

## *MM Mustang Front Coil-Over Kit - Bilstein (MMCO-1)*



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

Thank you for purchasing Maximum Motorsports' ultimate coil-over conversion kit manufactured specifically for Bilstein Struts. There are many features you will find that set our coil-over kit apart from the rest.

- Starting at the top, we maximize bump travel by providing an assortment of spacers to properly position the upper spring perch under the strut tower.
- Shaped far better than others on the market, our upper spring perch assembly has been designed for optimum strength, clearance, and bump travel.
- Two O-rings seal the thrust needle bearings to keep dirt and water out, and keep the grease in.
- The lower spring perch is drilled for easy adjustment with a spanner wrench, if pre-loading the spring is necessary.
- A set screw ensures that the lower spring perch will never move.
- While other companies simply anodize their aluminum parts for appearance, we have critical components *hard* anodized, at over twice the cost, for maximum life.

- Suspension loads from the threaded sleeve are fed into a clamp collar. That provides a large contact area, keeping the sleeve from galling on the strut ears.
- Overlooked by other companies, our threaded sleeve assembly is designed to fit the strut snugly. A tight fit keeps the threaded sleeve from rattling on the strut. More importantly, the lower spring perch is kept square to the strut, preventing the spring from arcing and rubbing on the threaded sleeve.
- Finishing off the kit, we use only the highest quality springs on the market, and back them with our extensive technical knowledge of rates, free lengths, and proper spring travel ensures that your car will perform to the max.
- We include dust boots to help protect your strut shaft from dirt and debris. Dirt and debris can damage seals and shorten the service life of your strut.

With the use of a Coil-Over Kit, the entire front weight of the car is now transmitted through the pivot of your Caster/Camber (C/C) plates; you should use a well-designed steel C/C plate with a high-quality spherical bearing. Rubber or urethane C/C plate bushings will not be able to handle the load without excessive deformation and possible failure. Most aluminum C/C plates are not strong enough for coil-over applications. Aluminum C/C plates that are strong enough for use with a Coil-Over kit will be very thick and may unnecessarily reduce bump travel.

The 1979-93 C/C plates only require three bolts because the strut top is captured within a triangle formed by these bolts (as viewed from the top). This means that each bolt carries a relatively equal portion of the vertical strut load, and the load is evenly distributed into the strut towers.

For 1994-04 Mustangs, Maximum Motorsports makes the only C/C plate suitable for use with a Coil-Over kit: our innovative 4-bolt C/C plates. On 1994-04 cars, the strut top is outside of the triangle formed by the three factory mounting bolts (as viewed from the top). With a 3-bolt C/C plate the entire vertical load is carried by two bolts, and the plate is in a cantilevered bending situation. The load will be unevenly distributed into the strut tower, resulting in a prying load which may bend the strut towers or result in failure of the C/C plates. MM added a fourth bolt, which results in the strut top being captured within the square formed by the four bolts, (as viewed from the top). Now the load is evenly spread out into the strut towers.

1. Measure the front ride height on both sides of the car. Record the measurements for future reference.



2. Raise the front of the car and place it securely on jack stands.
3. Remove both front wheels.



4. Unbolt the brake caliper and hang it securely. *Do not* let the caliper hang from the brake hose, as this can cause unseen damage to the hose. Steel braided hoses are especially susceptible to damage if the caliper is dropped or allowed to hang unsupported.



5. While it is not necessary, you may find it helpful to remove the brake rotor. Disconnect the outer tie-rod end from the spindle.



6. Disconnect the swaybar end-link from the control arm.



7. If the car is equipped with ABS, carefully unhook the sensor's wire from the mounting bracket on the strut to get enough slack in the wire to remove the sensor from the spindle. Remove the sensor-to-spindle bolt, and carefully remove the sensor from the spindle. Remove the mounting bracket from the strut.



8. Place a floor jack under the control arm, and slightly compress the spring to support the control arm when the strut top retaining nut is removed.
9. Loosen, but *do not* remove, the two bolts holding the strut housing to the spindle.
10. Remove the strut top retaining nut.



11. Remove the two bolts that hold the strut housing to the spindle, and carefully remove the strut from the car.



12. Carefully lower the control arm with the jack. Carefully remove the spring. If necessary, use a spring compressor. Often, aftermarket springs are shorter and can be gently "popped" out once the control arm is lowered far enough. The control arm may be angled straight downwards, at vertical. Stock springs are quite long and require a spring compressor for safe removal.





13. Be sure to remove the upper spring isolator. Sometimes they stick to the upper spring perch.
14. Remove all hardware, dust boots, etc., from the strut. If there are any stickers within 2" of the top of the strut ears, remove them.



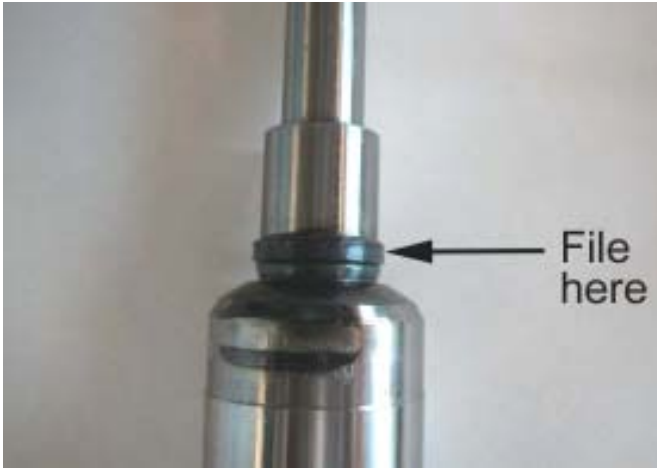
15. Place the Split Clamp Collar around the Bilstein strut housing. The side of the collar with the machined groove faces upwards.
16. Position the Split Clamp Collar immediately above the welded-on mounting brackets.



17. Evenly snug the Split Clamp Collar bolts so the gap between the two halves of the Split Clamp Collar is equal on both sides. Tighten the Split Clamp Collar bolts to 25 ft-lbs.
18. Identify the end of the threaded sleeve that is not threaded all the way to the end. That end goes downwards, against the Split Clamp Collar. Slide the threaded sleeve down until it bottoms against the Split Clamp Collar.



19. Thread the Lower Spring Perch onto the Threaded Sleeve.
20. Slide the Upper Spring Perch over the strut shaft to check for clearance around the shoulder that is at the top of the large-diameter section of the strut shaft. If the Upper Spring Perch does not clear this shoulder, file the shoulder down until the perch will just fit around the shoulder.



21. Install the bellow-style dustboot onto the strut shaft. It should seat below the shoulder referenced in Step 20.



22. Use a Moly wheel bearing grease to lube the thick, small diameter O-ring and slip it onto the strut shaft. It will set on top of the dustboot.



23. Place your 2-1/2" diameter Coil-Over Spring onto the Lower Spring Perch. Position the Lower Spring Perch so the top of the spring is below the top of the large-diameter portion of the strut shaft. That will keep the spring from interfering with the installation of the Upper Spring Perch Assembly.



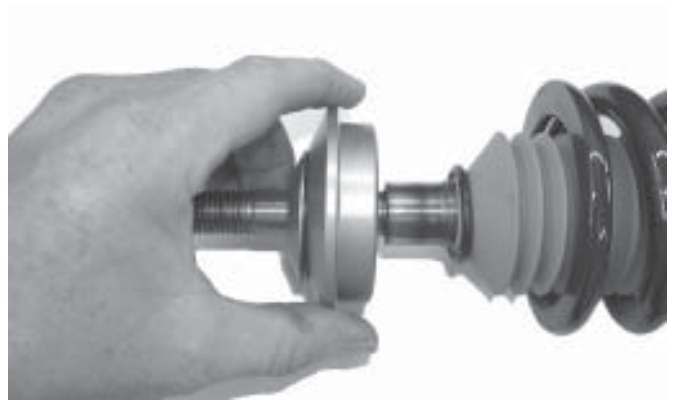
24. Grease the thin, large diameter O-ring and place it into the O-ring groove machined on the top side of the Upper Spring Perch.



25. Place one Needle Bearing Race into the recess on the top side of the Upper Spring Perch. Completely pack the Thrust Needle Bearing with a high quality Moly wheel bearing grease. Place the Thrust Needle Bearing on top of the installed Needle Bearing Race. Place the second Needle Bearing Race on top of the Thrust Needle Bearing.



26. Grease the bottom of the Thrust Cone where it will contact the thin, large diameter O-ring from Step #24. Set the Thrust Cone onto the top of the Upper Spring Perch.
27. Slip the completed Upper Spring Perch Assembly over the top of the strut shaft. It will slide down and the Upper Spring Perch will sit on the thick small diameter O-ring from Step #22.



28. Slip the large 7/8" inside diameter Spacer Bushing over the strut shaft. It will sit down onto the Thrust Cone.



29. Place the 17mm inside diameter Thrust Washer over the top of the strut shaft. Do not be surprised if the Thrust Washer will not contact the shoulder of the shaft. The thick small diameter O-ring from step # 22 will be compressed and expanded during installation, and the Thrust Washer will then contact the shoulder of the strut shaft.



