



## **COIL-OVER SUSPENSION KIT INSTALLATION INSTRUCTIONS**

PART NUMBER DI90-4212

### **APPLICATIONS:**

- 2015-17 Audi A3 2wd (MK3), without EDC
- 2015-17 Audi A3 Quattro (MK3) , without EDC
- 2015-17 Volkswagen Golf (MK7; 2.0L w/ 55mm housing & multi-link rear suspension) ,  
without EDC
- 2015-17 Volkswagen GTI (MK7; w/ 55mm housing & multi-link rear suspension) ,  
without EDC

Congratulations for being selective enough to use a Dinan Coil-Over Suspension Kit. We have spent many hours developing this kit to assure that you will receive maximum performance and durability with minimum difficulty in installation. Please take the time to read these instructions and call us if you have any difficulties during the installation.

**NOTE:** This kit is designed to work for the specific vehicles shown above. This kit may not fit all combinations of vehicle trims and drivetrains. DO NOT use this kit for any other application! Please contact your Dinan representative if you have any questions concerning the suitability of this kit for your vehicle.

### **WARNINGS:**

**The components in this kit allows for increased suspension travel, enabling the vehicle to be lowered beyond what is normally possible with stock components, yet retaining a civilized ride.**

**\*\* However, this additional travel opens the possibility of chassis contact with the ground (i.e., speed bumps, etc.), or tire-to-vehicle contact under heavy compression. Clearances must be carefully evaluated:**

- **During and after installation of this kit;**
- **After any ride height change;**
- **After any alteration to the original tire/wheel package.**

**If you determine there is insufficient clearance, the vehicle must be raised, or safety will be compromised! Dinan is not responsible for any damages or injury!**

## **INSTALLATION NOTES:**

DO NOT WORK ON VEHICLES SUPPORTED BY A JACK ONLY. USE SECURE JACK STANDS!

DO NOT USE A PNEUMATIC IMPACT GUN TO TIGHTEN THE SHOCK SHAFT TOP NUT! DOING SO MAY DAMAGE THE SHAFT AND THE SHOCK'S INTERNAL COMPONENTS. WARRANTY WILL BE VOIDED IF THIS PRECAUTION IS NOT FOLLOWED!

All suspension related components must be inspected and in good working condition. You should inspect all bushings, tie rods, hubs, bearings, strut mounts, sway bar end links, wheels, tires, etc. and replace if necessary.

Tightening of components & fasteners:

- All rubber-mounted strut/shock attachments must not be fully tightened until after the suspension system is loaded (wheels on the ground).
- Other mounting fasteners (brackets, strut mounts, etc.) must be securely tightened before load is placed on the suspension system.

**Dinan's recommended starting ride height is 3/4" lower than stock.** Dinan has determined that this is a safe starting value under most instances. However, the vehicle's specific configuration (wheel/tire selection, vehicle loadout, body options such as aerodynamic kits, etc.), as well as the local road conditions & speeds, and driving style, all have a huge influence over what is considered safe for your individual situation. Take care to assess all of these factors when determining ride height, and adjust as needed.

Additional lowering beyond Dinan's recommended starting point is certainly possible, but extra care must be taken to assess tire & chassis clearance as warned previously. Furthermore, additional lowering will result in more frequent bumpstop engagement, which has the effect of increasing spring rate and will alter the handling balance of the vehicle. Extreme care must be taken during the initial test drive to assess the vehicle's handling, and adjust as needed.

