

INTISARI

Dump Truck HD785-7 merupakan alat berat yang dioperasikan di pertambangan batubara pada *site* ADMO-Kalimantan Selatan. Unit HD785-7 dengan kode WT090-0004 mengalami masalah *engine oil and water coolant mixing* yang mengakibatkan kerusakan pada *diesel engine*. Tujuan dari penelitian ini adalah untuk mengetahui penyebab terjadinya kegagalan *engine*, untuk mengetahui dampak dari kegagalan *engine* dan mencari solusi untuk menyelesaikan masalah kegagalan pada *diesel engine*.

Penelitian dilakukan dengan melakukan pengecekan secara visual, pengamatan *historical maintenance*, pengamatan hasil *diesel engine overhaul*, serta hasil pengukuran komponen. Pengecekan secara visual dilakukan oleh mekanik dengan mengisi *form Technical Information*. Pengamatan *historical maintenance* dapat diperoleh melalui PT SIS *Ellipse 6.3.2 Implementation*. Pengamatan hasil *diesel engine overhaul* dan pengukuran dilakukan untuk mengetahui kondisi komponen di dalam *engine* yang terindikasi *engine oil and water coolant mixing*.

Hasil penelitian menunjukkan bahwa penyebab terjadinya kerusakan adalah rusaknya *piston cooling nozzle*. Kerusakan pada *piston cooling nozzle* dikarenakan material mengalami *fatigue* yang mengakibatkan *tube* terlepas dari *holder*. Hal tersebut membuat kegagalan lubrikasi pada *cylinder liner*, sehingga terbentuk panas berlebih pada area *cylinder liner-ring-piston (high friction)* dan menyebabkan *cylinder liner* mengalami *crack* dan bocor. Kebocoran pada *cylinder liner* membuat *water coolant* masuk ke dalam *cylinder liner* dan *step down* ke *crank case* dan *oil pan*. Dampak yang ditimbulkan dari kegagalan *engine* dengan kasus *engine oil mixed water coolant* adalah rusaknya komponen sistem lubrikasi pada *diesel engine*, sehingga *diesel engine* tidak bekerja secara optimal dan turunnya performa terhadap unit.

Kata kunci: *diesel engine, engine oil and water coolant mixing, piston cooling nozzle, sistem lubrikasi.*

ABSTRACT

Dump Truck HD785-7 is a heavy equipment operated in coal mining at the ADMO-South Kalimantan site. The HD785-7 Unit with the WT090-0004 code experienced engine oil and water coolant mixing problem which resulted in damage to the diesel engine. The purpose of the study are to determine the cause of engine failures, to determine the impact of engine failures, and to find solutions to solve diesel engine failure problems.

The research was done by visually checking, historical maintenance observation, observation of diesel engine overhaul results, and component measurement results. The visual check was done by the mechanics of completing the Technical Information form. Historical maintenance observations can be obtained through PT SIS Ellipse 6.3.2 Implementation. The observation of the engine overhaul and measurement diesel engines was performed to determine the condition of the components inside the engine that are indicated engine oil and water coolant mixing.

The results show that the cause of damage is piston cooling nozzle damage. Damage of piston cooling nozzle is caused by fatigue material that resulted in the tube regardless of the holder. It makes failure of lubrication on the cylinder liner, and causes excessive heat in the cylinder liner-ring-piston (high friction) area which in turn makes the cylinder liner crack and leak. The leak in a cylinder liner makes water coolant enters cylinder liner and steps down to crankcase and oil pan. The impact of engine failure in the case of the engine oil and water coolant mixing is the breakdown of lubrication system components in diesel engines, so that diesel engines do not work optimally and decrease in performance against the unit.

Keywords: *diesel engine, engine oil and water coolant mixing, piston cooling nozzle, lubrication system.*