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DETERMINATION OF THE FUEL CONSUMPTION OF A CAR IN THE CYCLE OF MOVEMENT IN URBAN CONDITIONS (IN THE MATLAB PROGRAM)

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Abstract

In this article, the determination of the influence of the parameters of the driving conditions of the car on its fuel consumption, the reasonable selection of the parameters of the car for certain operating conditions, and the research of determining the norm of the fuel consumption of the car in the given conditions require long-term test research. The current state of information technology and several computer software provides an opportunity to evaluate the existing processes employing simulation modelling.

Keywords: drive cycle, car, fuel consumption, moderation, economy, resource.

Introduction

To determine the fuel consumption of the car, we use the section called Fuel Consumption in the MatLab program, in this section we will be able to see the fuel consumption of the car based on the data from the engine [1-4].

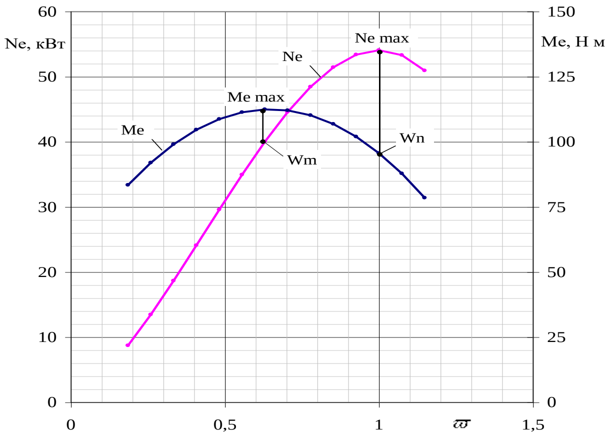

Figure 1. External speed characteristics of the Nexia car engine

To determine the full power, we extract the signal from the speed according to the formula, divide it by wN, and multiply it using the Polynomial function to the maximum power in the car passport. The result is in watts, we can divide it by 1000 to kw. We use the Saturation Dynamic function to get the desired power compared to the power coming from the engine [5-9].

$$\varpi = \frac{\omega_e}{\omega_N} \quad U = \frac{N_r}{N_\partial \, \eta_{TP}} \quad (2.1)$$

$$Pe=Pemax*(-1.815*\varpi^3+2.895*\varpi^2-0.1953*\varpi+0.1153)$$

We build a model according to the formula to determine the coefficients K_w and K_u, which are necessary to determine fuel consumption. To determine K_u, the power coming from the engine is divided by the power determined by the angular speed, and we get the result by putting the coefficients using the Polynomial function [10-17].

$$K_U = a_U + b_U U + c_U U^2 \quad (2.2)$$

To determine k_w, we can put the previously determined w into the Polynomial function. $K_\omega = a_\omega + b_\omega \varpi + c_\omega \varpi^2$

To determine the fuel economy, we use the G_T formula, multiplying the previously obtained results.

$$G_T = \frac{N_k g_{eN} K_U K_\omega}{1000 \eta_{TP}} \quad (2.3)$$

Result

We will correct the units of the obtained results. We can convert from hours to seconds, from grams to kilograms, and from kilograms/seconds to litres/seconds. We determine Q by taking the inverse derivative from G_T. This part of ours is also ready, now we will create the final subsystem and see the model that completes our work. The model created using the MatLab Simulink computer program, i.e., the model for evaluating the car's fuel consumption in the driving cycle, made it possible to record the result of 5.69 l/100km of fuel consumed by the Nexia passenger car when moving according to the requirements of the NEDC driving cycle (2- picture).