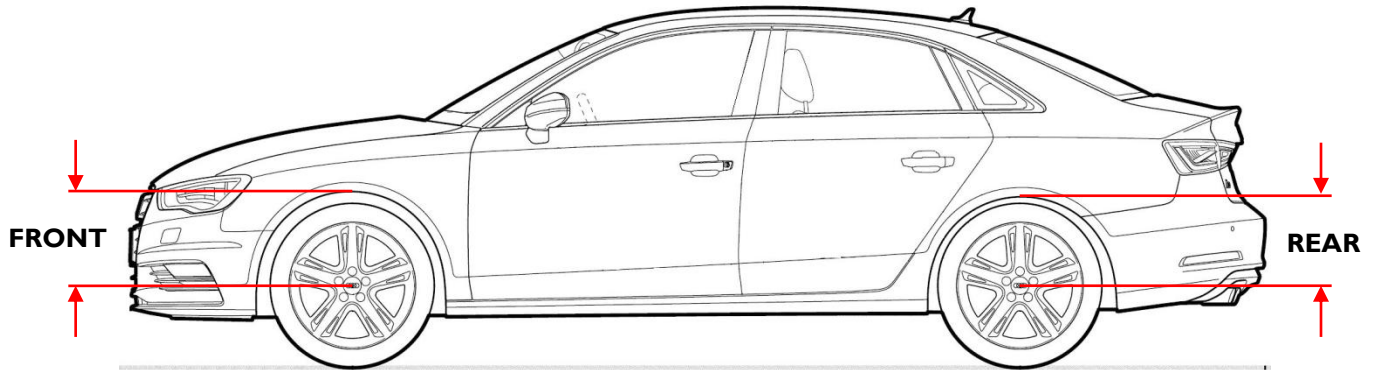
Springs will settle after a test drive. Please be sure to recheck and adjust ride height after a test drive, but before performing an alignment.

An alignment is required after installation of this kit.

After installing the suspension system, a four-wheel alignment must be performed according to manufacturer's specifications. Also check and reset load-dependent brake compensator, ABS system and headlight aim according to manufacturer's specifications, if applicable.

## **MEASURE STARTING RIDE HEIGHT:**

Before beginning installation, it is important to establish the starting ride height. Park the car on a level surface and take center-of-wheel-to-fender measurements as shown in the figure below.

