ATTACHMENT 2

AIRWORTHINESS GROUP CHAIRMAN'S FACTUAL REPORT

CEN13FA192

Sikorsky Aircraft Corporation Tail Gearbox Materials Engineering
Report No. MER-MI1308142 (8 Pages)

Sikorsky
A United Technologies Company

Materials Engineering Report
S-76 Tail Rotor Gearbox Components from Mishap, ERA 369

Requested by: Sikorsky Product Safety

Work performed under charge number: [redacted]

Parts Disposition: All parts returned to operator, per direction of Sikorsky Product Safety

[redacted]
Prepared by
[redacted]

[redacted]
Approved by
[redacted]

3/12/14
Date

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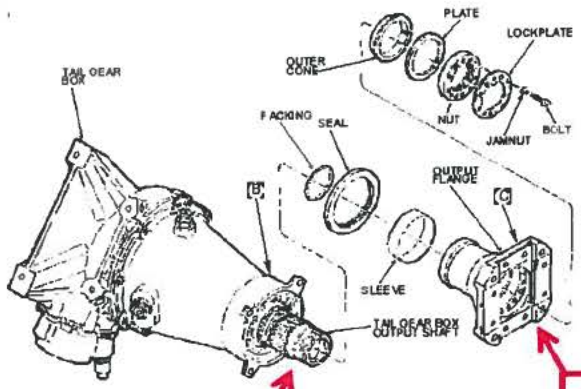
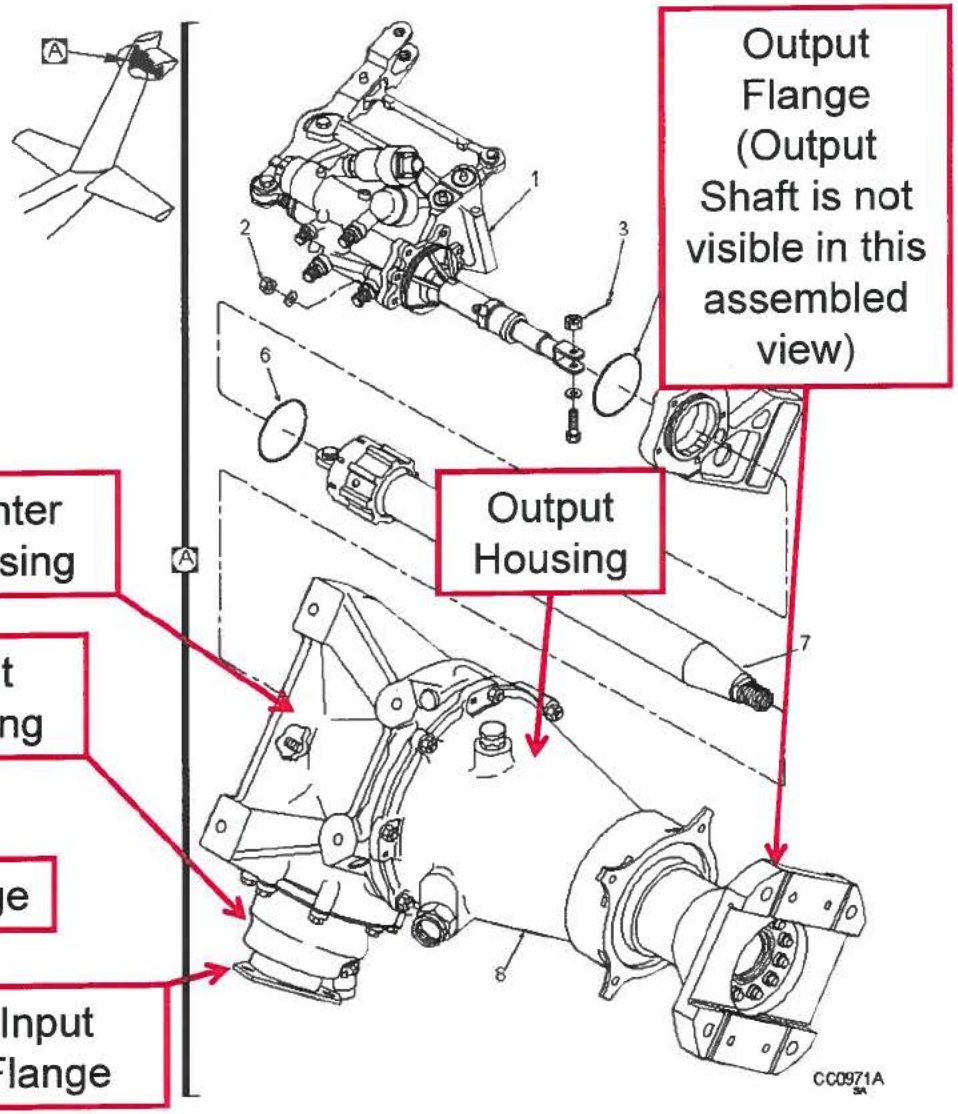
Background – The images at the right and below are from an S-76 IETM, and provide diagrams of the tail rotor gear box, including some of the components that are documented herein. The components shown on the next slide were those examined.



