



**AFCTN Report  
94-115**

**AFCTB-ID  
94-115**



**Technical Raster Transfer Using:**

**Rockwell Internatinal's Rocketdyne  
Division Data Supporting:**



**HQ AFMC/ENCT's CALS  
Evaluation and Integration Office**



**MIL-STD-1840A &  
MIL-STD-1840B**



**MIL-R-28002A (Raster)**

**Quick Short Test Report**

**17 August 1994**



Prepared for  
Electronic Systems Center  
Air Force CALS Program Office  
HQ ESC/AV-2  
4027 Colonel Glenn Hwy Suite 300  
Dayton OH 45431-1672

**19960606 103**

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Using:  
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HQ AFMC/ENCT's CALS Evaluation and Integration Office**

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MIL-R-28002A (Raster)**

**Quick Short Test Report**

**23 August 1994**

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**Prepared By**  
Air Force CALS Test Bed  
Wright-Patterson AFB, OH 45433

**AFCTB Contact**  
Gary Lammers  
(513) 427-2295

**AFCTN Contact**  
Mel Lammers  
(513) 427-2295

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# **Air Force CALS Test Bed**

## ***Notification of Test Results***

**17 August 1994**

This notice documents the results of an Air Force CALS Test Bed (AFCTB) Quick Short Test Report (QSTR) evaluation of data submitted by:

### **Rockwell International's Rocketdyne Division**

Identified as follows:

Title:	<b>Technical Raster Transfer</b>
Program:	<b>CALS Evaluation &amp; Integration Office</b>
Program Office:	<b>HQ AFMC/ENCT</b>
Contract No.:	<b>N/A</b>
QSTR No.:	<b>AFCTB-ID 94-115</b>

Received on the following media:      **Electronic Transfer**

The results of the QSTR evaluation are as follows:

MIL-STD-1840A & 1840B	<b>Pass</b>
Standard:	
MIL-STD-1840A & 1840B	<b>Pass</b>
Media Format:	
MIL-D-28000A IGES:	<b>N/A</b>
MIL-M-28001B SGML:	<b>N/A</b>
MIL-R-28002A Raster:	<b>Pass</b>
MIL-D-28003 CGM:	<b>N/A</b>

Formal results with associated disclaimer are documented and available from the AFCTB.

**Air Force CALS Test Bed  
HQ ESC/AV-2P  
4027 Colonel Glenn Highway, Suite 300  
Dayton, OH 45431-1672  
Phone: 513-257-3085      FAX: 513-257-5881**

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## 1. Introduction

### 1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-cycle Support (CALs) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840B, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALs standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALs initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) of the standards, interact with the AFCTN technical staff, gain experience using the standards, and develop increased confidence in them. The results of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

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## 1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Rocketdyne's (a division of Rockwell Int'l) interpretation and use of the CALS standards in transferring technical Raster data. Rocketdyne used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff using and electronic transfer to the internet server.

Two file sets were transmitted for this test, an 1840A and an 1840B data set.

## 2. Test Parameters

**Test Plan:** AFCTB 94-115

**Date of Evaluation:** 23 August 1994

**Evaluator:** George Elwood  
Air Force CALS Test Bed  
DET 2 HQ ESC/AV-2P  
4027 Colonel Glenn Hwy  
Suite 300  
Dayton OH 45431-1672

**Data Originator:** Betty Boyadjian  
Rocketdyne Division, Rockwell International  
6633 Canoga Ave M/S AB41  
Canoga Park, CA 91304  
(818) 586-4934

**Data Description:** Technical Raster Test (2)  
1 Document Declaration file  
6 Raster files

**Data Source System:** 1840

**HARDWARE** SUN

**SOFTWARE** AFCTN Tapetool 2.0B  
AFCTN Tapetool 1.2.10

Raster

**HARDWARE** SUN

**SOFTWARE** SPICER *IMAGEnation* VME

---

**Evaluation Tools Used:**

**MIL-STD-1840B (TAPE)**

PC 486/50

AFCTN Tapetool v1.2.10 DOS

AFCTN Tapetool v2.0.0 (1840B)

