

## MM IRS Coil-Over Kit - Bilstein/MM Shocks (MMCO-4)



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

Reminder: This installation requires a groove to be machined the shocks. See Step 12 for details.

Use the MMSM-10 rear upper shock mount isolator with all 2003-04 Cobra original equipment Bilstein shocks.

Thank you for purchasing Maximum Motorsports' ultimate IRS coil-over conversion kit. This kit is manufactured specifically for Maximum Motorsports (MM) and Bilstein shocks. 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 a Delrin pivotball and aluminum socket joint that does not reduce bump travel from that of a stock Mustang. Some of our competitor's coil-over kits reduce bump travel by as much as 1-1/4".
- The Delrin pivotball and aluminum pivot socket also provide a smooth, fluid motion that does not overstress the shock shaft.
- Our upper spring perch assembly has been fully engineered for optimum strength, clearance, and bump travel--it is shaped far better than any other

- The lower spring perch is drilled for easy adjustment with a MM Spanner Wrench, if pre-loading the spring is necessary. A set screw ensures that the lower spring perch will not rotate unintentionally on the threaded sleeve.
- While other companies simply anodize their aluminum parts for appearance, we have critical components *hard* anodized for maximum life.
- Suspension loads from the threaded sleeve are fed into a Spirolock ring that provides a large contact area, supporting up to 8,000 lbs.
- Overlooked by other companies, our threaded sleeve assembly is designed to fit the shock snugly. A tight fit keeps the threaded sleeve from rattling on the shock. More importantly, the lower spring perch is kept square to the shock, preventing the spring from arcing and rubbing on the threaded sleeve.

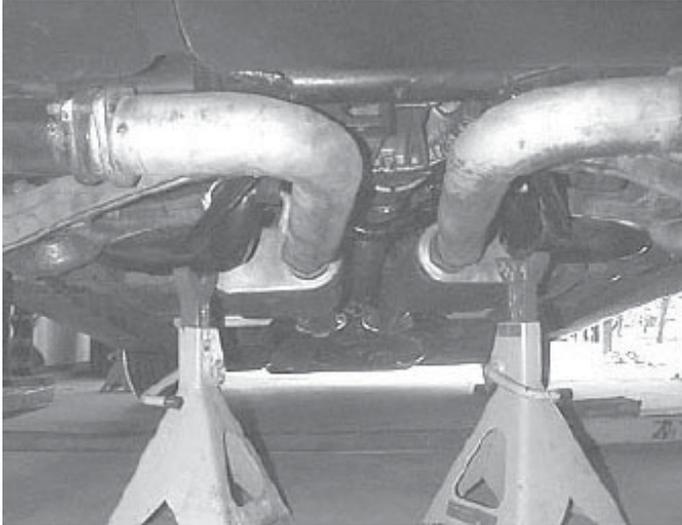
Finishing off the kit, we recommend using only top-quality springs such as Hypercoil and Eibach. We back them with our extensive technical knowledge of rates, free lengths, and proper spring travel, all to ensure that your car will perform to its maximum potential.

1. Measure the ride height of the rear of the car from the ground to the top of the wheel well opening. Record your reading, it will be needed later



2. Loosen, but do not remove, the lug nuts on the rear wheels.

- Block the front wheels and jack up the rear of the car. Position the jack under either the torque box or under a subframe connector. Once raised, support the rear of the car with jack stands under the IRS subframe jacking pads.



- Remove the rear wheels
- Using an internal-mounted coil spring compressor compress and remove each rear coil spring. Most auto parts and equipment rental stores rent these types of spring compressors.



- From inside the car, remove the nut, thrust washer and upper rubber isolator from the top of each shock shaft. Save these three components, as they will be re-used later in the coil-over installation.

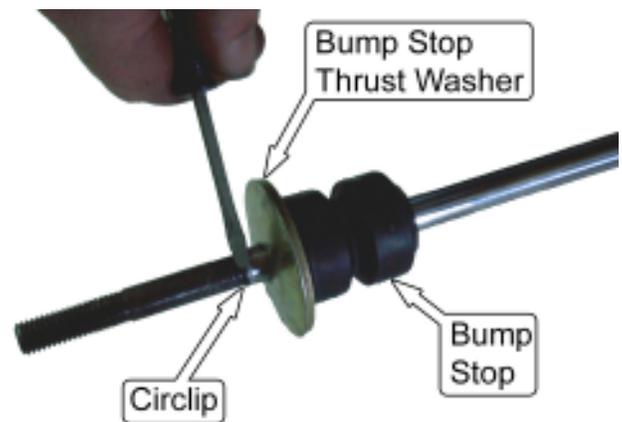
NOTE: If you are installing new MM or Bilstein shocks in place of your existing shocks, use the nuts, thrust washers and the isolators provided with your new shocks rather than the components that you removed in Step 6.

