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E30 BMW MotoMeter and VDO Odometer Gear Replacement

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 and the use 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) or four gears (MotoMeter).

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.

* 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. **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.

How to determine if you have a VDO or a MotoMeter unit, BMW E30 is the only vehicle with a MotoMeter option, (you cannot rely on the face plate as this can be removed from the old unit and placed on either brand). Once the speedometer is removed from the cluster look at the circuit board of the speedometer to determine manufacture. *Swapping of the face plate is very common as we exchange wrongly ordered gears on average of several times a month. We need to charge for the extra set of gears plus shipping and then we credit for the first set of gears once returned.*



Cluster Removal { <http://e30performance.info/viewtopic.php?f=25&t=487> }

(1) screw toward the pass. side of car



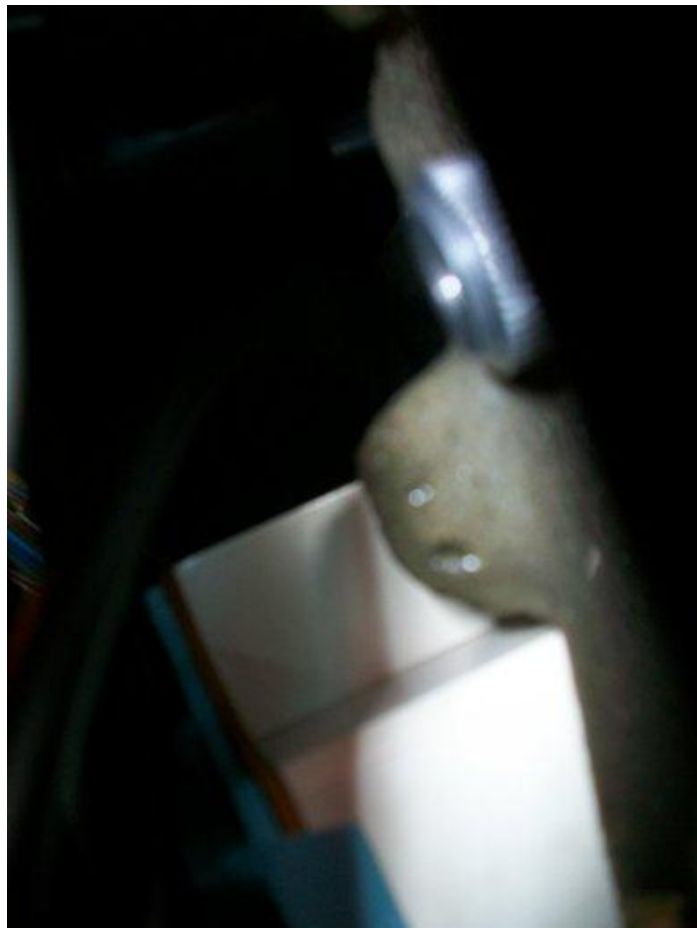
(2) screws towards the drivers side of car



Next is the removal of the trim underneath the cluster. This is also where I say it is nice to have small hands! Inside the dash, there are (2) small aluminum nuts with knurling on the edge. This is what they look like.



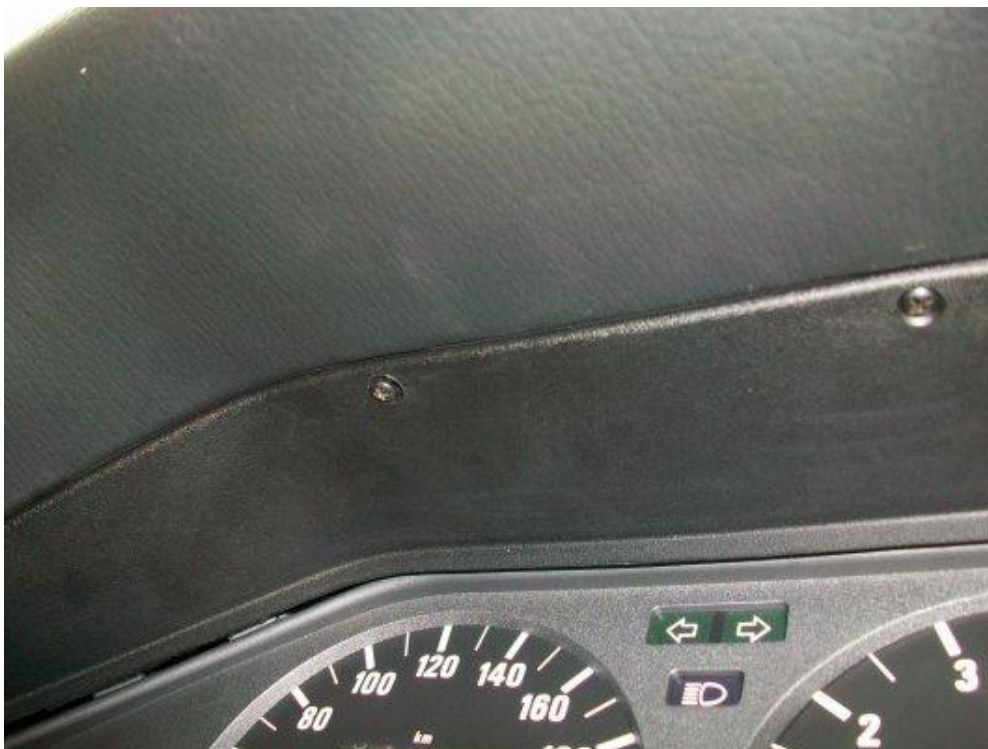
I tried to get a picture of them inside but damn it's tight in there! 😊 When you reach inside, just feel along the inside of the dash toward you, and you should find them. There's one on each side of the column.



This is what the trim piece looks like after it's removed. It's pretty flexible, but it can still break so be somewhat gentle. It's not easy but it will fit between the steering column shroud and the cluster with a little bit of finagling. You may be able to remove the shroud, but I chose not to.



Next is the removal of the last trim piece. It surrounds the cluster and is held by 6 screws.





Once they are removed, pull the piece out and set it aside. With that removed, you'll see the last (2) screws that actually hold the cluster itself.



Finally, 11 screws and 3 nuts later, it's ready to come out. I just grab on to the two tabs shown in the pictures above and pull forward rolling it toward you and laying the cluster, face down on the column. Again, it's going to take a little finagling, but it'll come out.

Now that it's out, this is what you should see.

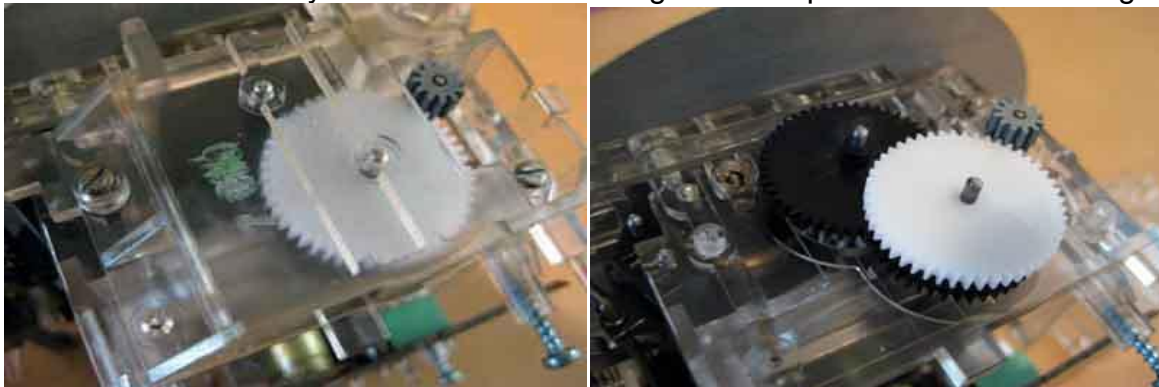


Remove the three large plugs (blue, white and yellow ones) and the two little lights that are wired to the blue and white plugs. In my case, There wasn't a green plug on the cluster I got, but the old US one had one. This is what they look like.



In some cases, nothing may be plugged in to this, but mine did. I think the cruise control is wired through this. This is what the plugs might look like. Re-installation is exactly reverse as what the removal was! 😊

This is the side of 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!!!! See instructions below

*First remove and put aside the four rubber spacers that are on the rear of the speedometer circuit board (when you are using the air compressor to clean the odometer you do not want to lose them)

Blow everything out with high pressure compressed air (DO NOT SKIP THIS STEP!)

If you do not have a compressor, see if a friend does and if not go to your mechanic and have them thoroughly blow the unit clean.

Missing this step is the #1 cause of the odometer still not working after replacing the gears.

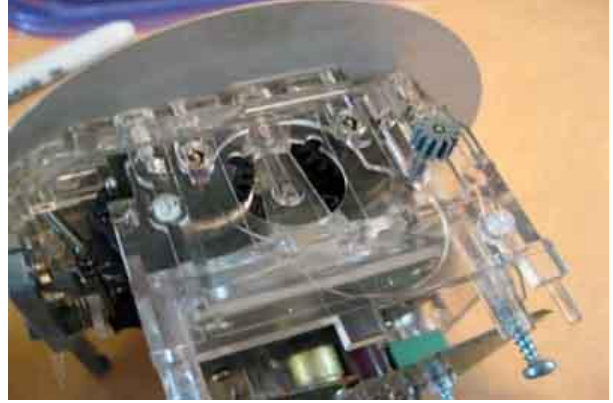
You cannot use too much pressure, we use 120 psi. Use the air throughout the unit. Any small pieces of the old gear can disable the odometer as the motor has very little to no torque.

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. If you have a MotoMeter unit then only one gear is not replaced.



With the gears and shafts removed

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

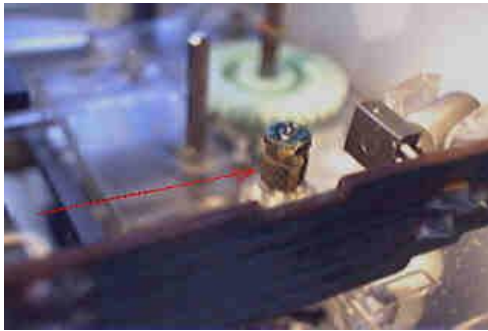
The E1 12 tooth drive gear when it goes bad it leaves a brass bushing on the shaft that has to be removed to install the new gear.

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 the #2 cause of the odometer still not working after replacing the gears (gear installed too far with no movement in the shaft).

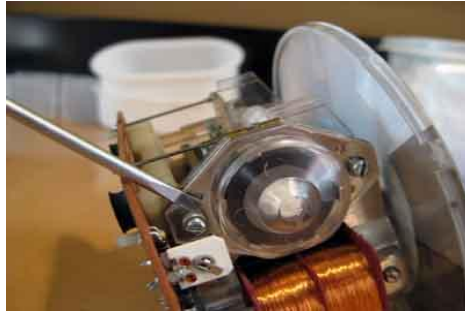
* You are going to deform the bushing so that it can be removed. Wear safety glasses because the bushing can break and fly. With [diagonal pliers](#) (dikes, wire cutters) or [lineman's pliers](#) squeeze the brass bushing across the diameter with a firm handshake grip. Then turn the shaft two clicks (90 degrees) and repeat with a firm handshake grip. Put the tool down and remove the brass bushing with your 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 WITH ANY TOOLS 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 first using your fingers, Hold the motor side cover if you have a VDO unit and if you have a MotoMeter unit remove the motor cover (SEE BELOW) and hold the motor shaft while pressing on the new gear.



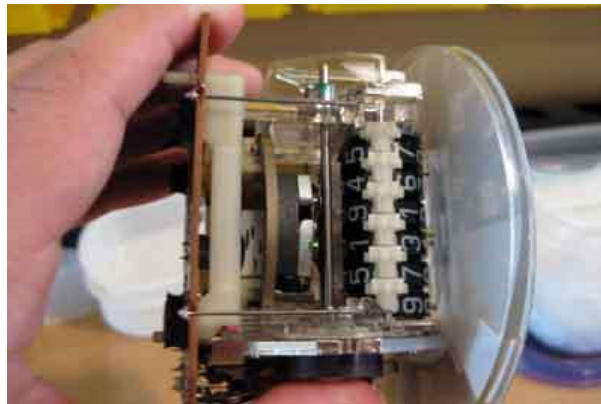
Brass gear that needs to be removed and discarded



Remove two screws that secure motor cover



Motor Cover removed



Use a finger to secure motor while pressing on new drive gear. Install the new gear to where the top of the shaft is level with the top of the gear. There needs to be a small amount of play in this shaft up and down.

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- * Remove all the gears and use a shop air compressor to thoroughly clean the speedometer and odometer assembly clean.
 - *Use a strong light source to check to verify that all the old debris is removed. Using a small screwdriver rotate the gears inside of the speedometer housing for the odometer and trip meter to verify that there is no debris left in between the teeth. This is very crucial as even the tiniest of the old gear will cause the odometer to either not work or only work left less than a mile.
 - *Remove the round cover over the motor (on opposite side of gears)
 - *Holding the motor, press the small gear on to the opposite end of the shaft with your thumbs, to where the gear is flush with the top of the shaft. There needs to be a small amount of up and down movement in the shaft.
 - *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 and that the odometer is adding miles.

Replace both covers, reassemble the cluster and then reinstall into the vehicle. Test drive several miles to verify that everything is working correctly.



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