

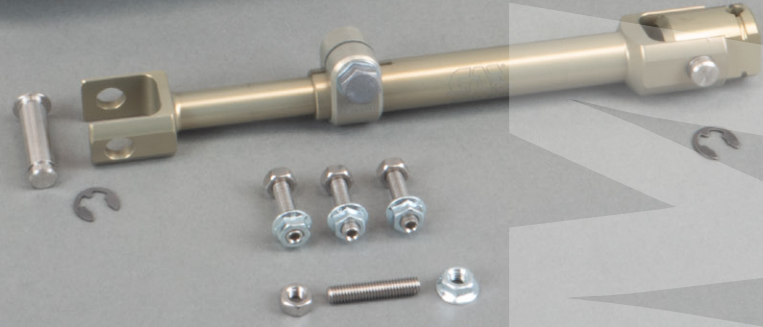
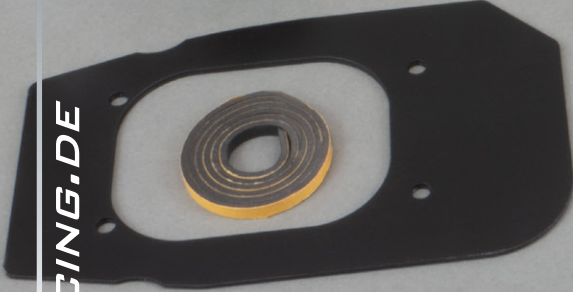
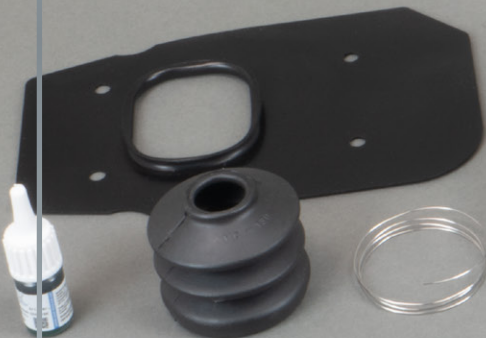


# Installation instructions

📍 10023 G8X

BMW M2 / M3 / M4

6-speed gearbox



WWW.CAE-RACING.DE

BMW M4

# 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.

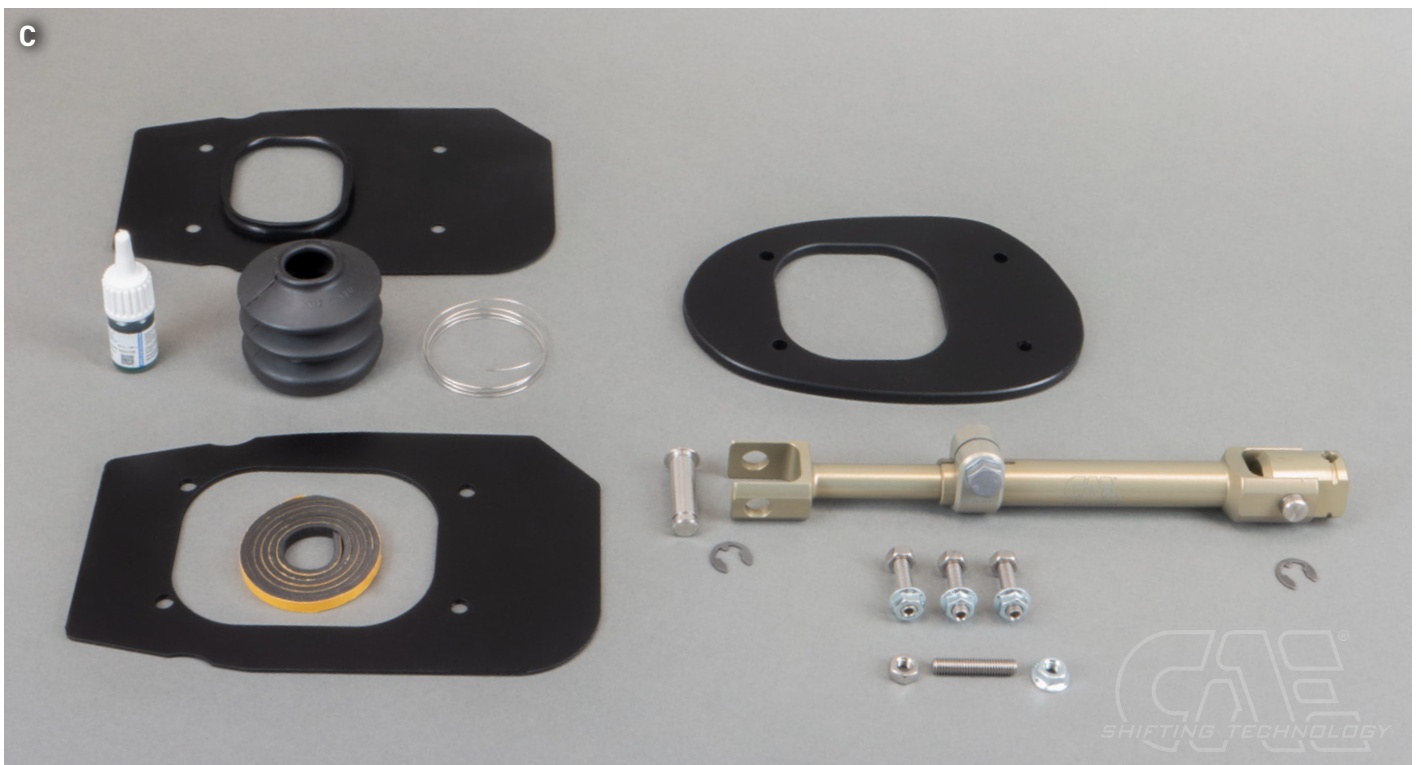
## TIPS FOR GEAR SHIFTING

### 📍 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 (The shifter is pre-assembled for shipping with 2 screws from the accessory package).  
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)



# THE ROTATABLE GEARSHIFT LOWER PART

## **i** MUST BE DISMANTLED FOR INSTALLATION WITH THIS SHIFTER

📍 The fixing screw engages in the groove of the lower part of the shift lever and thus fixes it axially. **The screw must never be installed and thus tightened without the toothed lock washer.**

The lower part of the shift lever must remain rotatable.

