



www.OdometerGears.com

1981-1985 240 Cable-Driven Speedometers (NOT for 1986 and later electronic units)

<http://www.davebarton.com/240-odometer-repair.html>

For this set of instructions below, I will not go into detail on removing the 240 instrument cluster from the dash. For detailed instructions on that, please refer to my [240 custom gauge face installation instructions](http://www.davebarton.com/pdf/240faceinstall81-93.pdf) at <http://www.davebarton.com/pdf/240faceinstall81-93.pdf>.

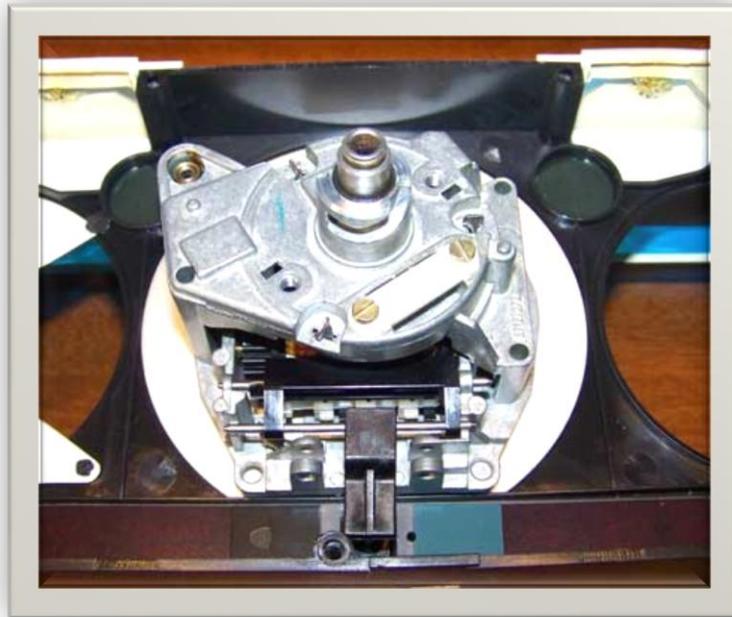


Here's the back of your typical '81-'85 240 instrument cluster.

- * Locate and remove the **7 Phillips head screws** around the outer edge (**noted by the white arrows**).
- * Also remove the **two slotted screws** on the back of speedometer (**noted by two red arrows**).



*Some speedometers have these additional electronic connections. If yours does, then remove the **smaller slotted screws** shown.



Lift out the circuit board.

*Here's what you now have before you. The speedometer remains in the box. Carefully remove it and have a look if you've never seen one up close before. Take a couple pics and impress your friends.



* If your cluster has a tach, you'll see this little item. Don't lose it. It often falls out if you turn the box over. How about you just don't tip it over?



Speedometer Needle Removal:

On the 1981-85 240, the Speedo needle needs to be removed. This is a delicate operation. Here is the back side of your Speedo. Look for two rectangular slotted holes (indicated by the screwdriver).



Insert a small slotted screwdriver (like the one shown) into one of the holes. This will lock the speed cup and mechanism inside the speedometer so the needle shaft cannot move.



*Now, after gently lifting the needle over the stop pin, grip the center plastic hub of the Speedo needle and turn it counter-clockwise (toward the "MPH"). **Be careful not to put pressure on**

the orange needle pointer. It's plastic and will snap off if you do. If you do not feel that the needle is locked into place, you do not have the screw driver in the rear correctly. The needle should feel like it does not want to move, this is when you know the internals are locked into place.

Since the internal mechanism inside the speedometer is locked, you will be turning and **forcing it counter-clockwise** until you feel it come loose and get easier to turn. Now you may turn it back and forth, **while at the same time gently pulling it toward you.** It'll come off in your hand without any fuss.

If you're still here... then let's continue.

If you break a Speedo needle, I usually have used replacements in my **Used Parts Page here** (Dave Barton). It's rare to break one, but it does happen once in a while.

However, if you follow my instructions carefully, you probably will not break anything.



* Once the needle is off, remove the metal speedometer faceplate using a small flat screwdriver to remove the 2 tiny screws.

