



How to change front
suspension strut on
BMW E39 – replacement
guide

VIDEO TUTORIAL

** Important!**

This replacement procedure can be used for:

BMW 5 Saloon (E39) 520i 2.0, BMW 5 Saloon (E39) 525tds 2.5, BMW 5 Saloon (E39) 523i 2.5, BMW 5 Saloon (E39) 528i 2.8, BMW 5 Touring (E39) 520i 2.0, BMW 5 Touring (E39) 523i 2.5, BMW 5 Saloon (E39) 525td 2.5, BMW 5 Touring (E39) 528i 2.8, BMW 5 Saloon (E39) 530d 3.0, BMW 5 Touring (E39) 530d 3.0, BMW 5 Touring (E39) 525tds 2.5, BMW 5 Saloon (E39) 520d 2.0, BMW 5 Touring (E39) 520d 2.0, BMW 5 Saloon (E39) 525d 2.5, BMW 5 Touring (E39) 525d 2.5, (+ 6)

The steps may slightly vary depending on the car design.

REPLACEMENT: SUSPENSION STRUT – BMW E39.
TOOLS YOU NEED:



- Wire brush
- WD-40 spray
- Brake cleaner
- Copper grease
- Combination spanner #13
- Combination spanner #16
- Combination spanner #18
- Drive socket # 13
- Drive socket # 16
- Drive socket # 18
- Drive socket # 22
- HEX bit No.H6.
- HEX bit No.H7.
- Wheel impact socket #17
- Ratchet wrench
- Torque wrench
- Shock absorber socket
- Tap wrench
- Crow bar
- Ball joint puller
- Hydraulic strut spring compressor
- Hydraulic transmission jack
- Fender cover
- Wheel chock

BUY TOOLS

Replacement: suspension strut – BMW E39. Tip from AUTODOC experts:

- Both shock struts of the front suspension should be replaced simultaneously.
- The replacement procedure is identical for the left and right shock struts of the front suspension.
- All work should be done with the engine stopped.

REPLACEMENT: SUSPENSION STRUT – BMW E39. TAKE THE FOLLOWING STEPS:

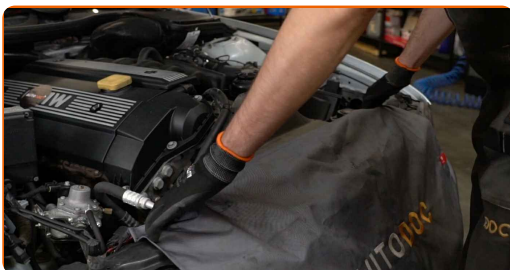
1

Open the bonnet.



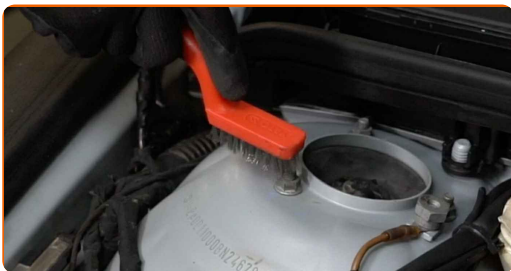
2

Use a fender protection cover to prevent damaging paintwork and plastic parts of the car.



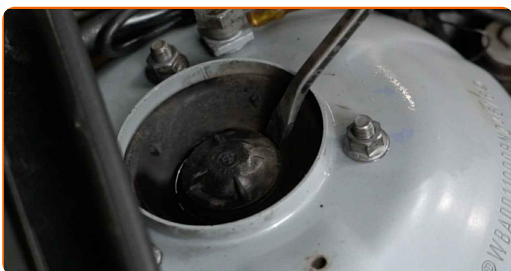
3

Clean the fasteners of the shock strut upper mount. Use a wire brush. Use WD-40 spray.



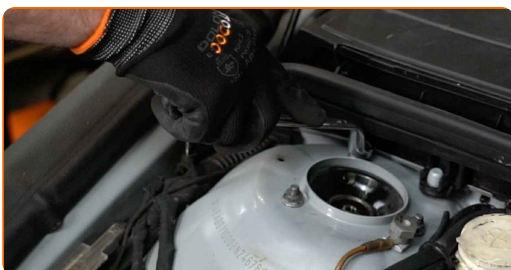
4

Remove the shock strut mount cap. Use a crowbar.



5

Loosen the upper fastener of the shock strut mount. Use a combination spanner #13.



6

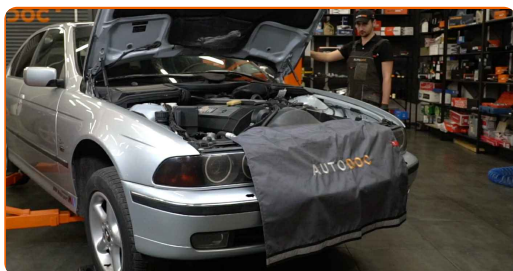
Secure the wheels with chocks.



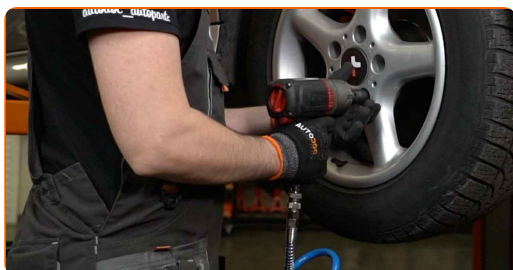
7 Loosen the wheel mounting bolts. Use wheel impact socket #17.