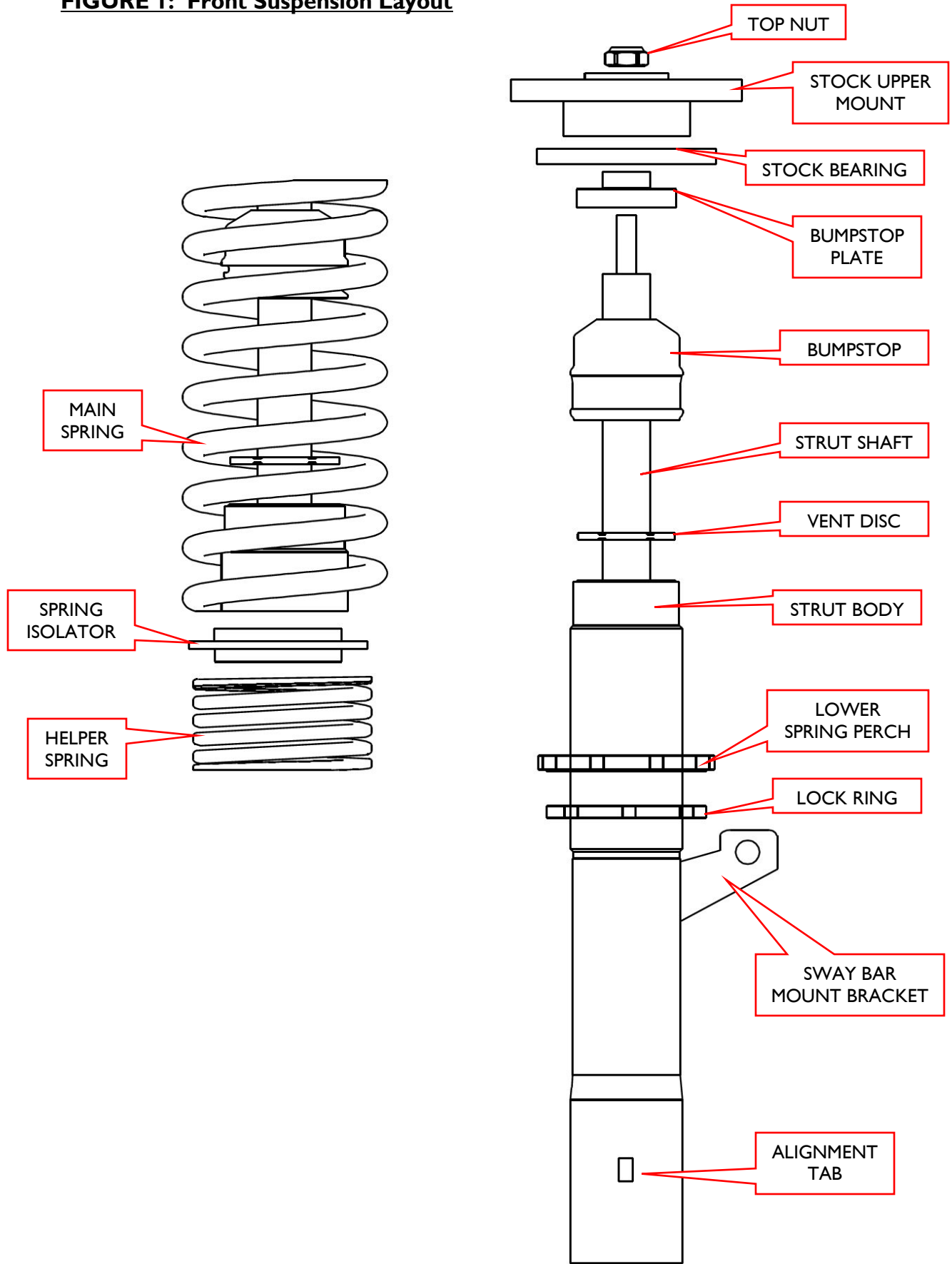


For reference, the factory ride height of the vehicles