Installation Procedures

Installation

This tutorial is provided as a courtesy by ECS Tuning.

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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ES1876397

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H&R Lowering Spring Kit Installation

Stock or Aftermarket Dampers?

The H&R spring set we have chosen is a moderate lowering kit that will drop our MKVI Jetta GLI about an inch, and still maintain ride quality. Due to the car's low mileage and overall good condition, we'll reuse the factory struts and shocks, plus several related items like strut bushings/bearings, dust boots, and bump stops.

The general procedures outlined here are intended to demonstrate general procedures for installing struts and springs on many VW cars. WE have provided torque specs for the MKVI. Please refer to factory authorized repair specifications for bolt size and tourque on your year and model.

We contacted H&R about the advisability of using stock struts with their lowering springs. They responded that while they do not make recommendations about the type of damper mated to their lowering springs, their OE Sports are designed to work with an OE grade damper, or an equivalent or an aftermarket upgrade. This also holds true for most Super Sport and Race spring applications.

They also state that while customers commonly appreciate the added benefits of matched performance dampers, H&R springs can be run successfully with OE dampers.

Tools Needed

You will need a few common hand tools, a spring compressor, and a safe way to raise and support the car. Where special tools make the job faster, easier, and safer, we will demonstrate their use.

We are working in the shop, and have access to a lift and hydraulic post jack, things we realize you may not have at home. Floor jacks and approved jack stands are always effective alternatives, when they are used as directed, and we attempted to simulate these conditions where possible.

Let's do it.

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Methodology

We reviewed several DIYs posted at various forums to get a feel for how others have tackled a spring installation. Then we experimented to find an approach that combines ease and safety. Our methods are slightly different from most DIYs on this topic, and we'll explain why as we go along.

The biggest change is that we chose to remove the strut as an assembly, rather than split the strut insert and knuckle in the car. We found this approach much easier, faster, and way more forgiving for our lower back and knuckles.

There are several reasons we chose this approach:

1) We decided that it is wise to unbolt, remove, and hang the brake caliper, and unplug the wheel speed sensor. It's just too easy to twist, stretch, or strike the brake fluid hose or wiring while the caliper is hanging from the knuckle. Caliper removal is a snap: two bolts and a couple of clips. Why not hang it off to the side, out of the way?
2) We didn't need to separate the strut and knuckle on our project car, since we were reusing the almost-new factory strut inserts.
3) With the caliper already removed, the only added step needed to remove the entire strut is to disconnect the tie rod end from the knuckle.
4) It's just easier. We tried it both ways–as an assembly, or in pieces–and given the choice, we'll remove the strut as an assembly from now on.

Coming out or going back in, we elect to let our floor jack do the heavy lifting. Note that even though the car is on a lift, it is at jack stand height, just like it would be for any DIYer working at home with a floor jack.

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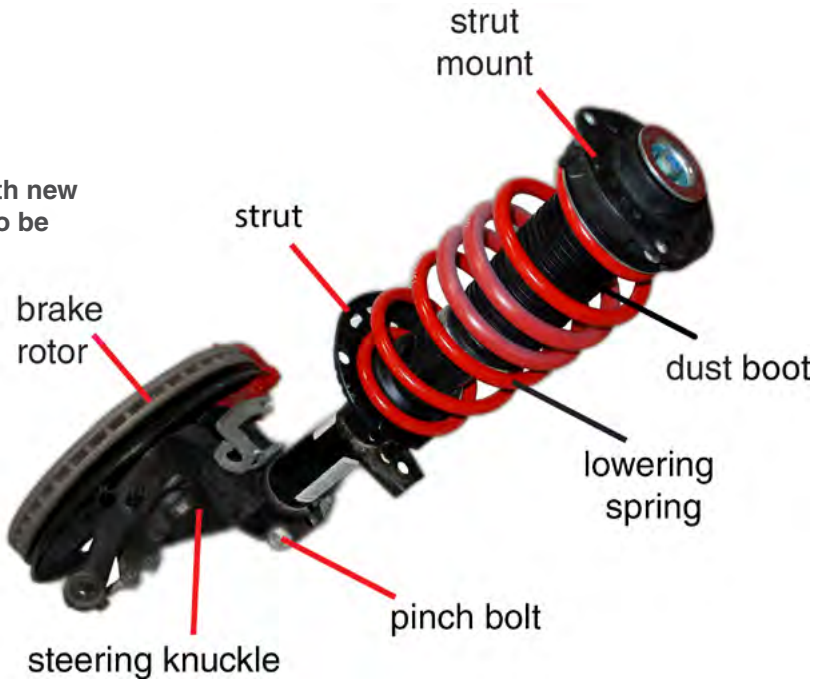
Strut Removal - Front
Removing Strut as Assembly (per side):

1) Remove the wheel center cap.
2) Loosen but do not remove the drive axle bolt.
3) Raise and safely support the vehicle.
4) Remove the road wheel/tire.
5) Back out the drive axle bolt about one inch. Rap the head of the bolt with a mallet just hard enough to loosen it in the drive hub splines. Do not attempt to remove the drive axle yet.
6) Unbolt and remove the brake caliper. Hang it safely off to one side, away from the work area.
7) Unplug the ABS wheel speed sensor connector from the rear of the steering knuckle. Pull the sensor wire away, and hang it next to the caliper.
8) Unbolt and disconnect both stabilizer links at the strut end. Pivot the links off to the side.
9) Loosen and disconnect the outer tie rod end from the steering knuckle.
10) Remove the nuts from the ball joint studs at the control arm. Pull the ball joint away from the control arm.
11) Raise the hood. Pull the cowl weatherstrip away, and lift the front edge of the plastic cowl trim panel far enough to expose the three strut mount bolts holding the strut mount to the strut tower.
12) Place a jack beneath the base of the strut assembly. Bring the head of the jack up just far enough to meet the base of the strut assembly.
13) Remove the three strut mount-to-strut tower bolts.
14) Use the floor jack to slowly lower the strut assembly.
15) Disassemble the strut and install the new lowering springs.
16) Reinstall the strut assembly, reversing your steps.
17) Do not re-use the large driveshaft axle bolt. Install a new bolt and torque to specifications.