**Note: Cars with 2003-04 original equipment Cobra Bilstein shocks:**

Due to the soft rubber used in the stock 2003-04 Cobra rear upper shock mount rubber isolator, there is not a sufficient amount of threads on the shock shaft to adequately preload the isolator. If the rubber is not correctly preloaded, a "clunking" noise and subsequent damage can result from the Delrin ball impacting the rear shock towers. An MMSM-10 Kit (\$9.95) is required when using the MM Rear Coil-Over Kit on any 2003-04 Cobra original equipment Bilstein shock.

- Remove the bottom shock bolts from the lower control arms and remove the shocks from the car. Save the OEM 14mm bolts and the special nuts from the backside of the control arm. Discard any washers that were on the 14mm bolt.
- Remove and discard the lower rubber isolator, lower thrust washer, and dust boot from each shock. Remove the circlip from each shock, and discard.

NOTE: The easiest way to remove the circlip is to use a flat-blade screw driver and insert it under the circlip, next to the gap of the circlip. Push in and rotate up and out to work the circlip off the shaft.



9. Remove the bump stop thrust washer and bump stop from each shock. Discard the bump stop thrust washer. Save the bump stops; you will need these later.
10. In a vise or press, remove the crush sleeve from each shock eyelet. Select a socket that is large enough to accept the crush sleeve into its center. Select a deep socket that is small enough to push out the crush sleeve through the rubber (*Do not* damage the crush sleeves, they will be re-used later)



11. Use a similar process to remove the rubber bushings from each shock eyelet. Select a socket that is large enough to accept the rubber bushing into its center, but will still support the steel eye of the lower shock mount. Then select a smaller deep socket that will be able to push the rubber bushing out of the steel eye.

NOTE: It can help to cut the lip off one side of the rubber bushing if you have trouble getting the socket to rest on the rim of the eyelet.

12. If each of your shocks already have a circlip groove machined in the shock body, proceed to Step 13. If not, send the two shocks to Maximum Motorsports for machining of a groove to accept a Spirolock ring. The Spirolock ring provides a seat for the coil-over threaded sleeve. If you have chosen to do this step through a qualified local machinist or installation shop, call us for the specifications on the groove.

CAUTION: If your shocks are machined incorrectly by a non-approved MM dealer, the warranty will be VOIDED.

13. Clean, prime, and paint the Spirolock groove in each shock. This will prevent corrosion and possible weakening of the shock body
14. Thread one of the lower spring perches onto a threaded sleeve.
15. Install the threaded sleeves (non-flanged end first) onto the shock body by sliding the sleeve on from the bottom (eyelet) end of the shock. Slide the sleeve up past the machined groove.



16. To install one of the Spirolock rings in the groove of the shock, use the enclosed shim stock to expand the Spirolock ring using the following technique: Holding the shock upside down, wrap the supplied piece of shim stock around the shock body with half of the material extending over the shock eyelet in a slight conical shape (like a teepee). Place the Spirolock ring over the tip of the cone, then slide the Spirolock ring down as far as possible without damaging the shim stock (you will need to push down pretty hard).



17. Grab the shim stock from the bottom with both hands. Slide it and the Spirolock ring over the shock body. Keep pulling until the Spirolock ring is close to the groove, then pull the shim stock out from under the Spirolock ring. Slide the Spirolock ring to the groove and let it snap into place within the groove.

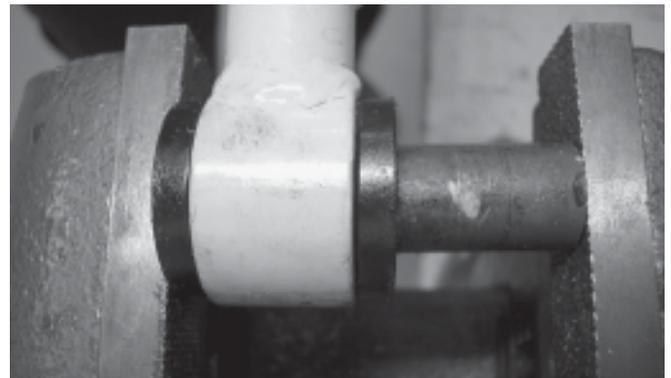
NOTE: Confirm that the Spirolock ring is properly and fully seated into the groove.



18. Slide the threaded sleeve down until it seats on the Spirolock ring.
19. Place one of the bumpstops into position on the shock shaft with the tapered end toward the shock body.

NOTE: The supplied grease is very difficult to remove if it gets on your skin. We suggest that you wear disposable gloves when handling greased parts.

20. Completely coat the bare metal surfaces inside the shock eyelet with grease.
21. Lubricate two of the MM lower shock mount urethane bushings, inside and out, with the supplied grease.
22. Push the greased urethane bushings into the eyelet of the shock. The two bushings go in from each side of the eyelet.
23. Completely coat the outside of the crush sleeve (removed in Step 10) with the supplied grease. Insert the crush sleeve into the urethane bushings. To do so, it will be necessary to use a vice or large set of pliers to press the crush sleeve into place inside the urethane bushings.



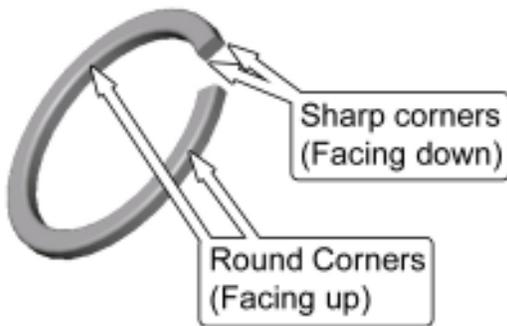
NOTE: With some Bilstein shocks, the crush sleeve will protrude from the urethane. Position the crush sleeve flush with one side of the urethane, while letting the other side protrude from the urethane. This protruding crush sleeve will be dealt with in Step 32. The picture depicts the difference between a crush sleeve that is flush with the urethane, left, and one that protrudes, right.



24. Place one of the coil-over springs onto the lower spring perch. Position the lower spring perch so the top of the spring is well below the top of the step in the shock shaft. This will make the installation of the remaining parts easier. Then, place the upper spring perch on the spring.



25. Observe the circlips provided. They are a stamping, therefore one side has sharp corners and one side has rounded corners. The side of the circlip with the sharp corners will be installed facing downward toward the spring perch.



27. Place one of the aluminum pivot sockets on the shock shaft with the cup facing upward. The counterbore on the bottom side of the pivot socket will encapsulate the circlip.



26. Orient the circlip with the sharp corners facing down toward the spring perch. Carefully thread the circlip down the threaded portion of the shaft until the threads stop. Carefully use a flat-blade screw driver to ease the circlip past the unthreaded portion of the shaft, sliding it down into the groove above the larger diameter portion of the shaft. The circlip should be tight around the shock shaft.

28. Completely coat the inside of the pivot socket with the supplied grease.



29. Place one of the Delrin pivot balls on the shock shaft with the curved side facing down toward the aluminum pivot socket.

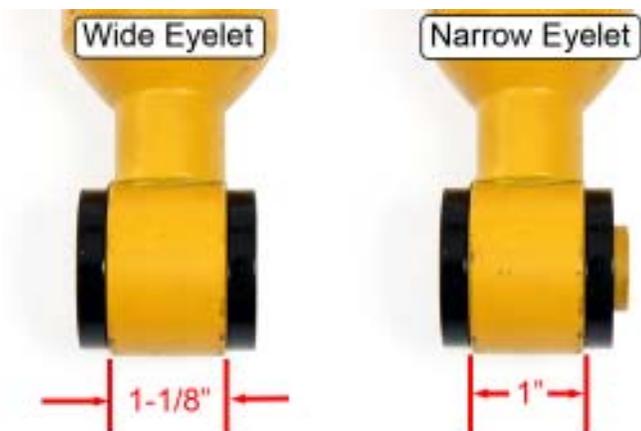


You have now completed assembling one coil-over assembly. Repeat Steps 14 - 29 for the second shock.