intended for this kit is:

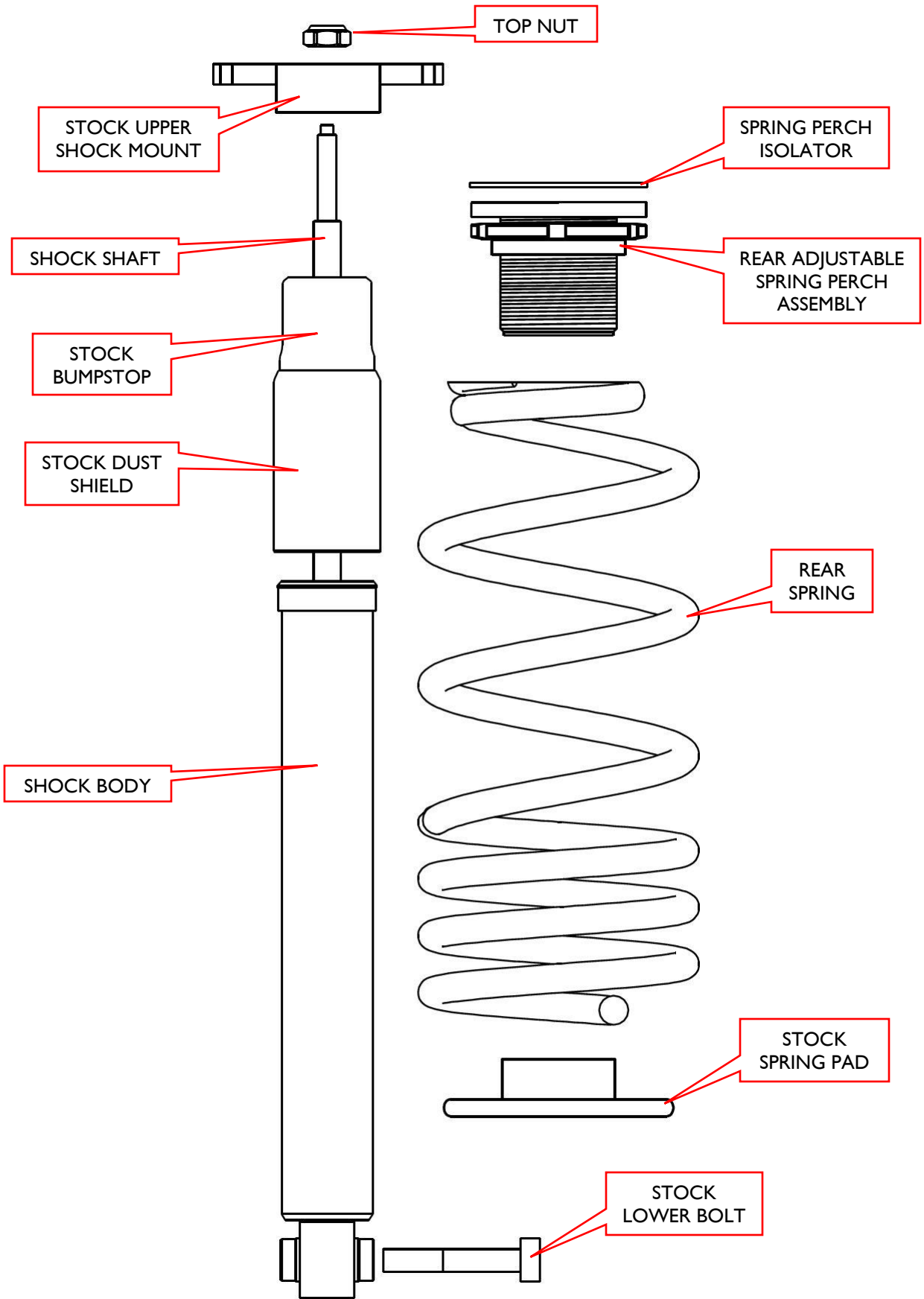
- Front = 15.0"
- Rear = 15.0"

