

LOCK-N-STITCH Inc.
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Wartsila engine block repair Final Report

Date June 18 2013

Part W18V32

Serial number Engine G-612

Inspected by Edward Mulvihill

1. Base metal

- cast iron
- ductile iron
- cast steel
- cast aluminum
- other _____

4. Cause of damage

- impact
- heat
- freezing
- normal operation
- other Welding

2. Machinability

- no previous repairs
- arc-welded
- brazed
- heat-related cracks
- other _____

5. Length of crack/s

3 inches

3. Casting shape where cracked

- flat
- inside/outside corner
- radius
- other _____

6. Material thickness

5/8 inch

7. Operating pressure

4 bars of water pressure

8. Operating temperature
180 Degrees

9. Working environment
 hot
 cold
 safety concerns
describe: _____

 other _____

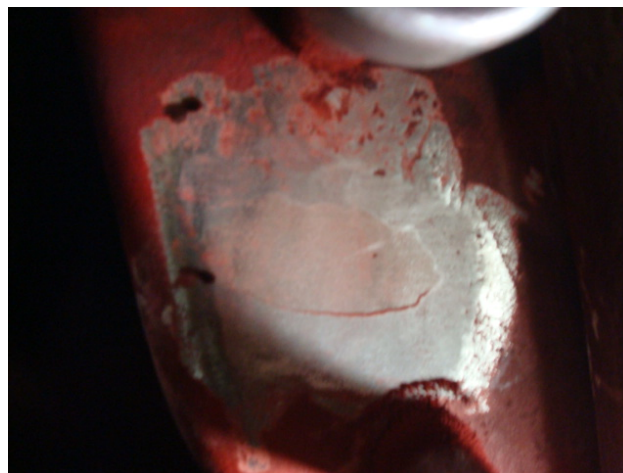
10. Remachining requirements
 bolt holes
 bearing bores
 machined surfaces
 other _____

13. Inspection method(s)
Magnet particle

14. Damage found

#1: Proceeded with removal of the paint and inspection using magnetic particle.

Found casting had been welded which caused the crack and leak in Water pumps cover.



11. Customer's needs
 permanent repair
 temporary repair
 turnaround time
describe: _____

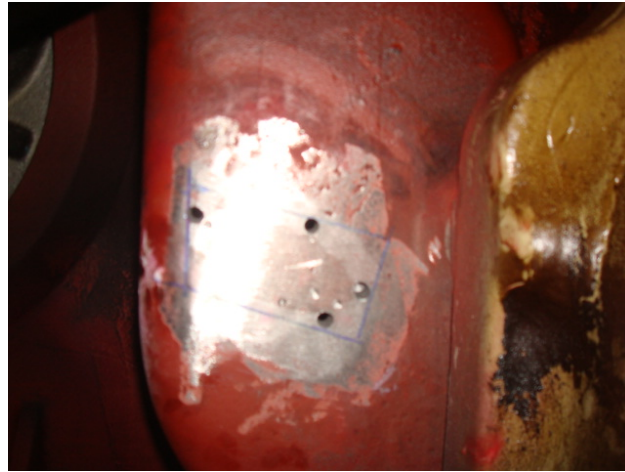
 other _____

12. Accessibility
 room for the tools?
 room for the operator/s?
 need for disassembly?
describe: _____

 other _____

Repair procedure

#2: Laid out lines and drilled test hole to determine how far the hardness was extending out from the welded area in the casting and where best to prepare for new casting.



#3: Cut out welded area and prepared for new casting.



#4: Manufactured new casting.



#5: Fitted new casting into place.



#6: Metal stitched in first row of C2.5 pins.



#7: Metal stitched in second row of pins with over lapping fashion.



#8: Metal
of pins to



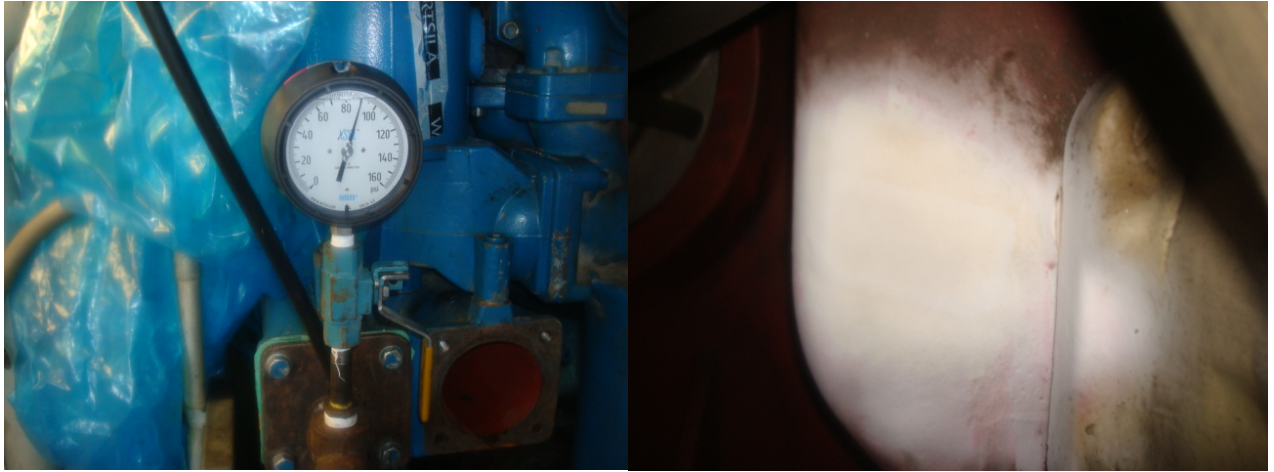
stitched in final row
complete stitching

in over lapping fashion.

#9: Hand finished to match water pump cover. Water pump cover is ready for pressure testing.



#10: Pressure testing was done over a duration of 5 hours at 6 bars /90 psi



Conclusion:

The welding of the Water pump cover casting caused confined expansion and contraction which was the cause of the crack and water leak.

Warranty available:

This limited warranty covers our materials and workmanship for the repair of your part. Disassembly and downtime are not covered by this warranty. The limited warranty is for a period of one year from the date of completion of the repair. If there should be any failure in our repair during that period of time due to faulty materials and or workmanship, we will again repair the part at our cost including all labor, materials and travel expense, or we could choose to refund the money you paid for the repair in part or full. We reserve the right to make the final decision whether to repair or refund. This is the limit of our liability. Be aware that we are not responsible for failures due to faulty installation or improper operation and maintenance of the part. If the problem that caused the original damage has not been remedied this warranty will become null and void.

Extended warranty: