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# BMW Z1 March 1989-June 1991

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***Please read the first few steps carefully as these are our most common questions we receive after a client has performed a repair and the odometer still does not work.***

*The reason the original gear or gears have failed is that they are made of urethane and lubricated with petroleum grease. This combination breaks down the urethane into a waxy substance which flakes and breaks away. This will also leave a waxy film and deposits on the shafts, gears, housing and peg on the pods.*

** Work smart, meaning have a clean area to work and the proper tools to perform the repair. General tools that will be needed depending on the vehicle are small standard screwdriver, small Phillips screwdriver, assortment of torx drivers, diagonal cutters (dikes), 1/4" socket set are just a few of the items that may be needed.*

** No grease is needed with the new gears. Our gears are made using Celcon® which has graphite mixed into the material and does not require any additional lubricant.*

**** Make sure that you have blown the speedometer and odometer assembly clean with high pressure compressed air. Even if you think that you have found all of the broken pieces you still need to perform this step.***

**** Wipe the area around the gears, any shaft or shafts that the gears may ride on, the motor shaft and the peg on the pod that the small gear spins on clean, using a clean cloth and rubbing alcohol. Any residue left over from the old gears can allow the new gears to stick and not allow the odometer to work.***

**** On units that use a gear and pod combination: install the gears into the housing first and then install the motor assembly. Before installing the screws that secure the motor and circuit board use a small standard screw driver and rock the tenths digit of the odometer up and down. This will help to seat the gears into place and allow the motor assembly to seat fully.***

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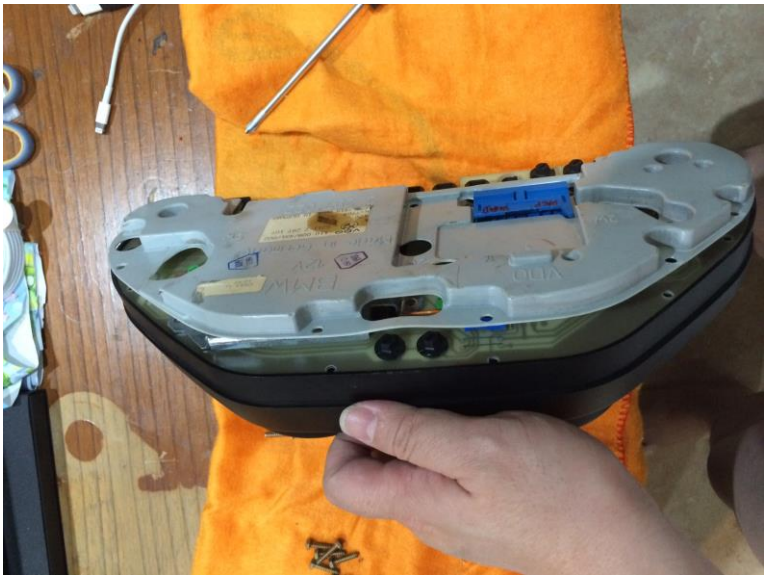
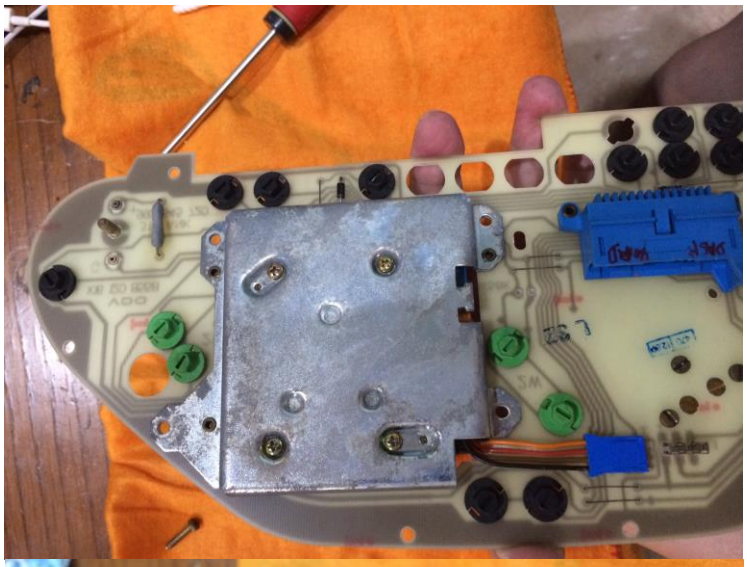
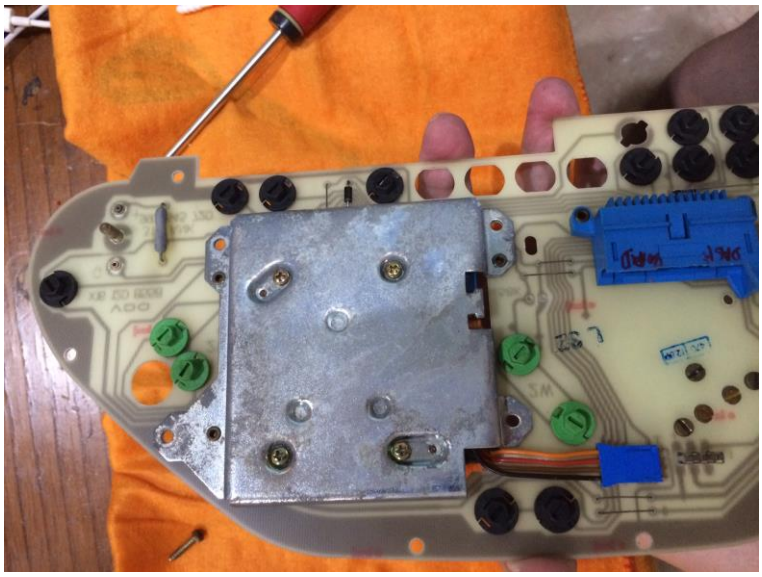
Remove eleven (11) screws that secure the grey plastic backing



Unplug small blue plug from circuit board.

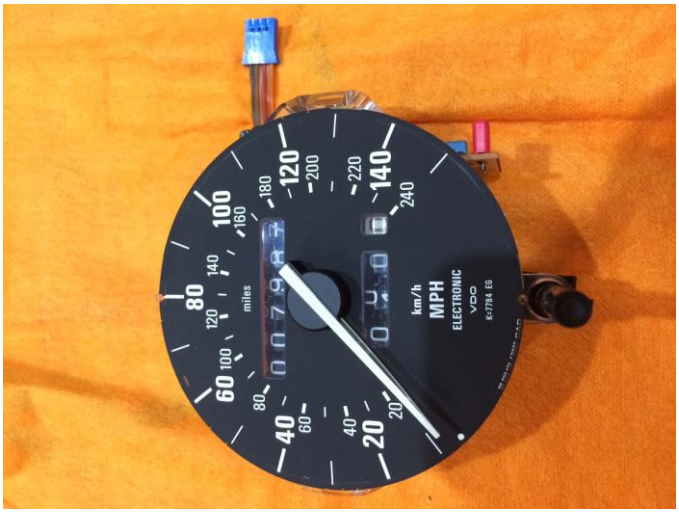


Remove four screws that secure speedometer into cluster.

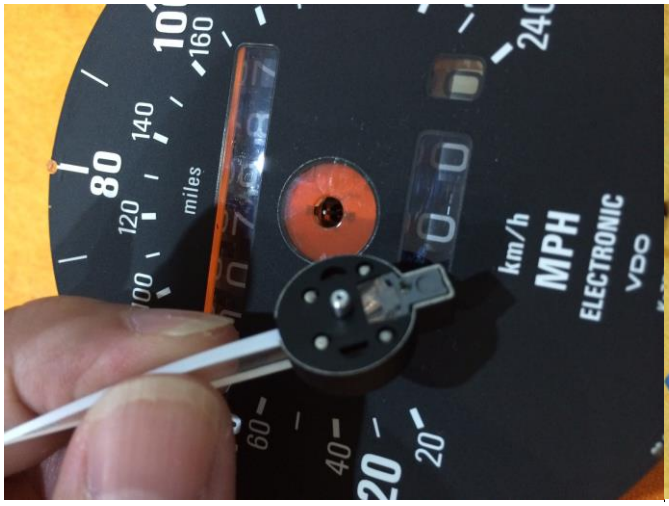


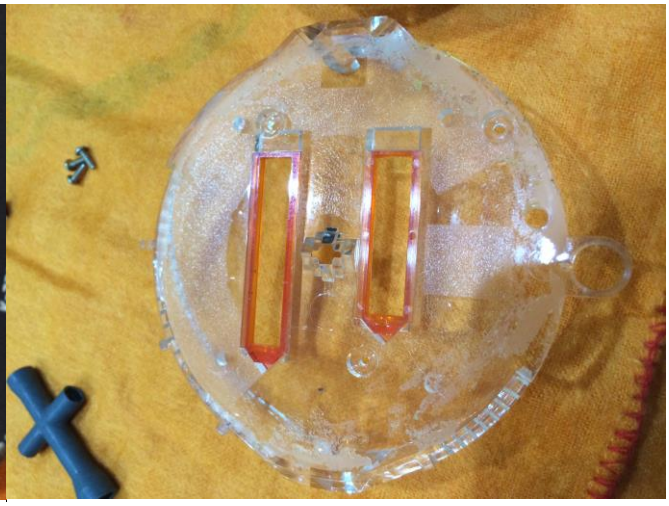
With the speedometer out of the cluster the next step is to remove the speedometer needle. Before beginning make a small mark on the very edge of the speedometer face where the needle is pointing as this is where the needle needs to line up when the job is complete. Sometimes there is a factory mark but your needle may rest slightly higher or lower. This will help to ensure the speedometer is close to the proper speed calibration when driving.

