Smiths Clock - How to reverse the polarity

Written by randall977 at Dec 24, 2012 11:31 am

Having decided to convert 108 to Negative Earth I thought I would reverse the polarity of the clock – one of the few items affected by such a change. The procedure is fairly simple, if a little fiddly - here is the procedure I used;

1. In order to access the mechanism carefully bend back the tags which fix the chrome bezel to the main body, the front will come off revealing the hands and face – be careful not to loose the spring and washer which are part of the hand adjuster.

2. Remove all four screws on the rear and lift the body off the mechanism – be careful not to damage the hands when laying the mechanism down. Avoid touching the mechanical parts of the clock.

3. To reverse the polarity two things need to be done. First the diode needs to be removed and turned round – in my clock it is a spring pressed against the disc diode which simply pushes into a slot. I removed the plate above the coil (and coil) to gain good access – this also allows you to make the second alteration easily as well…

4. Carefully remove the spring and disc diode – watch out that the spring does not go flying off! Turn the diode around and reinsert with the spring in the same configuration as before – I used thin pliers while someone else pushed the spring and diode in with a thin bladed screw driver.

5. The second alteration is to swap the connections over on the coil. I simply snipped the connections to the two pins, shortened the wires and re-soldered. It seems that this configuration works better so I wonder if it was intended that the clock be negative earth originally?

6. It's probably worth making a note of the change on the rear of the clock body with a fine indelible marker.

7. In my test, using a 12v supply, I had to manually move the pendulum to get it going again; I assume moving the car will do this when reinstalled.

Re: Smiths Clock - How to reverse the polarity

Written by SRD at Dec 24, 2012 3:40 pm

Christian - thanks for posting this.

A few small points were over-looked, in your otherwise excellent write up, which is very useful indeed.

1. Given that the clock on your car has not been used in 20 years plus, the pivots and plate pivot-holes will have dried out and there will be congealed oil and dust in them. I would recommend that you get yourself some clock oil and an oiler from "Cousins watch and clock spares". To do this for all pivots; you will need to remove the dial and hands, so you can lube the pivots from both ends of the steel arbors. With clock oil, less is more...

2. Take very, very great care when handling the clock when it's out of the case, as the balance wheel and hair spring are partially exposed and easily knocked. If you knock the hairspring out of parallel, you will not be able to true it, a watch/clock maker will be required.

[Tweezers and other fine tools are preferred for this work, using a very clean work, tool free surface, with a large sheet of white paper to work on].

3. This clock movement does not have a pendulum, it has a simple balance wheel arrangement. If you made a mark with a small amount of white tipex, when the clock is disconnected from 12 volts at the nominal 12 o'clock position, then reconnect to 12 volts, you will be able to quickly see how "gunged" up the pivots and pivot holes are by the amplitude of the "balance wheel". This is connected to the internal pallets and escape wheel.

When this escapement, is set up properly, you will have a nice clean tick-tock sound. It should beat at around 150 bpm, when correctly set up again after changing polarity.

Do note that a mechanical clock is not self starting, either you set it in motion by hand or when the car starts, the movement will start up. So disconnecting the battery will stop the clock, and it will not always start up when re-connected.

4. if you have been able to get the clock to keep decent time, don't expect quartz accuracy from any cheap mechanical car clock, then all is fine. If not, and having been down this road before, using a suitable capacitor and resistor will set things right. Then fine adjustment can be made via adjuster to front of clock, which will alter the position of curb pins with relation to the balance spring.

5. It's not a bad idea to put an inline fuse in the power lead when refitting the clock back in the dash to protect all that hard work – 250mA is ample.

Re: Smiths Clock - How to reverse the polarity

Written by randall977 at Jan 02, 2013 12:42 pm

Hi Simon, thanks for your expert input. After my Tag Heuer disaster I know not to touch clock mechanical parts! An inline fuse is a great idea.

Christian
