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# VDO Odometer Gears Repair

These pages, and the FAQ's, are strictly for suggested ways to fix your equipment. They are not intended to be absolute. The user/buyer of the FAQ's and new gears are solely responsible for any damage or accuracy that may occur to their property. If you are not sure how to take something a part, ask on the many car boards that are available. The user has to keep his eyes open and use common sense.

**NOTE:** It is recommended to replace all of the urethane gears at the same time three gears (VDO). If you do not think you should replace all of your gears rub a finger nail over the teeth of the old gears. If any of the teeth fall off, these gears should be replaced as well. The original gears are made of urethane and lubricated with petroleum grease. This combination causes the gears to become waxy and the gears start to disintegrate. If you do not want to perform this job twice.

**Replace the three gears that will fail the first time.**

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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.

\*It is recommended to apply a thin layer of heavy grease (axle/wheel bearing grease) just in between the teeth of the E2 gear. This will help to dampen any noise that the stepper motor may cause. The grease will not harm the new gears! The teeth of the gear should still be visible with the grease applied.

\* For VDO and MotoMeter units: the E1 gear is the gear that attaches to the stepper motor that drives the odometer. The original gear material would not allow the gear to hold firmly to the shaft and turn the odometer. This is why they molded the gear around the brass bushing. You need to remove this bushing in order to install the new gear. (**You are going to deform the bushing so that it can be removed. Wear safety glasses because the bushing can break and fly off**) With side cutters (dikes, wire cutters), squeeze brass fitting where small gear was across the diameter with a firm handshake grip. Then turn the shaft two clicks and repeat with a firm handshake grip. Put the tool down and remove the brass bushing with fingers. If it does not remove with your fingers, repeat using the side cutters until it comes off. **DO NOT USE ANY TOOLS** to pull the brass bushing off as this could damage the motor.

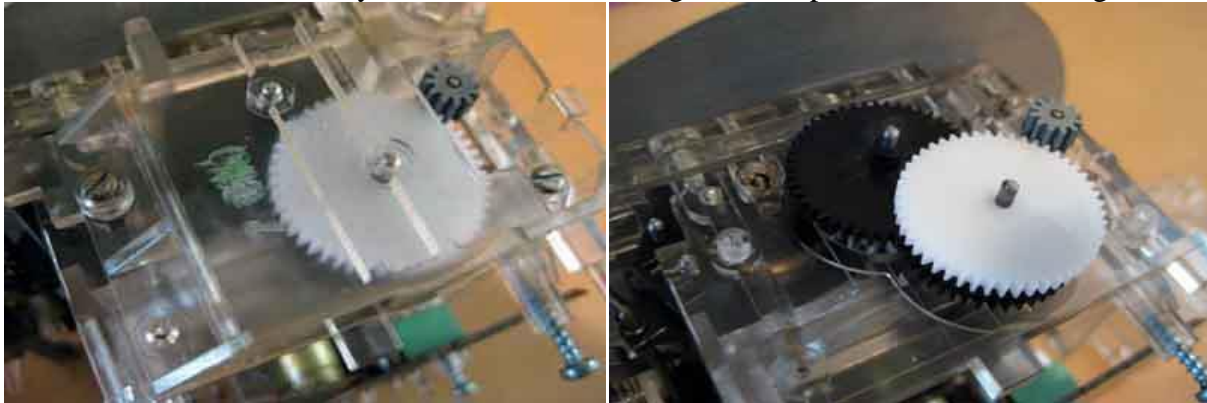
\* Make sure that you have blown the speedometer and odometer assembly clean with high pressure compressed air or compressed air in a can. If using the can of compressed air be sure to use the entire can to blow all areas clean. **Even if you think that you have found all of the broken pieces you still 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.

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This is the speedometer removed from the cluster.

There are two small shiny flathead screws holding the clear plastic cover over the gears.



\*First remove the clear cover

\*Remove all of the gears

\*Pull the two shafts out with pliers that the larger gears were on

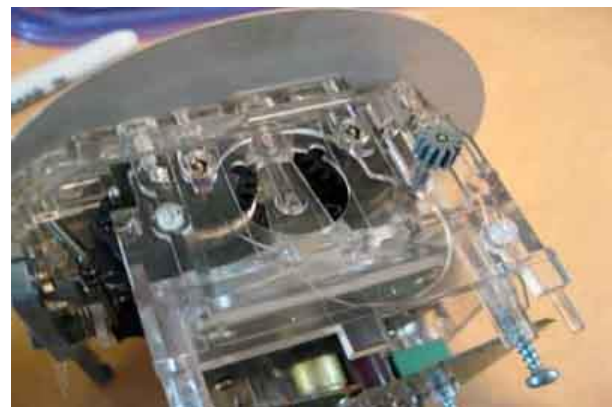
!!!!Do **NOT** try and remove the shaft that the twelve tooth drive gear is located on as this will damage the motor!!!!

\*First remove and put aside the four rubber spacers that are on the rear of the speedometer circuit board. Blow everything out with compressed air. You cannot use too much pressure. Use the air throughout the unit. Any small pieces of the old gear can disable the odometer as the motor is not very strong. After using the compressed air inspect the unit for any stray pieces.

\*Wipe clean all areas where the gears sit: plastic cover, housing, metal shafts, plastic original gear that is not replaced. Any residue that is left from the old gears and grease can cause the new gears to stick and not work properly.



These are the gears that are not replaced in the VDO unit.



With the gears and shafts removed

***This is a question we get asked multiple times a day!***

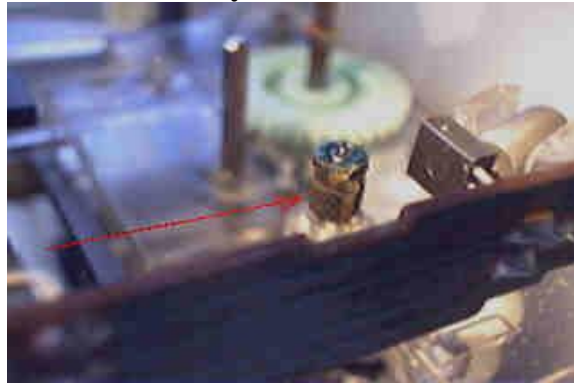
The E1 12 tooth drive gear when it goes bad it leaves a brass bushing on the shaft that has to be removed to install the new gear.

Before the next step gently push down on the shaft that the brass bushing is on. Note this play in the shaft. When you install the new gear you need to make sure that the shaft has up and down play, This is #2 cause of the odometer still not working after replacing the gears.

\* (You are going to deform the bushing so that it can be removed. Wear safety glasses because the bushing can break and fly) With [diagonal pliers](#) (dikes, wire cutters) or [lineman's pliers](#) squeeze the brass bushing across the diameter with a firm handshake grip. Then turn the shaft two clicks (90 degrees) and repeat with a firm handshake grip. Put the tool down and remove the brass bushing with fingers. If it does not remove with your fingers, repeat using the pliers method until it comes off with your fingers.

**DO NOT TRY TO PULL THE BUSHING OFF AS THIS WILL DAMAGE THE MOTOR.**

You do not need this bushing with the new gear. Press the new gear on starting with the larger side of the hole in the middle of the new gear using your fingers, Hold the motor side cover if you have a VDO unit.



**Brass gear that needs to be removed and discarded**

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- \*Holding the motor side, press the small gear on with your thumbs
  - \*Reinstall the two shafts (wipe the shafts clean with a paper towel or cloth first to remove any old gear material and grease.)
  - \*Install the smallest OEM gear first with the small gear down. Spin the gear to make sure the assembly spins freely
    - \*Install the next smallest gear on the opposite shaft
    - \*Then the gear with the boss. The boss should face up to you
    - \*Then the last gear.

**Each time you install a new gear, you should spin everything to make sure the gears are smooth and turning each other.**

Replace clear cover and reassemble the cluster. You are done.



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