



Audi B8 A4/5, S4/5 and RS5 Coilover Installation

ES2129997

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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.

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The ST coilover kit by KW has these 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

This kit provides an average lowering of 1 to 2.5 inches.

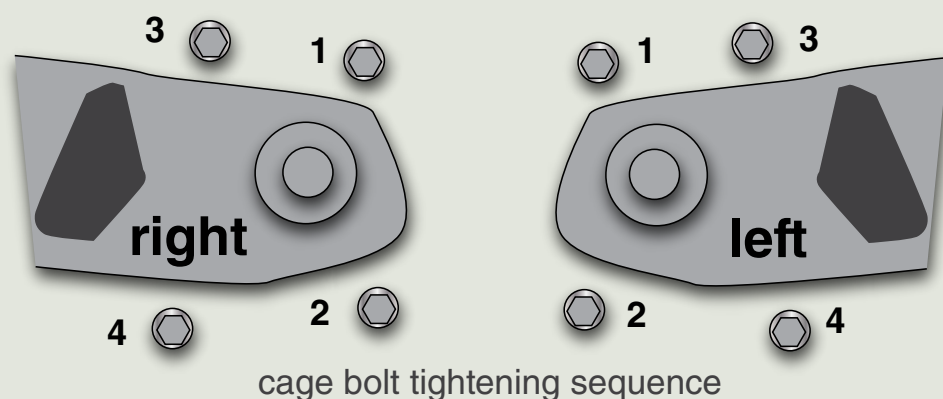
Coilovers improve your car's looks, sharpen handling without destroying ride quality, and don't require an engineering degree to install.

Today, we're doing what you do: installing a complete set of ST coilovers on an Audi B8 A4. Along the way, we'll point out tips and tricks to make the job easier, and help you replace the factory rear coils, even if you don't have the pricey factory spring compressor.

ES212997

Component Locations and Tightening Torques

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



rear torque specifications

strut nut 35Nm (25 ft-lb)

shock mount-to-chassis (bolts renew)
50Nm +45° (37 ft-lb+45°)

shock-to-rear knuckle (bolt renew)
150 NM (111 ft-lb)

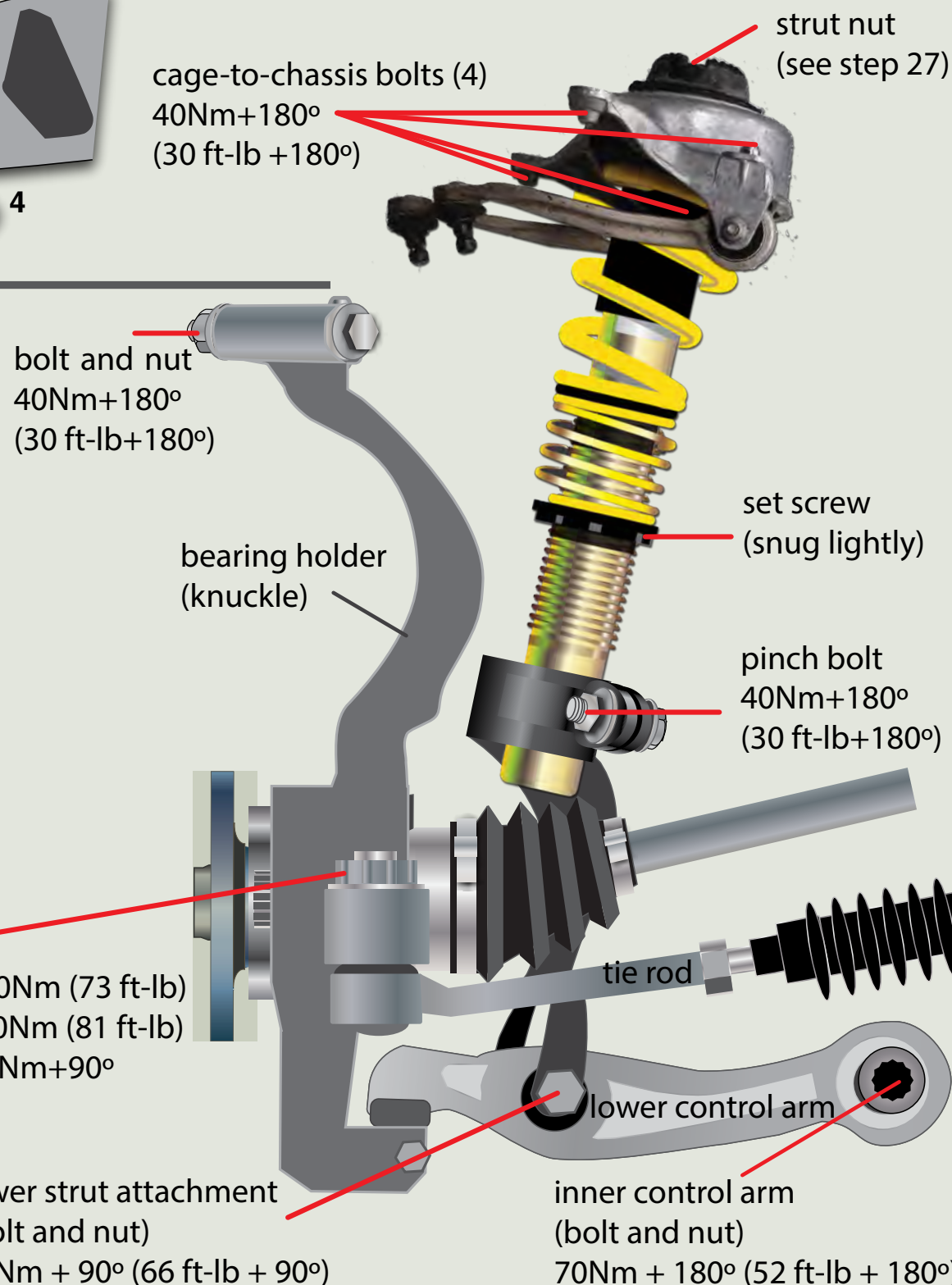
subframe-to-chassis (bolts renew)
115Nm+90° (85 ft-lb+90°)

body support plate-to-chassis
55Nm (41 ft-lb)

tie rod end nut
12-point w/washer 100Nm (73 ft-lb)
6-point w/washer 110Nm (81 ft-lb)
6-point flange nut 20Nm+90°

lower strut attachment
(bolt and nut)
90Nm + 90° (66 ft-lb + 90°)

inner control arm
(bolt and nut)
70Nm + 180° (52 ft-lb + 180°)



Remove the Lower Front Strut

KW Coilover Installation
Audi B8 A4/5, S4/5, and RS5



Step 1

Remove the plastic wheel bolt covers. A simple bolt cap removal tool like this one won't damage the caps and wheel surface like screwdrivers and pliers will.



Step 2

Raise and safely support the car.

A non-marring lug bolt socket and wheel hanger prevent damage to the wheel face.



Remove the Lower Front Strut

KW Coilover Installation
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Step 3

Using a 16mm box end, unbolt the stabilizer link from the back of the lower strut tube.



Step 4

Remove the nut from the outer tie rod end.



Remove the Lower Front Strut

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



Step 5

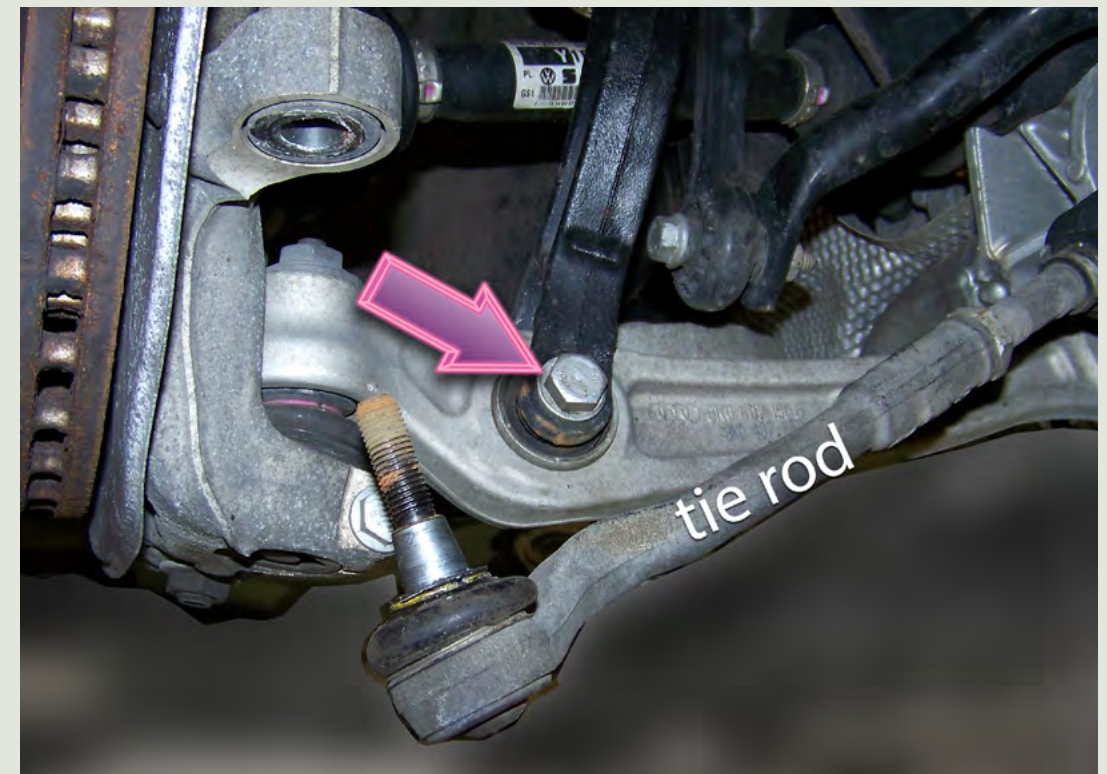
Use a tie rod separator to press the tie rod end from its tapered seat in the knuckle.



Step 6

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

Turn the steering all the way to the left. (This moves the tie rod bellows closer to the steering rack, making room to remove the inner control arm bolt (see next step). When working on the right side, turn the steering full right to provide similar clearance.



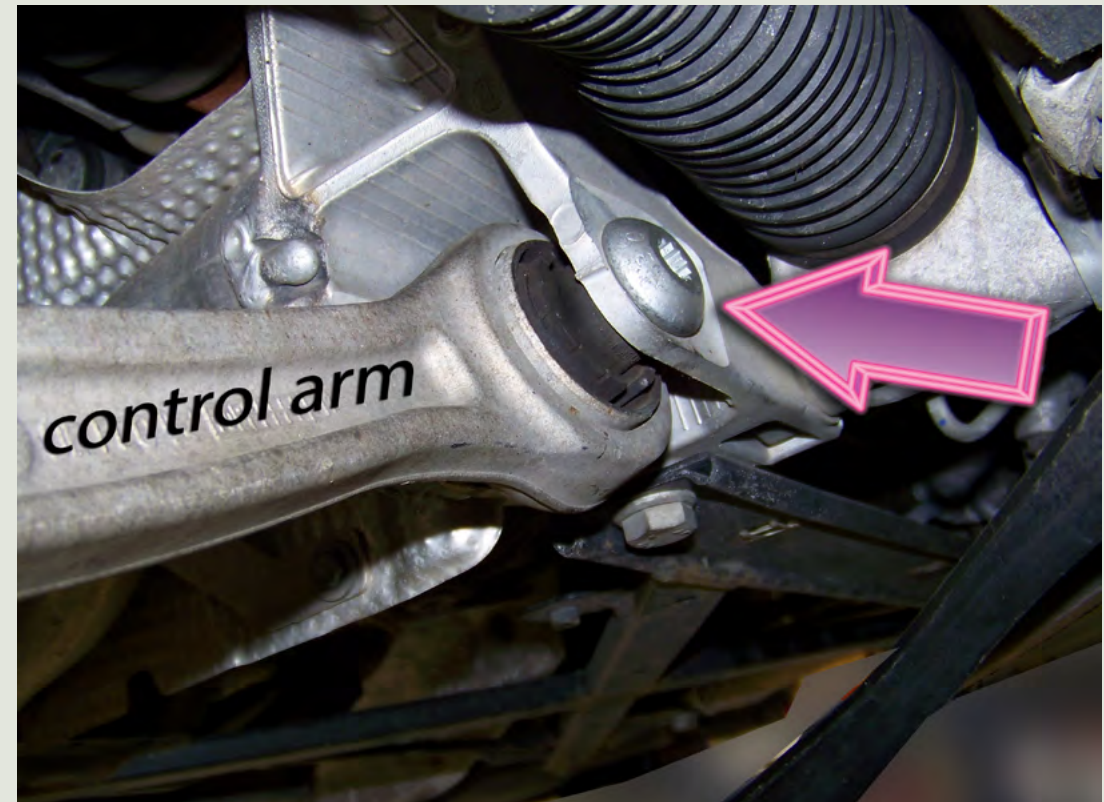
Remove the Lower Front Strut

KW Coilover Installation
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Step 7

Using an M12 triple square driver and 18mm box wrench, loosen and remove the inner control arm bolt.



Step 8

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



Remove the Lower Front Strut

KW Coilover Installation
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Step 9

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 degrees 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.)

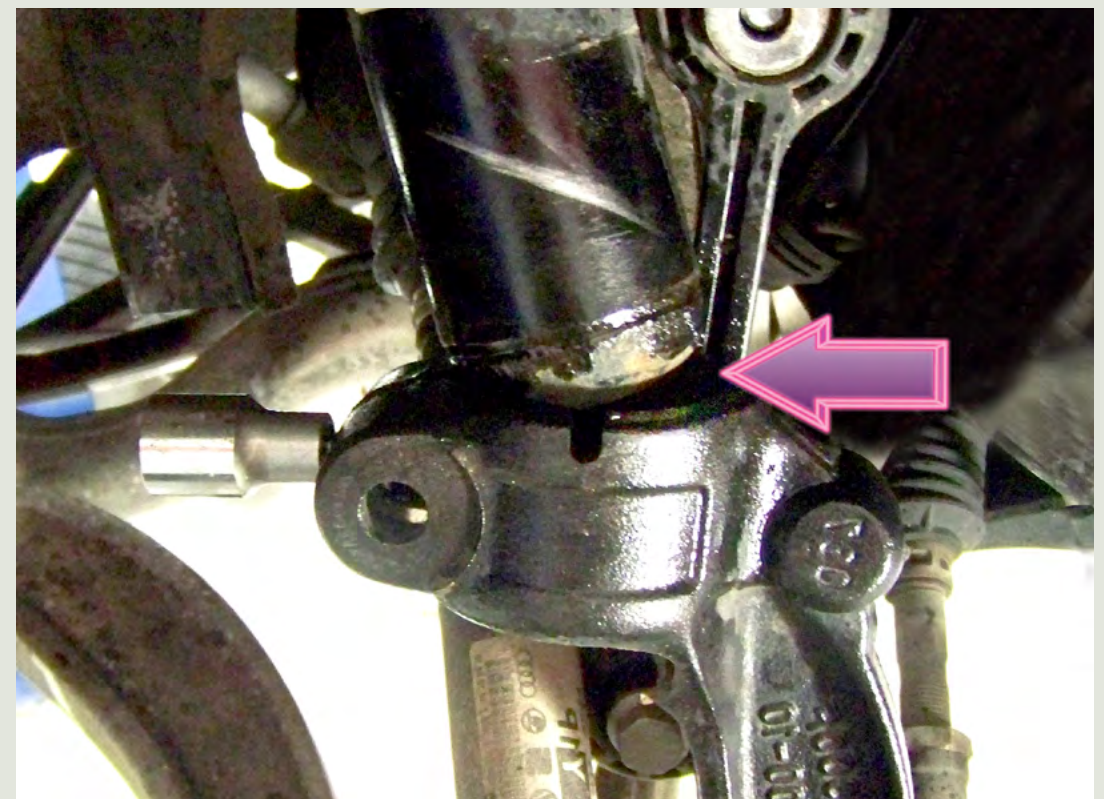
The correct tool spreads the collar just far enough to let you separate the strut tube from its base.



Step 10

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.



Remove the Upper Front Strut

KW Coilover Installation
Audi B8 A4/5, S4/5, and RS5



Step 11

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.

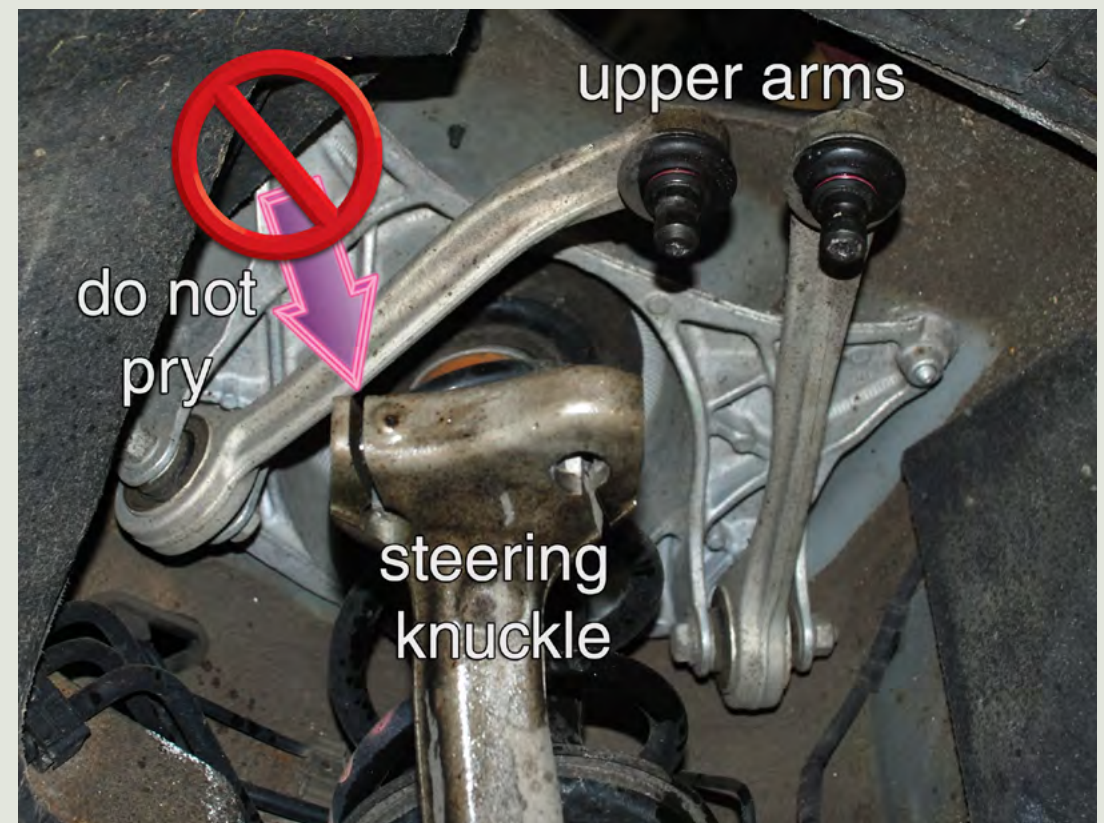


Step 12

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.



