

POSITIVE AND NEGATIVE

I have long wondered why my 1937 MG has positive earth whilst my 1936 Bentley has negative earth. Many cars constructed before about 1950 were positive earth with later cars reverting to negative earth. The following is a Lucas reply to a similar question regarding positive and negative earth put in 1966.

“Electrical equipment will only function with current flow which requires a return path for the current that has passed through the component. Originally most vehicle manufacturers utilised either a special wire or the chassis for a return path. To distinguish between the two wiring systems, the type that used special wire return was designated ‘insulated return or I.R’. and the chassis return as ‘earth return or E.R’.

Earth return would be dangerous where high voltages are used, but earth return is quite safe for low voltages between 6 and 12 volts, but any leakage between wiring and chassis causes corrosion at the leaky point.

Pre-war insulating material was usually basically wood, rubber, ebonite, glass or later bakelite. All but glass had tendencies to exhibit minute leakage, which over a period of time encouraged corrosion of the terminals. Battery connections were most prone to corrosion because of the added effect of the acid. Earth return is only effective if the battery has one terminal connected to the chassis, and for certain chemical reasons less corrosion occurs if the positive earth terminal is earthed.

It was because of the advantages of earth return that by about 1935 nearly all manufacturers were using this system and to reduce corrosion the positive battery terminal was earthed. An additional advantage of positive earth was that a sparking plug sparks better with the earth electrode positive.

Since the war, plastic insulation has been used extensively, and because of this the leakage current no longer prevails. As there is no leakage to bother about, it does not matter which battery terminal is earthed from a corrosion point of view. Sparking plugs still operate more effectively with a positive earth electrode but now that ignition coils can be made which reverse the earthing potential of the power flowing through them, it is possible to use a negative earth battery and still obtain positive earth high tension. In theory the last few facts are a

little more complicated than stated but in practice the effects are still the same.

Post war negative earthing has many factors in its favour, and the most predominant are given below: -

Television interference is easier to suppress with negative earth, and of course this was no bother before the war. Electrical equipment is now being used as standard in more cars additional to the radio (probably the first electronic device used in a British car)

It is characteristic of all electrical apparatus, as opposed to electric, to be polarity conscious, that is affected by which supply terminal is earthed. If a transistor is connected the wrong way round it will be immediately irreparably damaged. Universal negative earthing would ensure that all power supplies to electronic gear were to the same earth and therefore reversed connections impossible. Electrical components like bulbs etc are not affected by which terminal is earthed, therefore these can be unchanged and universal in their application.

To help avoid any confusion which may arise in the difficult in-between changeover period, when vehicles of both types of earthing are produced, components are being marked + and -. To consider an ignition coil, for instance with positive earth, + is earth, so this is for distributor contacts and - is live, so this is the ignition feed. The same coil when used with negative earthing would be earth at - and so this is for the contact breaker, and live at +, making this the ignition feed.

Thus to summarise, Positive earth gives a better spark and less corrosion when insulators leak current. Negative earth interference is easier to suppress and electronic components are less likely damaged".

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