FORT HILLS

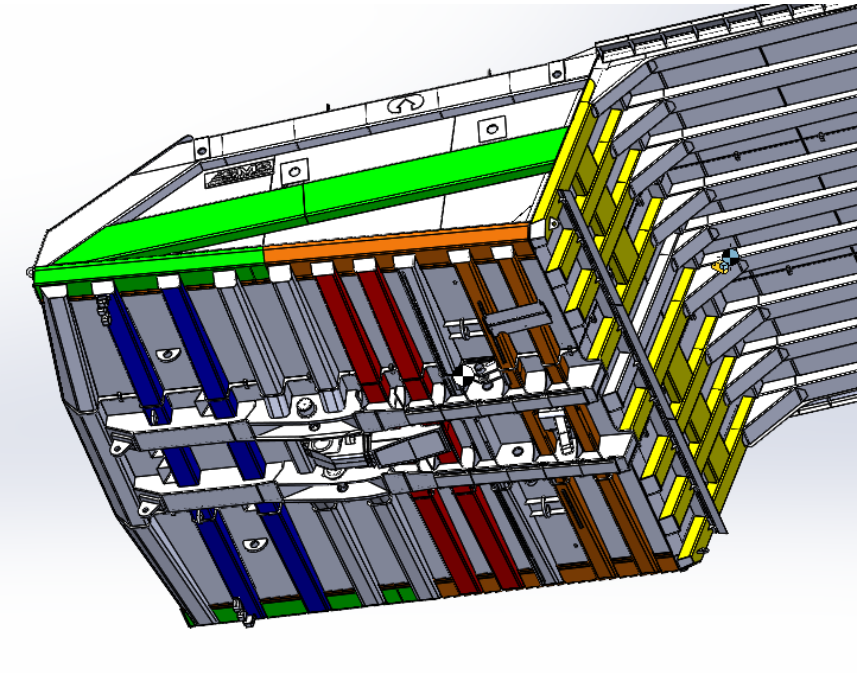
980E Dump Body Bolster Corrosion

10/16/24

Operated by SUNCOR

Bolster Function

- Structural support for dump body
- Used to heat up dump body by routing exhaust gasses through bed.
- Warm bed reduces the extent of oil sands sticking to bed.



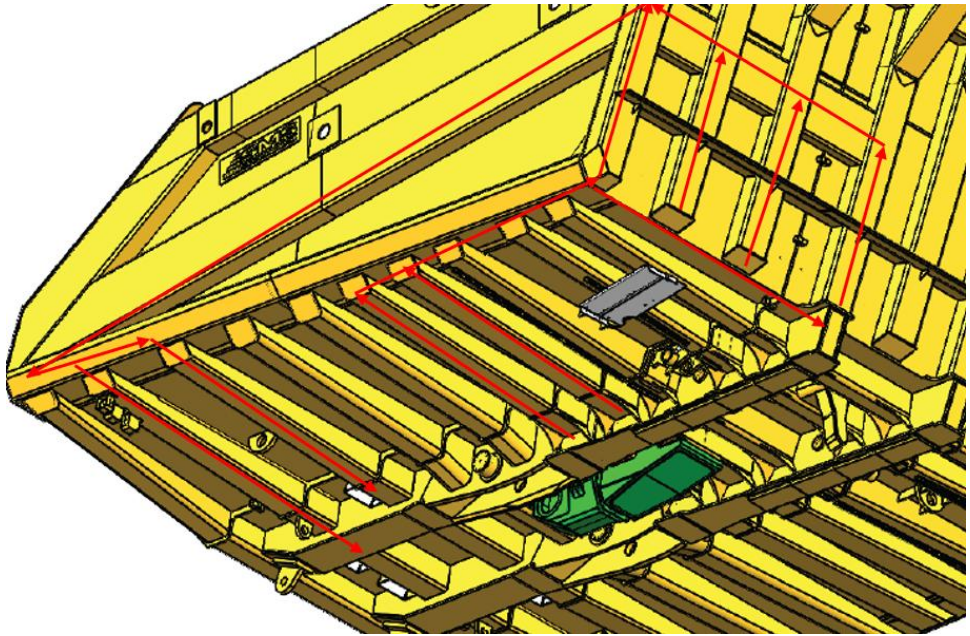
Arising Issue

- Heat and condensing gases from exhaust causing corrosion in bolster
- Leads to exhaust leaks thus insufficient heating of bed and decreased efficiency
- Causes preventable cracking and structural damage