Front strut assembly with new lowering spring, ready to be installed in car.



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Lowering Spring Installation
Volkswagen Cars

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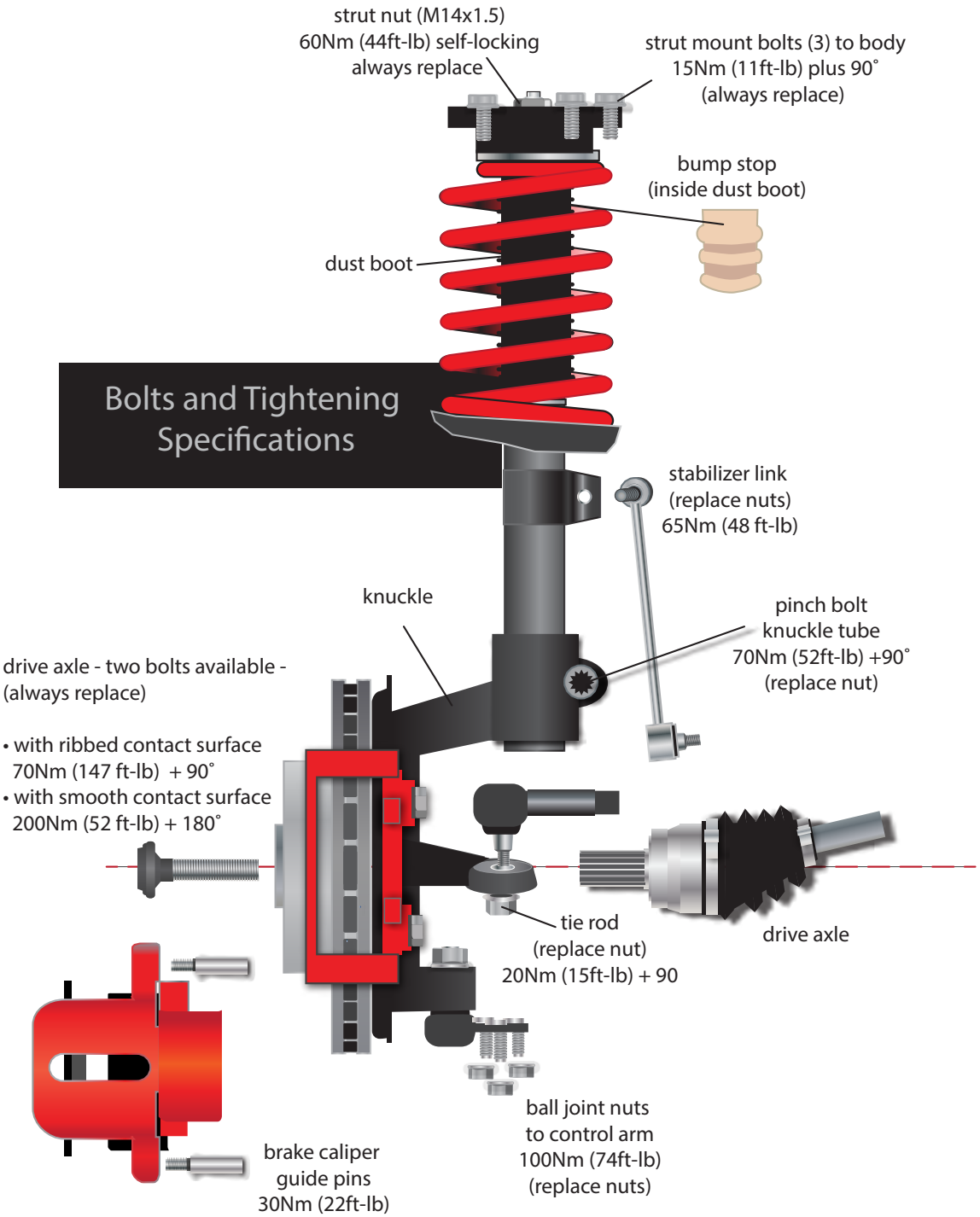

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Installing the Front Springs

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Step 1

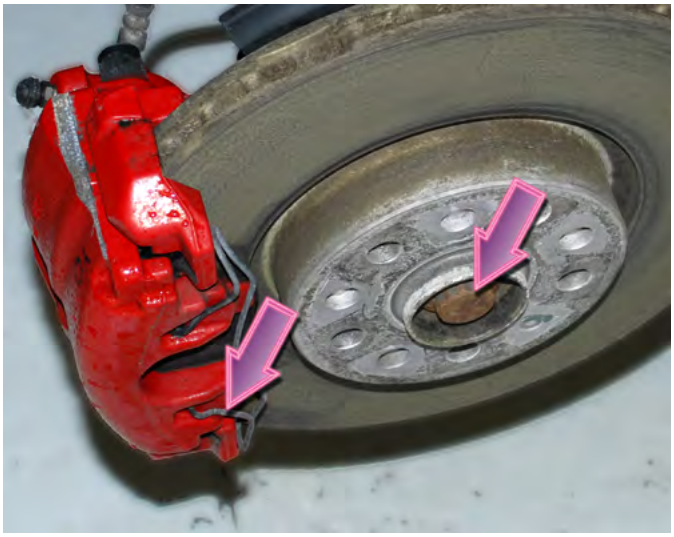
Remove the wheel center cap. Using a 24mm 12-point socket, loosen the drive axle nut one quarter turn. Do not loosen the bolt more than 90 degrees with the vehicle sitting on its own weight or you may damage the wheel bearing.