📍 **Familiarize yourself with this principle before installing the shifter!**

The insertion depth of the lower part, is 28mm the fixing screw must fit perfectly into the groove.

It must be possible to turn the shifter lower part without resistance in the shifter!

This is a condition for proper function.

📍 Tightening torque max 5 Nm

📍 It is essential to secure the screw with the wire supplied once assembly is complete!

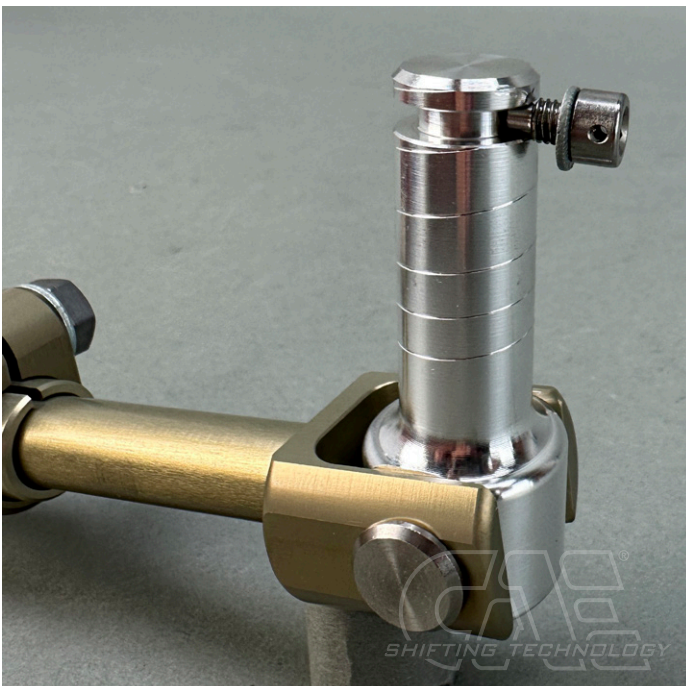
📍 **Regularly spray penetrating oil into the lubrication hole  $\varnothing$  2.5 mm above the fixing screw!**

**This is absolutely necessary for proper functioning! Make absolutely sure that the lubrication hole is clean!**

📍 We recommend Würth HHS 2000 for lubrication

**📍 IT IS ESSENTIAL TO PAY ATTENTION TO SCRUPULOUS CLEANLINESS DURING THIS WORK. DIRT, GRINDING DUST OR INSUFFICIENT LUBRICATION IN THIS BEARING BEARING WILL LEAD TO FAILURE OF THE SHIFTER WITHIN A VERY SHORT TIME!**

The following photos illustrate the principle of the rotatable shift lever base and are only for explanation!



## The spring stop

### **i** NEVER UNSCREW THIS SCREW COMPLETELY!

The center position of the shifter can be adjusted by loosening (max. 2 turns) the screw on **the spring stop**. (Picture 1)

Please **never** unscrew this screw completely, because you can only reassemble the mechanism in the installed state with a total loss of nerve!

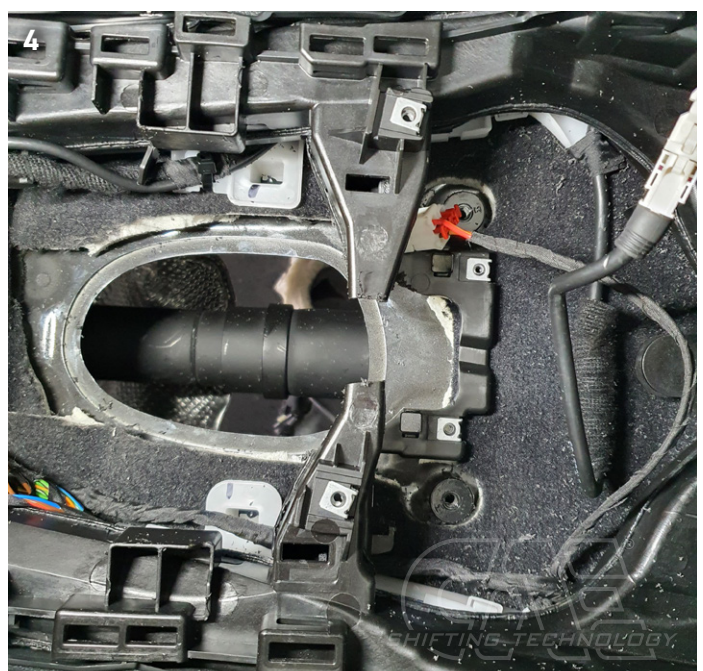
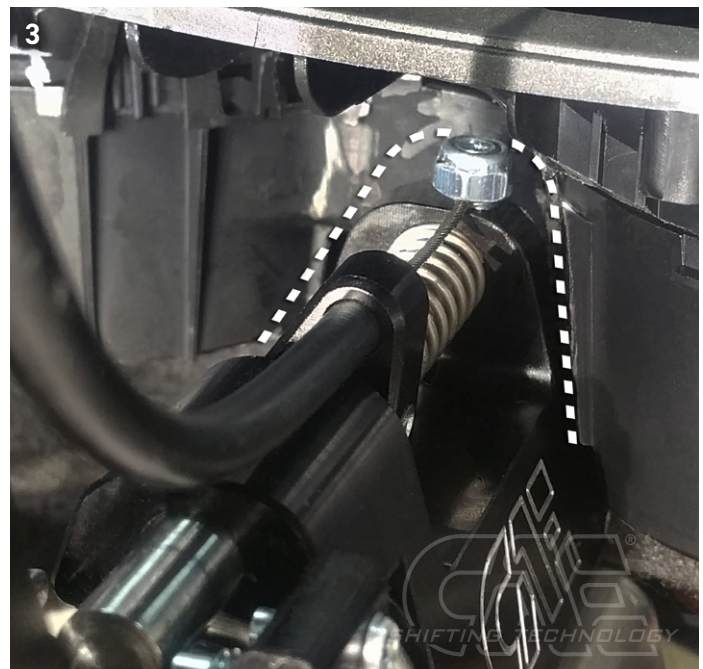
**To loosen the screw, use the Allen key supplied in the shifter package.**



**i** The shifter is intended for use with the original center console. This must be cut out according to these instructions until a corresponding clearance is guaranteed.

