

ABSTRACT

This study examines the causes, effects, and solutions for failures in the variable-displacement piston hydraulic pump (HPV375+375) on the Komatsu PC850-8R1 excavator, characterized by a drop in main pump pressure below standard levels, resulting in low power, attachment delay, and even engine stall under heavy loads. Using a qualitative descriptive approach involving observation, interviews, breakdown history, and overhaul records, the root cause analysis was conducted using Root Cause Analysis (RCA), including the 5 Whys, Fishbone diagram, Plan Do Check Act (PDCA), and Fault Tree Analysis (FTA). The root cause of the failure stemmed from the absence of a standard operating procedure (SOP) mandating replacement during the previous overhaul, resulting in the retention of a worn seal that had experienced material fatigue. This triggered continuous oil leakage, a decrease in fluid volume, loss of lubrication, and direct metal to metal contact, which caused adhesive wear and three body abrasion, ultimately destroying the internal gears (pinion, impeller, and transfer gear). Repairs included an overhaul, a complete flush, and ensuring the hydraulic oil met standards, while preventive measures involved implementing mandatory replacement SOPs, life tracking, stricter routine inspections, and a shift in maintenance culture from reactive to investigative.

Keywords: Komatsu PC850-8R1 Excavator, Hydraulic Pump, Wear, Root Cause Analysis (RCA), Mandatory Replacement

INTISARI

Penelitian ini mengkaji penyebab, dampak, dan solusi kerusakan pompa hidrolik *variable displacement piston* (HPV375+375) pada Excavator Komatsu PC850-8R1, yang ditandai penurunan tekanan main pump di bawah standar sehingga menimbulkan *low power*, *delay attachment*, hingga *engine stall* saat beban berat. Dengan pendekatan deskriptif kualitatif melalui observasi, wawancara, riwayat *breakdown*, dan *overhaul*, analisis akar masalah dikaji menggunakan *Root Cause Analysis* (RCA) meliputi 5 *Whys*, diagram *Fishbone*, *Plan Do Check Action* (PDCA), serta *Fault Tree Analysis* (FTA). Akar masalah kerusakan bersumber dari ketiadaan SOP *mandatory replacement* saat *overhaul* sebelumnya, sehingga *seal* aus yang mengalami kelelahan material (*material fatigue*) tetap dipertahankan. Hal ini memicu kebocoran oli berkelanjutan, penurunan volume fluida, hilangnya pelumasan, dan gesekan langsung antar logam (*metal to metal contact*) yang menimbulkan keausan adhesif serta abrasi tiga benda hingga menghancurkan roda gigi internal (*pinion*, *impeller*, dan *transfer gear*). Perbaikan mencakup *overhaul*, *flushing* total, dan pemastian kondisi oli hidrolik sesuai standar, sedangkan pencegahannya meliputi penerapan SOP *mandatory replacement*, *life tracking*, pengetatan inspeksi rutin, serta transformasi kultur perawatan dari reaktif menjadi investigatif.

Kata Kunci: Ekskavator PC850-8R1, Pompa Hidrolik, Keausan, *Root Cause Analysis* (RCA), *Mandatory Replacement*.