

## ***MM Spring Installation, IRS***



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

Maximum Motorsports' Engineering Team worked with a major spring manufacturer to develop our new spring sets. These are top quality springs, made to our specifications.

The new MM Springs are designed to have less progression than other spring brands. The more linear nature of the MM Springs makes the amount of lowering more consistent, and the handling more predictable. Except for the Open-Track series, the MM Springs are intended to be suitable for a daily driven car, and as such we have designed the MM Springs with just the right blend of performance and ride quality. Knowledgeable performance enthusiasts know that lowering a car too much is a sure-fire way to destroy a car's handling prowess, and therefore MM Springs are designed to avoid excessive lowering.

### **Note about Settling**

It is a commonly held myth that all springs settle and become shorter after a period of time in the car. That is not true of high quality springs. Well-made springs do not "take a set." However, spring isolators do settle over time. Urethane isolators have a much longer lifespan than the stock rubber spring isolators. If the initial ride height of your new springs isn't consistent from side to side, or is higher than you anticipated, allow some driving time to let the isolators take their final shape.

### **Note about Lowering**

The advertised lowering of the springs is based on best estimates for a stock-weight car. Any changes to the weight or weight distribution of the vehicle, such as adding aluminum cylinder heads (on 5.0L cars), a turbo or supercharger, removal of the back seats or interior, battery relocation, or other modifications that add or subtract weight, will alter the ride height of the car.

### **MM Recommends...**

When switching to stiffer springs, it may be necessary to upgrade your shocks and struts to maintain proper suspension damping. Please contact Maximum Motorsports if you have questions about your particular application. We offer a variety of shocks and struts, including Bilstein, Koni, Tokico, and custom valved MM Bilsteins.

If your car is not already equipped with MM Caster/Camber plates, we recommend installing them with your new springs. In addition to allowing fast and easy adjustment of both caster and camber settings, the MM Caster/Camber Plates will also help restore the suspension travel lost whenever a car is lowered.

### **Front Spring Installation**

Note: If you have MM Caster/Camber Plates installed on your vehicle, be sure to note the position of your strut shaft height as detailed in the MM Caster/Camber Plate consumer instructions. When re-installing the struts, set the strut shaft spacers as detailed in the MM Caster/Camber Plate consumer instructions to maintain correct bump and droop travel for the front suspension.

## Safety Warning

Compressed springs contain a lot of potential energy. Be very careful to not inadvertently release a compressed spring. Serious injury and property damage may occur. If you are not confident with your expertise in swapping springs, consult a professional installer.

1. Loosen the top strut-retaining nut, but **do not remove it**. This can sometimes be more easily done before raising the car onto jackstands. Depending upon the design of the strut shaft, a hex key or very large screwdriver may be needed to prevent the shaft from turning with the nut. An air-powered impact wrench works even better. Also break loose the front lug nuts, but **do not remove them**.
2. Block the rear wheels, and jack up the front of the car and place it safely on jack stands. The car must be high enough that the front control arms can swing down, nearly vertical, for the front spring installation.
3. Remove both front wheels.
4. Work on one side of the car at a time.
5. Remove the front 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 from the brake hose.

