

LOCK-N-STITCH Inc.
Casting Repair Specialists
1015 S. Soderquist Rd.
Turlock CA 95380

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Repair Final Report

Customer Andrie Inc. Phone (231) 740-8838
Contact Richard Paris Alt phone (231) 728-2226
Address 561 East Wester Ave. Fax _____
City, State, Zip Muskegon, MI. 49443 Date 7/27/2013

Part Tugboat Rotary Port Side Steering Pod Housing
Work Completed by Alaa and Scott

1. Base metal
 - cast iron
 - ductile iron
 - cast steel
 - cast aluminum
 - other _____
2. Machinability
 - no previous repairs
 - arc-welded
 - brazed
 - heat-related cracks
 - other _____
3. Casting shape where cracked
 - flat
 - inside/outside corner
 - radius
 - other _____
4. Cause of damage
 - impact Possible
 - heat
 - freezing
 - normal operation
 - other _____
5. Operating pressure
800PSI _____

6. Operating temperature
Less than 150 degrees

8. Customer's needs
 permanent repair

7. Remachining requirements
 bolt holes
 bearing bores
 machined surfaces
 other To be completed by
Meldrum Mechanical

12. Accessibility
 room for the tools.
 room for the operator.

Tugboat Rotary Port Side Steering Pod Housing repair

The bore on the steering pod was worn and a new Repair Sleeve was necessary to repair the bore.



1. Manufacturing of new Repair Sleeve performed by GPL, Inc.



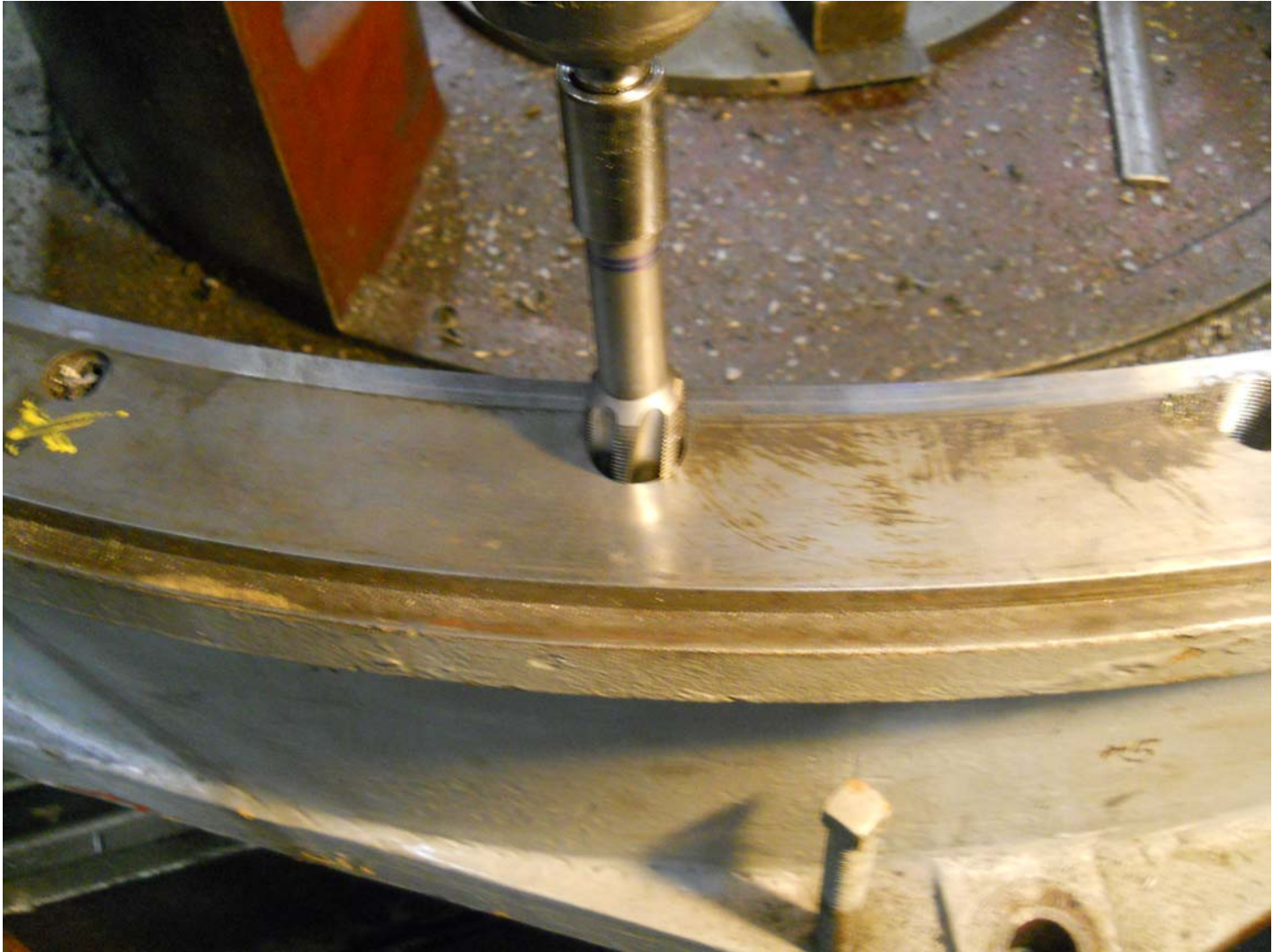
2. Liquid Nitrogen was used to shrink repair sleeve into steering pod. GPL, Inc. performed this task.



