Avalanche Speedometer Repair

Replacing the stepper motors on my 2005 Avalanche 2500. Much thanks to Keven and David who provided great advice on this task as noted below.

This set of instructions combines:
- information from David (digitalguy_1@charter.net) who will repair the cluster for you and return it to you fixed, or sell you the stepper motors for a reasonable price so you can do it yourself.
- instrumctions from Kevin via the Avalanche Fan Club site at http://www.chevyavalanchefanclub.com who provided instructions and encouragement to do it myself.
- my personal experience along with photos.

Tools needed:
- Fingers (they did not get damaged in my case)
- Small set of 1/4" drive sockets or a small set of the screwdriver type socket drivers. I found that a socket extension helped out some.
- Soldering iron with a fine tip
- Solder-sucker tool (blue one in the solder picture) I recommend the spring-loaded type with the button release (Radio Shack variety works but get the button release, not the squzee bulb type)
- Small screw driver and a very small needle-nose pliers are very useful too

Skills needed:
- Soldering skills, but it wasn't a high degree of difficulty
- Nerve to do it yourself
The process:
1. The dash panel and instrument cluster are very easy to remove and replace. The outer dash ring or panel is just clipped on. It comes off by just pulling on it starting on the lower right corner and working your way around. There are no screws, just snap clips. You have to turn on your ignition and put your gear-shifter into the lowest drive position to get it out of the way. If you have an adjustable steering column you will want to lower it as well. Then the panel ring comes off easily.
2. The instrument cluster is removed by unscrewing the four screws, one on each corner.

3. Undo the electronic wiring clip on the back. Mine (and I assume all models) had a little black and blue set of tabs you squeeze to release the connector clip. While holding these release thingies, then it's the typical pull and wiggle process to get the wiring disconnected.
4. Take the instrument panel cluster to your work bench or work table.

5. The instrument cluster comes apart in three pieces. The front has clips that you just undo and pull the face off. The instrument cluster snaps apart by gently releasing the clips (black tabs in the photo). The back side comes off easy, but the lower clips on the front piece were mildly stubborn and relinquished their grip with the help of a small screwdriver. But these are easy to see making it reasonably easy. I had a piece of bubble-wrap that made a nice cushion to lay the cluster on while doing the soldering work.

6. With the front and back covers removed now, you should mark with a piece of masking tape where all your gauge needles sit when the power is off. If you are
only replacing several, you still must take ALL the gage needles off. The tape helps you get them in the correct place again when you put them back on.

7. To remove the gauge needles, I followed the advice of Kevin and Dave and used a kitchen fork using the needle between the tines and pry up. Before prying them up, it helps to gently move them a bit to the left (counter-clockwise) to break them loose from the stem. You feel this happen with a little snap sound. It can take a little bit of force but they do lift up. Make sure you are prying/lifting strait up to avoid potential damage.

8. Now you can lift the faceplate off exposing the front of the circuit board with all the stepper motors soldered onto it.
9. If you have any electronic/soldering experience this isn't too hard either, just a little delicate. You have to unsolder the 4 pins on each of the old stepper motors. Be very careful not to use too much heat. I highly recommend using a desoldering sucker tool. If you use too much heat you will burn the circuit on the board and have to make a jumper to the next available spot in the circuit. Use a very small soldering point/tip and be careful to only heat up the desired pins.

10. From the back side of the circuit board, identify the 4 pins of the stepper motor you are going to unsolder. I cocked the desoldering sucker tool, then applied heat to the pins for probably about 3 seconds, then quickly put the desoldering tool down on the hot solder and fired the trigger. One shot per pin did it for me. This went much better than I feared.

11. Once you have the 4 pins for one stepper motor unsoldered, if the pins aren't strait, take a small needle-nose pliers and make each desoldered pin perpendicular (sticking strait up) from the circuit board.

12. At this point I turned the circuit board over and was able to pull the old stepper motor off easily.
13. Now insert the new stepper motor being careful to guide the 4 pins into the old holes.

14. Turn the board back over and solder the 4 connectors again. You probably don't want to apply heat for more than about 3 seconds to avoid damage to the board. I press the soldering tip so it touches the pins and the tiny metal connector plate on the circuit board for a few seconds then apply some solder before removing the soldering iron. It takes only a little bit of solder.

15. When you are done replacing the stepper motor/motors put the back of the cluster back on. Set the front panel with all the markings back on being careful to guide the motor shafts through the correct holes. Then you are ready to put your needles back on.

16. Here I had several approaches suggested. Here is what worked for me. Trying to put it needle on right where the tape was seemed less accurate than what I desired. So I put them on a bit to the clockwise side of where the tape was. Then you can turn them back to the correct place rotating the needle on the shaft. One suggestion, from David, was to just put them on in the 12 O'clock position, then turn them back to the tape. This will turn the motor to the zero position, then rotate the needle on the shaft to it's final zero position. I didn't push them quite all the way down on the motor shaft until I had them in the final position. Then a final little push and they were in place.

17. I only put the back cover piece onto the circuit board at this point (per Kevin's suggestion). Then I reattached the wiring harness on the back and just sat it into place leaving the dash apart. I have a handheld GPS so I drove down the road comparing the GPS speed with the speedo speed. If they are different, I could have adjusted. But in my case they were fine. However, the RPM appeared a bit high on the tach so I adjusted it just a bit and also for the gas gage (I don't want it showing above E when I run out!).

18. Now I was able to snap the front (the glass/plastic window) on without disconnecting the instrument cluster again.
19. Then put in the 4 screws in to hold the cluster in place.
20. Put the gearshift lever down into low and snap the frame back on.

It was great to fix this problem without paying the high cost of a new cluster or having the dealer charge their prices to do it. I appreciate the help I got on-line and wanted to give these instructions and photos for the benefit of others. I hope this helps someone else attempting this electronic repair task.

Cheers,
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