



Comparison of Restored Diesel IC Engine Performance with Brandnew Engine

S.R. Illangasinghe ^{a*}, M.A.P. Chathuranga ^a, B.L.S. Thilakarathne ^a,
D.R.B.K.K. Weerasekara ^b

^a*Department of Engineering Technology, Faculty of Technology, University of Ruhuna, Karagoda-Uyangoda, Kamburupitiya, Sri Lanka*

^b*HNDE, Sri Lanka Institute of Advance Technological Education, Labuduwa, Galle, Sri Lanka*

*Corresponding author: *ilangasinghes@gmail.com*

ABSTRACT

To meet the present requirements of the automotive industry, there is continuous improvement in the performance and exhaust emission of restored internal combustion (IC) diesel engine. This research presents the experimental data regarding the effect of exhaust gas temperature, cooling temperature, fuel consumption and emission gases of the restored and brand-new diesel IC engines. Catalytic convertor with modified muffler was installed to exhaust manifold to reduce emission. Exhaust gas tester (EGT) probe and temperature sensors were installed to muffler, upper & lower trunk hoses respectively. Arduino based sensors were used to this scenario. Dust sensor, carbon monoxide (CO) sensor and hydrocarbon (HC) sensors were used to test emission gases through the modified muffler. Researchers were developed a customized emission tester based on Arduino. The results show same values for cooling system temperature. The emission test data such as CO, HC & K-Factor of brand-new and restored engine were tested with ideal and high RPM conditions and there is a significant variation in exhaust gas temperature test data. However, those values do not surpass the vehicle emission standards in Sri Lanka. Addition of customized parts, change of mechanical properties due to the oldness of the engine, advance injection pump or retard angle, adjustment of injection timing can be caused for those variations. The results strongly indicate that modification of restored engine can be used for vehicle by maintain the Sri Lankan emission standards. Authors recommended restoring old engines by installing customized versions of modern technological components. Ultimately authors can conclude that old engine can be restored to satisfy the Sri Lankan motor traffic standards and emission standards with minimum cost and the result of the research proved that the performance parameters provide a solution to vehicle scraps and give an idea about restoring an old vehicle in profitable way

Keywords: *Diesel IC engine, EGT, Emission, K-Factor, Catalytic Convertor*