3. Because the Repair sleeve had over lapped the bolt holes in the part, FF820250 inserts were required to keep the integrity of bolt holes. The bolt holes were drilled and tapped to receive the new inserts. All inserts installed were performed by LNS Personnel.



4. Holes were then tapped to receive new inserts.



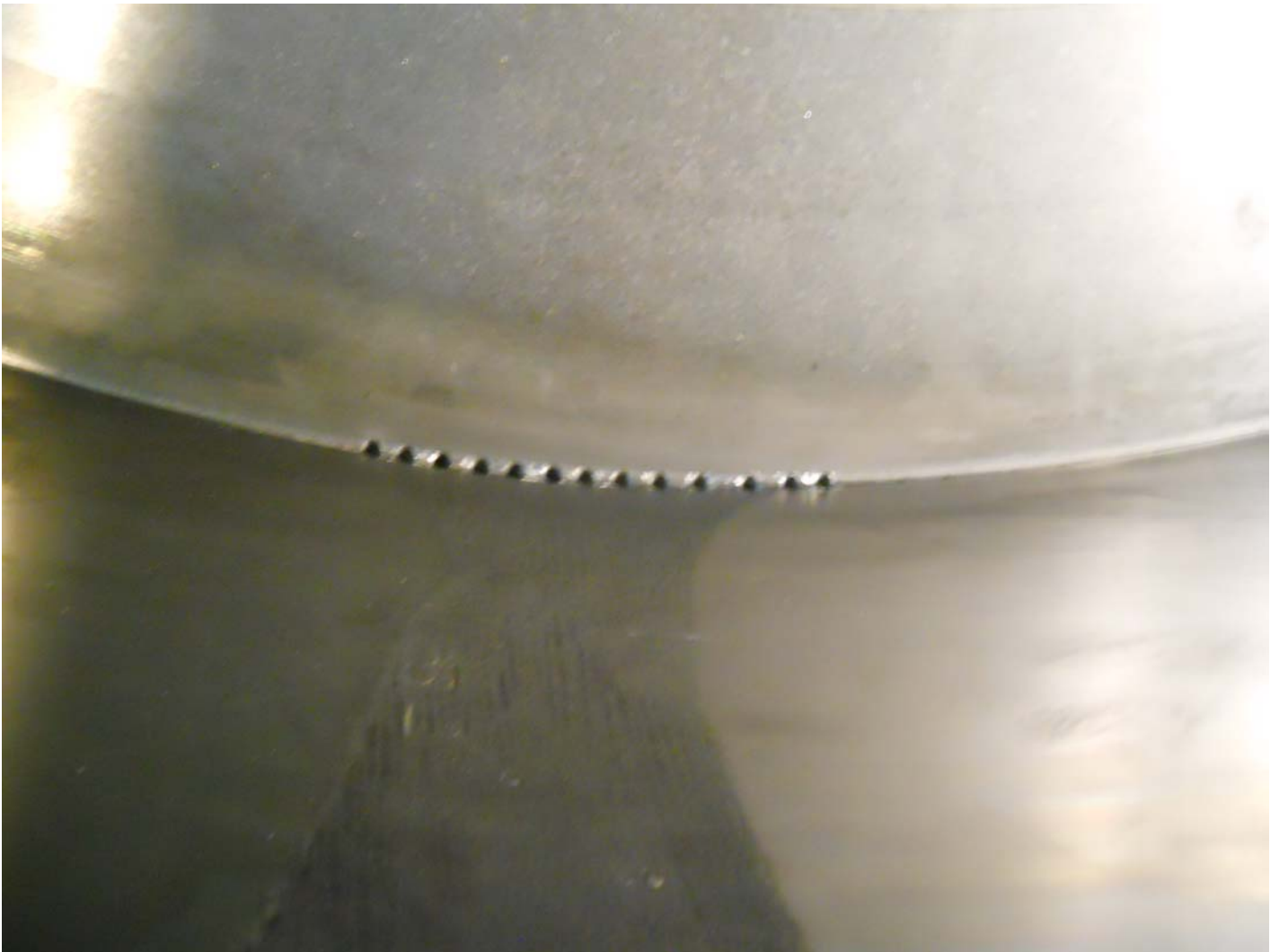
5. Installing the new insert flush with machine surface.



6. The new inserts installed along with retaining pins.



7. Stitching required inside the radius area where a low spot occurred when machining new sleeve. First Row of holes was drilled to receive L8 stitching pins.



8. Stitching completed and ready for final machining by GPL, Inc..



10. Steering pod was pressure tested to check for any leaks.
No leaks were found.



11. Leak was found in a prior repair. Extra stitching pins were installed and

supports were added for reinforcement.



12. The repair was covered with Titanium putty for extra protection.



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: