

This notice is a combined synopsis/solicitation for commercial items prepared in accordance with the format in FAR Subpart 12.6, as supplemented with additional information included in this notice. This announcement constitutes the only solicitation; offers are being requested and a written solicitation will not be issued.

This notice is being issued as a Request for Quotations (RFQ) for Jet Noise Rig Component Upgrades consisting of the following:

ITEM 1, QTY. 1, Core Adapter (28529M42A014 upgrade),
ITEM 2, QTY. 1, Core Insulation Liner (28529M42A015 upgrade),
ITEM 3, QTY. 1, New Core charging Station (CE-645708 legacy replacement/upgrade),
ITEM 4, QTY. 1, Seal Retainer and metal seals (between core adapter and Core/Fan Duct Assy),
ITEM 5, QTY. 1, Fan Duct Strut Assembly (CE-645706 upgrade),
ITEM 6, QTY. 1, Core Strut Assembly (CE-645686 upgrade), and
ITEM 7, QTY. 1, Core Charging Station (CE-645708 comprehensive upgrade)

ADDITIONAL SPECIFICATIONS are as follows:

DESIGN AND FABRICATE DFJER COMPONENT HARDWARE

Background

This Statement of Work (SOW) specifies design and fabrication of research rig components intended to support high temperature, supersonic, Jet Noise research. The new components will replace and upgrade existing components of the High Flow Jet Exit Rig (HFJER) housed within the Aeroacoustic Propulsion Laboratory (AAPL) at NASA Glenn Research Center (GRC) in Cleveland, Ohio. The new components are intended to increase existing temperature and pressure capabilities of the rig, as well as allow new modes of operation and testing.

Acronyms and definitions:

DFJER - Dual Flow Jet Exit Rig (High Flow Jet Exit Rig in dual flow configuration)

HBPR – High Bypass Ratio

NATR – Nozzle Acoustic Test Rig (53” freejet duct wind tunnel facility that surrounds the High Flow Jet Exit Rig and provides in-flight simulation airflow)

Drawing References:

- 75105M77B000 – High Flow Jet Exit Rig Dual Flow Assembly
- 75105M77B100 – Dual Flow Nozzle Assembly
- 75105M77B101 – Fan Adapter
- 75105M77B104 – Bypass OD Spacer

- 75105M77B105 – Inside Spacer
- 28529M42A014 thru 018 – Dual Flow pod legacy components
- CE-645686 – Core/Tailcone weldment
- CE-645706 – Fan Duct Weldment
- CE-645708 – Core Charging Station

Scope of Work: Provide engineering, drafting, and fabrication services necessary to design and deliver hardware components specified below. Work entails redesign of existing rig hardware components to meet max core flow operating conditions of 200 psig at 1400 deg. F. and max bypass flow operating conditions of 200 psig at 250 deg F. Components must also be capable of operating any combination of core/bypass conditions specified in table 1. General stress-level component Safety Factor shall be 3 based on material yield strength, or 5 based on material ultimate strength. New hardware must exhibit exceptionally low flow noise and must seamlessly interface with existing HFJER components. General component geometry shall be configured to prevent flow separation, minimize flow recirculation, and promote uniform flow profiles throughout the rig. Successful completion of this work requires knowledge of specific techniques and methods associated with design and fabrication of low-noise/low-drag aeronautical (wind tunnel) test hardware. Knowledge of wind tunnel test techniques and instrumentation requirements is also necessary.

HFJER Operational Requirements			
Core stream:			
Condition	Air flow (lbm/s)	Plenum pressure (psia)	Plenum temperature (°R)
1	4	17	500
2	2	17	1800
3	33	116	500
4	19	116	1800
5	10	66	2000
Bypass stream:			
Condition	Air flow (lbm/s)	Plenum pressure (psia)	Plenum temperature (°R)
6	4	17	500
7	3	17	650
8	33	116	500
9	30	116	650
10	17	66	650
11	34	38	500

TABLE 1. Operating Condition Summary

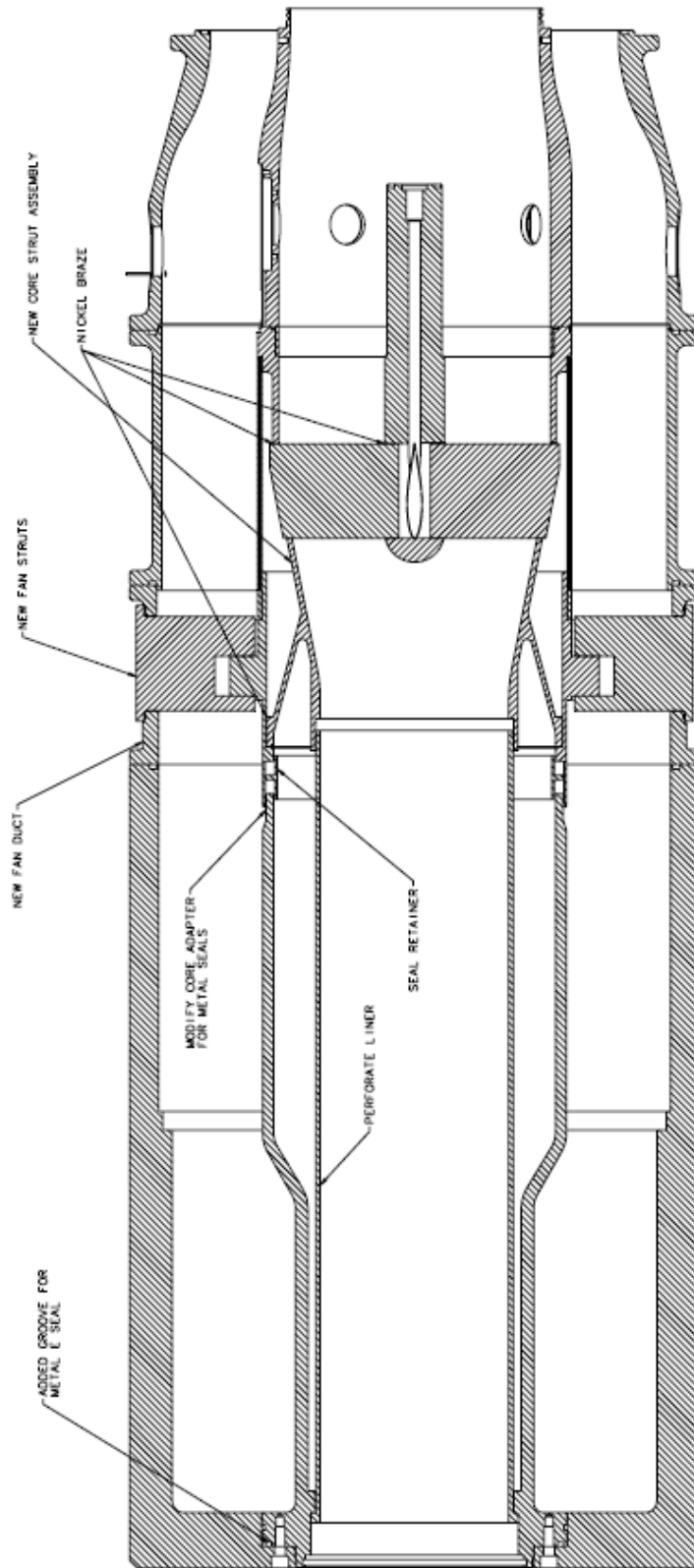


Figure 1. Conceptual Component Assembly

REQUIREMENTS:

Overview: Work entails design and fabrication of 7 separate components/assemblies as outlined below. See Figure 1 for view of existing component assembly. See Table 1. for summary of operating conditions. All parts must be able to withstand operation at any combination of core/bypass conditions specified in table 1. as well as the maximum operating conditions outlined scope above. General stress-level Safety factor shall be 3 based on material yield strength or 5 based on material ultimate strength. The seven component parts are:

1. Core Adapter (28529M42A014 upgrade)
2. Core Insulation Liner (28529M42A015 upgrade)
3. New Core charging Station (CE-645708 legacy replacement/upgrade)
4. Seal Retainer and metal seals (between core adapter and Core/Fan Duct Assy)
5. Fan Duct Strut Assembly (CE-645706 upgrade)
6. Core Strut Assembly (CE-645686 upgrade)
7. Core Charging Station (CE-645708 comprehensive upgrade)

Core Adapter (28529M42A014 replacement). Component shall feature geometry compatible with 28529M42A014 except with modifications/materials as required to meet stress safety factors. Design and fabrication shall incorporate features to prevent distortion resulting from thermal expansion (interference), residual stress, or uneven heating/cooling.

Core Liner (28529M42A015 replacement). Component shall feature geometry compatible with 28529M42A015 except with modifications/materials as required to meet stress safety factors. Design shall incorporate features to prevent thermal distortion resulting from thermal expansion (interference), residual stress, or uneven heating/cooling.

Core Charging Station (CE-645708 legacy replacement/upgrade). Component shall feature geometry compatible with CE-645708 except with modifications/materials as required to maximize stress safety factors and minimize thermal distortion to the maximum extent possible. Component must be compatible with existing instrumentation (rakes) although new instrumentation covers should be fabricated specifically for the new component. This component must be compatible with existing test nozzles and may be de-rated for lower operating conditions as required to accommodate existing test hardware interface geometry that is unsuitable for high pressure applications.

Seal Retainer and metal seals. Provide metal seals between core adapter and Core/Fan Duct Assembly as required to prevent mixing of the core and bypass flow streams through any possible combination of core and bypass conditions over the following respective ranges:

Core stream: 0 – 200 psig at temperatures ranging between 70 – 1400 deg. F.
Bypass Stream: 0 – 200 psig at temperatures ranging between 70 – 250 deg. F.

Fan Duct Strut Assembly (CE-645706 replacement) & Core Strut Assembly (CE-645686 replacement). Components shall reproduce existing flow lines to the maximum practical extent while meeting new operating condition and Safety Factor requirements.

Core charging Station (CE-645708 upgrade). Component shall feature low noise geometry and reproduce existing flow lines to the maximum practical extent while meeting new operating condition and Safety Factor requirements. Component must be compatible with existing instrumentation (rakes) although new instrumentation covers should be fabricated specifically for the new component. The hardware interface scheme may be upgraded to accommodate high pressure applications.

REVIEWS:

A 90 percent design review shall be accomplished for each component. The 90 percent design for component part shall be accepted by NASA prior to commencing fabrication of that part. Hardware components shall be inspected for dimensional compliance with design specifications. Component dimensions resulting from inspection shall be documented.

SUMMARY OF DELIVERABLES:

Design. Final design results shall be provided electronically in two formats:

1. Print version renderings of each design drawing in PDF file format (electronic files)
2. Solid model rendering of each component in IGES file format

Hardware. Fabricated components shall be provided per the parts list below. Dimensional inspection documentation shall be provided for all components. Contractor shall be responsible for delivery of hardware and any damages that may occur in shipment up to point of acceptance at the GRC receiving dock.

Parts List. Design and hardware shall be provided for the following components (single quantity of each part is required unless otherwise noted):

1. Core Adapter (28529M42A014 upgrade)
2. Core Insulation Liner (28529M42A015 upgrade)
3. New Core charging Station (CE-645708 legacy replacement/upgrade)
4. Seal Retainer and metal seals (between core adapter and Core/Fan Duct Assy)
5. Fan Duct Strut Assembly (CE-645706 upgrade)
6. Core Strut Assembly (CE-645686 upgrade)
7. Core Charging Station (CE-645708 comprehensive upgrade)

NOTE: In response to the RFQ, please reference the attached drawings.

1. MATERIAL: STAINLESS STEEL, TYPE 304 UNLESS OTHERWISE NOTED.
2. 1/25" ALL OVER UNLESS OTHERWISE NOTED.
3. ELECTROCHEMICAL ETCH PART NUMBER 28529M42A015 ON SPECIFIED SURFACE, PER AS478, METHOD 7A (ZONE C5).
4. QUANTITY: ONE REQUIRED.

