Steering lock repair or replacement
2000 Europa G500 & other G Models
by J.R. Brown *"with a little help from my friends"*

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While this procedure is not for the faint of heart, it is not a technically demanding task. It does require some specialized tools and great patience.

This procedure is highly recommended prior to any difficulties with the steering lock and absolutely recommended the first time that the steering lock sticks. I would not want to resolve this problem away from home. You will know that the steering lock is starting to fail when the key rotation stops prior to position 2 or it will not rotate at all. If this happens, and you are able to eventually get it to free up, DO NOT REMOVE the key until you are ready to fix the steering lock. You can still drive, start and turn off the G. The steering lock does not engage until you pull the key out. You will just have to leave a key in the ignition and carry a second key to lock and unlock the G. If this is your situation, read the *Other Conditions and Thoughts* at the end of this repair article.

General notes about the task

- Read all of this before proceeding.
- As always, kids should not be near this task.
- Airbags are very dangerous. If you are not comfortable working around airbags, then don't.
- Call your dealer or favorite mechanic and ask what the shop time is on this. I suspect that it is 2-3 hours plus the part.
- The task can be used to simply install a new steering lock or perform the permanent repair.
- This is about the steering lock failing, not the key cylinder failing.
- I would have used a metric set screw, but this is a permanent solution so it doesn't matter.
- The permanent repair is just that. You can never recover the steering lock to its original purpose.
- In the States, steering locks came into being decades ago as an anti theft deterrent. The only other purpose it can serve, that I can think of, is the fact that when you park on a hill you turn the wheels against the curb as a roll prevention step. If for some reason the vehicle starts moving (hit, parking brake not set), the wheels would be free to steer themselves out of the curb.
- The permanent repair might not be legal in some states or countries. I just don't know what the inspection rules are.
- In the end, if you use the permanent repair, the warning buzzer will sound, even if the key is removed because the system depends on the steering lock to engage to disconnect the buzzer. You can experiment later with connecting and disconnecting the buzzer at the switch by opening the access panel at the driver's knees and disconnect the harness. I do not know if any other system depends on that switch.

Parts

- A001 462 02 30 Steering Lock. Order a new one even if you chose the permanent repair. The reasoning behind this is if you make a mistake during the permanent repair, you can fall back on the new steering lock
- 10-32 stainless steel set screw about ½ inch long
- Steering thumb controls (good time to replace if yours are looking worn)
    - A 210 821 25 51 Left
    - A 210 821 25 51 Right
    - Yes, both numbers are the same

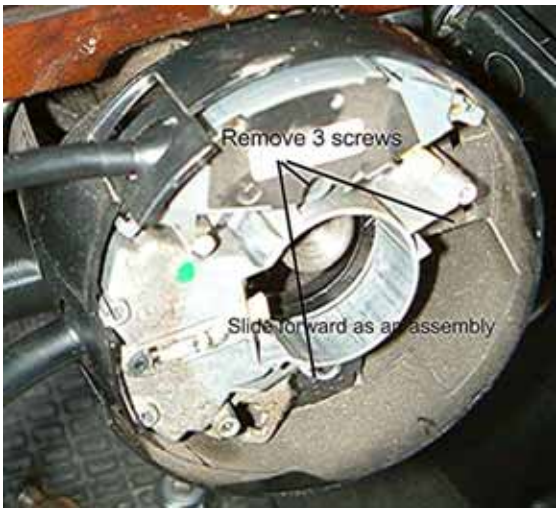
Tools

- 126 589 00 10 00 extra long, 2 ¾ inches, T30 bit. For airbag removal
- 140 589 02 33 00 pulling hooks
- 10-32 tap and 5/32 drill bit. Sometimes sold as a set. For permanent set screw installation
- 3/8" ratchet with a ¼" socket. To turn the T30 bit with
- Small mallet (To tap the T30 bit on the end to ensure that it is fully seated)
- Blue Loctite
- 10mm socket, flexible joint, short extension and ratchet
- 10mm hex drive, short extension, 12-18 inch ratchet or breaker bar
- 13mm combination wrench (battery negative cable)
- #2 phillips head screwdriver
- #1 phillips head screw driver
- Needle nose pliers
- Black Sharpie (permanent marker)

