

CAE Ultra Shifter

Installation instructions

📍 10023 E8/9X
with Shift Rod
10023 ROD-AL

BMW E8X, E9X
6-speed transmission



PLEASE NOTE

SAFETY FIRST!

- 📍 Raise the vehicle safely with a vehicle lift for installation. Improper lifting can cause damage to the vehicle and/or personal injury or even death!
- 📍 Please only do the installation if you have appropriate experience in the automotive sector and have the right tools! An incorrectly installed Shifter can seriously damage the transmission or make the vehicle undriveable or not shiftable and lead to serious accidents!
- 📍 If work on the electrical system is necessary, please follow the manufacturer's specifications.
- 📍 Carry out all work with care and cleanliness! For the professional assembly of a shifter is no force required. All parts are designed to fit your vehicle.
- 📍 If you are unsure, please contact your trusted workshop about the installation!

BASICALLY

- 📍 Use ethyl alcohol/brake cleaner to clean all aluminum parts.
- 📍 Occasionally lubricate all moving parts with spray grease, which has good creeping properties. Our recommendation: Würth HHS 2000 (WD-40 or similar is unsuitable because it is too thin)
- 📍 All screws and nuts that are not self-locking or are fitted with tooth lock washers glue in during assembly!

📍 SURFACES AND THEIR CARE

Please note that an untreated aluminum surface (ALU) is sensitive to aggressive Liquids to which i.a. Hand sweat also counts. Especially the high-strength 7075 aluminum we use has a tendency to form black spots of corrosion due to its high copper content. Under special circumstances, very salty air near the sea and coast can lead to corrosion. The surfaces should therefore be cleaned regularly and treated with care to prevent this. For this purpose, e.g. ethyl alcohol or brake cleaner. Only spray these onto a cloth and wipe the shifter with it, NEVER spray the shifter directly. If stains have already formed, they can be removed with commercially available aluminum polish, but that is also not allowed get into the movable parts of the shifter. The anodized versions of our shifters (EXS, EXGR) are more resistant to corrosion. The steel parts have to be also cared in all variants.

TIPS FOR GEAR SHIFTING

📍 FORCE DOESN'T MAKES YOU FASTER - IT ONLY HARMS THE TRANSMISSION

The question arises again and again: "Does a CAE shifter puts more strain on a gearbox than a standard gear lever?" The answer is clear: "No!" The things that are most stressful for a synchronizer ring in a transmission are excessive shifting forces or a wrong shift in gear. Basically, the shift travel with a CAE Shifter is significantly shorter than with the standard lever. We achieve 30 - 55 % reduction depending on the vehicle and transmission type. This can only be achieved by using the appropriate gear ratio on the shift lever. You can feel it through the precision of a CAE shifter engaging the gears is much better than with a standard gear lever designed for comfort. The force for this decreases in the same proportion - we put in the gears with significantly less load for the synchronizer rings. In addition, with a correctly adjusted CAE shifter put in the gears is very precise and shifting into the wrong gear is extremely rare. Even in motorsport, fast, precise, but still sensitive shifting leads to the goal! Everything else is pure tugging and tearing (often seen on various YT channels), which looks "important", but in no way makes it faster - but it puts a disproportionately high strain on a transmission and in the worst case causes a fatal wrong shift in gear!

THE ROTATABLE GEAR LEVER LOWER PART

ⓘ THAT SHOULD NEVER BE DISMANTLED!

The following pictures illustrate the principle of the rotatable gear lever lower part and they are for illustration purposes only!

- 📍 The fixing screw engages in the groove of the lower part of the gearshift lever and fixes it axially - and it may never be tightened! The lower part of the shift lever must remain rotatable.
- 📍 **Familiarize yourself with this principle before installing the shifter!** Memorize the insertion depth of the lower part, where the fixing screw engages in the groove. The lower part of the gearshift lever must be able to turn without resistance in the gearshift lever! This is a condition for proper function.
- 📍 The basic setting for the fixing screw: screw in **carefully** until the pin tip touches the bottom of the groove. Then turn back $\frac{1}{4}$ turn. Now hold the grub screw with a 2.5 mm allen key and tighten the nut (this is the default). Make sure that the grub screw is secured with the supplied wire after assembly!
- 📍 **Regularly spray penetrating oil into the \varnothing 2.5 mm lubrication hole above the fixing screw!**
This is absolutely necessary for perfect function! Pay attention to cleanliness!
- 📍 We recommend Würth HHS 2000 for lubrication.

