

**Thank you for purchasing your new SOLO WERKS S1 Coilover suspension.**

**IMPORTANT PLEASE READ BEFORE BEGINNING INSTALLATION:**

Please take a moment to review this installation process and verify that your kit is complete and all components have been received. If there are any questions during the process, contact us directly.

SOLO WERKS recommends that you have this kit installed by a qualified professional. Solo Werks or its authorized agents are not responsible for damage or failure resulting from an improper or modified installation. Do not use a pneumatic impact gun to torque the upper strut nut as damage may occur.

All suspension related components must be inspected and in good working condition. You should inspect all bushings, tie rods, hubs, bearings, strut mounts, sway bar end links, wheels, tires, etc. and replace if necessary.

This suspension system was designed to work best with the factory wheel/tire combination. Any deviations from these specifications could result in significantly altered handling characteristics and/or increased interference risk to other vehicle components.

**SOLO WERKS TIP: Depending on the offset & size your wheels/tires, wheel spacers may be required for proper fitment.**

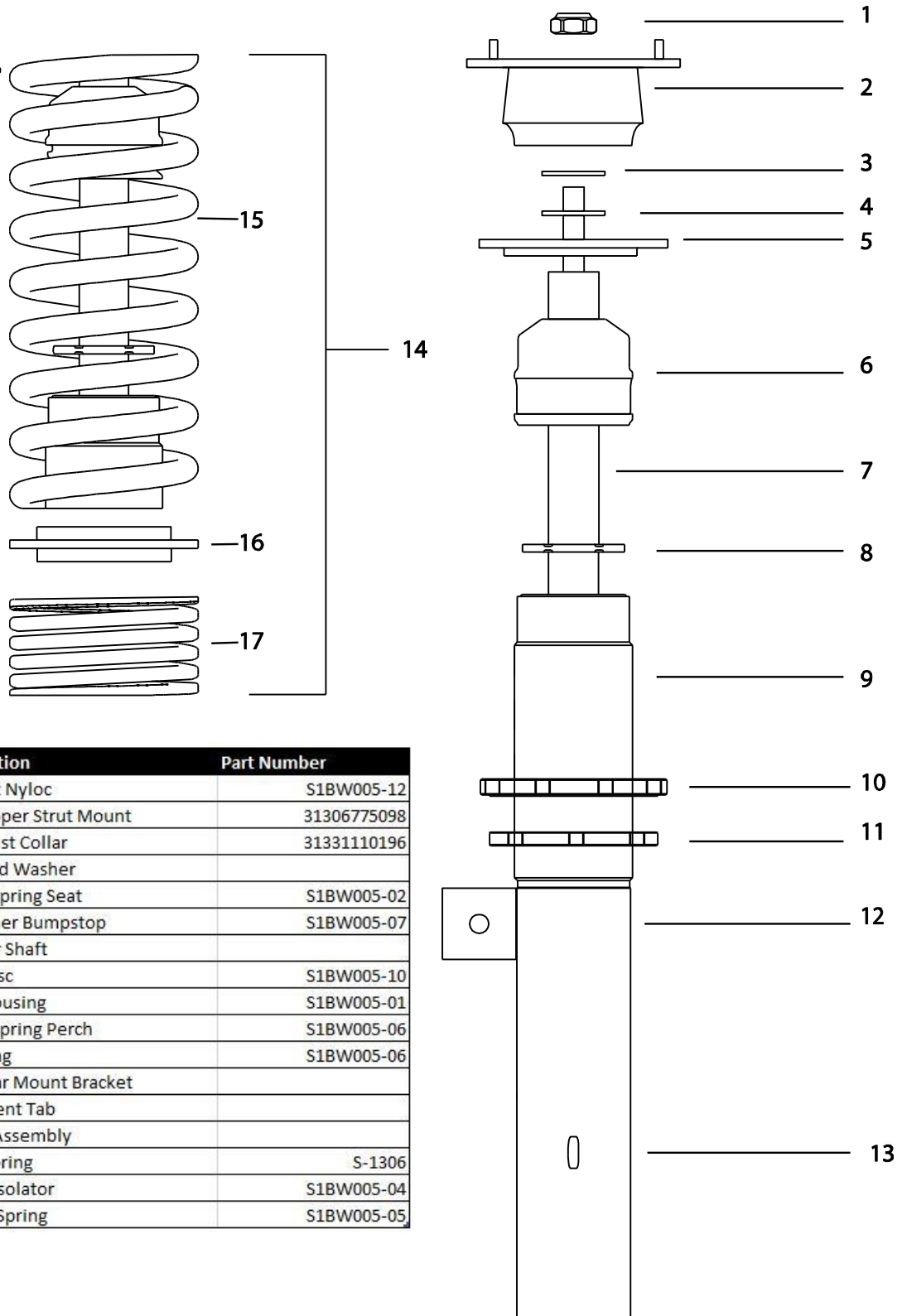
If suspension is lowered past the recommended measurements there can be possible interference with multiple vehicle components; (i.e. modification may be necessary to fender lips, seams etc...). This will also void your Solo Werks warranty.