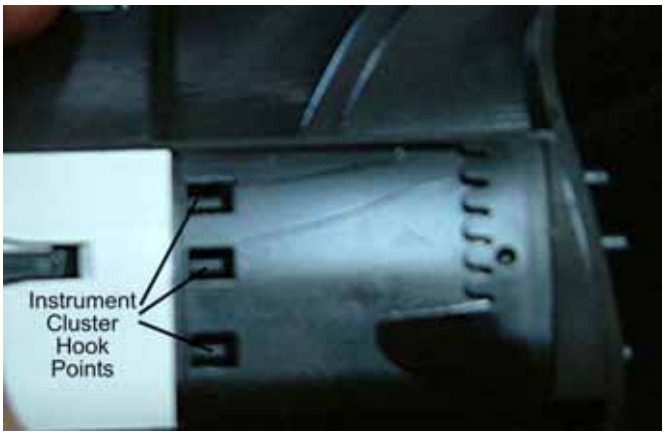
Steps

- **<u>Disconnect the ground cable from the battery. This is for your safety around the airbag.</u>**
- If the ignition key is not already in the lock, do so and rotate the ignition key to get the steering lock to withdraw.
- Turn the steering wheel 90 degrees from center and access the small hole in the back of the lower half of the steering wheel. Insert the T30 drive and work it in. When you are certain that the T30 bit has found home, take the mallet and firmly tap it to make sure that it fully seats. If you strip the head of the bolt, you are in a lot of trouble.
- Using a ¼" socket and ratchet, take a firm hold, apply pressure towards the bit, hold the steering wheel with your free hand and give the wrench a good firm counterclockwise turn (righty tighty lefty loosy). The bolt is installed with Blue Loctite so it will resist.
- There is no need to withdraw the bolt and you shouldn't for reassembly ease.
- Rotate the wheel back to center and then 90 degrees the other direction and repeat the procedure.
- Turn the steering wheel back to center and remove the ignition key
- Remove the airbag being careful of the two electrical connections. DO NOT disconnect at the connector at the center of the steering wheel. Disconnect the two electrical connectors at the airbag. Note the direction of the airbag connector with the permanent marker on the back of the airbag. Place the airbag on the back seat
- Confirm the steering wheel is centered (and of course the tires should be pointed straight ahead. This can't be emphasized enough. If the steering wheel is not centered, then the contact spiral will not be aligned properly for removal later.
- Using the 10mm Hex head drive and a long ratchet or breaker bar, remove the countersunk head bolt. It is not easy since it was installed with 80Nm.
- Once the bolt is removed, DO NOT remove the steering wheel yet. Look for the vertical alignment marks on the steering wheel and spindle. If you do not see them, make some with your marker.

- Now lift the steering wheel off. Place on the back seat
- Remove the contact spiral using a #1 phillips head screwdriver on the 2 screws. Lift off carefully and place on the back seat
- Dismount the jacket tube and switch assemblies by using a #2 phillips head screw driver on the 3 screws. The wire harness on the top right can be lifted over the metal structure and the entire assembly will hang below the steering column. Do not disassemble further



- Remove the center vent assembly using a #2 phillips screwdriver.
- Caution, if you grasp the outer trim of the cluster with the hooks, you risk snapping the edge off. There are hook points in the side of the cluster. Using the pulling hooks draw the instrument cluster out by moving each side a little bit at a time. By removing the center vent, you may be able to using your finger to move the cluster on that side and you can see the hook points.



- Once the instrument cluster is removed, the two wiring harnesses each have a lever that when unlocked and rotated, will release the harness. Place the cluster on the back seat.
- You do not have to remove the wood trim despite what it says in the WIS.