SECONDING
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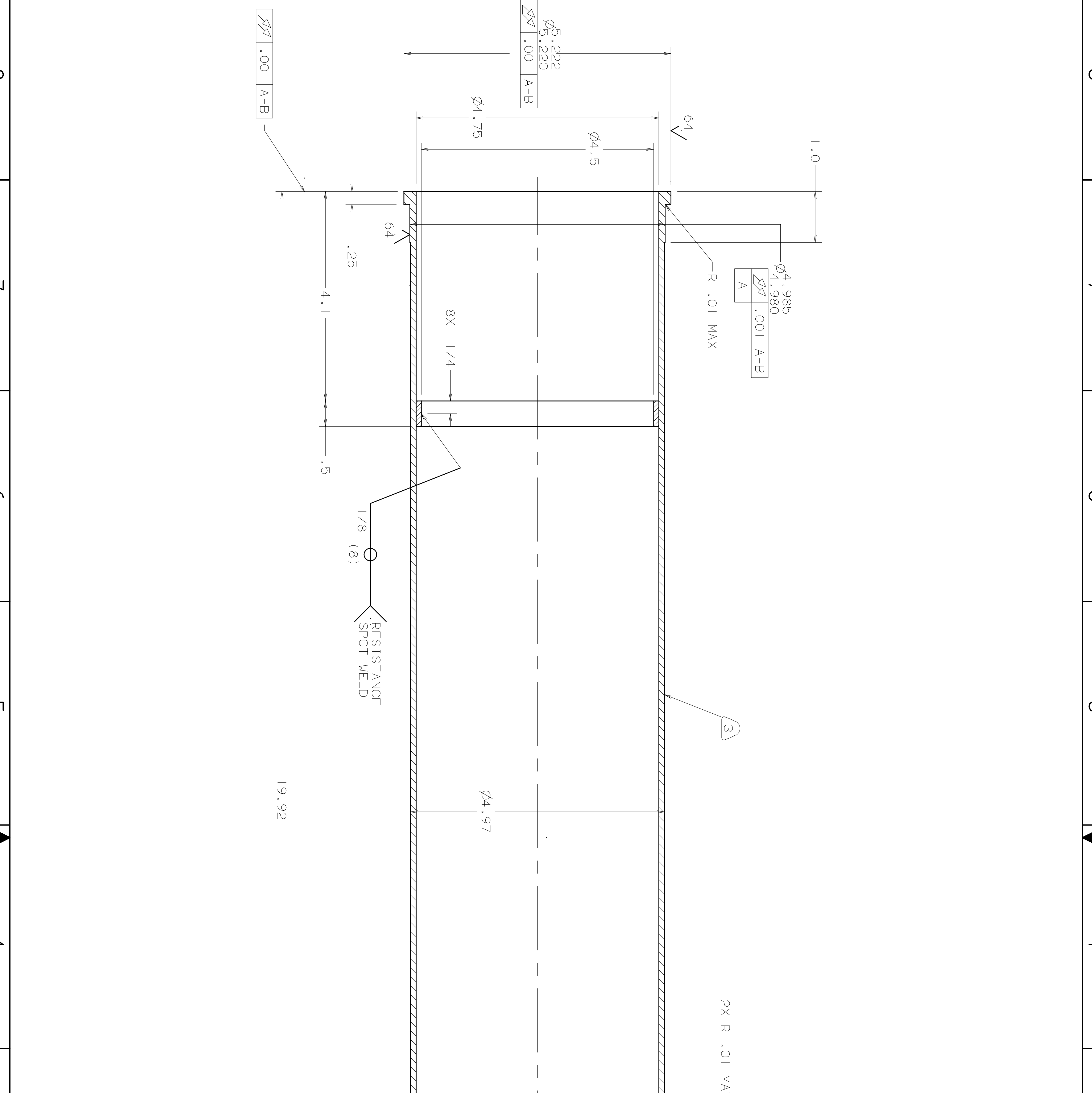
CHG	ZONE	DESCRIPTION	APP/DATE

MSA
 NATIONAL AERONAUTICS AND SPACE
 LEWIS RESEARCH CENTER
 CLEVELAND, OHIO

015 CORE INSULATION LINER
 JER ULTRA HIGH FLOW FAN ASSEMBLY

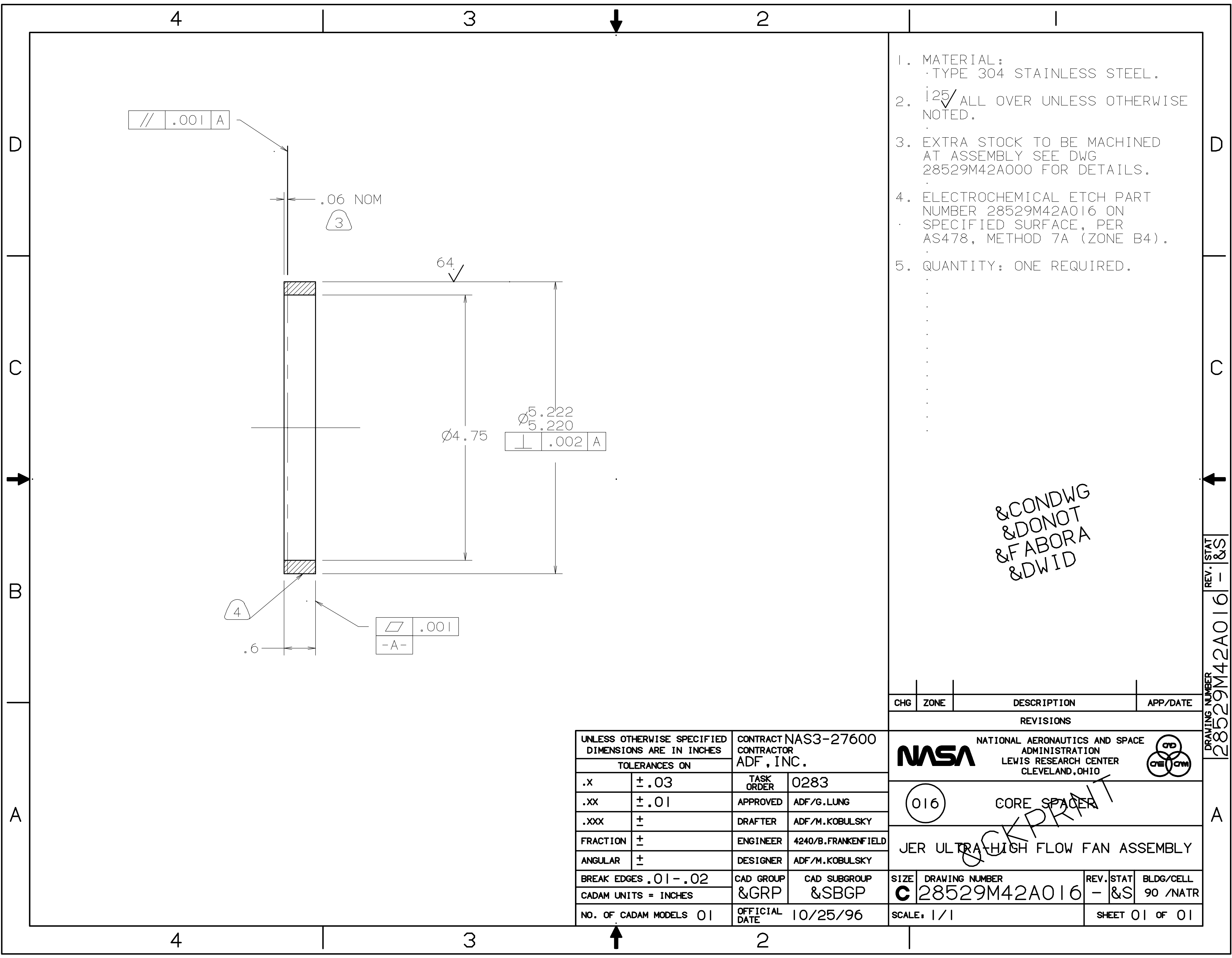
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SCALE: 1/1		SHEET 01 OF 01	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		CONTRACT NAS3-27600	
TOLERANCES ON		CONTRACTOR	
.X	± .03	ORDER	0283
.XX	± .01	APPROVED	ADF/G.LUNG
.XXX	± .005	DRAFTER	ADF/M.KOBLISKY
FRACTION	± 1/16	ENGINEER	4240/B.FRANKENFELD
ANGULAR	± 0° 30'	DESIGNER	ADF/M.KOBLISKY
BREAK EDGES .01-.02		CAD GROUP	
CADAM UNITS = INCHES		&GRP	&SBGP
NO. OF CADAM MODELS 01	OFFICIAL DATE	10/18/96	



8 7 6 5 4 3 2 1

A C D



1. MATERIAL:
TYPE 304 STAINLESS STEEL.
2. $\sqrt{125}$ ALL OVER UNLESS OTHERWISE NOTED.
3. EXTRA STOCK TO BE MACHINED AT ASSEMBLY SEE DWG 28529M42A000 FOR DETAILS.
4. ELECTROCHEMICAL ETCH PART NUMBER 28529M42A016 ON SPECIFIED SURFACE, PER AS478, METHOD 7A (ZONE B4).
5. QUANTITY: ONE REQUIRED.

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CHG	ZONE	DESCRIPTION	APP/DATE
REVISIONS			
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LEWIS RESEARCH CENTER CLEVELAND, OHIO			
(016)		CORE SPACER	
JER ULTRA-HIGH FLOW FAN ASSEMBLY			
SIZE	DRAWING NUMBER	REV. STAT	BLDG/CELL
C	28529M42A016	- &S	90 /NATR
SCALE: 1/1		SHEET 01 OF 01	

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.XX	± .01	APPROVED	ADF/G.LUNG
.XXX	±	DRAFTER	ADF/M.KOBULSKY
FRACTION	±	ENGINEER	4240/B.FRANKENFIELD
ANGULAR	±	DESIGNER	ADF/M.KOBULSKY
BREAK EDGES .01 - .02		CAD GROUP	CAD SUBGROUP
CADAM UNITS = INCHES		&GRP	&SBGP
NO. OF CADAM MODELS 01		OFFICIAL DATE	10/25/96

