



Audi B8 ST Coilover System Installation Instructions - [ES2795514](#)



Skill Level
2 - Moderate
Some Experience
Recommended



Proper service and repair procedures are vital to the safe, reliable operation of all motor vehicles as well as the personal safety of those performing the repairs. Standard safety procedures and precautions (including use of safety goggles and proper tools and equipment) should be followed at all times to eliminate the possibility of personal injury or improper service which could damage the vehicle or compromise its safety.

INTRODUCTION

The ST Coilover System by KW Suspension offers the following features:

- Adjustable composite spring seats
- Tempered high strength springs
- Hardened chrome piston rod
- Noise damping, corrosion resistant spring cap
- Rust resistant galvanized strut housings
- 5 year limited warranty
- Average of 1 to 2.5 inches lower ride height

Coilovers are a great way to improve the look of your vehicle, and sharpen handling without destroying ride quality. We're going to walk you through the install step by step, and we'll point out tips and tricks to make the job easier along the way. We'll even show you how to replace the factory rear coils, even if you don't have the pricey factory spring compressor.



TABLE OF CONTENTS

Required Tools and Equipment.....	pg.3
Installation and Safety Information	pg.4
Component Locations and Torque Specs.....	pg.5
Removing the Front Struts	pg.6
Installing the Front Coilovers	pg.16
Removing the Rear Shocks and Springs	pg.20
Installing the Rear Coilovers.....	pg.26
Special Section - For Vehicles w/Electronic Damping Control.....	pg.28
Measuring and Adjusting Ride Height	pg.31
Schwaben Tools	pg.32

REQUIRED TOOLS

Note: The tools required for each step will be listed by the step number throughout these instructions.

Standard Automotive Tools

- Protecta-Sockets (for lug nuts) [ES#2221243](#)
- **3/8" Drive Ratchet** [ES#2765902](#)
- **3/8" Drive Torque Wrench** [ES#2221245](#)
- **3/8" Drive Deep and Shallow Sockets** [ES#2763772](#)
- **3/8" Drive Extensions** [ES#2804822](#)
- **Hydraulic Floor Jack** [ES#2834951](#)
- Torx Drivers and Sockets [ES#11417/8](#)
- **1/2" Drive Deep and Shallow Sockets** [ES#2839106](#)
- **1/2" Drive Ratchet**
- **1/2" Drive Extensions**
- **1/2" Drive Torque Wrench** [ES#2221244](#)
- **1/2" Drive Breaker Bar** [ES#2776653](#)
- Bench Mounted Vise
- Crows Foot Wrenches
- Hook and Pick Tool Set [ES#2778980](#)

Required For This Install

Available On Our Website

- 1/4" Drive Ratchet [ES#2823235](#)
- 1/4" Drive Deep and Shallow Sockets [ES#2823235](#)
- 1/4" Drive Extensions [ES#2823235](#)
- Plier and Cutter Set [ES#2804496](#)
- Flat and Phillips Screwdrivers [ES#2225921](#)
- **Jack Stands** [ES#2763355](#)
- Ball Pein Hammers
- Pry Bar Set [ES#1899378](#)
- Electric/Cordless Drill
- Wire Strippers/Crimpers
- Drill Bits
- Punch and Chisel Set
- Hex Bit (Allen) Wrenches and Sockets [ES#11420](#)
- Thread Repair Tools [ES#1306824](#)
- **Open/Boxed End Wrench Set** [ES#2765907](#)

Specialty Tools

- **Spindle Housing Spreader** [ES#3894](#)
- **Triple Square Socket Set** [ES#1910215](#)

INSTALLATION NOTES

- **RH** refers to the *passenger side* of the vehicle.
- **LH** refers to the *driver side* of the vehicle.
- Always use the proper torque specifications.
- If applicable to this installation, torque specifications will be listed throughout the document and at the end as well.
- Please read all of these instructions and familiarize yourself with the complete process **BEFORE** you begin.

GENERAL PREPARATION AND SAFETY INFORMATION

ECS Tuning cares about your health and safety, please read the following safety information. This information pertains to automotive service in general, and while it may not pertain to every job you do, please remember and share these important safety tips.

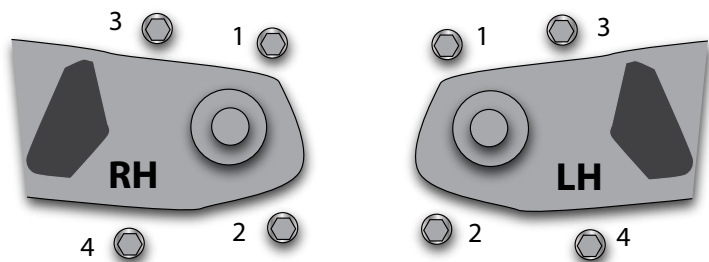
- Park your car in a safe, well lit, level area.
- Shut the engine off and remove the key from the ignition switch.
- Make sure any remote start devices are properly disabled.
- **ALWAYS** wear safety glasses.
- Make sure the parking brake is applied until the vehicle is safely lifted and supported.
- Whether lifting a vehicle using an automotive lift or a hydraulic jack, be sure and utilize the factory specified lift points.
- Lifting a vehicle in an incorrect location can cause damage to the suspension/running gear.
- **ALWAYS** support the vehicle with jack stands.
- **ALWAYS** read and follow all safety information and warnings for the equipment you are using.



NEVER get underneath a vehicle that is supported only by a jack, and **ALWAYS** make sure that the vehicle is securely supported on jack stands.

COMPONENT LOCATIONS AND TORQUE SPECIFICATIONS

strut cage bolt tightening sequence:



rear torque specifications:

strut nut (must replace)

35 Nm (25 Ft-lbs)

shock mount-to-chassis (must replace)

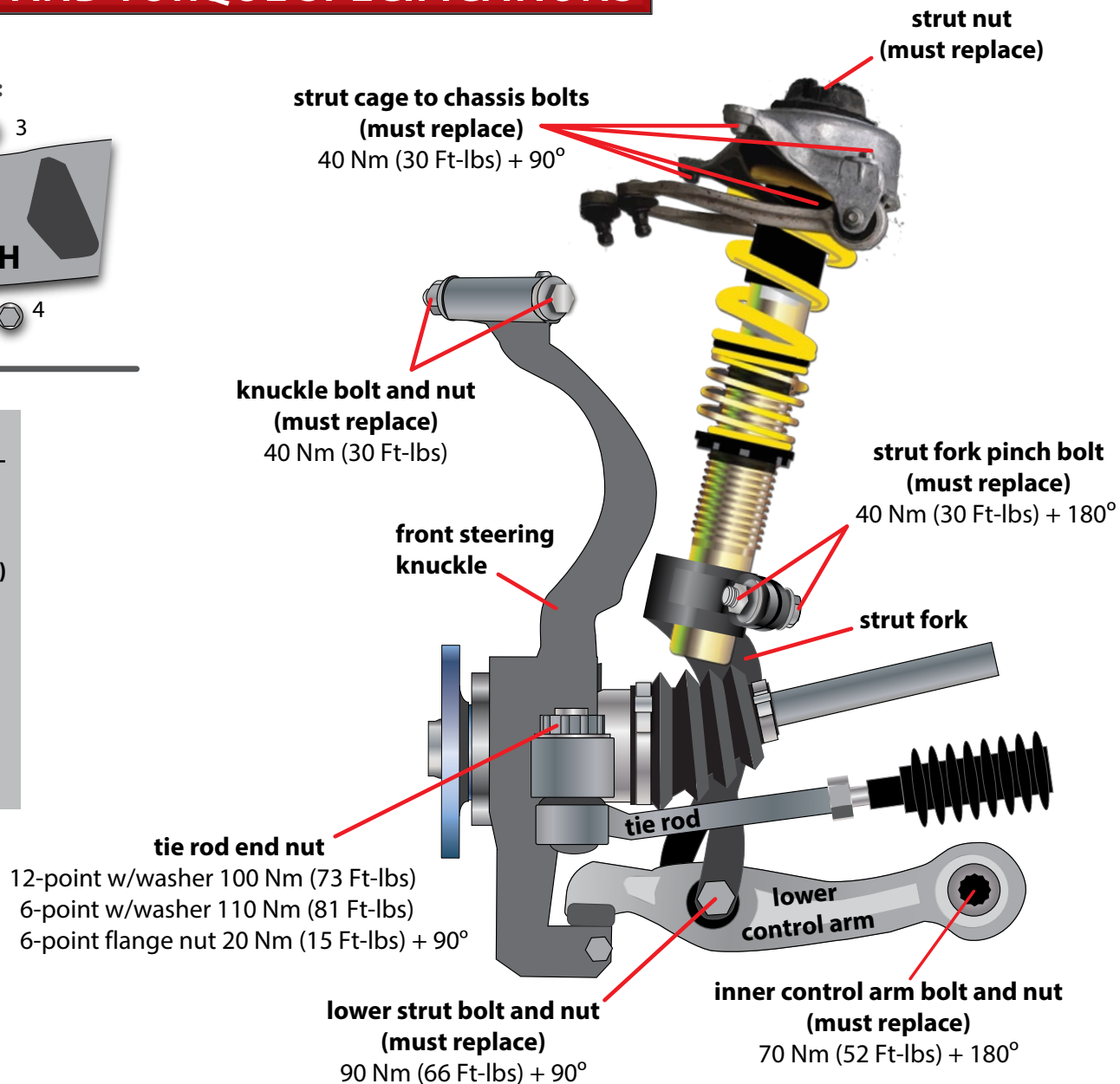
50 Nm (37 Ft-lbs) + 45°

shock-to-rear knuckle (must replace)