**MIL-R-28002 (Raster)**

HP 735

AFCTN *xrastb.hp*

InterCAP X-Change v7.82

Carberry CADLeaf v4.0

SGI Indigo2

AFCTN *xrastb.sgi*

IGES Data Analysis (IDA) CALSView

SUN SparcStation 2

IDA IGESView v3.0

PC 486

AFCTN *validg4*

IDA IGESView Windows

Inset Systems HiJaak Pro

Expert Graphics RxHighlight v1.0

**Standards**

**Tested:**

MIL-STD-1840B

MIL-STD-1840A

MIL-R-28002A

### **3. 1840A & 1840B Analysis**

#### **3.1 External Packaging**

The files arrived at the Air Force CALS Test Bed (AFCTB) via an electronic transfer to the internet server. No physical media was exchanged or evaluated.

#### **3.2 Transmission Envelope**

The electronic transfer received by the AFCTB contained MIL-STD-1840B and MIL-STD-1840A files. The files were named per the standard conventions.

##### **3.2.1 Tape Formats**

No tape was evaluated.

##### **3.2.2 Declaration and Header Fields**

No errors were found in the Document Declaration file or data file headers of either file set. This portion of the electronic transfers meets the requirements defined in CALS MIL-STD-1840A and MIL-STD-1840B.

### **4. IGES Analysis**

No Initial Graphics Exchange Specification (IGES) files were included in this evaluation.

### **5. SGML Analysis**

No Standard Generalized Markup Language (SGML) files were included in this evaluation.

---

## 6. Raster Analysis

Each transfer set contained six Raster files from a MIL-STD-1840A and MIL-STD-1840B data package. The Raster files were compared and found to be exact matches. The Raster evaluation was done using the MIL-STD-1840A data files.

The procedure used to create these files at Rocketdyne was as follows:

Original engineering drawing created using *CATIA*. These files were then output as HPGL files. These files were converted to CCITT G4 files using *SPICER IMAGEnation VME*. The 1840A output was generated using the AFCTB *Tapetool v1.2.10*. The 1840B output was generated using the AFCTN *Tapetool V2.0.0*. The 1840B header contained additional fields, which are not currently supported by the AFCTB Raster test tools; *xrastb* and *validg4*. All evaluations of the Raster files were done using the MIL-STD-1840A data set.

The 1840A files were read into the AFCTN *xrastb.sgi* viewing utility. No problems were encountered. It was noted that the decompressed file sizes were 10-15 megabytes. Files this large may cause problems in some systems with limited memory. The image quality was excellent. All text could be read. The SUN Sparc version of the software would not display the image due to lack of memory.

The AFCTB has several tools for viewing Raster files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The Raster files were read into Carberry's *CADLeaf* software without a reported error. All images were displayed and printed from this utility. In order to make the images acceptable, only a small section of the images could be displayed and printed.

The files were read using IDA's *CALSVIEW* without a reported error.

The files were read into IDA's *IGESView* without a reported error.

The files were read into Inset Systems' *HiJaak for Windows*. Because of the size of the files and available memory on the PC, error messages were displayed indicating a lack of memory to process the files.

No errors were reported while using InterCAP's *X-Change*. The images appeared correctly. The text size was very small, making it necessary to use the zoom function in order to view it.

The Raster files were imported into Expert Graphics' *Rx-Highlight* and displayed without any reported errors. The images were enlarged and all text was legible.

The six Raster files in these transfer sets meet the CALS MIL-R-28002A specification.

## 7. CGM Analysis

No Computer Graphics Metafiles (CGMs) were included in this evaluation.

## 8. Conclusions and Recommendations

The CALS Document Declaration file and data file headers were correct. This portion of the electronic transfers meet the CALS MIL-STD-1840A and MIL-STD-1840B requirements.