Thermal Image 980E-4

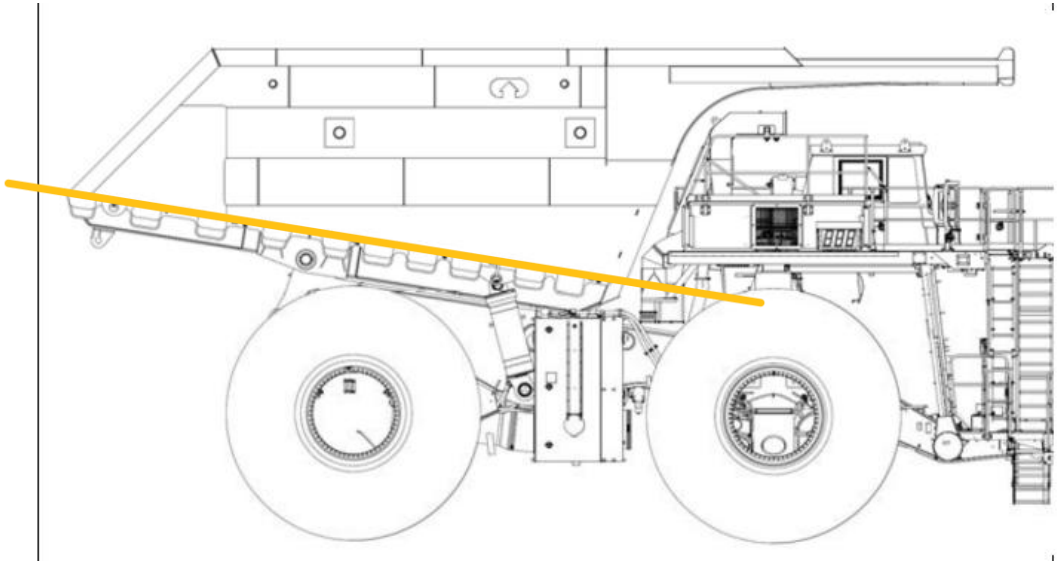
Exhaust Routing 980E-5

- Exhaust enters at the green box then flows outwards though bolsters 4 and 5
- Then through the outer rail and up the front wall
- Then routed through the side wall and through bolsters 8 and 9 and exits underneath the body.



Observations

- Bed is angled at a decline so condensation pools in the corners of bolsters closest to the ground.
- Leading edge corner most susceptible to corrosion and damage.



Observations

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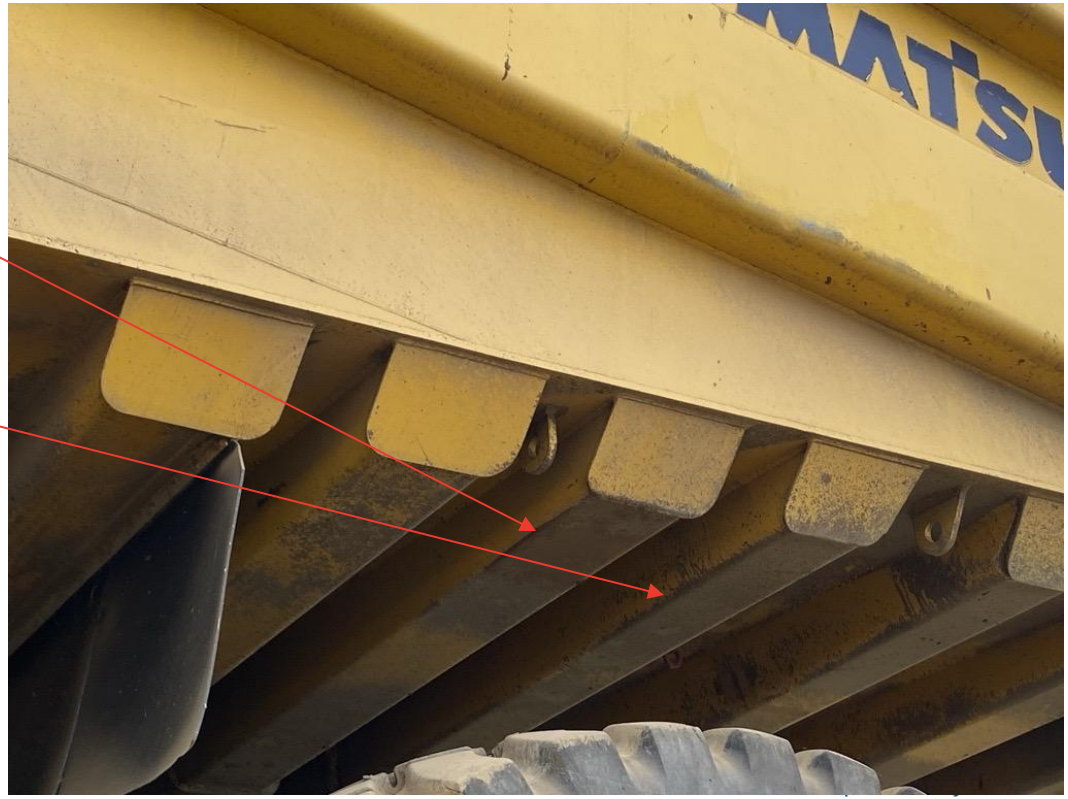
Conclusions