**i PLEASE NOTE:** Edit the center console. An air saw, for example, is suitable for this.

- ▶ Edit the center console. An air saw, for example, is suitable for this.
- ▶ Make sure that all moving parts of the shifter (reverse gear mechanism) have sufficient clearance when assembled.

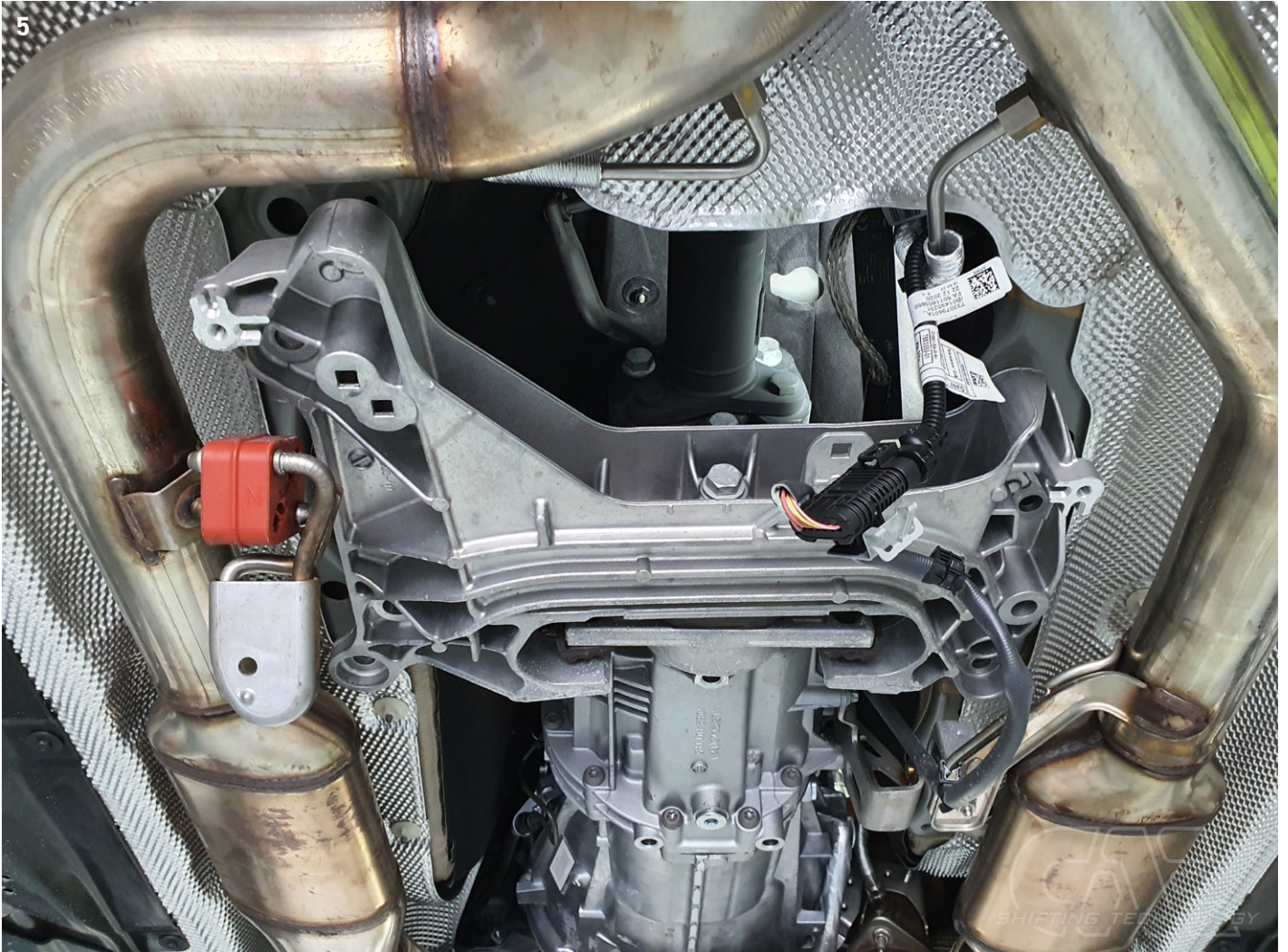


## The removal

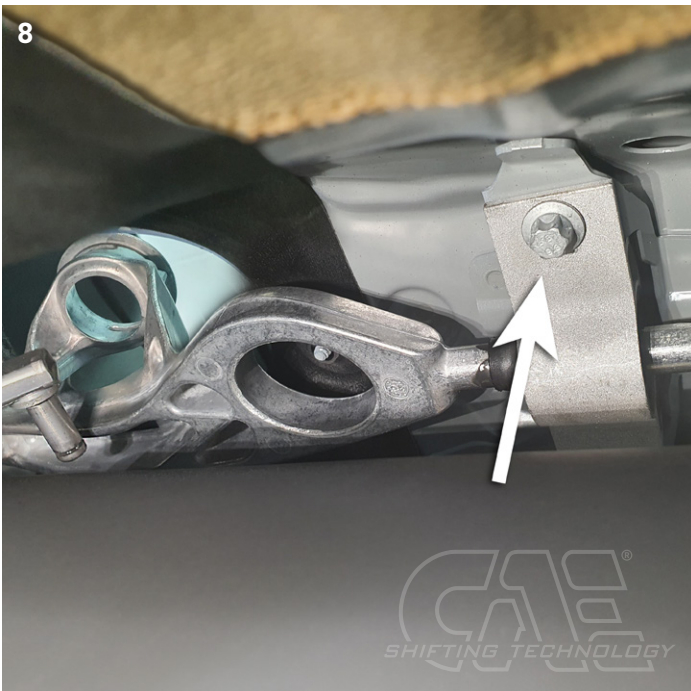
- ▶ Raise the vehicle safely on a vehicle lift. Shift transmission into neutral.
- ▶ Remove center console: Pull up shift bag, Pull up trim with I-Drive and disconnect connector from I-Drive.
- ▶ Pull up frame around shift bag and disconnect connector from drive mode switch.
- ▶ Unscrew cup holder. Now access the 2+3 front center console mounting bolts.
- ▶ Pull off cable clips and pull back cable.
- ▶ Remove ventilation unit from rear end of center console, disconnect all plugs (if phone is prepared, disconnect 2 plugs under cell phone holder) and unscrew 2 nuts for center console mount.
- ▶ Pull handbrake up **firmly**, unclip handbrake bag and remove center console completely.

