SHIFTING TECHNOLOGY

NOT JUST FOR RACING
MADE IN GERMANY

Installation Manual

10086

Toyota GT86
Subaru BRZ
Scion FR-S

6-speed gearbox



TOYOTA // SUBARU // SCION

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

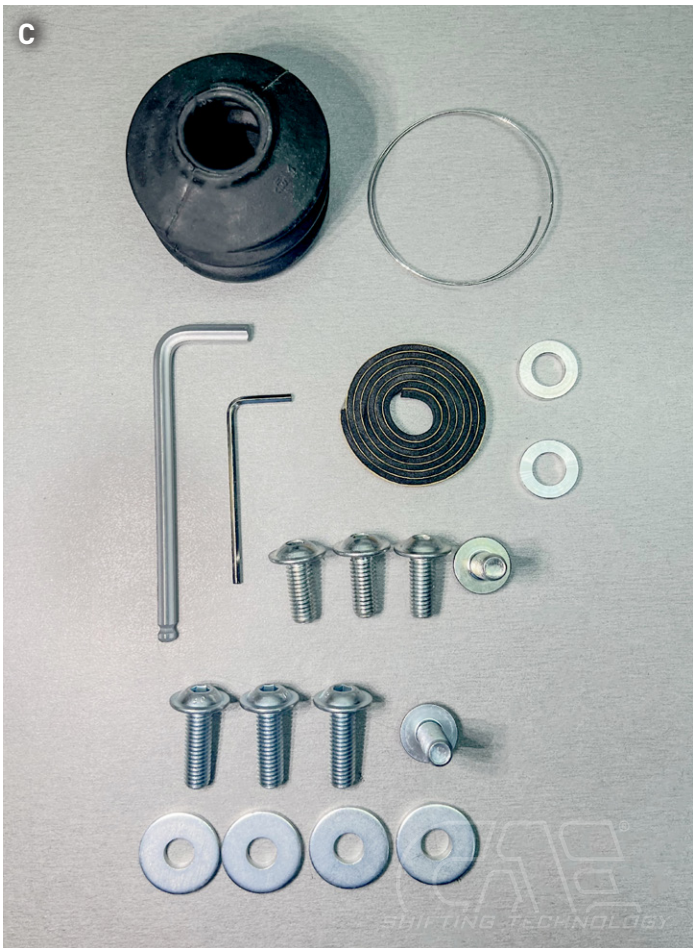
The question arises again and again: "Does a CAE shifter puts more strain on a gearbox than a standard gear lever?" The answer is clear: “No!” The things that are most stressful for a synchronizer ring in a transmission are excessive shifting forces or a wrong shift in gear. Basically, the shift travel 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!

Included in delivery

- 1x shifter completely assembled, design depending on ordered variant (Picture A)
- 1x Shift knob incl. counter screw M6x20 V2A,
  design depending on ordered variant (Picture B)
- Accessories package (Picture C)
- Cover plate (Picture D)









THE ROTATABLE GEAR LEVER LOWER PART

ⓘ THAT SHOULD NEVER BE DISMANTLED!

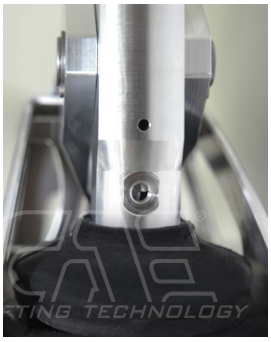
The following pictures illustrate the prinziple of the rotatable gear lever lower part and they are for illustration purposes only!

- 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 ¼ 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 Ø 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!

A 5 mm Allen key is required for this screw.



ⓘ The shifter is intended for racing vehicles without interior equipment. If the center console is installed, it must be removed or cut out until there is sufficient clearance for the shifter. The shifter must be screwed onto the sheet metal of the center tunnel and any existing carpet must be cut out.

The removal

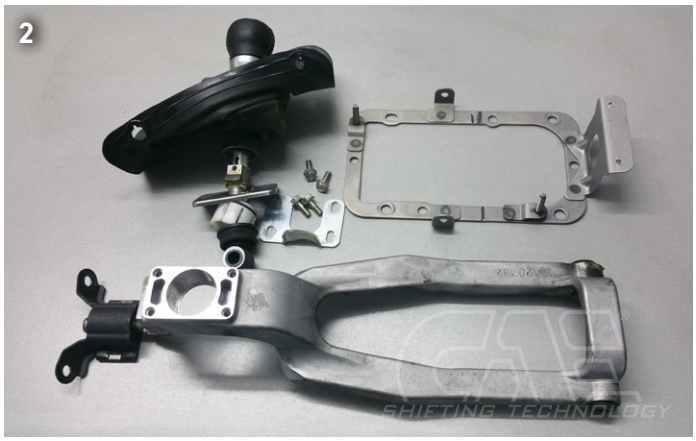
- Safely raise the vehicle on a vehicle lift.
  Shift the transmission to neutral.
- Remove the center console with panels.
- Completely remove the original gearshift including the shift lever bearing (Picture 1+2).