Your starting value may differ depending on vehicle load & options, as well as wear & tear of the stock components.

**FIGURE I: Front Suspension Layout**



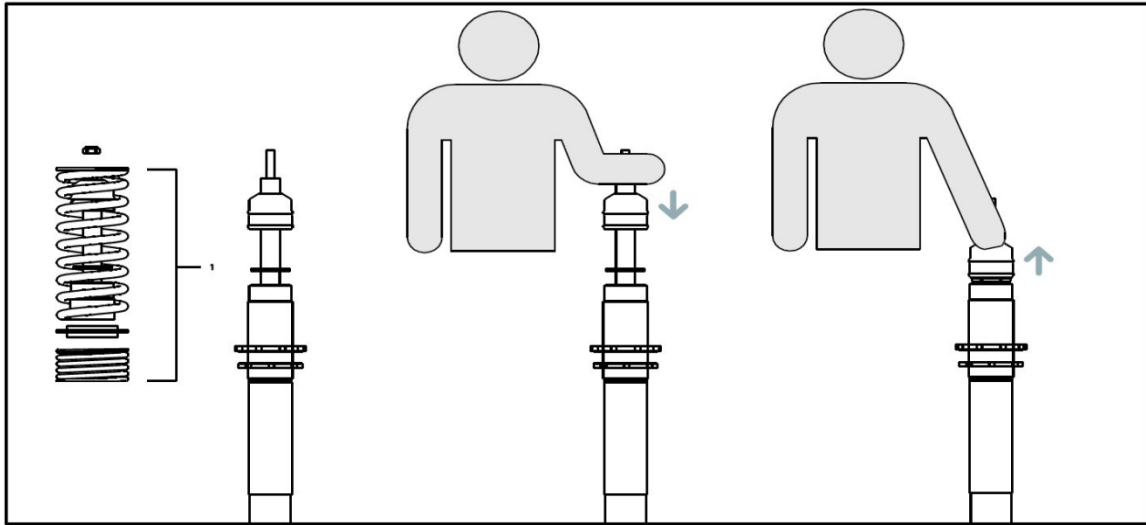
**FIGURE 2: Rear Suspension Layout**



## **FRONT INSTALLATION:**

1. If equipped, disconnect the headlight level sensor on control arm before any other steps are taken. Leaving the sensor connected could damage the linkage.
2. Support lower control arm/spindle with a floor jack.
3. Remove any lines/hoses from original suspension strut mounts.
4. Remove OEM sway bar endlink from strut housing (endlink will be reused).
5. Remove lower pinch bolt/nut from spindle.
6. Using strut spreader tool (VAG p/n SCW3435 or equivalent), spread spindle mount.
7. Lower the control arm to separate strut from spindle.
  - Ensure that the lower control arm remains supported.
  - Corrosion at the joint may limit movement. If necessary, use a rubber mallet to promote separation by tapping the cast spindle.
  - Disconnecting drive axle from transmission and lower ball joint from control arm can assist in removal by allowing greater range of movement, but may not be necessary.
8. Support strut from inside wheel well.
9. Remove three upper strut mount bolts, accessing them from inside the engine bay underneath wiper cowl.
10. Remove strut assembly, but leave the strut spreader in place.
11. Using a spring compressor, relieve the spring pressure from the upper mount, and remove the upper strut mount and bearing. These items will be reused.
12. Rotate the upper bearings a few times to verify they are free to move. If they are stuck or difficult to move, then the strut assembly cannot rotate as it should, which results in a "boing" or "clang" sound as the springs recoil. Replace the upper bearings as needed.

13. The suspension is shipped and stored in a horizontal position. It is suggested to exercise ("prime") the new struts before assembly:
- Remove the external components from the new strut assemblies, leaving just the bumpstop & vent disc in place.
  - Holding the strut vertical (as it would be installed in the vehicle), compress the strut shaft until the bumpstop contacts the strut body, then extend fully. Repeat 3-5 times, or until the shock forces feel consistent in both directions.



14. Refer to Front Suspension Layout (Figure 1). Assemble the new strut assembly with the OEM parts and new components provided.
- The flat end of the spring rests on the Dinan spring perch on the new strut assembly.
  - Torque the top nut to 44 ft-lbs.
  - Once assembled, use the included spanner wrenches to adjust the main perch/spring seat to 1" above the lowest setting. The actual vehicle height will be adjusted later.
  - Use of an anti-corrosion compound such as the included Boeshield T-9 on the threads can make the adjustment process much easier and add an extra layer of protection.
15. Insert strut assembly into vehicle. Reinstall three upper strut mount bolts but do not tighten at this time.
16. Inspect the inside of the spindle and verify it is clean and free of debris (rust/dirt, etc.) before installation of the new strut assembly. Also note the placement of the ridge that is built into the inner lower edge of the tube of the spindle. This is a locator for the strut body, which must be inserted into the tube until it is stopped by this ridge. Only at this point is the strut properly seated in the spindle.
17. With the strut spreader in place:
- Insert strut assembly into spindle housing with the metal bolt locator thru the split.
  - Slide the strut assembly down until the bottom of the strut housing has bottomed out on the internal ridge in the spindle.

18. Replace lower spindle bolt through spindle housing and strut locator.
19. Fasten the self-locking nut onto the lower spindle bolt and tighten to 37 ft-lbs, plus an additional 1/4 turn (i.e., 90°).
20. Reinstall OEM sway bar endlinks.
21. Repeat procedure on other side.
22. Once vehicle is placed back on the ground under its own weight, torque upper strut mount bolts to 11 ft-lbs.
23. Make sure all attaching bolts are tightened properly.

### **REAR INSTALLATION:**

24. The rear suspension of this chassis is a combination of a rear lowering spring & adjustable spring perch and specially matched shock absorber. The shock absorber does not need to be adjusted in any way to change the ride height.
25. If equipped, disconnect the headlight level sensor on lower control arm before any other steps are taken. Leaving the sensor connected could damage the linkage.
26. While supporting lower trailing arm or beam in the compressed position (loaded as if it were on the ground):
  - Remove lower shock bolts from both shocks.
  - Slowly lower rear trailing arm on both sides to remove pressure on the rear springs.
  - Remove the rear springs (this may require you to lower the rear beam or control arm further, to allow additional room).
27. Remove (2) upper bolts from the upper shock mounts and remove both shocks from the vehicle.
28. Take note of the orientation of the OEM shock mounts. Remove the OEM shock mounts and set aside, as they will be reused.
29. As with the front struts, the rear shocks are shipped and stored in a horizontal position. It is suggested to exercise ("prime") the new shocks before assembly:
  - Remove all parts from the new shocks.
  - Holding the shock vertical (as it would be installed in the vehicle), compress the shaft until only 1" of the shock rod is visible outside of the shock body, then extend fully. Repeat 3-5 times, or until the shock forces feel consistent in both directions.
30. Remove both upper and lower factory spring pads from the vehicle, and ensure that both areas are clean and free of any dirt or debris.
31. Reinstall OEM lower spring pad.



32. Install the Dinan spring (flat end upward), taking care to align the bottom of the Dinan spring pigtail with the indentation in the lower spring pad.
33. Prepare the adjustable spring perch assembly for installation.
  - Thread the adjustable perches close to the aluminum base.
34. Refer to Rear Suspension Layout (Figure 2). Install adjustable spring perch assembly on top of new Dinan spring.
  - Verify that the flat end of the spring rests against the Dinan spring perch.
  - Make sure the supplied rubber spring isolator is installed in between the chassis and the adjustable spring perch.
  - You may need to raise the rear suspension to keep the assembly in place.
35. Repeat on the other side.
36. Assemble Dinan rear shock, reusing the OEM upper shock mount. Torque shock shaft nut to 18 ft-lbs.
37. Place shock into vehicle and reinstall two upper shock mount bolts and torque to 37 ft-lbs.
38. Reinstall the lower bolt / lock washer / washer assembly through the opening in the bottom of the control arm/axle.
39. Reinstall the lower shock bolts.
  - Do not tighten lower shock bolts until vehicle is back on the ground and all weight is on vehicle, then torque lower shock bolts to 130 ft-lbs.
40. Make sure all attaching bolts are tightened properly.

### **CHASSIS SETUP:**

41. Take the car for a short test drive to settle the suspension.
42. Park car on a level surface and take center-of-wheel-to-fender measurements
43. Adjust the spring perches as necessary to obtain your target ride height.
  - Make sure you roll the car forward & backward after each adjustment to settle the suspension.
  - Lock the spring perches into place once you obtain your target ride height.
44. Take car for a short test drive and recheck the ride height.
45. An alignment must be performed after installation of this kit.

## **ALIGNMENT:**

### Notes:

- These alignment specifications are for a vehicle with full fuel tank and driver inside the vehicle.
- These values are suggestions only. Vehicle options (such as a factory sport suspension), other aftermarket equipment, and personal preference, may require different values. Please consult an alignment professional to discuss your specific needs.
- Set COLD tire pressures to factory recommendations.
- Additional information is available in the following section “Understanding Alignment Settings”. We recommend reviewing this section before finalizing the alignment.

<b>Alignment:</b>		
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<b>FRONT</b>	Setting	Tolerance
Camber	-1.00°	± 0.50°
Caster	7.6°	± 0.50°
Total Toe	0.17°	± 0.17°
<b>REAR</b>		
Camber	-1.50°	± 0.50°
Total Toe	0.33°	± 0.17°

## **UNDERSTANDING ALIGNMENT SETTINGS & VEHICLE SETUP**

Dinan has always been famous for creating a high performance suspension that not only handles great, but also rides great. This can be accomplished with proper engineering. However, to do this it is important to set the car up correctly, and understand proper alignment and set up of a Dinan vehicle. No suspension will work correctly without proper setup. The settings contribute as much to handling as the components themselves.

### **Pull:**

A pull is a front caster or camber alignment issue. Toe cannot cause a pull; it can only cause the steering wheel to be crooked.

