Assembly Manual

Always consider common safety guidelines for work on motor vehicles, for example:

- let the engine cool down
- disconnect the battery
- keep safety distance when engine is running
- wear eye protection

1. Open the hood and pull off the engine cover.
If the cover's rubber mounts stay on the engine, pull them off and slide them sideways back into the
attachments of the cover.
2. Look into the area below the glow plugs. There you can see the four swirl flaps from the top as well as
the operating rod. The rod probably lies next to the swirls.
3. Pull off the four glow plug connectors. Make sure you only pull on the connectors, not the cables.
Be Careful: The connectors are snapped on quite tightly, so when you pull they will pop off very
suddenly – risk of hand injury.
4. Take out the swirl operating rod. On some cars this can be done by hand, but on others it is easier to
make a pair of hooks from thick wire, for example an old coat hanger.
5. Mark the rod on the top left side with a marker, so you know up/down and left/right for later.
When you have the operating rod in your hands, the rod repair itself begins:
6. Remove the plastic bushings from the rod. This is done most easily with side cutting pliers or nipper
pliers. Knives are not recommended due to the risk of injury. Also remove remains in the 3mm holes
of the rod. Be Careful: The plastic material can burst.
7. Some engines have very limited space available at the third swirl flap from the left. Put one of the bushings onto this swirl flap and check for the clearance of the bushing, especially the threaded pin and nut. If there is enough clearance jump to point 9. If not, continue with point 7.
8. At the operating rod’s position of the third swirl from the left (note the mark you made before) drill
a countersink into the hole from the top, so the countersunk bolt is just flush with the bar. Do this
step by step, so the countersink will not end up being too deep. You can simply use a drill for this
operation, e.g. 5mm.

9. Put the countersunk bolt through the hole, add some high strength threadlocker (e.g. Loctite 270)
on the thread, mount the separate bushing that was supplied and tighten the bolt.
10. Now mount one bushing after the other. Put the threaded pins through the holes in the rod from the
bottom (the mark helps), slide the spring washer over the threaded pin and keep it in place with the
nut.
If the holes should contain some plastic remains, even small ones, it may be difficult to mount the
pins. In this case use a 3mm drill to drill the holes open.
11. When all four bushings are loosely fitted, tighten them from the left to the right (so you
don’t forget one) with a 5.5mm spanner. When doings so, hold the bushings in place by hand or keep
the threaded pin in place using a 1.5mm hex key (if available).
Now you „just“ need to re-mount the rod:
12. If possible, try to clean the area around the swirls a bit and to wipe off some of the tar-like oil-carbonmix from the EGR.
13. Use a long screwdriver to turn the swirls' ball joints to the same position as the third swirl from the left
(approx. 10 o'clock - the actuator is on the back of the third swirl, so this one cannot be moved).
14. First put the operating rod back on all the swirls' ball joints (note your mark for left/right), and then
(not before) firmly press it on to the joints - both most easily from the right to the left. This takes a bit
of fiddling and probably also several tries.
The long screwdriver can help as a guide during this procedure, and so can the wire hooks.
Inside the bushings there is a bit of grease, which can be squeezed out when attaching
them to the ball joints. This is no problem at all.
15. Put the four glow plug connectors back on the corresponding glow plugs and make sure they snap
firmly.