Working under the car

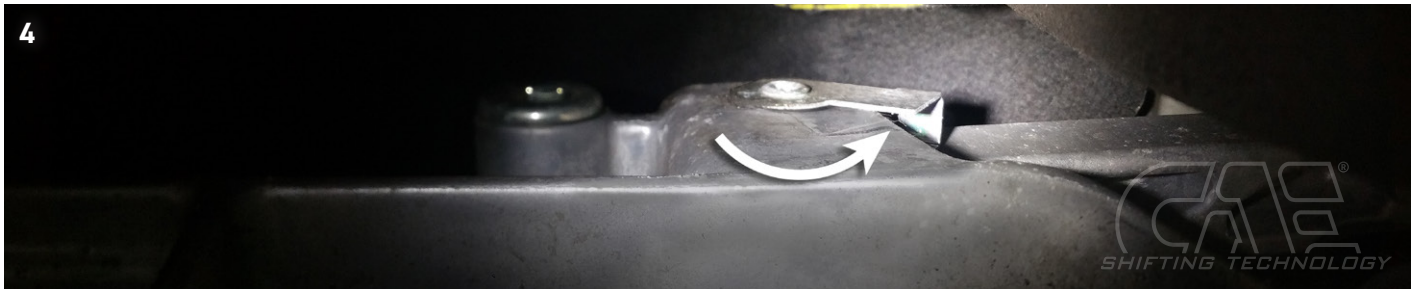
- Loosen the exhaust, the propshaft center bearing and the transmission bridge. Be careful that the propshaft does not slip out of the transmission.
- Support the engine/transmission unit and slowly tilt it back. This makes it much easier to reach the parts to be removed.
- The shift rod itself does not need to be detached from the gearbox!
- The shift lever bearing is secured on the gear unit side with two pin clips (Picture 3+4), which are clipped onto the gear unit housing. Press these up with a long screwdriver and pull the pin out to the side, then remove the shift lever bearing from the tunnel to the rear.











The installation

- Loosen the spring stop (Picture 5) under the switch bracket with a 5 mm Allen key until it can be moved sideways but is not loose.

ⓘ **Never unscrew the screw of the spring stop completely!** (see information "The spring stop")

- Mount the cover plate incl. rubber bellows on the shifter. The upper bead of the rubber bellows must be in the circumferential groove on the shifter, use a few drops of brake cleaner as a lubricant.
- Place the shifter with the cover plate and bellows on the center tunnel and insert the shift rod into the eye of the lower part of the shift lever (grease!) and screw the shifter onto the tunnel with the 4 original screws. But do not finally tighten yet, because the front/rear alignment of shifter and cover plate still has to be done.

- Shift the gearbox to 3rd or 4th gear. This is the "zero position" of the gearbox. To do this, simply move the shift lever forwards or backwards.
- Tighten the spring stop again and check lateral clearance.





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CHECK: When 3rd and 4th gear are engaged, the lateral clearance on the shift lever must be the same. If this is not the case, the spring stop must be readjusted. (0.5 mm is already a lot here).

This is the basic setting of the shifter and should be carried out very precisely. The shift lever is thereby laterally straight or minimally tilted to the right!

The perfectly adjusted center position is a combination of shift rod and spring stop.

- Center the lower part of the shift lever in the sheet metal at the front / rear, the shift lever is slightly tilted backwards.

- The front and rear position of the shifter can be changed by moving the entire unit forward or backward accordingly. Make sure that the lower part of the shifter is centered in the cover plate so that the lower part does not hit the plate when the gear is engaged.

- Fasten the shift rod in the lower part of the shift lever using spacers and locking split pins (Picture 7).

- Reassemble engine/gear unit and exhaust properly.

- Screw the shifter onto the center tunnel.



Machining the shift rod (if necessary)

- It occasionally happens that the weld at the head of the shift rod is raised and touches the cover plate under the shifter when it is deflected sideways to engage reverse gear.
- In this case, the shift rod must be reworked above. 1-2 mm of clearance is quite sufficient (Fig. 8).



Adjusting the gearshift travel

- The basic adjustment of 3rd and 4th gear has already been described and carried out.
- Shift the gearbox to gear level 1/2 using the shift lever and screw in the stop screw until 1st and 2nd gear can be engaged cleanly (Picture 9).
- Now shift the transmission to the 5/6 gear level using the shift lever and screw in the stop screw until the 5th and 6th gears can be engaged cleanly.
- Actuate the locking bolt via the cable and shift the transmission to the reverse gear level. Screw in the stop screw until reverse gear can be engaged cleanly.



PLEASE NOTE: For gears 1/2 and 5/6, the grub screw must not touch the locking bolt when the gear is engaged!

Approx. 0.3 mm clearance 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!

If you have any questions or encounter any problems, please be sure to contact us; we look forward to your feedback so we can improve our products.

CAE WISHES YOU A GOOD TRIP



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