Product:

Variable Height Spring

Part Numbers:

415-503001-N

Applications:

BMW F8x, M2/M3/M4 2014-17

Contents in the box:

Qty	Part #	Description
1	00P-0A1646-B	Front Passenger Sleeve Assembly
1	00P-0A1645-N	Front Driver Sleeve Assembly
2	00P-0P2485-B	Front Spring
2	00P-0P2413-A	End Link Cone Adapter
2	00P-0A1692-N	Rear Spring & Adjuster Assembly
1	00P-0P1493-A	Spring Perch Tool
2	00P-0C1193A	620 Retaining Compound 0.5mL

Difficulty of Installation: **Beginner** |----------x----------| **Advanced**
Reason: This is a fairly straight forward installation that does require some automotive skill, and adequate tool availability.
Expected Installation Time: 4-6 Hours

Recommended Tools:

- 16mm box end
- 13mm thin wall socket
- 13 mm deep socket
- 8, 10, 13, 15, 16, 17, 18 mm sockets
- 3/8" drive ratchet
- 3/8" drive extension
- Allen Wrench Set
- Complete Male & Female Metric Torx Socket Set
- ¾ box end wrench
- 3/8" drive Torque Wrench
- 2 Post Lift and Screw Jack (preferred)
- Hydraulic Press

This procedure is best performed on a vehicle lift by qualified mechanics, however it is possible to install these sway bars using a floor jack and jack however it is not recommended.

Front OEM Strut Removal

1. Using proper jacking points, lift and support the front of the car on jack stands.
2. Using a 17mm socket remove the front wheels.
3. Unbolt the sway bar end links from OEM Strut using a 16mm wrench and T-30 torx socket. If the vehicle is equipped with ride height sensors, disconnect the sensor from the driver's side control arm.

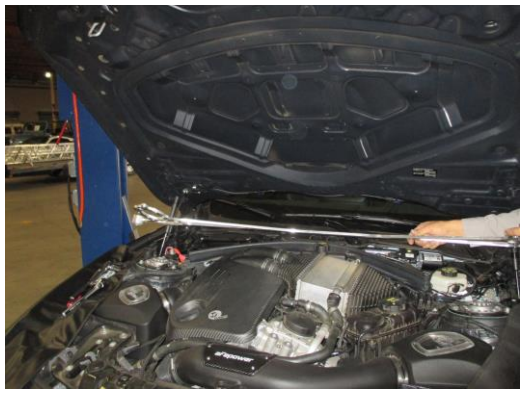
4. Position a screw, or floor jack under the front control arm to hold in place.
5. Using a 16 mm socket and wrench, remove the pinch bolt that holds the OEM strut into the upright. Slowly lower the jack and slide strut free from upright. You might need to use a pry bar to open up the split in the upright.
6. Move to the engine compartment. You will start by removing the plastic cowl cover by removing the plastic clips and 10 mm bolts.

7. Remove the (2) 10 mm bolt that holds the coolant reservoir.


8. Remove the Carbon fiber strut brace by removing the (8) 13 mm bolts, and carefully remove from vehicle.

9. Using a E-12 socket, remove the (10) bolts that hold the aluminum strut brace to the chassis. There are an additional (2) T-50 torx bolts that need removed.


10. Remove the two plastic cowl caps to gain access to the remaining (2) 16 mm bolts holding the brace to the vehicle. Carefully remove aluminum brace from vehicle.

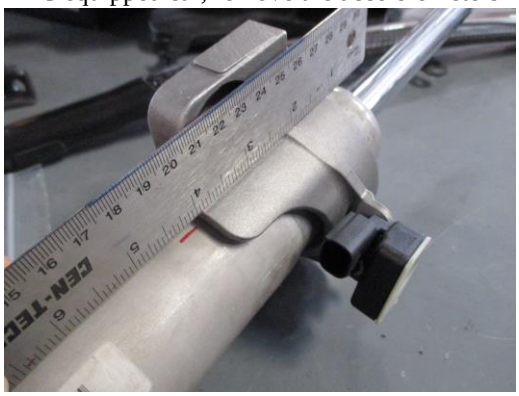


11. If the vehicle is equipped with Selective ride you will need to disconnect the connector before removing the OEM strut. The connector will pull straight up and out of the shock, after peeling back the boot.

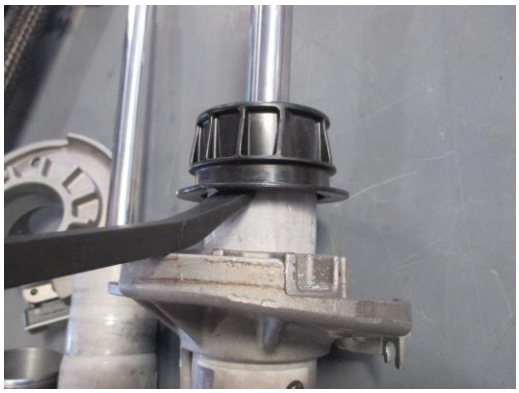
12. Using a 13 mm socket, remove the (3) bolts that hold the strut housing into the vehicle. Be careful to use a helper to hold the strut from the bottom of the car.