The Raster files meet the CALS MIL-R-28002A specification.

The electronic transfer sets submitted by Rocketdyne conform to the CALS MIL-STD-1840A and MIL-STD-1840B requirements.

---

## 9. Appendix A - Tapetool Report Logs

### 9.1 MIL-STD-1840A Data Set

#### 9.1.1 Tape Catalog

CALS Test Network Catalog Evaluation - Version 1.2; Release 10 (0)

Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information

ANSI X3.27 (1987) - File Structure and labeling of Magnetic Tapes  
for Information Interchange

ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Sun Aug 21 12:05:29 1994

MIL-STD-1840A File Catalog

File Set Directory: C:\TT\SET013

Page: 1

File Name	File Type	Record Format/ Length	Block Length/Total	Selected/ Extracted
D001	Document Declaration	D/00256	02048/000000	Extracted
D001R001	Raster	F/00128	02048/000000	Extracted
D001R002	Raster	F/00128	02048/000000	Extracted
D001R003	Raster	F/00128	02048/000000	Extracted
D001R004	Raster	F/00128	02048/000000	Extracted
D001R005	Raster	F/00128	02048/000000	Extracted
D001R006	Raster	F/00128	02048/000000	Extracted

Catalog Process terminated normally.

## 9.1.2 Tape File Set Validation Log

CALS Test Network File Set Evaluation - Version 1.2; Release 10 (0)

Standards referenced:

MIL-STD-1840A (1987) - Automated Interchange of Technical Information

Sun Aug 21 12:05:30 1994

MIL-STD-1840A File Set Evaluation Log

File Set: SET013

Found file: D001

Extracting Document Declaration Header Records...

Evaluating Document Declaration Header Records...

srcsys: Rocketdyne Div, Rockwell Intl, 6633 Canoga Ave, Canoga Park, CA 91303

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)

srcrelid: NONE

chglvl: ORIGINAL

dteisu: 19940819

dstsys: CALS Evaluation and Integration Office, %CALS Digital Standards Office, HQ  
AFMC/ENCT, Wright-Patterson AFB, OH 45433-50

dstdocid: Engineering Drawing #R0018020

dstrelid: NONE

dtetrn: 19940819

dlvacc: NONE

filcnt: R6

ttlcls: UNCLASSIFIED

doccls: UNCLASSIFIED

doctyp: Product Data

docttl: SSME Manifold, Details and Views

Found file: D001R001

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)

dstdocid: Engineering Drawing #R0018020

txtfilid: NONE

figid: NONE

srcgph: NONE

doccls: UNCLASSIFIED

rtype: 1

rorient: 000,270

rpelcnt: 015051,005422

rdensty: 0300

notes: NONE

Found file: D001R002

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
txtfilid: NONE  
figid: NONE  
srcgph: NONE  
doccls: UNCLASSIFIED  
rtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
notes: NONE

Found file: D001R003

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
txtfilid: NONE  
figid: NONE  
srcgph: NONE  
doccls: UNCLASSIFIED  
rtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
notes: NONE

Found file: D001R004

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
txtfilid: NONE  
figid: NONE  
srcgph: NONE  
doccls: UNCLASSIFIED  
rtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
notes: NONE

Found file: D001R005

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
txtfilid: NONE  
figid: NONE

---

srcgph: NONE  
doccls: UNCLASSIFIED  
rtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
notes: NONE

Found file: D001R006

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
txtfilid: NONE  
figid: NONE  
srcgph: NONE  
doccls: UNCLASSIFIED  
rtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
notes: NONE

Evaluating numbering scheme...

No errors were encountered during numbering scheme evaluation.  
Numbering scheme evaluation complete.

Checking file count...

No errors were encountered during file count verification.  
File Count verification complete.

No errors were encountered in Document D001.

No errors were encountered in this File Set.

MIL-STD-1840A File Set Evaluation Complete.

---

## 9.2 MIL-STD-1840B Data Set

### 9.2.1 Tape Catalog

CALS Test Network Catalog Evaluation - Version 2.0; Release 1 (C)

Standards referenced:

MIL-STD-1840B (1992) - Automated Interchange of Technical Information

ANSI X3.27 (1987) - File Structure and labeling of Magnetic Tapes  
for Information Interchange

ANSI X3.4 (1986) - Coded Character Sets - 7 Bit ASCII

Sun Aug 21 13:19:12 1994

MIL-STD-1840B File Catalog

File Set Directory: C:\TAPEB\SET003

Page: 1

File Name	File Type	Record Format/ Length	Block Length/Total	Selected/ Extracted
D001	Document Declaration	F/00128	02048/000000	Extracted
D001R001	Raster	F/00128	02048/000000	Extracted
D001R002	Raster	F/00128	02048/000000	Extracted
D001R003	Raster	F/00128	02048/000000	Extracted
D001R004	Raster	F/00128	02048/000000	Extracted
D001R005	Raster	F/00128	02048/000000	Extracted
D001R006	Raster	F/00128	02048/000000	Extracted

Catalog Process terminated normally.

## 9.2.2 Tape File Set Validation Log

CALS Test Network File Set Evaluation - Version 2.0; Release 1 (C)

Standards referenced:

MIL-STD-1840B (1992) - Automated Interchange of Technical Information

Sun Aug 21 13:19:12 1994

MIL-STD-1840B File Set Evaluation Log

File Set: SET003

Found file: D001

version: MIL-STD-1840B, 0, 19921103

srcsys: Rocketdyne Div, Rockwell Intl, 6633 Canoga Ave, Canoga Park, CA 91303

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)

srcrelid: NONE

chglvl: ORIGINAL, 0, 0, 19940819/1032:54

dteisu: 19940819/1032:54

dstsys: CALS Evaluation and Integration Office,%CALS Digital Standards Office, HQ  
AFMC/ENCT,Wright-Patterson AFB, OH 45433-50

dstdocid: Engineering Drawing #R0018020

dstrelid: NONE

dtetrn: 19940819/1032:54

dlvacc: NONE

filcnt: R6

ttlcls: UNCLASSIFIED

doccls: UNCLASSIFIED

doctyp: IBM VM CATIA 3.2.6 Drawing

doctl: SSME Manifold, Details and Views

transactyp: PRODUCT DATA

Found file: D001R001

specversion: NONE

srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)

dstdocid: Engineering Drawing #R0018020

moduleid: NONE

dtype: 1

rorient: 000,270

rpelcnt: 015051,005422

rdensty: 0300

didid: NONE

doccls: UNCLASSIFIED

notes: NONE

Found file: D001R002

specversion: NONE  
srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
moduleid: NONE  
dtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
didid: NONE  
doccls: UNCLASSIFIED  
notes: NONE

Found file: D001R003

specversion: NONE  
srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
moduleid: NONE  
dtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
didid: NONE  
doccls: UNCLASSIFIED  
notes: NONE

Found file: D001R004

specversion: NONE  
srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
moduleid: NONE  
dtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
didid: NONE  
doccls: UNCLASSIFIED  
notes: NONE

Found file: D001R005

specversion: NONE  
srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
moduleid: NONE

dtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
didid: NONE  
doccls: UNCLASSIFIED  
notes: NONE

Found file: D001R006

specversion: NONE  
srcdocid: CATIA Drawing #R0018020, 6 sheets (SSME)  
dstdocid: Engineering Drawing #R0018020  
moduleid: NONE  
dtype: 1  
rorient: 000,270  
rpelcnt: 021639,005422  
rdensty: 0300  
didid: NONE  
doccls: UNCLASSIFIED  
notes: NONE

Evaluating numbering scheme...  
No errors were encountered during numbering scheme evaluation.  
Numbering scheme evaluation complete.