Raise the car and support it safely. Then remove the wheel and tire.

Step 2

Use a flat-bladed screwdriver to pop off the caliper spring clip (left arrow).

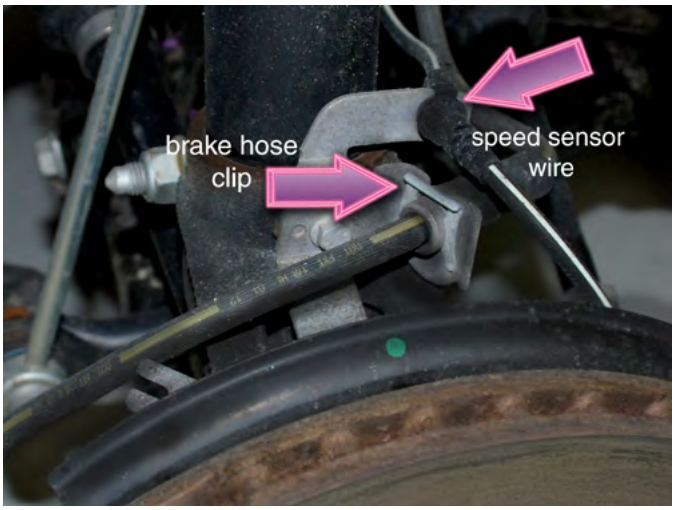
Back off the driveshaft axle bolt (right arrow) about one inch. Then strike the head of the bolt with a mallet. Doing so will "unstick" the splined end of the driveshaft from the mating splines in the drive hub.



Step 3

Use a flat-bladed screwdriver to pop off the u-shaped brake hose retainer clip (left arrow). Then push the metal support collar out of the hose support bracket.

Unplug the electrical connector from the wheel speed sensor located on the back of the knuckle. Then pry the rubber speed sensor grommet from its retainer on the strut (right arrow). Pull the wire aside and secure it in a safe place.



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Step 4

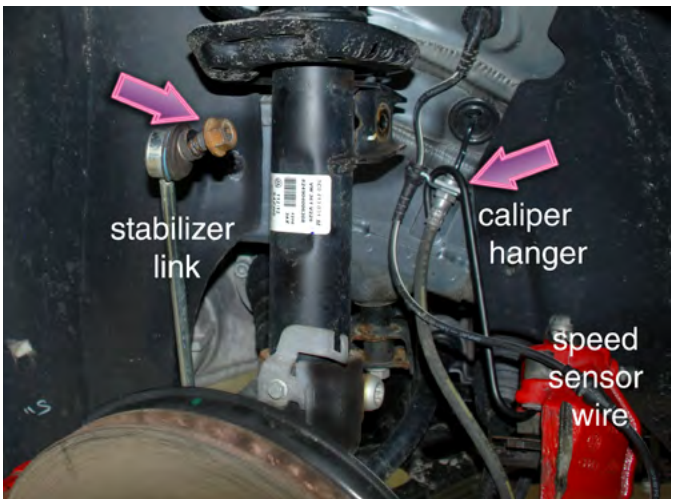
Remove the two plastic caps and hex head guide pins from the rear of the caliper.

Slide the caliper off and hang it out of the way with a dedicated caliper hanger, strong wire, or bungee cord.

Step 5

Unbolt and disconnect the upper end of the stabilizer link (left arrow). Loosen and tighten the link using a backing wrench to hold the stabilizer ball joint shaft as you turn the nut.

Note how our caliper is hung from the brake line support bracket with a strong caliper hanger hook (right arrow). In this location it is safely out of our way, and the brake hose is under no stress.

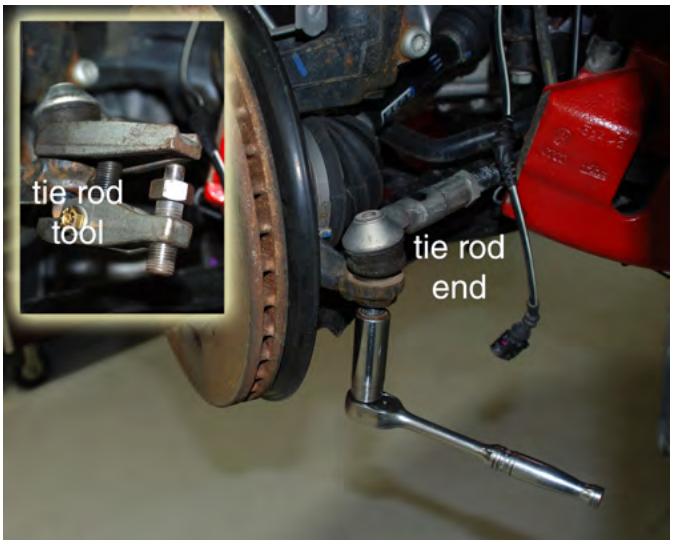


Step 6

Remove the nut from the tie rod end. Use a tie rod end removal tool to pop the end from the knuckle. (Many local parts stores will rent these pullers.)

Note: We do not recommend the use of pickle fork style ball joint separators, since they usually tear the rubber boot.