Remove the Upper Front Strut

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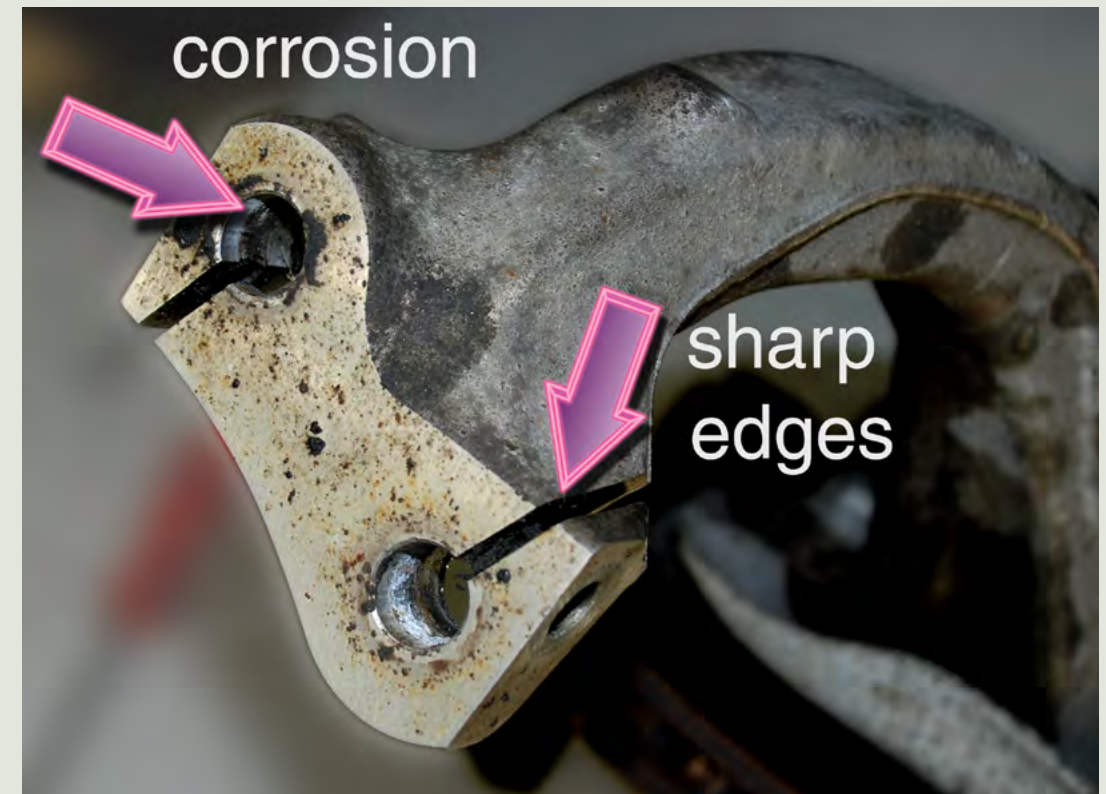
Step 13

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 14

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.



Remove the Upper Front Strut

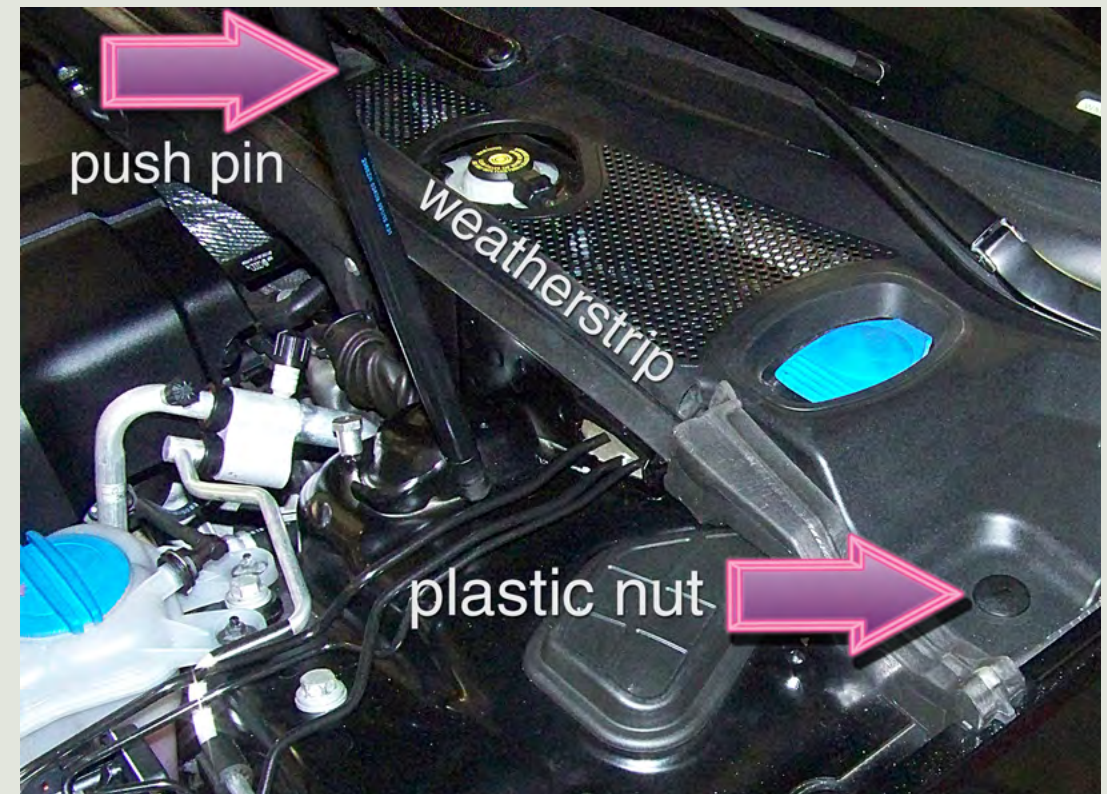
KW Coilover Installation
Audi B8 A4/5, S4/5, and RS5



Step 15

Raise 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 16

Slide the water tray up and forward to remove it.



Remove the Upper Front Strut

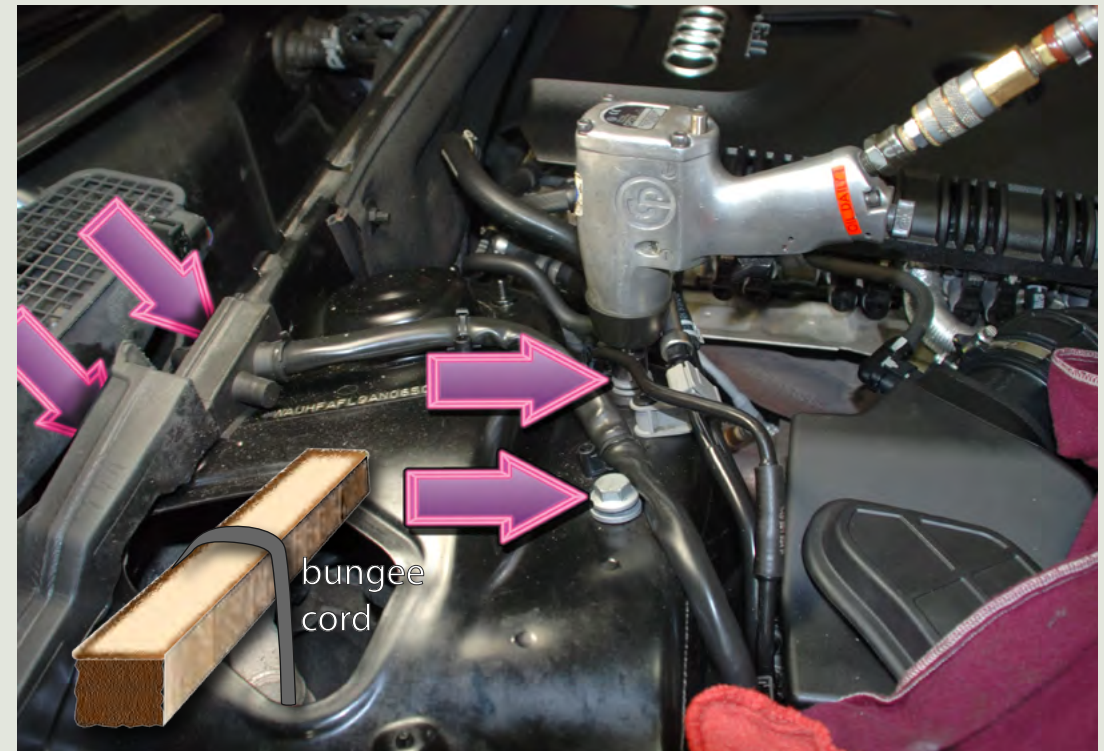
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Step 17

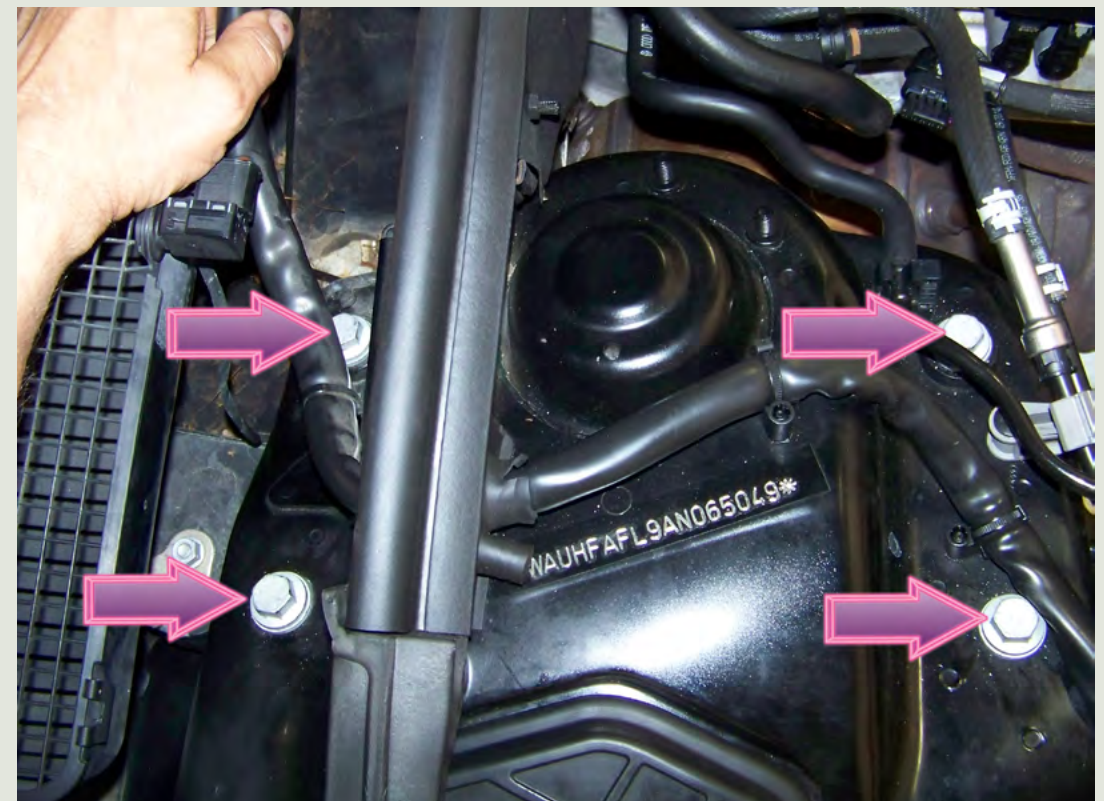
Each strut cage is attached to the chassis by four bolts. Two of the bolts are located inside the water tray (left arrows); the other two are inside the engine compartment (right arrows).