Checking file count...  
No errors were encountered during file count verification.  
File Count verification complete.

No errors were encountered in Document D001.

No errors were encountered in this File Set.

MIL-STD-1840B File Set Evaluation Complete.

## 10. Appendix B - Detailed Raster Analysis

### 10.1 File D001R001

#### 10.1.1 Output CADLeaf

ACCUMULATION.

COORDINATE WELD FITUP RE  
UEL BOWL LINER DWG ROC  
UEL BOWL FAIRED INLETS

BLEND WELD SMOOTHLY WIT  
URFACES. NO NOTCHES OF  
PERMISSIBLE. .10 RADIUS

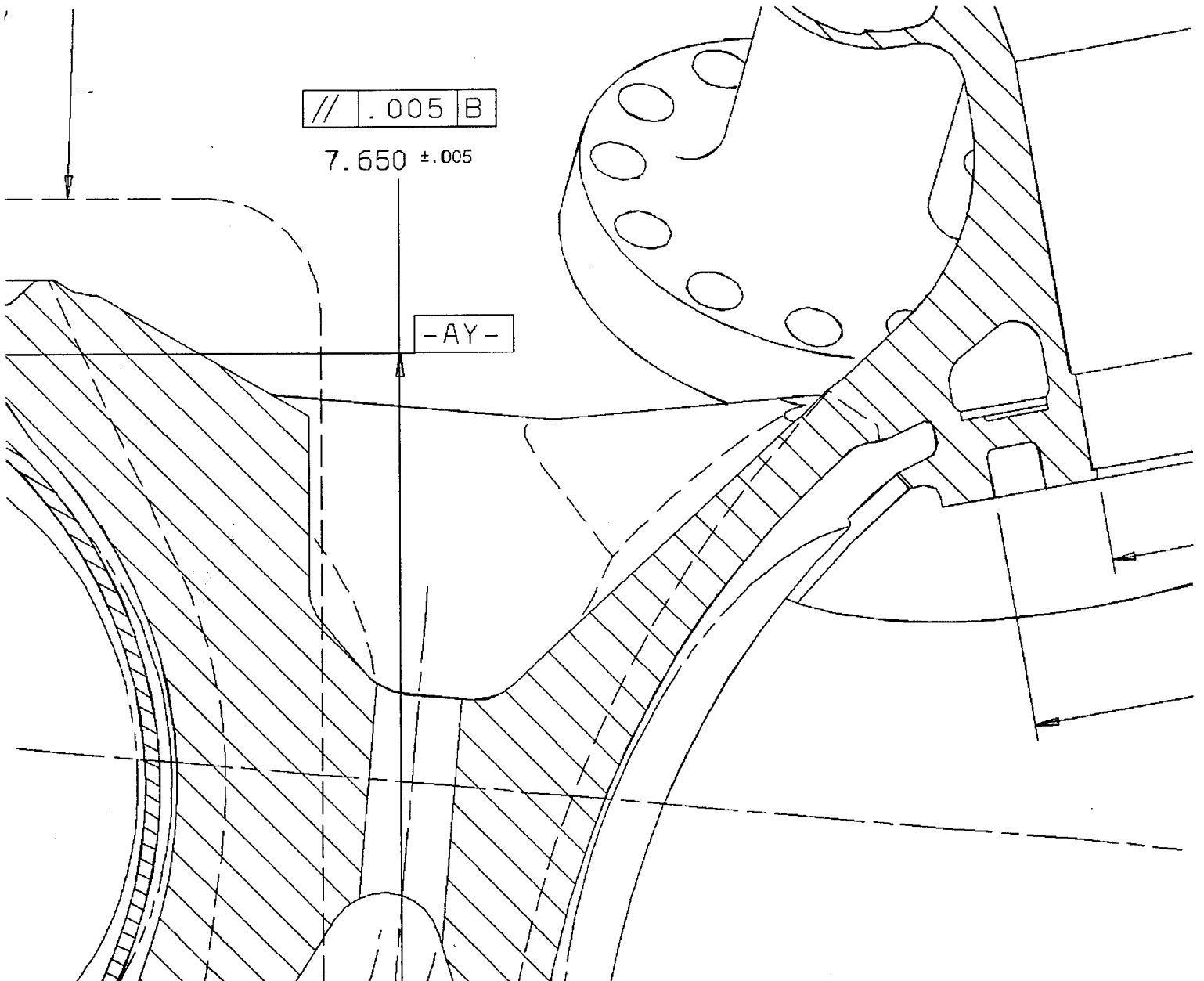
CRITICAL GSE INTERFACE

---



### 10.3 File D001R003

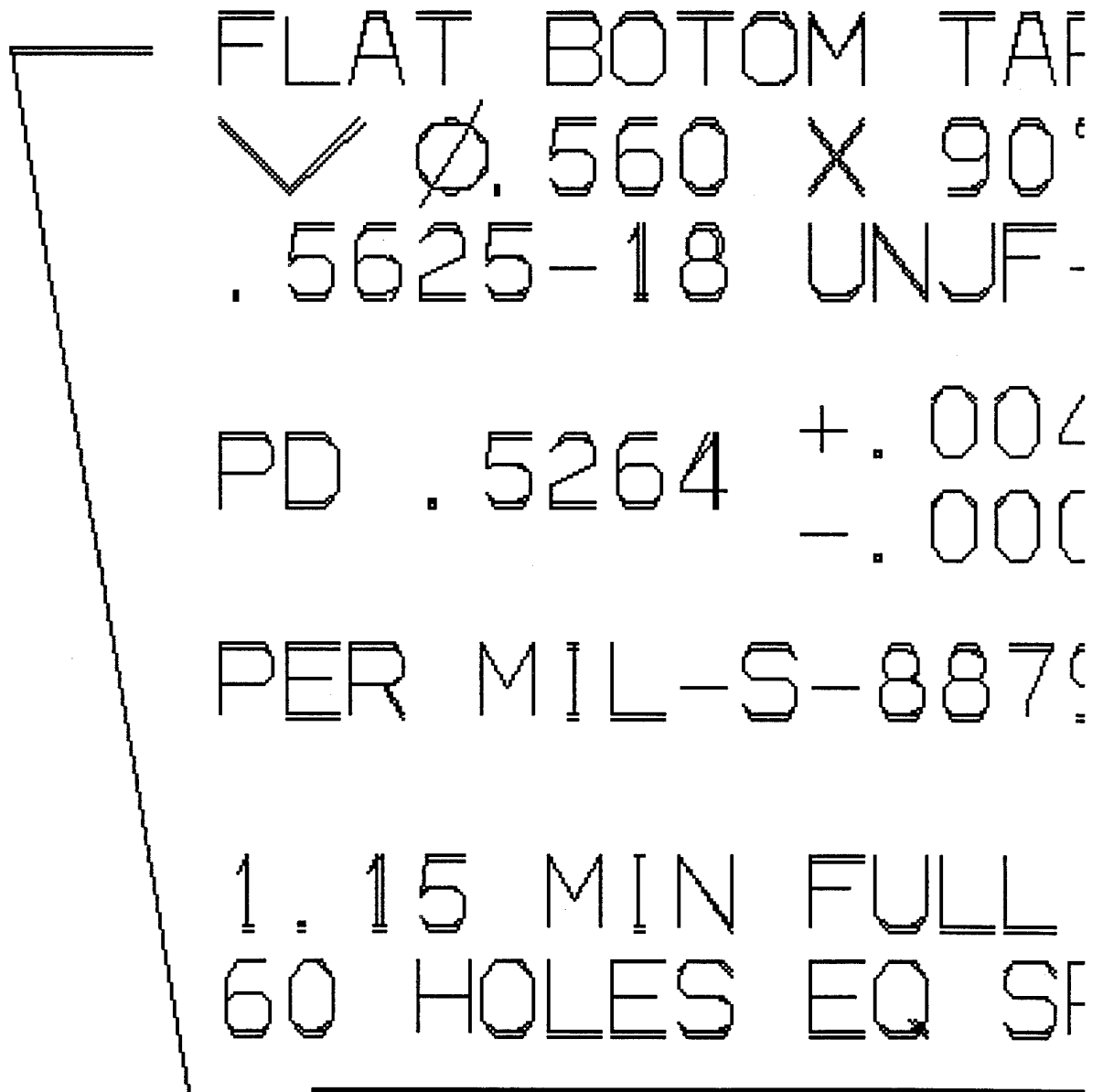
#### 10.3.1 Output CADLeaf



---

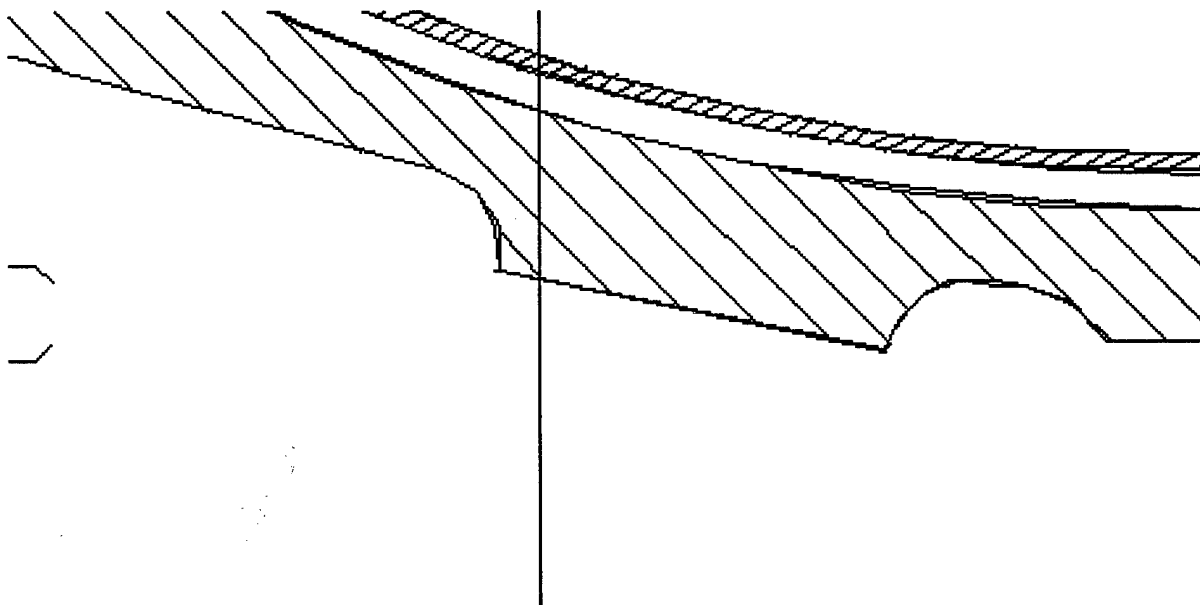
10.4 File D001R004

10.4.1 Output CADLeaf



## 10.5 File D001R005

### 10.5.1 Output CADLeaf





.. 10 MIN GAP TO BE  
MAINTAINED DURING  
WELD FITUP.  
2 PL ALL AROUND

## 10.6 File D001R006

### 10.6.1 Output CADLeaf

POINT A IS CENTER OF MATI  
URFACE AND  $\varnothing 3.550$  ON ROO  
NLET FLANGE

  RD111-4009-6836 B0

 RD153-5004-1008 W,

RD153-1002-0008 W,

 RD114-8014-0008 NI