- Using a pair of needle nose pliers, grasp the electrical connector at the bottom of the steering lock and remove. There is an additional wire harness that may require disconnecting that originates off the same black switch. It was not connected to anything on my truck. Be very careful of a single black wire that is snaked through the area. It is a sensor wire that in-circles the fascia around the ignition key hole.
- Remove the wiring harness at the back of the steering lock assembly.
- Grasp the outer ring of the ignition switch fascia and rotate counter clockwise. After about 3-4 complete rotations, you can slide it out. Attached to it is a long black wire. It is the sensor wire for the ignition interlock security system. BE CAREFUL. DO NOT BREAK IT OR PINCH IT.

- Insert the ignition key, rotate the key to the 2 position, insert a probe (the end of a removal hook works nicely) into a small release hole at the back of the lock assembly at about the 3 o'clock position. You may have to rotate the key a bit back and forth to slide the key and lock cylinder out. At this point the steering lock is where it should be, disengaged.
- Using the 10mm socket, flexible joint, extension and ratchet, remove the bolt that holds the fixing clamp.
- Rotate the fixing clamp opening towards the engine compartment about 45 degrees. This will seem harder that it should. The back of the collar has a small alignment "dent". You can over come this by simply take a long screw driver and pushing or bumping the collar around the shaft. You will be looking for a small opening that will have a locking tab protruding through it. This locking tab insures that the steering lock assembly is positioned correctly. Depress it and begin to move the steering lock assembly towards your right. You will have to rotate it so that eventually the lock cylinder bore is facing downward. You will have to contend with some ventilation hose, but there is room.

- When the steering lock is free of the steering lock housing, remove the steering lock out through the instrument cluster void.
- Remove the locking collar (has the 10mm bolt in it)

Installing a new steering lock

- Slide the lock cylinder and key into the cylinder hole and rotate the key to number 0 (lock will engage).
- Using your favorite lock assembly lubricant, lubricate the steering lock bolt and shaft. It looks like the manufacturer uses the equivalent of the sunroof grease.
- Rotate the key to the 2 position, insert a release pin and remove the lock cylinder and key again.
- With the old steering lock in the disengaged position (equivalent to the key in position 2), slide the black warning buzzer switch out and install into the new steering lock (also in the disengaged position)
- Resume assembly

Permanently repairing the steering lock

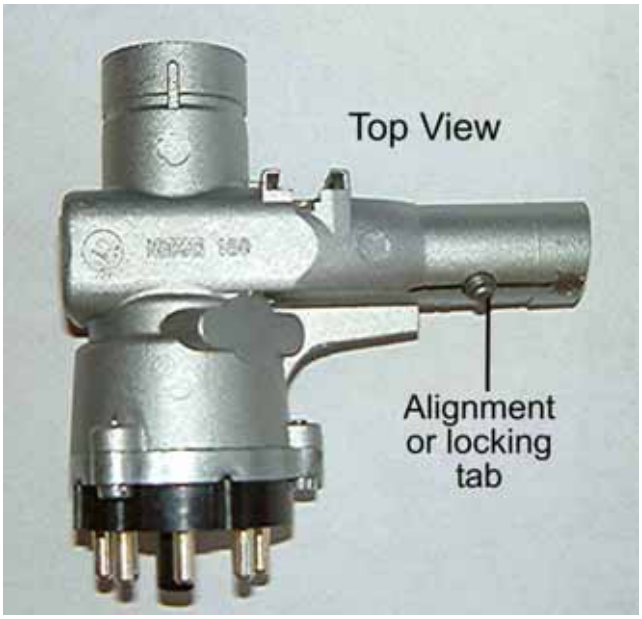
- With the steering lock in the disengaged position (equivalent to the key in position 2), note the end of the lock tube. When this task is complete, a set screw will go through the side of the lock tube and you will see the base of the deep notch being held back by the set screw. Some error is okay, but the ideal is that the locking shaft inside the tube is held in one place and is not moved deeper or shallower in the tube.
- Measure the depth of the notch, mark it on the outside of the shaft housing.
- Place the 5/32nd drill bit on the edge of the mark and mark the other side of the drill bit. Split the difference between the two marks and mark it.
- Using a center punch, make a starter mark for your drill bit.
- Using the 5/32nd drill bit, drill through the outer casing. (A drill press is ideal, but not necessary.
- Using a 10-32 tap, tap the hole.
- Knock all of the loose debris out. I do not recommend blowing it out.
- Thread the set screw in and out a few times. On the last time, place some Blue Loctite on the threads and screw it in.
- Using a file or small grinder, grind all excess set screw material away so that it is flush with the outer part of the cylinder.
- Insert the cylinder and key and perform some trial rotations. It should feel very free and easy to turn. Enough to make you worry, but don't be.
- Remove the key and its cylinder as described earlier
- Resume assembly