Service Tip: 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 18

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



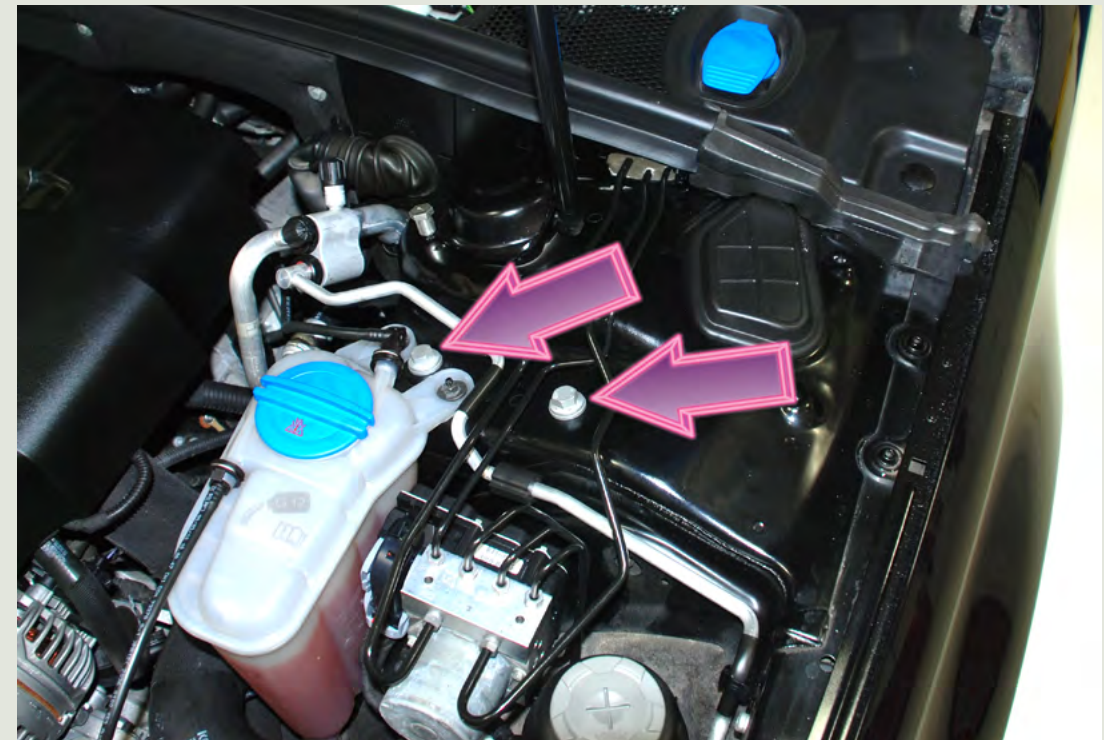
Remove the Upper Front Strut

KW Coilover Installation
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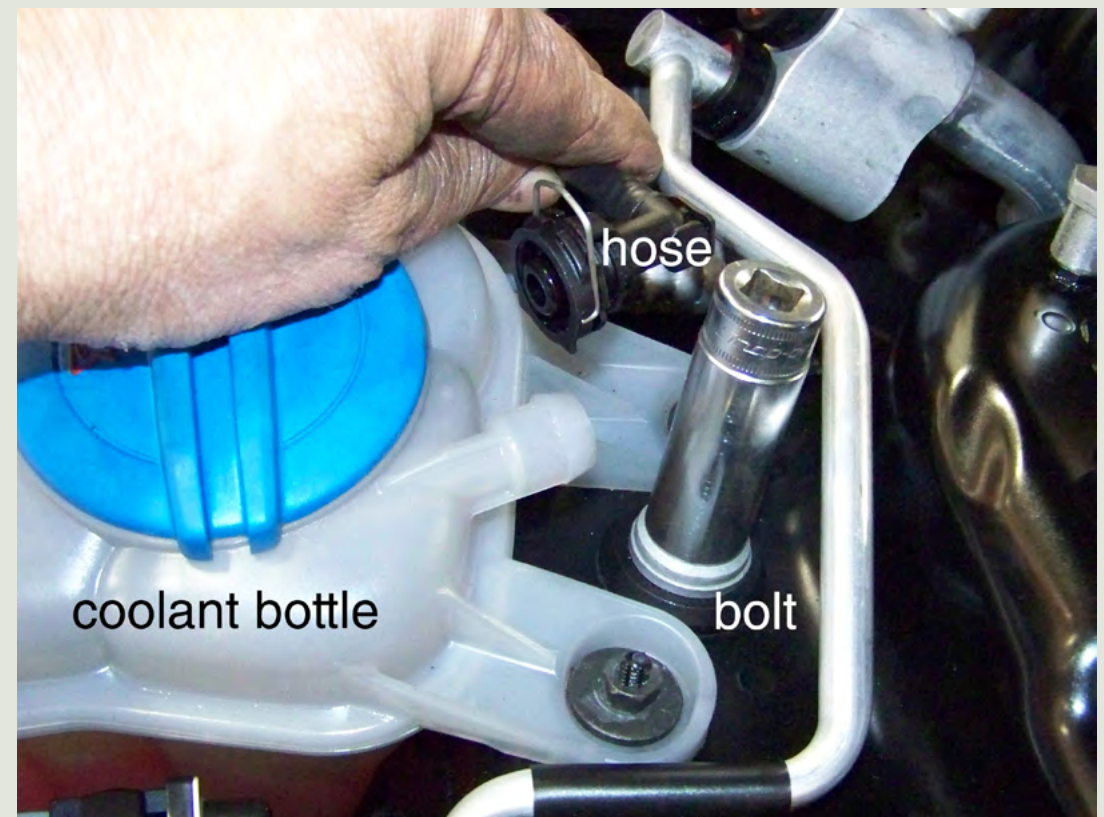
Step 19

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



Step 20

To remove the left 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.



Remove the Upper Front Strut

KW Coilover Installation
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Step 21

The rear bolts on the left 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.

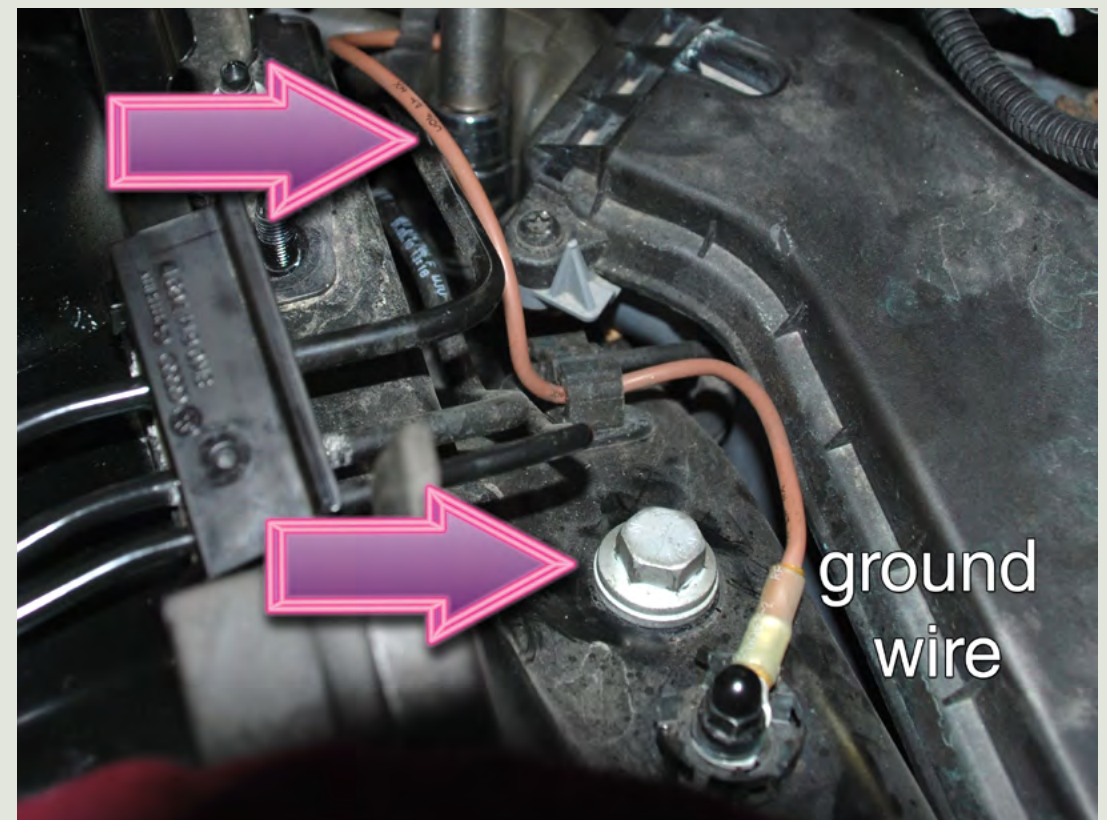


Step 22

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

Service Tip: 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 retighten this connection.

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



Step 23

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. There is no need to do so. Over-compressing the spring 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.

