

Analisa Penyebab Kebocoran Pelumas pada Journal Bearing Kereta Moda Raya Terpadu = Causes of Grease Leakage Analysis in Mass Rapid Transit Train Journal Bearing

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Abstrak

Grease merupakan pelumas padat atau semi-cair yang penting dalam berbagai peralatan berputar, termasuk bearing pada kereta. Efektivitas grease dapat dipengaruhi oleh suhu, tekanan internal, dan kondisi lapangan yang dapat menyebabkan masalah seperti kebocoran dan kegagalan bearing. Adanya insiden kebocoran grease di luar jadwal perawatan pada tapered roller bearing kereta moda raya terpadu di Indonesia. Menurut panduan perawatan dari pabrikan bearing, penggantian bagian penting harus dilakukan setiap 4 tahun atau 480.000 km. Namun, pada jarak tempuh 270.000 km, bearing tersebut sudah mengalami kebocoran grease. Oleh karena itu, penelitian ini menyelidiki penyebab kebocoran grease pada bearing kereta moda raya terpadu, terutama tapered roller bearing. Beberapa inspeksi dan uji dilakukan untuk mengevaluasi penyebab kebocoran grease. Pada saat dilakukan perawatan rutin ditemukan adanya bekas gesekan, suara retakan ketika bearing diputar, dan kontaminan seperti silikon, seng, dan aluminium di dalam sampel grease, hal ini meningkatkan kemungkinan kegagalan bearing akibat kebocoran grease. Pelumasan yang buruk, cap screw yang longgar, dan gerakan eksternal bisa menjadi penyebab insiden ini, sedangkan pemeriksaan besar torsi pada cap screw hanya dilakukan selama perawatan besar, yaitu setiap 1.000.000 km. Pada referensi lain, pemeriksaan seharusnya dilakukan setiap 4 bulan, dikarenakan kondisi lingkungan dapat mempengaruhi umur bearing dan grease.

.....Grease, a solid or semi-liquid lubricant, is essential in various equipment, including bearings in trains. The effectiveness of grease can be affect by temperature, internal pressure, and operating conditions, leading to issues like grease leakage and bearing failure. An incident of grease leakage was happened outside the maintenance schedule on tapered roller bearing of rapid transit train in Indonesia. According to inspection guide from the bearing manufacturer, heavy maintenance, including replacement of major important part should be performed every 4 years or 480,000 km. However, at a mileage of 270,000 km, the bearing has already experienced grease leakage, therefor this study investigates the causes of grease leakage on rapid transit train bearing, especially tapered roller bearing. A few inspections and tests were done to evaluate the cause of grease leakage. Routine maintenance discovered there are friction marks, cracked noise and contaminants like silicon, zinc, and aluminium inside the sample of the tapered roller bearing grease which increase the possibilities of bearing failure caused by grease leakage. Poor lubrication, loosen cap screw, and external movement could be the cause of this incident. Torque meter checks on the cap screw are currently performed only during major maintenance, which is 1,000,000 km, which according to other reference, the check should be done every 4 months. An important check such as torque meter check on cap screw and regular inspections are recommended to be done every 4 months to maintain bearing condition and prevent grease leakage.