8 Raise the front of the car and secure on supports.



9 Unscrew the wheel bolts.



Replacement: suspension strut – BMW E39. Tip:

- To avoid injury, hold up the wheel when unscrewing the bolts.

10 Remove the wheel.

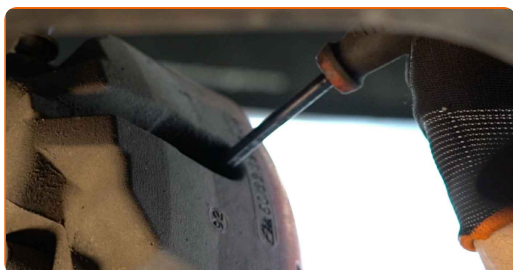
11 Clean the stabiliser link fasteners. Use a wire brush. Use WD-40 spray.



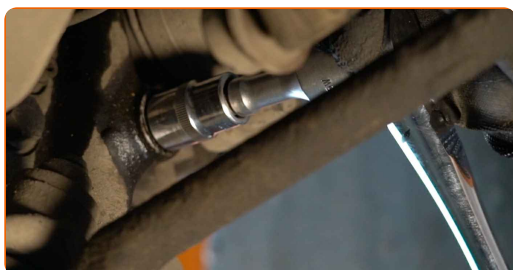
12 Clean the brake caliper bracket fasteners. Use a wire brush. Use WD-40 spray.



13 Spread the brake pads. Use a crowbar.



14 Unscrew the caliper bracket fastening. Use a drive socket #18. Use a tap wrench.



15

Remove the brake caliper together with its bracket. Use a crowbar.

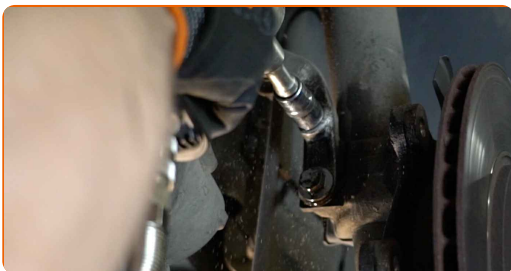


Replacement: suspension strut – BMW E39. AUTODOC recommends:

- Tie the caliper to the suspension or to the body with a wire without disconnecting from the brake hose to prevent depressurization of the brake system.
- Make sure that the brake caliper is not hanging on the brake hose.
- Don't press the brake pedal after the brake caliper has been removed. As a result, the piston can fall out from the brake cylinder, and brake fluid leakage and depressurization of the system may occur.

16

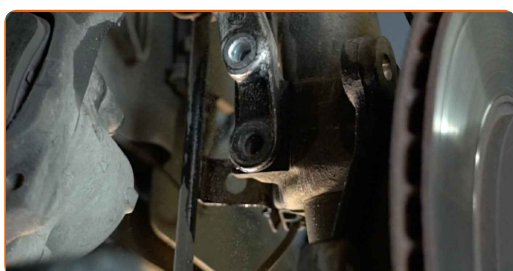
Unscrew the fastener connecting the stabilizer link to the shock strut. Use a drive socket #16. Use a ratchet wrench.



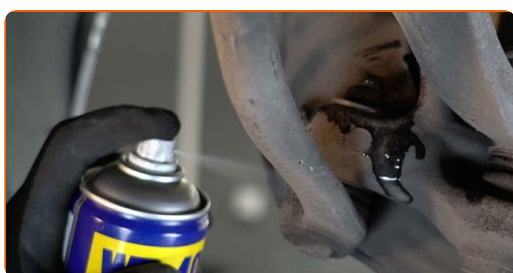
- 17 Unscrew the lower fastener connecting the shock strut to the steering knuckle. Use a combination spanner #18. Use a drive socket #16. Use a ratchet wrench.



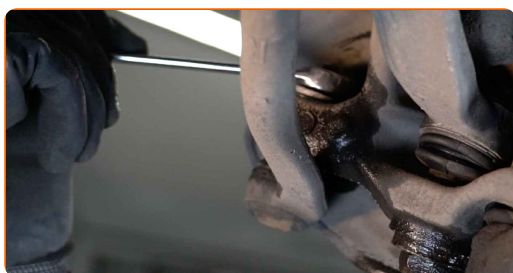
- 18 Remove the fastening bolts.



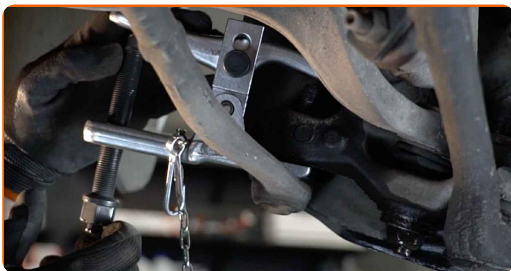
- 19 Clean the fastener connecting the tie rod end to the steering knuckle. Use a wire brush. Use WD-40 spray.



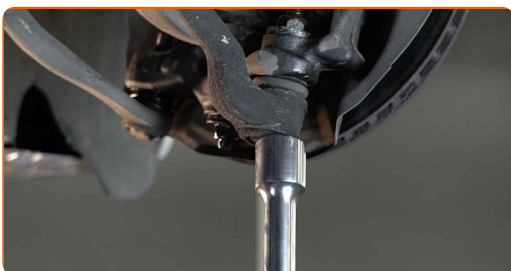
- 20 Unscrew the end fastening nut to the steering knuckle. Use a combination spanner #18.