DRAWING NUMBER 28529M42A016 - &S

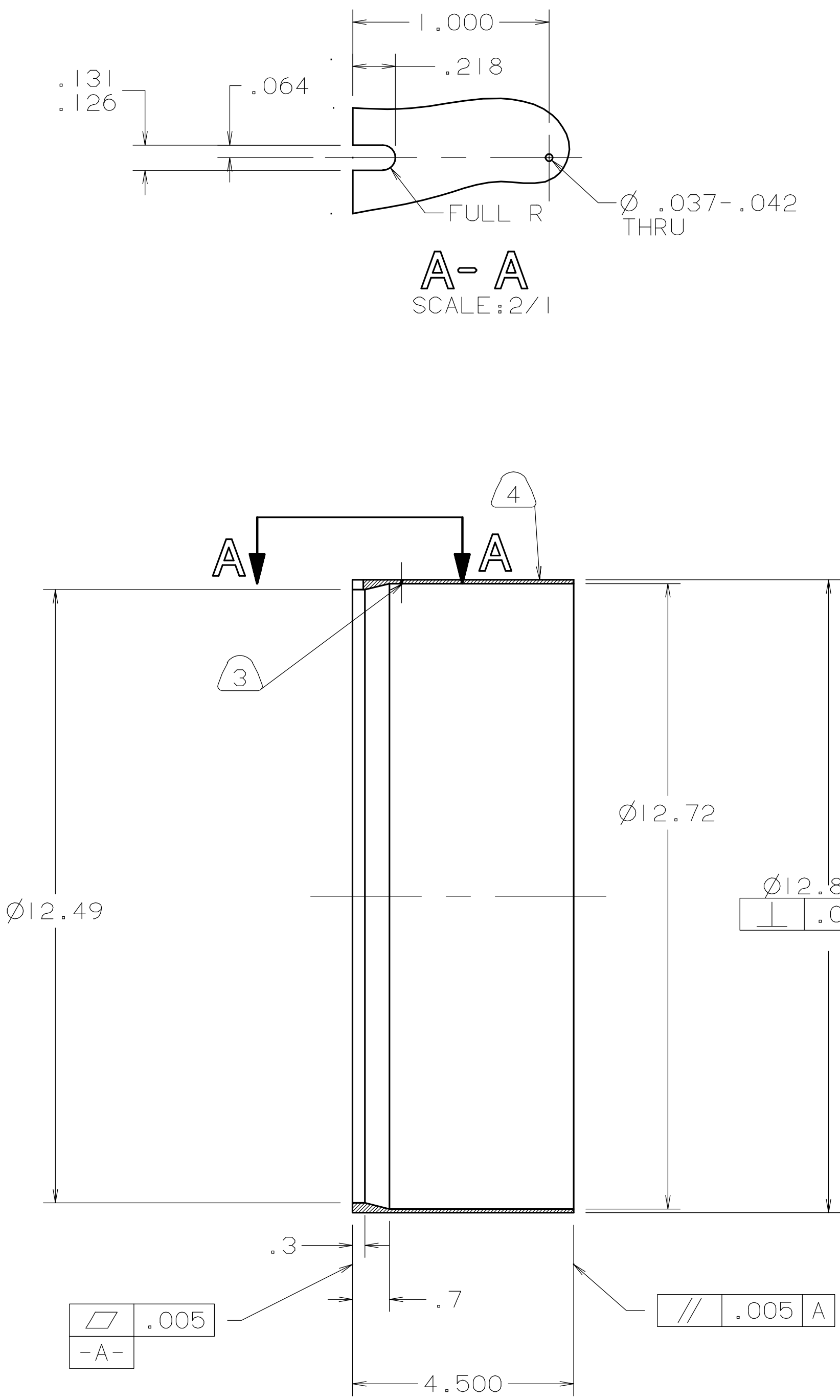
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1. MATERIAL:
TYPE 304 STAINLESS STEEL.
2. $\sqrt{R25}$ ALL OVER.
3. THE HOLE SHALL BE ROUND, FREE OF BURRS, AND THE CORNER SHALL HAVE A SHARP EDGE AS SEEN UNDER 20 TIMES MAGNIFICATION. NO CHAMFER PERMITTED.
4. ELECTROCHEMICAL ETCH PART NUMBER 28529M42A017 ON SPECIFIED SURFACE, PER AS478, METHOD 7A (ZONE C3).
5. QUANTITY: ONE REQUIRED.

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CHG	ZONE	DESCRIPTION	APP/DATE
REVISIONS			
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION LEWIS RESEARCH CENTER CLEVELAND, OHIO			
(017)		FAN SPACER	
JER ULTRA-HIGH FLOW FAN ASSEMBLY			
SIZE	DRAWING NUMBER	REV. STAT	BLDG/CELL
C	28529M42A017	- &S	90 /NATR
SCALE: 1/2		SHEET 01 OF 01	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		CONTRACT NAS3-27600	
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.XX	± .01	APPROVED	ADF/G.LUNG
.XXX	± .005	DRAFTER	ADF/M.KOBULSKY
FRACTION	±	ENGINEER	4240/B.FRANKENFIELD
ANGULAR	±	DESIGNER	ADF/M.KOBULSKY
BREAK EDGES .01 - .02		CAD GROUP	CAD SUBGROUP
CADAM UNITS = INCHES		&GRP	&SBGP
NO. OF CADAM MODELS 01		OFFICIAL DATE	10/25/96



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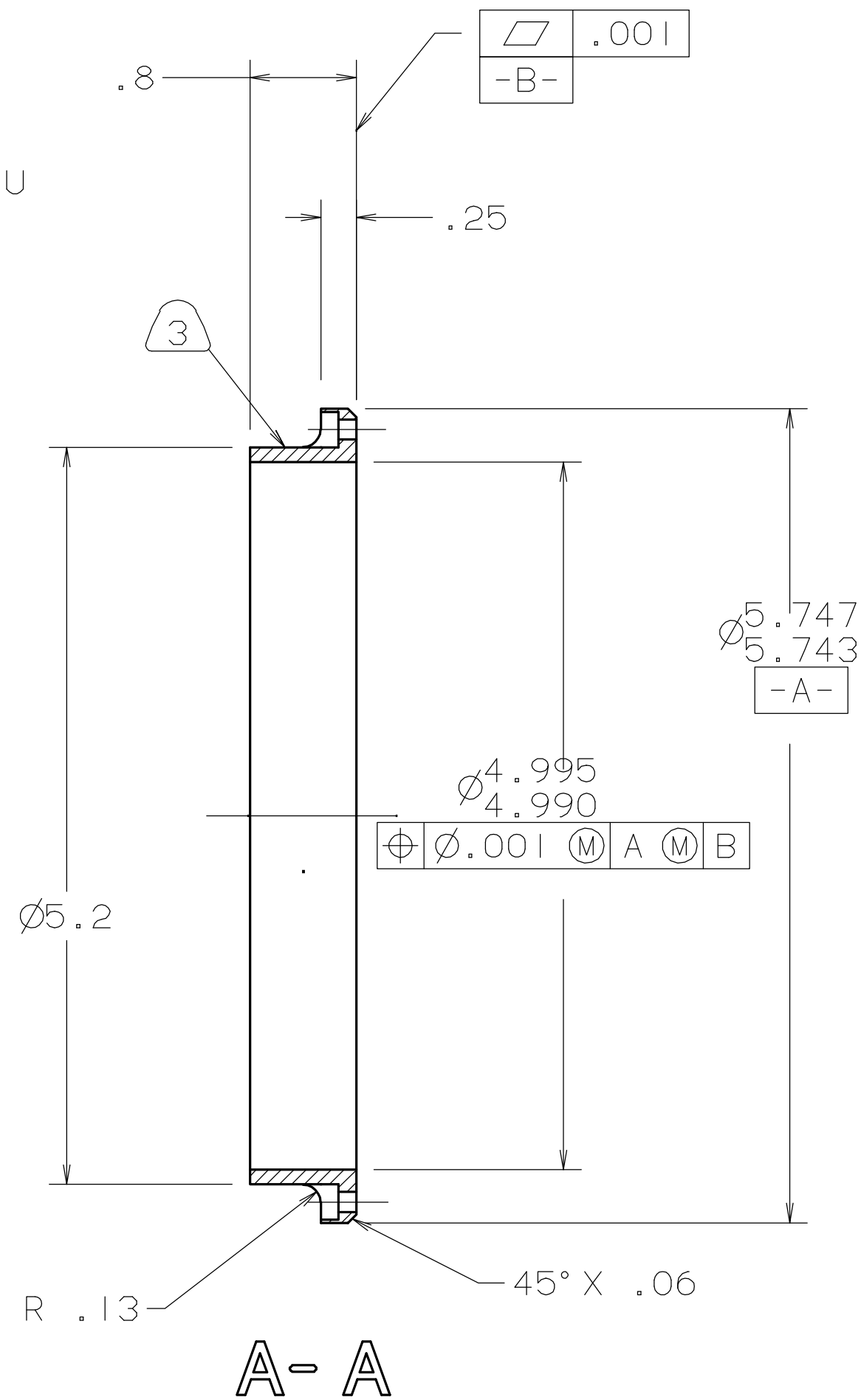
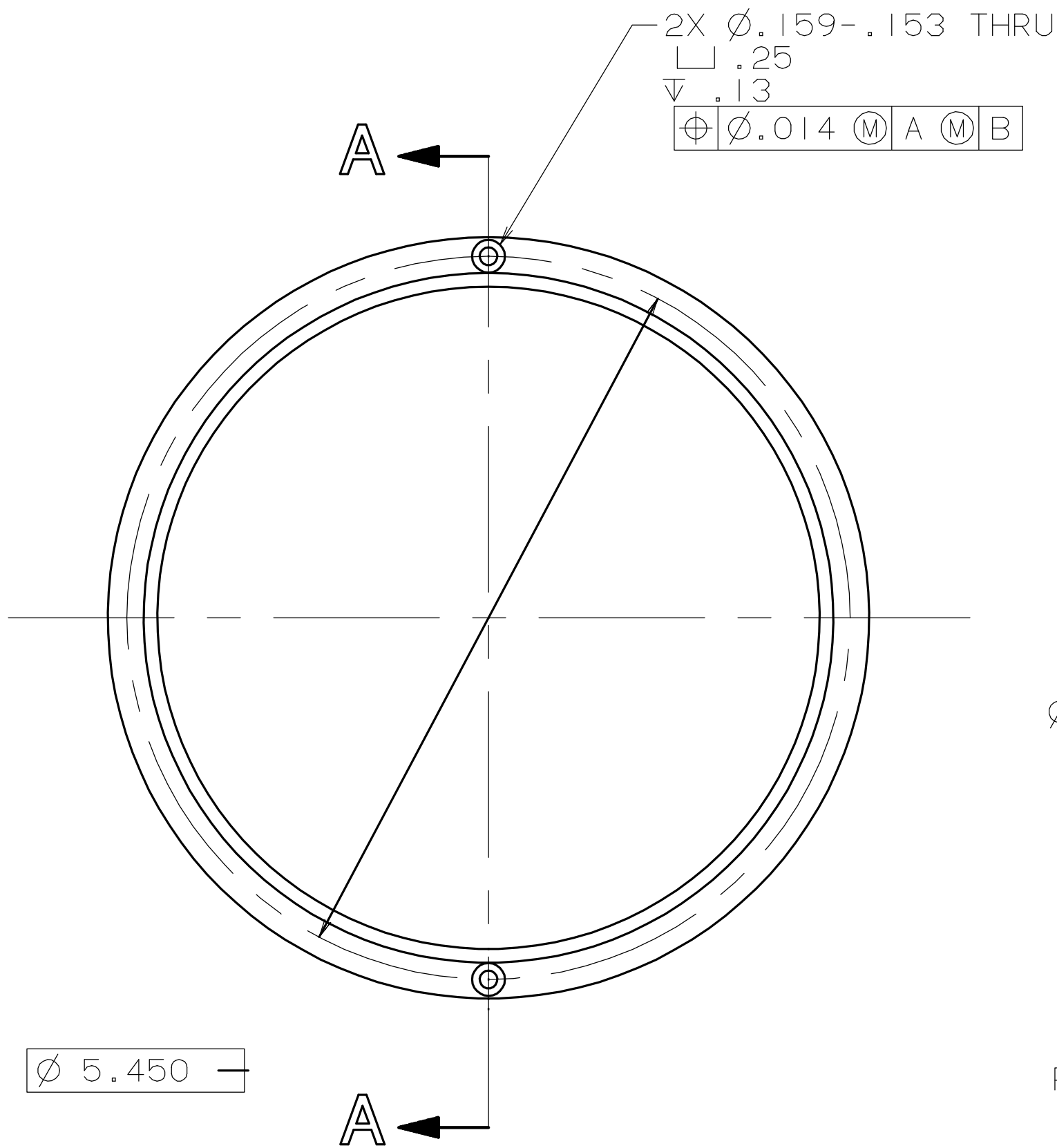
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A

1. MATERIAL:
TYPE 304 STAINLESS STEEL.
2. $\sqrt{125}$ ALL OVER.
3. ELECTROCHEMICAL ETCH PART NUMBER 28529M42A018 ON SPECIFIED SURFACE, PER AS478, METHOD 7A (ZONE C3).
4. QUANTITY: ONE REQUIRED.



