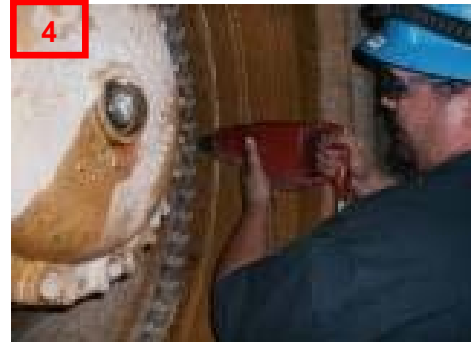


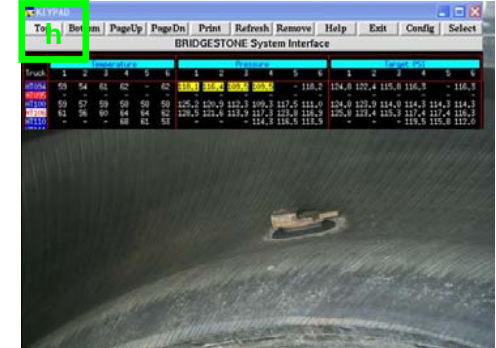
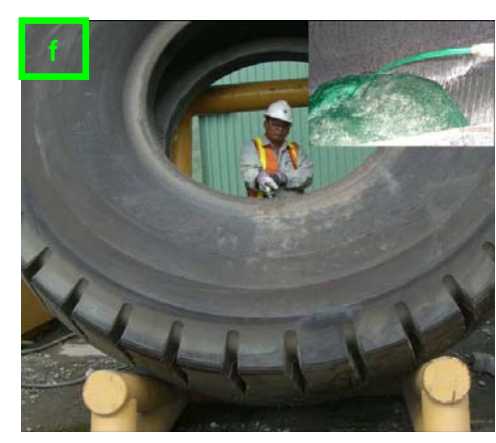
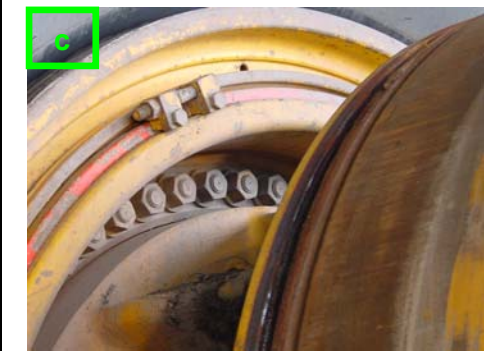
Risks to be mitigated



12. Tires & Rims

Objective	To minimise the risk of events involving earth moving equipment tire and rim operation and maintenance that could cause injury, to ALARP, including consideration in design for foreseeable human error.
General outcome	The intended design outcome should include a Wheel (rim & tire) design that considers the weight, stored pressures and physical size of modern earth moving equipment tyres with respect to handling, affixing to the vehicle, and assembly, to minimise the risk to the people fitting & maintaining the tyres and involved in the operation of earth moving equipment.
Risks to be mitigated	<ol style="list-style-type: none"> 1. Risk of an uncontrolled release of pressure from the tire and rim assembly during operation and maintenance. Causal factors could include an overly complicated rim design, inter-reliance of components, or failing to remove pressure from tyres, or failing to follow the correct procedure or sequence, when attempting to maintain or remove them 2. Risk of crush injury during maintenance activities. Causal factors include the physical size of the wheels and the need to have people working inside the arms of tire manipulators. Also equipment having impractical and inaccessible jacking points. 3. Risk of strain and sprains during maintenance activities 4. Risk of chronic health implication from high frequency use of maintenance tooling 5. Risk of an abnormal rim condition that becomes evident only when the rim fastening system is released 6. Risk of assembly failure from mismatched components on multiple component rim assemblies 7. Risk of pyrolysis / explosion of the tire and rim assembly from induced overheating from other vehicle components 8. Risk of wheel nuts falling off due to the failure to retorque some time after fitment 9. Risk of tire or rim failure due to loss of control of the previous duty or repair history of these components 10. Risk of a tire operating condition becoming critical without the operator's knowledge
Examples of industry attempts to mitigate risks	<ol style="list-style-type: none"> a. A rim fastening system that independently attaches each rim to the hub / axle b. Double gutter rim design c. Two piece lock ring with bolted connection d. Rims directly bolted to axle/hub flanges e. non-destructive rim testing programs as per AS 4457-1997 f. Liquid tire additives assisting with crack detection and minimising corrosion g. Use of ergonomic aids to reduce manual handling exposure from lifting cleats and tooling h. Remote tire condition monitoring systems i. Serial number for tracking of rims and their fatigue life j. Bead seat clips to prevent movement during zero deflation

Industry attempts to mitigate risks



Clip to prevent bead seat band from movement during zero deflation