Note: At this point, disconnecting the tie rod end this is the only extra step needed to remove the strut assembly as a single component.



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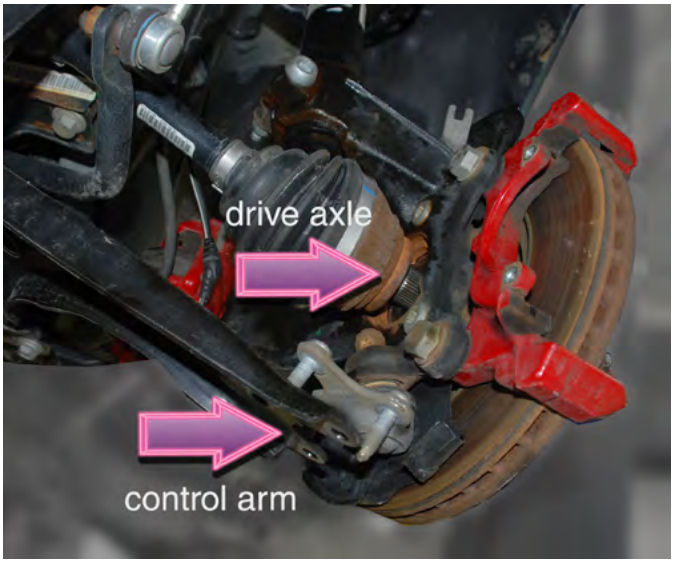
Step 7

- Remove the nuts from the ball joint studs and separate the ball joint from the lower control arm.
- Pull the base of the strut outward and slide the drive axle out of the drive hub splines.
- Place a floor jack under the base of the strut, below the ball joint. Raise the jack just far enough to make contact and support the strut.



Step 8

Open the hood. Pull the rubber weatherstrip away from the front edge of the cowl.

Gently lift the front edge of the plastic cowl cover to expose the three M8 bolts holding the strut mount to the body, and remove them using a 13mm wrench.

Step 9

With the three top bolts removed, steady the top of the strut as you lower the jack.

Tip the strut top inboard slightly to clear the fender lip as you slide the base of the strut outward.

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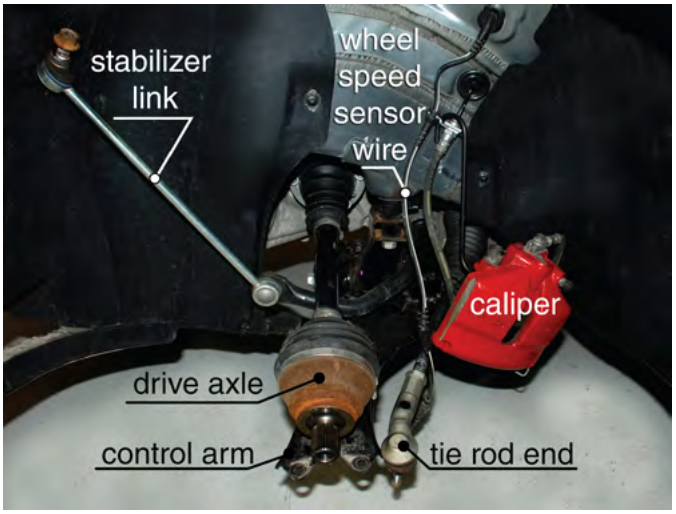
Step 10

Here's a recap of the things we've disconnected so far. Note how everything is pulled to the side, out of harm's way.

Now let's move to the work bench and install our new lowering springs.

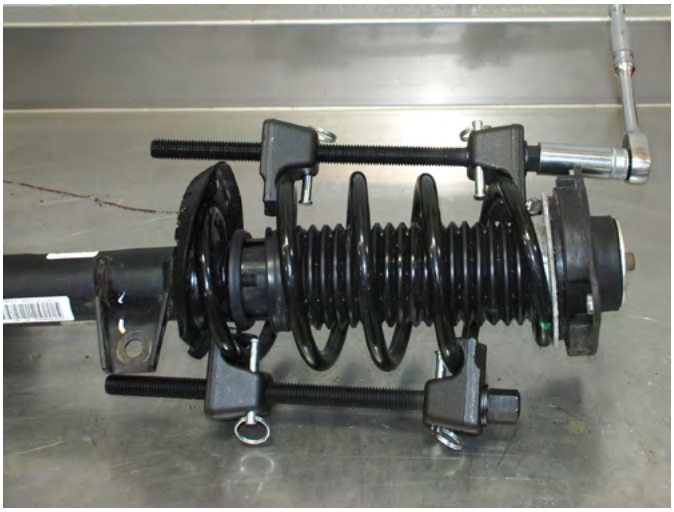


Step 11

We will use our Schwaben coil spring compressors (ES1306817) to compress the old springs. Easy does it. Compress the springs just far enough to take the tension off the strut bushing, then remove the strut nut.

These springs are not monsters, but it still pays to exercise caution when removing them.

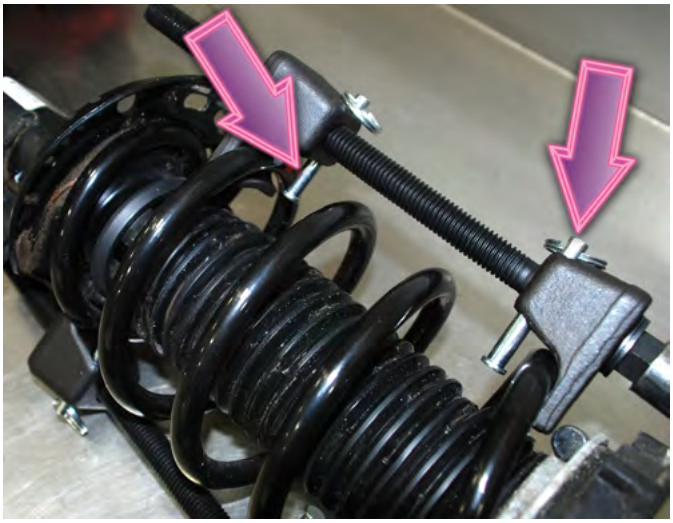
- Wear gloves and keep your fingers out of the coils at all times.
- Never stand in front of the strut bushing as you remove it.