150 Nm (111 Ft-lbs)

subframe-to-chassis (must replace)

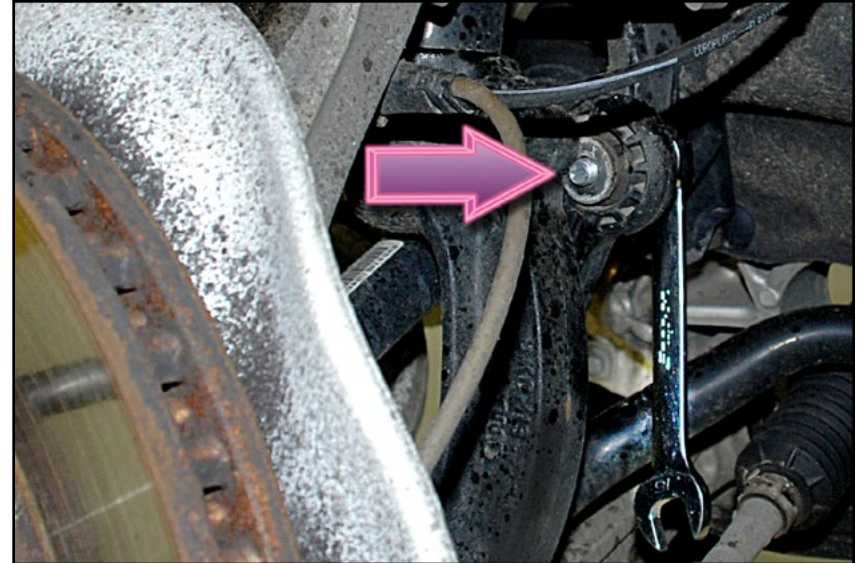
115 Nm (85 Ft-lbs) + 90°



REMOVING THE FRONT STRUTS

Step 1: 16mm Wrench

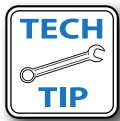
Safely lift and support the vehicle, then remove the wheels (not shown). Unbolt the stabilizer link from the back of the lower strut tube (arrow).



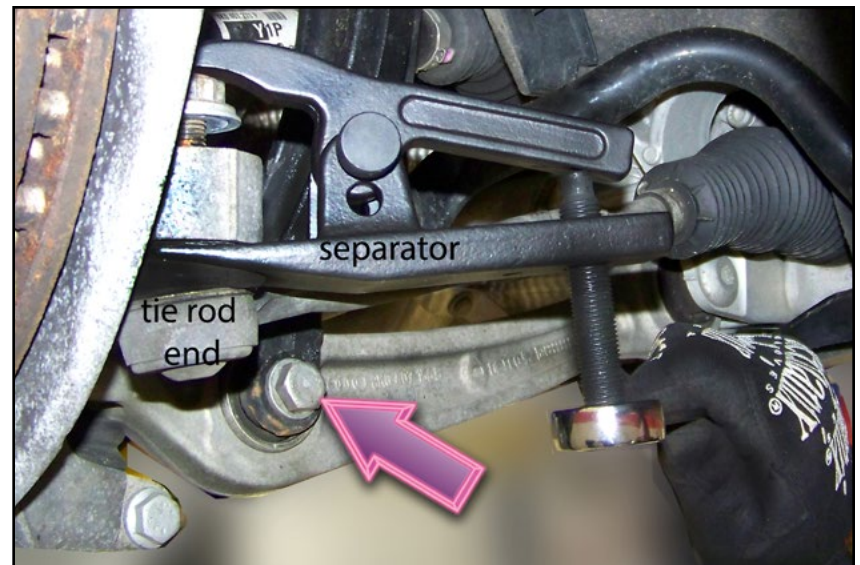
Step 2:

Remove the nut from the outer tie rod end. Use a tie rod separator to press the tie rod end from its tapered seat in the knuckle. Use a tie rod separator to press the tie rod end from its tapered seat in the knuckle.

Loosen and remove the bolt attaching the lower strut wishbone to the control arm (arrow).



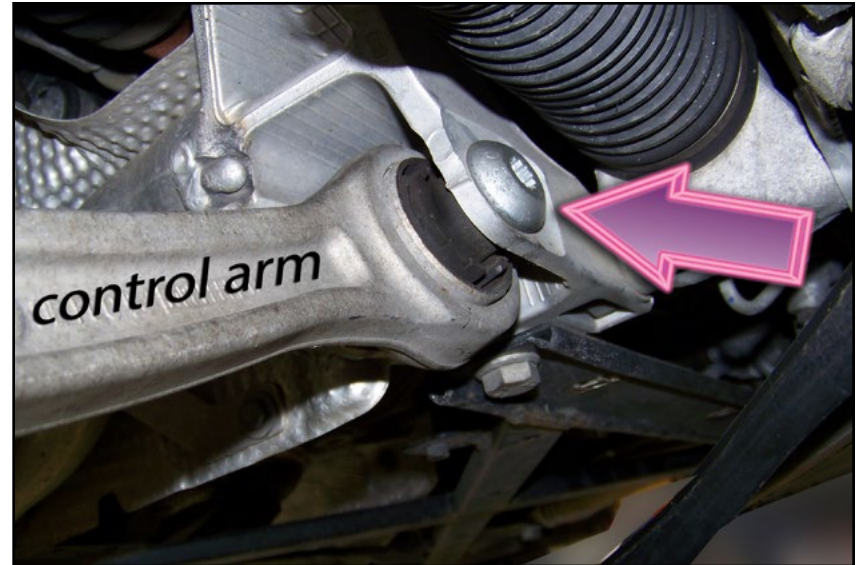
Turn the steering all the way to the left when removing the LH lower strut bolt, all the way to the right when removing the RH lower strut bolt. This moves the tie rod bellows closer to the steering rack and gives you extra room to pull the bolt out.



REMOVING THE FRONT STRUTS

Step 3: M12 Triple Square, 18mm Wrench

Loosen and remove the inner lower control arm bolt.



Step 4:

Pivot the lower control arm downward until it clears the lower strut wishbone.



REMOVING THE FRONT STRUTS

Step 5: Spindle Housing Spreader & Ratchet or Breaker Bar

Loosen and remove the pinch bolt from the strut collar (arrow).

Insert a spreader tool into the gap in the strut collar and turn it 90° until it locks in place. We do not recommend using chisels or other a wedge shaped drivers that can spread the collar too far and damage it.

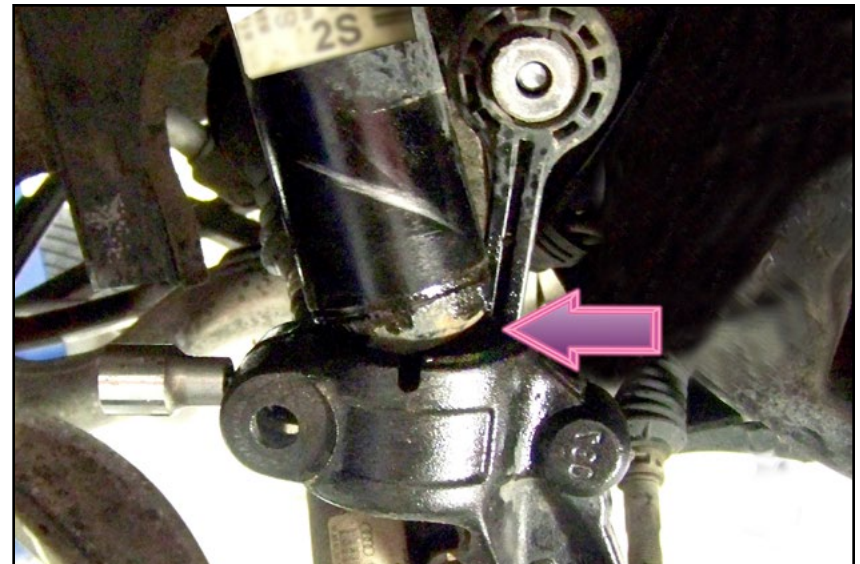
The correct tool spreads the collar just far enough to let you separate the strut tube from its base.



Step 6:

Slide the lower strut downward off the strut tube. You may have to rap downward with a mallet to get it moving, especially if it is heavily rusted.

Remove the lower strut.



REMOVING THE FRONT STRUTS

Step 7:

Loosen and remove the nut on the long horizontal bolt that secures the upper pivot arm ball joints to the steering knuckle. Remove the bolt.