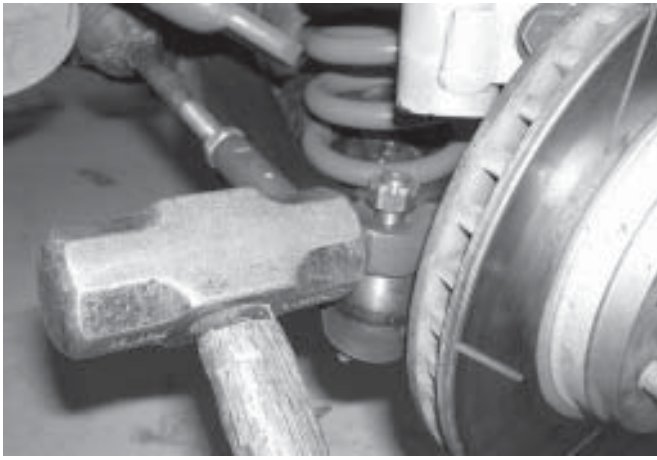


## **Front Caliper Removal for 1979-93 Cars:**

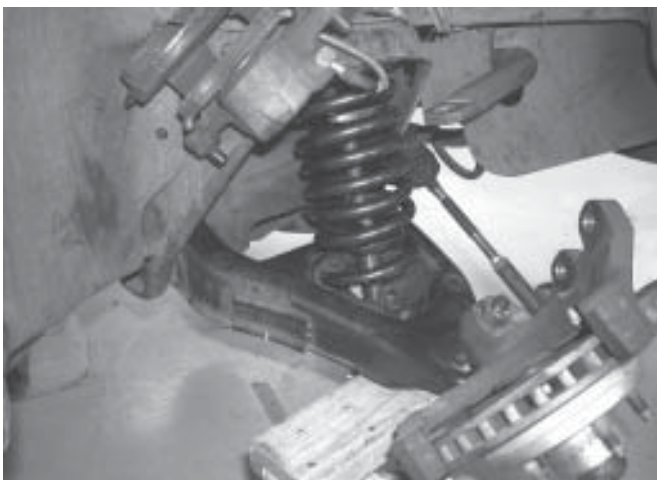
- To remove the caliper, remove the bolts securing the brake caliper to the spindle.

## **Front Caliper Removal for 1994-04 Cars:**

- Remove the caliper bolts securing the brake caliper to the anchor plate. Use a back-up wrench to prevent the guide-pins from spinning.
  - If you are removing the brake rotor, you will need to remove the anchor plate where it attaches to the spindle.
6. Remove the front brake rotor, if desired. While not absolutely required, removal will make the control arm assembly lighter and much easier to handle. On 1979-93 cars, removal of the rotor will require wheel bearing adjustment during re-assembly.
  7. Detach the front swaybar end link from the front control arm.
  8. Loosen the front strut to spindle bolts, but **do not remove** them.
  9. Loosen the tie rod end nut, but **do not remove** it.
  10. If the OEM rubber control arm pivot bushings are present, loosen the front control arm pivot bolts, but **do not remove** them. If urethane or Delrin control arm bushings are fitted, there is no need to loosen the pivot bolts.
  11. Spray the outer tie-rod end's tapered stud with penetrating oil.
  12. Turn the steering wheel to full lock so that the tie-rod end is pointed out.
  13. Free the tie-rod end from the spindle by hitting the front end of the steering arm with a large hammer. Be careful to not hit and damage the threads of the outer tie-rod end.



14. Remove the nut, and the tie-rod end from the steering arm.
15. Use an internally mounted coil spring compressor and compress the front coil spring. Compress the spring onto the control arm by placing the bottom portion of the spring compressor underneath the control arm. Most auto part and equipment rental stores rent this type of spring compressor. Some experimentation may be required to find the best location for placement of the spring compressor.
16. Support the front control arm by placing a floor jack under it, as close to the ball joint as possible. Exert just enough upwards force with the jack to allow removal of the strut to spindle mounting bolts.
17. Remove the strut from the car.
18. Carefully lower the floor jack until the front spring becomes unseated from the upper spring perch. Allow the control arm to hang free.

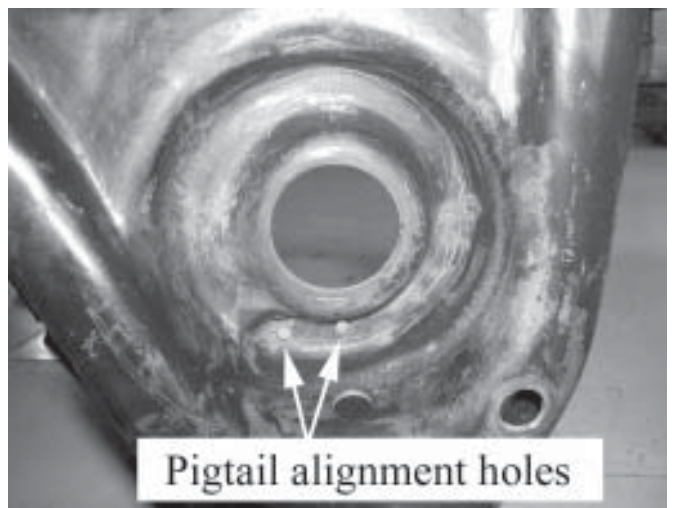


19. With the floor jack completely removed from under the control arm, *carefully* release the

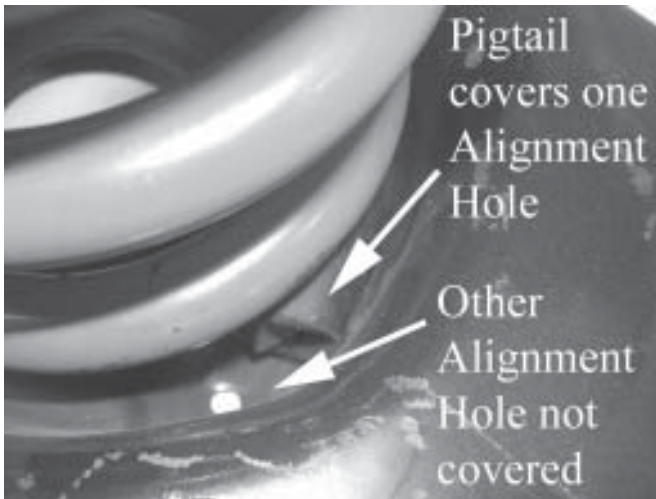
internal spring compressor to free the spring from the control arm. Do not stand in line with the spring, in case it unexpectedly comes loose from the compressor.



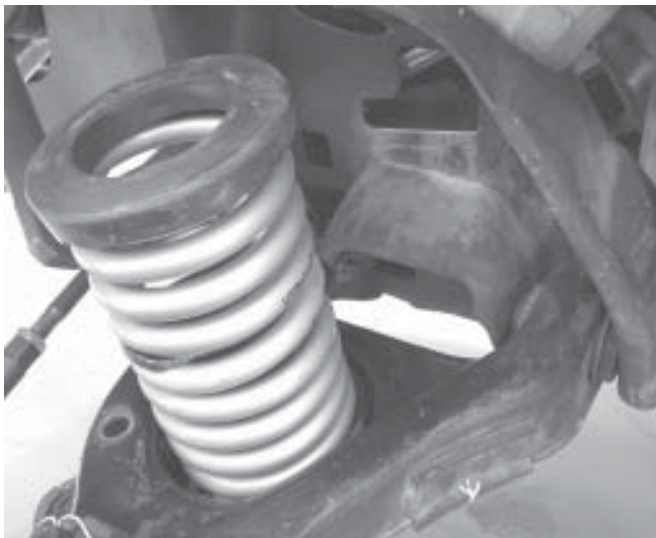
20. Install new spring isolators on the new front spring. Use factory replacement parts, or contact MM to upgrade to Urethane Spring Isolators. (Part number: 6-1703-BL)
21. Set the spring in the lower seat on the control arm. To properly align the spring in the lower spring perch. Note that there are 2 holes near the end of the pocket on the control arm, spaced about 1 inch apart. The end of the spring should be placed *between* the two holes.







22. Compress the new front spring with the spring compressor, onto the front control arm.



23. Using a floor jack, raise the control arm up so that the spring is starting to seat in the upper perch. Make sure the upper spring isolator is in place. Note: The floor jack must be positioned to lift the control arm from directly underneath the ball joint. If the jack is positioned inboard of the ball joint, the leverage of the control arm will begin to lift the car off the stands before the spring is compressed enough to allow installation of the strut.



