AMMETER SHUNTS FOR THE INSTALLATION OF A MODERN ALTERNATOR IN ANTIQUE JAGUARS

If you plan to install a modern alternator in your antique Jaguar, you will first discover that the original Lucas alternator after 1964 is rated at 40 amps, while modern units are rated between 80 and 100 amps. The story is similar for pre 1965 Jaguars with DC generators. Also, it is useful to note that an alternator is an AC generator with inbuilt solid state circuitry to convert the AC current to DC for the car's electrical system. If you have found the correct shaft drive pulley to adapt the replacement alternator to your Jaguar, you then need to think about installing a shunt across the input posts of the original ammeter, since the ammeter rotating coil is only rated to 40 amps and a higher current will burn out the delicate wiring. The two input posts on the back of the ammeter carry current from the generator/alternator and the battery allowing the electrical system to operate on either energy source. The difference in current between the two sources causes the magnetic force generated by the moving coil to swing the needle clockwise or counterclockwise i.e. clockwise (so called charge) is dominated by the generator/alternator and counterclockwise (so called discharge) by the battery. By installing a piece of conducting metal across these input posts the excess current beyond 40 amps generated by the new unit will bleed across from the generator/alternator post to the opposite battery post and avoid overloading the coil. If the battery is fully charged, the alternator will correspondingly reduce its output due to the control built into the solid state circuitry in the alternator itself. Because steel, aluminum and copper are conductors whose resistance is a strong function of ambient temperature with resistance rising with temperature, it is important to use a specially derived alloy of manganese and copper called manganin for the shunt. Also, the X sectional area of the shunt must be calibrated to the bleeding current i.e. a new alternator generating 80 amps must bleed 40 amps across the shunt and a 100 amp replacement unit must bleed 60 amps across the shunt. To get the right area I have calibrated from my own installation of a modern GM DELCO alternator of 80 amps from a supplier of Jaguar components. I was able to obtain a small supply of manganin flat strips on the internet and recently made a shunt for the Jaguar MK. 2 that Lee and Mike O'Brien are rebuilding with a 100 amp alternator. If anyone else in the club is considering one of these installations of a modern alternator, I would be happy to make the required shunt from my stock.

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