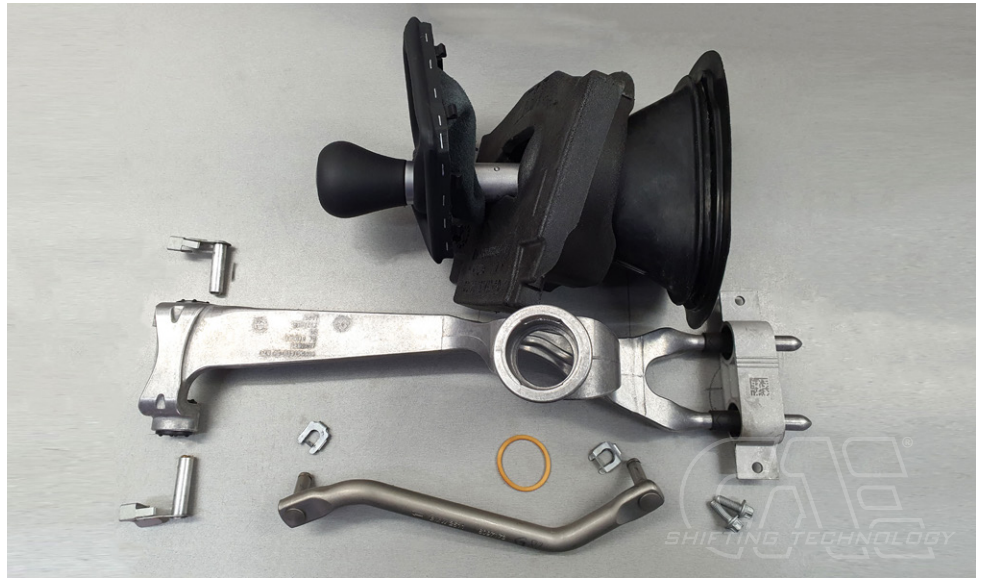
## Works under the car

- ▶ Remove underbody paneling. Loosen transmission bridge (Picture 5) and hang engine slightly, it does not need to be supported, nevertheless work carefully. Loosen the front heat protection plate and slide it backwards over the exhaust until you have access to the gearshift. **The cardan shaft does not have to be loosened!**
- ▶ Completely remove the original gearshift including the shift lever bearing. First remove the rear bolt of the gearshift rod from the gearshift lever by pulling the safety clip off the bolt (Picture 6).
- ▶ The aluminum shift lever bearing (Picture 8) is secured on the gearbox side with two bolt clips ([Picture 9], [Picture 10] on page 3), which are clipped onto the gearbox housing. Press up the clips with a long screwdriver and pull the bolts out to the side.
- ▶ Then unscrew the rear body mount (Picture 8) and thread the shift lever bearing down out of the tunnel. To do this, twist and turn the part accordingly to get it past the propshaft (it really fits!).



- ▶ To pull the plastic bearing of the shift lever out of the aluminum bone bearing, use a screwdriver to push in the tabs of the plastic surround of the ball through the openings on the side. (Picture 6,7,8)
- ▶ Remove the shift lever by pulling it upward.





- ▶ Completely remove the original shift rod. To do this, press the retaining clips off the 10 mm bolts of the shift rod and remove the shift rod from the side (Picture 11-15).
- ▶ Then press off the retaining ring from the gearbox connection piece and then press the 6 mm bolt out of the gearbox connection. Due to the tightness above the gearbox in the center tunnel, patience is required here!

**ⓘ The foam insert, dowel pin and circlip from the original adapter are still used! (Picture 16).**





# THE ADJUSTABLE CAE SHIFT ROD

## **i** CAE shift rod

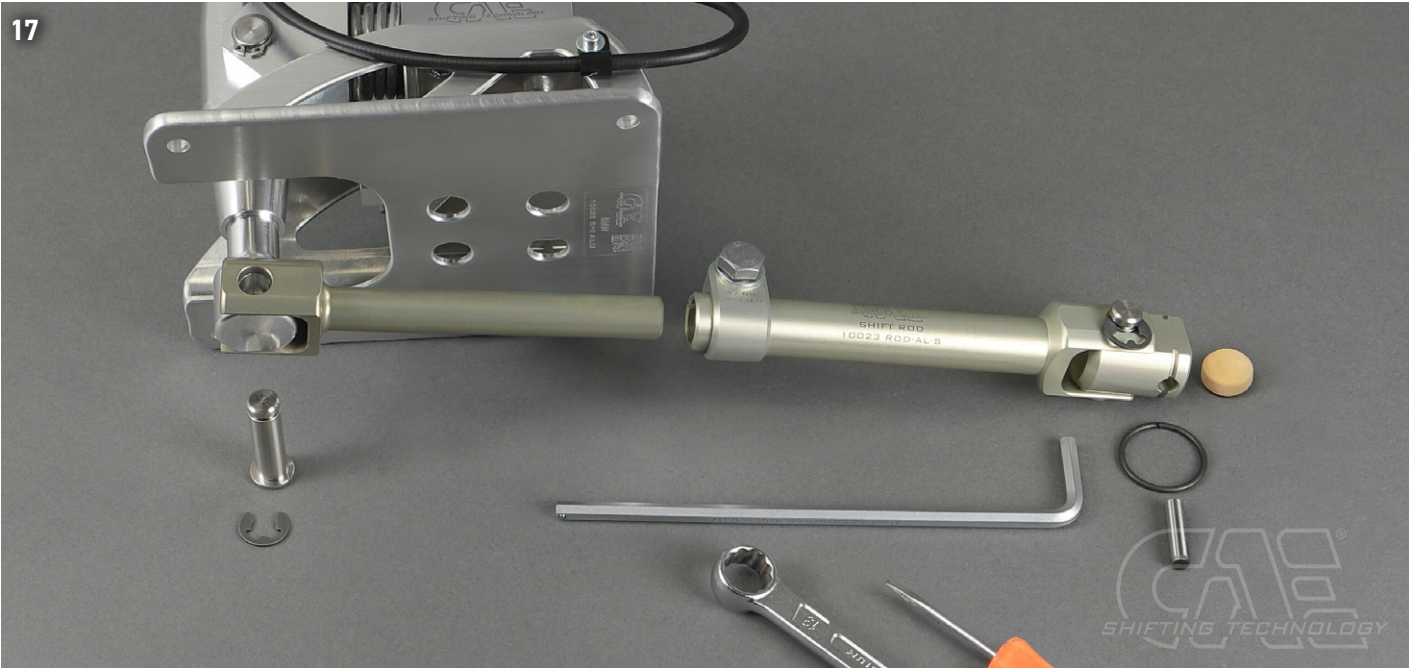
- ▶ Never use force to assemble our shift rod.
- ▶ Please carry out all work with extreme care and pay attention to absolute cleanliness !
- ▶ Never spray the moving connections/joints directly with brake cleaner or similar.  
This removes the grease layer in the joints and leads directly to seizure of the components.
- ▶ For cleaning and maintenance, use only a soft cloth and a little thin spray oil, such as Würth Multi.
- ▶ The CAE Rods are designed to fit our shifters exactly, they are designed 100% backlash-free and all dimensions are designed as a fit. This makes it difficult to turn the adapter as well as the lower part of the shifter by hand when mounted.  
The 10 mm fitting bolts sit tightly in each case in the fork and the adapter and the shift lever base turn only on the bolts.
- ▶ Absolute cleanliness must be ensured during assembly! Dirt in the bearing points leads directly to seizure of the components.
- ▶ For proper function and a long service life, the hinge pins and the contact surfaces must be well greased. This should be repeated once a year.