A car pulls towards the side of most positive camber or least positive caster. The severity of pull caused by camber and caster is not equal -- a  $\frac{1}{2}^\circ$  of camber pull is equivalent to about  $1^\circ$  of caster pull. It is possible for the camber and caster to be off in opposite directions, and the car will still track straight.

Example – A car with the following alignment will track straight:

LF Camber: -0.50°	RF Camber: -0.75°
LF Caster: +7.0°	RF Caster: +6.5°

A defective tire can also cause a pull. This can be diagnosed by temporarily swapping the front tires and checking to see if the pull follows the tire.

### **Tolerances:**

Our technical support lines receive frequent calls regarding a complaint about a pull on a recently-aligned car. Technicians always report that "...the car's alignment measurements are within the factory or Dinan specified ranges, as indicated by a green display on the alignment machine..."

The measurements are allowed to be on the positive or negative limits, but they must be equal from side to side. A side-to-side discrepancy will result in a pull. An alignment range will normally be  $\pm 0.5^\circ$ . That does not mean that one side can be at  $+0.5^\circ$ , and the other side at  $-0.5^\circ$ , or else the car will have a considerable pull, even though the measurements are "within tolerance".

### **Finer Points of Alignments:**

Before aligning any car, check the tire pressures and adjust as necessary. In addition, the car must be driven on a straight smooth road with an average crown before you put it on the alignment rack. This will allow you to evaluate if the car has a pull, so that when you see the measurements, they will make sense.

### **Road Crown:**

Roads are designed with a crown for water drainage. Without compensation, cars will naturally want to drift towards the side of the road (left-hand drive cars will tend towards the right, and right-hand drive cars will tend to the left). As a result, it is good

practice to set up the alignment with a little compensation for road crown. This is done by setting the side closest to the center of the road with a little more positive camber, or a little less positive caster, than the side closest to the side of the road. It requires approximately 0.1° to -0.2° more positive camber, or 0.2° to -0.4° less caster, to compensate for road crown. Don't adjust aggressively if the car didn't pull during your test drive.

Example – the following variances from side-to-side will usually make a car go straight on most left-hand drive roads:

LF Camber: -0.80°	RF Camber: -1.00°
LF Caster: +7.0°	RF Caster: +7.0°

Or...

LF Camber: -1.00°	RF Camber: -1.00°
LF Caster: +6.6°	RF Caster: +7.0°

### **Tire Wear:**

Excessive tire wear can be caused by camber or toe.

- Too much positive camber will wear the tire on the outside, and too much negative camber will wear the tire on the inside.
- Too much toe-in will wear the tire on the outside, and too much toe-out will wear the tire on the inside.

When a tolerance is given for an alignment setting, it is because each driver operates their car differently, and you must evaluate the customer's needs when performing an alignment. The best way to do this is to examine tire wear.

- A very aggressive driver, one that drives curvy roads frequently, or who frequently participates in track days will wear the tires on the outside edge.
- Conversely, someone who drives sedately or spends much time on the highway in a straight line will likely wear tires on the inside.

If a camber range is given, the aggressively driven car should be setup on the negative side, and the sedately driven car should be setup on the positive side of the allowed range.

Do not be fooled by the fact that the customer is purchasing a high performance suspension. Often people purchase a suspension just for the look of a lowered car, and not because they drive fast. Their tire wear will tell the story.

### **Wheels & Tires:**

Wheels and tires will have a dramatic effect on your car performance. Often people create a tire and wheel combination that has a detrimental effect on the car's performance. The biggest mistakes made are too big of a tire width difference front-to-rear, or too large of a tire diameter. It is best to stay with the factory overall tire diameter, and do not exceed the factory width difference between the front and rear tires.

### **Ride Quality:**

The largest contributor to poor ride quality is ride height, and not stiff springs. The bump stop should have at least 1/2" clearance, (preferably 3/4") in the front, and 3/4" to 1" in the rear. If you are installing a coil over suspension, please adjust the ride height accordingly.