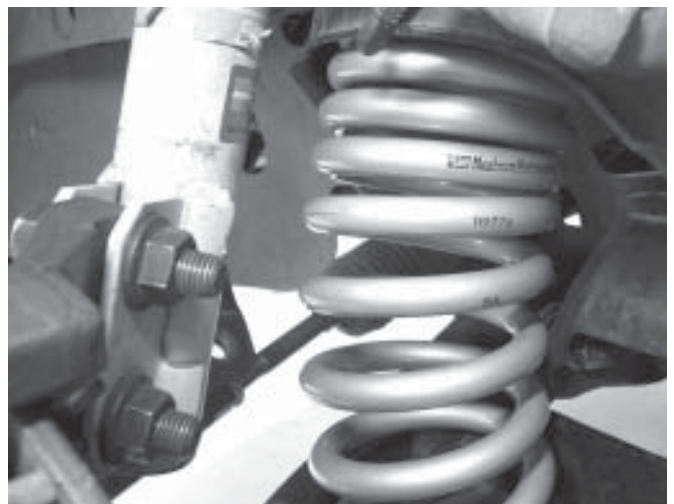
24. Continue raising the jack until the spring is fully seated in the upper perch, and the spring is compressed enough to allow reinstallation of the strut.

25. Re-install the strut. It is easier to install the strut by first placing it in the upper mount, threading on the top retaining nut, and then attaching the strut to the spindle.

Note: If using MM Caster/Camber Plates, be sure to adjust the strut spacer stack to accommodate the new ride height. Refer to your MM Caster/Camber Plate instructions.

26. Once the strut is attached to both its upper mount and the spindle, it is safe to remove the floor jack, as the spring cannot become dislodged.

27. Carefully release the spring compressor tension, and remove it from the spring.



28. Torque the strut mounting bolts at the spindle to 148 ft-lb.
29. Torque the strut shaft nut to 74 ft-lb. Some aftermarket struts, particularly adjustable ones, require a lower torque value. Over-tightening those may cause the strut shaft to break. Refer to your strut manufacturer's torque recommendations.
30. Re-install the tie rod ends. Torque the tie rod studs to 41 ft-lb and install a new cotter pin. If an adjustable outer tie-rod end bumpsteer kit has been fitted, torque to the manufacturer's instructions.
31. Reinstall the brake rotor if previously removed. If applicable, adjust the wheel bearings as per a shop manual.
32. Re-install the brake caliper to the spindle.
33. Torque the brake caliper mounting bolts. The stock calipers are torqued to the following specifications. For aftermarket calipers, consult the manufacturer's instructions:  
 1979-93 Caliper to Spindle: 45-65 ft-lbs.  
 1994-04 Caliper to Anchor Plate: 23 ft-lb  
 1994-04 Anchor Plate to Spindle: 85 ft-lb
34. Repeat Steps 5 through 33 on the other side of the car.
35. Re-install the wheels and torque the lug nuts to the wheel manufacturer's specifications.

Note for customers using stock rubber front control arm bushings

When rubber control arm bushings are still in use, the car must be at the new lower ride height when tightening the control arm pivot bolts. If the car is placed on ramps for ease of access, be sure that all 4 wheels are up on ramps of equal height. The best method is to have the car on a drive-on lift such as those found at a muffler shop. Failure to torque the bolts with the car at the new lower ride height will add undesirable pre-load to the rubber bushings. This will change the wheel rate of the suspension, increase ride harshness, and will cause the rubber bushings to wear out prematurely. Urethane and Delrin control arm bushings may have their pivot bolts tightened with the suspension at full droop, without any resulting damage or problems.

36. Torque the front control arm pivot bolts to 148 ft-lb.
37. Reconnect the swaybar end links.

Note: After the spring installation, the car will have different static alignment because of geometry changes caused by the change in ride height. The camber should be adjusted. **The toe setting must be adjusted.** Have your car aligned by a professional alignment shop immediately.

Rear Spring Installation

38. Raise the front end of the car by jacking under the center of the K-member. Support it with jack stands positioned under the K-Member right behind the forward front control arm pivot, as indicated by the "X" in the picture below.

Note: It is important to support the front end of the car under the engine. If the IRS subframe is completely removed from the car, the weight balance shifts forward significantly, and the car could tip forward off the jackstands if it is not properly supported. If you are installing other IRS components with your new springs such as MM Control Arm Delrin Bushings, you may wish to completely remove the subframe.

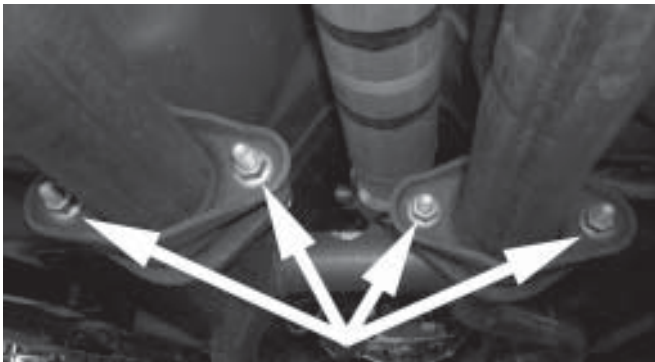


39. Raise the rear of the car with a jack and support the rear of the car on a pair of jack stands. This pair of jack stands **MUST** be positioned under the chassis of the car (e.g., under aftermarket subframe connectors or under the torque boxes), not under the IRS subframe.

Note: To remove the IRS subframe from the vehicle, a minimum distance of 19" is necessary between the ground and the pinch weld seam at the bottom of the rocker panels. Removal of the entire subframe *is not* required for spring installation. However, if you are installing other IRS products in conjunction with your new springs, it may be necessary.

40. Remove the rear wheels.

41. Remove the tail section of the exhaust from the vehicle, disconnecting it at the front of the mufflers. A flat-head screwdriver is useful in prying the rubber exhaust hangers from the exhaust.



42. Place the jack firmly beneath the passenger side rear control arm.

43. Remove the passenger side lower shock bolt from the control arm.

44. **SLOWLY** lower the jack until the control arm is resting on the subframe.

45. Repeat steps 42-44 for the driver side control arm.

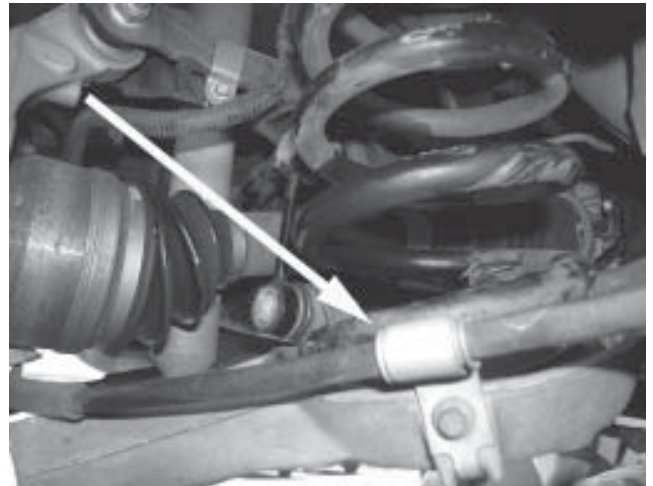
46. Mark the orientation of the drive shaft flange to the pinion flange.

47. Remove the four bolts retaining the drive shaft to the pinion flange. It may be helpful to set the parking brake to stop the drive shaft from rotating, or place a pry bar through the U-joint.