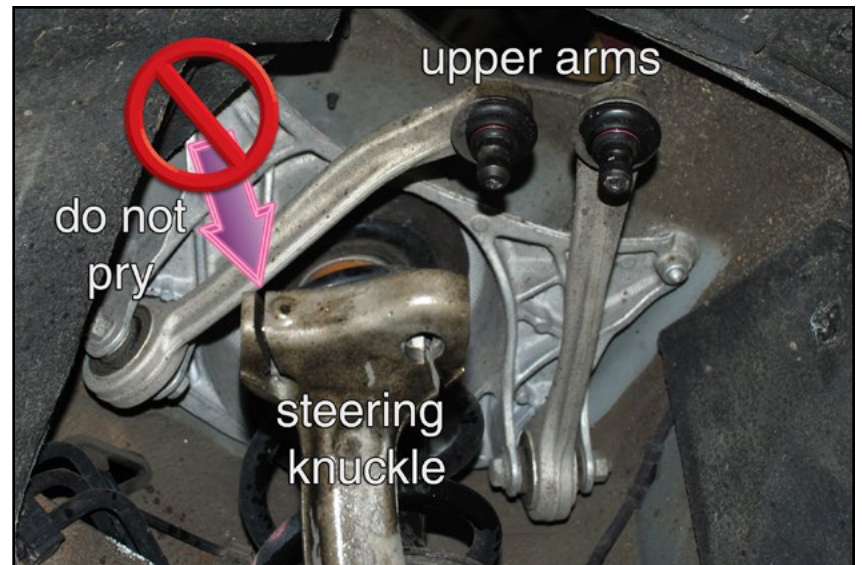


Step 8:

With the pinch bolt removed, separate the upper arms from the steering knuckle (the knuckle is also referred to as the bearing holder in some service and parts materials).

DO NOT insert a chisel or any other prying device into the machined gaps where the arms enter the knuckle or you will damage the knuckle (arrow). If the arms are stuck, use a punch to coax them up and out of the knuckle from below.

We suggest you wear work gloves to protect your hands from the sharp edges on the upper mount. See next step for details.



REMOVING THE FRONT STRUTS

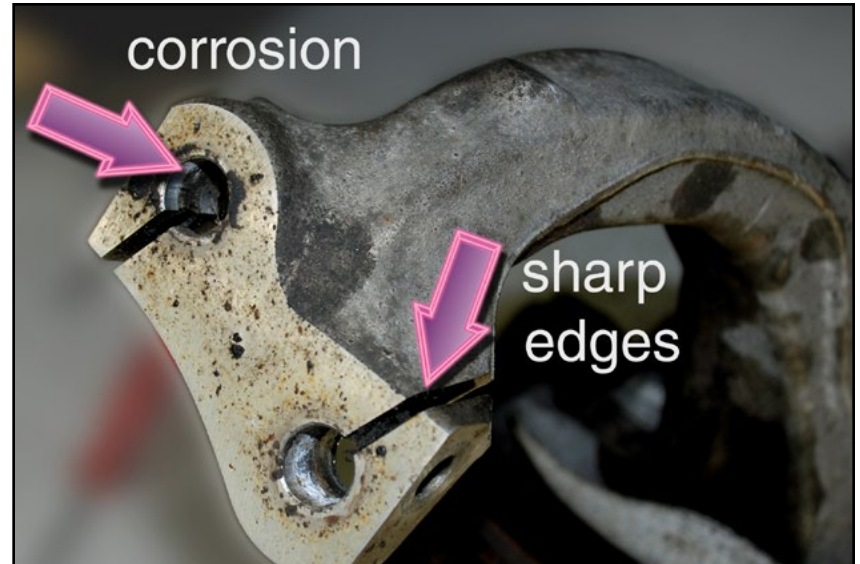
Step 9:

The edges of the machined notches at the ball joint holes in the upper knuckle are very sharp, so be careful.

Clean the stud holes to remove burrs or corrosion, and apply a light grease.

Our photo shows a large accumulation of road salt and corroded aluminum. Cleaning the holes makes reassembly much easier later and is worth the time it takes.

Repeat this process on the opposite side.



Step 10:

At this point, the upper strut assemblies are hanging inside the wheel well.

The strut assemblies bolt to aluminum cages (arrow) attached to the chassis strut towers (four bolts per side).

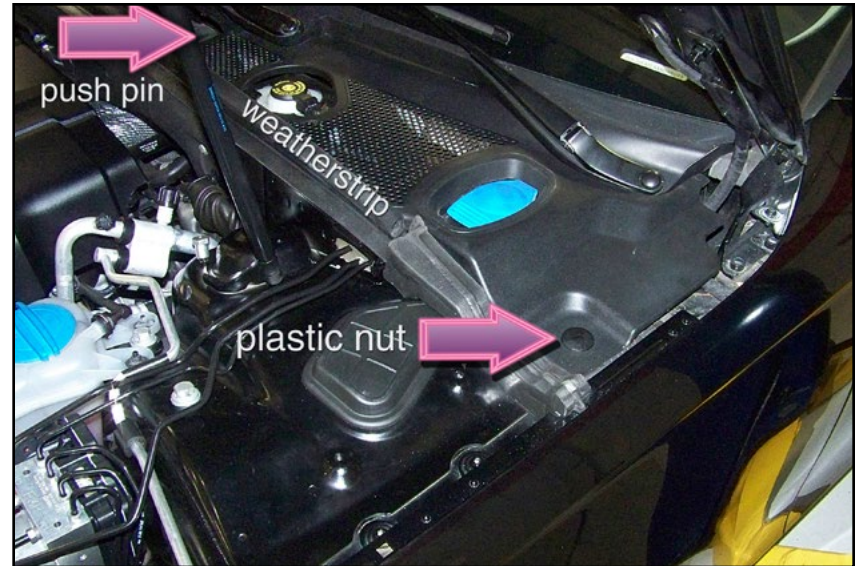
Since there is no access to the strut nuts from the top while they are installed in the car, we'll need to unbolt the aluminum strut carriers and drop the upper struts with cages still attached.



REMOVING THE FRONT STRUTS

Step 11:

Working under the hood, unscrew the two plastic threaded nuts at the outer ends of the water tray cover, and the push pin from the center. The push pin is located beneath the plastic access door for the positive jumper cable lug.



Step 12:

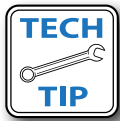
Slide the water tray up and forward to remove it.



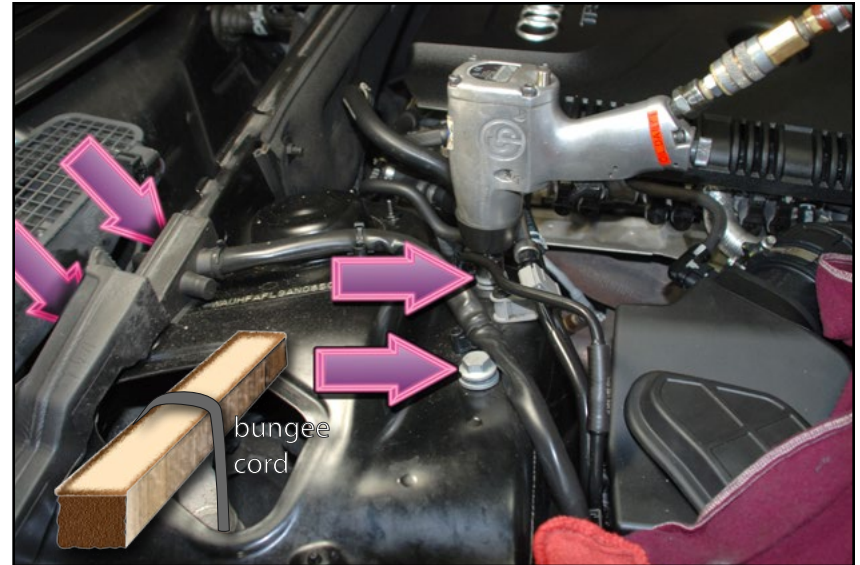
REMOVING THE FRONT STRUTS

Step 13: 16mm Socket & Impact

Each strut cage is attached to the chassis by four bolts. Two of the bolts are located inside the water tray (left arrows); the other two are inside the engine compartment (right arrows).

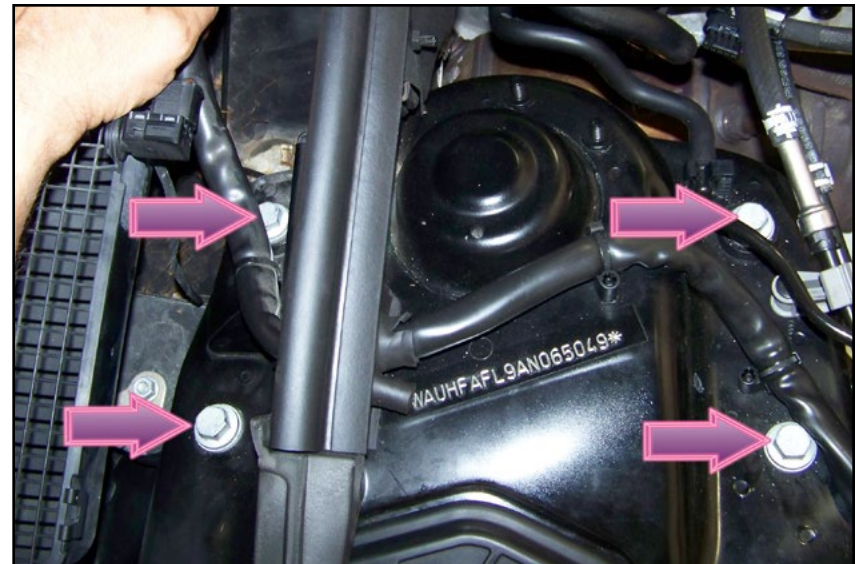


To keep the upper strut as you remove the bolts, pry out the rubber access cover from the inner fender and lay a short piece of wood across the hole. Attach a rope or sturdy strap from the wood to the strut assembly so it cannot fall until you are ready to remove it.