### **Scrub:**

Scrub is the distance between the centerline of the tire, and the geometric centerline of the outer ball joint or attachment location in the suspension. As you put wider wheels and tires on your car, the scrub increases. Increased scrub will cause the car to dart around or follow ruts in uneven pavement. This is because the leverage of the scrub will cause more bushing distortion in the suspension.

This darting can be reduced and the car made more stable by stiffening the bushing in the suspension. Stiffer bushings are highly recommended when larger wheels and tires are installed on your car.

### **Tire Clearances:**

Due to differences in construction, different brands of tires are different widths even if they are marked with the same size. With a coil-over track suspension that has a large range of ride height adjustment and camber settings, it is very easy to get larger-than-stock wheels and tires to rub. This is not just on the fender lip, but also on the inside plastic fender liner, and the top of the fender well from the car being lowered excessively. If you have larger than stock wheels, then suspension adjustments, or rolling & trimming of fender lips may be required (at additional expense) to ensure clearance. Oftentimes rubbing isn't evident until the car is loaded or driven very hard. Multiple repair attempts may be required. Choosing larger diameter wheels (like 20" when a car was originally equipped with 19") will compound the problem tremendously. It may be necessary to raise the ride height slightly to prevent the tires from rubbing on the top inside of the wheel wells.

### **Tire Pressures:**

Most people run too much air pressure in their tires for maximum grip. More pressure does not mean more grip. Most low profile high performance tires will make maximum grip between 36-40 psi hot. What this means is you drive your car aggressively on your favorite winding road or race track, immediately jump out of the car and measure the pressures before the tires have started to cool. The cold pressure can then be determined after the car sits over night and the tires have cooled to ambient temperature. Because of the extreme temperature reached on a race track, the proper cold pressures for track use will be lower than the cold pressures for street use.

### **Track Adjustments:**

#### **Camber:**

Over-steer is when the car gets sideways equally when cornering hard. Under-steer is when the car plows in the front end and does not want to turn. Different chassis set up and tires will alter the handling characteristics of your car. To properly set up your coil over suspension you will need an experienced racing driver to determine the balance of your car with the tires you have chosen.

The end of the car that is stiffest does the most amount of work and therefore loses traction first.

- So if your car over-steers you would stiffen the front bar.
- If it under-steers then you would soften the front bar.

A stiffer bar does not mean a better handling car. The bar should be adjusted for a proper under-steer, over-steer balance.

Another way to adjust the balance of your car is camber. More negative camber usually means more grip in a street car. This is because most street cars run a more positive camber setting to promote good tire wear when driving in a straight line on the freeway. If your car over-steers, you can add negative camber to the rear. If it under-steers you can add negative camber to the front. Don't get too carried away – most cars can tolerate between  $-0.5^{\circ}$  and  $-1.5^{\circ}$  of camber on the front, and between  $-1.4^{\circ}$  and  $-1.8^{\circ}$  of negative camber in the rear, before excessive tire wear is experienced. The more aggressively you corner, the more negative camber can be tolerated. If it is a dedicated track car, then between  $-3.0^{\circ}$  and  $-4.5^{\circ}$  in the front, and between  $-2.0^{\circ}$  and  $-2.5^{\circ}$  in the rear is OK. This is for a car that is trailered to the track, and never to be driven on the street.

#### Toe:

Toe can be adjusted to improve grip as well.

- Toe-in the front will reduce front grip and make a car under-steer (or reduce over steer).
- Toe-out will make it over-steer (or reduce under-steer).
- Toe-in the rear will add grip and increase under-steer (or reduce over-steer)
- Toe-out in the rear will make over-steer and a very unstable car

#### Compensating for Camber and/or Grip with bar settings, springs, or shocks:

As you add more negative camber and toe out in the front, the car will gain a lot of front grip, which causes the car to roll more and be more responsive. This increased roll and response will make the car hard to control and it will need more support. Support can come from a stiffer front bar, spring, or shocks. If you do not want to stiffen up the car, then you will need to be more conservative with the alignment settings.