Caution: If you are unfamiliar with this part of the job, ask for help.



Step 24

When the spring is safely compressed, remove the OE strut nut.

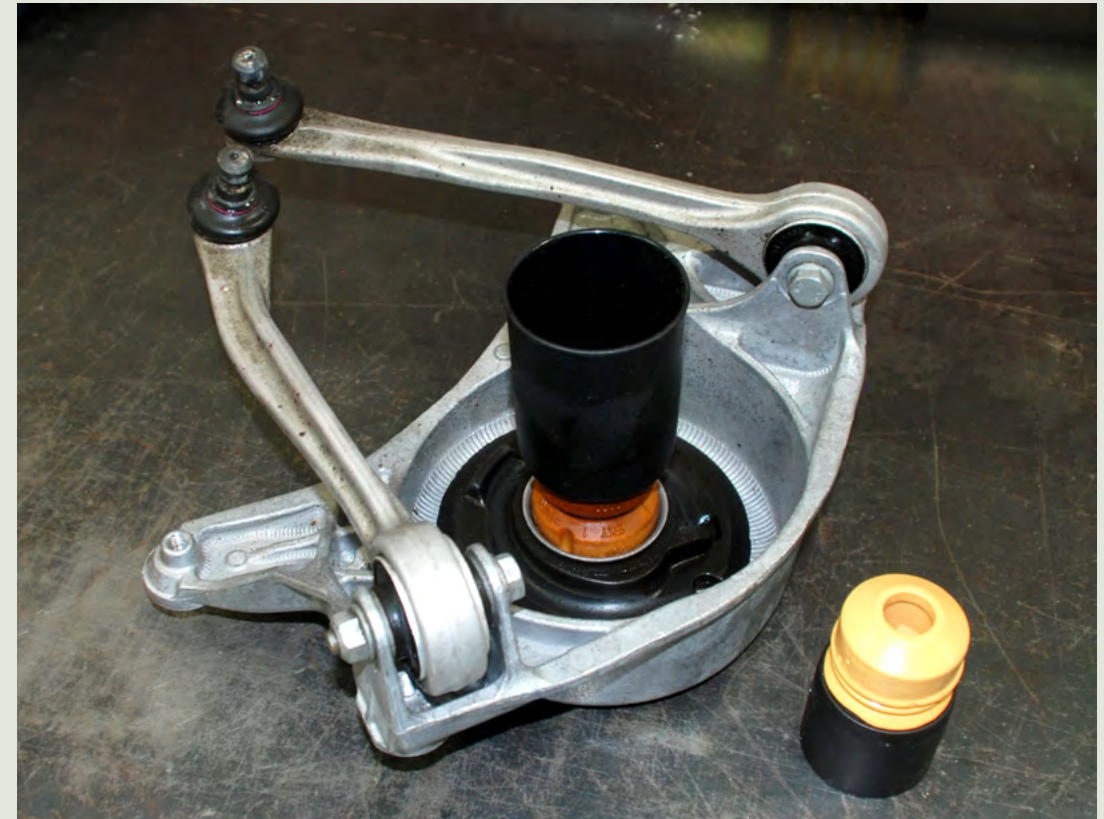
Lift the carrier with strut bushing off the strut shaft.



Step 25

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 26

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.

Service Tip: We'll measure this setting and use it on the opposite side strut.

Note: 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.



Step 27

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 = 25Nm (18 ft-lb)

M10 = 20Nm (15 ft-lb)

M12x1.25 = 35Nm (26 ft-lb)

M12x1.5 = 40Nm (29 ft-lb)

M14x1.5 = 50Nm (37 ft-lb)

M16x1.5 = 50Nm (37 ft-lb)

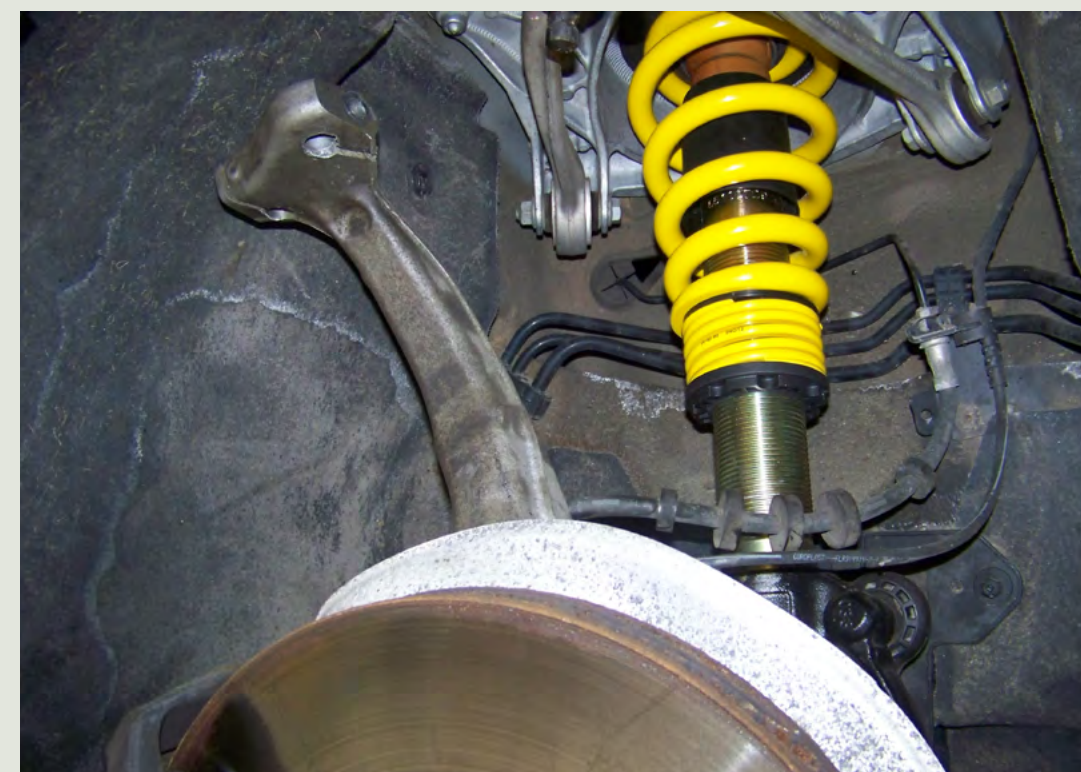


Step 28

Reinstall the upper strut carrier assemblies. Use new bolts and torque them to 40Nm+90° (30 ft-lb+90°)

(See bolt tightening sequence page 3.)

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



Reinstall Front Strut

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



Step 29

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 40Nm (30 ft-lb).



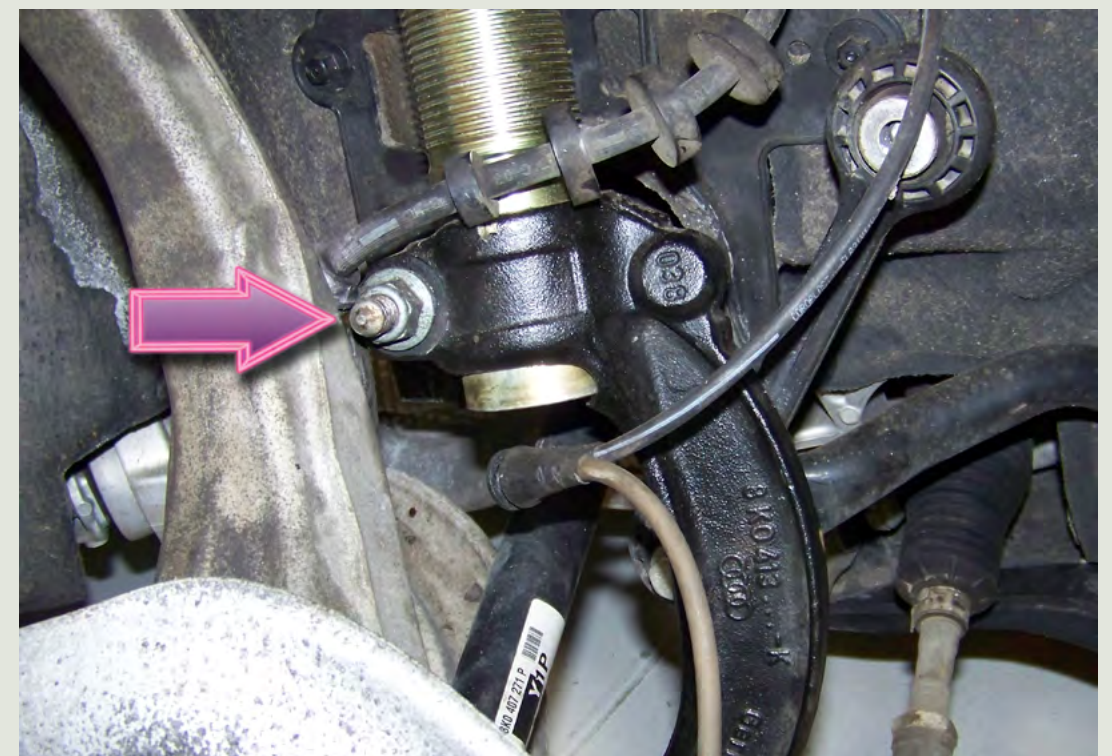
Step 30

Slide the lower strut onto the new strut tube.

Install a new pinch bolt and nut, and tighten the nut to 40Nm+180° (30 ft-lb +180 degrees).

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

Service Note: 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.



Reinstall Lower Front Strut

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



Step 31

Slide the wishbone back over the lower control arm. Align the holes and slide the bolt through the wishbone and control arm bushing, bolt head 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 - 90Nm+90° (66 ft-lb+90°).
- Inner control arm nut - 70Nm +180° (52 ft-lb+180°).

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

Step 32

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



Reinstall Lower Front Strut

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



Step 33

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 100Nm (74 ft-lb).

Note: If your car uses a hex-head nut with washer, the torque spec is 110Nm (81 ft-lb).

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



Installing the Rear Springs and Shocks

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.