**i** **ATTENTION:** WD-40 or multi-oil are unsuitable for the LUBRICATION of the ROD joints and the shifter!  
We recommend **Würth HHS 2000** for this purpose.

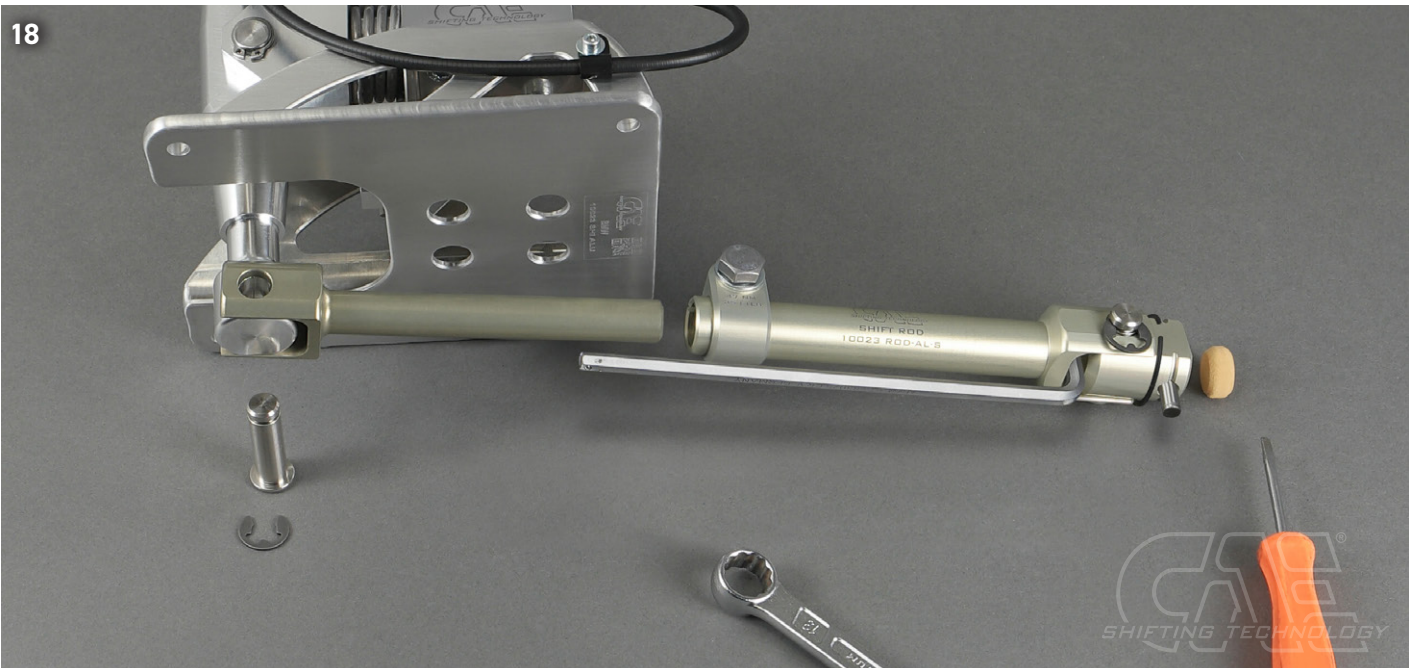
- ▶ Please carry out all work on the fitting surfaces/boreholes with extreme care!  
The clamping connection of the length adjustment must be kept absolutely dry and free of grease!  
Tightening torque of the clamp max 38Nm



