

ABSTRACT

Heavy equipment work, especially dump trucks, requires maintained engine durability to maintain stable engine performance so that the unit can always produce. The dump truck unit belonging to PT PP Presisi uses a coolant in the form of river water due to limited spare parts, this lasts quite a long time and continuous use of the unit causes engine overheating. In this work the performance of the cooling system greatly influences the effectiveness of dump truck performance.

In collecting data on overheating damage that occurred on the Hino Dutro 300 dump truck unit, the component that will be examined is the cooling system because corrosion and buildup of scale and deposits were found. This research was carried out by analyzing the effect of using alternative liquids to replace radiator coolant if in the field there is no coolant according to the unit specifications. Tests carried out include pH tests, total dissolved solids tests, dissolved oxygen tests and cooling effectiveness tests of the coolant.

The results of research analysis show that reverse osmosis water has a pH value of 7 (neutral), a TDS value of 90 ppm, a DO value of 6.4 ppm and has a cooling effectiveness percentage value of 18.5%. Rainwater has a pH value of 6.4 (acid), a TDS value of 171 ppm, a DO value of 7.6 ppm and has a cooling effectiveness percentage value of 13.9%. River water has a neutral pH value of 7, TDS value of 276 ppm, DO value of 7.6 ppm and has a cooling effectiveness percentage value of 11.7%. From several tests carried out, the most suitable medium to be used as an alternative fluid for a diesel engine cooling system is reverse osmosis water.

Keywords: *reverse osmosis, coolant, pH test, TDS test, DO test.*

INTISARI

Pada pekerjaan alat berat khususnya dump truk memerlukan ketahanan mesin yang terjaga untuk menjaga kestabilan kinerja mesin. Unit dump truk milik PT PP Presisi menggunakan cairan pendingin berupa air sungai karena keterbatasan sparepart, hal ini berlangsung cukup lama yang menyebabkan engine overheating. Dalam pekerjaan ini kinerja dari sistem pendingin sangat berpengaruh terhadap efektivitas kinerja dump truk.

Dalam mengumpulkan data kerusakan *overheating* yang terjadi pada unit *dump truk* Hino dutro 300, komponen yang akan diteliti yaitu sistem pendingin karena ditemukan korosi dan penumpukan kerak maupun endapan. Penelitian dilakukan dengan menganalisa pengaruh penggunaan cairan alternatif pengganti radiator coolant. Pengujian yang dilakukan antara lain uji pH, uji total padatan terlarut, uji oksigen terlarut dan uji efektifitas pendingin dari cairan pendingin.

Hasil analisis penelitian menunjukkan air reverse osmosis memiliki nilai pH 7 (netral), nilai TDS 90 ppm, nilai DO 6.4 ppm dan memiliki nilai presentase efektifitas pendinginan 18.5 %. Air hujan memiliki nilai pH 6.4 (asam), nilai TDS 171 ppm, nilai DO 7.6 ppm dan memiliki nilai presentase efektifitas pendinginan 13.9 %. Air sungai memiliki hasil dengan nilai pH 7 (netral), nilai TDS 276 ppm, nilai DO 7.6 ppm dan memiliki nilai presentase efektifitas pendinginan 11.7 %. Dari beberapa pengujian yang dilakukan media yang paling cocok dijadikan cairan alternatif sistem pendingin mesin diesel adalah air reverse osmosis.

Kata kunci : *reverse osmosis, cairan pendingin, uji ph, uji tds, uji do.*