Output Shaft (threaded end visible with Output Flange removed)

Output Flange



Output Flange (Output Shaft is not visible in this assembled view)

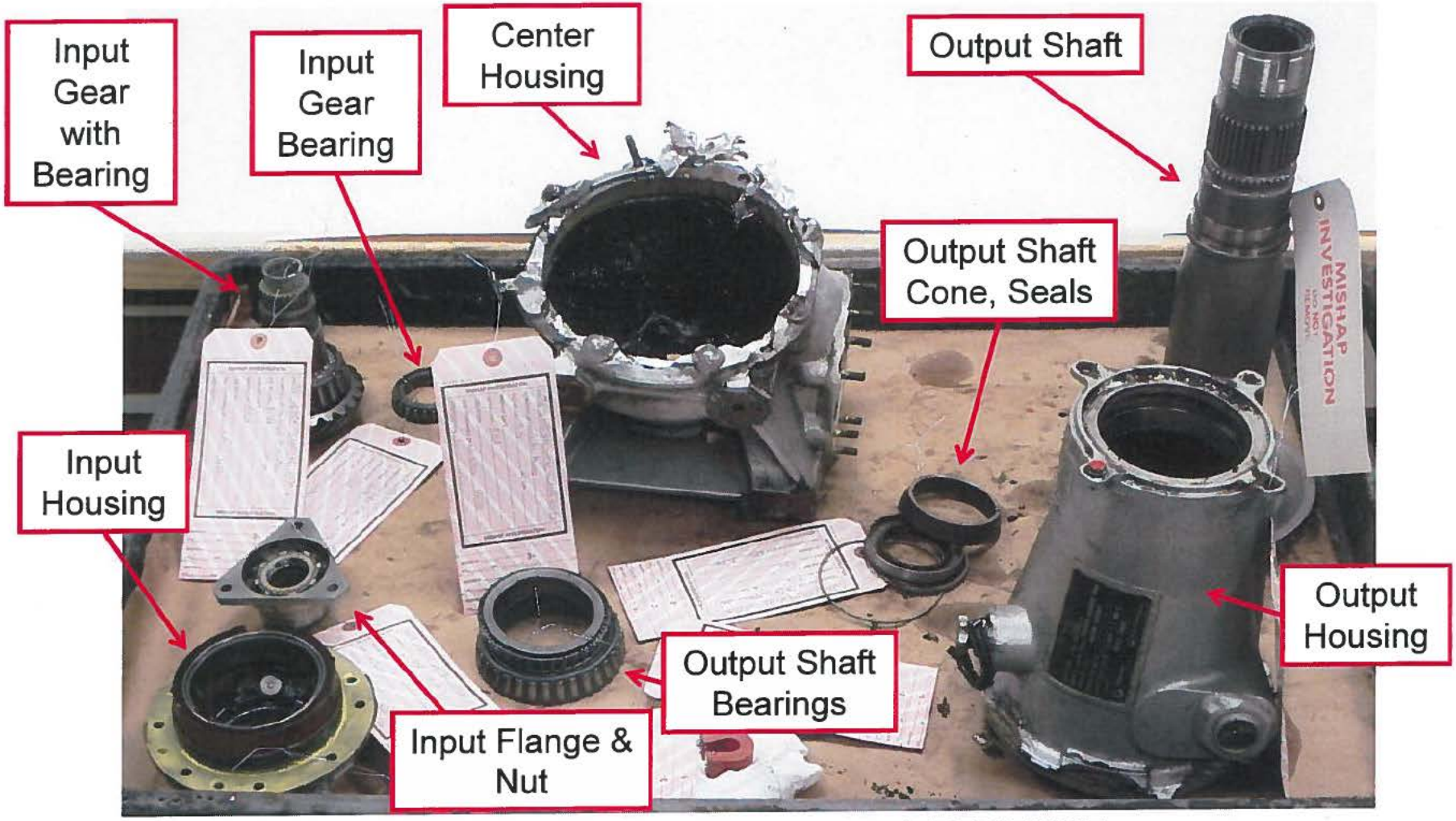
Center Housing

Output Housing

Input Housing

Input Flange

Observations – Appearance of as-disassembled Tail Gear Box components.