Step 14: 16mm Socket & Impact

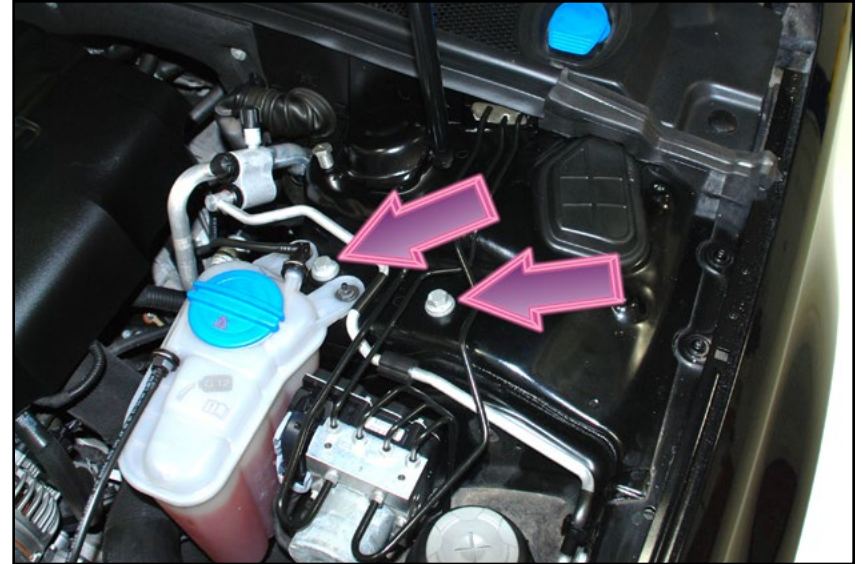
This photo gives you a better look at the RH bolt locations.



REMOVING THE FRONT STRUTS

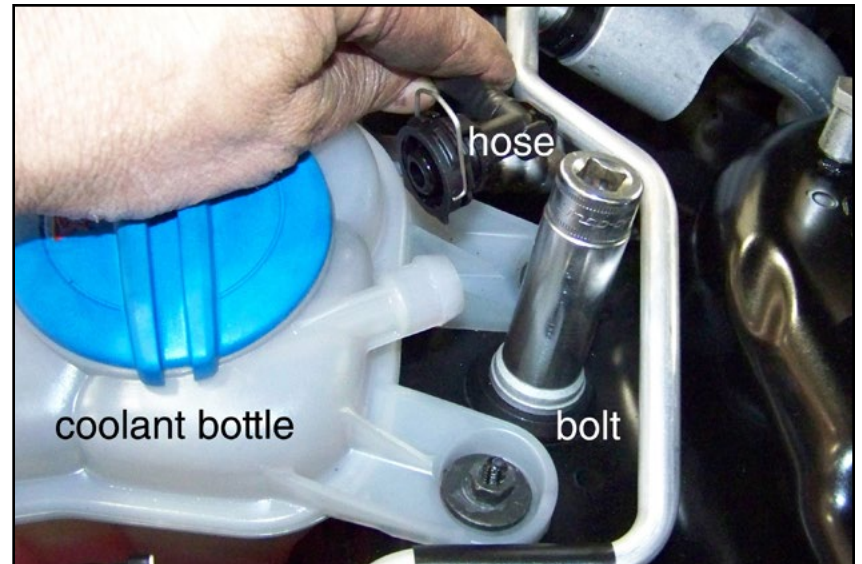
Step 15:

The bolts on the LH side are similarly located (arrows), although the removal process is slightly different.



Step 16: 16mm Socket & Ratchet or Breaker Bar

To remove the LH side strut cage bolts, start by disconnecting the small hose at the rear of the coolant bottle to improve access to one front bolt. Lift the wire retainer clip to release it, then pull the hose straight off.



REMOVING THE FRONT STRUTS

Step 17:

The rear bolts on the LH side are located inside the water tray, beneath the washer fluid remote fill bottle.

To remove the fill bottle, unscrew its retainer nut, then lift it off its mounting stud and pull the fill neck (arrow) out of the main washer fluid container located inside the left front fender.



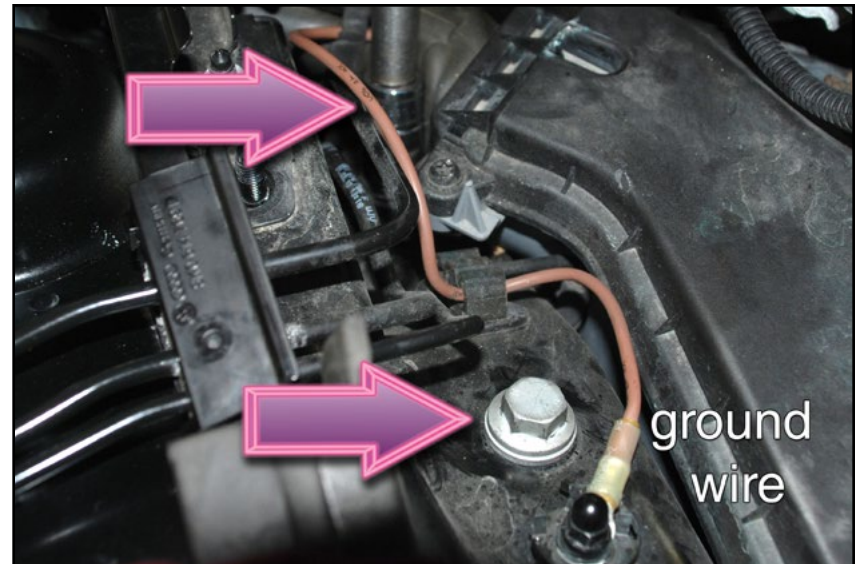
Step 18: 16mm Socket & Ratchet or Breaker Bar

Here are the rear LH side strut carrier bolts (arrows), located in the water tray.



The large brown wire is a bolt-to-chassis ground connection. It may be installed in a position that blocks access to one of the rear bolt heads. If you loosen the nut to reposition the wire, make sure you clean and properly re-tighten this connection.

Continue to remove the remaining bolts and the strut carrier as you did on the RH side.



REMOVING THE FRONT STRUTS

Step 19:

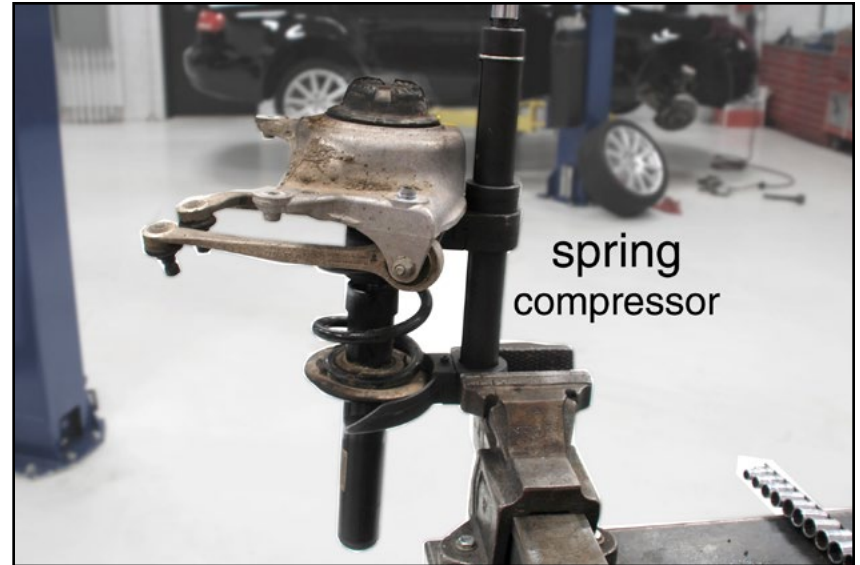
Using a suitable spring compressor, compress the coil spring until it no longer exerts pressure against the strut bushing.



CAUTION: Do not over-compress the spring, doing so only stores more energy in the coils. Compress the spring just far enough that the strut mount can be rotated freely by hand, indicating that the spring is no longer pressing against it.



TECH TIP Compressing coil springs can be a dangerous task. If you are unfamiliar with this part of the job, don't be afraid to ask for help.



Step 20:

When the spring is safely compressed, remove the OE strut nut. Lift the carrier with strut bushing off the strut shaft.

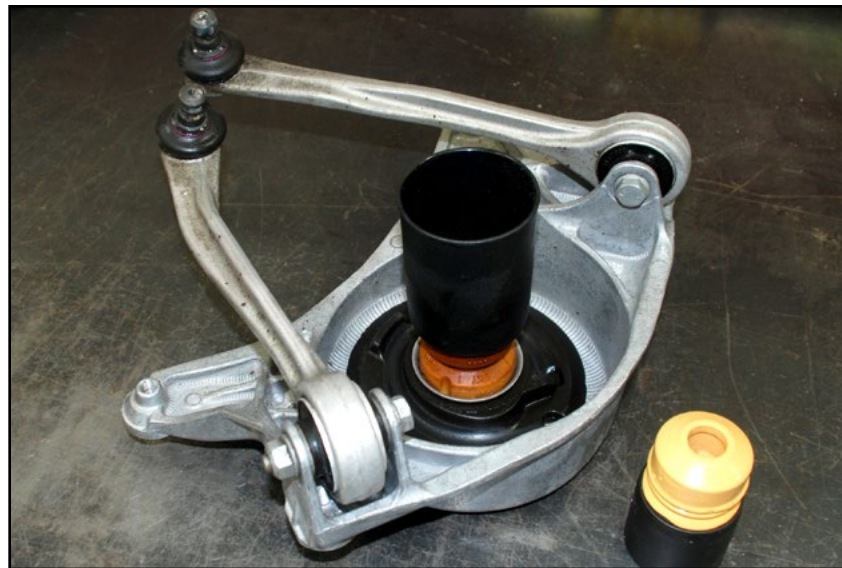


INSTALLING THE FRONT COILOVERS

Step 1:

Flip the housing over. The new bump stop included in the coilover kit is too small to fit snugly in the base of the strut mount.

