

Metal Surgery Milwaukee LTD.

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Kiln Gear Repair 19'6"

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This repair took place on top of the kiln approximately 70 feet from ground level utilizing the high lift baskets (See page one illustration). We worked around the clock and completed the repair in approximately three days.

The main rib was cracked in half. This view shows the location of the crack and approximate size of the rib is 6 inches wide at the bottom and 5 3/4 inches in height.



When the layer of cement was removed you could see the rib was cracked all the way through. All paint was removed around the repair prior to any work commencing on the rib. A one inch thick steel plate was installed on the bottom of the rib approximately 8 inches wide by 10 inches in length. This was clamped on and tac welded in approximately 6 places, then the heating equipment was installed. The steel 8 inch wide plate gave us a 1 inch overhang on each side, which was also used as a run-off tab during welding. Most important of all, this plate secured the alignment of the rib during excavation of the fracture.

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The ceramic pads, kao wool and thermo-couplers were installed all around the repair area to heat and monitor throughout the repair and document by a computer generated graph. The gear was then slowly heated by procedure



This repair was done in three stages, clean, inspect and secure. Stage 2 was to excavate 50 percent, weld and reinforce. These pictures reveal the bottom plate welded on with a 1 inch fillet weld around perimeter and 50% of the rib excavated and welded in progression.



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Stage 3 was to excavate and weld the remaining material plus 10 percent into the already welded section. Once all remaining fracture was removed by carbon arc, it was ground to bright metal, inspected and welded up 100 percent which included another reinforcing bar. The two side reinforcing bars were approximately 1 inch thick by 3 inches wide by 12 inches long. Once the repair was completely welded it was then stress relieved for 6 hours. It was then slow cooled to ambient temperature, M/S then hand finished the repair to contour. The repaired area was then mag particle tested 100 percent with no defects.



The time line for this job was estimated to take approximately 5 to 6 shifts. It was located 70 feet from ground level. The weather conditions throughout the entire job was certainly not on our side, thunderstorms to 60 mph winds. Even with that being said Metal Surgery prevailed and completed the job in 6 shifts.