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# BMW E28 Odometer Gears Replacement

<http://www.mye28.com/viewtopic.php?t=26424>

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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.

\* 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.

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**Azure**

▢ Posted: Nov 21, 2006 11:09 PM Post subject: My Odometer stopped working! (Odo gear replacement)

Joined:  
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**Problem:** Odometer and tripmeter no longer function.

**Cause:** Old Odometer gears have stripped and no longer rotate the odometer.

**Solution:** Install new Odometer gears!

**Disclaimer: You can potentially damage your instrument cluster beyond repair by attempting this fix, as the needles and other components of the cluster are fragile. Neither the author, mye28.com staff or members, odometergears.com staff or anyone else make any form of warranty express or implied. The author is in no way associated with odometergears.com, Jeff Kaplan or mye28.com.**

**These instructions are shown for this particular example of a 1987 BMW 535is. There may be variations in your vehicle due to manufacturing, conditions, problems, model, year or other differences.**

**You attempt this fix purely AT YOUR OWN RISK.**

**Artificially altering odometer readings is illegal.**

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Cluster removal:

Start by removing the instrument cluster, there are two screws holding it in which point upwards into the dash at the top of the cluster. The whole thing just pulls forward after this.

Remove the wires. There should be 5 main connectors and some bulbs. The 3 large cables pull right out once you've pulled the black centres on the connectors away from the cluster - they pop out, which allows the cable to be removed.

The two smaller (single wire) cables both pull downwards, after you've pulled out the black securing tray which you pull away from the cluster, after which it'll swing freely.

Remember when installing these two cables "Blau", that is, blue, refers to the colour of the connector, not the wire!

Any remaining bulb sockets (perhaps one or two) will pull straight out, no special attachments.

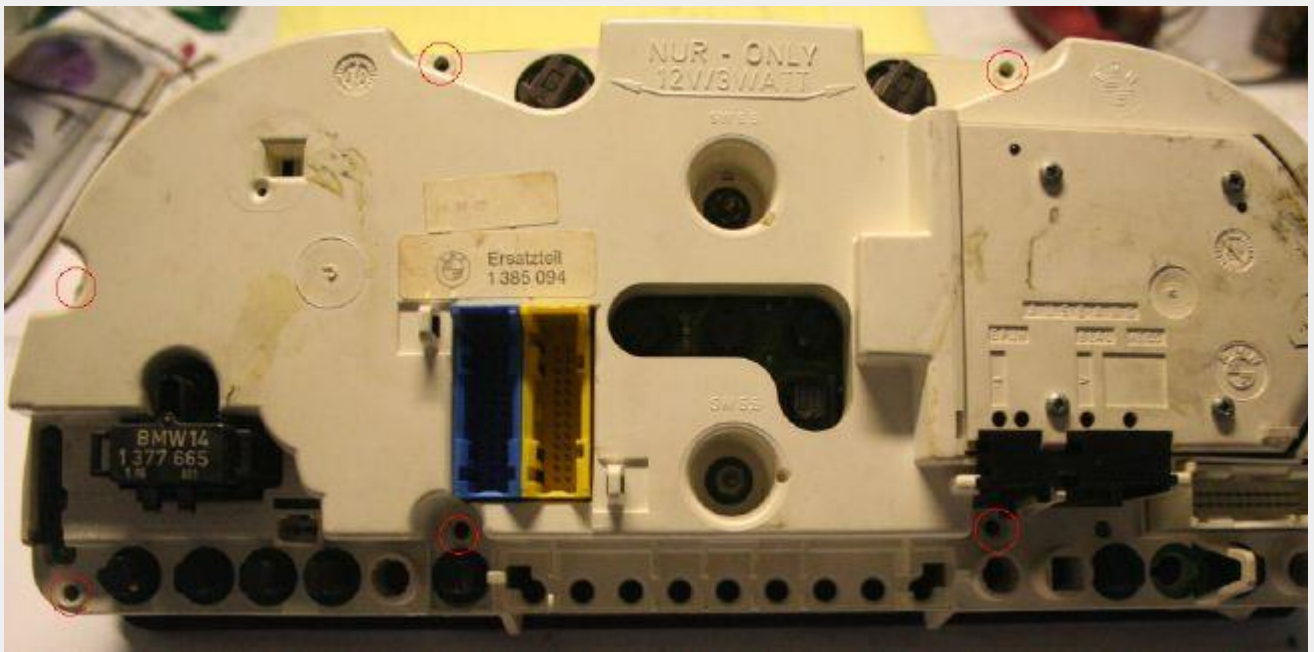
You can remove the cluster without removing the steering wheel by telescoping the wheel all the way towards you, you should be able to slide the cluster out towards the drivers door with some careful angling.

Consider that first part the test, if you can't figure out how to get the cluster out, you should perhaps think twice before taking the cluster apart... if you got that part ok... read on!

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Odometer Gear Replacement:

Remove the 8 screws shown in the picture below.

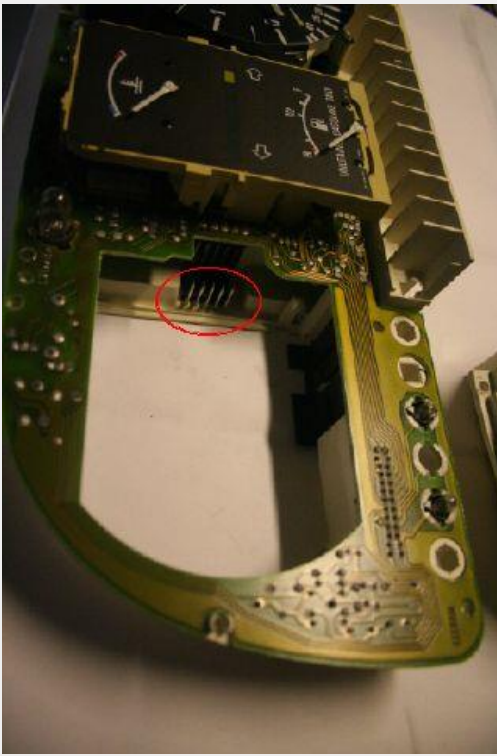


Lift the white portion of the cluster away from the black housing and sit it on its back, it should come away easily (I consider the back the facing you just removed the screws from).

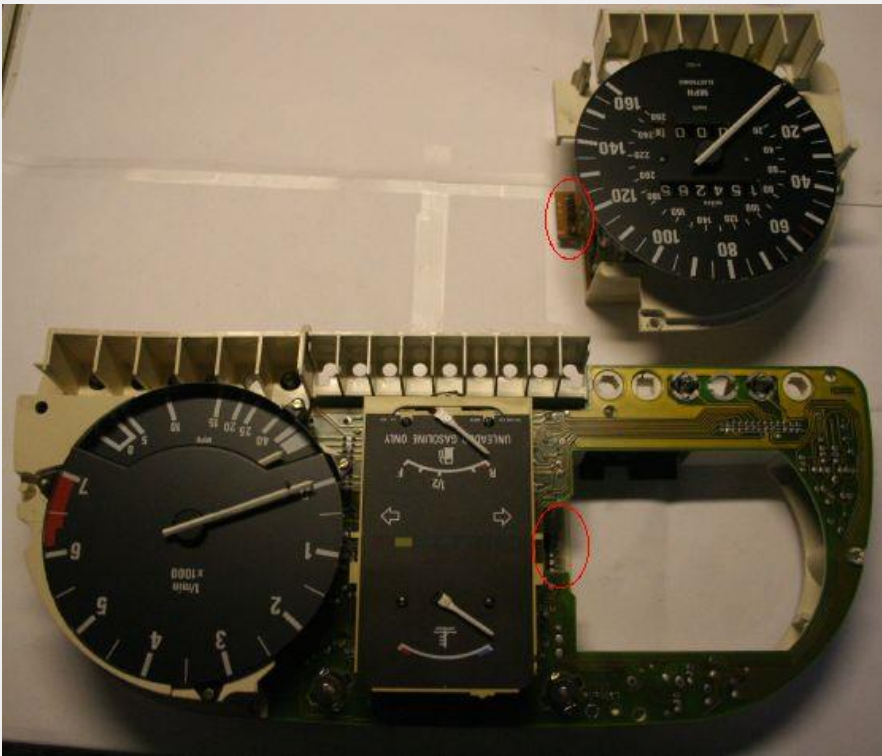
You should end up with something like this:



Next, you'll need to split the speedometer portion of the cluster out so you can access the gears. With the needles facing upwards, like in the picture below, you'll have to push out the speedo section. You do this by pushing it out of the cluster from the back. There is going to be some resistance as you're disconnecting a 5-pin connector as you do this. The connector is shown below - you'll want to push on the back of the cluster in the vicinity of this connector.



You should end up with this: (connector highlighted).



Looking at the speedo section (now separated), you should be able to locate the odometer gears easily behind a clear plastic cover. Remove the two highlighted screws to access them (shown below). I've numbered the 3 gears which you should have received in your package, these are the ones you'll be replacing.



If you haven't already, you should check your package to make sure you got the correct stuff. I ordered mine from Jeff at [Odometergears.com](http://Odometergears.com), real nice guy, and a 5erfest sponsor to boot! From here on, my guide covers his gearset - if you purchased yours from elsewhere, the instructions may vary somewhat.

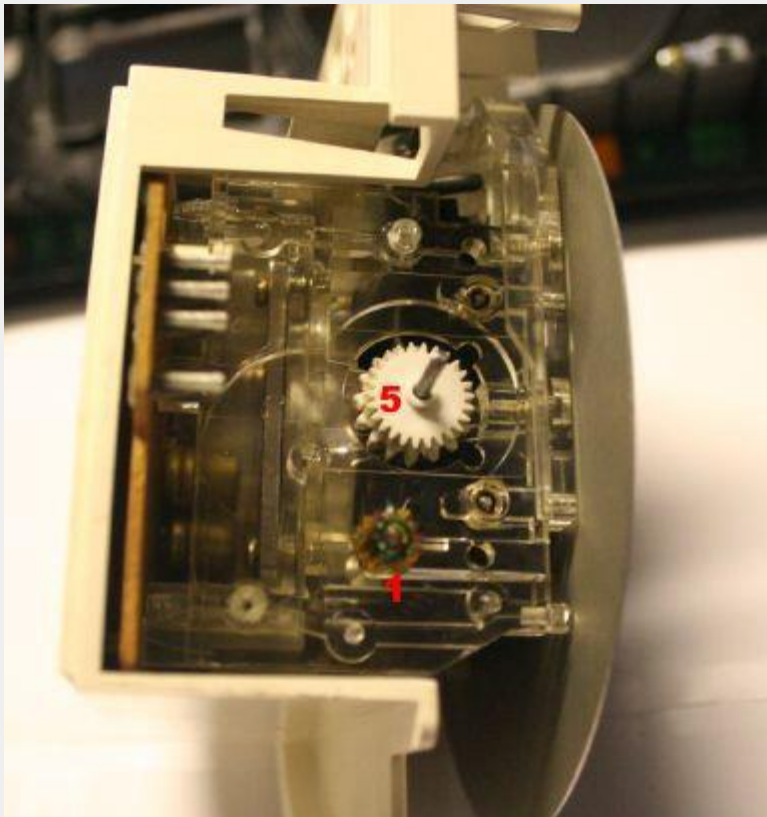


Ok, with the screws removed you should be able to remove the clear plastic cover that holds the gears. Make sure you're somewhere clean as you might lose a shaft and/or the gears as

you remove the cover as the grease on them tends to make them stick. You can see in this image my No3 and 1 gears are missing teeth. Aha! There's our problem! No1 (the small one) is the drive gear which turns and makes the odometer function.

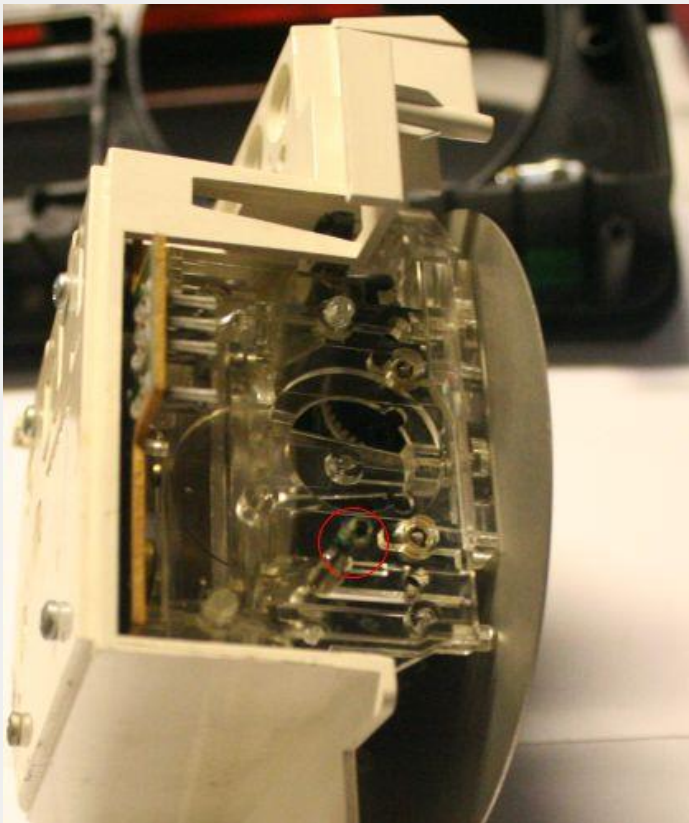


Go ahead and remove the two shafts and the attached gears, and clean them down to remove the excess grease. In the image below, I have one shaft still installed along with gear 5 which we keep from the original set. You also see gear 1, which we're going to remove. Try to pull it off, it's pretty much going to turn to mush and fall to pieces, leaving a bronze insert stuck to the shaft.