After installing the suspension system, a four wheel alignment must be performed according to manufacturer's specifications. Check and reset load- dependent brake compensator, ABS system and headlight aim according to manufacturer's specifications (If applicable).

ALL RUBBER- MOUNTED STRUT/ DAMPER ATTACH-MENTS MUST NOT BE FULLY TIGHTENED UNTIL AFTER THE SUSPENSION SYSTEM IS LOADED (WHEELS ON THE GROUND). OTHER MOUNTING FASTENERS (FOR EXAMPLE BRACKETS) MUST BE SECURELY TIGHTENED BEFORE LOAD IS PLACED ON THE SUSPENSION SYSTEM

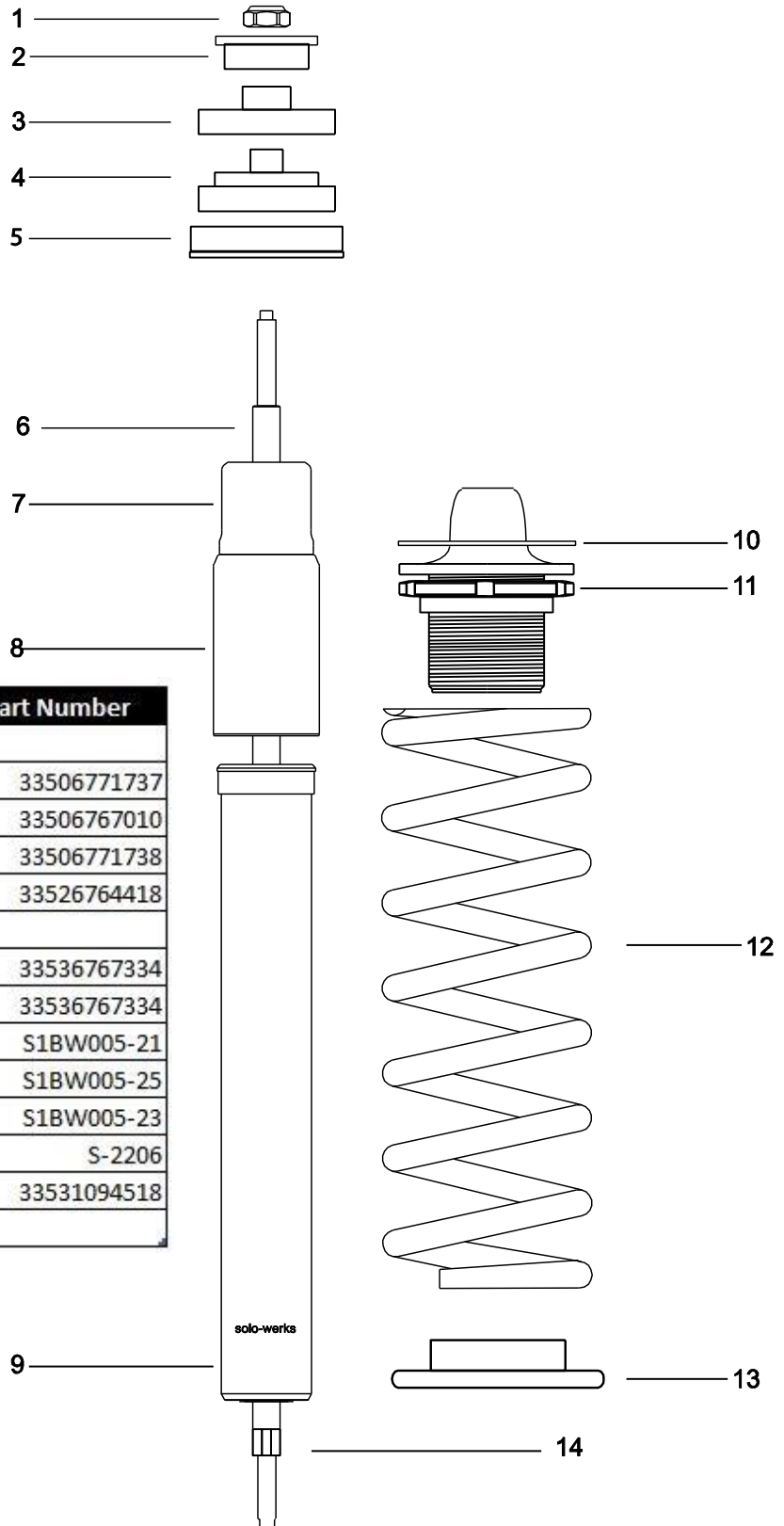
Every effort has been made to avoid printing errors in our literature. However, if there are any application or specification errors or omissions we must disclaim responsibility.