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CHG	ZONE	DESCRIPTION	APP/DATE
REVISIONS			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		CONTRACT NAS3-27600	
TOLERANCES ON		CONTRACTOR ADF, INC.	
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.XX	\pm .01	APPROVED	ADF/G.LUNG
.XXX	\pm	DRAFTER	ADF/M.KOBULSKY
FRACTION	\pm	ENGINEER	4240/B.FRANKENFIELD
ANGULAR	\pm 0° 30'	DESIGNER	ADF/M.KOBULSKY
BREAK EDGES	.01 - .02	CAD GROUP	CAD SUBGROUP
CADAM UNITS =	INCHES	&GRP	&SBGP
NO. OF CADAM MODELS	01	OFFICIAL DATE	10/18/96

NASA NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
 LEWIS RESEARCH CENTER
 CLEVELAND, OHIO

(018) GUIDE FOR CORE LINER

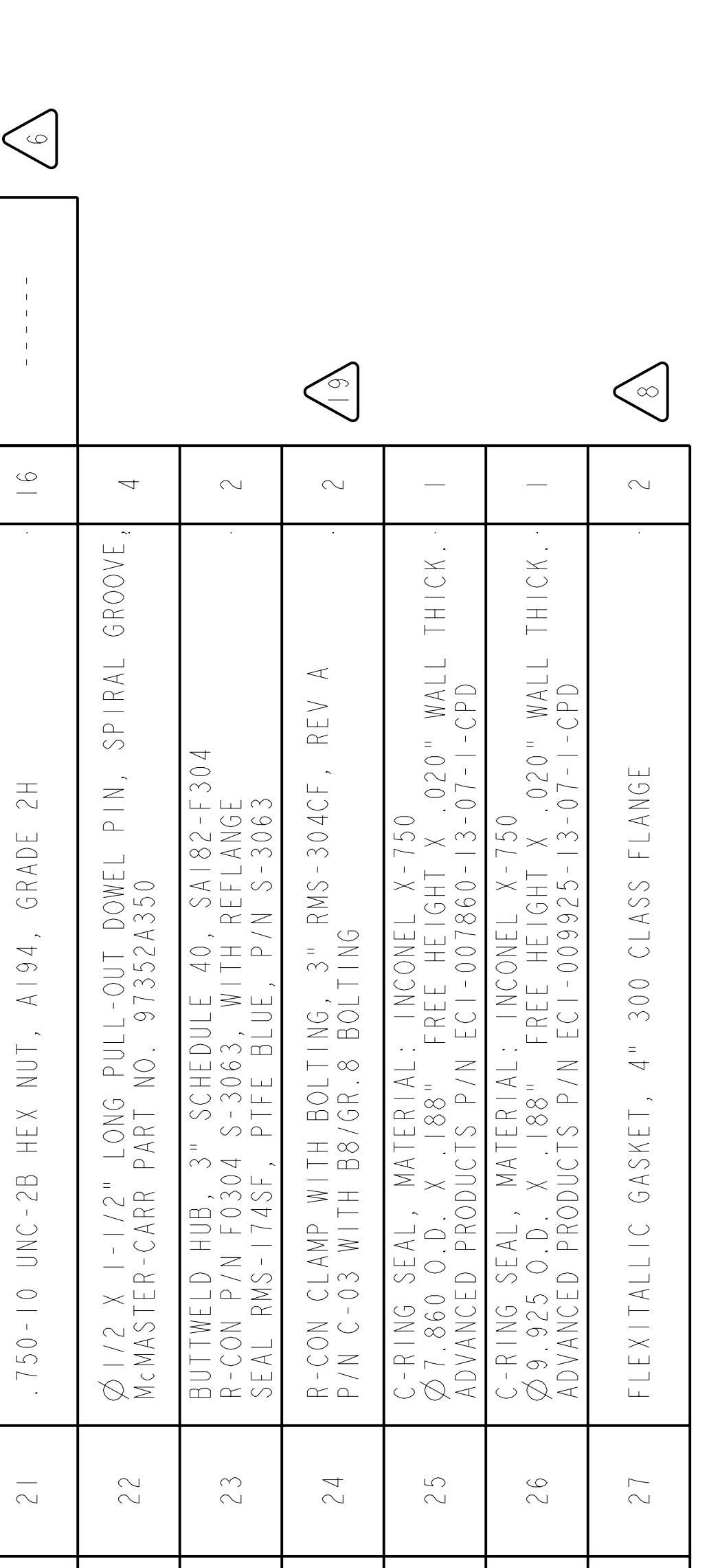
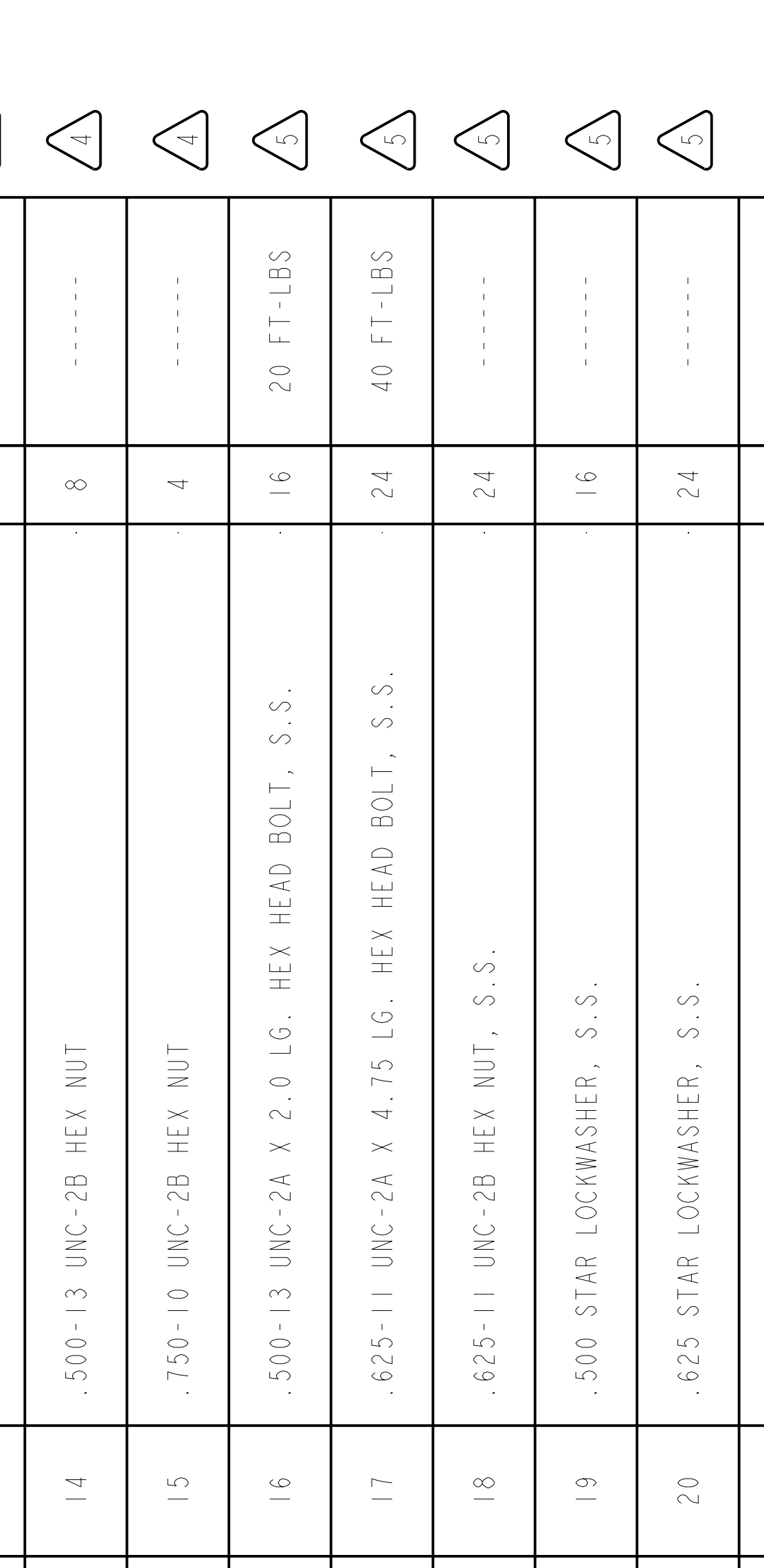
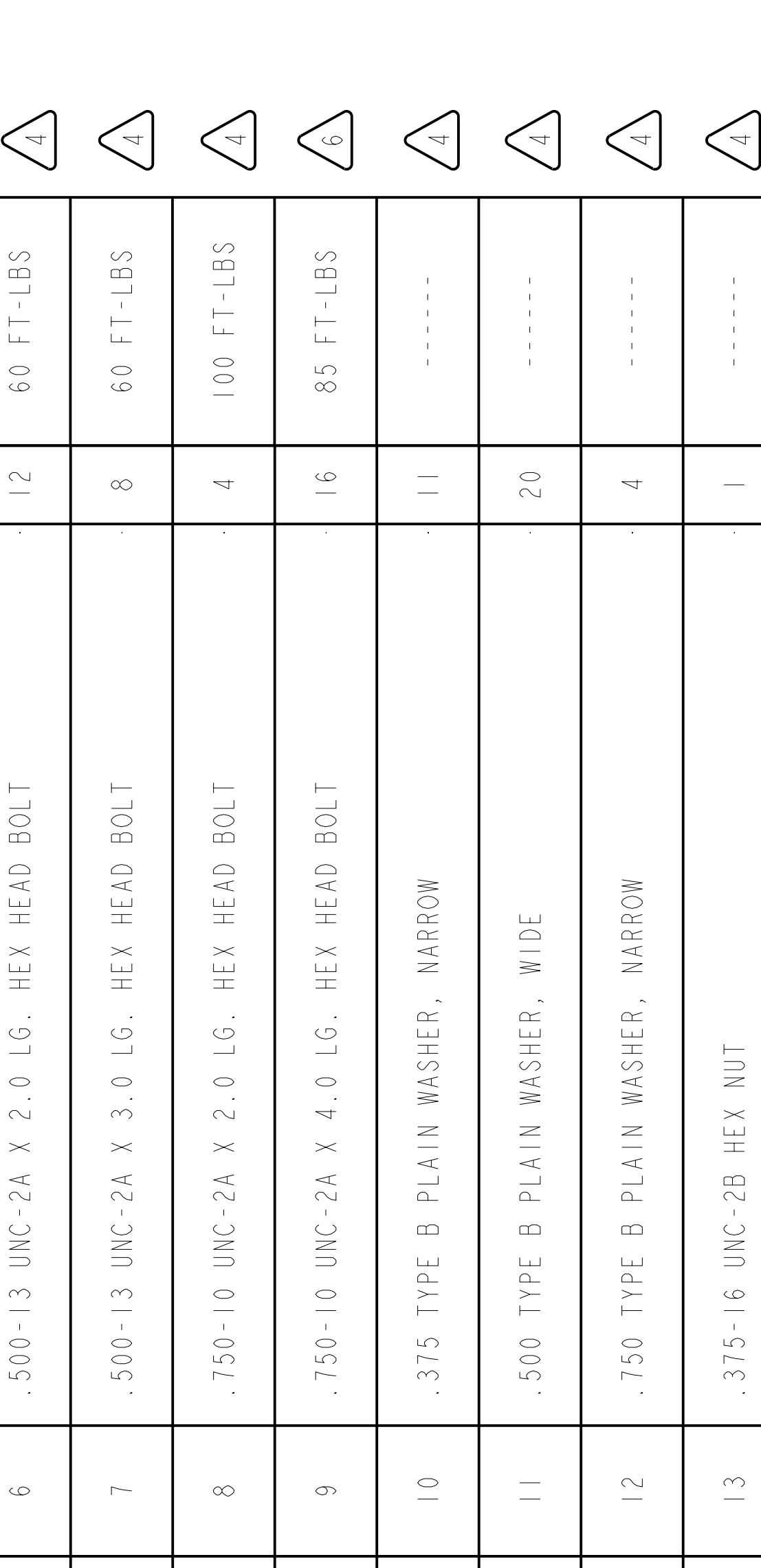
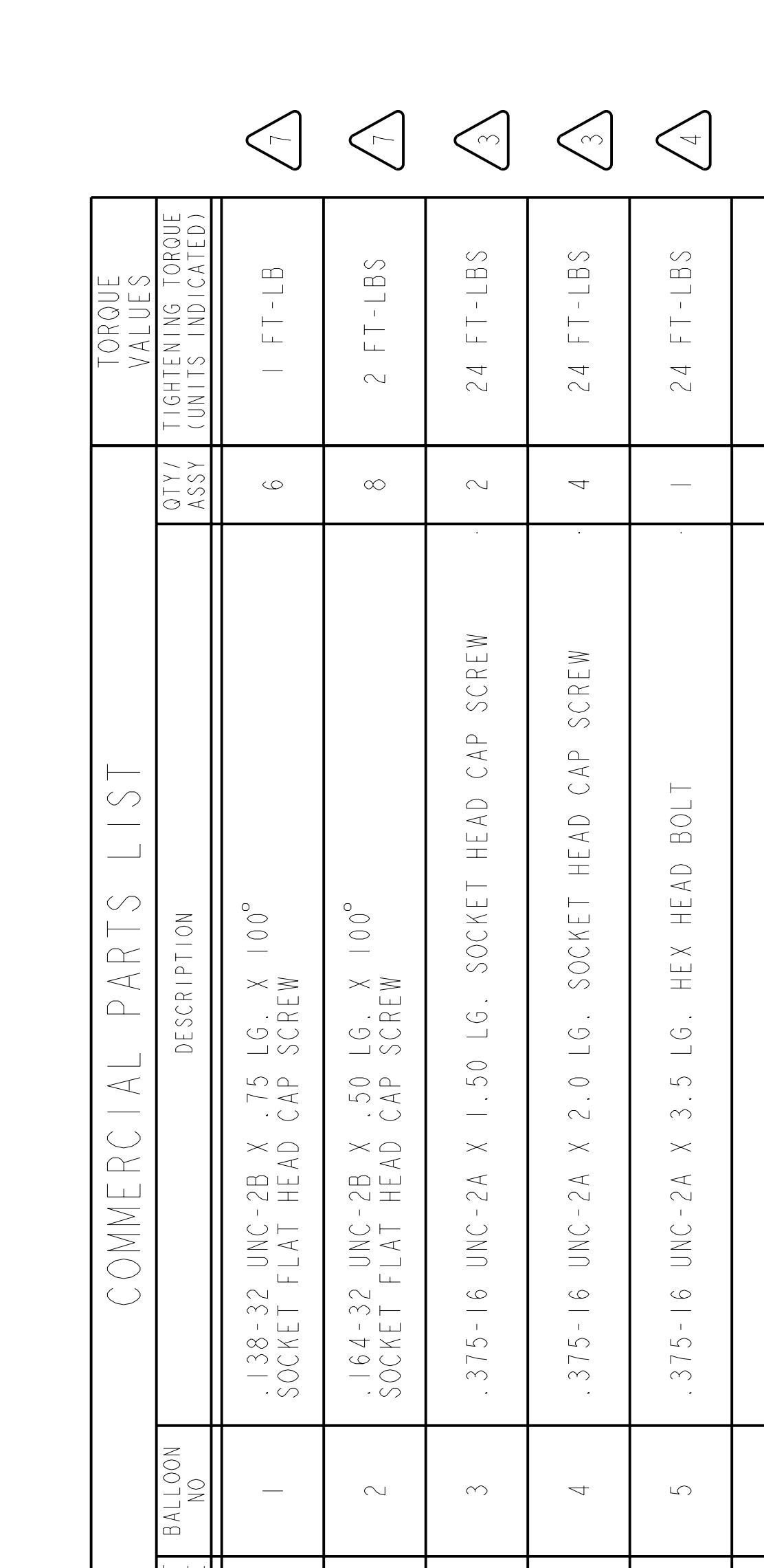
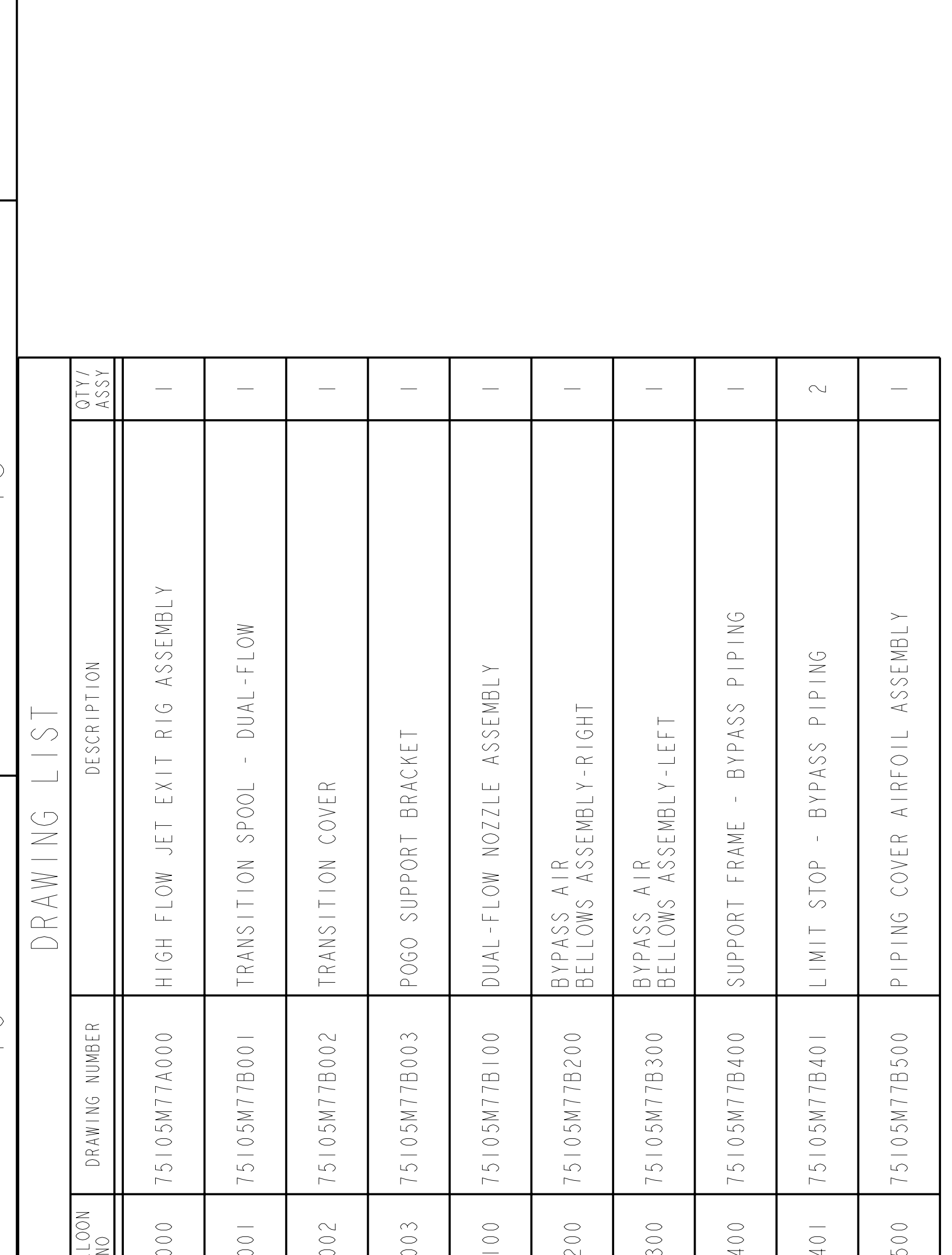
JER ULTRA-HIGH FLOW FAN ASSEMBLY