Step 12

Install the spring compressors on the spring, 180 degrees apart. Try to keep the jaws on each compressor as far apart as possible while still getting a good grip on the coils.

When the jaws are placed on the coils, push the silver safety pins down until they snap in place (arrows). These pins lock the jaws to the coils.



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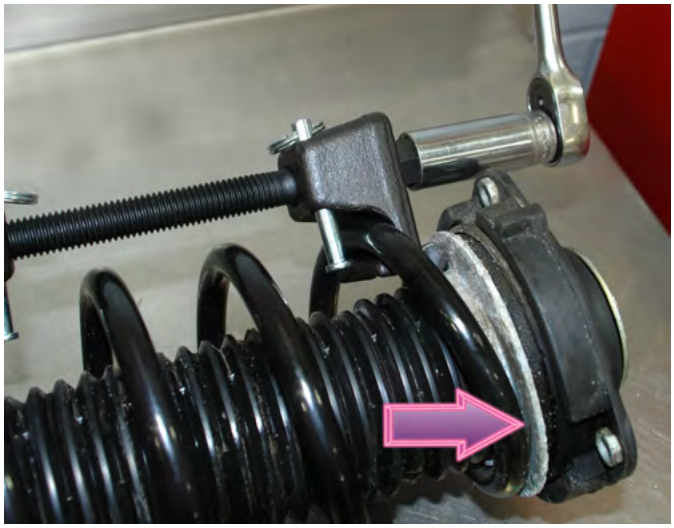
Step 13

Turn the hex heads on the compressors jack screw with a wrench to compress the coils.

Draw the jaws down down **evenly**, alternating from side to side as you tighten. This applies tension evenly as the spring is compressed.

Do not overtighten. When you can rotate the metal spring perch on the strut bushing by hand (arrow), you've compressed the springs far enough.



Step 14

Using a 21mm wrench, remove the strut nut.

An impact gun makes short work of removing the strut nut. Without one you'll need to hold the center shaft with a hex head wrench, then loosen the nut with an offset box wrench or special strut removal socket.

We feel it's okay to reuse this nut, providing it is in good condition. (A drop of medium strength thread sealer is advisable, however.)

Step 15

- Pull the strut bushing off the shaft.
- Pull the bump stop, dust boot, and coil spring off the strut.
- Carefully remove the coil spring compressors.
- If you are installing a new strut bushing and bearing, transfer the bump stop and dust boot.

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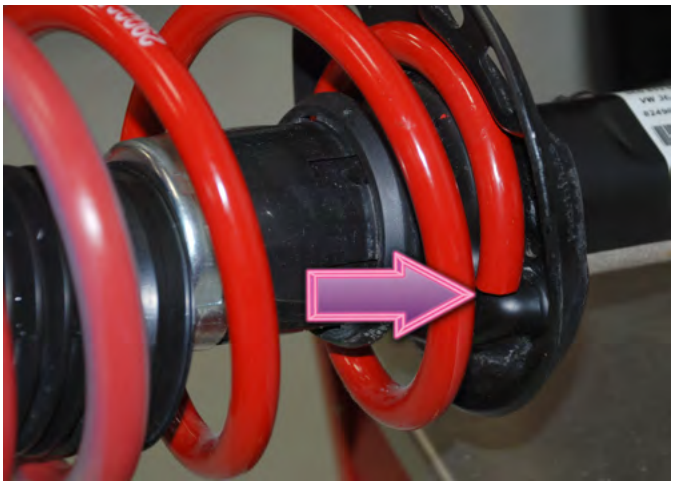
Step 16

Slide the new coil spring over the strut shaft. Align the end of the coil with the stamped stop in the lower strut perch (arrow).



Step 17

Install the strut bearing with dust boot attached and then slide the strut bushing over the shaft end.

Note: We are reusing the original struts since this is a very low mileage car. The stock length strut shaft is long enough that we can thread the strut nut onto the shaft without compressing the spring.

If we were installing struts with shorter shafts, we would have to compress the new springs far enough to start the nut.

Step 18

Here, we're tightening the nut using the Schwaben offset strut nut wrench (ES2219682) while we hold the strut shaft with a hex driver.

Note: If you have no way to hold the strut as you tighten the nut, you may find it easier to hand tighten the nut on the bench, and final-torque the nut after the strut is back in the car.

