Component Life Projection for Mining Off-Highway Truck Based on a Deep Learning Model

Condition Monitoring Management Process for Lift Cylinder (Best Practices)



The hottest points of the cylinders were captured by the camera and it was observed that the lifting cylinder I/d of the boom has a temperature of 5° c above the lifting cylinder I/e (Figure 7)

Using thermography on the EH3201, a thermal differential was identified in the boom cylinder on the right side, as can be seen in Figure 6a with a temperature differential of 4.7°C in relation to the left side.



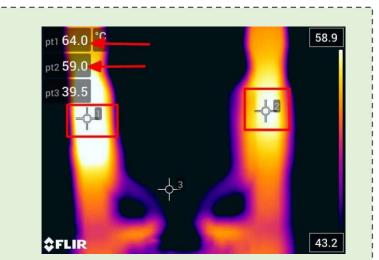


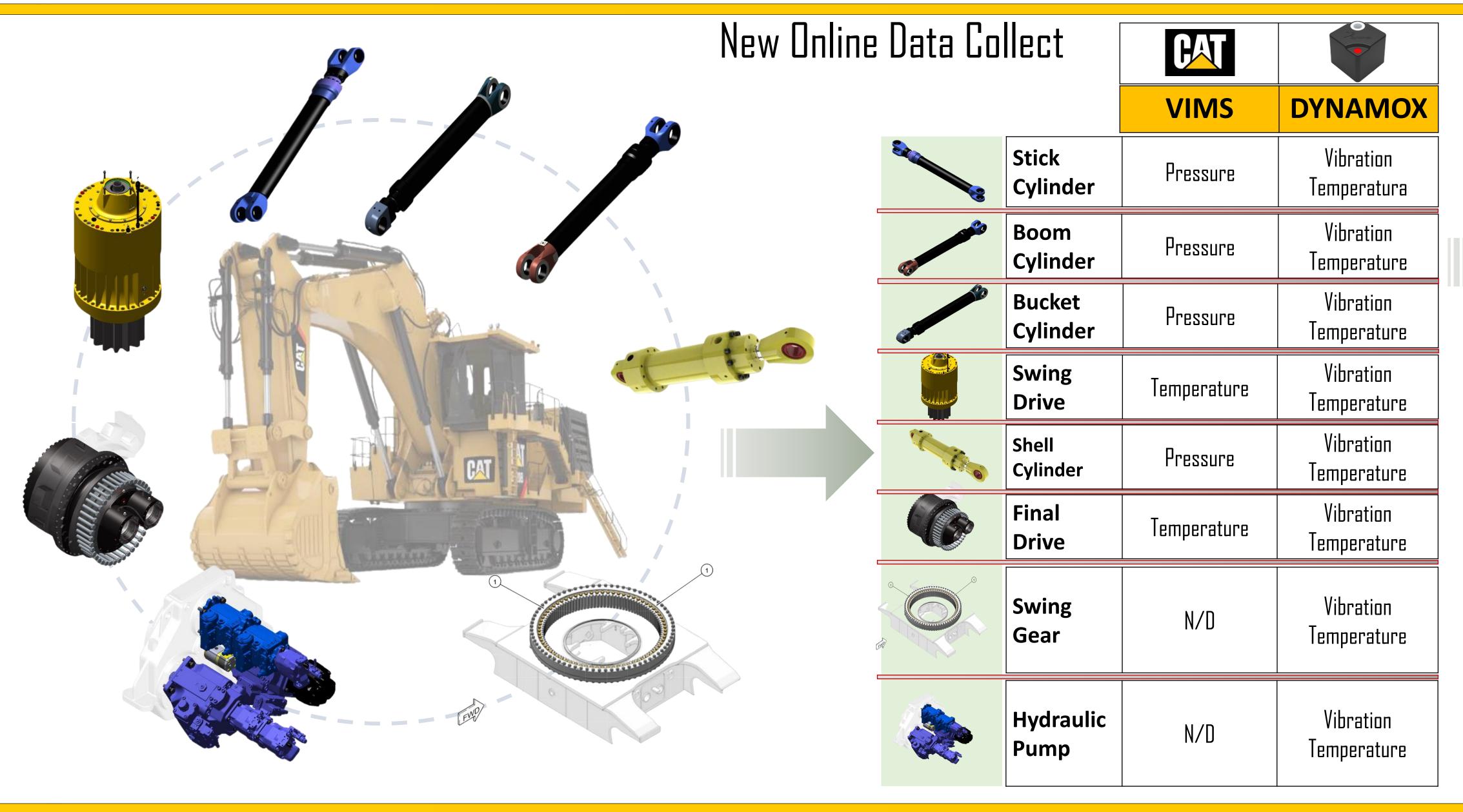
Figure 7. Thermographic image indicating a 5° c difference between the hottest points of the boom lift cylinders

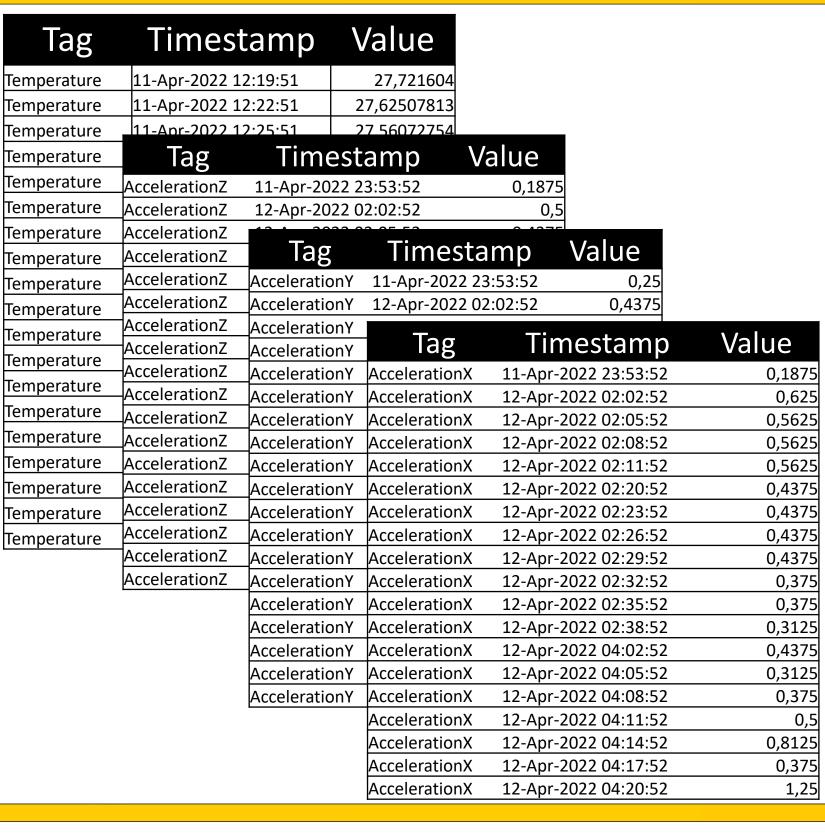
Field Condition

After disassembly in Workshop



Based on this study, it was possible see the effectiviness of using this process to indicate possible internal oil leakage by the cylinder seal assembly. The Remanufacturing Center confirmed the issues with with cylinder. Removing the cylinder based on the thermography along with the other tests was shown to be the proper course of action.





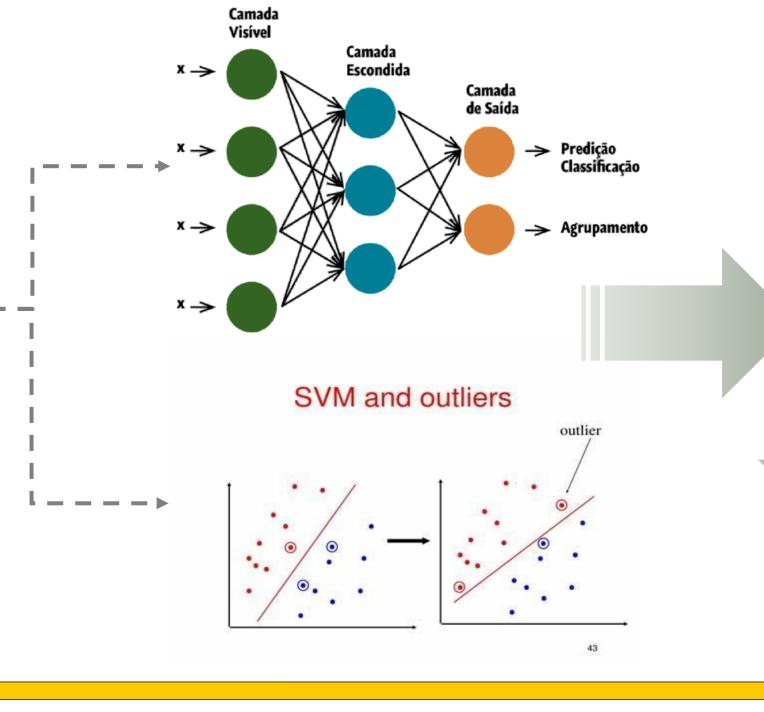


RNN

STD

SVM

Exploratory Data Analisys



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Componente	<b>SMR Atual</b>	<b>SMR Projected</b>	% Acc
Stick Cylinder LD	8450	12000 +-500	85%
Stick Cylinder LE	8450	12000 +-500	85%
Boom Cylinder LD	8450	12000 +-500	85%
Boom Cylinder LE	8450	12000 +-500	85%
Bucket Cylinder LD	8450	12000 +-500	85%
Bucket Cylinder LE	8450	12000 +-500	85%
Swing Drive LD	8450	12000 +-500	85%
Swing Drive LE	8450	12000 +-500	85%
Final Drive LD	8450	12000 +-500	85%
Final Drive LE	8450	12000 +-500	85%
Swing Gear LD	8450	12000 +-500	85%
Swing Gear LE	8450	12000 +-500	85%
Hydraulic Pump 1	8450	12000 +-500	85%
Hydraulic Pump 2	8450	12000 +-500	85%
Hydraulic Pump 3	8450	12000 +-500	85%
Hydraulic Pump 4	8450	12000 +-500	85%