

L190-T940020-00-B


**Chicago Bridge & Iron**

Technical Services Company

 Research Center  
 1501 North Division Street  
 Plainfield, Illinois 60544-8929

 815 436 2912  
 FAX: 815 436 8345

**TELEFAX TRANSMISSION**

TO: LARRY JONES FROM: Larry Reel  
 COMPANY: CALTECH DATE: 8/31/94  
 FAX NO.: 818-304-9834 # PAGES: 11 (Including Cover Sheet)

Attached are the following:  
 Nonconformance Report Nos. QT-10, QT-11, & QT-12  
 Assembly Check List Nos. REP-H1, REP-H2, REP-H3  
 REP-H4, & REP-H5  
 MISHAP REPORT No. 8434  
 Shop Release for Shipment Check List No. QT-H3

The Mishap Report has been initiated for  
 the shipping damage to Assembly 21-C-1.

CBI will use this information to develop the  
 instructions and procedures for handling items  
 related to nonconformance or mishaps for the  
 LEGD Project.

During your next visit to Plainfield please  
 allow time for detailed discussion of this subject.

Larry Reel

P.S. Please give me a  
 call if you have  
 any thoughts that  
 can be used during  
 development of QT.



Nonconformance Report

Contract No. 930212

Report No. QT-10

Item or Part No. Assembly 21-D-1

Description of Nonconformance

Copper deposit in Vacuum stiffener to Beam Tube  
Fillet weld.

Signed William Jany Reed  
Welding & CC Supervisor

Recommended Disposition

1. Remove Vacuum Stiffener  
as shown

2. Chipp out Copper

3. Liquid Penetrant examine removal area

Corrective Action To Be Taken

Per Above  
& Look at other  
welds for same.

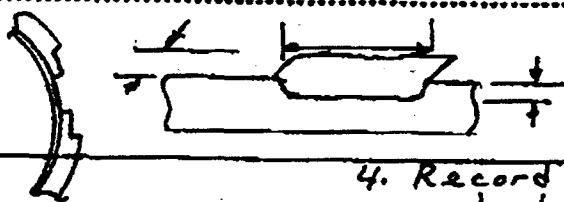
4. Record Length, width  
and depth of repair  
cavity.