**Fig. 1**



#	Description	Part Number
1	Top Nut Nyloc	S1BW005-12
2	OEM Upper Strut Mount	31306775098
3	OEM Dust Collar	31331110196
4	Supplied Washer	
5	Upper Spring Seat	S1BW005-02
6	Elastomer Bumpstop	S1BW005-07
7	Damper Shaft	
8	Vent Disc	S1BW005-10
9	Strut Housing	S1BW005-01
10	Lower Spring Perch	S1BW005-06
11	Lock Ring	S1BW005-06
12	Sway Bar Mount Bracket	
13	Alignment Tab	
14	Spring Assembly	
15	Main Spring	S-1306
16	Spring Isolator	S1BW005-04
17	Helper Spring	S1BW005-05

**Fig. 2**



#	Description	Part Number
1	Top Nut Nyloc	
2	OEM Guide support, upper part	33506771737
3	OEM Sealing grommet	33506767010
4	OEM Guide support, lower part	33506771738
5	OEM SUPPORTING CUP	33526764418
6	Damper Shaft	
7	OEM BUmpStop	33536767334
8	OEM Dust Shield	33536767334
9	Damper Housing	S1BW005-21
10	Spring Perch Isolator	S1BW005-25
11	Rear Adjustable Spring Perch	S1BW005-23
12	Rear Spring	S-2206
13	Oem Spring Pad	33531094518
14	Lower Shock Mount	

## Original Suspension Removal

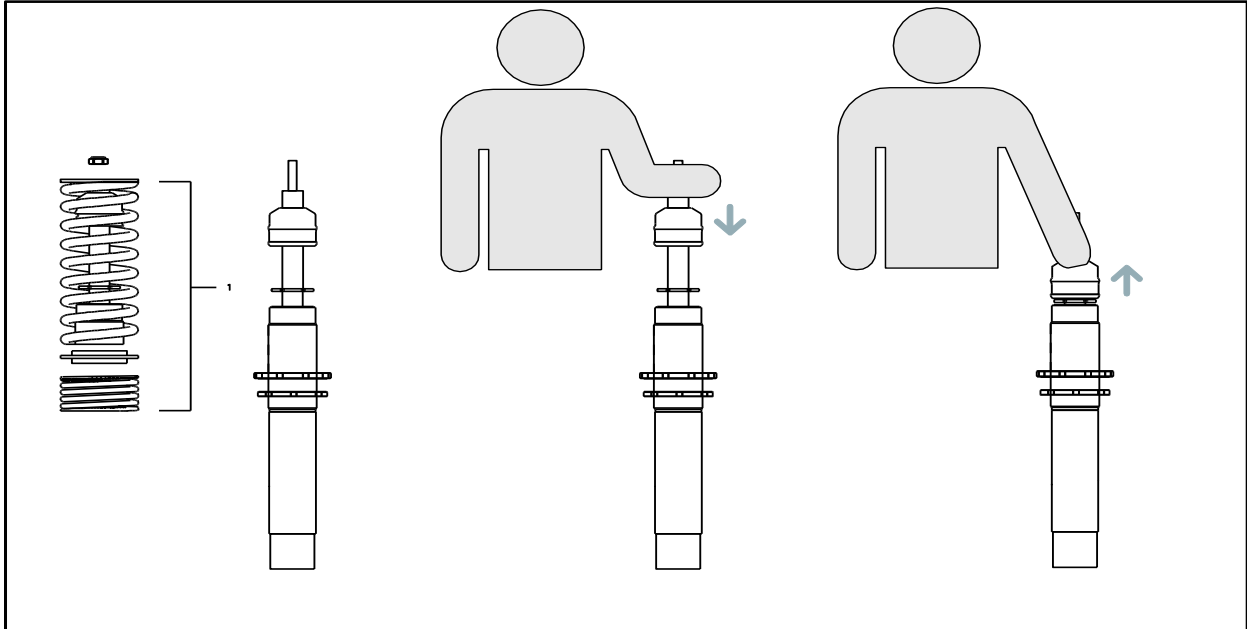
### Front

1. Support Lower Control Arm/Spindle
2. Remove OEM front inner fender liner (To allow access to lower control arm)
3. Remove any OEM lines/brackets from original suspension strut mounts
4. Remove sway bar end link from strut housing and sway bar
5. Unclip Headlight leveling sensor from LCA
6. Loosen (but do not remove) LCA bolts at chassis
7. Support strut from inside wheel well
8. Remove three (3) upper strut mount nuts (Fig.1 #2)
9. While pushing downwards on the suspension, walk the top portion of the strut out of the fenderwell before trying to remove OEM strut. (Taking caution not to scratch fender with the upper mount)
10. Remove Lower spindle (Pinch) Bolt from spindle
11. Using Strut Spreader Tool, spread spindle mount
12. Separate strut from spindle. (Fig.1 #13)
  - a. Ensure that the lower control arm is still supported
  - b. This may require work to separate as corrosion may limit movement
  - c. Using rubber mallet tap the cast spindle to free strut from spindle
13. Remove strut assembly
14. Leave the Strut Spreader in place

***SOLO WERKS TIP:*** As the strut mounts are a consumable/wear item and are a known fail point on this chassis. Solo Werks recommends using new replacement parts and leaving your original suspension as an assembly. These parts are available from your Solo Werks Dealer or your local BMW parts dealer.

NOTE: If you are using your existing OEM upper strut mount (Fig. 1 #2) you must remove this from the strut assembly. This component is under extreme pressure from the front spring and must be removed using an appropriate spring compressor to relieve the pressure. Follow the directions given by the manufacturer of the Spring Compressor to safely remove the spring and disassemble the Strut Assembly.

## Solo Werks Coilover Pre Assembly – Priming the Dampers



**SOLO WERKS TIP:** As the suspension is shipped and stored in a horizontal position, it is advisable to exercise or Prime ALL shock absorbers before you install them to ensure that the internal contents are in the correct chambers. Therefore we advise that before you assemble the front coilover shock absorber, take a moment to purge the shock absorber.

To do this, one side at a time remove the following from one of the front Coilover Assemblies:

- Two Upper fasteners (lock nut and securing nut)
- Upper Spring Perch
- Main Spring
- Spring Isolator
- Helper Spring

You will then be left with the coilover strut with the bumpstop and vent disc on the shaft. Pull the bumpstop up to the top of the chrome shock shaft, just before the threaded portion.

With the shock upright (as it would be installed in the vehicle) compress the shock shaft until the bump stop touches the shock housing, and then pull to extend the shock shaft back to full extension.

Repeat 3-5 times. You will notice the shock forces getting progressively harder each time. Once they feel consistent each way, you are ready to install.

## Solo Werks Coilover Assembly and Installation

### Front

1. Assemble the coilover assembly with the OEM Strut Mount using the provided hardware as in the diagram (Fig. 1) Torque supplied upper strut nyloc nut to **47 Ft Lbs.**

NOTE: Use of an anti-corrosion spray such as the Boeshield T-9 on the threads & main perch/spring seat at this point can make the adjustment process much easier and will add an extra layer of protection. Boeshield T-9 is available from your Solo Werks dealer.

2. Insert strut assembly into vehicle
  - a. Hand tighten three (3) upper strut mount nuts

NOTE: Before proceeding with the next step, inspect the Spindle for debris (rust/dirt etc. as this can make installation difficult.

3. Connect strut housing to spindle:
  - a. Insert Strut into spindle making sure housing is completely seated within spindle. (Fig.1 #13)
  - b. Remove strut spreader tool and insert OEM Pinch bolt and nut, torque to spec (**34 Ft Lbs.**).

4. Reattach any brake, ABS lines, etc. that were removed.
5. Repeat procedure on the other side of vehicle.
6. Once vehicle is placed back on the ground tighten three (3) upper strut mount nuts (**25 Ft Lbs.**) and LCA bolts (**50 Ft Lbs.**) to proper torque specifications. (Or supporting lower control arm in the compressed position (loaded as if it is on the ground) using floor jack, jack stand or equivalent.
7. Reinstall front fender liner.
8. Adjust lower spring perch to desired vehicle height.

## Original Suspension Removal

### Rear

**SOLO WERKS TIP:** *The removal and installation of the rear is easiest if you are able to disconnect the rear anti sway bar end links from the lower control arms.*

1. While supporting lower control arm in the compressed position (loaded as if it is on the ground) using floor jack, jack stand or equivalent.
  - a. Remove lower shock bolt (Fig. 2 #14)
  - b. While supporting the LCA with a jack stand loosen and remove outboard LCA bolt.
  - c. Slowly raise up chassis to remove tension from rear coil spring.
  - d. With tension relieved lower LCA and remove rear coil spring.
  - e. OEM Upper spring cup must be removed to accept adjustable spring perch
2. Remove the upper bolt from the upper shock mount on each side & remove rear shocks. (Fig. 2 #1-2)

**SOLO WERKS TIP:** *Access to upper shock mount nuts requires removal of trunk interior. Please refer to repair manual (i.e. Bentley Manual) for proper procedure.*

3. Remove factory upper mount and bumpstop/dust shield assembly from OEM shock. (Fig. 2 #7&8)
  - a. These will be reused with new Solo Werks rear shock.
  - b. Note orientation as they will be reinstalled in same fashion.

## Solo Werks Coilover Assembly and Installation

### Rear

The Rear of this platform is a combination of a rear lowering spring & adjustable spring perch and specially matched shock absorber. The shock absorber does not need to be adjusted in any way to change the ride height.

**SOLO WORKS TIP:** *Just like the front struts, it is advisable to Prime the rear shocks as well. To purge the rear shocks: Refer to procedure on page 5.*

### Rear Spring Assembly

1. Remove the lower factory spring pad from the control arm, and ensure that the area is clean and clear of any dirt or debris. – Note: This lower spring pad will be reused.
2. Remove the upper spring pad and metal cup from the factory pocket on the body and ensure that that the area is clean and clear of any dirt or debris. This IS NOT reused.



3. With the adjustable perch on top of the spring, place the assembly into the lower control arm pocket & body spring locator. (Fig. 2 #10,11,12,13)
  - a. You will need to raise the rear axle to keep the assembly in place.
  - b. Make sure bottom of rear spring is oriented properly in OEM lower spring pad.
  - c. Note: with the spring perch installed on top, this allows for easier access for adjustment once installed in vehicle.



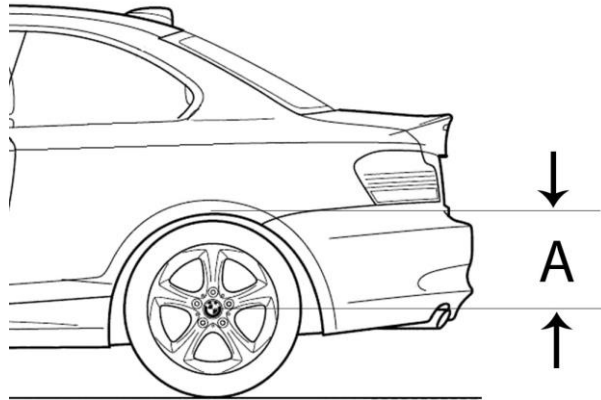
**Solo Werks Tip:** *Make sure the supplied rubber spring perch isolator is installed in-between the chassis and the adjustable spring perch. (Fig. 2 #10)*

### Rear Shock Absorbers Assembly:

1. Assemble new Solo Werks rear shock absorber using original upper shock mounts and dust shield/bumpstop assembly (Fig. 2 #3,4,5,7&8)
2. Install shock into upper shock mount and hand tighten shock mount nut. (Fig. 2 #1)
  - a. Once vehicle is placed back on the ground torque upper shock mount nuts to proper torques settings. **(20 Ft Lbs.)**
3. Compress lower control arm until lower shock mount bolt can be reinstalled. (fig.2 #14)
  - a. Torque lower shock bolt to proper torque settings. **(28 Ft Lbs.)**
4. Replace trunk interior to finalize installation.
5. Final check that all hardware is tight and torques properly.

**SOLO WERKS TIP:** *It is advisable that all attaching hardware be checked after approx. 200 miles to ensure it has retained appropriate OEM torque settings.*

## Solo Werks Coilover Final Details – Heights & Working Ranges



		Lowering Range			
		in Mm		in Inch	
Model	Year	Front	Rear	Front	Rear
BMW E90 Sedan	07'-12'	30-60	25-55	1"- 2.25"	1"-2.3"

Front Measurement					
Max low mm	Max low Inch	Max high mm	Max high Inch	OEM mm	OEM Inch
315	12.4"	345	13.5"	375	15"

Rear Measurement					
Max low mm	Max low Inch	Max high mm	Max high Inch	OEM mm	OEM Inch
320	12.5"	350	13.75"	380	15"

- These measurements are in place to allow both front and rear dampers to operate properly and allow for ample shock travel.
- All measurements will be referenced from "center of wheel hub to bottom lip of fender" (see example figure "a")
- Using this system outside of this range can cause premature failure and is cause to void your manufacturer specified warranty.
- Helper springs are intended to keep preload on the main spring under full suspension extension, do not remove!