SIZE	DRAWING NUMBER	REV. STAT	BLDG/CELL
C	28529M42A018	- &S	90 /NATR
SCALE: 1/1		SHEET 01 OF 01	

DRAWING NUMBER 28529M42A018 - &S

BALLOON NO.	DRAWING NUMBER	DESCRIPTION	QTY/ UNIT	UNIT
A000	75105M7B000	HIGH FLOW JET EXIT RIG ASSEMBLY	1	ASSEMBLY
B001	75105M7B001	TRANSITION SPOOL - DUAL-FLOW	1	ASSEMBLY
B002	75105M7B002	TRANSITION COVER	1	COVER
B003	75105M7B003	POOD SUPPORT BRACKET	1	BRACKET
B100	75105M7B100	DUAL-FLOW NOZZLE ASSEMBLY	1	ASSEMBLY
B200	75105M7B200	BYPASS AIR BELLOWS ASSEMBLY-RIGHT	1	ASSEMBLY
B300	75105M7B300	BYPASS AIR BELLOWS ASSEMBLY-LEFT	1	ASSEMBLY
B400	75105M7B400	SUPPORT FRAME - BYPASS PIPING	1	FRAME
B401	75105M7B401	LIMIT STOP - BYPASS PIPING	2	STOP
B500	75105M7B500	PIPING COVER AIRFOIL ASSEMBLY	1	ASSEMBLY

PART/BALLOON NO.	COMMERCIAL PARTS LIST	VALUES
C 1	.188-32 UNC-2B X .75 LG. X 100° SOCKET FLAT HEAD CAP SCREW	6 1 FT-LB
C 2	.188-32 UNC-2B X .50 LG. X 100° SOCKET FLAT HEAD CAP SCREW	8 2 FT-LBS
C 3	.315-16 UNC-2A X 1.50 LG. SOCKET HEAD CAP SCREW	2 24 FT-LBS
C 4	.375-16 UNC-2A X 2.0 LG. SOCKET HEAD CAP SCREW	4 24 FT-LBS
C 5	.375-16 UNC-2A X 3.5 LG. HEX HEAD BOLT	1 24 FT-LBS
C 6	.500-13 UNC-2A X 2.0 LG. HEX HEAD BOLT	12 60 FT-LBS
C 7	.500-13 UNC-2A X 3.0 LG. HEX HEAD BOLT	8 60 FT-LBS
C 8	.750-10 UNC-2A X 2.0 LG. HEX HEAD BOLT	4 100 FT-LBS
C 9	.750-10 UNC-2A X 4.0 LG. HEX HEAD BOLT	16 85 FT-LBS
C 10	.375 TYPE B PLAIN WASHER, NARROW	11
C 11	.500 TYPE B PLAIN WASHER, WIDE	20
C 12	.750 TYPE B PLAIN WASHER, NARROW	4
C 13	.375-16 UNC-2B HEX NUT	1
C 14	.500-13 UNC-2B HEX NUT	8
C 15	.750-10 UNC-2B HEX NUT	4
C 16	.500-13 UNC-2A X 2.0 LG. HEX HEAD BOLT, S.S.	16 20 FT-LBS
C 17	.625-11 UNC-2A X 4.75 LG. HEX HEAD BOLT, S.S.	24 40 FT-LBS
C 18	.625-11 UNC-2B HEX NUT, S.S.	24
C 19	.500 STAR LOCKWASHER, S.S.	16
C 20	.625 STAR LOCKWASHER, S.S.	24
C 21	.750-10 UNC-2B HEX NUT, A194, GRADE 2H	16
C 22	.750-10 UNC-2B HEX NUT, 304 STAINLESS STEEL	4
C 23	BUTTERFLY VALVE, 3" NPT, 304 STAINLESS STEEL	1
C 24	R-COM CLAMP WITH BOLTING, 3" RMS 304ST-REV A	2
C 25	C-RING SEAL, MATERIAL: INCOREL X-750, .009" WALL THICK.	1
C 26	C-RING SEAL, MATERIAL: INCOREL X-750, .020" WALL THICK.	1
C 27	ADVANCED PRODUCTS PAN LECT-00780-13-071-1-070	2



17. HYDROSTATICALLY PRESSURE TEST THE NEW BELLOWS TO 330 PSIG WITH CLEAN WATER FOR ONE HALF HOUR WITH NO TEST SHALL CONFORM TO THE LATEST REVISION OF THE PROCESS PIPING CODE SUPPORTED TOURING THE HYDRO TEST OR PARALLEL TO THE BELLOWS OCCUR PARTS 4200, A380 & A400 AND ALL BOLTING PARTS 4200, A380 & A400. ENGINEERING'S DATE: 3/2/95.