Installing the Rear Springs and Shocks

KW Coilover Installation
Audi B8 A4/5, S4/5, and RS5



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. It just snaps off.



Installing the Rear Springs and Shocks

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5

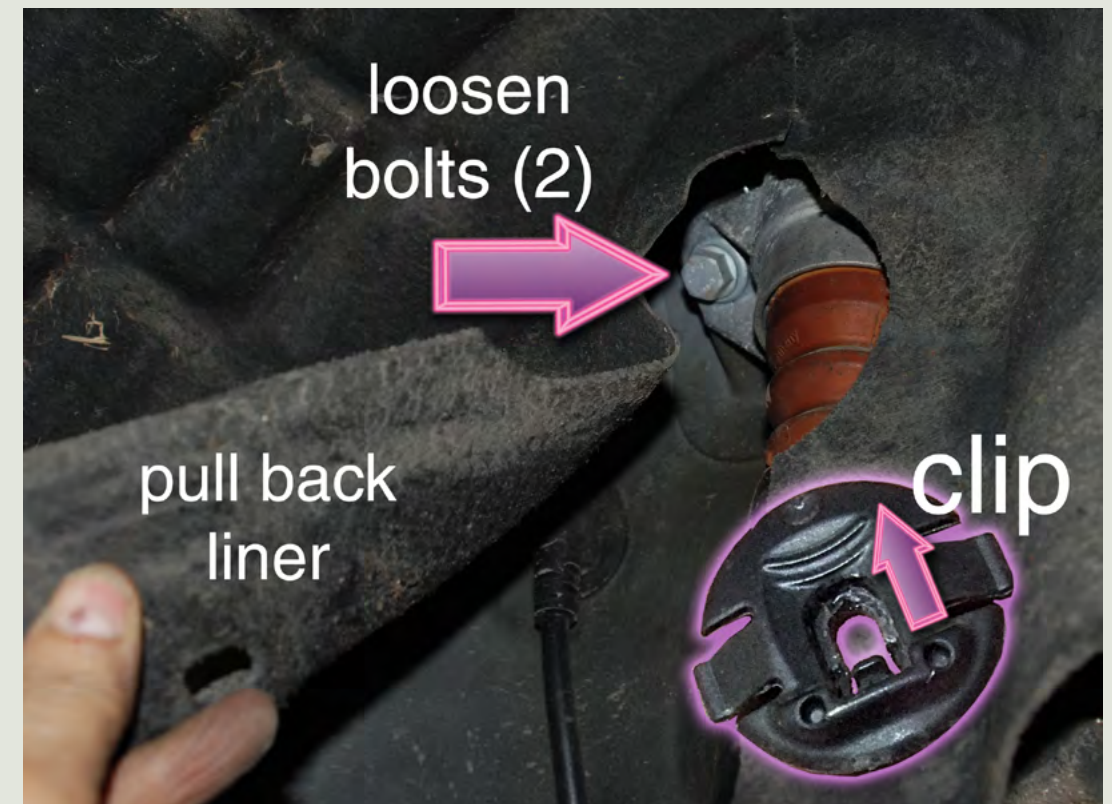


Step 3

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

Service Tip: The round plastic retainer clips (show 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.
- Remove it from the car.



Installing the Rear Springs and Shocks

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



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.

(ECS has new mounts if you need them.)



Step 6

Using a 5mm hex driver and offset 17mm box wrench (or suitable alternative), torque the retaining nut onto the new shock to 35Nm (25 ft-lb).

Do not reinstall the shock yet.



Installing the Rear Springs and Shocks

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5

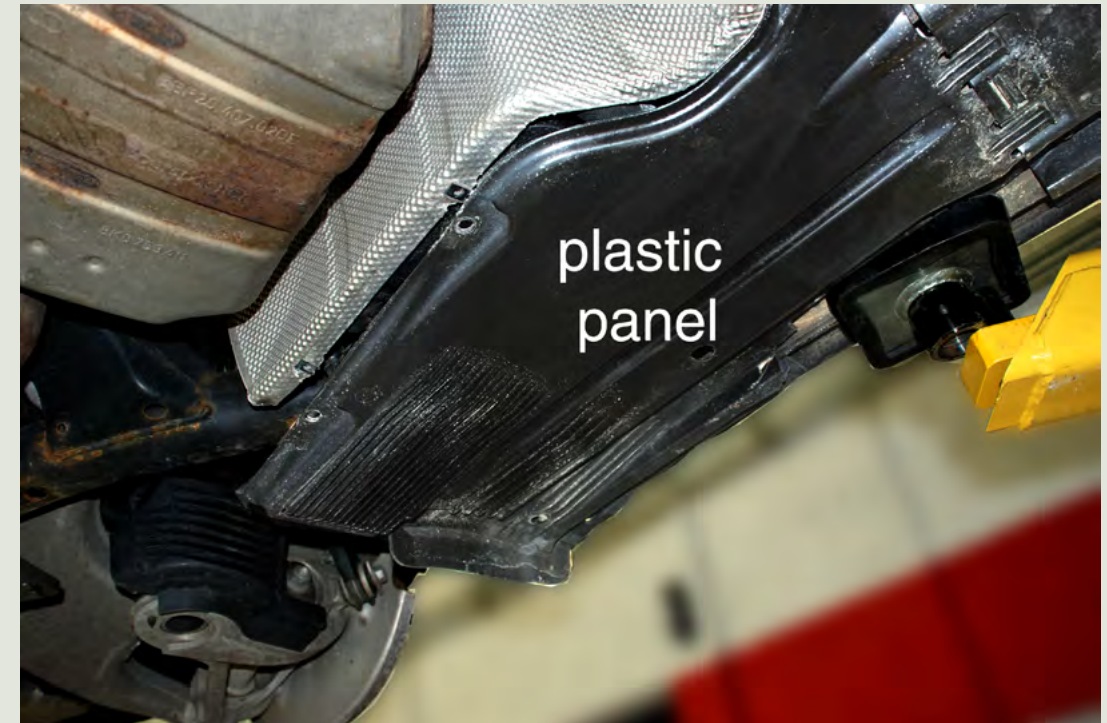


Step 7

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.



Step 8

Service Tip: 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.



