# INSTALLATION INSTRUCTIONS

Strong-Strut, pivotless design

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**PLEASE READ THESE INSTRUCTIONS COMPLETELY BEFORE COMMENCING INSTALLATION**

## FORWARD (SS=Strong-Strut)

These instructions are written for the novice installer. It is so simple, just about anybody can install the Strong-Strut. This is a summary of the procedure: Remove three nuts atop each of the shock towers. Everything will remain in position but do not jack up or move the car with the nuts removed. Place the SS tower plates in position and replace the nuts finger lose to allow the plates to jiggle a little The cross bar attachment fitting is a machined, stainless steel fastener of a non-pivoting design. It threads into the end of the cross bar and locks with a jam nut. The other end engages a machined "U" shaped channel in the tower ring receiver block and is held in place with two capscrews. The attachment fitting can be shifted left and right to allow for manufacturing differences in cars and to align the threaded holes.

We have included a lot of verbiage covering the "what ifs" and so forth. Most of you will never need 70% of the instruction we have provided. We include it in response to customer feedback however rare the issue may be. 70% of this text is merely "chatter", not instruction, so relax. Your Grandmother could probably install the Strong-Strut in about 20 minutes!!!!!!!

A new issue has developed over which, we have no control. There are cars showing up with stud nuts that have a larger flange diameter. The SS was designed to accept the 5/8 inch diameter nuts (shoulder measurement), the only ones known to exist at the time, and the counterbore cannot be increased in diameter to accommodate the larger, atypical nuts. A few owners have reported this to us and we have never actually seen one of the atypical nuts. At the outset of installation, we suggest you remove one of the stud nuts and measure it to determine if it will fit in the SS plate counterbore. If not, the solution is simple because the BMW dealer has the small sizes in stock and they are inexpensive. Purchase 6 of the proper size or order our accessory installation kit of stainless steel acorn nuts and washers which is even a better idea.

Please do not use sharp objects to unwrap the SS due to the possibility of scratching it. The cross bar is shipped with the pivotless fasteners attached to the cross bar and the capscrews temporarily in place on the retaining blocks so they won't get lost.

You will need the following tools to install your Strong-Strut.

2 blocks of clay for measuring clearance (provided)

3/16 (5mm) in hex allen wrench or in hex socket for small capscrew

5/15 (8mm) in hex allen wrench or in hex socket for large capscrew

¾ inch (19mm) open end wrench for jam nuts

½ inch (13mm) socket for shock tower nuts (socket only, no wrench here)

torque wrench is optional but recommended

**USE OF PLIARS OR SIMILAR TOOLS TO TIGHTEN THE KNURLED CAPSCREWS WILL MAR AND RUIN THEM THE FIRST TIME.** Please use the appropriate allen wrench or in hex socket.



**GROUNDING STUD** The cutout in the tower plate has been enlarged and will accommodate the random placement of the grounding stud by BMW. In extremely rare cases, the stud placement may be so far off, it prevents installation of the tower plate. The overlap will usually be very small and we suggest you use appropriate tools like a small file or Dremel tool to trim the square base of the grounding stud so the SS plate will fit. The stud itself is a ¾ inch nut that is easily removed allowing clear access to the square base. A small dab of body color paint will complete the job. FYI, the grounding stud is placed there as a convenience, since the battery is in the trunk You would only use this device for jump starting you car. There are any number of optional sites where a "ground" lead could be connected for "jumping" purposes.

**CLEARANCE CONCERNS** The tower domes tilt downward and inward. The upper out edge is the highest point of the dome are obvious when looking at them**. This high spot also corresponds with the diagonal cut on each of the SS tower plates.** Once you establish proper clearance at these two points, you will have no clearance issues elsewhere. Raising the hood is not a requirement for Strong-Strut installation unless someone has tinkered with the hood stoppers and it is lower than factory settings. Since the stoppers are adjustable, we must assume the possibility that someone may have tampered with them on any given vehicle. The clay measuring exercise is to verify that factory settings/clearances have not been violated. The most common hood setting for the hood to body seam gap is about 1/4 to 3/8 of an inch. Apparently, it is not an exact science as delivered from the factory as we have seen or

heard of just about every dimension possible. We have seen some cars with no gap and metal to metal contact wearing off the paint. This would not allow room for ANY bracing product under the hood. Since we have no idea where the hood stoppers may be adjusted on any given customers car, we have you measure first, with the clay provided with the Strong-Strut. Most customers find it unnecessary to make any adjustments but we have to play it on the safe side for obvious reasons.

## THE ADJUSTABLE STOPPERS AND HOOD CLEARANCE

There are two rubber "stoppers' mounted on the body in front of the radiator above the electric cooling fan and a stopper mounted on the body, toward the front of each wheel well arch. The factory uses these to adjust the hood to body seam in an attempt to make it uniform and attractive to the eye. The stoppers can be adjusted up and down by turning them with your fingers. A clockwise turn lowers the stoppers and reduces under hood clearance and makes a tighter body seam. A counter-clockwise turn has the opposite result. Adjustment is seldom necessary but must be part of the installation process so you will be confident there is sufficient clearance for the SS rings**. Do not install the SS rings and close the hood until you know you have the required clearance.** Our concern is preventing the tower rings from dinging the hood. The secondary consideration is the size of the resulting body seam. We have intentionally made the clearance measuring process appear tedious. We want you to worry a little so you will move slowly with forethought and deliberation. We have built in a "fudge factor" beyond what you are reading here, so follow the instructions and everything will be fine. If you live in a cold climate, be sure the clay measuring blocks are soft and pliable before using them. Closing the hood on hard clay is to be avoided!



**ESTABLISH A SAFE CLEARANCE step one, gross available clearance**. Be sure the SS rings are OFF the car now. With the pliable clay blocks placed in the "high spot" on the tower domes, close the hood to the fully latched position compressing the clay blocks. (be sure you have removed all tools and equipment before closing hood) Open the hood, leave the clay in place and examine the newly formed shape and thickness. This is a 3D image of how much clearance you have and exactly where the clearance is positioned above the rings. Measure the clay at the thinnest point. The minimum desired thickness is 7/16$^{th}$ of an inch. Most cars will have a full ½ inch clearance. If you have less clearance than this, raise the four stoppers evenly approximately 1/3 of a turn and measure again with the clay blocks. Repeat until you have the desired clearance. Most cars will be OK on the first measurement but since the stoppers ARE adjustable, it's anybody's guess who may have been tampering with them at some time in the past.

**RING INSTALLATION** If not already removed, remove the six shock tower nuts. Mount the SS tower rings on their appropriate sides of the car and replace the factory, or SS "kit" nuts and leave them finger lose so the plates can be jiggled a bit.

**NET AVAILABLE CLEARANCE** If you don't have the minimum 7/16$^{th}$ of an inch clearance, repeat step above. The tower plate is 3/8$^{th}$ inch thick so it will occupy 3/8$^{th}$ of an inch of the 7/16ths clearance. This leaves only 1/16 of an inch which doesn't seem like much but remember, these are minimum parameters. Here's where the "fudge factor" comes to the rescue. The angled cut on the SS rings gives an addition 3/16 inch clearance for a total of approximately ¼ inch which is plenty. NOTE: if you have an ///M version and have purchased our large accessory kit with plastic tower caps, install them before installing the rings. If you haven't already done so, remove the six OEM shock tower nuts. Set the SS rings in place and install the OEM or SS kit nuts finger lose. Repeat the same measuring steps with the clay that you did previously except this time, the clay blocks will be resting on the SS rings atop the angled cut. This time, DON'T close the hood to the full latched position (just to be on the safe side) bring it down a bit short of full latch and check the clay blocks again. If it looks OK you can proceed with full hood closing and latching. If not, raise the hood stoppers ( this almost NEVER happens at this point) OK, measure the clay blocks again and you want a minimum of 3/16$^{th}$ of an inch clearance. You will probably have more than that. At this point you can eyeball the hood to body seam gap and it should be around 3/8$^{th}$ of an inch, which seems to be "standard." If yours is larger and you want to trim it down, you can carefully lower the stoppers 1/3 turn at a time taking measurements with the clay blocks after each adjustment. Now that we have explained all this, the fact is, most of you will never need all this detailed info. The first measurement with the clay will be plenty and you'll proceed without a hitch. We include all this because of "Murphy's Law."