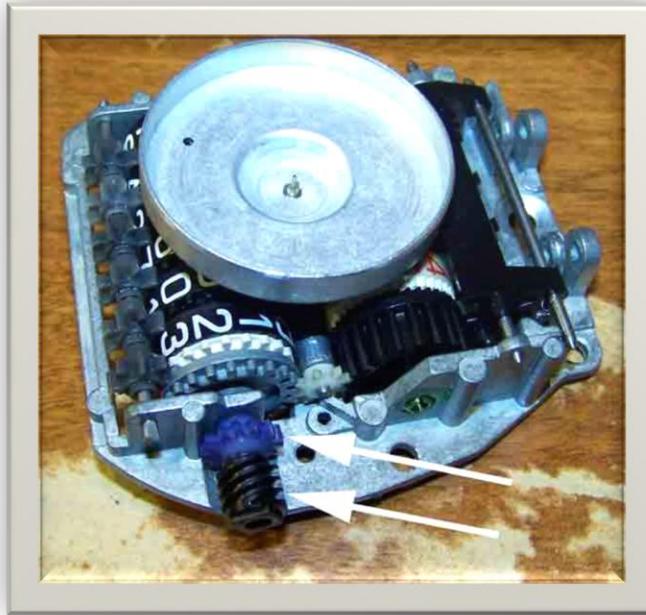
Be careful if they're tight. They are soft metal and are easy to gouge. Get a screwdriver that fits these small slots well.



*Here's the naked speedometer after removing the faceplate. See those 3 slotted screws? Remove them. They hold the two halves of the Speedo together. Once the screws are removed, be gentle when pulling in apart. The parts inside are delicate, but it won't explode... trust me. You'll see one piece that can fall out at this point, but not to worry, just put it back like the picture.



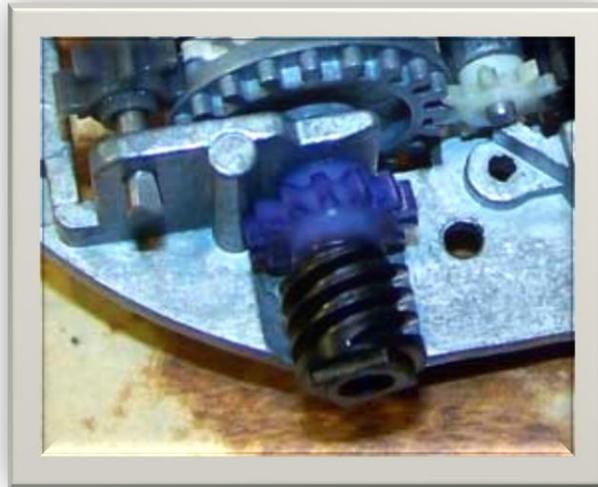
Here's the back half of the Speedo.
*The thing with the arrow is what I was talking about. Just be sure to put it back before you reassemble.



Here's the front half of the Speedo, viewed from the back.

See these two gears (one is blue and one is black)? To avoid confusion, I'll call these them **"outside gears"** since they're on the outside of the odometer assembly. The blue plastic gear is often the culprit for a failed odometer in a cable-driven Speedo, but not always as I discovered.

You'll notice in this photo the odometer reset button is missing from the bottom of the Speedo. I removed it so it wouldn't get in my way. It pops off quite easily. They also tend to break after years of getting pushed and pushed. If you need one, I have replacements in my [Used Parts Page here](#). (Dave Barton).

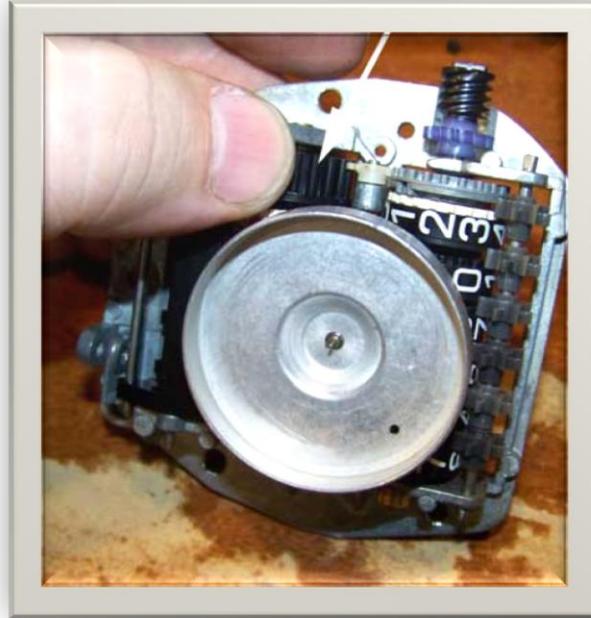


Here's a closer look at the blue gear. Your gear may be a different color... I haven't seen that many yet. If anyone knows the colors, please email me. **This is the gear if damaged that you will need to count the teeth to order the correct replacement gear.**

FYI, this is the same gear referenced in [Dave's Shannon's page](#) (the gear he found was white instead of blue, so it might have had a different number of teeth). This gear (as found by Dave Shannon) has a tendency to crack. It might also lose teeth after years of use. There is a long metal shaft going through this and these outside gears. In order for the odometer to function

correctly, these gears need to grip the shaft... so slipping allowed. Dave Shannon's gear was cracked and that was causing it to slip in the shaft.