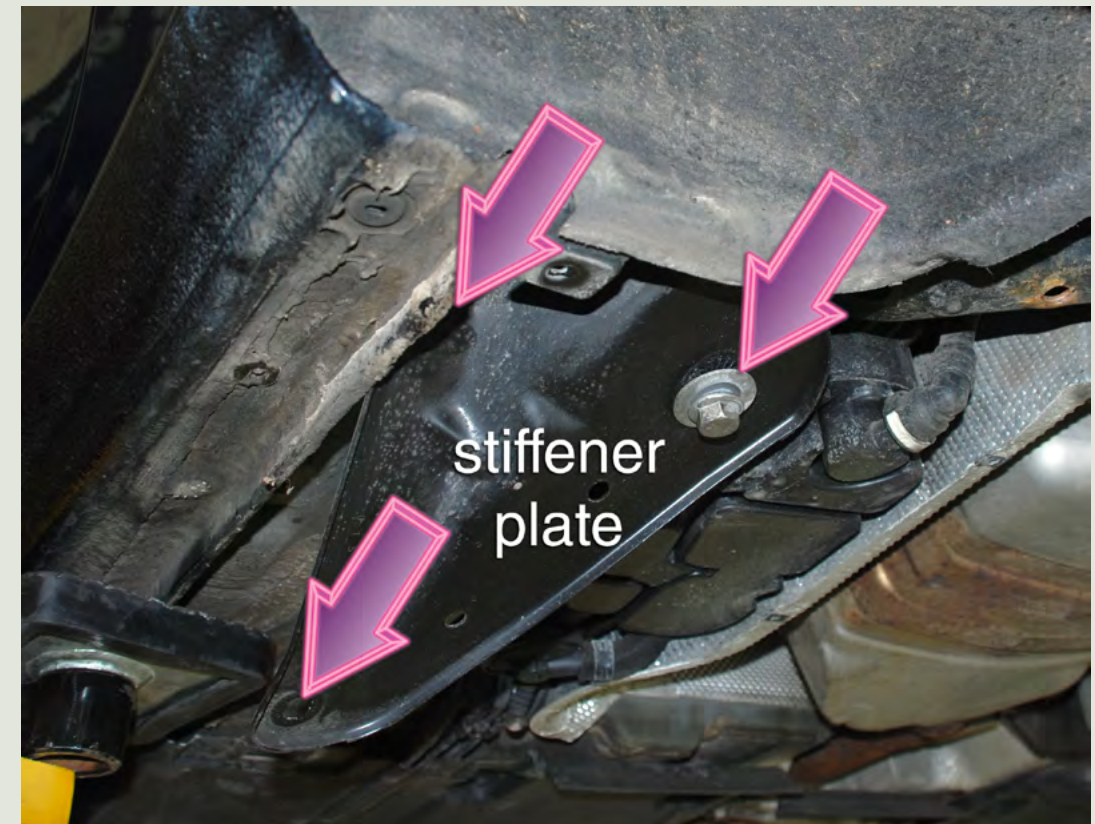
Installing the Rear Springs and Shocks

KW Coilover Installation
Audi B8 A4/5, S4/5, and RS5



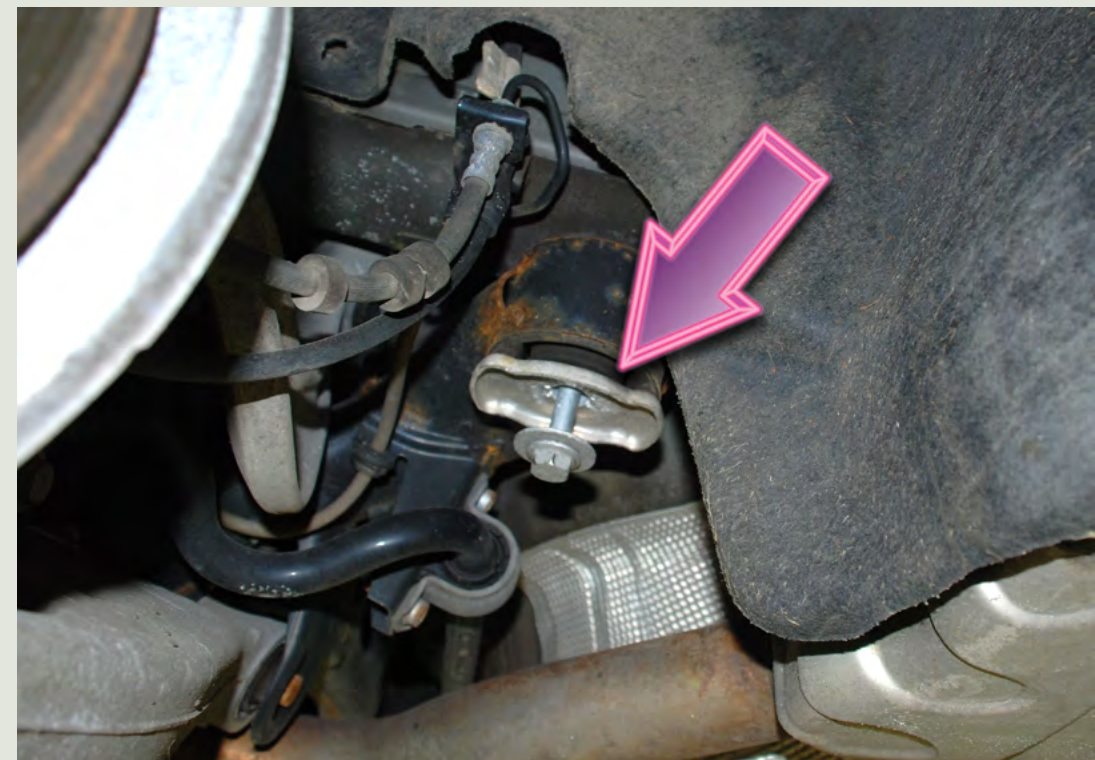
Step 9

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).



Step 10

Loosen the rear subframe bolt (arrow).



Installing the Rear Springs and Shocks

KW Coilover Installation
Audi B8 A4/5, S4/5, and RS5



Step 11

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.



Step 12

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 Springs and Shocks

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



Step 13

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 $115\text{Nm}+90^\circ$ ($85\text{ ft-lb}+90^\circ$). Tighten the shorter bolts in the support brace to 55Nm .

Service Note: Do not draw the suspension back in place with the bolts alone. Raise it with a jack first.

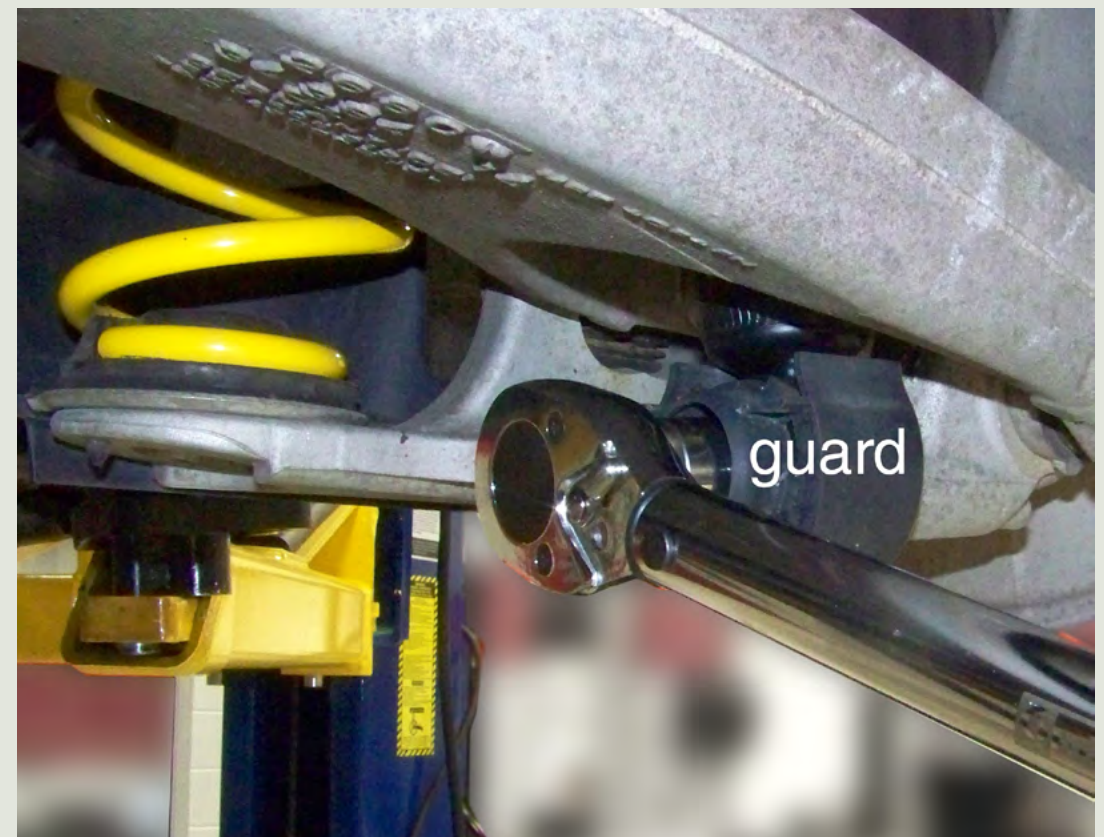


Step 14

Use new shock bolts when reinstalling the rear shocks.

- Torque the strut-mount-to-chassis bolts to $50\text{Nm}+45^\circ$ ($37\text{ ft-lb}+45^\circ$).
- Torque the lower shock-to-knuckle bolt to 150Nm (111 ft-lb). Don't forget to reinstall the spacer between the shock and knuckle (see Step 2 in this section).
- Reinstall the plastic fender liner clips.

Repeat these steps on the opposite side.



Special Section - Cars with Electronic Damping Control

KW Coilover Installation Audi B8 A4/5, S4/5, and RS5



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 (**ES2608438**) 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.



Audi OEM shocks have actuators that change damper valving, on command. Electronic Damping Cancellation Kit resistors modify circuit voltage to satisfy the control unit, and keep the dash light off. **ES2608438**



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.

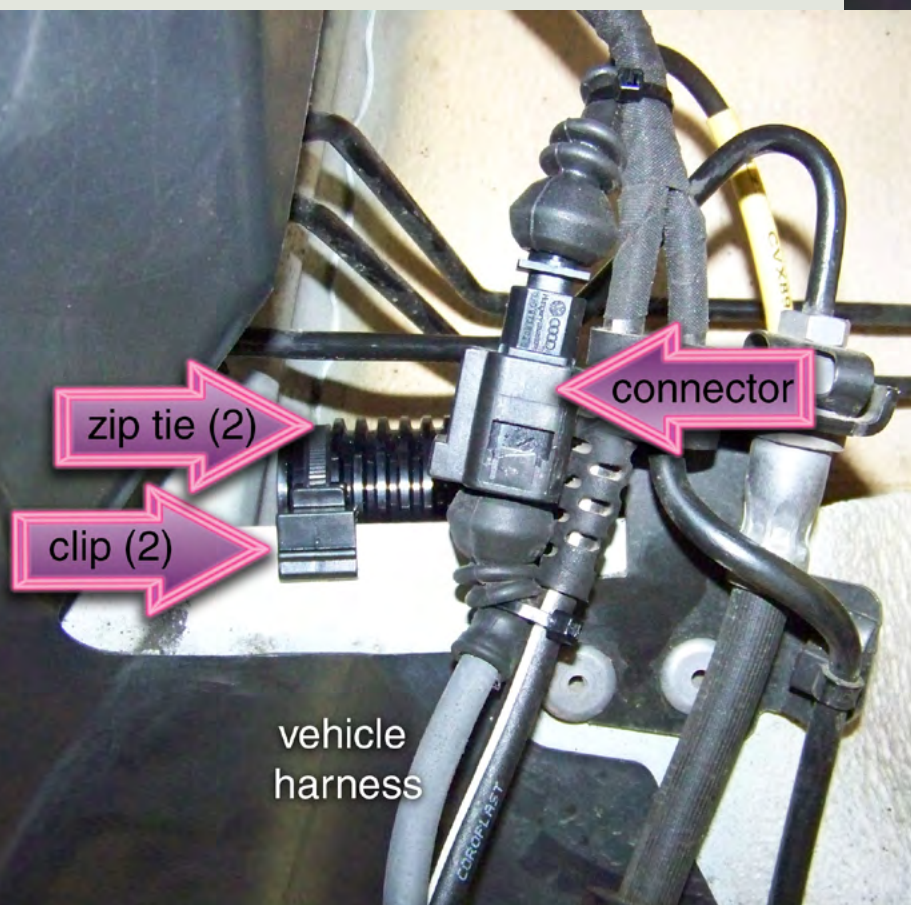
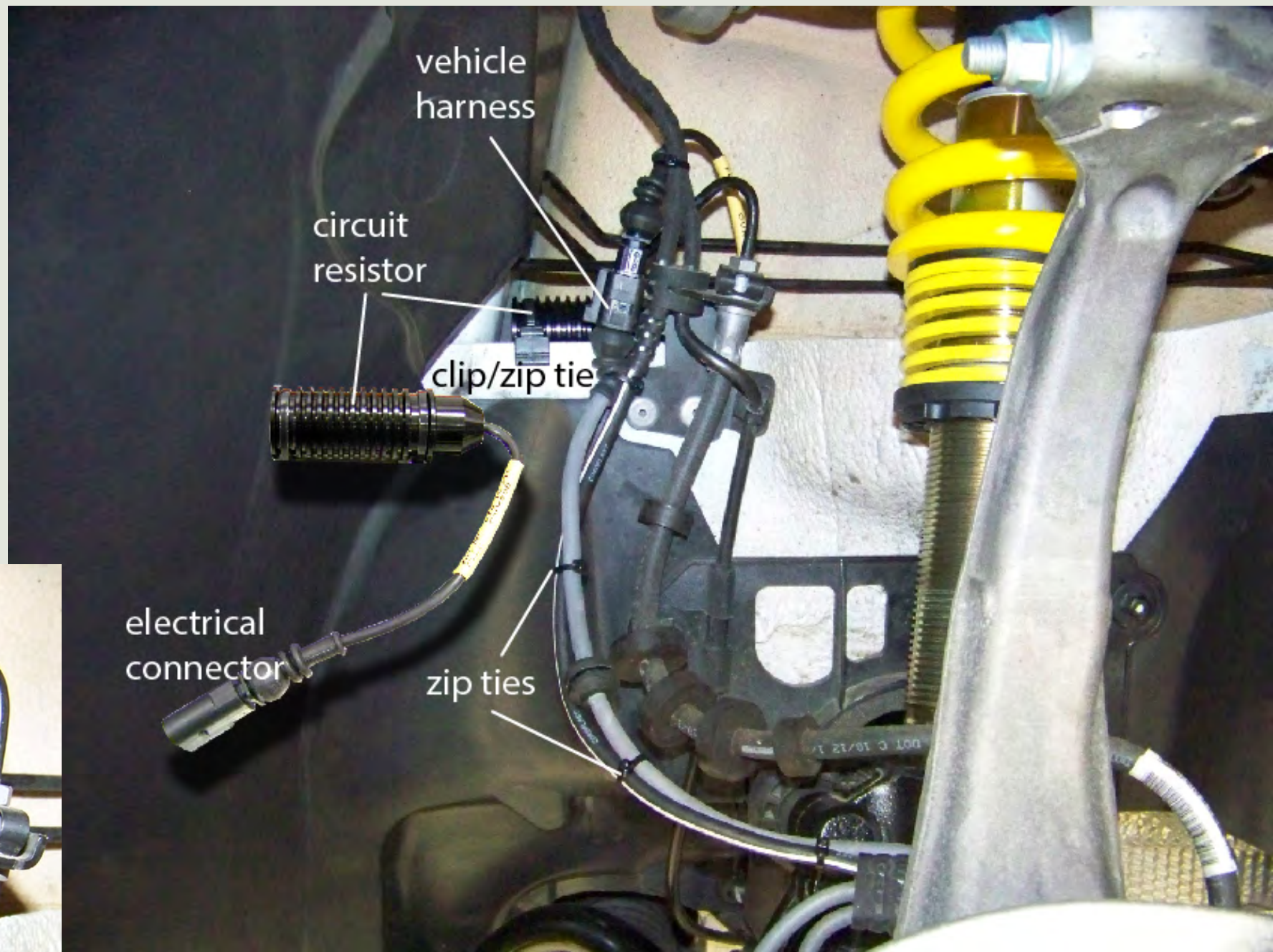
Installing the Front Circuit Resistors

