

Tasks for 2nd Mid Term Exam in subject Vehicle aerodynamics 2012 December

1. Generation and methods of reduction of front drag of cars.
 2. Generation, effect and control of lift force acting on cars.
 3. Effects of wheels and wheelhouses on the drag and lift of cars.
 4. Please analyse the flow field past sloping rear wall (window) of cars and the relation between lift force and the angle.
 5. Effect of side wind on the pressure distribution past cars (line diagram). How can be reduced the harmful effect of side wind on the directional control.
 6. Please, show by using a line diagram the front and rear spoilers and list and explain their effects on lift and drag.
 7. Please, list (without explanation) the modifications of car body resulting in drag reduction.
 8. Please, sketch the parts of a car where boundary layer separation can be expected and the separation bubbles as well as open vortex tubes.
 9. Please describe the generation of rear (base) drag of cars and methods of its reduction.
 10. Please list of characteristics of flow past bus body in general and past individual parts of the body.
 11. Please write about composition and reduction of drag force acting on a bus (brick shaped bluff) body and methods of reduction.
 12. Please list and value the changes of bus body geometry according to drag reduction capability.
 13. Please, list and value the add on devices used at buses according to drag reduction (or increase) capability.
 14. Please explain the fluid mechanical background of mud deposition on rear wall of buses and the methods of its reduction.
 14. Please explain the fluid mechanical background of mud deposition on side walls of buses and the methods and mechanisms of its reduction.
 15. Please list the consequences (drag, rear and side wall mud deposition) of use of a front spoiler for a bus and explain the reasons for it.
 16. The consequence of sharp vertical leading edges on the side wall mud deposition, and its explanation.
 17. Please estimate the increase of values of drag and lift coefficients in comparison to that of a car body without wheelhouse when adding wheelhouse and wheel to the body.
 18. Besides change of drag and lift coefficient please, define two reasons for significance of wheelhouses and wheels in terms of development of flow field past a car body.
- koruli aramlasban!
19. Please, list three possible measuring methods that can be used for measurement of flow past wheels and evaluate them.
 20. Please, explain the drag reduction by using shear layer conditioning.
 21. Use of shear layer conditioning for drag reduction at trucks, lorries.
 22. Use of spoilers, turning vanes, modification of trailer front face for reducing drag.