

## INTISARI

*Soot* merupakan partikel karbon berukuran mikro yang merupakan hasil dari pembakaran tidak sempurna hidrokarbon. Selain keluar melewati *exhaust valve*, *soot* juga akan terlepas dan diserap oleh pelumas. Kadar *soot* yang tinggi menyebabkan penurunan sifat fisik dari pelumas. Penelitian ini memiliki tujuan untuk menemukan penyebab dari kondisi *high soot engine* pada mesin diesel Komatsu SAA6D140E-3 unit *Excavator* Komatsu PC750-7 dan PC800-7 milik PT. Kaltim Prima Coal serta menentukan program peningkatan perawatan untuk mengurangi timbulnya kondisi *high soot engine*.

Kondisi *high soot engine* dapat diketahui dari hasil pengukuran dengan *Fourier Transform Infrared (FT-IR) Spectrometry*. Analisis penyebab *high soot engine* dilakukan dengan meninjau riwayat *engine blow-by pressure* serta meninjau kembali dan membandingkan *engine corrective maintenace work order* pada saat *trend* kondisi *engine soot* meningkat. Penentuan program peningkatan perawatan menggunakan konsep *Reliability Centered Maintenance II* berdasar pada hasil analisis penyebab *high soot engine* tersebut.

Riwayat hasil pengukuran *engine blow-by pressure* untuk semua *engine* menunjukkan pada kondisi normal. Kondisi *high soot engine* mengalami kecenderungan meningkat saat terjadi kegagalan pada komponen *air intake and exhaust system* khususnya pada *air cleaner*, *turbocharger*, *aftercooler* dan *exhaust manifold*. *Proactive task* yang perlu ditambahkan pada program perawatan untuk mengurangi timbulnya *high soot engine* adalah:

1. Pembersihan *outer element filter* dan *vaquator valve* pada *daily periodical maintenance*.
2. Pengecekan visual kondisi komponen *air intake and exhaust system* pada *daily periodical maintenance*.
3. Pengecekan kondisi *air intake and exhaust system* dengan melakukan *boost pressure test* yang dapat dilakukan melalui *monitor panel* pada *daily periodical maintenance*.
4. Tes kebocoran pada *air intake system* menggunakan *special tool air intake leakage tester* pada *periodical maintenance* 1000 jam.

**Kata Kunci:** *High soot engine*, mesin diesel Komatsu SAA6D140E-3, *air intake and exhaust system*, *reliabilty centered maintenance*.

## ABSTRACT

*Soot is microscopic carbon particle which is incomplete combustion product of hydrocarbons. Besides passes out the exhaust valve, soot also contaminated and absorbed by the lubricant. The high soot amount can cause the derivation of lubricant physical characteristic. This research aims to find the agent of high soot engine in Komatsu SAA6D140E-3 diesel engine, unit of excavator Komatsu PC750-7 and PC800-7. PT. Kaltim Prima Coal as an owner has determined the maintenance optimization programs to reduce the appearing of high soot engine condition.*

*High soot engine condition measured by Fourier Transform Infrared (FT-IR) Spectrometry. The cause analysis of high soot engine did by the observation of engine blow-by pressure history and the observation and comparison of engine work order history while the trend of soot condition increase. The determination of the maintenance optimization programs using Reliability Centered Maintenance II concept based on the results of the cause of high soot engine.*

*The engine blow-by pressure measurement for all engines show in normal condition. The high soot condition have preferenced to increase while the air intake and exhaust system component failure was happened especially on air cleaner, turbocharger, aftercooler and exhaust manifold. The proactive task which needed to add on maintenance program in order to reduce the appearing of high soot engine are:*

- 1. Outer element filter and vaquator valve cleaning on daily periodical maintenance.*
- 2. Condition visual checking of air intake and exhaust system component on daily periodical maintenance.*
- 3. Air intake and exhaust system checking by boost pressure test that can be operated with monitor panel on daily periodical maintenance.*
- 4. Air intake system leakage testing using special tool of air intake leakage tester on periodical maintenance 1000 hours*

**Key Words:** *High soot engine, Komatsu SAA6D140E-3 diesel engine, air intake and exhaust system, reliabilty centered maintenance.*