📍 DIRT, GRINDING DUST OR A LACK OF LUBRICATION IN THIS BEARING LEAD TO FAILURE OF THE SHIFTER WITHIN A VERY SHORT TIME!



THE SPRING STOP

ⓘ NEVER UNSCREW THIS SCREW COMPLETELY!

By loosening (max. 2 turns) the screw on the Spring stop, the zero position of the gearbox can be determined. Please **never** completely loosen this screw as you will never get the mechanism together under the car again, only with the total loss of nerve costume!

The allen key which is provided in the shifter package is used for loosen the screw.



- i** The Shifter is intended for use with the original center console. It must be cut out in accordance with these instructions until the shifter can be moved freely.



The center console must be cutted for installation

- ▶ Edit the center console according to the adjacent photo.
- ▶ Also work on the ashtray insert or the storage compartment and its cover. An air saw, for example, is suitable for this.
- ▶ Make sure that all moving parts of the shifter (reverse gear mechanism) have sufficient space when assembled.



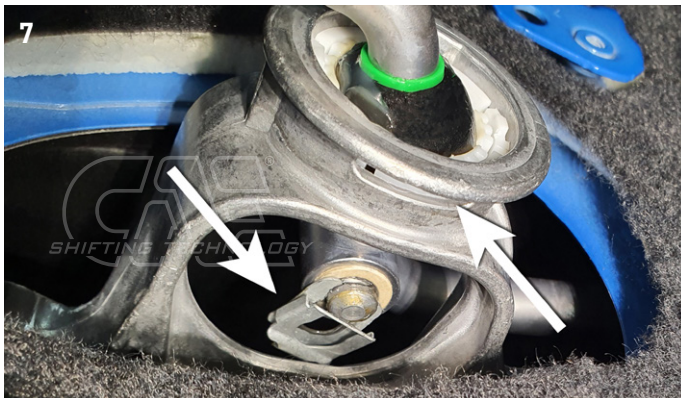
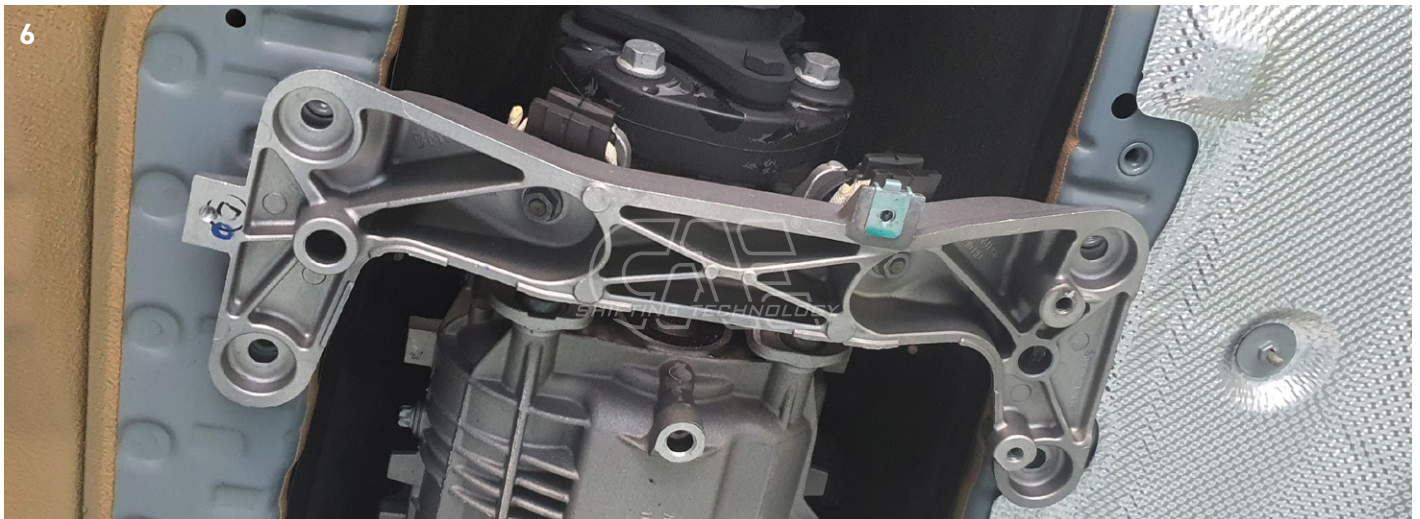
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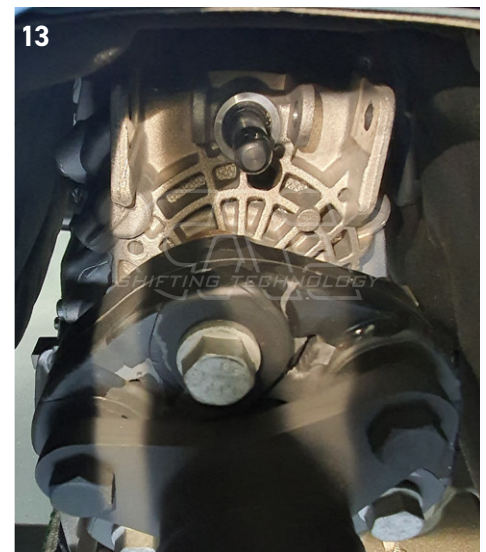
- ▶ Lift the vehicle safely on the car lift. Shift the transmission to neutral.
- ▶ Remove the covers of the center console, remove at least shift bag, frame and ashtray to gain access to the tunnel panel.
- ▶ Remove center console: Pull up the shift bag, pull up the fairing and remove the plug. Pull up the frame around the shift bag. Unscrew the cup holder.
- ▶ Now the 2+3 screws of the front center console fastening are accessible. Pull off cable clips and pull back cable.
- ▶ Remove the ventilation unit from the rear end of the center console, disconnect all plugs (2 plugs under the cell phone holder in case of telephone preparation) and unscrew the 2 nuts for the center console fastening.