- Corrosion is highest on bolsters where exhaust initially enters
- Also where exhaust is hottest
- Bolster 4 and 5 on 980E-5

980E-5 Dump Body

Bottom panel on bolster 4 & 5 are darkest indicating most corrosion

Leading edge on bolster 4 & 5 showing the most wear



980E-4 Findings

- Exhaust path through bolsters is different on the 980E-4 thus different areas of high corrosion.
- Exhaust enters through the front wall, matches where corrosion is highest.

980E-4 Dump Body Front wall

980E-4 Findings

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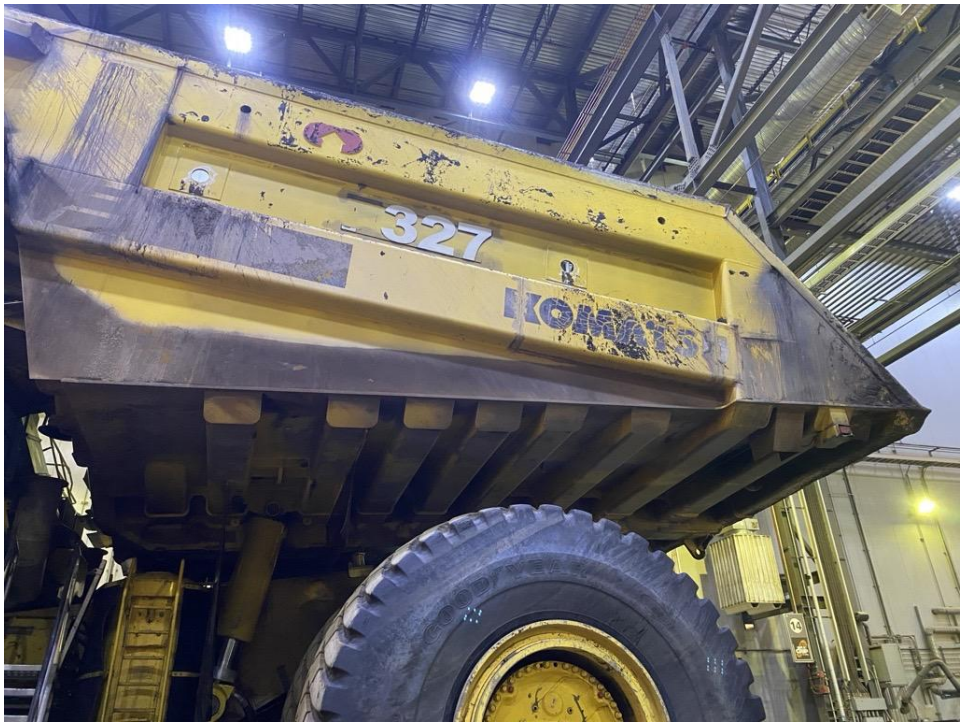
- Exhaust enters through the front wall, matches where corrosion is highest.