5. Weld cavity using  
WPS-ER302L/Repair

6. Splice New Segment of Vacuum Stiffener  
using splice details shown on Drawg No. 15  
for each end of segment.

7. Weld Fillet attachment on opposite  
Side

8. Visual Check Repair &  
record on Assembly Check List



Disposition/Corrective Action Approval

Welding & CC Manager \_\_\_\_\_ Date \_\_\_\_\_

Disposition/Corrective Action Acceptance

Authorized Inspector N/A Date N/A

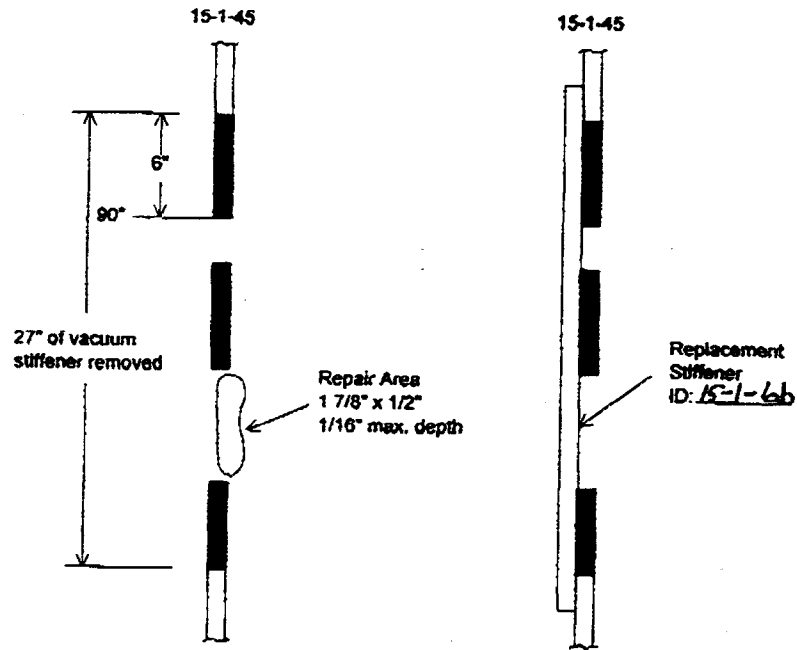
Corrective Action Completed

Welding & CC Supervisor \_\_\_\_\_ Date \_\_\_\_\_

Authorized Inspector Acceptance N/A Date N/A



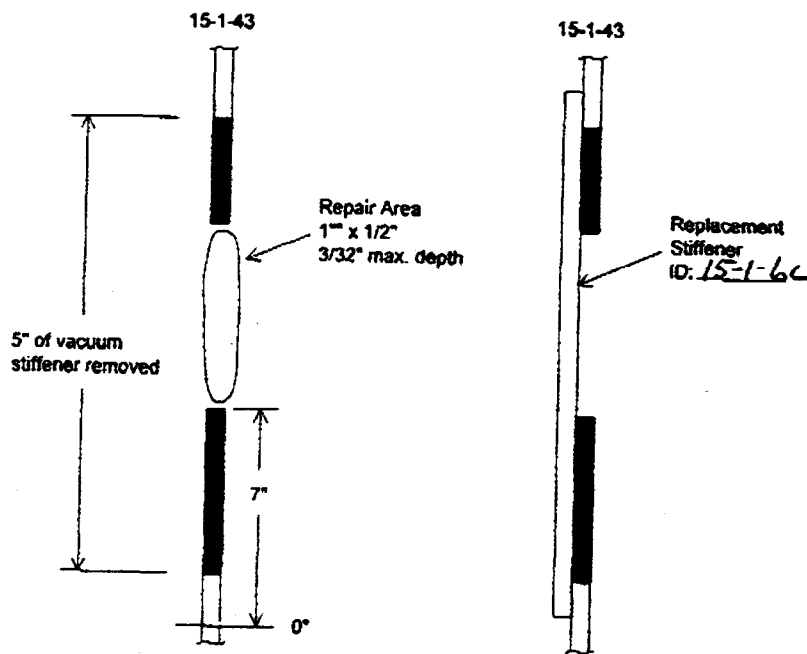
# CBI ASSEMBLY CHECK LIST



| Description |   | CBI                                 |                 |                         |         |               |
|-------------|---|-------------------------------------|-----------------|-------------------------|---------|---------------|
| Seq. No.    | Operation, Inspection, or Examination to be Completed | Applicable Procedure or Instruction | Init. Req'd "X" | Operation Insp. or Exam |         | For A.I. Only |
|             |   |                                     |                 | Initial                 | Date    |               |
| 1           | Remove defect by grinding or chipping                 |                                     |                 | RWP                     | 8/15/94 |               |
| 2           | PT surface prior to welding                           | PT-8                                | X               | WKB                     | 8/15/94 |               |
| 3           | Weld repair area                                      | WPS-ER308L/REPAIR                   |                 | RWP                     | 8/18/94 |               |
| 4           | Record welder ID                                      | WKB                                 |                 | RWP                     | 8/18/94 |               |
| 5           | PT final surface                                      | PT-8                                | X               | WKB                     | 8/18/94 |               |
| 6           | Check replacement stiffener fit-up                    |                                     | X               | RWP                     | 8/18/94 |               |
| 7           | Weld replacement stiffener                            | WPS-ER308L/GMA                      |                 | RWP                     | 8/18/94 |               |
| 8           | Record welder ID                                      | GAA                                 |                 | RWP                     | 8/18/94 |               |

|                |         |     |      |                 |  |              |
|----------------|---------|-----|------|-----------------|--|--------------|
| Made By<br>RWP | Chkd by | REV | By   | Contract Number |  | No. REP-H2   |
| Date           | Date    |     | Chkd | 930212          |  | Sheet 1 of 1 |
| 8/16/94        |         |     | Date |                 |  |              |

# CBI ASSEMBLY CHECK LIST



Tube ID: 21-D-1

| Description |   | CBI                                 |                 |                         |         |               |
|-------------|---|-------------------------------------|-----------------|-------------------------|---------|---------------|
| Seq. No.    | Operation, Inspection, or Examination to be Completed | Applicable Procedure or Instruction | Init. Req'd "X" | Operation Insp. or Exam |         | For A.I. Only |
|             |   |                                     |                 | Initial                 | Date    |               |
| 1           | Remove defect by grinding or chipping                 |                                     |                 | RWP                     | 8/15/94 |               |
| 2           | PT surface prior to welding                           | PT-8                                | X               | WKB                     | 8/15/94 |               |
| 3           | Weld repair area                                      | WPS-ER308L/REPAIR                   |                 | RWP                     | 8/18/94 |               |
| 4           | Record welder ID                                      | WKB                                 |                 | RWP                     | 8/18/94 |               |
| 5           | PT final surface                                      | PT-8                                | X               | WKB                     | 8/18/94 |               |
| 6           | Check replacement stiffener fit-up                    |                                     | X               | RWP                     | 8/18/94 |               |
| 7           | Weld replacement stiffener                            | WPS-ER308L/GMA                      |                 | RWP                     | 8/18/94 |               |
| 8           | Record welder ID                                      | GAA                                 |                 | RWP                     | 8/18/94 |               |
|             |   |                                     |                 |                         |         |               |
|             |   |                                     |                 |                         |         |               |