13. Using a strut compressor, remove the factory springs from the strut, by removing the top nut, using a 18mm ½" drive **12 point socket** and a impact gun

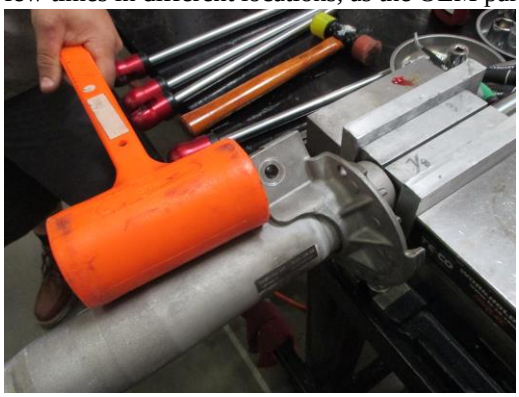
After removing the spring from the strut, **use a straight edge and a marker to mark the position of the end-link bracket on the strut. You will use this later to line up the VHS sleeve.** If a EDC equipped car, remove the accelerometers from the factory strut. Save for later use.



14. Place the strut in a vise. To avoid damage, it is highly recommended you use soft jaws, or a rag to avoid damage to the aluminum strut tube. Using a pry bar, pry off the plastic dust cover from the OEM strut.

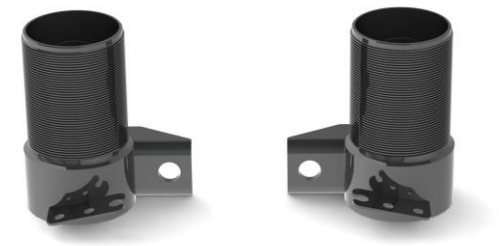


15. Using a rubber mallet, knock the OEM spring seat off the strut. It might be necessary to hit it a few times in different locations, as the OEM part has a bonding agent applied.



Front aFe Control VHS Sleeve Installation

1. Locate the Variable Height Sleeve (VHS) that I appropriate to the side of the vehicle you are working on.



2. Apply .05mL of Loctite 620 retaining compound around the surface of the strut, just prior to sliding the sleeve all the way down. You should apply a bead around the circumference of the strut.

3. Taking care to line up the sway bar bracket with the mark you made on the strut, slide the VHS sleeve down over the strut until it stops on the taper.

4. Using a Arbor, or Hydraulic press, press the VHS sleeve onto the OEM strut until it is tightly seated.

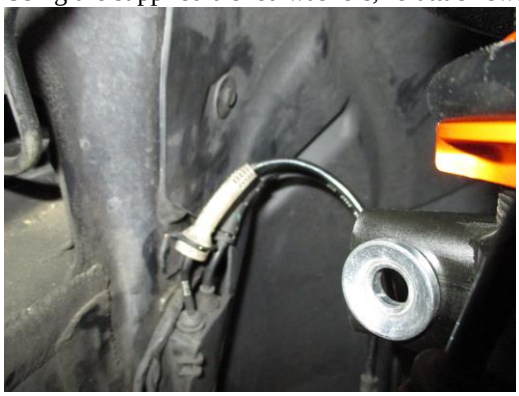
5. The sleeve is fully seated when it is almost level with the top of the strut.

6. Using a strut compressor install the stock upper spring mount, rubber isolator, and bearing onto the new assembly using the supplied P2485 spring.

7. Using a 18 mm ½" drive **12 point** socket, tighten the top nut while still in strut compressor by using a impact driver.

8. Locate the correct strut for side you are installing, by looking at the position of the sway bar end link bracket. The correct position would place the accelerometer bracket towards the front of the vehicle.
9. Slide the strut tube into the upright, note there is a pin in the housing that will go into the slot in the upright. Install the new strut assembly into the vehicle by lifting into place, and positioning the upper mount to the body. Note there are positioning pins to pilot into the body. Having a helper on hand, reinstall the (3) upper bolts using a 13mm socket. Torque to 25 lb-ft. Using a floor or screw jack, raise the lower control arm until the upright bottoms on the tapered stop on the strut tube. If too tight, use a pry bar to slightly pry the split open further.

10. Torque pinch bolts to 20 lb-ft using a 16 mm socket.
11. Using the supplied dished washers, re-attach sway bar end link and torque to 25 lb-ft



12. Re-attach any brake line clips, and electrical connectors, that were moved during installation.
13. If the vehicle was equipped with EDC, reattach the accelerometers using the supplied 6mm nut and re-connect the EDC wiring into the top of the strut now.