Our OE bump stop/dust boot is an exact match to the OE strut bushing, however, so we will reuse it. Push it into the cup in the mount, as shown here.



Step 2:

Turn the adjustment collar on the strut base (arrow) to a point where there is just enough room to install the strut mount/carrier assembly and retaining nut without compressing the spring. We'll measure this setting and use it on the opposite side strut.



We can't give you an absolute initial setting dimension, since lowering preferences vary widely, although this starting point turned out to be very close to our final ride height setting.



INSTALLING THE FRONT COILOVERS

Step 3:

Install the strut bearing/carrier onto the new strut and spring. Tighten the nut to the specified torque using a torque wrench and backing wrench. No impacts, please.

Strut shaft nut torque for KW coilover kits:

M8 = 25 Nm (18 Ft-lbs)

M10 = 20 Nm (15 Ft-lbs)

M12x1.25 = 35 Nm (26 Ft-lbs)

M12x1.5 = 40 Nm (29 Ft-lbs)

M14x1.5 = 50 Nm (37 Ft-lbs)

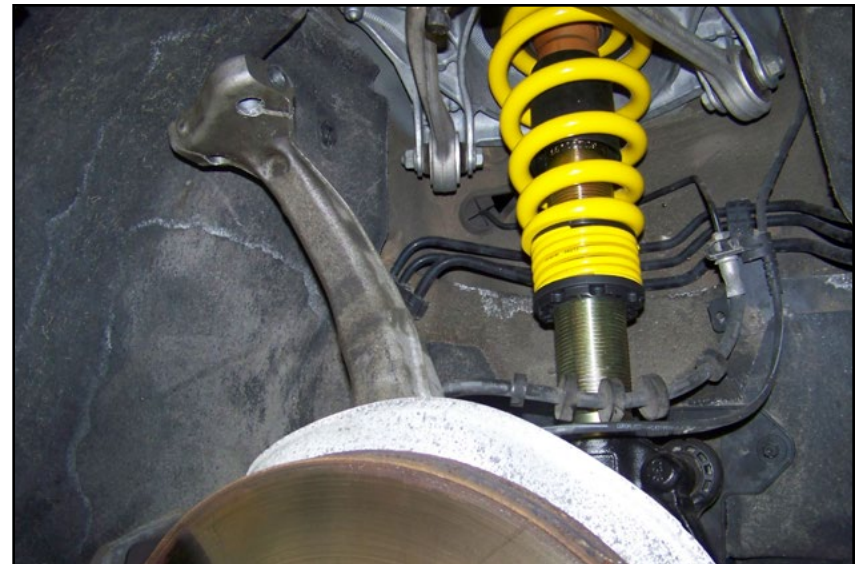
M16x1.5 = 50 Nm (37 Ft-lbs)



Step 4: 16mm Socket & Torque Wrench

Reinstall the upper strut carrier assemblies. Use new bolts and torque them to 40 Nm (30 Ft-lbs) + 90° (reference the cage bolt tightening sequence on [Page 5](#)).

Reinstall the washer fluid fill bottle and water tray cover we removed earlier.



INSTALLING THE FRONT COILOVERS

Step 5:

Raise the knuckle and reattach the upper control arms. If everything is clean, lubed, and properly aligned, you should be able to push the joints into their holes in the knuckle, by hand.

Slide a new cross bolt back through the long horizontal hole in the knuckle casting to hold the arms in place.

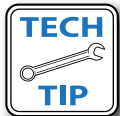
Torque to 40 Nm (30 Ft-lbs).



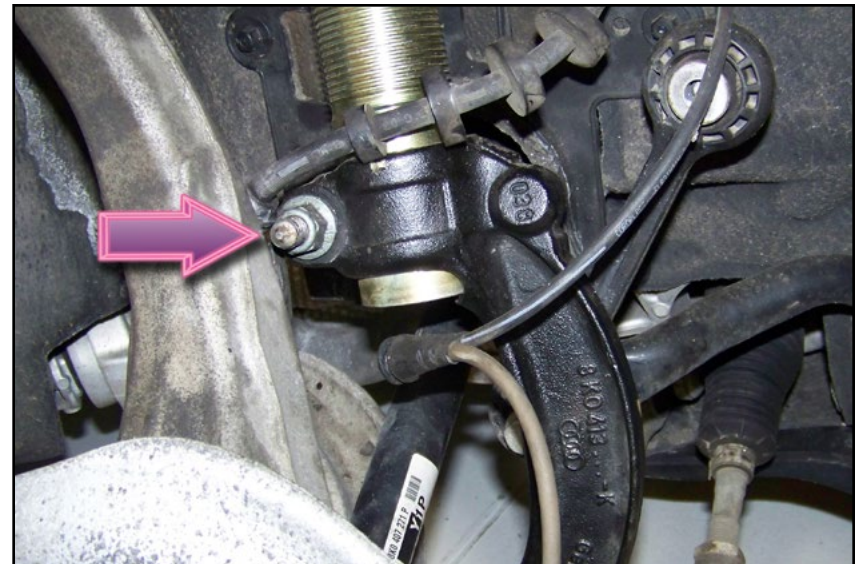
Step 6:

Slide the lower strut onto the new strut tube. Install a new pinch bolt and nut, and tighten the nut to 40 Nm (30 Ft-lbs) + 180°.

This is a torque-to-yield bolt and should always be replaced.



By now, you may be wondering why Audi recommends replacing so many fasteners. Many of the bolts used with critical suspension parts are TTY (torque-to-yield). These bolts are stretched during tightening, and should be replaced for performance and safety reasons. All bolt replacement recommendations in this tutorial come from the factory repair manual.



INSTALLING THE FRONT COILOVERS

Step 7: M10 Triple Square Socket, 18mm Socket, Torque Wrench

Slide the wishbone back over the lower control arm, then slide the bolt through the wishbone and control arm bushing with the bolt head facing forward.

Install a new inner control arm bolt and nut (arrow). Use a jack to raise the outer end of the control arm to its normal ride height before tightening the fasteners.

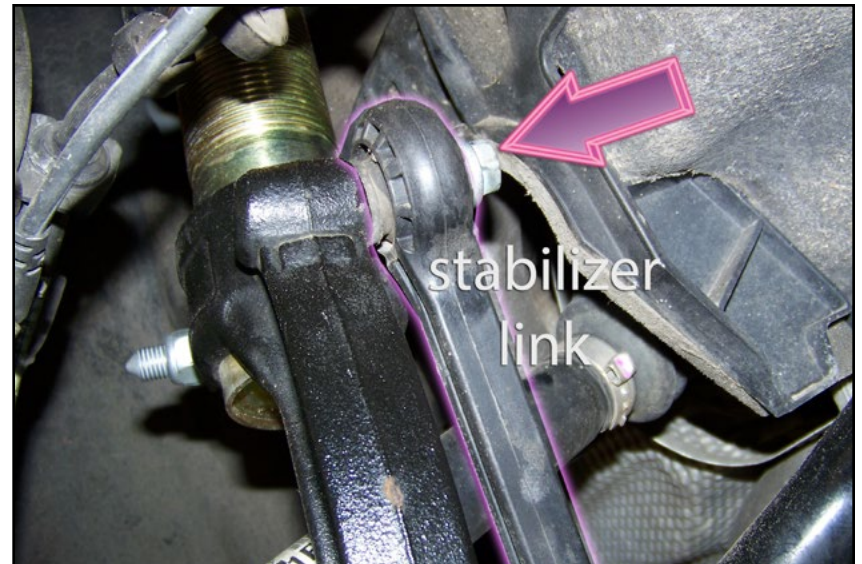
- Lower strut bolt/nut - 90 Nm (66 Ft-lbs) + 90°.
- Inner control arm nut - 70 Nm (52 Ft-lbs) + 180°.



Do not tighten rubber bonded bushing fasteners with the control arms hanging.

Step 8: 16mm Socket & Torque Wrench

With the suspension still at normal ride height, reattach the stabilizer links to the lower strut with new bolts, and torque them to 40 Nm (29 Ft-lbs) + 90°.



INSTALLING THE FRONT COILOVERS

Step 9:

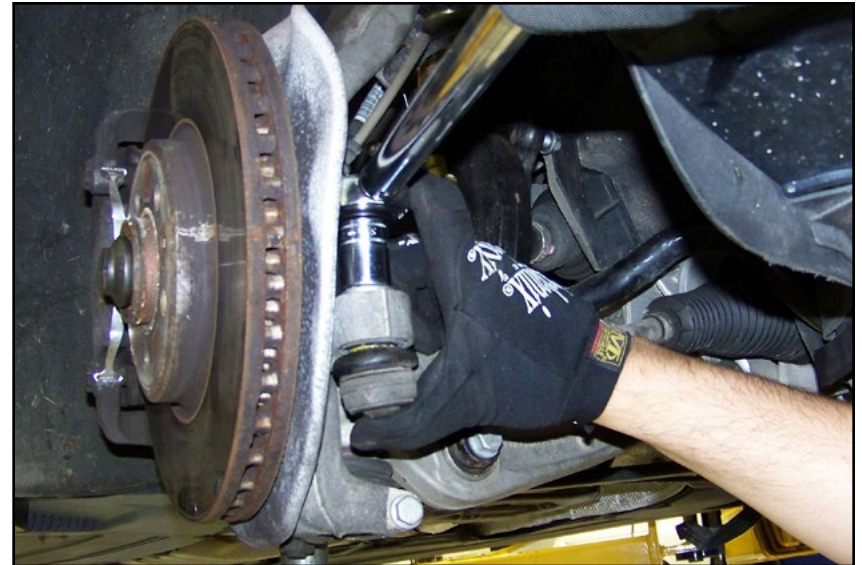
Reattach the outer tie rod end to the knuckle.