|                 |         |     |      |  |  |  |  |  |                           |              |
|-----------------|---------|-----|------|--|--|--|--|--|---------------------------|--------------|
| Made By<br>RWP  | Chkd by | REV | By   |  |  |  |  |  | Contract Number<br>930212 | No. REP-H3   |
| Date<br>8/16/94 | Date    |     | Chkd |  |  |  |  |  |                           | Sheet 1 of 1 |
|                 |         |     | Date |  |  |  |  |  |                           |              |



# CBI ASSEMBLY CHECK LIST

Tube Assembly ID: 21-D-1

| Stiffener ID | Location | PT Exam |
|--------------|----------|---------|
| 15-1-45      | 270°     | OK      |
| 15-1-50      | 254°     | OK      |
| 15-1-50      | 207°     | OK      |
| 15-1-48      | 228°     | OK      |
| 15-1-49      | 152°     | OK      |
| 15-1-49      | 129°     | OK      |
| 15-1-49      | 164°     | OK      |
| 15-1-47      | 164°     | OK      |
| 15-1-39      | 112°     | OK      |
| 15-1-45      | 90°      | OK      |

- Notes: 1) Suspect areas include all surface variations from the normal stiffener weld.  
 (Including all starts and stops during welding)  
 2) Suspect areas had a maximum length of 4".

| Seq. No. | Operation, Inspection, or Examination to be Completed | Applicable Procedure or Instruction | Init. Req'd "X" | CBI                     |         | For A.I. Only |
|----------|---|-------------------------------------|-----------------|-------------------------|---------|---------------|
|          |   |                                     |                 | Operation Insp. or Exam |         |               |
|          |   |                                     |                 | Initial                 | Date    |               |
| 1        | Clean suspect area                                    | Grinding / Chipping                 |                 | RWP                     | 8/15/94 |               |
| 2        | PT surface  | PT-8                                | X               | LJKIS                   | 8/15/94 |               |
| 3        | No weld repair required                               |                                     | X               | RWP                     | 8/15/94 |               |
|          |   |                                     |                 |                         |         |               |
|          |   |                                     |                 |                         |         |               |
|          |   |                                     |                 |                         |         |               |
|          |   |                                     |                 |                         |         |               |
|          |   |                                     |                 |                         |         |               |

|                 |         |     |      |                           |            |              |
|-----------------|---------|-----|------|---------------------------|------------|--------------|
| Made By<br>RWP  | Chkd by | REV | By   | Contract Number<br>930212 | No. REP-H5 |              |
| Date<br>8/19/94 | Date    |     | Chkd |                           |            | Sheet 1 of 1 |
|                 |         |     | Date |                           |            |              |



Nonconformance Report

Contract No. 930212

Report No. QT-11

Item or Part No. Assembly 21-C-1

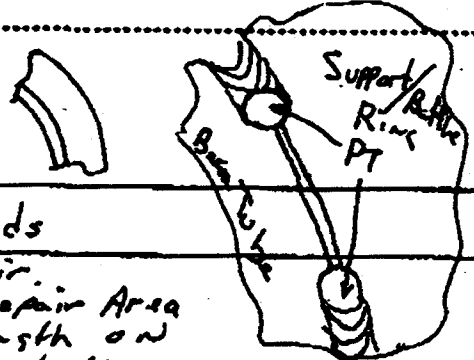
Description of Nonconformance

Fatigue Crack in Piece Mark 16-B-1 and  
16-A-2 used as shipping supports during  
shipment from Houston, TX to Plainfield, NJ.  
Two cracks in 16-B-1 8" and 7" Long  
One Crack in 16-A-2 2 1/2" Long

Signed William Langford  
 Welding & QC Supervisor

Recommended Disposition

1. Remove Crack
  2. Liquid Penetrant Examine Weld Ends
  3. Repair Weld using WPS ER308L/Repair.
  4. Visual Check Repair Area & Record on Length on Assembly Check List
  5. Make a MESHAP Report per CALTech
- Corrective Action To Be Taken Per Above



Disposition/Corrective Action Approval

Welding & QC Manager \_\_\_\_\_ Date \_\_\_\_\_

Disposition/Corrective Action Acceptance

Authorized Inspector N/A Date N/A

Corrective Action Completed

Welding & QC Supervisor \_\_\_\_\_ Date \_\_\_\_\_

Authorized Inspector Acceptance N/A Date N/A



NO. 08434  
 MASTER FILE NO.

