

# **A study on the Capacity and Capability of Local Diesel Engine Manufacture in Tanzania**

**Respich Zilangeza Mahob'he Mvukiye**

**Master of Science (Mechanical Engineering)**

**University of Dar es salaam, school of Engineering, college of engineering and technology  
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An attempt has been made to identify the capacity and capability of manufacturing major diesel engine components such as engine blocks, cylinder heads, crankshafts, etc, using the existing facilities and expertise in the country. Data were compiled and evaluated from questionnaires sent to KIDC, TAZARA, MMMT, NECO and other related reports. It has been revealed that most of the industries are working below 50% capacity utilization mainly due to lack of trained personnel, poor facilities, lack of funds, raw materials and infrastructures, etc. findings on the state of equipment and machineries in the surveyed industries show that much as they are old, could save up to more than ten years if well maintained. Forging machines include drop forging machines up to 300 tonnes but are used for forging of simple shaped metal blanks heated by charcoal, coke or oil. Most of machining facilities (lathes, milling, shipping, grinding, etc) are conventional, but capable of machining most engine parts. Facilities at KIDC, MMMT and TAZARA are capable of conventional heat treatment, and not surface treatment such as crankpins surface hardening. All foundries have cupola and electric furnaces of up to 400 kg/h and 500 kg/charge respectively. Pattern making is carried by all industries, but TATC has good and well-trained pattern makers. The ratios of engineers: technicians: artisans are 1:2:6, 1:3:8, 1:2:65, 1:2:6, and 1:1:11 for KIDC, TAZARA, MMMT, NECO, and TATC respectively. This is on the lower side compared to standard 1:5:25 recommended by ILO. Thus, more technicians and artisans need to be recruited. Given the above facilities, casting could be taken as the most economical basic process for the production of engine blocks, cylinder heads (using grey casting iron), connecting rods, crankshafts (using ductile iron) and engine sump using aluminum) locally. However, for mass production each industry should concentrate on certain components so as to maintain quality. Thus, KIDC will have to specialize on connecting rods, TATC on engine blocks, cylinder heads, crankshafts and oil sumps and pattern making, NECO on machining the parts and TAZARA on heat treatment. An assembling plant, such as TAMCO, which will have to receive finished components and other off-the shelf parts from local or foreign markets by orders is required. Hence, the engine designs should base on the available off-the shelf parts (piston heads and rings, etc.) in the markets. Future work is therefore required to investigate the economical and financial viability of the engine development projects in Tanzania. Also, investment in training of technical personnel and acquiring of modern machines such as NC and CNC will be of great advantage to manufacture engine parts massively.