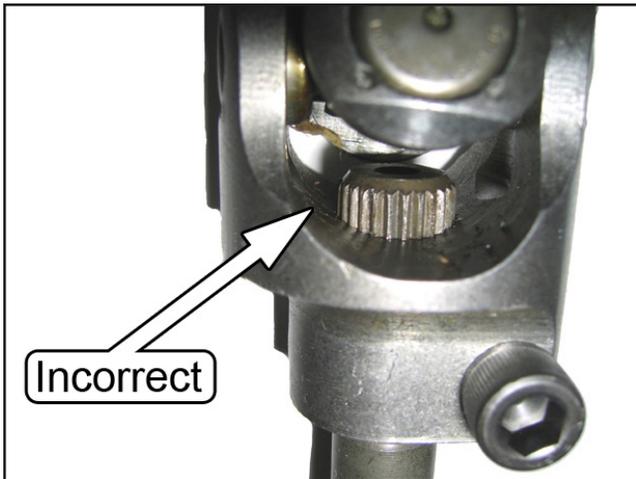
11. Install the splined upper stub shaft into the steering column. It will only fit in one orientation.
12. Install the retaining bolt and nut (removed in Step 2) onto the steering column and hand tighten.
13. Locate the pinch bolt retaining groove on the steering rack input shaft. This feature will vary depending on the manufacturer of your steering rack.



14. Install the lower portion of the MM Steering Shaft assembly onto the input shaft of the steering rack. Orient the lower u-joint so that when inserted, the pinch bolt passes through the retaining groove.

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

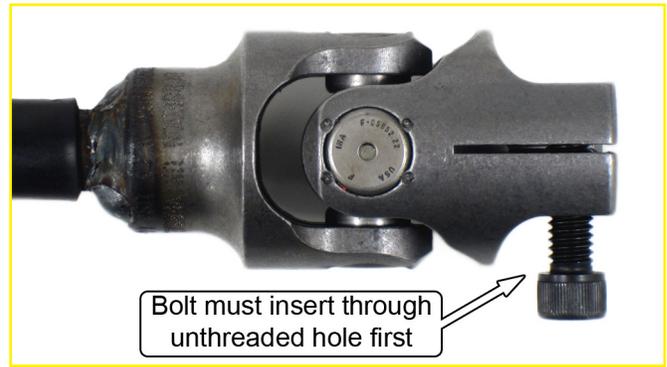
WARNING: The top of the steering rack input shaft should be flush with the top of the lower U-joint splined section. If the input shaft protrudes past the lower U-joint's splined section interference within the U-joint will occur as it is rotated. Also, if the input shaft is not fully inserted into the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



15. 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



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.



16. Extend the MM 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.

Centering the Steering Rack

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

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. 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.
23. If the steering rack was correctly centered in Step 22, 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.

24. Remove the tape from the steering wheel.
25. After Step 22, the steering rack will be centered. Without rotating the input shaft of the steering rack, disconnect the upper U-joint from the upper stub shaft by removing the pinch bolt and collapsing the lower telescoping section.
26. 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.



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. 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. If there is still play between the two shafts, increase the torque to 60 ft-lbs.

29. Reinstall the front wheels, and torque the lug nuts.
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 Solid Steering Shaft