**MISHAP REPORT**

(See Instructions on Reverse Side of Yellow Part 2)

NOTE: Fill in unshaded blocks within one working day. Please print or type. Fill out reverse side of this sheet.

**GENERAL INFORMATION**

|   |  |   |  |   |  |  |  |
|---|--|---|--|---|--|--|--|
| 1. NAME OF ORGANIZATION<br><b>CBI</b>   |  | 2. MISHAP DATE (MM/YY)<br><b>08/16/94</b> |  | 3. MISHAP TIME (24 HR)<br><b>1000</b>                           |  | 4. ORG FILE NO.                                    |  |
| 8. MISHAP CATEGORY (Check as appropriate)   |  |   |  | 5. CLOSE CALL   |  | 7. LEVEL OF POTENTIAL<br><b>\$1000 to \$10,000</b> |  |
| TYPE A<br><input type="checkbox"/> DEATH<br><input type="checkbox"/> LOST TIME<br><input type="checkbox"/> INJURY<br><input type="checkbox"/> DAMAGE<br><input type="checkbox"/> TEST FAILURE<br>TYPE B<br><input type="checkbox"/> LOST TIME<br><input type="checkbox"/> PERM DISABILITY<br><input type="checkbox"/> INJURY<br><input type="checkbox"/> HOSPITALIZATION<br><input type="checkbox"/> DAMAGE<br><input type="checkbox"/> TEST FAILURE<br>TYPE C<br><input type="checkbox"/> LOST TIME<br><input type="checkbox"/> INJURY<br><input type="checkbox"/> DAMAGE<br><input type="checkbox"/> TEST FAILURE<br>INCIDENT<br><input type="checkbox"/> INJURY<br><input checked="" type="checkbox"/> DAMAGE<br>MISSION FAILURE<br><input type="checkbox"/> |  |   |  | 6. BLOS. NO. LOCATION<br><b>Houston to Plainfield</b>           |  | 8. BLOS. NO. LOCATION<br><b>at 16-B-1</b>          |  |
|   |  |   |  | 9. SPECIFIC AREA<br><b>Beam Tube Assembly 21-C &amp; 16-A-2</b> |  | 10. MISSION AFFECTED<br><b>LIGO</b>                |  |
|   |  |   |  | 11. PROGRAM IMPACT<br><b>Shipping Procedure Chan.</b>           |  |  |  |

12. DESCRIPTION OF MISHAP (Sequence of events, extent of damage and injuries, cause, if known, etc. Use additional sheets, if necessary.)  
**Fatigue Crack in Beam Tube Assembly 21-C-1 at Piece Mark 16-B-1 (two cracks 7" & 8" Long) and at Piece Mark 16-A-2 (one crack 2 1/2" Long) during shipment from Houston, TX to Plainfield, LLC**

**PERSONNEL INVOLVED**

|  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|
| 13. NAME (Last, first, middle initial)<br><b>N/A</b>   |  | 14. AGE                                    |  | 15. SEX<br><input type="checkbox"/> M <input type="checkbox"/> F                       |  | 16. SECTION / JOB TITLE  |  |
| 17. SHIFT WORKED<br><input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 |  | 18. HOURS OF CONTINUOUS DUTY BEFORE MISHAP |  | 19. FIRST AID ONLY<br><input type="checkbox"/> YES <input type="checkbox"/> NO         |  | 20. FATALITY<br><input type="checkbox"/> YES <input type="checkbox"/> NO   |  |
| 21. INJURY TYPE (Code)   |  | 22. BODY PART(S) AFFECTED (Codes)          |  | 23. DAYS LOST<br><input type="checkbox"/> TOTAL<br><input type="checkbox"/> CONTINUING |  | 24. CAUSE(S) OF DAMAGE (Codes)   |  |
|  |  |  |  | 25. MISHAP ENVIRONMENT (Codes)   |  | 26. HAS EMPLOYEE RECEIVED TRAINING / CERTIFICATION APPLICABLE TO TASK?<br><input type="checkbox"/> YES <input type="checkbox"/> NO |  |

