



## CASE STUDY

# BALANCE MACHINERY LUFFING CYLINDERS REFURBISHMENT

### SITUATION

Our client is within the top 5 world leading mining companies in the world today by market Capitalisation as at 31<sup>st</sup> December 2020. The client required the assessment and refurbishment of a Hydraulic Boom Luffing Cylinder. The Cylinder has been in storage for ~3 years and requires assessment for any damage or operational limitations before installation or complete refurbishments.

### SOLUTION

Pressure Dynamics managed the refurbishment of a client's Hydraulic Boom Luffing Cylinder and performed the Strip and Inspect works of the Manifolds.

Due to the condition of Manifold PRV ports, the repairs required would introduce additional leak paths in the future. Given criticality of equipment, the Manifold and all other components were replaced with new assembly.

### PROBLEM

After considering the client requirements to ensure trouble free installation, the Pressure Dynamics team performed a comprehensive inspection of the Luff Cylinder. This was carried out in several stages, the first being the attached pipework, valves and manifolds. The Low-Pressure Relief valve was found to have been damaged in the threads area. The High-Pressure Relief valve was also found to be ceased into the port and could not be removed. Both Relief valve body also has surface corrosion and rust present from a visual inspection.

### BENEFITS

A client had a Hydraulic Boom Luffing Cylinder that has been in storage for ~3 years and requires assessment for any refurbishments. Pressure Dynamics assisted in the management of the refurbishment through inhouse and the use of a subcontractor to be able to supply a trouble installation. Pressure Dynamics was able to help provide a practical solution for a client.

## OVERVIEW

Pressure Dynamics managed the refurbishment of a client's Hydraulic Boom Luffing Cylinder and performed a comprehensive hydraulic Strip and Inspect works of all ancillary valves and Manifolds and finally the cylinder and piston.

Due to the condition of Manifold PRV ports, the repairs required would introduce additional leak paths in the future. Given criticality of equipment, the Manifold and all other components were replaced with new manifolds and valving assembly.

## APPROACH

A client required the assessment and refurbishment of a Hydraulic Boom Luffing Cylinder. Pressure Dynamics performed the Comprehensive Strip and Inspect works of the Cylinder.

The comprehensive overall external and internal condition of the manifold block appears in good order. No excessive corrosion was found on external surfaces, hardware and fittings and all other areas were within manufactured tolerances and specifications.

However, upon further inspection, the Low-Pressure Relief valve was found to have been damaged during the last strip and rebuild within the threads. The High-Pressure Relief valve ceased into the port and could not be removed. Pressure relief valve body also has signs of surface rust present.



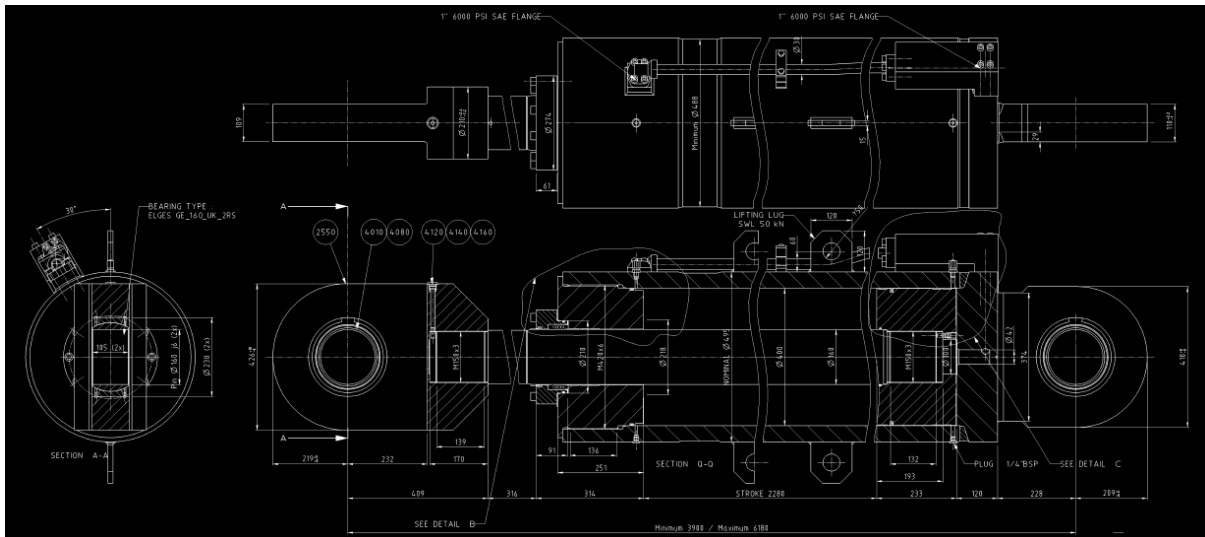
Due to the visual  
Manifold Pressure

*Seized HP Relief valve thread*

condition of  
Relief Valves

ports. With importance of the ceased High-pressure valve, the repairs required to bring back the manifold to OEM specifications this would introduce additional leak paths in the future. Given criticality of equipment, the Manifold and all other components were recommended to be replaced with new hydraulic assembly.

Subsequent inspection reports for both the manifolds and the cylinder were reported to the client along with a new replacement cost, The client made the commercial decision to go ahead with a full refurbishment of the entire assembly.



*Drawing of the Hydraulic Boom Luffing Cylinder*

During the final assembly process of mating the newly supplied Manifold to the existing luffing Cylinder, it was found that the bolt holes in the Cylinder were larger than the original OEM design indicating a previous unknown modification had been performed unrecorded.

The result was an agreed modified bolting arrangement by the client to the newly supplied Manifold and implemented into the final assembly prior to performing the third and final Assembly Testing.



## **RESULTS/BENEFITS**

A client is within the top 5 world leading mining companies in the world today, by market Capitalisation had a Hydraulic Boom Luffing Cylinder that has been in storage for ~3 years and requires confidence of a trouble-free Installation. The client needed commercial confidence that the equipment was fit for purpose and required assessment for any potential refurbishments of compliance. Pressure Dynamics assisted in the management of the Risk assessment, and recommendations to refurbishment through inhouse engineering.

The cylinder was completed for final assembly with a modified bolting arrangement. A final assembly testing was conducted and successfully completed. The client received a complete recertified Cylinder with test certificates.

## **CONCLUSION**

This case study demonstrates Pressure Dynamics proficiency for managing the refurbishment of Hydraulic Boom Luffing Cylinders.