Use a new lock nut and tighten to specifications. The 12-point attachment nut on this car should be tightened to 100 Nm (74 Ft-lbs).



If your car uses a hex-head nut with washer, the torque spec is 110 Nm (81 Ft-lbs).

Reinstall the front wheels and torque the lug bolts to 120 Nm (88 Ft-lbs).



REMOVING THE REAR SHOCKS & SPRINGS

The hardest part of installing the rear springs and shocks on our B8 A4 is removing the old springs. Conventional spring compressors we tried just wouldn't fit in the space available and, like most of you, we do not have access to the factory spring compressor.

One workaround—which we will use today—is to drop the rear subframe—one side at a time. Doing so, drops the rear spring perch on the lowered side far enough that you can wriggle the top of the OE spring away from its upper spring mount.

We'll assume you already have the car raised and safely supported, with the rear wheels removed, and go from there.

REMOVING THE REAR SHOCKS & SPRINGS

Step 1:

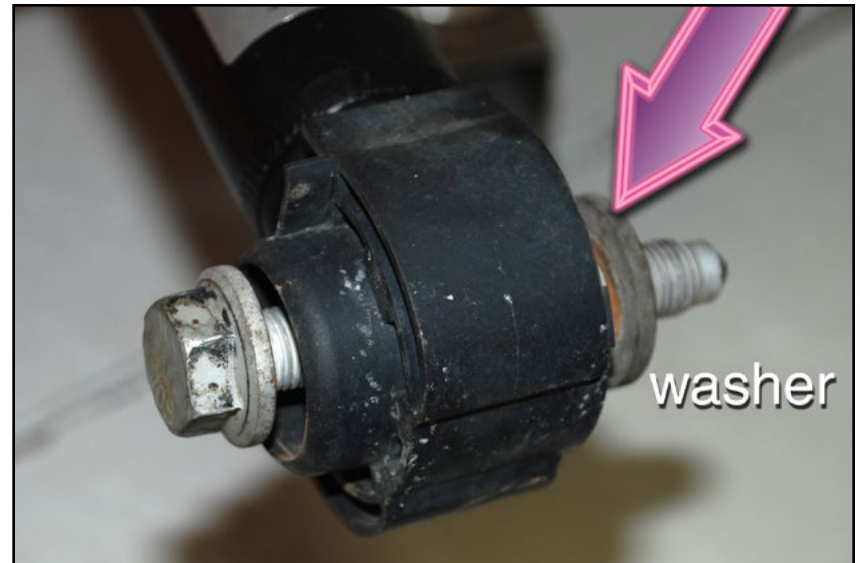
Remove the lower shock bolt from the rear knuckle.



Step 2:

There's a spacer between the shock and knuckle. Don't lose it, and make sure you transfer it to the new shock when you install it.

Remove the plastic cover at the base of the shock and transfer it to the new one.



REMOVING THE REAR SHOCKS & SPRINGS

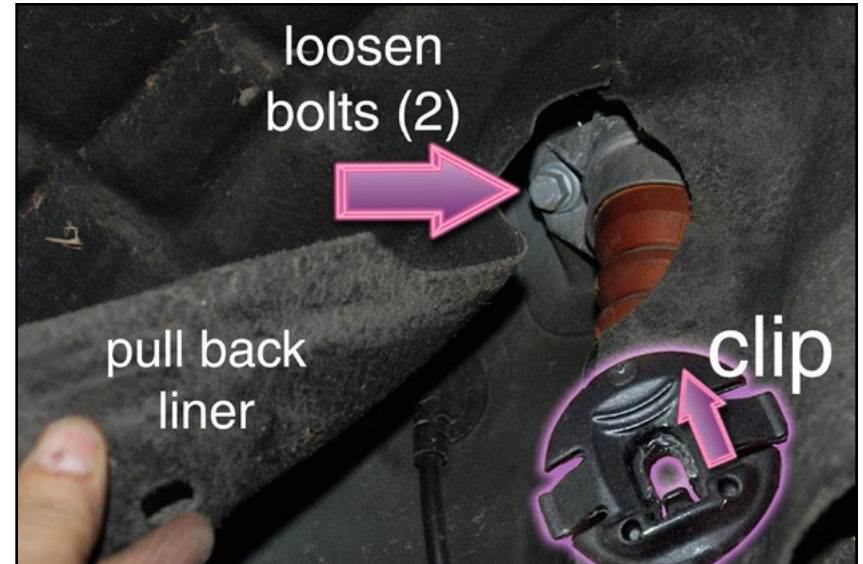
Step 3:

Remove the plastic clips holding the fender liner to the rear wheel well.



The round plastic retainer clips (shown larger than normal here) are re-usable. Pry their lower edge away from the liner slightly as you push up in the direction of the small arrow to remove them.

Pull the flexible liner back. Reach up beneath the liner with an extension and socket.



Step 4:

Remove the two upper bolts holding the shock to the chassis. Pull the shock down through the opening in the rear suspension and remove it from the vehicle.



REMOVING THE REAR SHOCKS & SPRINGS

Step 5:

Pry the rubber cap off the top of the shock. Remove the retaining nut from the shaft. Slide the mount off the shaft and inspect it. If it is serviceable, transfer it to the new shock, or look on our site for upgraded mounts.



Step 6:

The rear coil springs sit between a spring perch built into the rear knuckle and the chassis. If you do not have a spring compressor that fits, remove the old spring by lowering the rear suspension subframe, one side at a time.

There are four subframe bolts, two per side.

To access the front subframe bolt, remove the plastic underbody panel just ahead of the rear wheel, held in place by several screws.



REMOVING THE REAR SHOCKS & SPRINGS

Step 7:



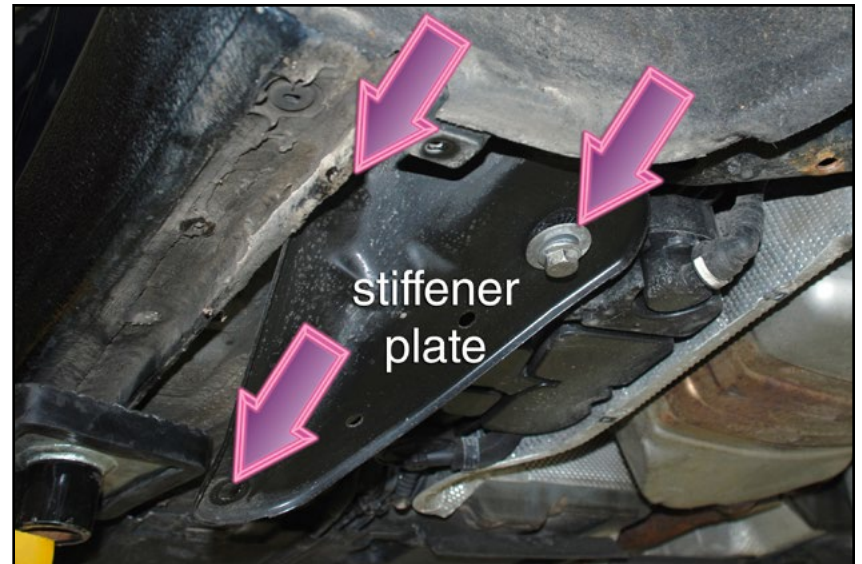
We are about to drop one side of the rear suspension subframe. Work carefully!

To avoid snagging or stressing them, we will disconnect the brake fluid hose and wiring harness from the rear of the knuckle, and unbolt the ride height sensor from the control arm.



Step 8:

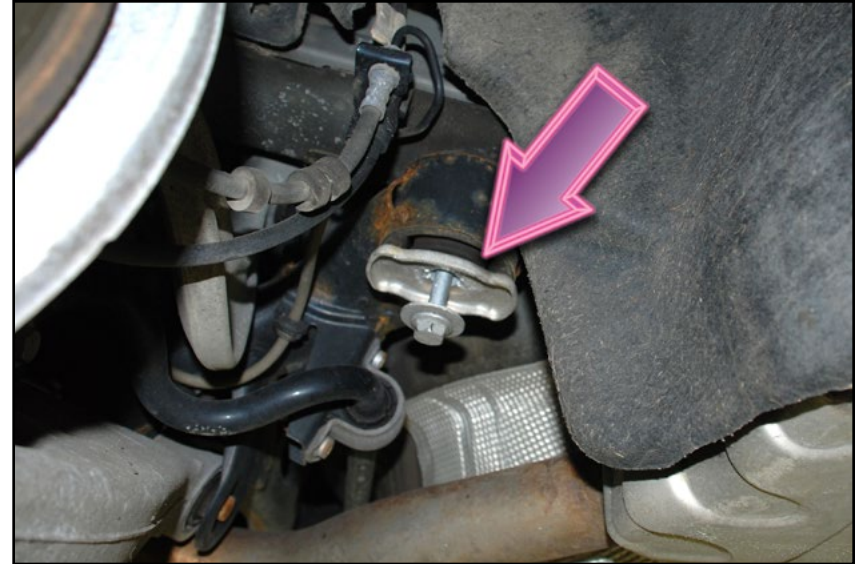
Remove the two bolts from the black body support (stiffener) plate below the plastic panel, and the large bolt at the front of the subframe (bolt locations arrows).