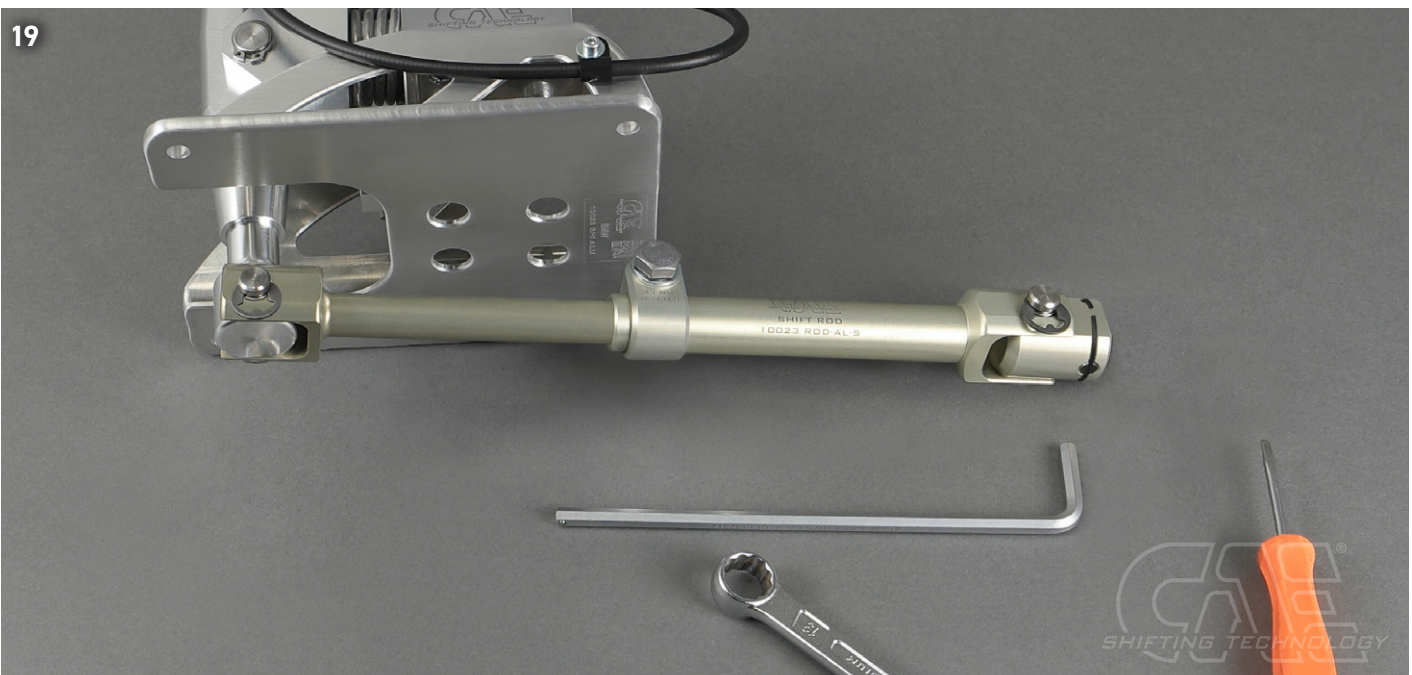
17



18



19



▶ Slide the original circlip over the notch into the "parking position" of the adapter so that it can be pushed back into the notch when installed. Also take the 6mm dowel pin and the foam insert from the original adapter and grease everything well. The foam insert serves as a grease reservoir and creates counterpressure so that the pin does not vibrate (Picture 14, 15, 16 on page 3).

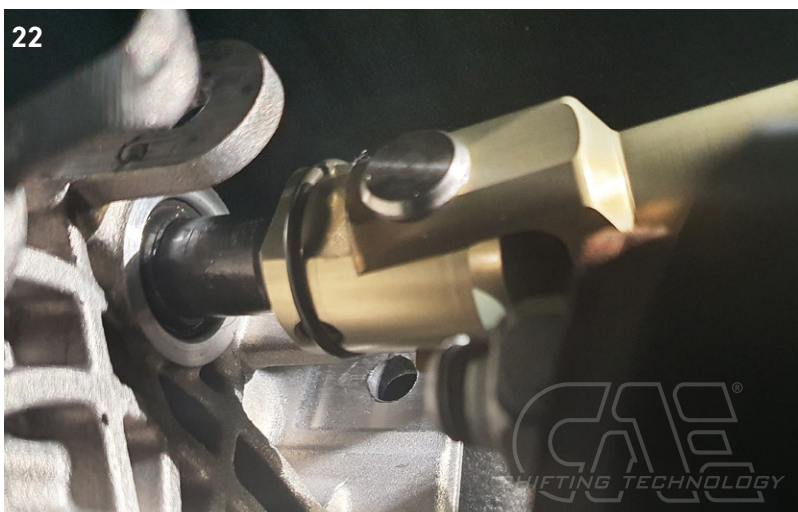
▶ Mount the shift rod prepared in this way to the gear unit using the gear unit adapter.

**i** We recommend inserting a 5 mm Allen key (as shown in Figure 18 on page 5) between the adapter and the fork to prevent the adapter from tilting and to be able to align the shift rod in the center tunnel and press in the dowel pin.

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

▶ Place the shift rod on the transmission shift shaft and align the adapter (Picture 20, 21, 22, 23). Press/knock in the 6 mm fitting bolt! It sits tightly in the adapter!

▶ Then push the retaining ring into the groove from the park position ▶ "Click!"



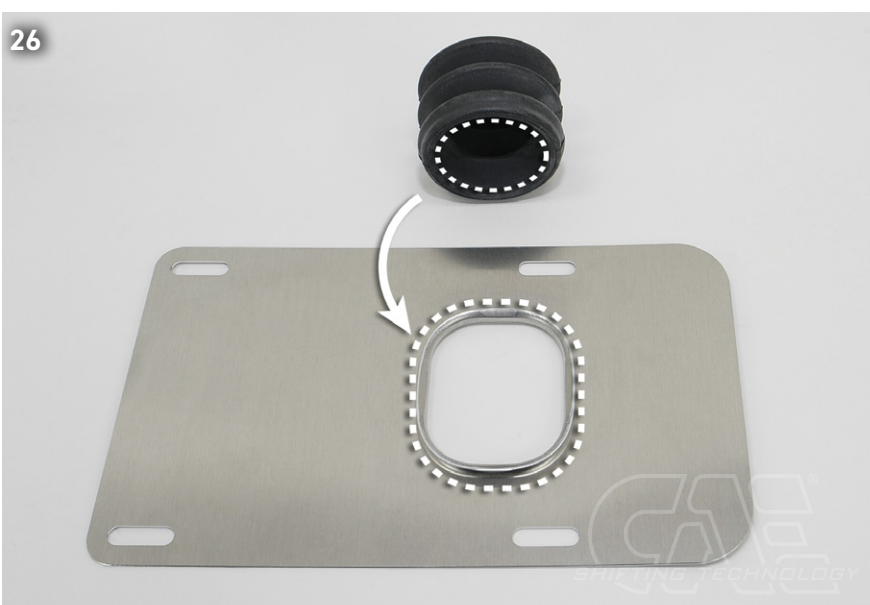
- ▶ Unscrew the fixing screw of the lower part of the shift lever (Allen key 4 mm) Remove the screw and toothed lock washer. Pull the lower part of the gearshift lever (SHU) out of the gearshift lever. Grease the fork of the shift rod and mount the SHU with the 10mm bolt.
- ▶ Carefully tap the bolt into the fork using a plastic or aluminum hammer. Make sure that the hole in the lower part of the shift lever is aligned with the holes in the fork. (Picture 24, 25)

