

ABSTRACT

High downtime of Komatsu HD785-7 units in the mining sector has been identified as originating from engine disturbances, specifically injector system abnormalities triggering error code CA553, which necessitates injector removal. The use of common tools for injector removal causes piping damage and drastically inflates repair lead time from a target of 16 hours to 43.72 hours, highlighting inefficiencies and safety risks. Through literature review, direct observation, and interviews, this study aims to identify the root cause, measure time efficiency and cost savings with special tool implementation, and provide technical recommendations for improving work safety. Concrete results show that injector replacement successfully restored rail pressure and suppressed the frequency of error code CA553. Furthermore, the implementation of a special tool demonstrably reduced the "Remove and Install" injector job lead time from the company's 16-hour target to approximately 11 hours, resulting in a total lead time saving of 5 hours. This translates to potential operational cost savings of Rp 31,424,000. Beyond efficiency and economic impacts, Job Safety Analysis (JSA) confirmed that special tool usage significantly improved work safety by minimizing five categories of potential hazards. In conclusion, the absence of special tools was the primary cause of inflated lead time and component damage, and the adoption of special tools proved effective in reducing lead time, saving costs, and ensuring work safety, making a contribution to improving operational efficiency.

Keywords: remove and install, injector, special tool, Komatsu HD785-7

INTISARI

Masalah tingginya *downtime* unit Komatsu HD785-7 di sektor pertambangan diidentifikasi berasal dari gangguan *engine*, khususnya abnormalitas sistem *injector* yang memicu *error code* CA553 yang menandakan harus dilakukan pelepasan *injector*. Penggunaan *common tools* dalam proses pelepasan *injector* menyebabkan kerusakan *piping* dan pembengkakan *lead time* perbaikan secara drastis dari target 16 jam menjadi 43,72 jam, menyoroti inefisiensi dan risiko keselamatan. Melalui studi literatur, observasi langsung, dan wawancara, penelitian ini bertujuan untuk mengidentifikasi akar masalah tersebut, mengukur efisiensi waktu dan penghematan biaya dengan implementasi *special tool*, serta menyediakan rekomendasi teknis untuk peningkatan keselamatan kerja. Hasil secara konkret menunjukkan bahwa penggantian *injector* berhasil memulihkan tekanan *rail* dan menekan frekuensi *error code* CA553. Lebih lanjut, implementasi *special tool* terbukti mereduksi *lead time* pekerjaan "Remove and Install" *injector* dari 16 jam dari target yang diberikan perusahaan menjadi sekitar 11 jam, menghasilkan penghematan *lead time* total 5 jam yang berimplikasi pada potensi penghematan biaya operasional sebesar Rp 31.424.000. Selain dampak efisiensi dan ekonomis, analisis *Job Safety Analysis* (JSA) mengonfirmasi bahwa penggunaan *special tool* secara signifikan meningkatkan keselamatan kerja dengan meminimalkan lima kategori potensi bahaya. Kesimpulannya, ketiadaan *special tool* adalah penyebab utama *lead time* yang membengkak dan kerusakan komponen, dan adopsi *special tool* terbukti efektif dalam mereduksi *lead time*, menghemat biaya, serta menjamin keselamatan kerja, memberikan kontribusi terhadap peningkatan efisiensi operasional.

Kata Kunci: *remove and install, injector, special tool, Komatsu HD785-7*