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THE CALCULATION OF THE HEATING SYSTEM OF CAR

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In this work the calculations allowing to estimate the efficiency of the regular heating system and the thermophysical characteristics of the car saloon under winter operation is presented. The time of air heating inside the car depends not only on productivity of the heating system, but also on thermoisolation of the saloon, thermal capacities of materials of upholstery elements and on tightness of joints in the car. In the given calculations it was taken into account, that the circulation of air in the saloon has a complex character: besides the forced movement of air from the fan of the heater, a free convection takes place as well, resulting in some changes in value of temperature. Large thermal capacity and mass of details of upholstery absorbing partially the heat result in a negative influence on the time of heating. For confirmation of the given calculations some experiments were carried out and their results are presented.

Key words: automobile, amount of heat, thermal capacity, factor of heat transfer, criterion of similarity

PRORAČUNI U VEZI SA SISTEMOM GREJANJA AUTOMOBILA

U ovom radu predstavljeni su proračuni koji omogućavaju procenu efikasnosti regularnog sistema za grejanje i termofizičke karakteristike unutrašnjosti automobila kod rada u zimskim uslovima. Vreme zagrevanja vazduha unutar automobila zavisi ne samo od produktivnosti sistema za grejanje, već i od termoizolacije unutrašnjosti automobila, toplotnog kapaciteta materijala tapaciranih elemenata i od čvrstoće spojeva u automobilu. U datim proračunima uzeto je u obzir da ptorok vazduha u unutrašnjosti automobila ima kompleksan karakter: pored prisilnog kretanja vazduha iz ventilatora grejača, dolazi i do slobodne konvekcije (strujanja vazduha) što za rezultat ima promenu visine temperature. Veliki toplotni kapacitet i brojni tapacirani elementi koji delimično apsorbuju toplotu imaju za rezultat negativan uticaj na vreme grejanja. Za potvrdu datih proračuna izvršeni su neki eksperimenti i dati su njihovi rezultati.

Ključne reči: automobil, količina toplote, toplotni kapacitet, faktor prenosa toplote, kriterijum sličnosti