10. TO BE REMOVED FOR 100 TO 1000 PSI AT 120 PSIG MAX. 1. NOZZLE DESIGN PRESSURE IS 20 PSIG. 2. BELLOWS SHIPPING BRACE (75105M7B201) WAS SPECIFIED AND PURCHASED FROM DOW. 75105M7B101.

1. FOR PARTS SHOWN IN PHANTOM, SEE DRAWING 75105M7A000.

2. OPERATING CONDITIONS:

ALLISON ANALYST NOZZLE AS SHOWN ON ROZZLE WAS DESIGNED TO 20 PSIG AT 1200 RPM. PLEASE REFER TO THE CHOME ENGINEERING'S DATE: 3/2/95.

3. CASE FROM PACKAGE COMBUSTION AIR. 4. 4 LEWIS AT 1100 DEG. 5. 120 PSIG MAX. 1. NOZZLE DESIGN PRESSURE IS 20 PSIG. 2. BELLOWS SHIPPING BRACE (75105M7B201) WAS SPECIFIED AND PURCHASED FROM DOW. 75105M7B101.

8. BYPASS FLOW AS SHOWN AT 200 DEG. F. 9. 175 PSIG MAXIMUM PRESSURE UPSTREAM OF THE MICRO-HOLE DRILLED GROOVE DOWNSTREAM OF GROOVE PLATES. 20 PSIG (MAX.) NOZZLE DESIGN PRESSURE PER THE MANUFACTURER'S VASEL STRESS REPORT AT 200 DEG. F.

10. STAINLESS STEEL BOLTS SHALL BE HEX HEAD CAP SCREWS, TYPE 304 STAINLESS STEEL PER ASTM A194, GRADE 2H.

11. STAINLESS STEEL BOLTS SHALL BE HEX HEAD NUTS, TYPE 304 STAINLESS STEEL PER ASTM A194, GRADE 2H.

12. 100° FLAT HEAD SOCKET CAP SCREWS SHALL BE PER ANSI/ASME B18.6.3. ALLOY STEEL, BLACK OXIDE FINISHED.

13. FLEXITALLIC GASKETS SHALL BE SPECIFIED PER ANSI/ASME B18.6.3. ALLOY STEEL, BLACK OXIDE FINISHED.

14. LEAKAGE TEST REPORTS (CMR/CS) SHALL BE PROVIDED FOR ALL WELDS USED IN THE FABRICATION OF THIS ASSEMBLY.

15. PIPE SHALL BE WELDED OR SEAMLESS PER ASME B31.3 OR B31.1. WELDS SHALL BE PER ASME B31.3 OR B31.1. WELDS SHALL BE PER ASME B31.3 OR B31.1. WELDS SHALL BE PER ASME B31.3 OR B31.1.

16. INSPECTION SHALL BE FOR NORMAL FLUID SERVICE PER THE ACCEPTANCE CRITERIA SPECIFIED IN TABLE 341-3.2 OF ASME B31.3. ALL WELDS SHALL BE 100% LIQUID PENETRANT INSPECTED. ONE WELD SHALL BE RADIOGRAPHED.

1. FOR PARTS SHOWN IN PHANTOM, SEE DRAWING 75105M7A000.

2. OPERATING CONDITIONS:

ALLISON ANALYST NOZZLE AS SHOWN ON ROZZLE WAS DESIGNED TO 20 PSIG AT 1200 RPM. PLEASE REFER TO THE CHOME ENGINEERING'S DATE: 3/2/95.

3. CASE FROM PACKAGE COMBUSTION AIR. 4. 4 LEWIS AT 1100 DEG. 5. 120 PSIG MAX. 1. NOZZLE DESIGN PRESSURE IS 20 PSIG. 2. BELLOWS SHIPPING BRACE (75105M7B201) WAS SPECIFIED AND PURCHASED FROM DOW. 75105M7B101.

8. BYPASS FLOW AS SHOWN AT 200 DEG. F. 9. 175 PSIG MAXIMUM PRESSURE UPSTREAM OF THE MICRO-HOLE DRILLED GROOVE DOWNSTREAM OF GROOVE PLATES. 20 PSIG (MAX.) NOZZLE DESIGN PRESSURE PER THE MANUFACTURER'S VASEL STRESS REPORT AT 200 DEG. F.

10. STAINLESS STEEL BOLTS SHALL BE HEX HEAD CAP SCREWS, TYPE 304 STAINLESS STEEL PER ASTM A194, GRADE 2H.

11. STAINLESS STEEL BOLTS SHALL BE HEX HEAD NUTS, TYPE 304 STAINLESS STEEL PER ASTM A194, GRADE 2H.

12. 100° FLAT HEAD SOCKET CAP SCREWS SHALL BE PER ANSI/ASME B18.6.3. ALLOY STEEL, BLACK OXIDE FINISHED.

13. FLEXITALLIC GASKETS SHALL BE SPECIFIED PER ANSI/ASME B18.6.3. ALLOY STEEL, BLACK OXIDE FINISHED.

14. LEAKAGE TEST REPORTS (CMR/CS) SHALL BE PROVIDED FOR ALL WELDS USED IN THE FABRICATION OF THIS ASSEMBLY.

15. PIPE SHALL BE WELDED OR SEAMLESS PER ASME B31.3 OR B31.1. WELDS SHALL BE PER ASME B31.3 OR B31.1. WELDS SHALL BE PER ASME B31.3 OR B31.1.

16. INSPECTION SHALL BE FOR NORMAL FLUID SERVICE PER THE ACCEPTANCE CRITERIA SPECIFIED IN TABLE 341-3.2 OF ASME B31.3. ALL WELDS SHALL BE 100% LIQUID PENETRANT INSPECTED. ONE WELD SHALL BE RADIOGRAPHED.

1. FOR PARTS SHOWN IN PHANTOM, SEE DRAWING 75105M7A000.

2. OPERATING CONDITIONS:

ALLISON ANALYST NOZZLE AS SHOWN ON ROZZLE WAS DESIGNED TO 20 PSIG AT 1200 RPM. PLEASE REFER TO THE CHOME ENGINEERING'S DATE: 3/2/95.

3. CASE FROM PACKAGE COMBUSTION AIR. 4. 4 LEWIS AT 1100 DEG. 5. 120 PSIG MAX. 1. NOZZLE DESIGN PRESSURE IS 20 PSIG. 2. BELLOWS SHIPPING BRACE (75105M7B201) WAS SPECIFIED AND PURCHASED FROM DOW. 75105M7B101.

8. BYPASS FLOW AS SHOWN AT 200 DEG. F. 9. 175 PSIG MAXIMUM PRESSURE UPSTREAM OF THE MICRO-HOLE DRILLED GROOVE DOWNSTREAM OF GROOVE PLATES. 20 PSIG (MAX.) NOZZLE DESIGN PRESSURE PER THE MANUFACTURER'S VASEL STRESS REPORT AT 200 DEG. F.

10. STAINLESS STEEL BOLTS SHALL BE HEX HEAD CAP SCREWS, TYPE 304 STAINLESS STEEL PER ASTM A194, GRADE 2H.

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12. 100° FLAT HEAD SOCKET CAP SCREWS SHALL BE PER ANSI/ASME B18.6.3. ALLOY STEEL, BLACK OXIDE FINISHED.

13. FLEXITALLIC GASKETS SHALL BE SPECIFIED PER ANSI/ASME B18.6.3. ALLOY STEEL, BLACK OXIDE FINISHED.

14. LEAKAGE TEST REPORTS (CMR/CS) SHALL BE PROVIDED FOR ALL WELDS USED IN THE FABRICATION OF THIS ASSEMBLY.

15. PIPE SHALL BE WELDED OR SEAMLESS PER ASME B31.3 OR B31.1. WELDS SHALL BE PER ASME B31.3 OR B31.1. WELDS SHALL BE PER ASME B31.3 OR B31.1.

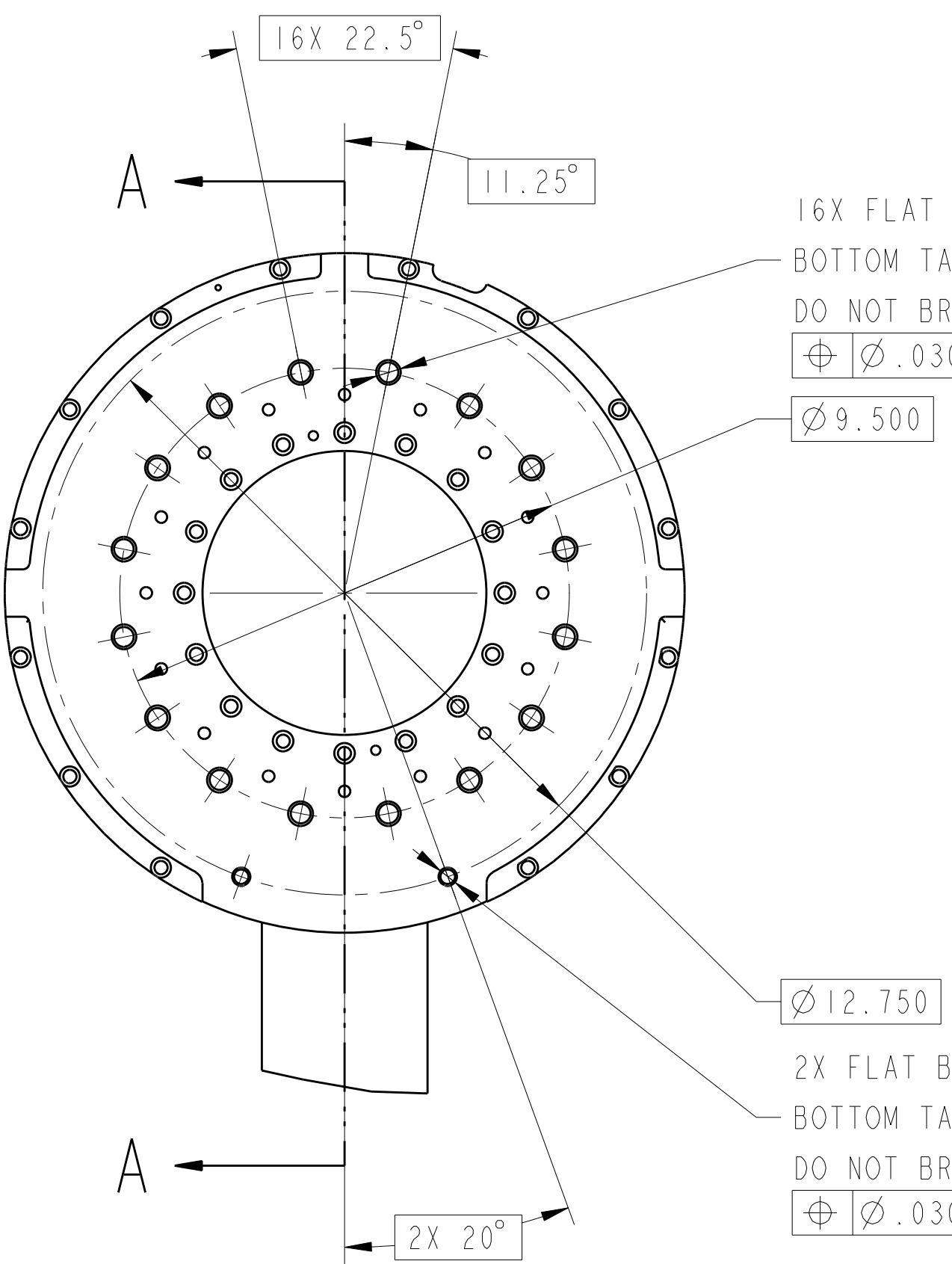
16. INSPECTION SHALL BE FOR NORMAL FLUID SERVICE PER THE ACCEPTANCE CRITERIA SPECIFIED IN TABLE 341-3.2 OF ASME B31.3. ALL WELDS SHALL BE 100% LIQUID PENETRANT INSPECTED. ONE WELD SHALL BE RADIOGRAPHED.