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Volkswagen Cars

Read This Page Only If You Are Installing New Struts

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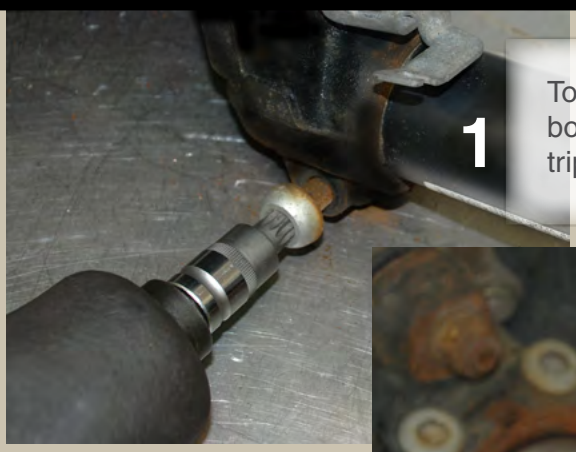
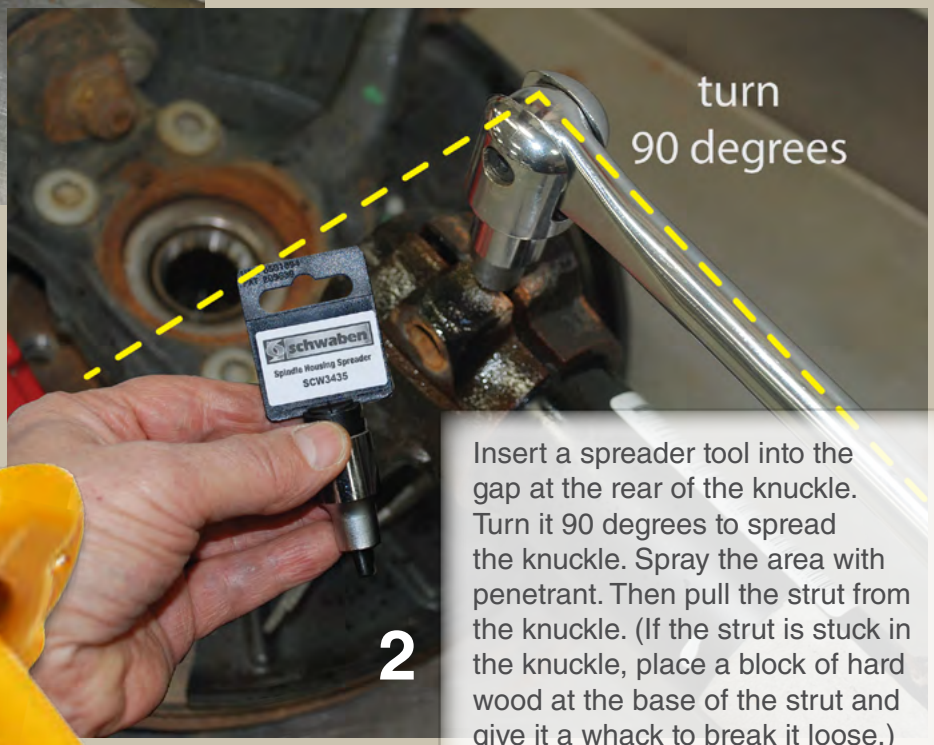


1

To install new struts: Remove the pinch bolt from the knuckle using an M14 triple square driver.

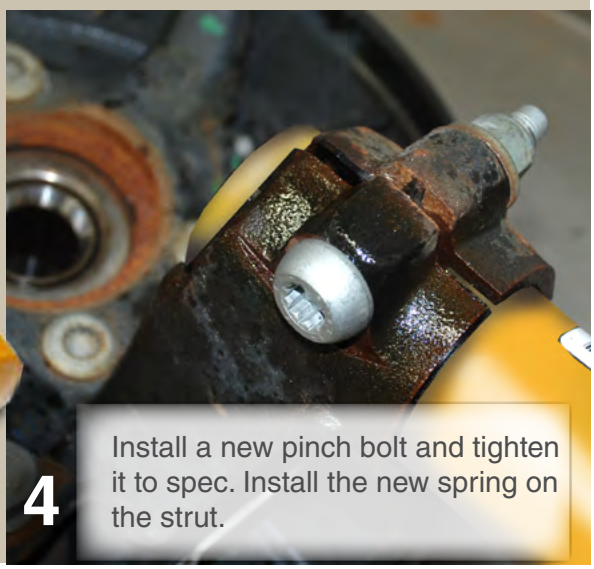


2

Insert a spreader tool into the gap at the rear of the knuckle. Turn it 90 degrees to spread the knuckle. Spray the area with penetrant. Then pull the strut from the knuckle. (If the strut is stuck in the knuckle, place a block of hard wood at the base of the strut and give it a whack to break it loose.)

3

Slide the strut into the knuckle. Make sure the locating tab (arrow) slides into the notch in the knuckle.



4

Install a new pinch bolt and tighten it to spec. Install the new spring on the strut.

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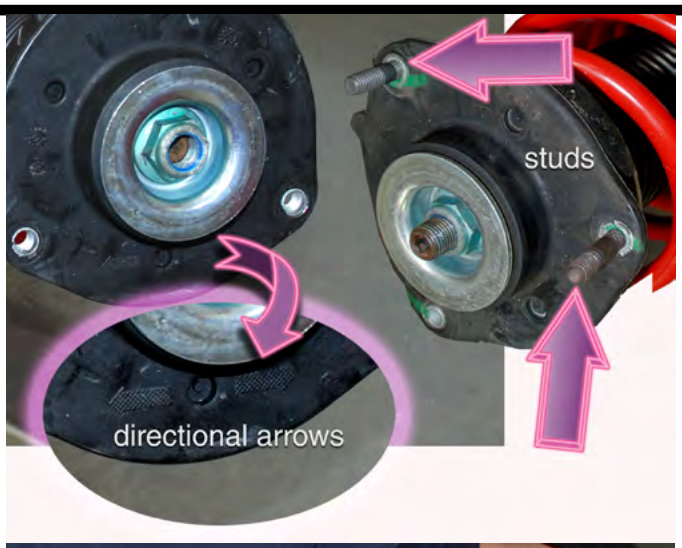
Step 19

VW uses bolts–not studs–to secure the strut mount to the chassis. To make it easier to align the strut as we reinstall it, we screw two 8 x 125 studs into the two threaded strut mount holes.