- ▶ Pull up the handbrake **strongly**, clip out the handbrake bag and remove the center console completely.



Working under the car

- ▶ Remove underbody panelling. Loosen gear bridge (Picture 6) and slightly suspend the engine, it does not need to be supported, but work carefully nevertheless. Loosen the front heat protection plate and push it backwards over the exhaust until you have access to the gearshift. **Loosen the cardan shaft is not required!**
- ▶ Remove the original shift lever including the gearshift bearing completely. First remove the rear shift rod bolt from the shift lever by pulling the safety clamp off the bolt (Picture 7).
- ▶ In order to pull the shift lever out of the bearing, use a screwdriver to push the tabs of the plastic surround of the ball through the openings at the side (Picture 7). Remove the shift lever upwards.
- ▶ The aluminium gear shift lever bracket (Picture 8) is secured on the transmission side with two bolt clips (Picture 9, Picture 10 on page 3), which are clipped onto the transmission housing. Press up the clips with a long screwdriver and pull out the bolts laterally.
- ▶ Then unscrew the rear body mount (Picture 8) and thread the shift lever bearing out of the tunnel downwards. To do this, turn and flip the part accordingly to get it past the cardan shaft (it really fits!).





- ▶ Remove the original shift rod completely. To do this, push the safety clamps off the 10 mm bolts of the shift rod and remove the shift rod laterally (Picture 11-15).
- ▶ Then press the locking ring off the gear connection piece and then press the 6 mm bolt out of the gear connection. Due to the tightness above the gearbox in the center tunnel, patience is required here! 😊


ⓘ The foam inlay, dowel pin and locking ring from the original adapter are still used! (Picture 16).



THE ADJUSTABLE SHIFT ROD FROM CAE

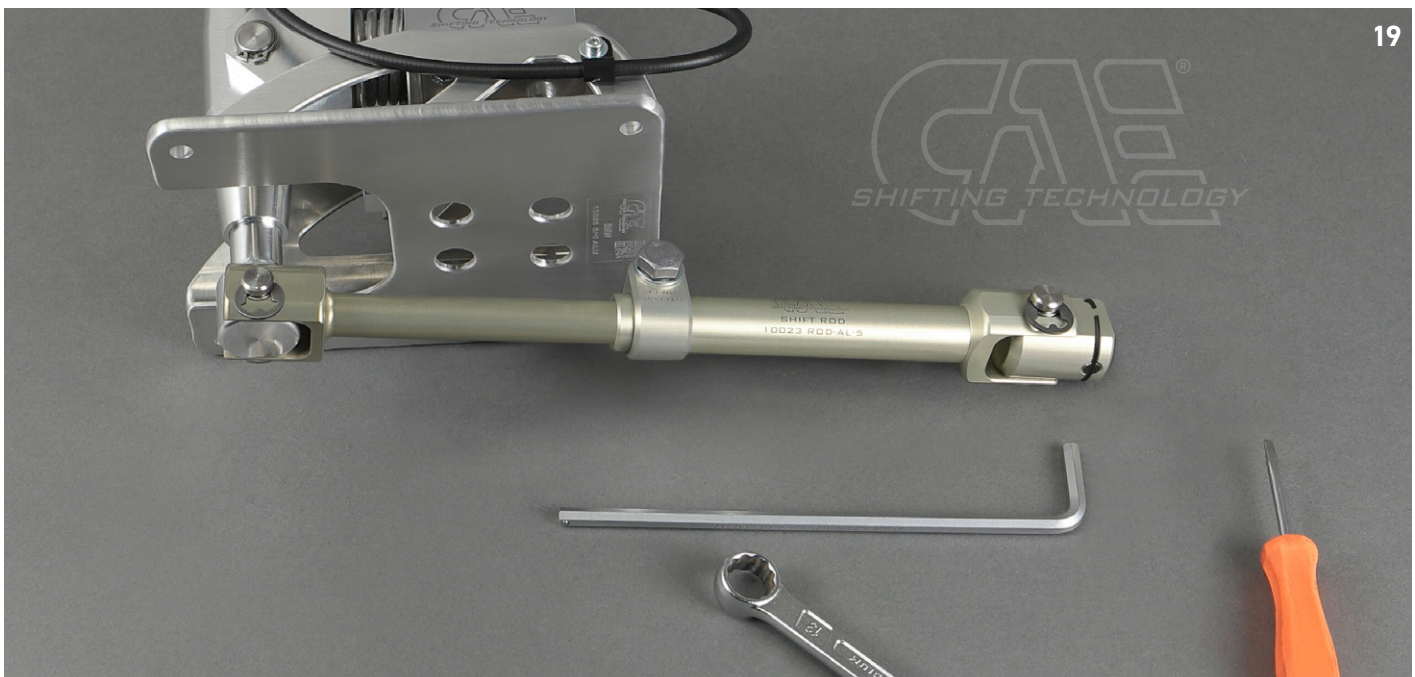
CAE Shift Rod

- ⚠ Never use force to assemble our Shift Rods.
- ⚠ Please carry out all work with the greatest care and cleanliness!
- ⚠ Never spray brake cleaner or similar degreaser directly on/in the moving connections/joints. This will remove the grease layer in the joints and leads directly seizing up the components.
- ⚠ Only use a soft cloth and a thin oil spray for cleaning and care. For example Würth Multi or WD-40.
- ⚠ The CAE Rods are designed to fit our shifters, they are 100 % play-free and designed all dimensions are designed as a fit. This makes it difficult to turn the adapter and the lower part of the shift lever by hand when installed. The 10 mm fitting bolts are each firmly seated in the fork and the adapter and the lower part of the gear shift lever only rotate on the bolt.
- ⚠ Absolute cleanliness must be ensured during assembly! Dirt in the bearings leads directly to the seizure of the components.
- ⚠ For a perfect function and a long lifetime, the hinge pins and the contact surfaces have to be greased well. This should be repeated once a year. We recommend Würth HHS 2000 for this.

 **ATTENTION:** WD-40 or Multi oil are not suitable for the lubrication of the joints!

- ⚠ Please carry out all work on the mating surfaces/holes with the utmost care! The clamp connection of the length adjustment must be kept absolutely dry and free of grease!





- ▶ Disassemble the CAE shift rod into 2 halves (Picture 17+18 on page 5), for this loosen the clamping screw with SW 13 mm.
- ▶ Slide the original locking ring over the groove into the "parking position" of the adapter, so that it can be pushed back into the groove when installed. Also the foam insert from the original adapter and grease everything well. The foam insert is used as a grease reservoir and creates counter pressure so that the bolt does not vibrate (Picture 14-16 on page 3).
- ▶ Slide the shaft circlip into the groove of the 10 mm bolt ▶ **"Click!"**
- ▶ Mount the shift rod half prepared in this way with the gearbox adapter on the gearbox.

❗ We recommend inserting a 5 mm Allen key (as shown in Picture 18 on page 5) between the adapter and fork, to prevent the adapter from tipping over and to be able to press in the dowel pin.

**❗ ATTENTION: The ear of the clamp points upwards!
Otherwise it could touch the cardan shaft!**

- ▶ Place the shift rod half on the gear shift shaft and align the adapter (Picture 20-23).
Push/knock in the 6 mm bolt! It sits tight in the adapter!
- ▶ Then slide the locking ring into the groove from the parking position ▶ **"Click!"**



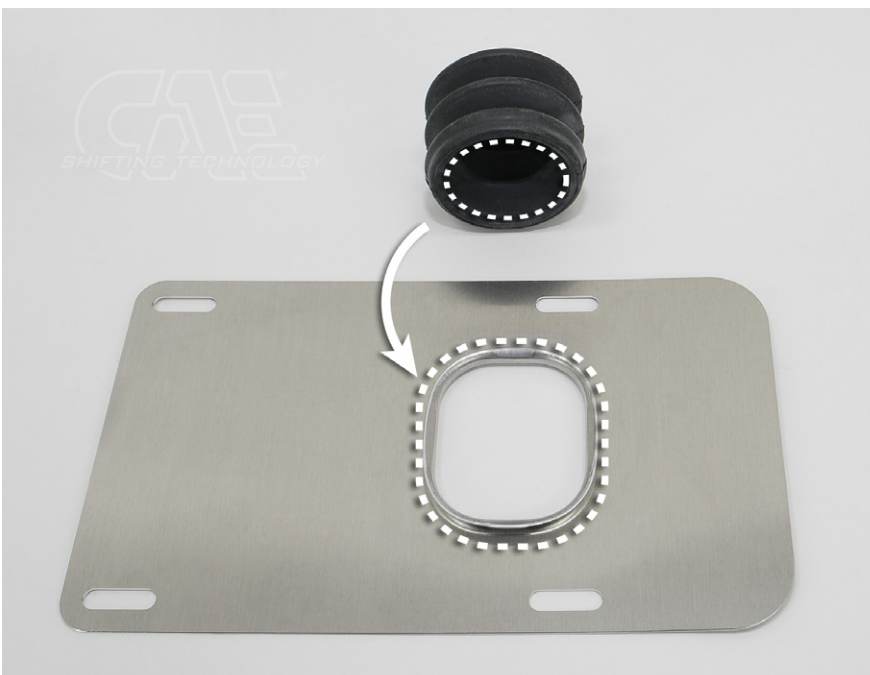
- ▶ Mount the fork of the other half of the shift rod on the lower part of the shift lever (Picture 24+25). Grease the bolt and fork well - our recommendation: Würth HHS 2000
- ▶ Carefully hammer the bolt into the fork with a plastic or aluminum hammer. Make sure that the hole in the lower part of the gear shift lever is aligned with the holes in the fork.