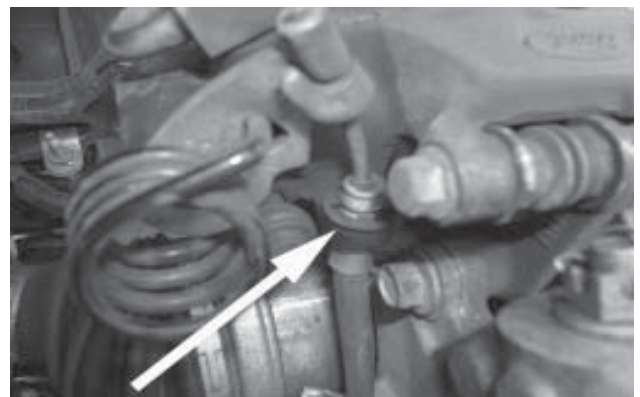
48. Using tie wire or zip-ties, secure the drive shaft to the parking brake cable bracket located slightly forward of the rear bulkhead. **AVOID** removing the drive shaft from the transmission; doing so will allow oil to drain from around the output shaft of the transmission.



49. Unbolt the parking brake cable mounting-bracket from each control arm.

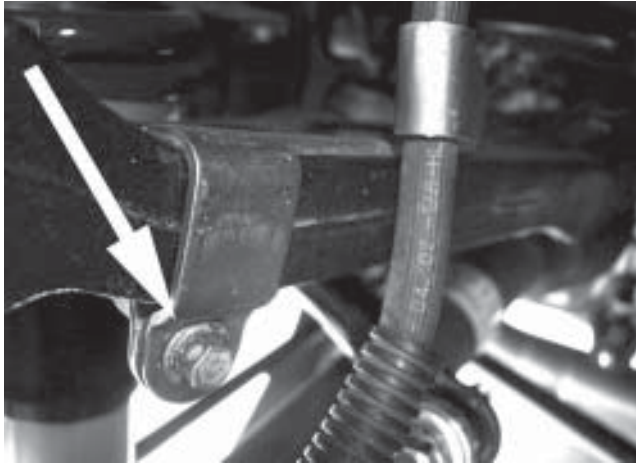


50. Make sure the parking brake is not set, then remove the parking brake cable housing retaining clip on each caliper.

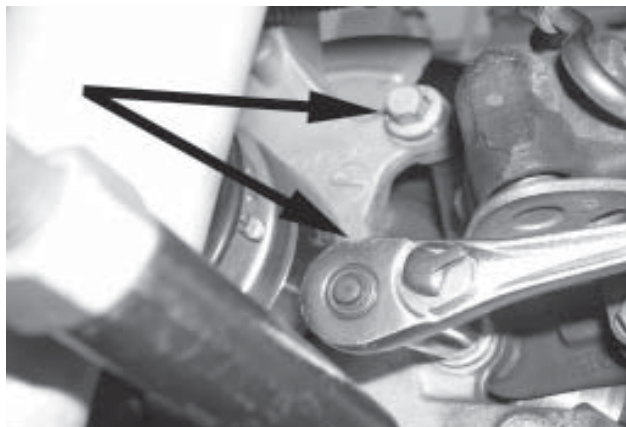




51. Disconnect the parking brake cable from the parking brake lever on each caliper. Remove the cable from the locating hole in the calipers.
52. On 2003-04 vehicles, remove the retaining bolt on each of the brake hose locator brackets bolted to the rear upper control arms.



53. On 2003-04 vehicles, remove the brake hose locator brackets from the control arms. It will be necessary to spread the bracket legs apart in order to remove them.
54. Remove the two bolts holding the caliper assembly to the spindle on the passenger side. 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 from the brake hose.



55. Using a zip-tie or safety wire, hang the caliper from the rear chassis mounting bracket for the IRS sub-frame. DO NOT hang the caliper from the subframe because the brake hose will be stretched when the subframe is lowered, resulting in brake hose damage.



56. Repeat steps 54-55 for the driver side.
57. Unbolt the ABS sensors from each side of the differential housing and disconnect the plastic retaining clips. These attachment bolts have a head with both an external hex and an internal Torx.
58. Position the jack under the differential and raise the jack until it just contacts the differential. It may be necessary to place a block of wood between the jack and the differential. Be careful not to lift the rear of the car off the jack stands.