Also note the directional arrows stamped into the rubber on the top of the strut mount. These arrows should point in the direction of vehicle motion–fore and aft–when the strut is reinstalled.

Service Tip: A small paint mark helps index the mount during installation



Step 20

Now it's just a matter of sliding our strut over to the car on the floor jack, and guiding it into the wheel well.

Step 21

Jack slowly, pausing occasionally to guide the top of the strut into the tower.

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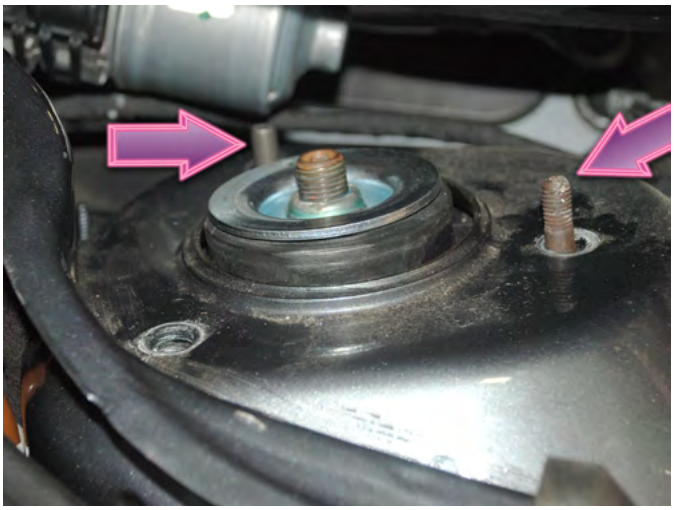
Step 22

Use the studs installed earlier to align the mount to the chassis holes. This photo shows the studs sticking up through the holes.

Install one bolt loosely in the vacant hole, then unscrew the studs one at a time as you install the remaining two bolts.

Torque the bolts to spec.

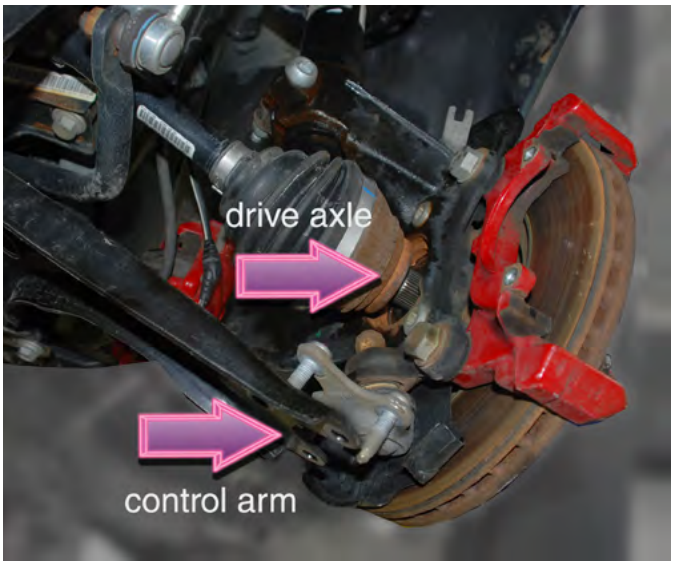


Step 23

Spline the axle into the drive hub, then drop the three ball joint studs through the holes in the control arm.

Reinstall the ball joint nuts and torque them to spec.

Reattach the tie rod end and brake caliper, and reconnect the wheel speed sensor. Wait to reinstall the stabilizer links when both sides are done.



Step 24

Install new drive axle retainer bolts. Some bolts have a smooth contact surface; others, a ribbed contact surface. Please see our torque specs on page 5 for details.

Do not place the entire weight of the vehicle on the ground until the bolts are torqued. You can damage the wheel bearing and shorten their service life.

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

Now let's do the rears.

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Install the Rear Springs

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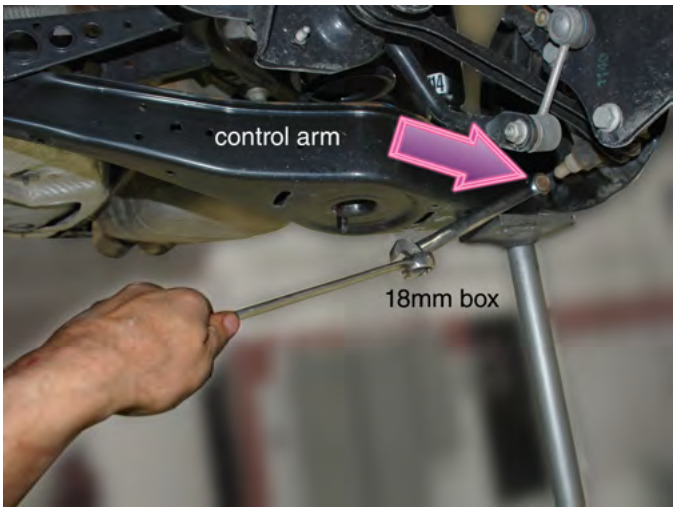
Step 25

Installing the rear springs is a simpler and easier task.

Remove the rear wheels.

Place a jack under the outside end of the rear control arm.