Front wall experiences highest concentration of highest temperature

980E-4 Findings

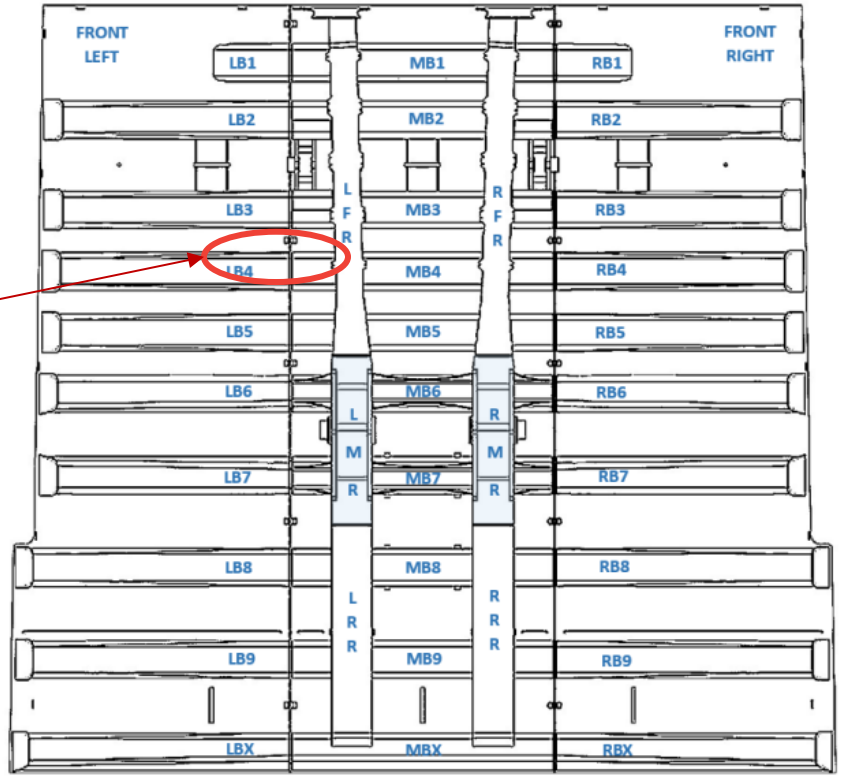
- Bolster corrosion of 980E-4 is fairly even
- No bolster showing more corrosion than the others
- Front wall takes the extent of damage from exhaust.



UT Readings

- Standard bolster thickness is 3/8” = 9.525mm
- Took readings on bolster #4 on F0325
- Average reading of 5.8mm, across 5 points
- Lowest Reading of 3.3mm
- Thinnest near middle of truck, thicker moving further away

