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重型柴油车道路循环工况下排放特性的仿真分析 

Simulation on the emission characteristics of heavy-duty diesel vehicle under transient driving cycle

关键词: [重型柴油车](#) [NO_x排放](#) [动态特性](#) [道路循环工况](#)

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摘要: 柴油车道路工况下NO_x排放和排温的动态特性对柴油机排气后处理系统的工作以及后处理系统控制策略的确定具有重要的影响.根据6114涡轮增压柴油机的万有特性及NO_x和排温的MAP图,仿真分析了道路循环工况下配有6114柴油机的重型柴油车的NO_x排放和排温的动态变化;研究了道路工况、行驶特征、驾驶行为以及柴油车载荷等对柴油车排放的影响规律.研究表明,城市道路循环工况下,柴油车NO_x排放的整体水平不高,但变化频繁、剧烈;高速公路道路循环工况下,柴油车NO_x排放整体水平较高,但变化平缓;加速过程,尤其是在高速区对柴油车排放的影响显著;冲动的驾驶方式会显著提高柴油车的排放水平;满载时,柴油车的高排放区将由半载时的高速高加速区向外扩展至其他工况点,高排放区显著增大.

Abstract: The transient characteristics of NO_x emission and exhaust temperature of heavy-duty diesel vehicle under road conditions have important effects on the work of the after-treatment system and the establishment of the control strategy of the after-treatment system. The transient characteristics of NO_x emission and exhaust temperature of a heavy-duty diesel vehicle equipped with 6114 diesel engine under transient driving cycle have been analyzed based on the universal characteristic curves and the MAPs of NO_x emission and exhaust temperature of the 6114 diesel engine. The effects of road conditions, characteristics of running, behaviors of driving and loads of the vehicle on the transient emission characteristics of the heavy-duty diesel vehicle have been investigated. The simulation results show that under the urban roads cycle conditions, NO_x emission is relatively lower with more frequent and intensive changes. Under the highway cycle conditions, NO_x emission is higher with more gentle changes. The influence of the acceleration of the vehicle on the NO_x emissions, especially in the high-speed area, is remarkable. The aggressive driving behavior can increase markedly the emissions of the heavy-duty diesel vehicle. Under full-load condition, the high emission area will extend to other areas from high-speed and high-acceleration area, which leads to the high emission area increase obviously.

Key words: [heavy-duty diesel vehicle](#) [NO_x emission](#) [transient characteristic](#) [transient driving cycle](#)

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