**CROSS BAR INSTALLATION** The nuts on the tower rings should be lose at this time. Position the cross bar over the engine and retaining fasteners over the ring blocks. Screw the retainers in or out of the cross bar ends to align the holes with the threads in the ring blocks. For best appearance, strive for an equal amount of space on each end of the bar. The fit of the retainer to the ring block is microscopic, requiring "jiggling" of all the components to align the holes for the capscrews. Once aligned, carefully install the capscrews and avoid cross threading. If necessary, due to variations in vehicles, it is OK to bolt one end of the cross bar to either ring and apply slight pressure on the bar to set the other end in place for capscrew installation. If you have the proper fitting tools and torque wrench, torque the small capscrew to 14 ft. pounds and the large one to 20 ft. pounds. If you do not have a torque wrench, turn the capscrews down until they bottom out and then give ¼ turn approximately. Now tighten the six shock tower stud nuts to 18 ft pounds (or snug + ¼ turn) The final step is to level the cross bar in its front to rear plane and tighten down the jam nuts on each end against the end of the cross bar.

**OPTIONAL** The clearances are intentionally on the "safe side." You might be able to reduce the body seam width and still maintain safe hood clearance. You may even end up with a smaller seam than you started with.Turn down the stoppers in small increments, about ¼ turn and measure the clay each time. Do not reduce under hood clearance at the "high points" below 3/16 of an inch.

**FINISHED !!!!!!** Admire your handy work, then go drive your "sweet ride." Notice the difference the SS makes in reduced cowl shake and chassis flex. It will be most noticeable when driving over bumpy or uneven surfaces like RR crossings and wash board roads. The long term benefit of the SS will insure and maintain structural integrity of the chassis and the car will continue to feel new and solid as it ages.

Note: When taking your car to the dealer, instruct them not to change adjustment of the hood stoppers and explain why. Always inspect your hood for dings before leaving the dealer to be sure nobody has fiddled with the adjustment.

Please email us at azz3man@cox.net we enjoy hearing from our customers. We would appreciate it if you would tell other Z3 drivers about the Strong-Strut.

We thank you and extend our sincere appreciation for the confidence you have shown in the SS Team. If you become unhappy with our product for any reason, please tell us right away so we can address the issue to your satisfaction. Please visit the Strong-Strut web page at http://www.Strong-Strut.com from time to time. We periodically add new products. You may be interested in our read Strong-Strut, the rear Strong-Strut, currently available and in stock.

THE SAGGING HOOD BLANKET

In many cases, there will be contact between the cross bar and the hood blanket unless the blanket is glued as described. This has not been reported as constituting an issue by our customers or in our own vehicles.

Every Z3 comes from the factory with a sagging hood blanket, some more than others. Examine yours and you will see rub marks on it from various components in the engine compartment. Place you hand over the center of the blanket and push and you will see the blanket droops down at least ½ inch off the hood and even more in other places. We recommend you glue the hood blanket to the underside of the hood. There are many products that will do the job, such as contact cement, liquid nails automotive trim adhesive and one of the best is 3 M spray on adhesive. Be sure to glue it well under the center section which is the main unsupported area.

With the hood open and a COLD engine, place a drop cloth over the entire engine bay opening. You will be dropping plastic fasteners in the following process and if you don't have the drop cloth, they will disappear forever into the dark recesses of the engine bay. This will also prevent dripping glue from getting onto surfaces where you don't want it.

You have the option of removing the hood blanket completely of just detaching it from one side to give you access to apply the glue. It’s handy to have two persons available if you detach the blanket. If you decide on partial removal, don’t allow the blanket to “hang” under its own weight from the attached side. It has sufficient weight to “crease” itself or break the “backing” of the blanket material at the fastener points. Remove whatever fasteners are required for the access you need to apply the glue. The hood blanket is attached by numerous plastic fasteners around the perimeter which engage holes in the hood. Using a Phillips head screwdriver, back out the plastic screw in the center of the fastener about 3/8th of an inch but don't remove it completely. Using your fingers, pull outward on the head of the extended screw and the entire fastener should pull out of it's hole in the hood. With the first one removed, look it over and it will be obvious what you're dealing with as you remove the remaining fasteners the same way. Once you have the access you need, follow the directions on the glue you selected and apply it. Replace the fasteners by inserting the lower "stem" in it's mounting hole while the screw is in the backed out position. Then tighten down the plastic Phillips head screw. The blanket will tend to return to it's sagged position and pull away from the hood as the glue is drying. You must address this in the gluing process as it is drying and setting up. We placed an old rolled up blanket on the engine cover and lowered the hood until there was pressure applied to the blanket. We allowed it to dry overnight in this configuration.