Crack on leading edge of Left Bolster #4 near frame

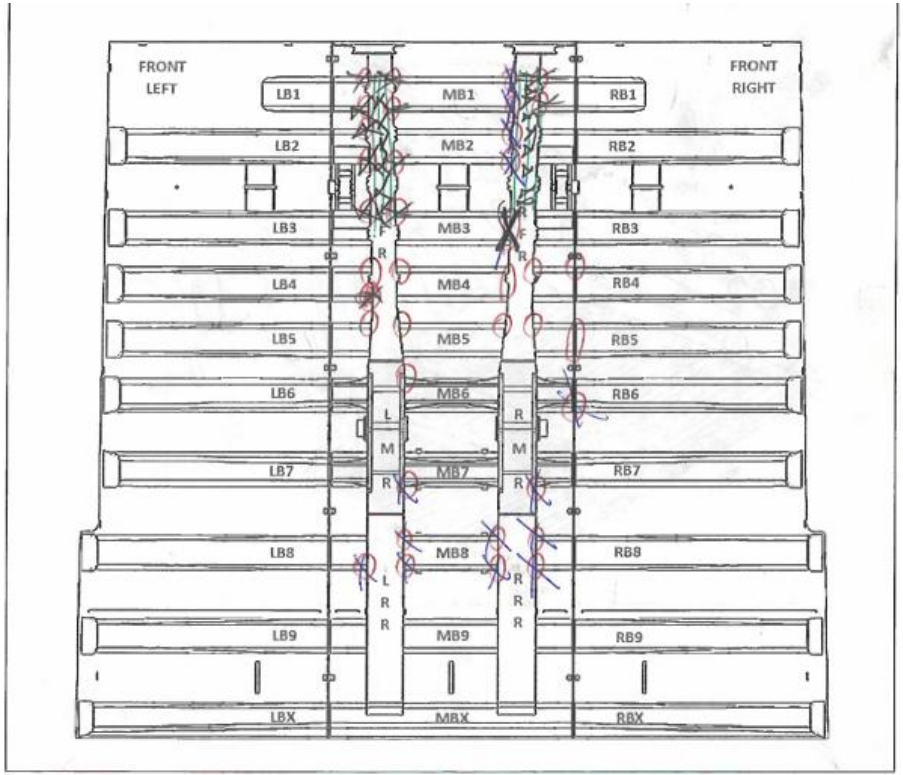


Welded patches on leading edge of right bolster #3 & 4 near frame

Critical Bolsters

- On 980E-4 Front Wall Bolsters see most corrosion due to exhaust heat – However they are not removed during rebuilds.
- Bolsters 3, 4, 5 subject to second most exhaust heat corrosion. Specifically first 3ft from the center of bed.
- Bolster 8 subject to greatest length of cracks – Suspected mechanical fatigue, not corrosion induced.

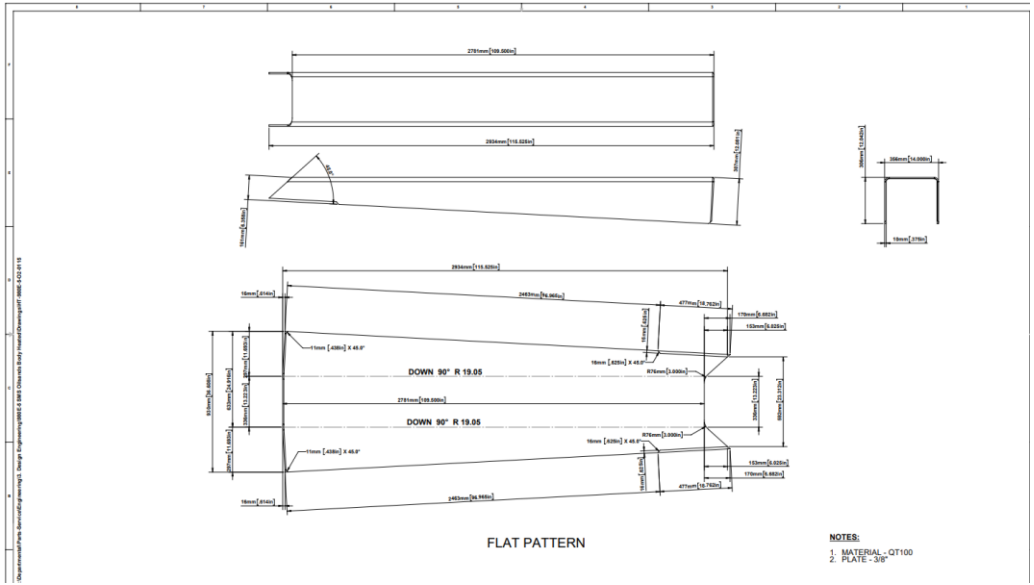
F347 Crack Map



Critical Bolsters Dimensions

- Bolsters are ~ 3m long and 1 wide/around
- ~ 18sq m of of coating required to cover bolster 4 ,5 & 6 on both side.
- Thickness TBD

Bolster Drawing



Recommendations.

- Corrosion Mitigation: application of a thermal spray coating on **critical horizontal exhaust bolsters** most susceptible to corrosion.
- Use aluminum or Inconel based thermal spray coating
- Apply thermal spray coating to the inside of bolster 3,4 & 5 on 980E-4 due for rebuilds.
- Apply thermal spray coating to bolster 4 & 5 on 980E-5 dump bodies waiting to be in installed/assembled
- F347 is the -5 closest to a rebuild. Not economical to take -5 trucks out of operation to coat bolsters.
- Greatest results to be seen from coating first 3ft from the middle on bolsters 3,4,5 on 980E-4
- Contact Kymera International & SMS to discuss coating new bolsters before being welded to bed floor during rebuild.

Candidate Dump Bodies

- During Q3 there were 11 dump bodies sent to Weldco or SMS for a rebuild
- Out of these 11, 7 were 980E-4 Komatsu bodies that were missed opportunities for improvement. 4 were Westech Bodies
- Looking forward there are currently 5 dump bodies being rebuilt that are possible candidates for thermal spray coating. (**F0307,F0338,F0325,F0345 F0339**)
- Additionally, there are 4 more scheduled to be rebuilt in the near future **(F0347,F0322,F0327,F0312)**
- 980E-5 bodies that possible candidates which are in the process of being installed or assembled include (**F0368,F0369,F0370**)

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