21 Disconnect the tie rod end from the steering knuckle. Use a ball joint puller.



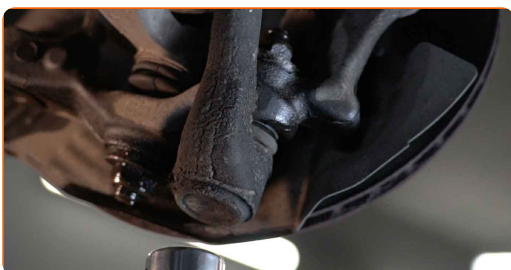
22 Support the arm. Use a hydraulic transmission jack.



23 Disconnect the tie rod end from the steering knuckle.



24 Remove the support from under the arm.



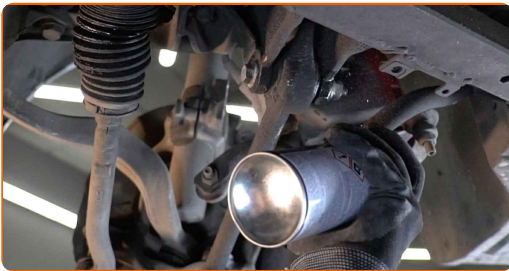
AUTODOC recommends:

- Replacement: suspension strut – BMW E39. Lower the transmission jack smoothly, without jerks, to avoid damaging components and mechanisms.

25 Disconnect the ABS sensor wiring.



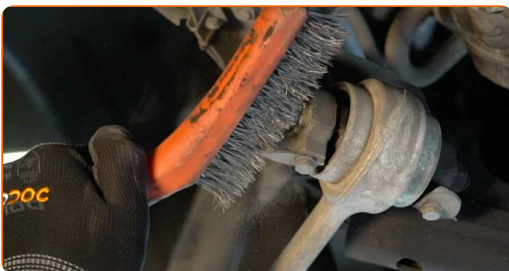
26 Clean all joints of the arm. Use a wire brush. Use WD-40 spray.



27 Remove the control arm cover.



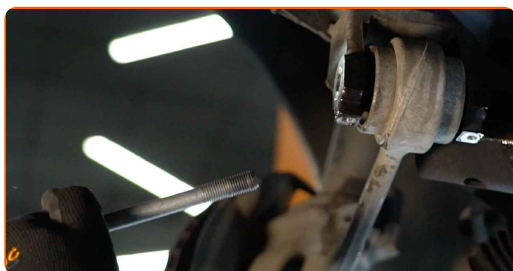
28 Clean all joints of the arm. Use a wire brush. Use WD-40 spray.



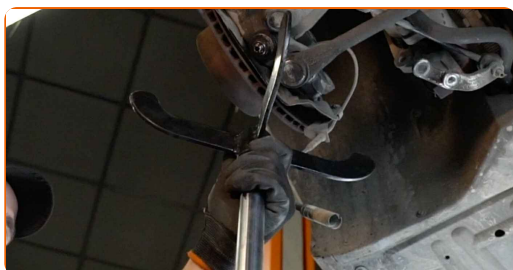
29 Unscrew the front arm fastener. Use a combination spanner #18. Use a drive socket #18. Use a ratchet wrench.



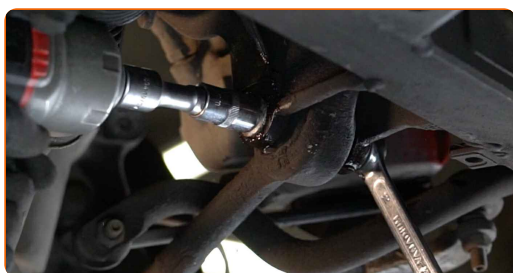
30 Remove the front fastener of the control arm.



31 Prop up the steering knuckle. Use a hydraulic transmission jack.



32 Unscrew the rear fastener connecting the control arm to the subframe. Use a combination spanner #16. Use a drive socket #18. Use a ratchet wrench.



33

Remove the rear fastener of the control arm.



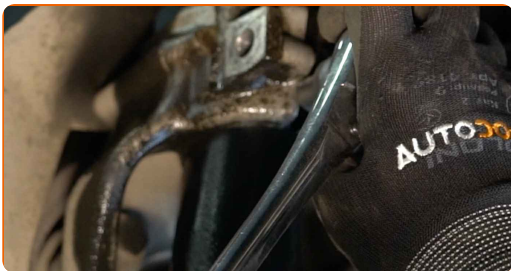
34

Clean the fasteners connecting the shock strut to the steering knuckle. Use a wire brush. Use WD-40 spray.



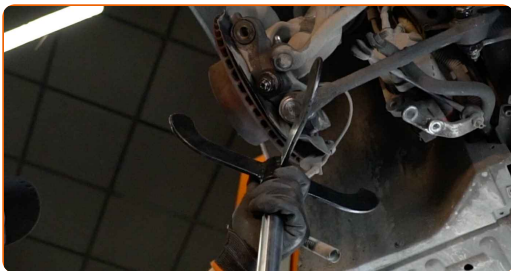
35

Release the lower fastener connecting the shock strut to the steering knuckle. Use a special drive socket to remove the shock absorber.



36

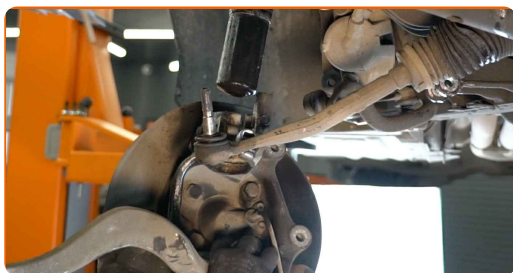
Remove the support from under the steering knuckle.



AUTODOC recommends:

- BMW E39 – Do not lower the transmission jack sharply to avoid damaging components and mechanisms of the car.

37 Disconnect the steering knuckle from the shock absorber strut.

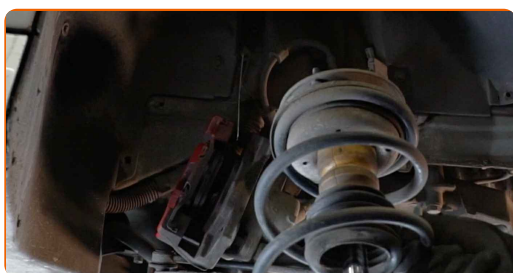


38 Unscrew the top fastening of the shock strut mount.

Replacement: suspension strut – BMW E39. Tip from AUTODOC:

- To avoid injuries, hold the shock strut when undoing the fastening bolts.

39 Remove the suspension strut.



40 Set the shock absorber strut on the spring compressor tool.

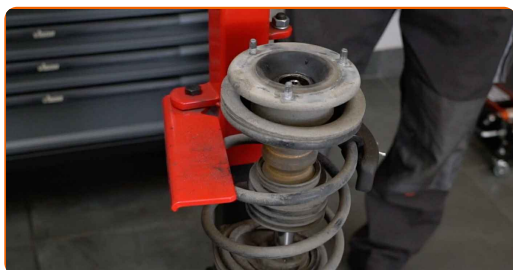


Replacement: suspension strut – BMW E39. Tip from AUTODOC experts:

- Note that when using a spring compressor, spring coils need to be securely gripped, compressing the spring on the opposite sides.
- Ensure the correct position of the spring in the retainer.
- Make sure that the spring coils tightly entered the lock handles.

41

Compress the spring.



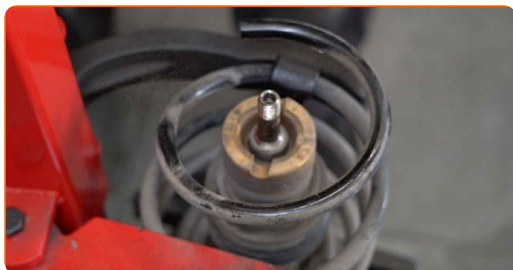
42

Remove the strut piston rod nut. Use a drive socket #22. Use HEX No.H7. Use a ratchet wrench.

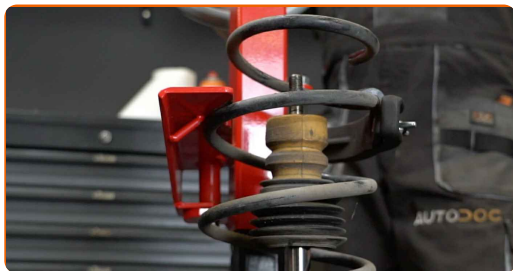


43

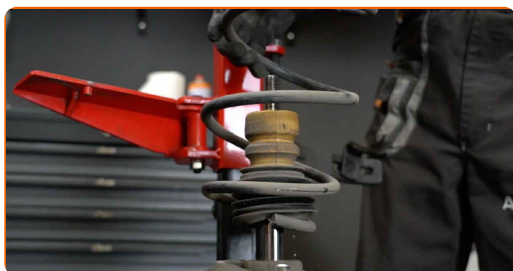
Remove the top strut mount.



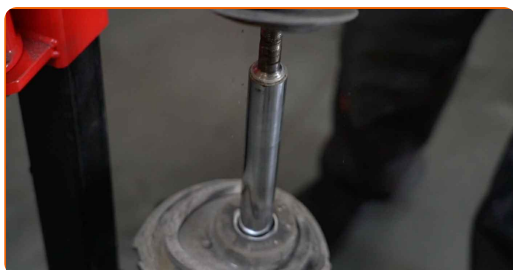
44 Release the coil spring.



45 Remove the spring.



46 Remove the shock absorber dust cap and the bump stop.



Replacement: suspension strut – BMW E39. AUTODOC experts recommend:

- Thoroughly examine the shock absorber mount, dust boot, bump stop. Replace them if necessary.

47 Remove the old shock absorber from the hydraulic coil spring compressor.

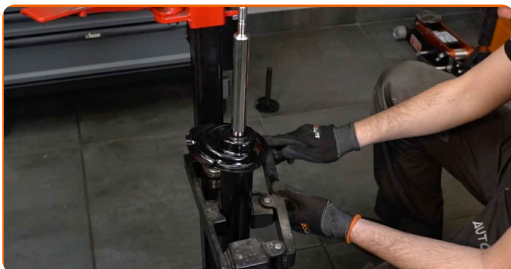


Replacement: suspension strut – BMW E39. AUTODOC recommends:

- Before installing a new shock absorber you should pump it manually 3-5 times.

48

Install the new shock absorber on the hydraulic coil spring compressor.



49

Install the dust sleeve and the bump stop on the new shock absorber.