**EQUIPMENT / PROPERTY DAMAGED**

|  |  |  |   |   |  |
|--|--|--|---|---|--|
| 27. CLASS OF EQUIPMENT / PROPERTY DAMAGED<br><input type="checkbox"/> FLIGHT HARDWARE<br><input type="checkbox"/> GROUND SUPPORT EQUIPMENT (GSE)<br><input type="checkbox"/> FACILITY<br><input type="checkbox"/> PRESSURE VESSEL<br><input type="checkbox"/> MOTOR VEHICLE<br><input type="checkbox"/> AIRCRAFT<br><input checked="" type="checkbox"/> OTHER<br><b>Beam Tube Assembly</b> |  |  | 28. SPECIFIC ITEM DAMAGED<br><b>Assembly 21-C-1</b> |   |  |
| 29. SERIAL / NEMS NO.<br><b>16-B-1 &amp; 16-A-2</b>  |  | 30. SYSTEM / SUB-SYSTEM AFFECTED<br><b>Guided Support DWG # 16</b> |   | 31. CAUSE(S) OF DAMAGE (Codes)<br>PRIMARY CONTRIB. POTENTIAL<br><b>AG(1) P(1)</b> |  |
|  |  |  |   | 32. COST<br>ESTIMATE FINAL<br><b>\$1,000 5</b>                                    |  |

|  |  |  |  |                                  |  |                        |  |
|--|--|--|--|----------------------------------|--|------------------------|--|
| 32. SUBMITTED BY (Name, title, mail code)<br><b>William Larry Reed</b> |  | SIGNATURE<br><i>William Larry Reed</i> |  | PHONE NO.<br><b>815-439-6038</b> |  | DATE<br><b>8/16/94</b> |  |
|--|--|--|--|----------------------------------|--|------------------------|--|

**CORRECTIVE ACTION**

34. ACTION PLAN (Describe Corrective Action to be taken, including completion dates and names of personnel and organizations responsible for correction. Use extra sheets, if necessary.)  
 1. Remove Cracked Weld  
 2. Liquid Penetrant Examine Weld Ends  
 3. Repair Weld using WPS ER308L/Repair  
 4. Visual Check repair area  
 5. Change handling Procedure for shipments of other like Assemblies

|   |  |           |  |           |  |      |  |
|---|--|-----------|--|-----------|--|------|--|
| 35. SECTION APPROVAL (Name, title, mail code) |  | SIGNATURE |  | PHONE NO. |  | DATE |  |
|---|--|-----------|--|-----------|--|------|--|

**35. JPL MANAGEMENT CONCURRENCE WITH CORRECTIVE ACTION PLAN**

|  |  |           |  |           |  |      |  |
|--|--|-----------|--|-----------|--|------|--|
| DIVISION APPROVAL (Name, title, mail code) |  | SIGNATURE |  | PHONE NO. |  | DATE |  |
|--|--|-----------|--|-----------|--|------|--|

**OCCUPATIONAL SAFETY OFFICE USE ONLY**

|   |  |                   |  |                          |  |                |  |
|---|--|-------------------|--|--------------------------|--|----------------|--|
| 37. LESSONS LEARNED<br><input type="checkbox"/> YES <input type="checkbox"/> NO   |  | REF. NO. (if Yes) |  | 40. APPROVAL FOR CLOSURE |  | NAME AND TITLE |  |
| 38. TYPE OF INVESTIGATION<br><input type="checkbox"/> BOARD <input type="checkbox"/> TEAM <input type="checkbox"/> INVESTIGATOR |  |                   |  |                          |  | PHONE NO.      |  |
| 39. STATUS<br><input type="checkbox"/> OPEN <input type="checkbox"/> CLOSED   |  | SIGNATURE         |  |                          |  | DATE           |  |



SHOP RELEASE FOR SHIPMENT CHECK LIST

AUG 31 '94 7:22 FROM CBI INDUSTRIES TO 718183049834 PAGE.010/011

| NO. | NO. PCS. | PIECE MARK | SERIAL NUMBER | ITEM CLASS LEVEL | THESE COLUMNS FILLED IN AT OPTION OF SHOP |          |             |        | SHIPPING SHOP |         | RECEIVING SHOP OR FIELD |         |
|-----|----------|------------|---------------|------------------|---|----------|-------------|--------|---------------|---------|-------------------------|---------|
|     |          |            |               |                  | B.S. NO.                                  | LINE NO. | DESCRIPTION | WEIGHT | INSPECTED BY  | DATE    | INSPECTED BY            | DATE    |
| 1   | 1        | 21-D       | 1             | 4A               |   |          |             |        | RWP           | 8/19/94 | WLR                     | 8/30/94 |
| 2   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 3   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 4   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 5   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 6   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 7   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 8   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 9   |          |            |               |                  |   |          |             |        |               |         |                         |         |
| 10  |          |            |               |                  |   |          |             |        |               |         |                         |         |