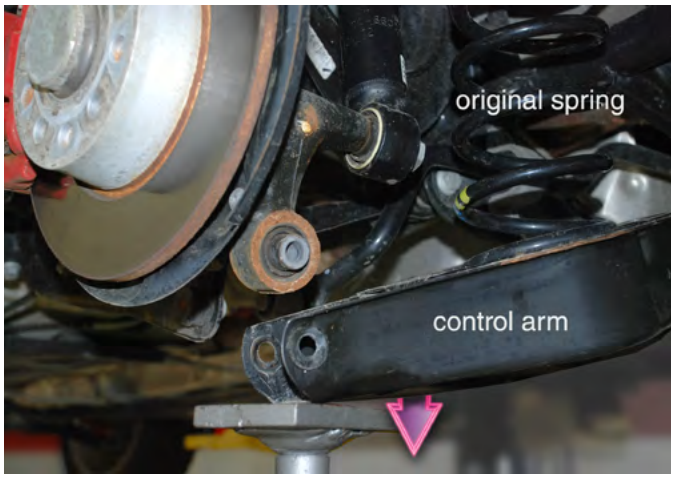
Loosen the nut on the outer control arm bolt. If you need extra leverage, hook the box end of a long combination wrench over the open end of an 18mm combination wrench, as shown here.



Step 26

With the bolt removed, slowly lower the jack until the spring tension is relieved.

(There isn't a lot of tension on the spring with the axles already hanging free, but be careful working around the spring anyway.)



Step 27

Transfer the rubber upper strut mount to the new coil. (Just pull it from the old spring and push it into the top coil of the new spring.

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Install the Rear Springs

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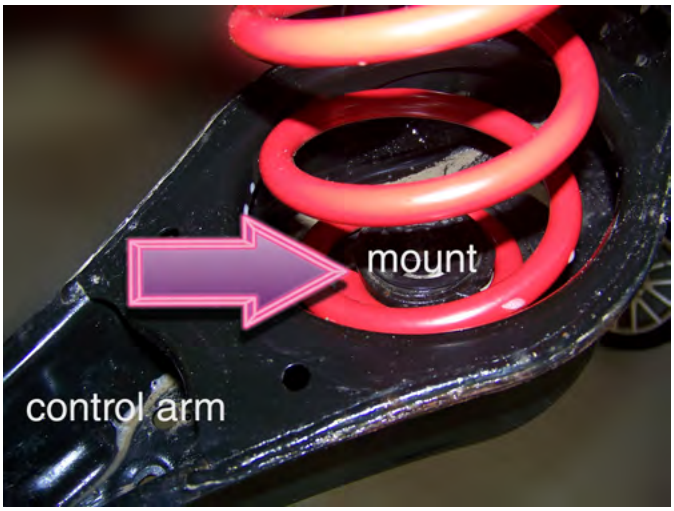
Step 28

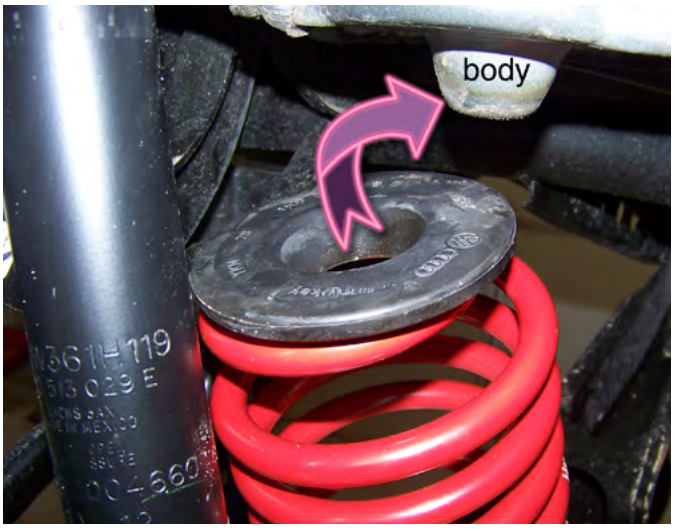
Install the new spring in the control arm. Place the lower coil over the raised circular center knob on the rubber spring mount (arrow).



Step 29

Tip the top of the new coil inward to center the upper rubber mount around the raised knob on the body.

With the spring aligned top and bottom, use the jack to raise the control arm until you can reinsert the bolt in the control arm and rear knuckle.



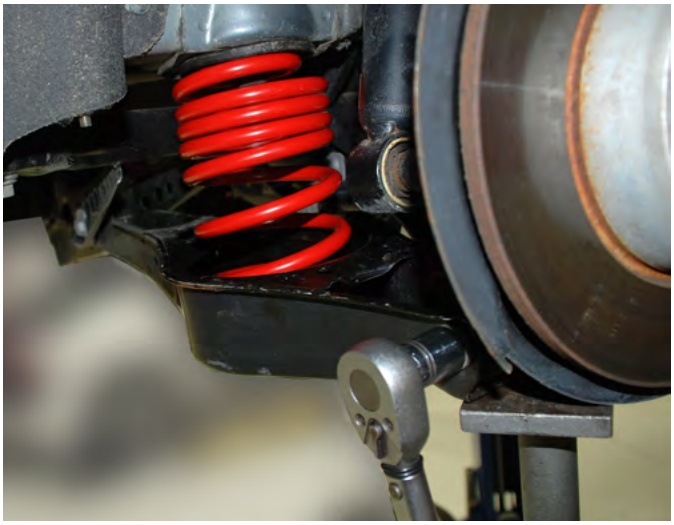
Step 30

Raise the control arm to its normal ride height, supporting the vehicle weight. Install a new control arm bolt and nut, and torque to 90Nm (66ft-lb) plus 90 degrees.

Note: Do not tighten the nut with the axle hanging.

Repeat these steps on the opposite side to install the other lowering spring.

This completes the H&R lowering spring installation.



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