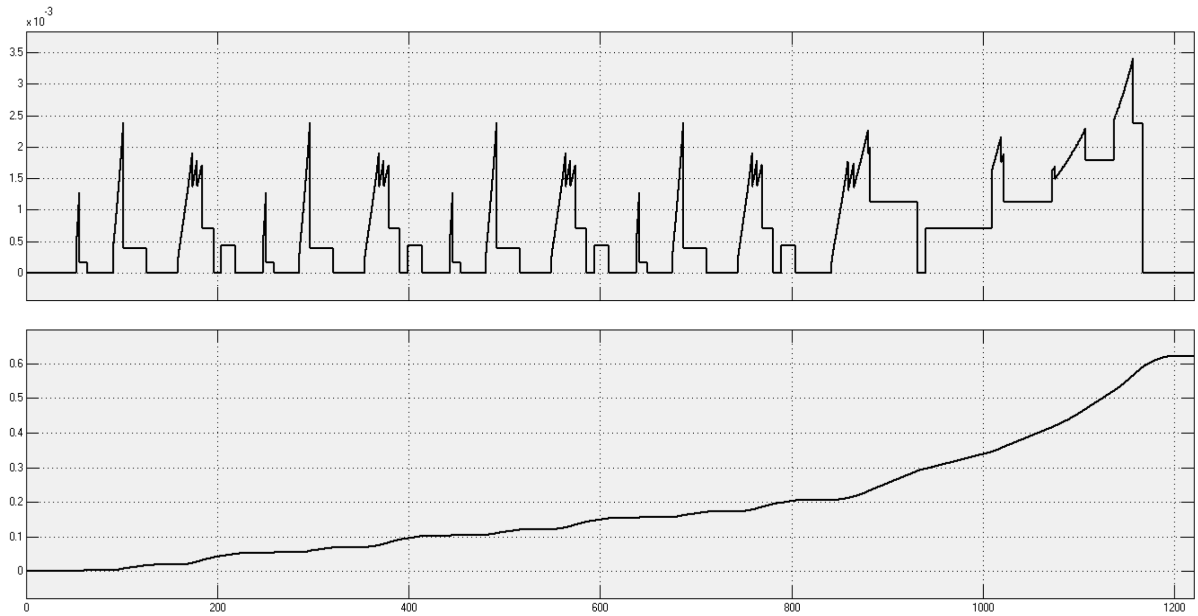

Figure 2. The amount of fuel consumed by the Nexia passenger car when driving according to the requirements of the NEDC driving cycle.

Conclusion

The advantage of the program is that it eliminates the complexities of road test studies and the time and financial costs involved in it. At present, testing and research work is being carried out to confirm the reliability of this model.

References

1. Ўзбекистон республикаси президенти Ш. Мирзиёев Қарори 2017 — 2021 йилларда гидроэнергетикани янада ривожлантириш чора-тадбирлари дастури тўғрисида тошкент ш., 2017 йил 2 май, Пқ-2947-сон.
2. Anvarjon, I. A. (2022). Research on polishing properties of gear oils and ways to improve them. *Innovative Technologica: Methodical Research Journal*, *3*(09), 13-21.
3. Ismadiyorov, A. A., & Sotvoldiyev, O. U. (2021). Model of assessment of fuel consumption in car operation in city conditions. *Academic research in educational sciences*, *2*(11), 1013-1019.
4. Alimova, Z. X., & Ismadiyarov, A. other. Improvement of the operating properties of transmission oils used in agricultural machinery. *International jurnal for innovative engineering and management research*, *9*(12), 181-184.
5. Алимова, З. Х., Исмадиёров, А. А., & Тожибаев, Ф. О. (2021). Электронное научно-практическое периодическое международное издание «Экономика и социум» Выпуск№ 4 (83)(апрель, 2021) часть1. *Россия, г. Саратов*, 595-599.
6. Alimova, Z. K., Ismadierov, A. A., & Tozhibaev, F. O. (2021). Influence of the chemical composition of motor oils on viscosity indicators. *Z. Kh. Alimova, AA Ismadierov, FO Tozhibaev//Economy and society*, (4-1), 83.
7. Qobulov, M., Ismadiyorov, A., & Fayzullayev, X. (2022). Analysis of the braking properties of the man cla 16.220 for severe operating conditions. *European International Journal of Multidisciplinary Research and Management Studies*, *2*(03), 52-59.
8. Qobulov, M., Ismadiyorov, A., & Fayzullayev, X. (2022). Overcoming the Shortcomings Arising in the Process of Adapting Cars to the Compressed Gas. *Eurasian Research Bulletin*, *6*, 109-113.
9. Anvarjon, I. A. (2022). Research on polishing properties of gear oils and ways to improve them. *Innovative Technologica: Methodical Research Journal*, *3*(09), 13-21.
10. Ходжаев, С. М., Низомиддинова, М. С., Камбарова, Ч. О., & Ходжаева, Н. С. (2022). Организация станции технического обслуживания при Ферганском политехническом институте. *Science and Education*, *3*(10), 265-274.
11. Khodjaev, S. M. (2022). The main problems of organization and management of car maintenance and repair stations in the Ferghana region. *Innovative Technologica: Methodical Research Journal*, *3*(09), 38-47.
12. Maxmudov, N. A., Ochilov, T. Y., Kamolov, O. Y., Ashurxodjaev, B. X., Abdug'Aniev Sh, A., & Xodjayev, S. M. (2021). TiN/Cr/Al2O3 and TiN/Al2O3 hybrid coatings structure features and properties resulting from combined treatment. *Экономика и социум*, (3-1 (82)), 176-181.
13. O‘G, G. O. U. B., Jaloldinov, L., Otabayev, N. I., & Xodjayev, S. M. (2021). Measurement of tires pressure and load weight on the. *Academic research in educational sciences*, *2*(11), 1055-1061.
14. Xujamkulov, S., Abdubannopov, A., & Botirov, B. (2021). Zamonaviy avtomobillarda qo’llaniladigan acceleration slip regulation tizimi tahlili. *Scientific progress*, *2*(1), 1467-1472.

15. Xujamqulov, S. U., Masodiqov, Q. X., & Abdunazarov, R. X. (2022, March). Prospects for the development of the automotive industry in uzbekistan. In *E Conference Zone* (pp. 98-100).
16. Meliboyev, A., Khujamqulov, S., & Masodiqov, J. (2021). Univer calculation-experimental method of researching the indicators of its toxicity in its management by changing the working capacity of the engine using the characteristics. *Экономика и социум*, (4-1), 207-210.
17. Fayziev, P. R., Tursunov, D. M., Khujamkulov, S., Ismandiyarov, A., & Abdubannopov, A. (2022). Overview of solar dryers for drying lumber and wood. *American Journal Of Applied Science And Technology*, *2*(04), 47-57.