

Analysis of Fuel Efficiency in Heavy Construction Compaction Machine and Factors Affecting Fuel Efficiency

Authors : Amey Kulkarni, Paavan Shetty, Amol Patil, B. Rajiv

Abstract : Fuel Efficiency plays a very important role in overall performance of an automobile. In this paper study of fuel efficiency of heavy construction, compaction machine is done. The fuel Consumption trials are performed in order to obtain the consumption of fuel in performing certain set of actions by the compactor. Usually, Heavy Construction machines are put to work in locations where refilling the fuel tank is not an easy task and also the fuel is consumed at a greater rate than a passenger automobile. So it becomes important to have a fuel efficient machine for long working hours. The fuel efficiency is the most important point in determining the future scope of the product. A heavy construction compaction machine operates in five major roles. These five roles are traveling, Static working, High-frequency Low amplitude compaction, Low-frequency High amplitude compaction, low idle. Fuel consumption readings for 1950 rpm, 2000 rpm & 2350 rpm of the engine are taken by using differential fuel flow meter and are analyzed. And the optimum RPM setting which fulfills the fuel efficiency, as well as engine performance criteria, is considered. Also, other factors such as rear end gears, Intake and exhaust restriction for an engine, vehicle operating techniques, air drag, Tribological aspects, Tires are considered for increasing the fuel efficiency of the compactor. The fuel efficiency of compactor can be precisely calculated by using Differential Fuel Flow Meter. By testing the compactor at different combinations of Engine RPM and also considering other factors such as rear end gears, Intake and exhaust restriction of an engine, vehicle operating techniques, air drag, Tribological aspects, The optimum solution was obtained which lead to significant improvement in fuel efficiency of the compactor.

Keywords : differential fuel flow meter, engine RPM, fuel efficiency, heavy construction compaction machine

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020