I found nothing obviously wrong with either of these outside gears. No cracks and no missing teeth. And they appeared to be gripping the shaft from what I could see. This was a mystery, since the odometer clearly was not working. So I gave up. It's not my fault Volvo owners give up so easily.



NO! Volvo owners are NOT quitters! (You didn't fall for that, right?) Instead, I found a way to test the odometer to see where my problem was.

As I mentioned, that blue gear could be cracked, missing teeth or just plain slipping on the shaft, although I could find no problem at this point.

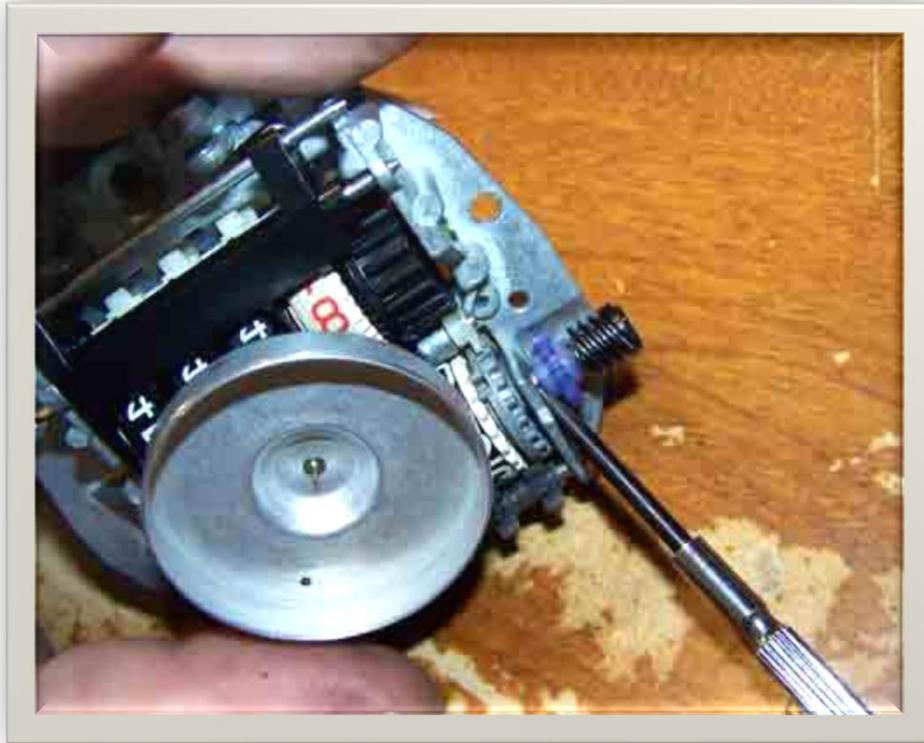
I needed to see for certain if that gear was gripping or slipping on the shaft. To test this, pick up the assembly and **grip the wide black inside gear** (like I am in the photo) and hold it so it can't turn. Now see if you can turn the two outside gears on the end of the shaft. Don't force them.... be gentle. You should NOT be able to turn the two outside gears without the wide black inside gear turning also. If you can spin the outer gears without the inside gear turning, you know something is slipping somewhere. It's important to find out exactly what is slipping before you pull anything apart.

If you find one of the plastic outside gears is slipping, your best solution is to replace it. If these gears seem tight on the shaft as they should be, or if you're still not sure what's wrong, then keep reading....



See this **brass collar**? It's pressed onto the shaft (opposite end from the outside gears). This shaft goes through the odometer number wheels and through the two outside gears on the other side. When you try to spin the outside gears (while holding the wide black inside gear steady), **have a look at this collar** to see if the shaft is spinning along with them. If the shaft is NOT spinning, then one or both outside gears are loose. As mentioned in [Dave's Shannon's Page](#), he found a cracked plastic outside gear. Replacement gears weren't available then, so his repair method was to epoxy or JB Weld the gear back together and to use some 220 grit sandpaper to roughen the shaft for a better grip. This gear may now be available from the [240 Odometer Repair page listed above](#) or specifically this link: <http://www.odometergears.com/cable.html>.