Reassembly

- Congratulations. At this point, it will be worrisome at how fast it will all go back together. Just take your time and account for all of your hardware as you reassemble
- Looking at the locking collar, note the alignment "dent". When reassembled, that tab will need to align with the slot on the back of the steering lock housing. Install the locking collar so that you can see the hole in the steering lock housing.
- Reinstall the steering lock and note that the locking tab needs to engage in the hole on the top of the steering lock housing.
- Rotate the locking collar back to its original position.
- While keeping the ignition key bore centered in the rough opening, tighten the 10mm hex nut.
- Reattach the large wiring harness to the back of the steering lock.
- Reattach the warning buzzer wiring harness.
- Insert the key bore fascia. Note that it is keyed. See the small metal fin at 12 o'clock on outside of the ignition key bore.
- Be careful to rethread the black wire so as to not be pinched.
- Rotate the collar clockwise noting that 0 1 and 2 on the fascia are correctly positioned.
- After the collar is fully seated, gently push the inner fascia to insure that it is fully seated.
- Double check that the two wire harnesses are reinstalled and the 10mm hex bolt is tight
- Connect the two wiring harnesses of the instrument cluster and slide the cluster back into place using equal pressure on each side of the instrument cluster.
- Reassemble the jacket tube and switches. Do not over tighten the phillips screws. Note the mounting interfaces of the switches. When installed correctly, there should be no air gaps.
- Reinstall the contact spiral. Note the diagrams of the car and which way it faces along with the alignment tabs.
- Place some Blue Loctite on the airbag bolts before installing the steering wheel.
- Reinstall the steering wheel while threading the two wiring harnesses through the appropriate opening. Note the alignment marks.
- Place some Blue Loctite on the countersunk head bolt. Tighten to 80Nm.
- Replace the steering wheel switches if desired at this time.
- Reinstall the airbag. 8Nm (eight).
- Connect the airbag and wiring harness.
- Reinstall the center air vent.
- Reconnect the battery ground.
- Start the engine.
- Enjoy the ride!!!
- Have you changed the ignition key batteries lately? Two per key.
    - CR2025 are the correct ones. Allows the battery cover to give a good weather seal.
    - CR2032 are okay in a pinch but are too wide and too thick.
    - When installing the new batteries check that the contactors on the side of the battery bore are making good contact. BE VERY CAREFUL if you need to tension them out a bit.