14. Move to other side of vehicle and repeat process. Reinstall the front wheels using a 17mm socket and torque to 90 lb-ft.
15. **Before driving vehicle it would be best practice to allow 16-24 hours for the retaining compound to fully cure.**
16. Using a E-12 socket, reinstall the (10) bolts that hold the aluminum strut brace to the chassis. There are an additional (2) T-50 torx bolts that need reinstalled under the cowl cover. Reinstall plastic caps.

17. Reinstall the Carbon fiber strut brace by reinstalling the (8) 13 mm bolts.

18. Reinstall the (2) 10 mm bolt that holds the coolant reservoir.


19. Reinstall the plastic cowl cover by reinstalling the plastic clips and 10 mm bolts.

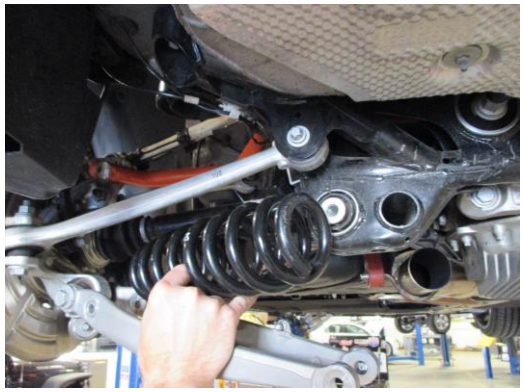
Rear OEM Spring Removal

1. Using proper jacking points, lift and support the rear of the car on jack stands.
2. Using a 17mm socket remove the wheels.
3. Unbolt the sway bar end links from the sway bar using a 16mm wrench and T-30 torx socket.

4. Disconnect the ride height sensor located on the driver's side lower rear control arm.

5. Using either a floor jack, or a trans jack, support the lower control arm.
6. Remove the rear shock mount bolts using a 18 mm socket and wrench.

7. On selective ride models, disconnect the wires to the accelerometer and the wires that attach the top of the shock to the chassis.
8. Using a E12 socket, remove the (3) bolts that hold the upper aluminum shock mount. Remove the shock assembly from the vehicle.
9. Using a 21 mm wrench and socket, remove the bolt holding the lower control arm at the sub frame. Slowly lower the control arm to release tension on the OEM springs, and remove spring from vehicle.



Rear coil spring & adjuster installation

1. Start by removing the upper spring seat from the chassis of the vehicle. This can be done by using a flat blade screw driver and mallet.


2. Next install the coil spring adjuster and rear spring. The adjuster will press into the upper chassis mount, and be held in by a loose press fit, and the tension of the spring.


3. Be careful to properly index the spring in the lower mount.

4. Using a screw, or floor jack, raise the lower control arm into position, and align the bushing to the sub frame. Using a 21 mm socket, and open wrench, torque bolts to 56 ft-lbs
5. Reinstall the OEM shock absorber, and Reinstall the ride height sensor, and any other connectors that might have been disconnected.
6. Re-attach the end links to the sway bar and torque to 25 lb-ft.
7. Reinstall the rear wheels using a 17mm socket and torque to 90 lb-ft.

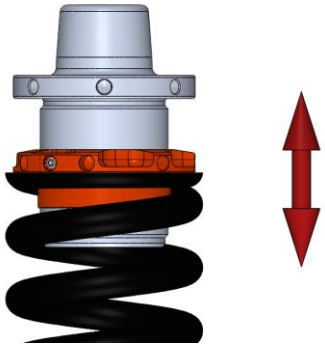
Ride Height Adjustment:

Loosen the small Allen head screw in the spring perch before attempting to change ride height, and tighten by hand after ride height changes have been completed. **(Note: The allen uses a small plastic ball to protect the threads, do not overtighten, hand tight with tool is sufficient)**

Set the car to your desired ride heights by adjusting the spring perches with the supplied spring perch tool.

For the **Front** shocks threading the spring perch **UP** the threaded coilover body will **RAISE** the car, threading it **DOWN** will **LOWER** the car.

For the **Rear** threading the spring perch **UP** the body of the rear adjuster will **LOWER** the car, threading the perch **DOWN** the body will **RAISE** the car.



aFe Control recommends a final ride height at the fender arch of:
Front: 24.5”
Rear: 24.75”

This measurement should be taken from the ground to the fender lip. The BMW F80 suspension is pretty effective at a wide range of ride heights. We suggest setting up the car where you are happy with the visual stance, and that the car is still functional with the streets in your area.

Front: 7 turns = 1/2" change to ride height
Rear: 3.7 turns = 1/2" change to ride height

After making ride height adjustments be sure to either roll the vehicle or take a short drive to allow the vehicle to settle at its new ride height.

When the ride height is set, take the vehicle to alignment shop for a proper alignment.

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