KW Coilover Installation Audi B8 A4



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.

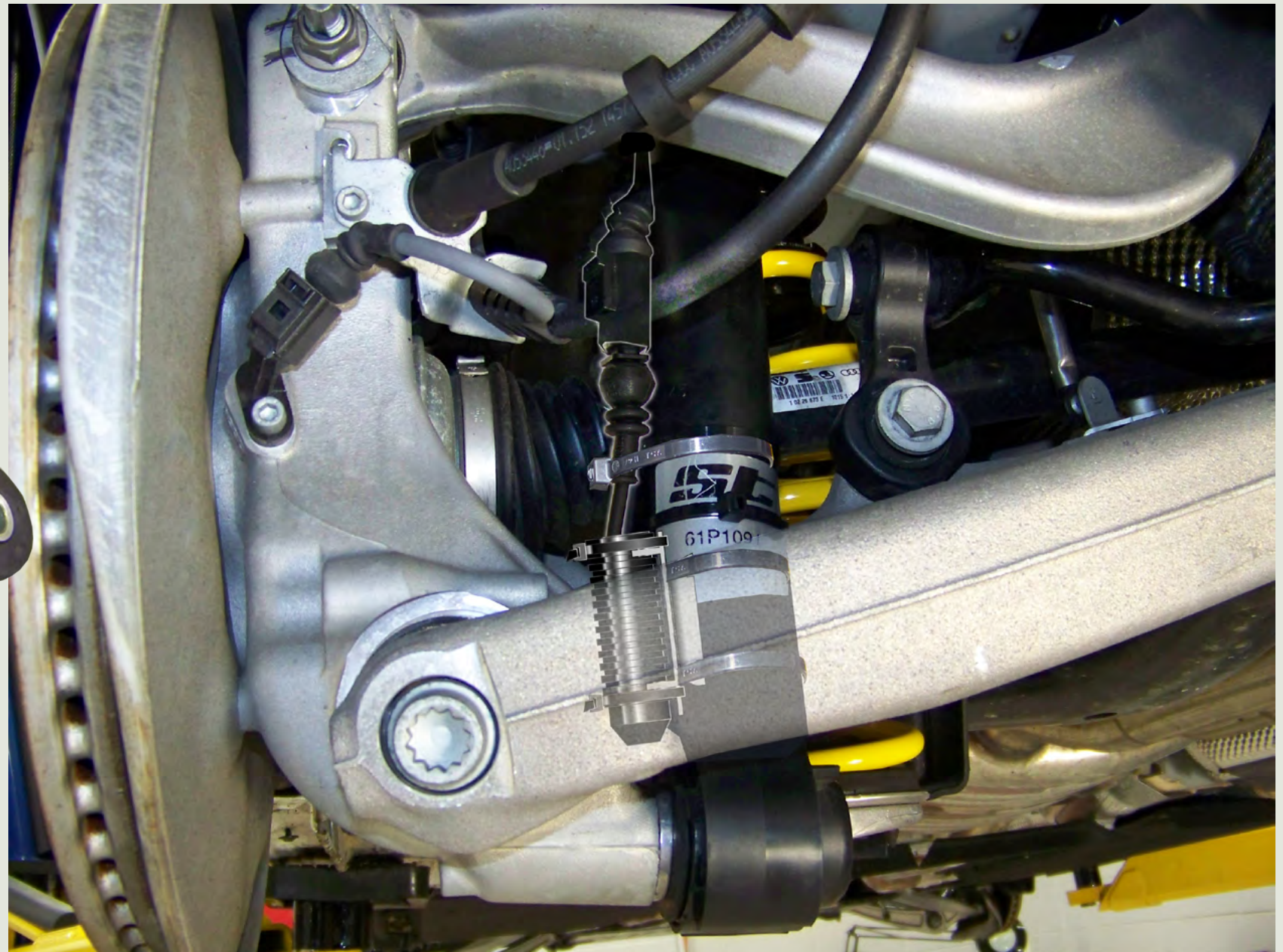
Installing the Rear Circuit Resistors

KW Coilover Installation
Audi B8 A4/5, S4/5, and RS5



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.

Finishing Up - Final Steps

After your coilovers are installed, install the wheels and torque the wheel bolts to specs.

With the car sitting on its wheels again, check tire-to-body clearance front and rear. Make sure you have adequate clearance between the tires and fender lips with the wheels straight ahead and as they are turned. Leave a little extra room for normal suspension travel and body roll so you don't experience tire-to-body interference.

If ride height is where you want it, and level from side to side, tighten the set screws on the front coilover adjustment collars. Just barely snug these; there is no need to screw them in hard, which will damage the threads.

If you haven't already done so, apply a good quality strut lube to the adjustment threads. A wax-based lube is a good choice.

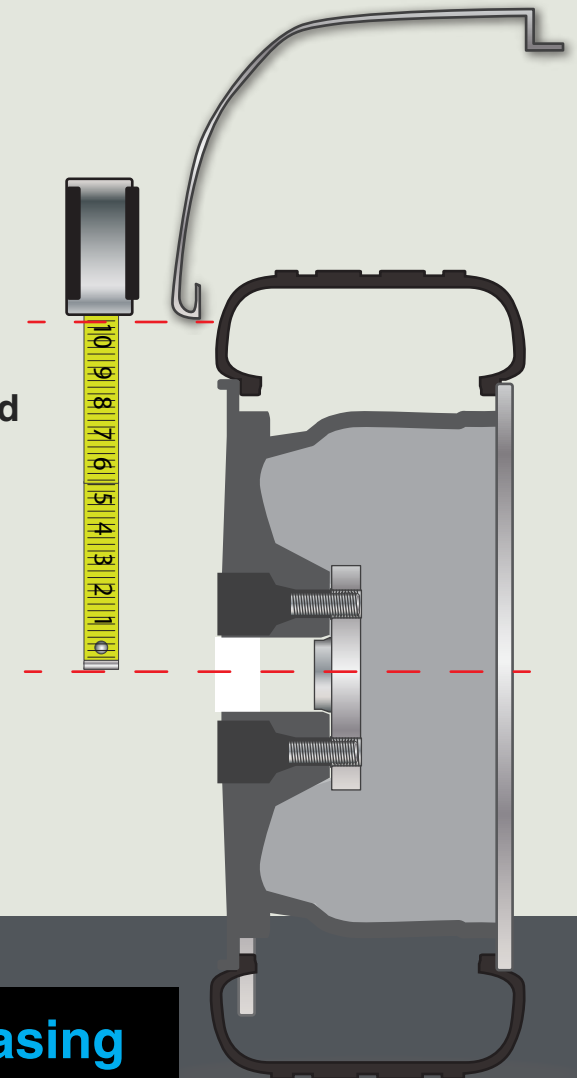
Service Tip: When making your initial height adjustments, leave the car slightly higher than where you want it. Then drive the car for several days to give the new suspension a chance to settle.

Then use the strut collar wrench in the kit to make your final ride height adjustments.

Enjoy!



For consistency and accuracy we recommend measuring ride height from the lower edge of the wheel arch to the wheel center.



**Thanks for purchasing
your coilover set from
ECS Tuning.**

**We appreciate your business, and
hope this tutorial has been helpful.**

ES2129997