NOTES: (Precede notes with "S" for shop or "F" for field to indicate originator of note)

(H3.) VI 8 to be revised for LIGO requirements  
 (H4.) DCQT to be revised for QT Dimensional Measurements  
 (P52) Dent at Vacuum Stiffener 15-1-35. Repair per QT-P3 Assembly Check List.  
 (See NCR #12)

TO THE BEST OF MY KNOWLEDGE, THE LISTED ITEMS HAVE BEEN MANUFACTURED AND DOCUMENTED ACCORDING TO THE APPLICABLE CBI QUALITY ASSURANCE MANUAL AND MEET APPLICABLE CODE AND CUSTOMER REQUIREMENTS, EXCEPT AS NOTED

CBI SHOP QA WLR DATE 8/19/94

SHIPMENT NO. QT-H3 CONTRACT NO. 930212

REVIEWED: CUSTOMER INSPECTOR \_\_\_\_\_ DATE \_\_\_\_\_

MADE BY WLR APP'D BY \_\_\_\_\_  
 DATE 8/11/94 DATE \_\_\_\_\_

REV BY \_\_\_\_\_  
 APP'D \_\_\_\_\_  
 DATE \_\_\_\_\_

REVIEWED (FOR CODE COMPLIANCE): AUTHORIZED NUCLEAR INSPECTOR (Shop) \_\_\_\_\_ DATE \_\_\_\_\_

SH 1 OF 1



Nonconformance Report

Contract No. 930212

Report No. QT-12

Item or Part No. Beam Tube Assembly 21-D-1 and Vacuum

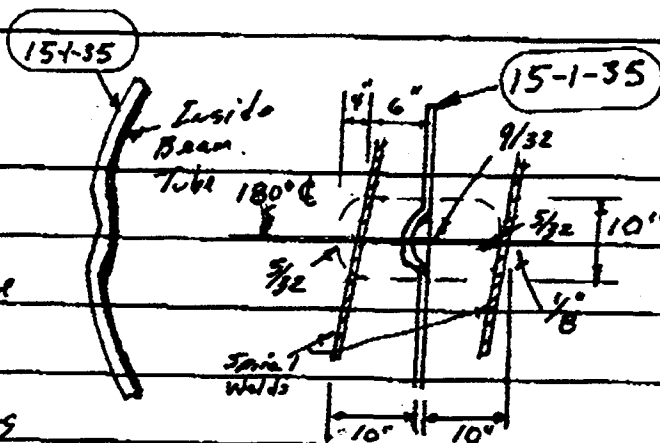
Stiffener 15-1-35

Description of Nonconformance

Assembly 21-D-1 dropped during handling at time of shipment Receiving (8/26/94)

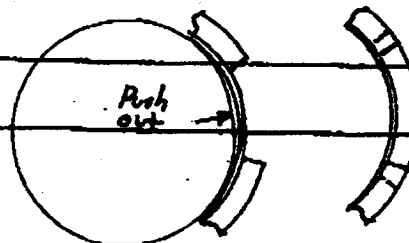
Dent was made in Beam Tube and Vacuum Stiffener.

9/32" Depth X 10" wide X 20" Long



Signed William Lang Reed  
Welding & QC Supervisor

- Recommended Disposition:
1. Remove 1'-0 length of Vacuum Stiffener
  2. Push out Dent with turnbuckle fixture.
  3. Install Purse Boy (Segmental).
  4. Weld Segment of New Vacuum Stiffener per WPS-ER308L/Repair.
  5. Final Visual check Repair Area.



Corrective Action To Be Taken

Disposition/Corrective Action Approval

Welding & QC Manager \_\_\_\_\_ Date \_\_\_\_\_

Disposition/Corrective Action Acceptance

Authorized Inspector N/A \_\_\_\_\_ Date \_\_\_\_\_

Corrective Action Completed

Welding & QC Supervisor \_\_\_\_\_ Date \_\_\_\_\_

Authorized Inspector Acceptance N/A \_\_\_\_\_ Date \_\_\_\_\_