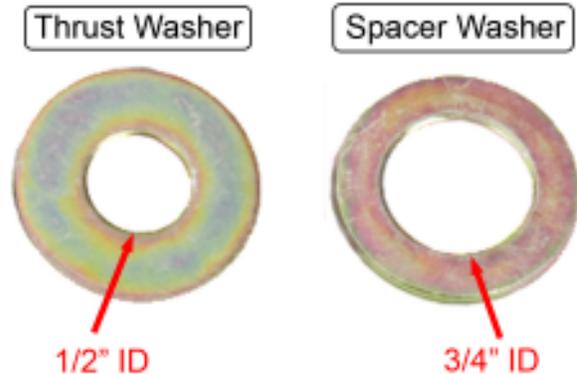
### Eyelet Identification

Bilstein manufactures different versions of the Mustang IRS rear shock. Some versions of the shock have a wide eyelet (1-1/8") and some have a narrow eyelet (1"). It is necessary to identify which version you have to correctly install the MM coilover kit.

Measure the width of the shock eyelet for both the passenger and driver shocks. If the eyelet is just over 1-1/8" wide, you have a Wide Eyelet. If the eyelet is 1" wide, you have a Narrow Eyelet.



NOTE: There are two types of washers used for installation. The two Thrust Washers are always used regardless of whether it is a narrow or a wide eyelet, whereas the Spacer Washer is only used for the Narrow Eyelet. The Thrust washer MUST be installed between the control arm and the urethane bushing to prevent the crush sleeve from pressing into the control arm and preventing the bolt from being properly torqued.



30. On the passenger side of the car, position the shock shaft of one of the completed coil-over assemblies through the hole in the shock tower. The top of the shaft is not bolted to the top of the shock tower, it is just located by the hole.

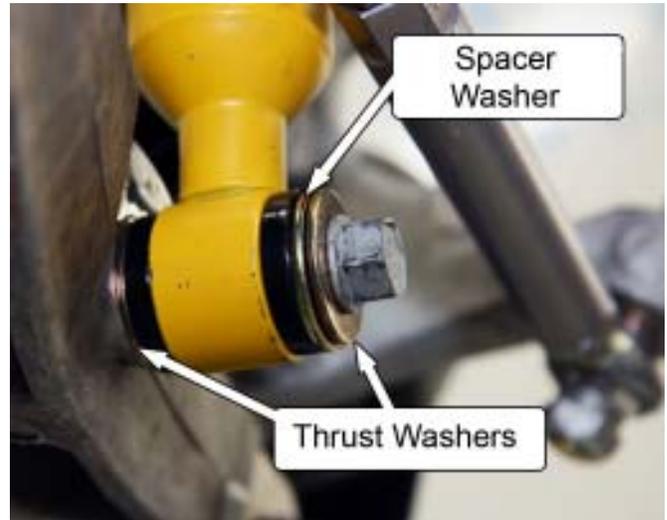
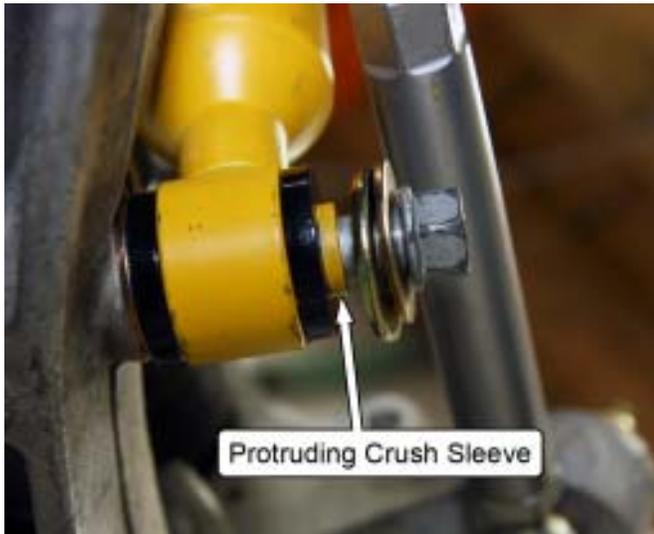


31. Completely coat the exposed faces of the urethane with the supplied grease.

NOTE: Proceed with Step 32 if you measured your shock eyelet to be a Narrow Eyelet. Proceed with Step 33 if you measured your shock eyelet to be a Wide Eyelet.

32. For **NARROW EYELETS**, place a 1/2" ID Thrust Washer under the head of the OEM 14mm bolt followed by a 3/4" ID Spacer Washer. Then, insert the 14mm bolt into the shock eye crush sleeve from the side where the crush sleeve protrudes from the urethane. The 3/4" ID Spacer Washer will fit around the OD of the protruding crush sleeve. Place another Thrust Washer over the end of the bolt, and insert the bolt into the hole in the control arm. Skip to Step 34.

NOTE: The following pictures are to clarify the purpose and location of the washers.



33. For **WIDE EYELETS**, place a 1/2" ID Thrust Washer under the head of the OEM 14mm bolt. Then, insert the 14mm bolt into the shock eye crush sleeve. Place another Thrust Washer over the end of the bolt, and insert the bolt into the hole in the control arm. Discard the two 3/4" ID Spacer Washers.

NOTE: The following pictures are to clarify the purpose and location of the washers.





34. Thread the OEM 14mm bolt into the OEM special nut on the back side of the control arm. Torque the OEM 14mm lower shock bolt to 98ft-lb.
35. Using a jack, raise the passenger side lower control arm to seat the Delrin pivot-ball against the bottom side of the shock tower. Keep the Delrin pivot-ball centered in the mounting hole of the shock tower as the pivot-ball engages the bottom side of the shock tower.
36. From inside the car, on top of the shock tower, place a Bilstein rubber isolator, thrust washer, and nut on top of the shock shaft. Tighten the nut until the thrust washer just begins to drag on the rubber isolator, and then tighten the nut 4 more turns.

NOTE: The 2003-04 OEM Ford/Bilstein upper rubber pieces should not be used, only the aftermarket Bilstein rubber. Replace OEM Ford/Bilstein rubber with our MMSM-10 kit, as noted in the warning at the start of the instructions.



37. Raise the lower spring perch by threading it upwards until the spring is just contacting the upper and lower spring perches.

Repeat Steps 30-37 to install the other coil-over assembly into the driver side of the car

NOTE: Check for possible interference/rubbing on the sheet metal of the chassis, near the spring and upper perch. Bend the steel if need be.

38. Reinstall the wheels and torque the lug nuts to factory specs.
39. Remove the jack stands and lower the car
40. Roll the car back and forth to settle the suspension.
41. Check the ride height (recorded in step 1) to determine if the car needs to be raised or lowered. If needed, support the car on jack stands to get the weight off the springs, and adjust the spring perches. The car must be jacked up to unload the suspension before trying to adjust the spring perch height. Hold the threaded sleeve with one hand and turn the lower spring perch with your other hand. (up, to raise the car and down, to lower the car) NOTE: If you need to preload the spring, use MM's spanner wrench to help rotate the lower spring perch.

42. Lower the car and repeat Steps 39 - 41 until the desired ride height is achieved.

43. Once the ride height is correct, use the supplied 5/32" hex key to snug the nylon tipped set screw in the lower spring perch. This will hold the spring perch in position.

NOTE: The set screw should only be snugged enough to prevent the perch from rotating. Overtightening can cause damage such as stripped threads and a broken spring perch.

NOTE: The spring perches should be at about the same distance from the bottom of the threaded sleeve, on both sides of the car. While there may be a small difference due to variations in the car's weight from side to side, large differences of greater than 1" indicate a problem with the adjustment, which is throwing the corner weights off.

44. Test drive and enjoy. Re-torque all bolts after 1000 miles.

This kit includes the following:

- 2 Threaded sleeves
- 2 Lower spring perches
- 2 Upper spring perches
- 2 Spirolock rings
- 2 Delrin pivot-balls
- 2 Aluminum pivot sockets
- 2 Set screws
- 4 Urethane bushings
- 1 5/32" Hex key
- 1 Shim stock
- 1 Prothane Grease Packet
- 4 1/2" ID Thrust Washers
- 2 3/4" ID Spacer Washers
- 2 Circlips

Available for your Rear Coil-over Kit

### **MMSM-7 Racing Rear Upper Shock Mount.**

This racing duty upper shock mount uses a spherical bearing (just like the MM Caster/Camber plates) to positively locate the upper end of the rear shock. It eliminates the last little bit of potential binding that may come from the rubber still used at the very top of the shock mount. The machined aluminum block sandwiches the rear shock tower with a doubler plate.