Other conditions and thoughts

- Key will not rotate (this has happened to me)
    - Bang the steering wheel as you try to rotate the key.
    - If the steering wheel feels like it is pinned against one particular side, try turning the wheel the other direction and rotating the key.
    - Failing that
        - Raise the front end off the ground to free the steering wheel of any tension.
        - Remove the access panel at the driver's knees.
        - Locate the steering lock. Being careful, use a long wooden dowel and hammer and bang on the steering lock assembly as a helper tries to rotate the key while keeping the steering wheel as neutral as possible.
        - When the lock rotates, DO NOT REMOVE the key.
- Key will finally rotate, so I haven't removed the key. I elected to remove the key during my repair because I was confident that the steering lock had not completely failed. Your situation may be different and I offer a theory on another way to do it. Consider visiting with a mechanic (not a service writer) experienced in this before you make your decision. The mechanic may have a very slick trick that will make it worth your while to have him do the entire job.
    - Disassemble as far as you can without removing the key. This means that you can't yet remove the key bore fascia.
    - You will have to do this somewhat blind, but since you bought a new steering lock anyway, you can orientate yourself. Find the small hole through which you will release the lock cylinder. Using a stiff piece of wire, build a release tool that you can use to reach through the instrument cluster void and insert into the small hole. Rotate the key to position 2. Rotate the fascia collar counterclockwise until it can go no further because the key is still in. Using your homemade tool release the lock cylinder while pulling and rotating the key gently about position 2. You should feel the key cylinder free itself. Continue to rotate the fascia as you ease the key and lock cylinder out together. Once out, you can pickup on the remainder of the disassembly. You will have to hold the lock cylinder in one hand as you rotate the key to remove the key.


Top View
Alignment
or locking
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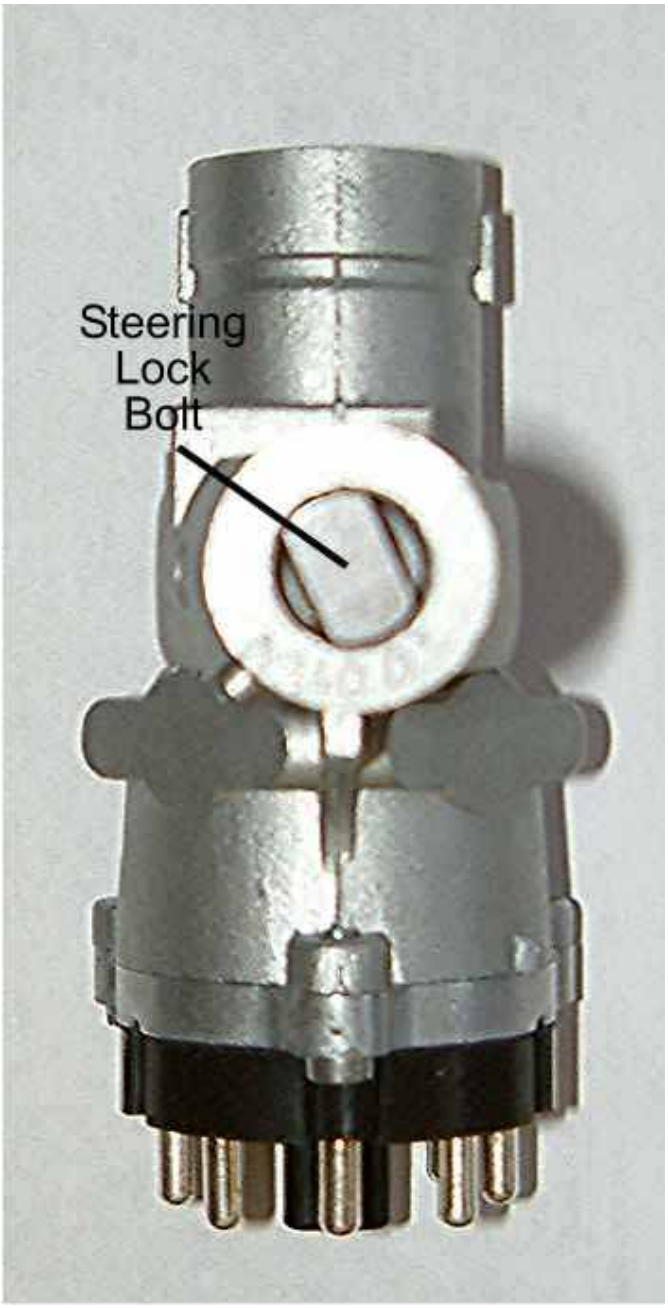
Steering
Lock
Bolt


Bottom View