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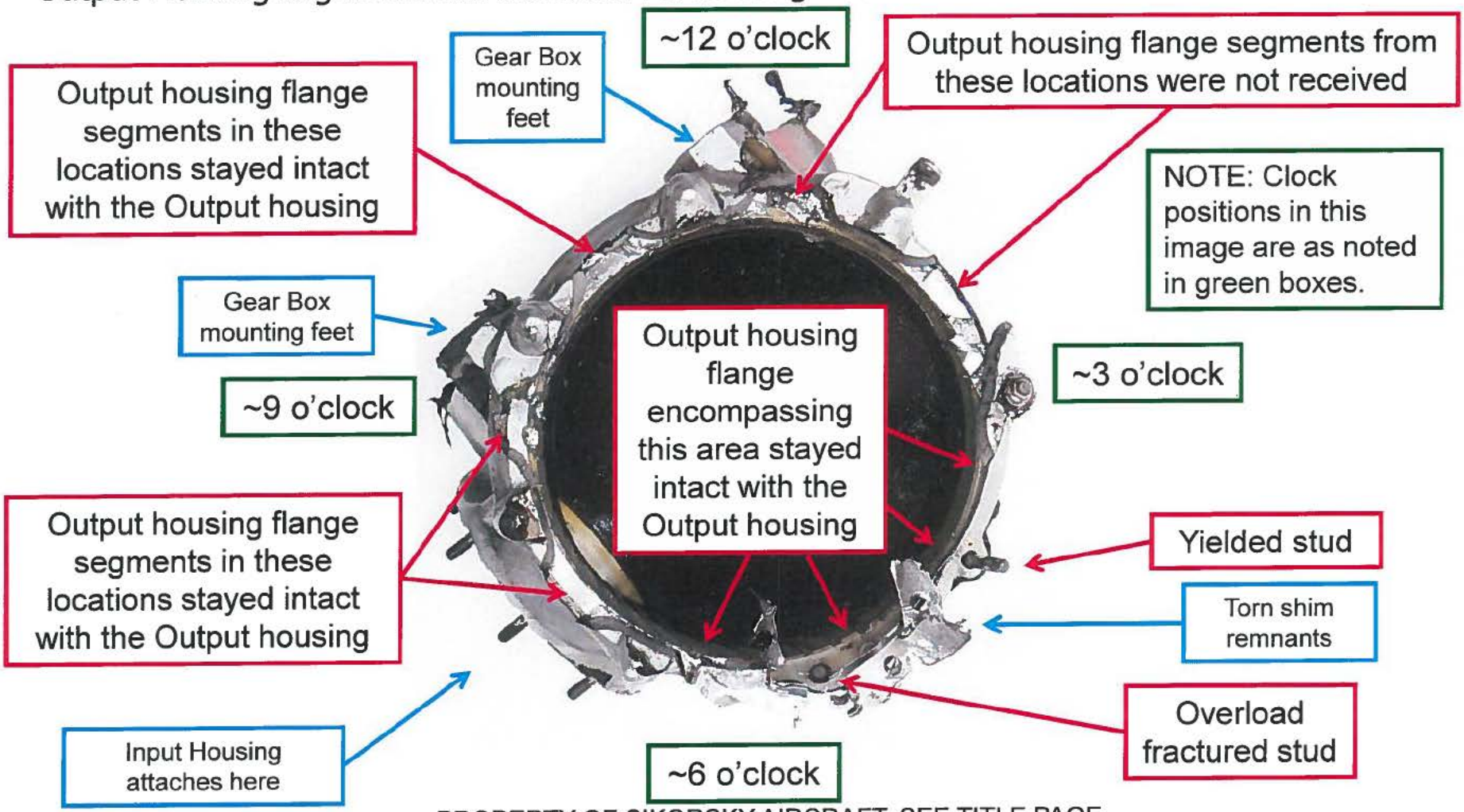
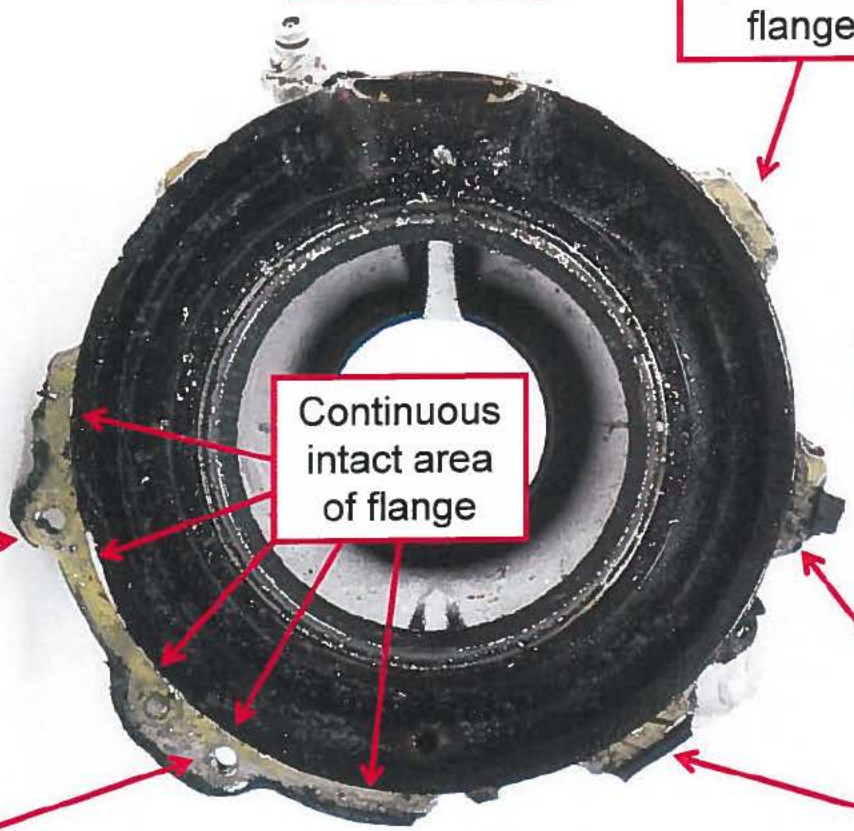
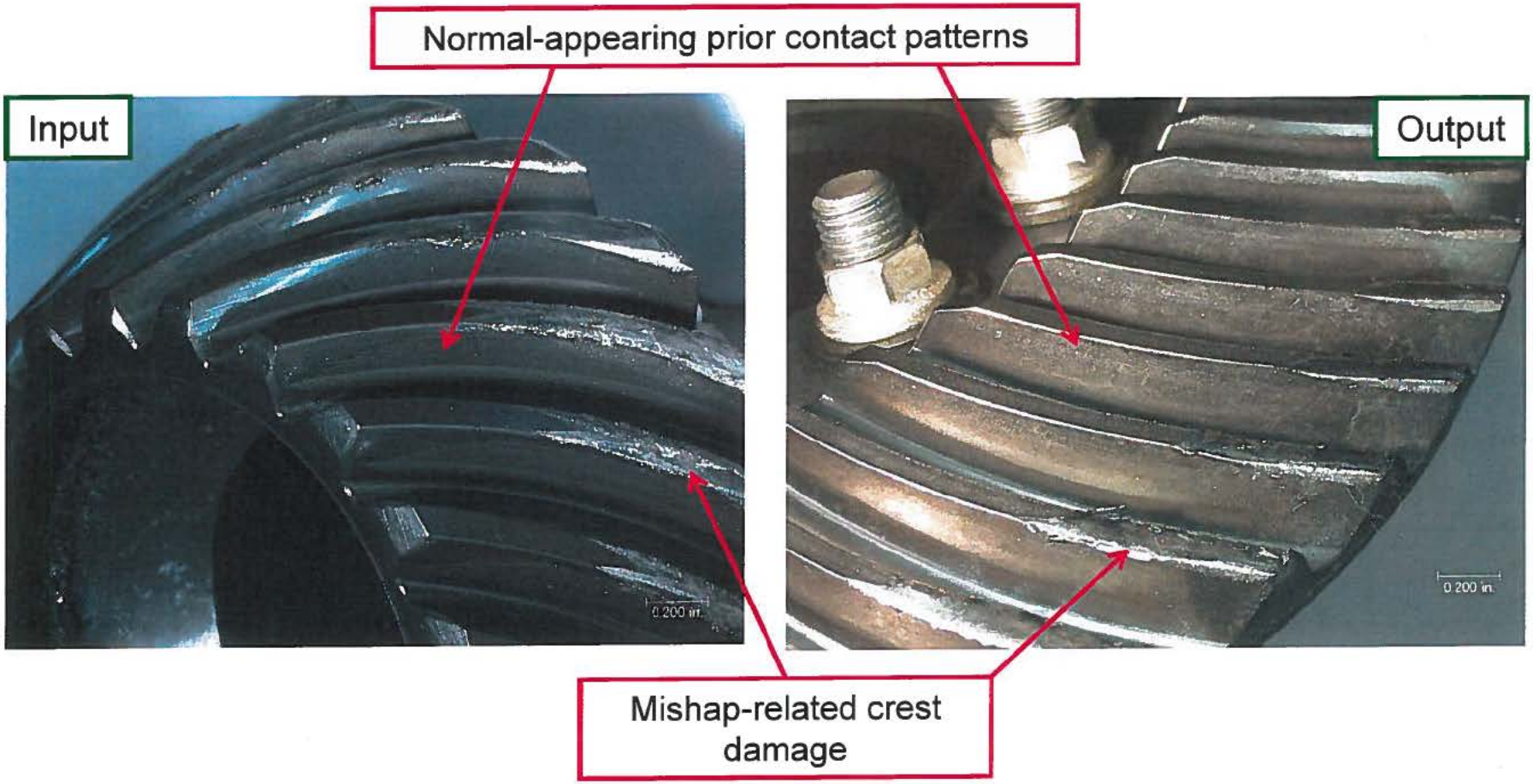
Observations – Tail Gear Box Center Housing, looking inboard, with several fractured Output Housing segments still attached. All housing fractures were overload.



Observations – Tail Gear Box Output Housing, looking outboard, with much of the flange portion separated by overload fracture.



Observations – Input and Output Bevel Gear teeth had normal-appearing, centered contact patterns. Crest damage appeared to have been sustained during separation of Output Housing from Center Housing.



Observations – Output Bevel Gear to Output Shaft bolted connection had one overload fractured bolt. The shank portion and nut were not received.

Additional Observations – Bearings

- All Bearings were reviewed with cognizant Design Engineering Bearing Specialist.
- All Bearings were found to rotate smoothly with no signs of any prior distress.

Summary of Findings

- All fractures were overload, and are considered to have been the result of the mishap. There was no evidence of fatigue cracking.
- Along with the fractures, all other visible damage to the subject components appeared to have been the result of the mishap.
- There were no indications of any pre-existing anomalies with the subject components prior to the mishap.