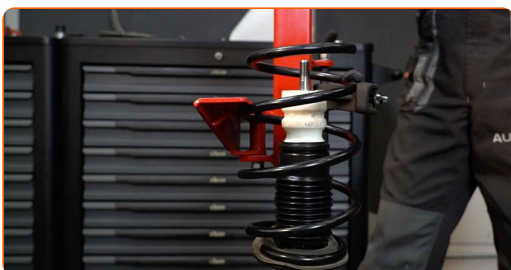
50

Install the spring on the shock absorber.

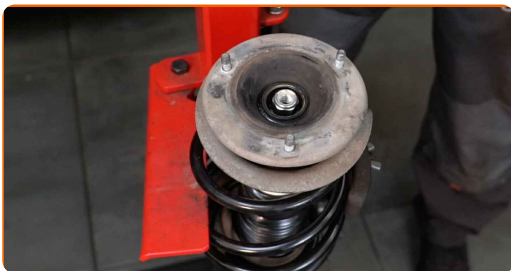


51

Compress the spring.



52 Install the upper strut mount and the strut mount bearing.



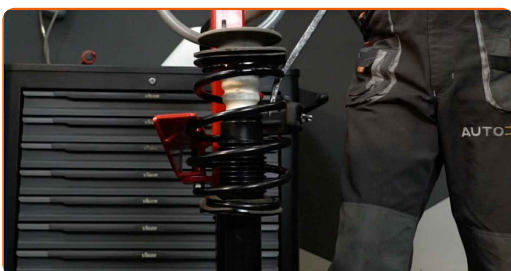
53 Tighten the shock strut piston rod nut. Use a drive socket #22. Use HEX No.H6. Use a torque wrench. Tighten it to 64 Nm torque.



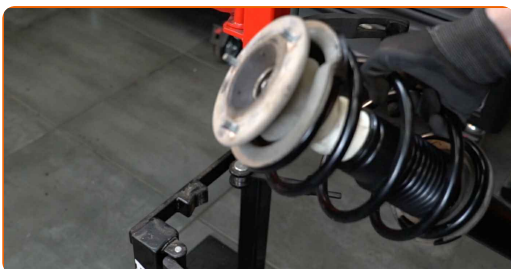
AUTODOC recommends:

- Check to make sure the spring is positioned correctly. Avoid its misalignment.

54 Decompress the spring.



55 Remove the assembled shock strut.



56 Install the shock strut into the wheel arch.

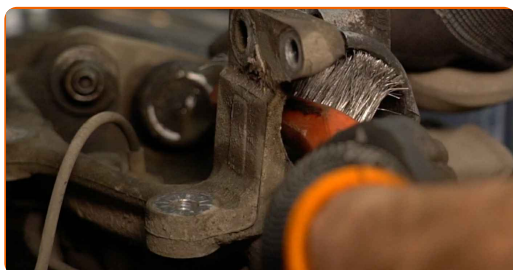


57 Screw the top fastening of the shock strut mount. Do not tighten it.

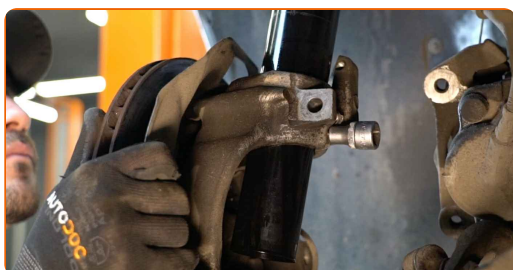
AUTODOC recommends:

- BMW E39 – To avoid injury, hold the suspension strut while screwing in the fastening bolts.

58 Treat the shock strut mounting seat on the steering knuckle. Use a wire brush. Use WD-40 spray.

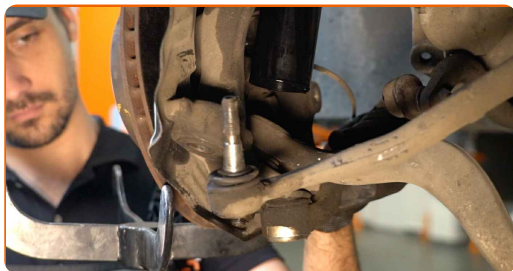


59 Fix the shock absorber strut on the steering knuckle.



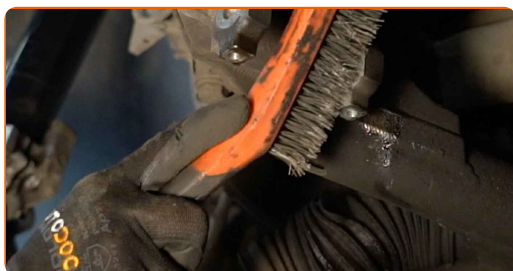
60

Prop up the steering knuckle. Use a hydraulic transmission jack.



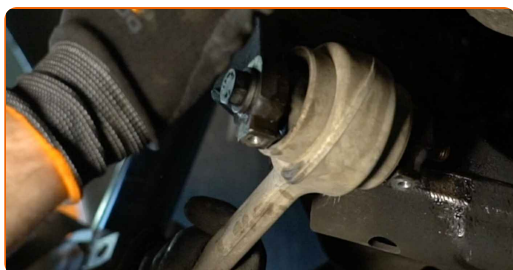
61

Clean the mounting seats and the thread of the suspension arm. Use a wire brush. Use WD-40 spray.



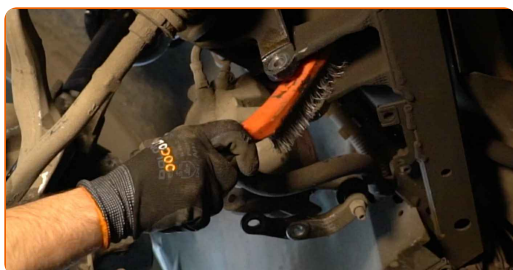
62

Install the front fastener of the arm.



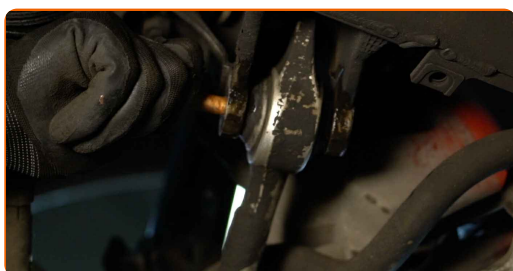
63

Clean the mounting seats and the thread of the suspension arm. Use a wire brush. Use WD-40 spray.

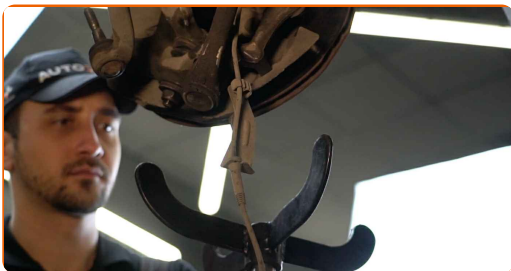


64

Install the rear fastener of the control arm.



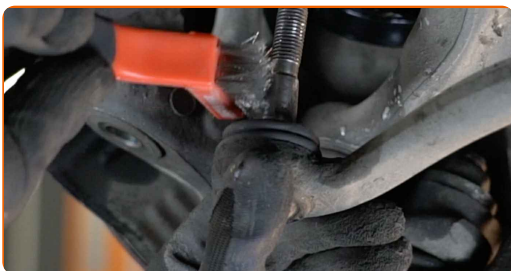
65 Remove the support from under the steering knuckle.



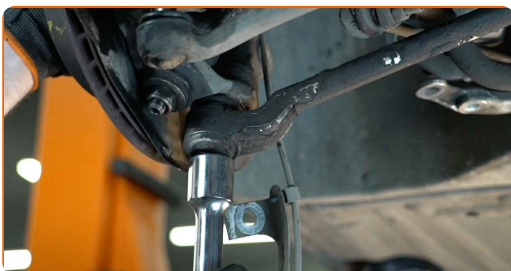
Replacement: suspension strut – BMW E39. Tip from AUTODOC:

- Lower the hydraulic transmission jack smoothly, without jerks, to avoid damaging assemblies and mechanisms.

66 Clean the mounting seats of the tie rod end. Use a wire brush. Use WD-40 spray.



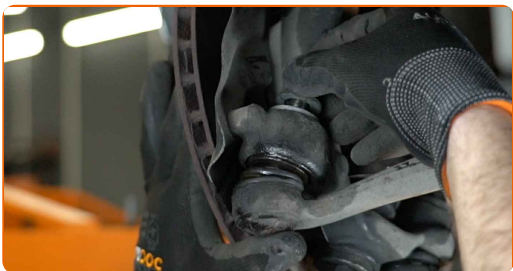
67 Support the arm. Use a hydraulic transmission jack.



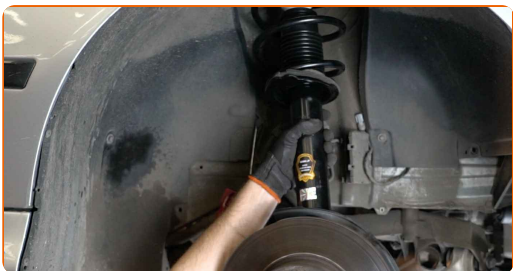
68 Connect the tie rod end to the steering knuckle.



69 Screw on the fastening nut that connects the tie rod end to the steering knuckle. Use a combination spanner #18.



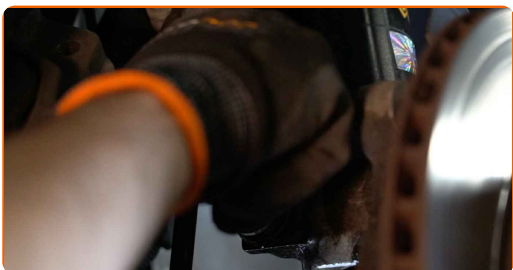
70 Install the shock absorber mount using the center hole as a guide.



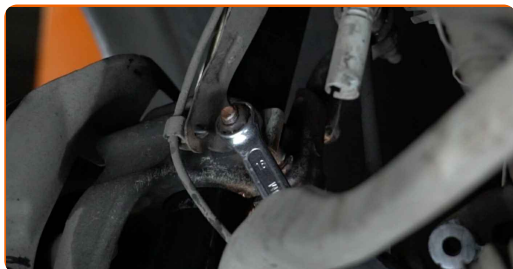
71 Clean the mounting seats of the stabiliser link. Use a wire brush. Use WD-40 spray.



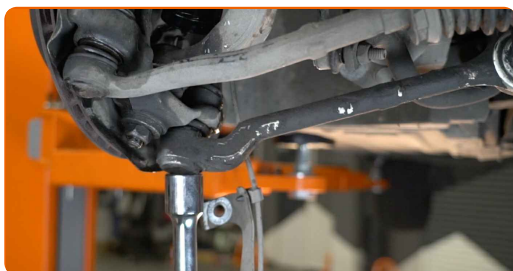
72 Install the fastening bolts.



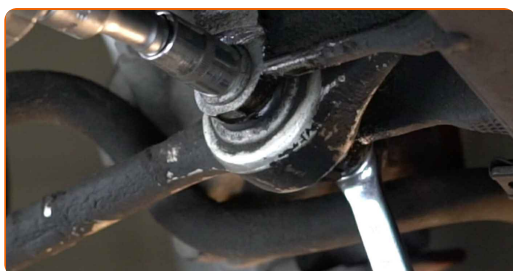
73 Screw in the fastener that connects the shock strut to the steering knuckle.



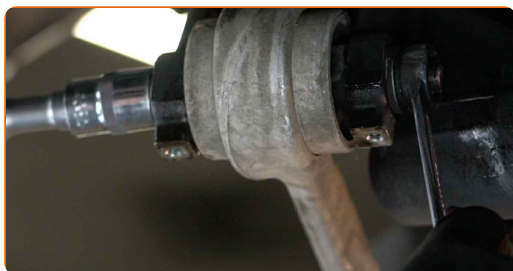
74 Raise the hydraulic transmission jack by 10-15 cm.



75 Screw the rear fastener connecting the control arm to the subframe. Use a combination spanner #16. Use a drive socket #18. Use a ratchet wrench.



76 Screw the front arm fastener. Use a combination spanner #18. Use a drive socket #18. Use a ratchet wrench.



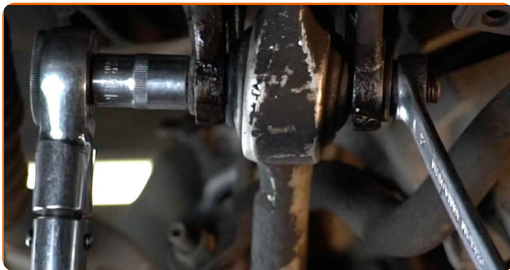
77

Tighten the front fastener connecting the control arm to the subframe. Use a combination spanner #18. Use a drive socket #18. Use a torque wrench. Tighten it to 110 Nm torque.



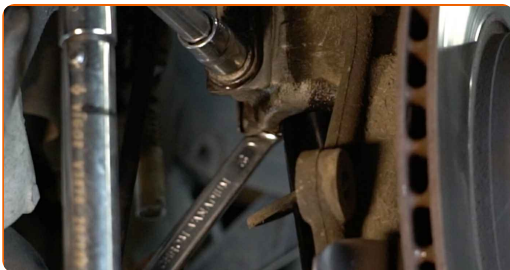
78

Tighten the rear fastener connecting the arm to the body subframe. Use a combination spanner #16. Use a drive socket #18. Use a torque wrench. Tighten it to 110 nm torque.



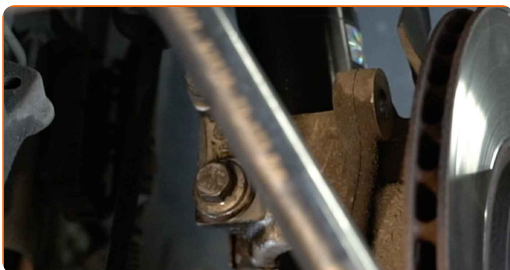
79

Tighten the lower fasteners connecting the shock strut to the steering knuckle. Use a combination spanner #18. Use a drive socket #16. Use a torque wrench. Tighten it to 81 Nm torque.



80

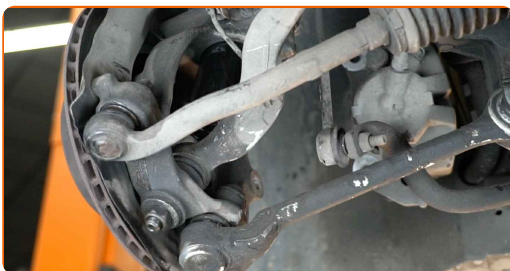
Tighten the fastener connecting the stabilizer link to the shock strut. Use a drive socket #16. Use a torque wrench. Tighten it to 65 Nm torque.



- 81** Tighten the fastening nut connecting the tie rod end to the steering knuckle. Use a drive socket #18. Use a torque wrench. Tighten it to 65 nm torque.



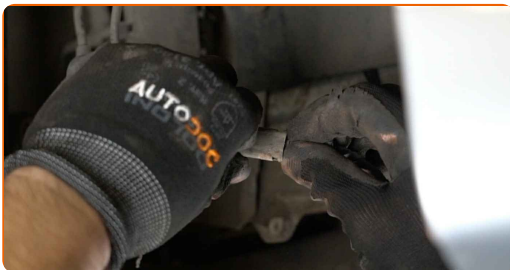
- 82** Remove the support from under the arm.



AUTODOC recommends:

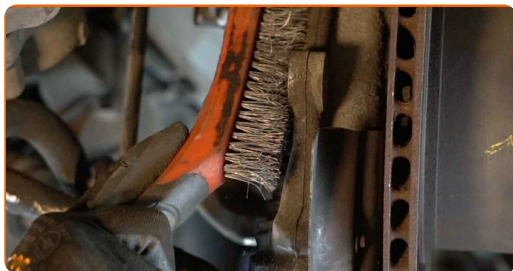
- BMW E39 – Do not lower the transmission jack sharply to avoid damaging components and mechanisms of the car.

- 83** Connect the ABS sensor wiring.



84

Clean the mounting seats of the caliper and its bracket. Use a wire brush. Use a brake cleaner.



AUTODOC recommends:

- Replacement: suspension strut – BMW E39. After applying the spray, wait a few minutes.

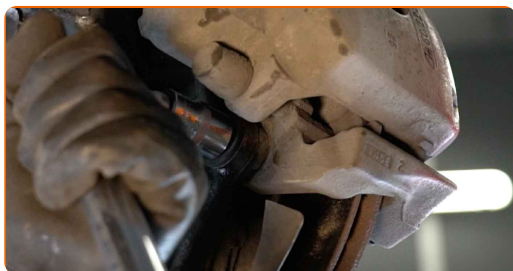
85

Install the brake caliper together with its bracket.



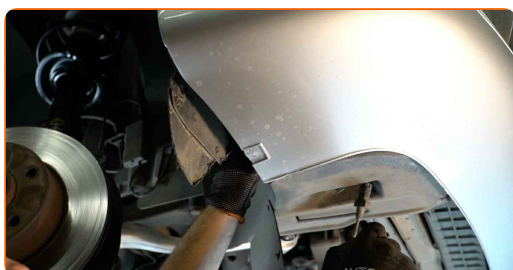
86

Tighten the brake caliper bracket. Use a drive socket #18. Use a torque wrench. Tighten it to 110 Nm torque.

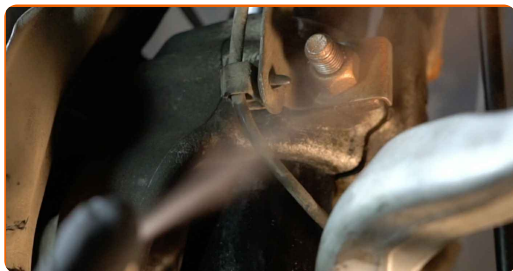


87

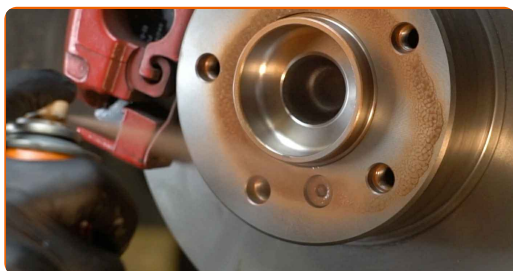
Install the control arm cover.



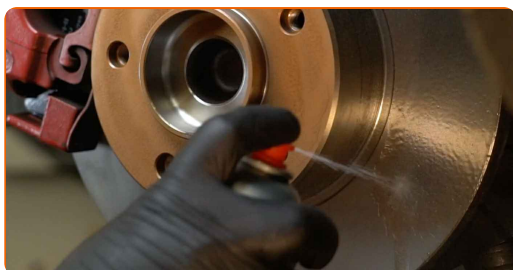
88 Treat all joints of the arm. Treat the shock strut fasteners. Use copper grease.



89 Treat the surface where the brake disc contacts the wheel rim. Use copper grease.



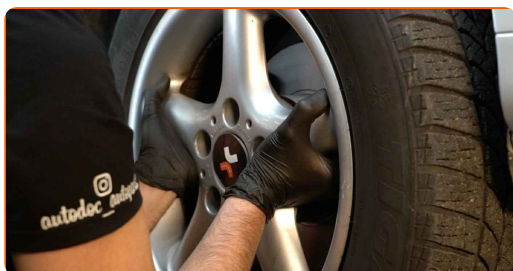
90 Clean the brake disk surface. Use a brake cleaner.



Replacement: suspension strut – BMW E39. AUTODOC recommends:

- After applying the spray, wait a few minutes.

91 Install the wheel.



AUTODOC recommends:

- Important! Hold the wheel while screwing in the fastening bolts. BMW E39

92

Screw in the wheel bolts. Use wheel impact socket #17.



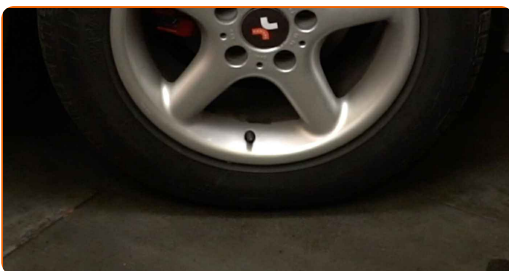
93

Lower the car and working in a cross order, tighten the wheel bolts. Use wheel impact socket #17. Use a torque wrench. Tighten it to 120 Nm torque.



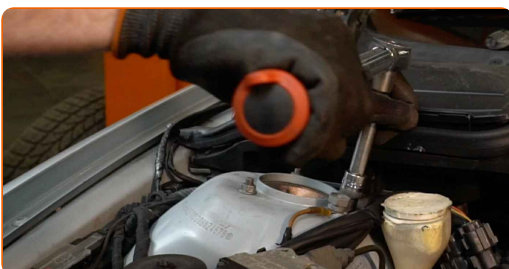
94

Remove the jacks and chocks.



95

Tighten the upper fastener of the shock absorber strut mount. Use a drive socket #13. Use a torque wrench. Tighten it to 24 Nm torque.



96 Treat the fasteners of the shock strut mount. Use copper grease.



97 Install the shock strut mount cap.



98 Remove the fender protection cover.



99 Close the hood.



AUTODOC recommends:

- BMW E39 – Without starting the engine, press the brake pedal several times until it feels firm.

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