REMOVING THE REAR SHOCKS & SPRINGS

Step 9:

Loosen the rear subframe bolt (arrow).



Step 10:

Lower the jack slowly. When the subframe drops down far enough to provide clearance, pull the spring away from the chassis and lift it off its perch.



INSTALLING THE REAR COILOVERS

Step 1: 5mm Hex (Allen), 17mm Box Wrench

Torque the retaining nut onto the new shock to 35 Nm (25 Ft-lb).

Do not reinstall the shock yet.



Step 2:

Place the adjustment collar into the top of the spring, against the machined face of the top coil, as shown here, then install the spring and collar between the perch on the knuckle and the chassis.

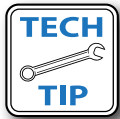
Inert the raised boss on the collar (arrow) into the locator hole in the chassis.



INSTALLING THE REAR COILOVERS

Step 3:

Use the jack to raise the subframe back to its normal height. Use new long bolts at all four subframe mount locations and torque them to 115 Nm (85 Ft-lbs) + 90°. Tighten the shorter bolts in the support brace to 55 Nm.



Do not draw the suspension back in place with the bolts alone, raise it with a jack first.

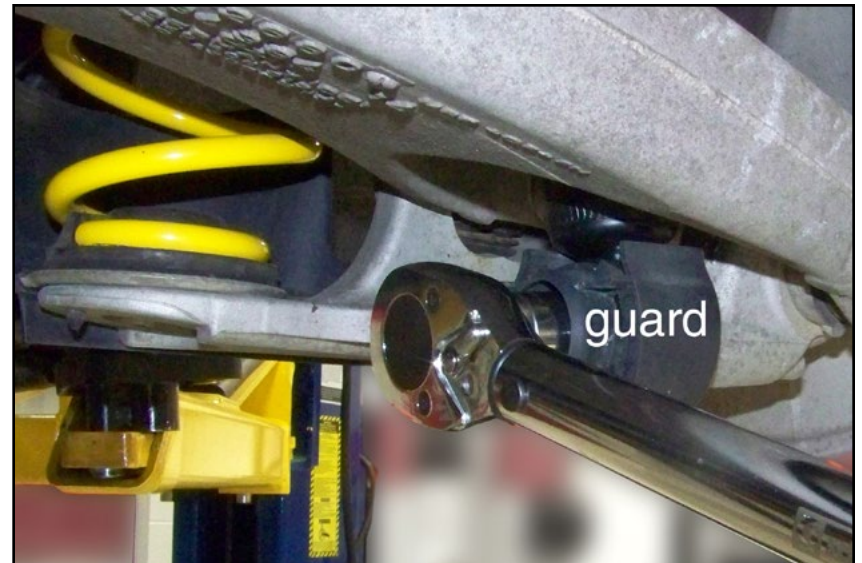


Step 4:

Use new shock bolts when reinstalling the rear shocks.

- Torque the strut-mount-to-chassis bolts to 50 Nm (37 Ft-lbs) + 45°.
- Torque the lower shock-to-knuckle bolt to 150 Nm (111 Ft-lbs). Don't forget to reinstall the spacer between the shock and knuckle (see step 2 on [Page 21](#)).
- Reinstall the plastic fender liner clips.

Repeat these steps on the opposite side.



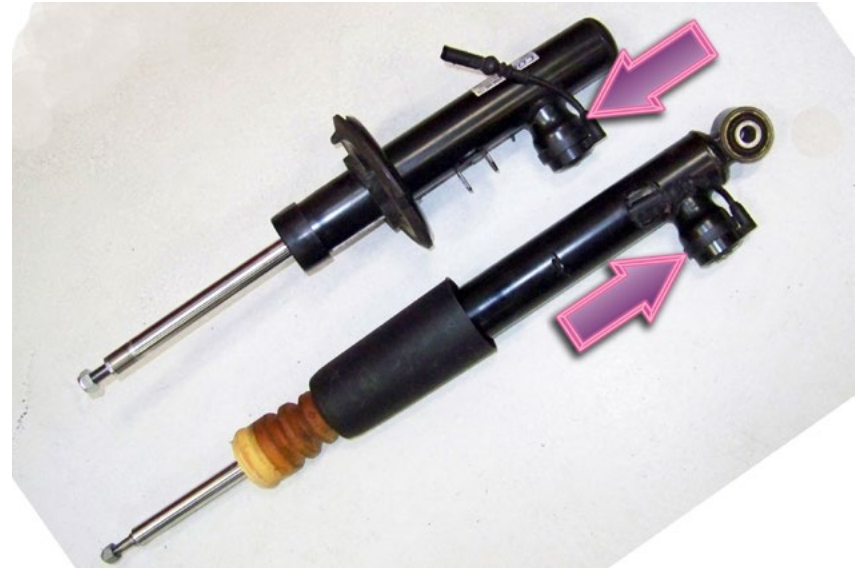
SPECIAL SECTION - FOR VEHICLES W/ELECTRONIC DAMPING CONTROL

Audi vehicles with Electronic Damping Control (EDC) have electrically-operated actuators in all four shocks to regulate damping rates.

Installing coilovers that have no actuators creates an open at each of the four damper circuits that turns on a dash warning light.

The electronic damping cancellation kit ([ES#2608438](#)) prevents EDC warning light illumination. Kits come with a set of four resistors, each with an OE electrical connector that plugs into the car harness at each corner. The kit includes mounting brackets, and zip ties for easy installation.

Once the resistors are connected, non-adjustable coilovers can be installed without illuminating the dash warning light. The kit also works with coilovers from other manufacturers, on EDC-equipped cars.

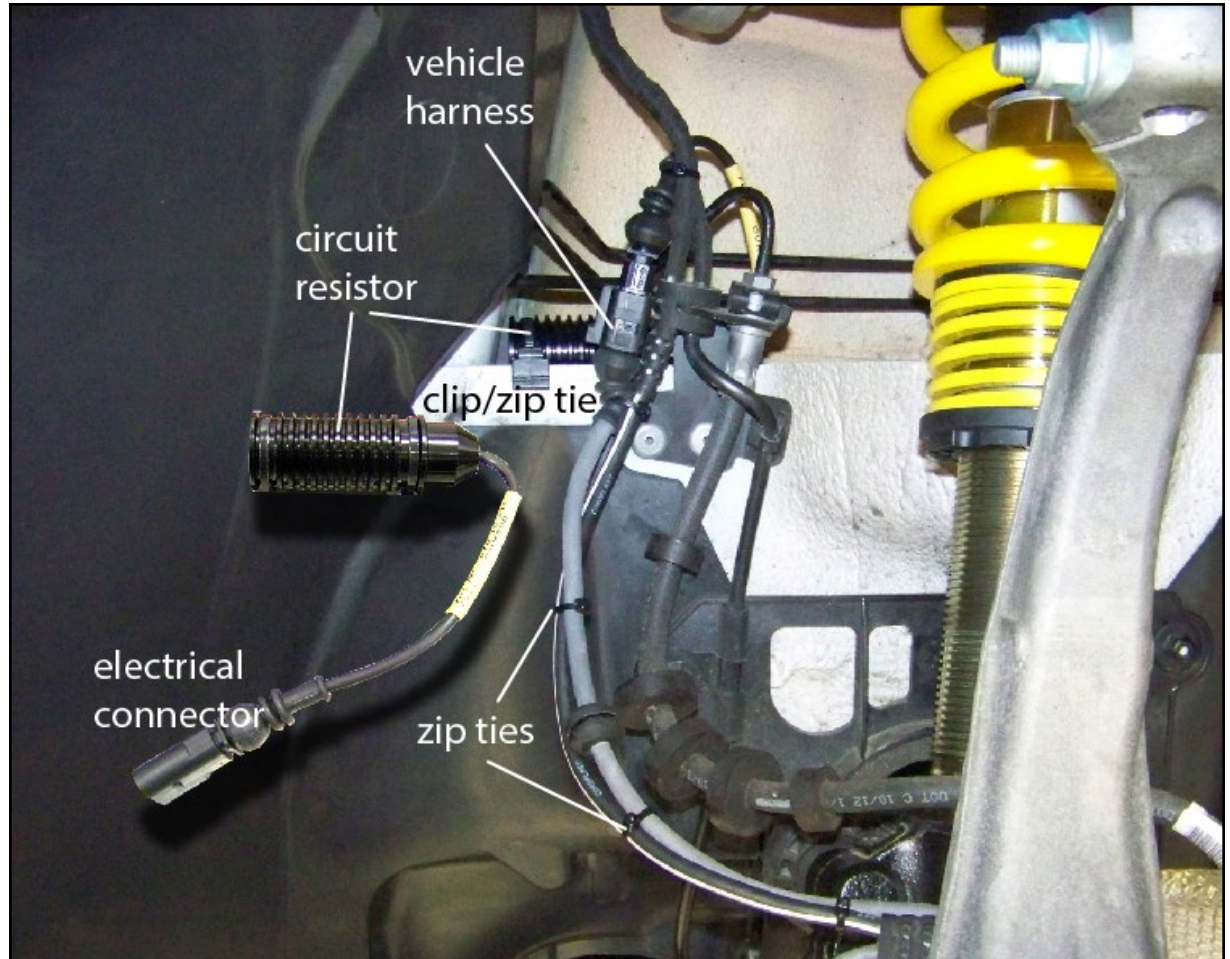
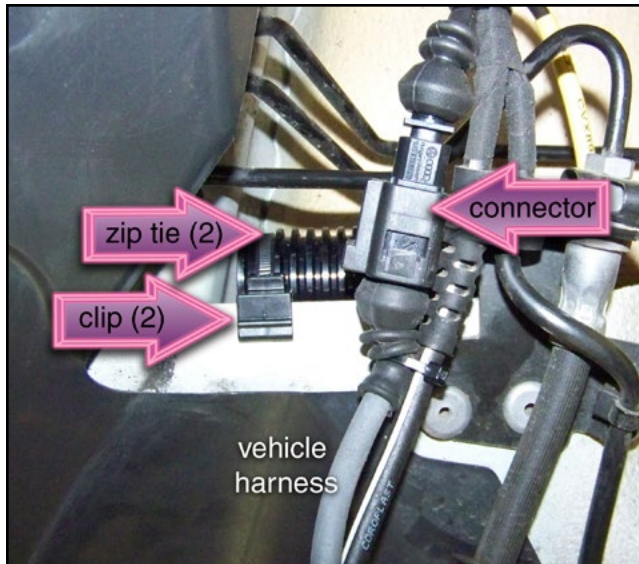


The kit comes with four mounting brackets and zip ties, some with the built-in edge connectors. In this application, we will use only two of the brackets (rear) and the edge clips to mount the front resistors.

SPECIAL SECTION - FOR VEHICLES W/ELECTRONIC DAMPING CONTROL

To install the front resistors:

- Use zip ties with edge connectors to clip a resistor body onto the raised edge on the chassis that forms the recessed ledge in the inner strut tower.
- Plug the resistor into the car harness.
- Zip tie the wire harness to the wheel speed sensor harness.
- Repeat on the opposite side.



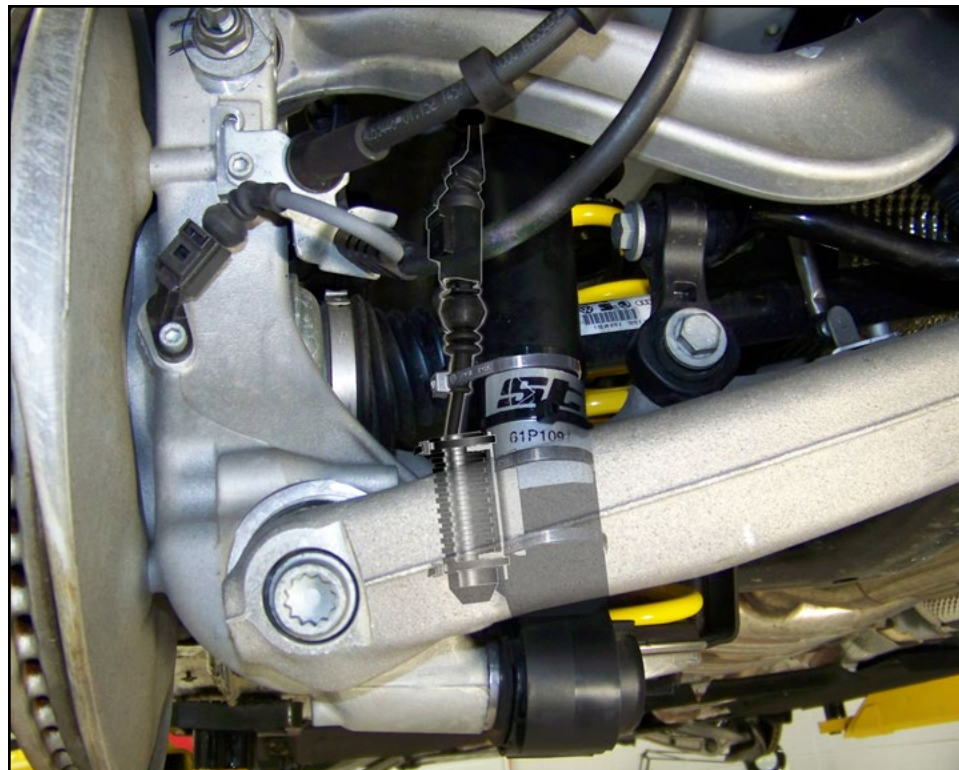
Here's a closeup view of component locations.

SPECIAL SECTION - FOR VEHICLES W/ELECTRONIC DAMPING CONTROL



To install the rear resistors:

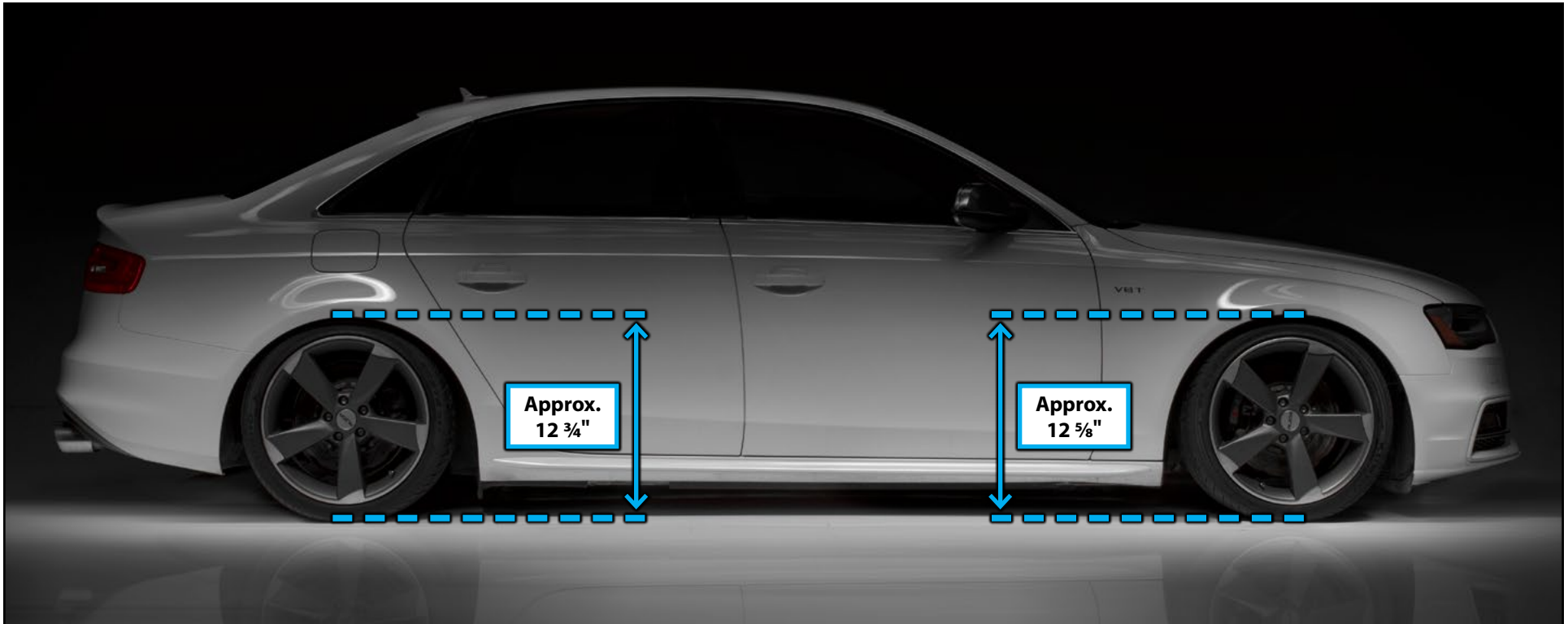
- Zip tie a resistor to a metal bracket from the kit.
- Zip tie the bracket/resistor to a rear shock.
- Install the shock; route the short resistor harness upward and connect it to the car harness.
- Zip tie the harnesses to the shock tube.



We found it easier to install the resistor on the shock, and then install the shock and resistor in the car as an assembly.

When mounting the resistor, position it so it is protected by the control arms. Route and secure all wiring to protect it from moving suspension parts and possible road hazards.

MEASURING AND ADJUSTING RIDE HEIGHT



- The photo above shows the final results of our B8 S4 coilover adjustment. We ended up with the front height at 12 $\frac{5}{8}$ " , and the rear height at 12 $\frac{3}{4}$ " .
 - This measurement is taken from the lower edge of the wheel arch to the wheel center.
 - This ride height gave us adequate tire-to-fender clearance for suspension movement and lock-to-lock steering, as well as an aggressive stance/appearance.
- Make sure that you don't forget the following important steps:
 - Torque all fasteners to spec once you've finalized your adjustments (torque any bushing fasteners w/the suspension set to ride height to avoid bushing twist).
 - If you haven't already done so, apply a good quality lube to the adjustment threads. A wax-based lube is a good choice.
 - Take the vehicle in for a 4-wheel alignment immediately after installing the coilovers.
 - Recheck all fasteners (including all locking collars) after 500 miles. If they've backed off, tighten them back up with the included collar wrenches.
 - If the locking collars continue to back off you can use a flat blade screwdriver and a hammer to tighten them up, but know that doing so will mar the finish.

Congratulations, your coilover installation is complete!

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Your ST Coilover System installation is complete!



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