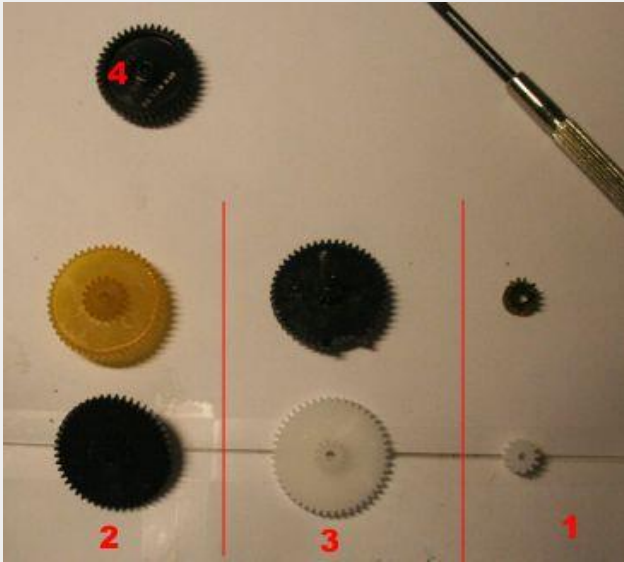


You're going to need to remove the bronze insert from the shaft. This thing is a pain in the ass. What I did, if you see in the picture below, there's a piece of white straight flat plastic in the lower part of the picture. I used the side cutters on a pair of pliers to grasp the bronze insert, and used that piece of plastic as a fulcrum, then leveraged the insert off. That seemed to work best. Trying to pull it straight off with pliers didn't work for me. Your mileage might vary ( see below ).

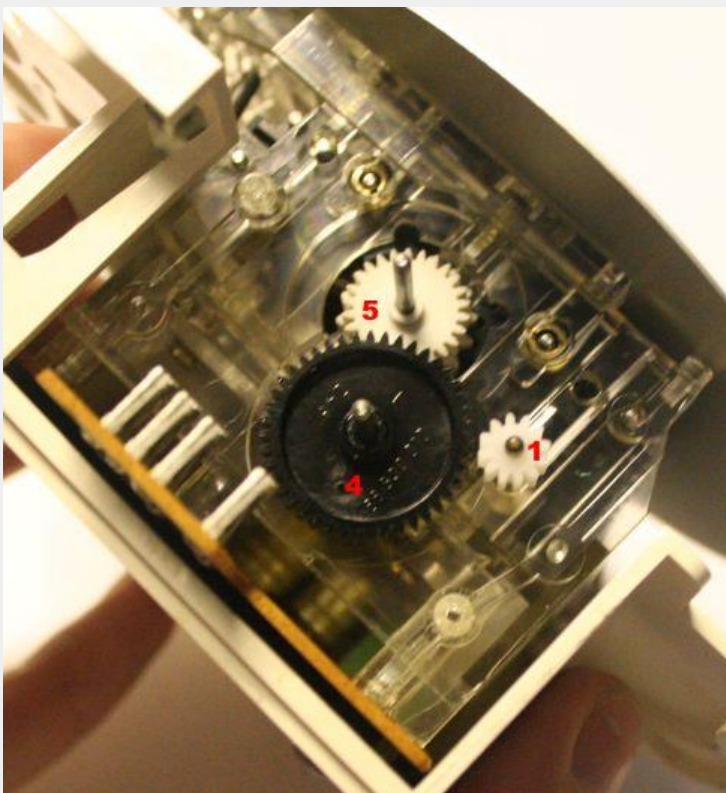
**This is a question we get asked multiple times a day!** The E1 12 tooth drive gear when it goes bad leaves a brass bushing on the shaft that has to be removed to install the new gear. Before the next step gently push down on the shaft that the brass bushing is on. Note this play in the shaft. When 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 you're your thumbs for support while pressing on the new gear. Only install this gear to where the top of the gear is flush with the top of the shaft. There needs to be a small amount of up and down movement on the shaft.



Here's what you should have left now. Again, gears 3 2 and 1 we're replacing, gear 4 came off the cluster we're keeping. The three new gears are the ones lower in the picture (without the missing teeth!) 😊

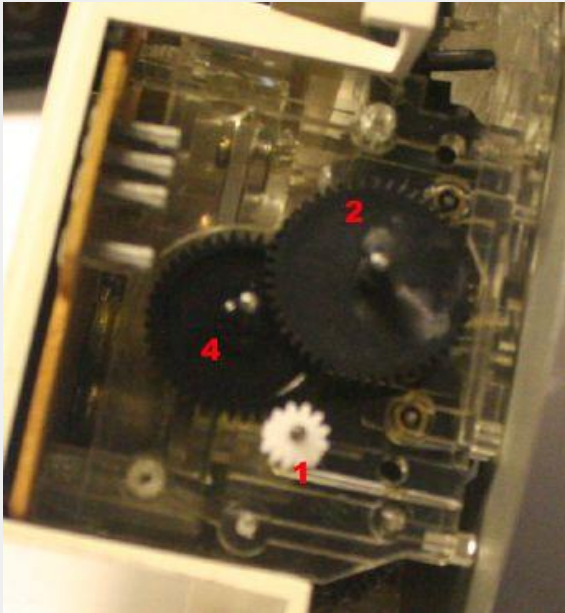


Go ahead and reinstall gear 5 and the shaft if you haven't already. Make sure gear 5 is oriented correctly so it mates up with the gears below it inside the cluster. Pop gear 4 back in (again, we're keeping from the cluster) and ensure it's installed so it mates up with gear 5. With the bronze insert removed, clean up the shaft at gear 1 well so there's no grease left on it. The new gear 1 is a direct press fit, so you want to make sure it sticks to the shaft well (this is the shaft that drives the gears remember). There will be some resistance as you push it on, give it a firm push and pop it on the shaft. In the picture below, gears 5, 4, and 1 are installed and correctly oriented.

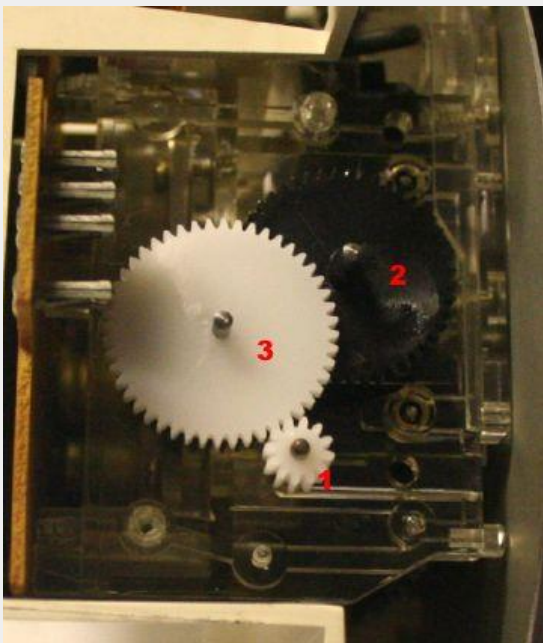




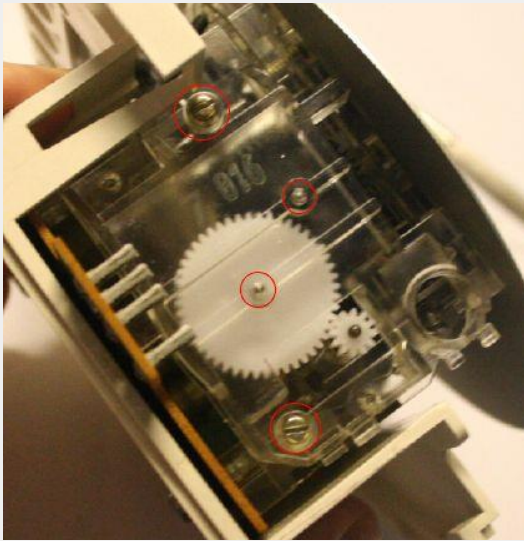
Go ahead and take out your new gear 2 and install it on the shaft with gear 5. Ensure it mates up correctly with gear 4.



Take out your new gear 3 and install it on the shaft with gear 4. Make sure it mates up correctly with gears 1 and 2. You should be able to tell if everything is going to work now. When you rotate gear 1, the others should all turn... but don't turn them too much, your odometer is affected!



Go ahead and reinstall the clear plastic cover now, making sure the two shafts marked in the picture below mate up with their respective holes in the cover. Replace the two screws that hold it in on. Voila! You now have a working odometer!



Now all you have to do is install the speedo back into the cluster, (be careful with the 5-pin connector you disconnected earlier, you don't want to force it and bend it up!), place the cluster back into the black housing, put the 8 screws back in their respective locations and put the cluster back in. - Installation is the reverse of removal.

Congratulations!



Last edited by Azure on Dec 22, 2006 9:54 AM; edited 1 time in total



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