If the shaft IS spinning and it still appears the outside gears are gripping the shaft, then something else is slipping. I will cover this a little further below, so don't be a cheater and skip ahead.



REMOVING THE OUTSIDE GEARS: If you need to remove the outside gears, **gently** pry them with a small flat screwdriver (see photo). I don't know yet if it matters, but for now **pay close attention to which direction they face**, so you can put them back on the same way.

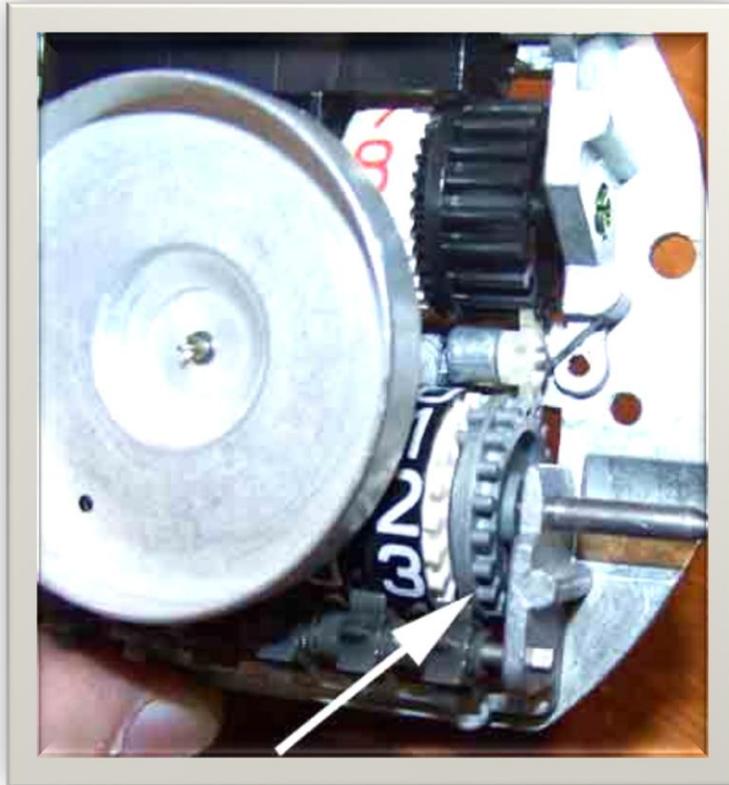


For those of you who don't read directions very well, here's a close up of these gears. NOTE: The tops of these gears were facing away from the Speedo body. Maybe that will help those of you who weren't paying attention to the positions of your outside gears (assuming it really matters).

The blue gear in this photo is a **14 tooth unit** and may be typical of a 1984 era 240's. I have seen this exact same gear in a 1981 also. The following location appears to sell these gears in a variety of tooth counts: OdometerGears.com. You will need to get the **same tooth count** to

match what you have.

If you found that one or both of your outside gears were spinning on the shaft, try roughing up the shaft with some sandpaper. It's also possible to use a small punch or screwdriver to tap small dents around the gear center hole. This might help close up the hole slightly. Be careful, since beating on your gear may destroy it. With it being so old, it might be brittle. You will have to decide on the risk. Remember? You're a decisive 240 owner.



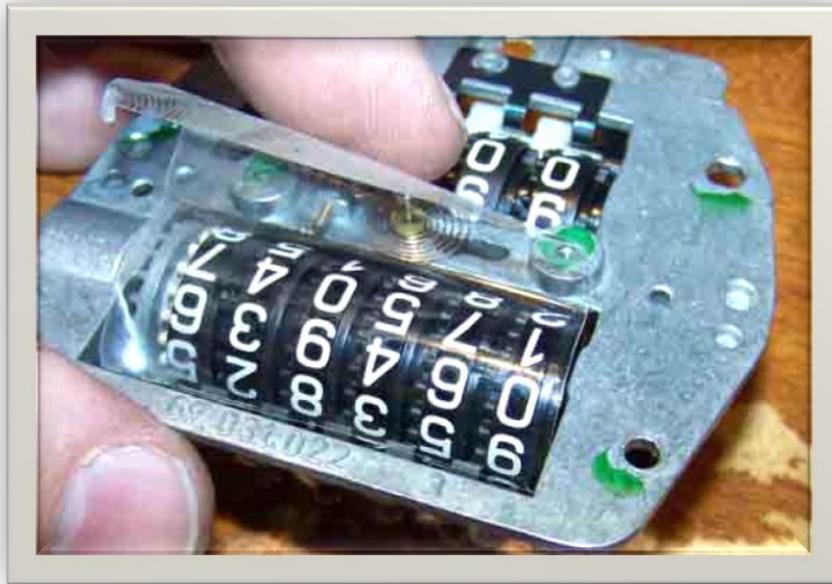
HERE'S WHAT I FOUND THAT WAS DIFFERENT WITH MY ODOMETER FAILURE:

When I tested my outside gears to see if they were gripping or spinning on the shaft, I found they were gripping quite well, but they were spinning the shaft when I turned them while holding the wide black inside gear steady. As it turned out, my outside gears were just fine. What I discovered was that the GRAY METAL GEAR you see in this photo was slipping on the shaft.

It's an inside gear. It's supposed to GRIP the shaft.

Removing this metal gear is tricky.

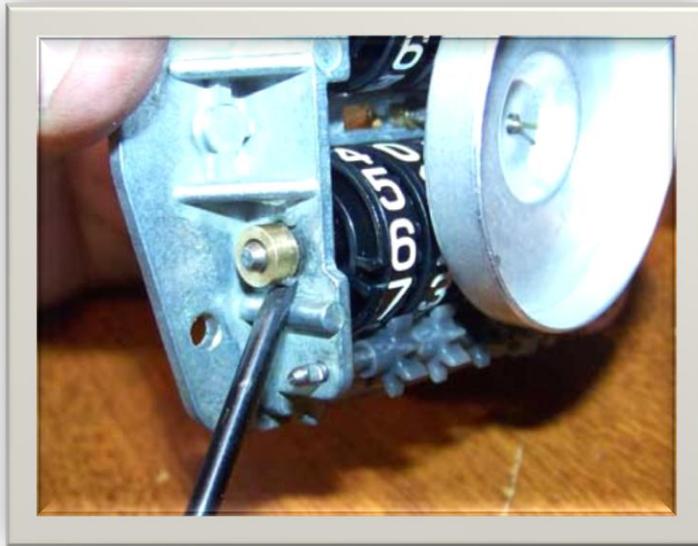
See the shaft going through the gear? Remember how it goes through all the odometer number wheels too? If you remove this shaft, the odometer will explode and a lot of little parts will fall out and bounce everywhere. Not good.



I found a way. The shaft needs to be pulled out just enough to release this metal gear. The last thing I wanted to see was all those little number wheels falling out, or even moving in the slightest amount. So I applied a piece of **packing tape** across the wheels (see photo) to keep them snugly together. No moving equals much, much better.



*Then I used a felt marker and marked both the gray metal gear and the white plastic one next to it. I wanted the gray metal gear to go back in the exact **same position**, in case it made a difference.



First, go back up a few steps and remove the outside gears. To slide the shaft out, use a small screwdriver to pry under this brass collar. The collar and shaft are pressed together. The shaft should begin coming out along with the collar.

DO NOT pry the shaft out too far.

Pry the shaft out just enough so the gray gear is free. Then carefully lift the gray gear out. Try not to disturb the odometer number wheels.



<<< Here's the metal gear. It's made of some sort of cheap pot-metal. If you look closely, the hole in the center has some very faint splines. These wore down on my gear, so it was slipping on the shaft.

My solution to tighten up this gear on the shaft was to use a pointed tool (a punch or small screwdriver works) and give the area around the hole a few taps to slightly deform/expand the metal and tighten the grip on the shaft.

Three taps on mine worked wonderfully. The gear went back on and was nice and tight.

This repair will last awhile and then loosen again. If you would like to repair the unit permanently then you will need to replace this gear. The majority of the mechanical

Volvos will use a thin lead gear but you may have a large thickness. There are three different thickness options for the lead gear; 1/8" or 4.57mm, 3/16" or 5.44, and the final thickness 1/4" or 6.35mm. These sizes are nominal. These are available from OdometerGears.com



After you re-insert the gray metal gear, push the shaft back through and test the odometer function again before installing the outside gears. Pay attention to the alignment of the top odometer numbers. The first time I re-installed the gray metal gear, I found the far right number wheel was no longer aligned (see photo). This means I allowed that number wheel to slip or the gray metal gear was installed slightly off the mark.

I pulled it back out and got it right the second time. Now I have a perfect odometer again.

Total time, including pulling the cluster out of the car and re-installing, was around an hour.

Why don't you fix yours now?

When reinstalling the Speedo needle, make sure you gently push down evenly on the center hub of the needle. Once it is in firm enough, use the stop points at max speed and 0 mph/kph to realign the needle with 0.



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