59. Remove the two rear 12mm IRS subframe mounting bolts.
60. Loosen the two forward 14mm IRS subframe mounting bolts.

Note: On most factory equipped IRS Mustangs, Ford used 12mm bolts to secure the 14mm forward IRS subframe mounts. To prevent excessive movement of the IRS subframe, the proper 14mm factory mounting bolts can be obtained from Maximum Motorsports.

61. Slowly lower the jack, allowing the IRS subframe to pivot about the forward mounting bolts, until the springs are uncompressed.

62. Remove the rear springs from the control arms.
63. Install new spring isolators on the new rear springs. Use factory replacement parts, or contact MM to upgrade to Urethane Spring Isolators. (Part number: U-3)
64. Insert the springs into the spring perches on the lower control arms, being sure to orient the spring pigtail ends so that they align with the mounting hole for the parking brake cable bracket.



Note: Testing by MM showed that orienting the springs 180 degrees from the recommended position will raise the car as much as 1/4". If you find that the ride height of your new springs too low for your liking, you may wish to re-orient the spring pigtails to raise the car.

65. Jack the rear of the IRS subframe up into position, making sure that the springs seat correctly into the upper spring perches on the chassis.
66. Install the two rearward 12mm IRS subframe mounting bolts.
67. Torque each of the four IRS subframe mounting bolts to 76 ft-lb. If your forward subframe bolts are 14mm, torque them to 111 ft-lb.
68. Reinstall the ABS sensors onto the differential housing, being sure to attach the wires to their respective retaining clips. Torque the Torx bolts to 5 ft-lb.
69. Reinstall the brake calipers. Torque the caliper mounting bolts to 76 ft-lb.
70. On 2003-04 vehicles, replace the brake hose locator brackets back onto the upper control arms.
71. On 2003-04 vehicles, insert the mounting bolt back into each of the brake hose locator brackets and tighten until the bracket's legs are touching.
72. Reinstall the parking brake cable onto the parking brake lever on each caliper.
73. Reinstall the parking brake cable housing retaining clips.
74. Reinstall the parking brake cable mounting brackets to the lower control arms and torque the bolts to 9 ft-lb.
75. Connect the drive shaft to the differential. Use the mark made in Step 46 to correctly orient the drive shaft. Torque the bolts to 83 ft-lb. Set the parking brake, or use a pry bar through the U-joint, to stop the drive shaft from rotating while tightening the bolts.
76. Use a jack to raise the passenger side rear control arm until the lower shock bolt can be inserted. Place the factory nut on the bolt.
77. Torque the lower shock mounting bolt to 98 ft-lb.
78. Repeats steps 76-77 for the driver side control arm.
79. Reinstall the exhaust system and torque the exhaust flange bolts to 34 ft-lb.
80. Reinstall the rear wheels and torque the lug nuts to the manufacturer's specifications.



### Note for customers using stock rubber rear control arm bushings

If rubber lower control arm bushings are still in use, the lower control arm pivot bolts must be loosened and re-torqued with the car at the new lower ride height. If the car is placed on ramps for ease of access, be sure that all 4 wheels are up on ramps of equal height. The best method is to have the car on a drive-on lift such as those found at a muffler shop. Failure to re-torque the bolts with the car at the new lower ride height will add undesirable pre-load to the rubber bushings, because of the change in ride height. This will change the wheel rate of the suspension, increase ride harshness, and will cause the rubber bushings to wear out prematurely. Urethane, Delrin, and spherical bearing control arm bushings do not require this procedure.

If it is necessary to loosen the lower control arm bolts to remove bushing pre-load, torque the bolts to the following specifications:

Lower Control Arm: 184 ft-lb.

Note: Since the rubber bushings in the upper control arm are not fully bonded to the steel bushing shell, they can rotate to a neutral position when the vehicle ride height is changed. This may take a few miles of driving. It is not necessary to loosen and re-torque the upper control arm pivot bolts.

82. Safely lower the car to the ground and test drive.
83. Re-torque the four subframe mounting bolts after 1,000 miles of driving.

### This kit includes:

- 2 Front Springs
- 2 Rear Springs