EXISTING PARTS LIST

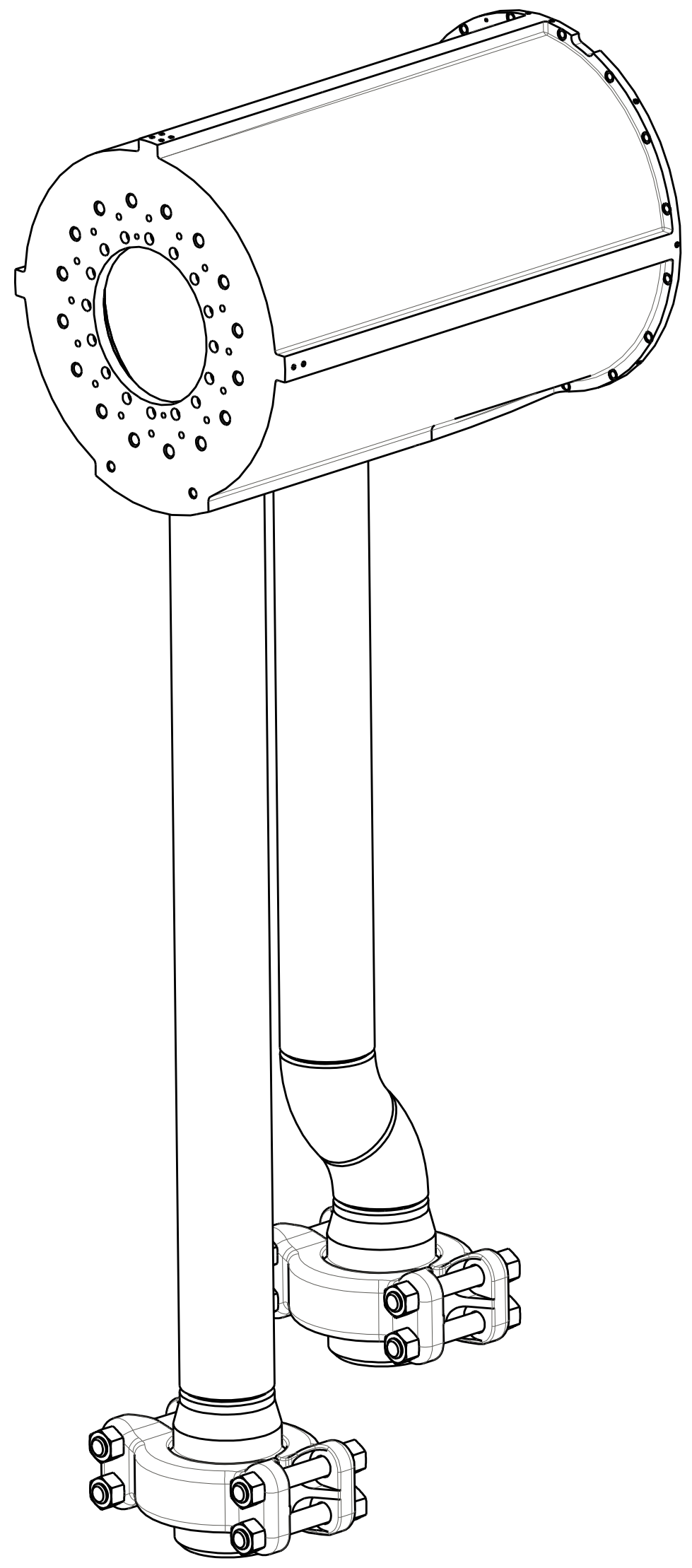
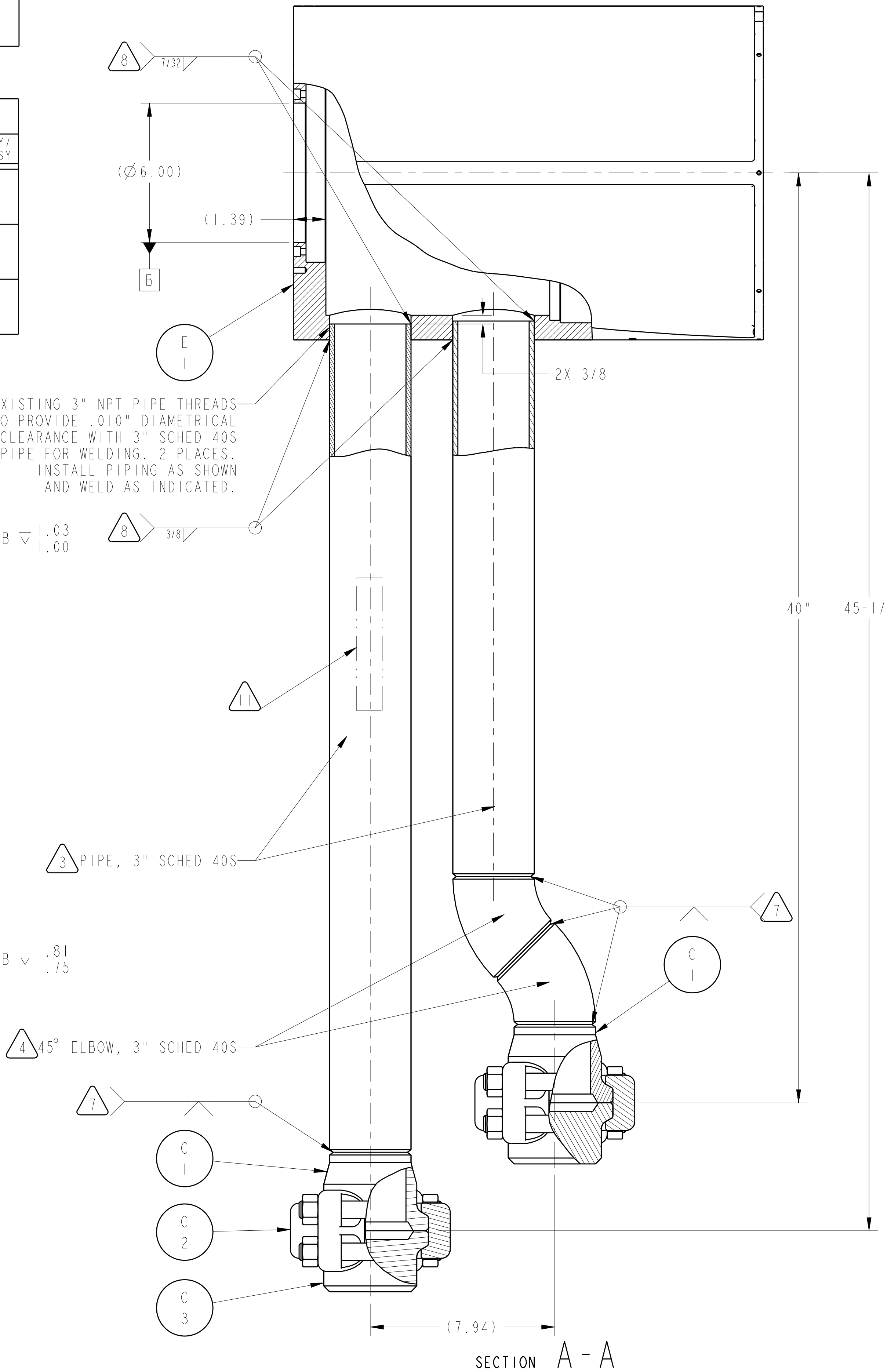
PART TYPE	BALLOON NO	DRAWING NUMBER	DESCRIPTION	QTY/ ASSY
E	1	28529M42A013	FAN ADAPTOR	1

COMMERCIAL PARTS LIST

PART TYPE	BALLOON NO	DESCRIPTION	QTY/ ASSY
C	1	BUTT WELD HUB, 3" SCHEDULE 40, SAI82-F304 R-CON P/N F0304 S-3063, WITH REFLANGE SEAL RMS-174SF, PTFE BLUE, P/N S-3063	2
C	2	R-CON CLAMP WITH BOLTING, 3" RMS-304CF, REV A P/N C-03 WITH B8/GR.8 BOLTING	2
C	3	BLIND HUB, 3" , CARBON STEEL, ASTM A105 R-CON P/N B03 S-3063	2