***DO NOT PRY UP ON THE NEEDLE TO REMOVE!*** *This is the trickiest part of the job. The needle is pressed onto a shaft that is extremely thin. It feels like a pretty tough metal, but you need to be careful here. Do not pull straight up. Do not put any torque on the shaft. Grip the speedometer needle at the center and rotate counter-clockwise, you may have to gently lift the needle above the needle stop, until it hits an internal stop. Gently continue to rotate the needle while also gently applying a small amount of upwards tension at the same time. The friction is all that is holding the needle to the shaft. Keep turning and applying a small amount of upwards tension until the needle comes off. Do not force it.)*

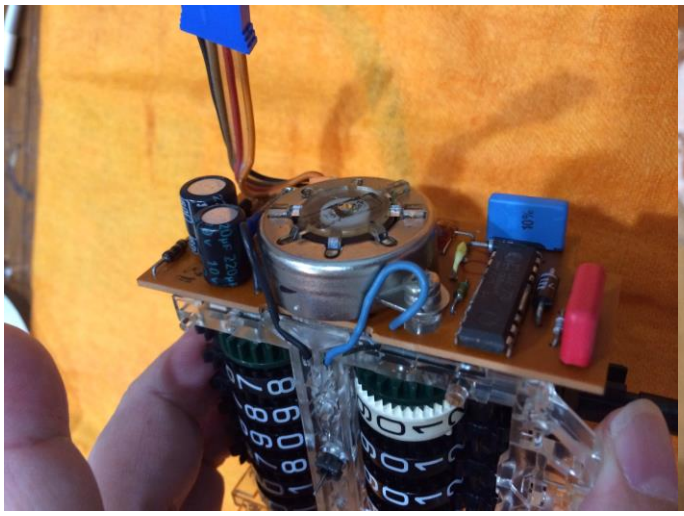


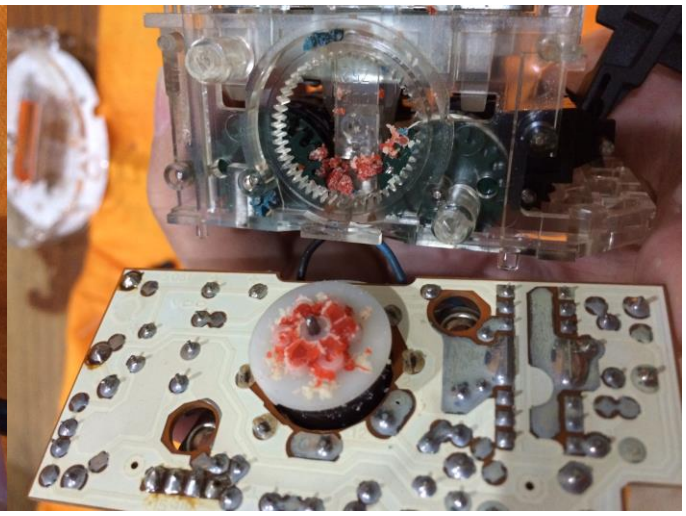

Next you need to peel the face off the plastic housing to access the screws that secure the front and rear halves of the speedometer. The gauge face is held on with sticky contact glue. Be careful and peel the gauge face from the plastic housing and place face down on a clean surface. You do not need to apply any additional glue when you reinstall the gauge face. Now remove the screws that secure the plastic cover to the back of the speedometer.



Now that the face is removed you can access the two screws that hold on the stepper motor circuit board to gain access to the odometer gear and pod.





You will see the remains of the odometer gear and pod. **The next step is very important! Use an air compressor (if you do not have one you will need to take to your repair shop and have them blow out the speedometer). Even if you think that you have found all the broken pieces you still need to perform this step. 99% of the calls we receive stating that the odometer still does not work after installing the new gear this step was not done. After going back and using the air compressor has resolved the issue very time.** You cannot use too much air or air pressure. Be sure to also blow and clean around the metal shaft that goes through the pod, this is the stepper motor and it also has a very tiny gear at the base of the shaft. Wipe grease from gear area, off motor and motor shaft. Install the new gears into the odometer unit. The new gears do not require any lubricant. Then place the motor back on the unit. Wiggle the 10ths number dial to make sure the gears haven't locked up on each other. While tightening the two screws that secure the circuit board continue to wiggle the 10ths digit to ensure that nothing is binding. If the 10ths digit stops wiggling then remove the motor housing, determine and repair the cause.

Install the plastic front and rear housings together. Line up and place the gauge face back on.

**To reinstall the needle:**

Place the needle on the motor shaft with the needle pointing to the mark you made on the face of the speedometer. Using both thumbs; press the needle straight down evenly at the pivot point. If you are not centered on your mark use the internal stop to help adjust. If you are too high rotate the needle counter clockwise against the internal stop in small increments until aligned. If you are too low rotate the needle clockwise past the 240 kph mark and you will feel the internal stop, twist slightly past this stop in small increments and release the needle to see if it lines up with the mark. Once the needle is calibrated follow the instructions in reverse order to reinstall in the instrument cluster and test drive.

ODOMETER GEARS

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