**ⓘ We recommend using a second plastic hammer or a plastic pad as a counter-support!**  
**It is essential to work carefully! Do not damage bores in fork and shift lever lower part!**

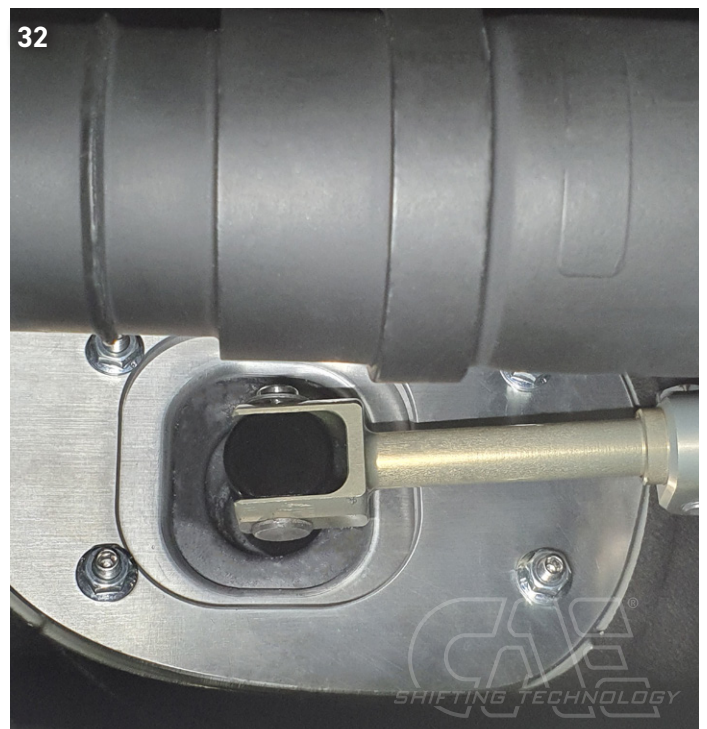
- ▶ Push the two shaft lock rings into the grooves of the 10 mm bolts "Click!"
- ▶ If the shift rod halves are separated (as shown in Picture 19 on page 5) they have to be reassembled absolutely free of grease. the set length/position of the shift rod can no longer change after the clamp has been tightened!



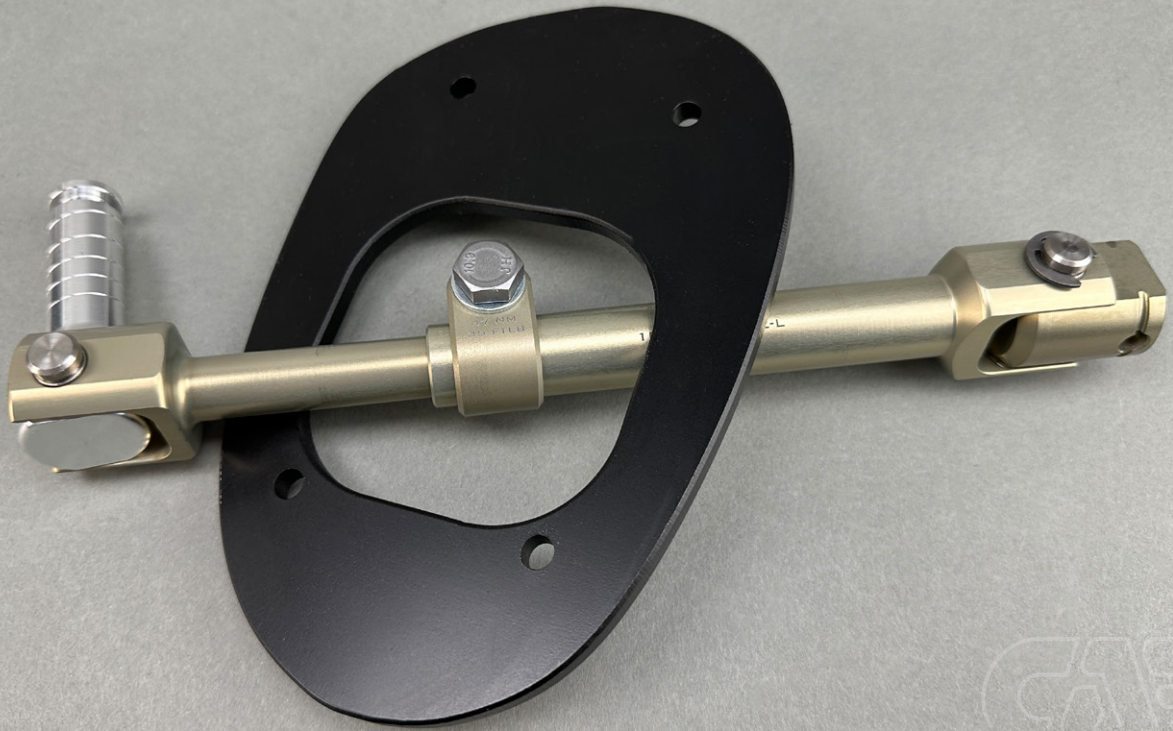
- ▶ Mount the rubber bellows on the cover plate (please degrease first!) (Picture 26, 27, 28). Mount the plate incl. rubber bellows on the shifter (as shown in Picture 29). The upper bead of the rubber bellows must fit into the circumferential groove on the shifter. If necessary, use a few drops of brake cleaner as a lubricant.



- ▶ Complete the shifter with the grub screws, the spacer and foam rubber. See picture.  
Glue the grub screws and lock them on the upper side with the supplied nuts, no thread of the grub screws is visible anymore. (Picture 29 )  
Glue on the Moss rubber strips as shown in Picture 29a.
- ▶ Hang the counter-support (Picture 30 right) over the already mounted shift rod (6mm thick) (Picture 28). Make sure that the mating layer is correctly aligned; it fits 100% into the tunnel reinforcement plate from below (Picture 32).
- ▶ Place the complete shift unit on the tunnel, carefully insert the lower part of the shift lever into the 16mm shift lever hole. Make sure that the hole is clean and well greased.
- ▶ Now screw the shifter, the cover plate and the counter layer together from below using the 4 ribbed nuts supplied (10 Nm) (Picture 32-34).
- ▶ Screw in the fixing screw of the lower part of the gearshift lever including the toothed lock washer. It must engage in the groove, see page 3 (Allen key 4mm max. 5 Nm).  
Secure the screw with wire (see Picture 34).