❗ We recommend using a second plastic hammer as a counter surface or a plastic pad when the shifter is removed! Work carefully! Do not damage the holes in the fork and the lower part of the gear lever!

- ▶ Slide the shaft circlip into the groove of the 10 mm bolt ▶ "Click!"
- ▶ Later, when the shifter is installed, the shift rod halves are brought together (as shown in Picture 19 on page 5). This has to be done **without any grease**, so that the adjusted length of the shift rod cannot change after tightening the clamp.



- ▶ Mount the rubber bellows on the cover plate (please degrease!). Mount the sheet metal incl. rubber bellows on the shifter. The upper bead of the rubber bellows must be inserted into the circumferential groove at the shifter. If necessary, use a few drops of brake cleaner as lubricant.



- ▶ Glue on the foam rubber strips according to picture 26.
- ▶ Hang the counter position (Picture 27 right) over the already mounted shift rod half (Picture 28). Make sure that the counter layer is correctly aligned, it fits 100% into the tunnel reinforcement plate from below (Picture 29). At the cover plate with bellows (Picture 27 left) the bevelled corner points to the left, seen from above.
- ▶ Place the complete shifting unit on the tunnel, carefully putting the halves of the shifting rod together. Do not tilt!
- ▶ Now screw together the shifter, the cover plate and the mating layer from below using the 4 ribbed screws (10 Nm) supplied (Picture 29-31). Insert a small screwdriver into the holes to align. Counter from above with the nuts supplied.



26



27



29



28



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31

- ▶ Now the zero position of the gear unit must be determined (see also "Setting the gear shift paths"). To do this, loosen the spring stop (Picture 32-34) under the shift bracket using the supplied Allen key until it can be shifted sideways (max. 2 turns). The spring is now without function.

ⓘ Never unscrew this screw completely!
(see information "The spring stop")



Adjustment of gear shift paths 6-speed transmission

- ▶ Align the shift rod to the shifter very precisely in length and angle and tighten the screw of the clamp with 47 Nm. Several attempts will probably be necessary to find the perfect position.
- ▶ Perform a collision check on the lower part of the shift lever in all gears! There must always be sufficient space to the components of the shifter and the cardan shaft!
- ▶ The lower part of the shift lever must be centered in the opening of the cover plate (see also Picture 29 on page 8). Please check from below!
- ▶ The spring in the shifter must now be synchronized with the spring in the gearbox. To do this, shift the transmission to gear level 3/4. This is the zero position of the gearbox, just move the shift lever back or forth.



TEST: With 3rd and 4th gear engaged, the lateral play at the shift lever must be equal. If this is not the case, the spring stop must be re-adjusted. (0.5 mm is already a lot here)

**This is the basic setting of the shifter and should be done very accurately.
The shift lever should be positioned laterally straight or slightly tilted to the right!
The perfectly adjusted center position is a combination of shift rod and spring stop.**

- ▶ Shift the transmission to gear level 1/2 using the shift lever and screw in the stop screw until the 1st and 2nd gear can be shifted cleanly.
- ▶ Now shift the transmission to gear level 5/6 using the shift lever and screw in the stop screw until these gears can also be engaged cleanly.
- ▶ Activate the reverse gear locking pin by pulling it and shift the transmission into reverse gear. Screw in stop screw until reverse gear can be engaged. In doing so, the spring pressure lock in the transmission must also be overcome.

! **PLEASE NOTE:** In gears 1/2 and 5/6 the grub screw must not touch the locking pin when the gear is engaged!

Approx. 0.3 mm air is okay!



! **FINALLY** check all functions and settings during the test drive and readjust if necessary!

Incorrect or inaccurate settings can cause damage to the gear box and consequential damage!

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