*Note: Some companies' C/C plates have a fixed-type spacer bushing pressed into the spherical bearing. With these types of C/C plates, skip step 30, and you may not be able to maximize bump travel in steps #31-32.*

30. Use the longest C/C plate spacer bushings (16mm inside diameter) that came with your C/C plates, and place it over the strut shaft. Slide it down until it sets on top of the Thrust Washer.
31. Place the strut shaft top into the spherical bearing of the C/C plate. Tighten the strut top retaining nut with enough spacers on top of the spherical bearing to prevent the nut from running out of threads on the strut shaft. Torque the bolts in place that hold the strut to the spindle.
32. Check clearance between the Upper Spring Perch Assembly and the bottom of the C/C plate. The tightest spot will be toward the rearward bolt heads on the C/C plate bottoms. Check clearance at full droop while the suspension is being steered. Jack the control arm up to ride height and check for clearance while the suspension is being steered. *Tip:* Remember that the relative position of the Upper Spring Perch will change with different front end alignment settings. Be sure to allow clearance for any future caster/camber settings you may use. A small mirror may be necessary to check all clearances. (Spring and dust boot not shown for clarity)



33. The vertical position of the Upper Spring Perch Assembly is adjusted by using different combinations of Spacer Bushings. If needed, additional Spacer Bushings are included with the MM Coil-Over Conversion Kit. If the tightest clearance is less than 1/8", use the next appropriate thick Spacer Bushing (or combination of bushings) to gain necessary clearance. If clearance is in excess of 1/4", use the next appropriate thin Spacer Bushing (or combination of bushings) to position the Upper Spring Perch Assembly as high as possible for maximum bump travel.
34. After you have determined the proper combination of Spacer Bushings to place underneath the C/C plate, secure the strut shaft to the C/C plate with the strut top retaining nut. One Spacer Bushing is required on top of the spherical bearing, underneath the strut top retaining nut. Wait until the car is on the ground to torque the retaining nut.
35. Reattach the outer tie-rod end to the spindle and torque to factory specification. Install a new cotter pin.

36. Do your first check for potential interference between the Coil-Over Spring, the Split Clamp Collar, and the brake hose where it attaches to the hard line. Use the jack to move the suspension from full droop to fully compressed, and check while someone moves the steering wheel back and forth. Check for clearance between all components. 1994-04 cars usually do not have any interference problems. Earlier cars may require relocating the bracket that holds the brake hard-line to the chassis (where it attaches to the flexible hose). If it needs to be moved, find a position where it clears the Coil-Over components, and drill a new hole for the attachment screw. Brake hard lines can be easily re-bent by hand. Be careful to bend gently, and take care not to kink the hard line. In rare cases there may be an interference between the Spring/Lower Spring Perch and the K-member, near where the stock spring was located. To remedy that situation you will need a hand held grinder to clearance the K-member. After the installation is complete, with final ride height set, another check for interference between components must be made.

37. Adjust the position of the Lower Spring Perch. Raise it to a position where the Spring is just touching both the Upper Spring Perch and the Lower Spring Perch.

38. If the car has ABS, the mounting bracket for the sensor will need to be modified.



Bracket Before Modification

39. Use two sets of pliers to hold and bend the bracket forward near the base.



40. Then carefully bend it upward near the end where the wire attaches.



Finished Bracket

41. Reattach the mounting bracket to the spindle and adjust the bends if necessary to keep the mounting bracket close to the strut.



42. Reattach the ABS sensor to the spindle. Reattach the sensor's wire to the mounting bracket.



43. Reattach the swaybar end-link to the control arm. Do not overtighten the end-link bushings.

44. Torque the strut to spindle bolts to factory specifications.
45. If you removed the brake rotor, reinstall it now.
46. Reattach the brake caliper and torque the mounting bolts to factory specifications.



47. Mount the tire and wheel. Check for clearance to the Coil-Over components. Remember that the final ride height has not yet been set, and so the position of the Lower Spring Perch may change.
48. Lower the car to the ground. Torque the lug nuts to factory specifications.
49. Torque the strut shaft retaining nut to factory specifications or to the strut manufacturers specification if using an adjustable strut.
50. Roll the car back and forth to settle the suspension.
51. Measure the ride height, as in step 1. You can adjust the ride height to match your previous measurement, or change your ride height as desired.
52. To change ride height, carefully jack the front of the car up and place it on jack stands. Hold the Threaded Sleeve with one hand, and use your other hand to rotate the Lower Spring Perch. In some instances it may be necessary to rotate the Lower Spring Perch with a Spanner Wrench (available separately from MM).
53. After the ride height is set, tighten the nylon-tip set screw on the Lower Spring Perch with the supplied Hex Key. Do not overtighten the set screw, as doing so will cause damage to the aluminum. The set screws have a nylon tip and only need to be tightened enough to keep the psring perch from rotating. Do not tighten the screw as much as you would in a normal clamping situation.

54. Have the front end professionally aligned. Remember that any time the ride height is changed, the camber and toe settings will have to be adjusted.

This kit includes the following:

- 2 Threaded Sleeves
- 2 Lower Spring Perches
- 2 Upper Spring Perches
- 2 Thrust Cones
- 2 Thrust Needle Bearings
- 4 Thin Needle Bearing Races
- 2 Split-Clamp Collars
- 2 16mm ID x .12" long spacer bushings
- 2 16mm ID x .24" long spacer bushings
- 2 7/8" ID x .5" long spacer bushings
- 2 17mm ID Thrust Washers
- 2 Thick, small diameter O-rings
- 2 Thin, large diameter O-rings
- 1 1/4" Allen wrench
- 1 5/32" Allen wrench
- 2 Nylon-tip Set Screws (installed in Lower Spring Perch)
- 2 Dust Boots