31



33



34



- ▶ The zero position of the gear unit must now be determined (see also "Adjusting the shift travel"). To do this, loosen the spring stop (Picture 35-37) under the gearshift block with the Allen key provided until it can be moved sideways (max. 2 turns). The spring is now without function.

**i** Never unscrew the screw of the spring stop completely!

(see information "The spring stop").



### Adjustment of the gearshift travel 6-speed gearbox

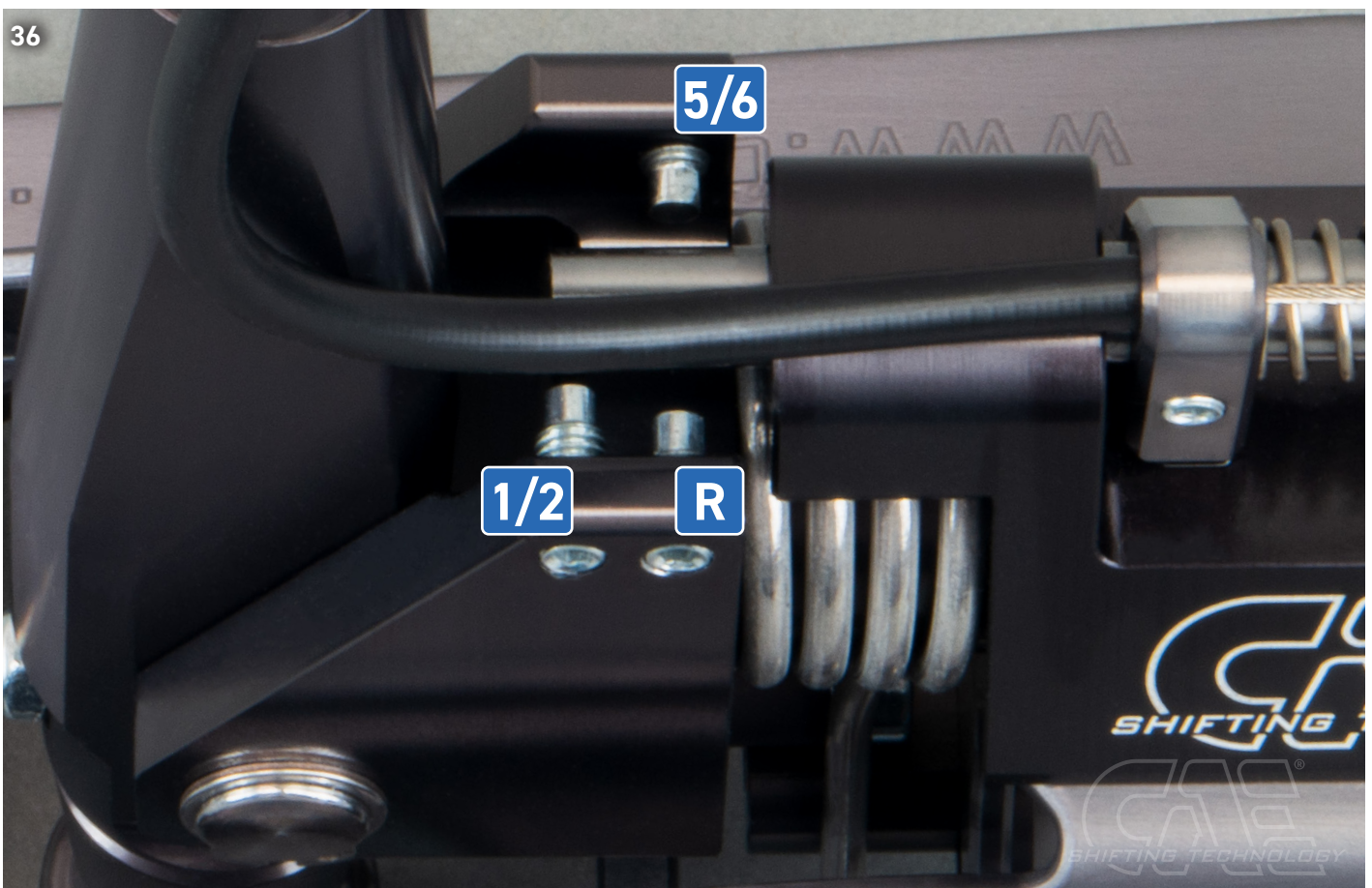
- ▶ Align the shift rod to the shifter very precisely in length and angle and tighten the clamp screw to 47 Nm. Several attempts are probably necessary here to find the perfect position. (Not applicable for series shift rod)
- ▶ Perform a collision check on the lower part of the shifter/shifter rod in all gears! There must always be sufficient clearance between 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 Fig. 32) Please check from below!
- ▶ The center position spring in the shifter must be synchronized with the spring in the gearbox. To do this, shift the gearbox to gear level 3/4. This is the zero position of the transmission. To do this, simply move the shift lever forwards or backwards.



**With 3rd and 4th gear 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).**

- ▶ Per Schalthebel Getriebe in Gang-Ebene 1/2 schalten und die Anschlagsschraube einschrauben, bis sich der 1. und 2. Gang sauber schalten lassen. (Bild 36)
- ▶ Nun per Schalthebel das Getriebe in Gang-Ebene 5/6 schalten und die Anschlagsschraube einschrauben, bis sich auch diese Gänge sauber einlegen lassen. (Bild 36)
- ▶ Rückwärtsgang-Sperrstift über Zug betätigen und das Getriebe in den Rückwärtsgang schalten. Anschlagsschraube einschrauben, bis sich der Rückwärtsgang einlegen lässt. (Bild 36) Hierbei muss zusätzlich die Federdrucksperr im Getriebe überwunden werden.

**ⓘ 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 gap is okay!**



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

**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!**



# RACE THE ORIGINAL



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