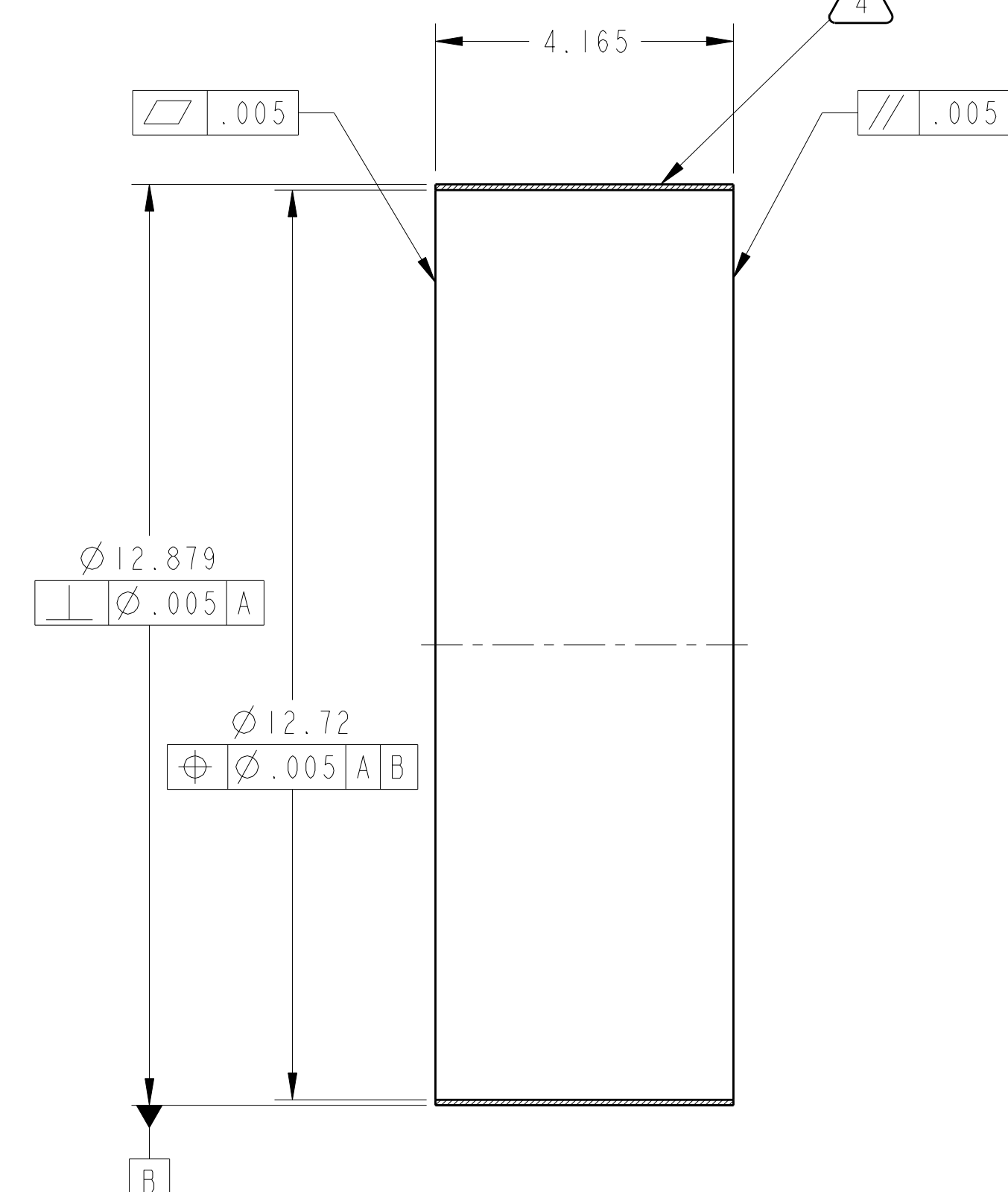
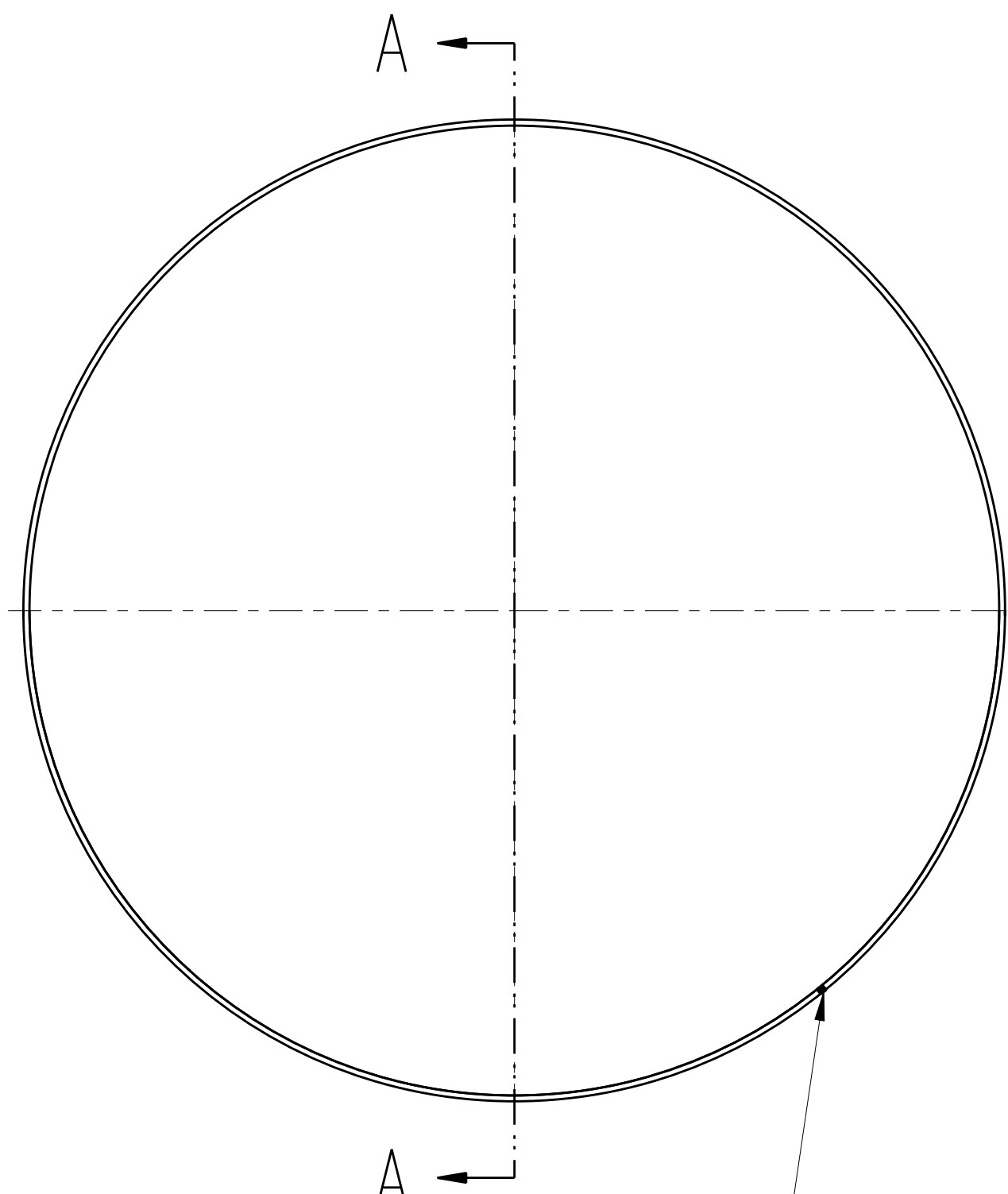
MACHINE EXISTING 3" NPT PIPE THREADS IN PART E-1 TO PROVIDE .010" DIAMETRICAL CLEARANCE WITH 3" SCHED 40S PIPE FOR WELDING. 2 PLACES. INSTALL PIPING AS SHOWN AND WELD AS INDICATED.



- DESIGN CONDITIONS:
INTERNAL AIR PASSAGE: 175 PSIG AT A MAXIMUM METAL TEMPERATURE OF 200° F.
- THIS HARDWARE SHALL BE FABRICATED PER THE REQUIREMENTS OF ASME B31.3 PROCESS PIPING CODE. THE FABRICATING CONTRACTOR SHALL BE CERTIFIED PER THIS CODE.
- PIPE SHALL BE WELDED OR SEAMLESS SCHEDULE 40S, TYPE 304 STAINLESS STEEL PER ASTM A249, TP304.
- ELBOWS SHALL BE AS INDICATED, SCHEDULE 40S, PER ASME B16.9, 304 STAINLESS STEEL PER ASTM A403, GRADE WP 304.
- CERTIFIED MATERIAL TEST REPORTS (CMTR'S) ARE REQUIRED FOR ALL MATERIALS USED IN THE FABRICATION OF THIS HARDWARE.
- 125 RA ALL MACHINED SURFACES.
- ALL WELDS SPECIFIED TO BE FULL PENETRATION UNLESS OTHERWISE NOTED. ALL ROOT PASS WELDS SHALL BE GTAW. ALL SUBSEQUENT PASSES MAY BE COMPLETED BY ANY CONVENTIONAL METAL-ARC PROCESS.
- TAKE PRECAUTION DURING WELDING TO PREVENT DISTORTION OF EXISTING HARDWARE.
- INSPECTION SHALL BE FOR NORMAL FLUID SERVICE AS PER THE ACCEPTANCE CRITERIA SPECIFIED IN TABLE 341.3.2 OF ASME B31.3. ALL WELDS SHALL BE 100% VISUALLY INSPECTED. ALL PIPE WELDS SHALL BE 100% LIQUID PENETRANT INSPECTED. ONE CIRCUMFERENTIAL BUTT WELD SHALL BE RADIOGRAPHED.
- HYDROSTATICALLY PRESSURE CHECK TO 275 PSIG WITH CLEAN WATER FOR ONE HALF HOUR WITH NO LEAKAGE OR LOSS OF PRESSURE. THE HYDRO TEST SHALL CONFORM TO THE LATEST REVISION OF THE PROCESS PIPING CODE B31.3.
- PAINT DRAWING NUMBER 75105M77B101 IN BLACK LETTERS ON SPECIFIED SURFACE PER SAE AS478, METHOD 32.

CHG	ZONE	DESCRIPTION	APP/DATE
REVISIONS			
CONTRACT NAS3-00145		NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	
CONTRACTOR ZIN TECHNOLOGIES		JOHN H. GLENN RESEARCH CENTER	
TASK ORDER 0064		LEWIS FIELD	
DRAFTER ZIN/C. GRIFFITHS		CLEVELAND, OHIO	
ENGINEER 7730/B. BUEHRLE		DUAL-FLOW NOZZLE ASSEMBLY	
DESIGNER ZIN/C. GRIFFITHS		75105M77B100	
DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994		B101 PIPING ASSEMBLY - FAN ADAPTER	
PDM REL LEVEL: RELEASE PDM REVISION: x.4+		SIZE D	DRAWING NUMBER 75105M77B101
PDM DATABASE: HFJER		SCALE: 33/100	INITIAL REL DATE: 4/30/02
MODEL NAME: 75105M77B101_FAN_ADAP_PIPE_ASSY		SHEET 1 OF 1	DISCIPLINE MECHANICAL
CHECK FOR ANY OUTSTANDING ECO'S PRIOR TO USE			

SIZE DRAWING NUMBER D 75105M77B101



1. MATERIAL: TYPE 316N STAINLESS STEEL, PER ASTM SA-240.
2. 125 Ra ALL MACHINED SURFACES.
3. ALL WELDS TO BE FULL PENETRATION UNLESS OTHERWISE NOTED. ALL ROOT PASS WELDS SHALL BE GTAW. ALL SUBSEQUENT PASSES MAY BE COMPLETED BY ANY CONVENTIONAL METAL-ARC PROCESS.
4. ELECTROCHEMICAL ETCH DRAWING PART NUMBER 75105M77B104 ON SPECIFIED SURFACE PER SAE AS478, METHOD 7A, (ZONE D2).
5. DIMENSIONS APPLY WHEN THE PART IS IN THE CONSTRAINED CONDITION.

LONGITUDINAL SEAM WELD LOCATION AND NUMBER OPTIONAL ONE PIECE CONSTRUCTION OPTIONAL

SECTION A - A

PRIOR TO USE VERIFY THE INTENDED PURPOSE IN PDM ("FOR" ATTRIBUTE)		CHG	ZONE	DESCRIPTION	APP/DATE																																																																																																												
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		<table border="1"> <tr> <th colspan="6">REVISIONS</th> </tr> <tr> <td colspan="2">CONTRACT</td> <td colspan="4">NAS3-00145</td> </tr> <tr> <td colspan="2">CONTRACTOR</td> <td colspan="4">ZIN TECHNOLOGIES</td> </tr> <tr> <td colspan="2">TASK ORDER</td> <td colspan="4">0064</td> </tr> <tr> <td colspan="2">DRAWER</td> <td colspan="4">ZIN/C. GRIFFITHS</td> </tr> <tr> <td colspan="2">ENGINEER</td> <td colspan="4">7740/P. TRIMARCHI</td> </tr> <tr> <td colspan="2">DESIGNER</td> <td colspan="4">ZIN/C. GRIFFITHS</td> </tr> <tr> <td colspan="2">TOLERANCE ON</td> <td colspan="4"></td> </tr> <tr> <td>.X</td> <td>±</td> <td colspan="4"></td> </tr> <tr> <td>.XX</td> <td>± 0.01</td> <td colspan="4"></td> </tr> <tr> <td>.XXX</td> <td>± 0.005</td> <td colspan="4"></td> </tr> <tr> <td>FRACTION</td> <td>± -</td> <td colspan="4"></td> </tr> <tr> <td>ANGULAR</td> <td>± 0.50°</td> <td colspan="4"></td> </tr> <tr> <td>BREAK EDGES</td> <td>.01-.02</td> <td colspan="4"></td> </tr> <tr> <td colspan="2">PDM REL LEVEL: RELEASE</td> <td colspan="4">PDM REVISION: x.4</td> </tr> <tr> <td colspan="2">PDM DATABASE: HFJER</td> <td colspan="4"></td> </tr> <tr> <td colspan="2">MODEL NAME: 75105M77B104_OUTSIDE_SPACER</td> <td colspan="4"></td> </tr> <tr> <td colspan="6">CHECK FOR ANY OUTSTANDING ECO'S PRIOR TO USE</td> </tr> </table>				REVISIONS						CONTRACT		NAS3-00145				CONTRACTOR		ZIN TECHNOLOGIES				TASK ORDER		0064				DRAWER		ZIN/C. GRIFFITHS				ENGINEER		7740/P. TRIMARCHI				DESIGNER		ZIN/C. GRIFFITHS				TOLERANCE ON						.X	±					.XX	± 0.01					.XXX	± 0.005					FRACTION	± -					ANGULAR	± 0.50°					BREAK EDGES	.01-.02					PDM REL LEVEL: RELEASE		PDM REVISION: x.4				PDM DATABASE: HFJER						MODEL NAME: 75105M77B104_OUTSIDE_SPACER						CHECK FOR ANY OUTSTANDING ECO'S PRIOR TO USE					
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DUAL-FLOW NOZZLE ASSEMBLY		75105M77B100																																																																																																															
SPACER - NOZZLE BYPASS OD		B104																																																																																																															
SIZE	DRAWING NUMBER	REV	BLDG	AREA																																																																																																													
C	75105M77B104	-	145	-																																																																																																													
SCALE:	INITIAL REL DATE	SHEET	DISCIPLINE																																																																																																														
1/2	4/30/02	1 OF 1	MECHANICAL																																																																																																														

REV -
C 75105M77B104
SIZE DRAWING NUMBER

4

3

2

1

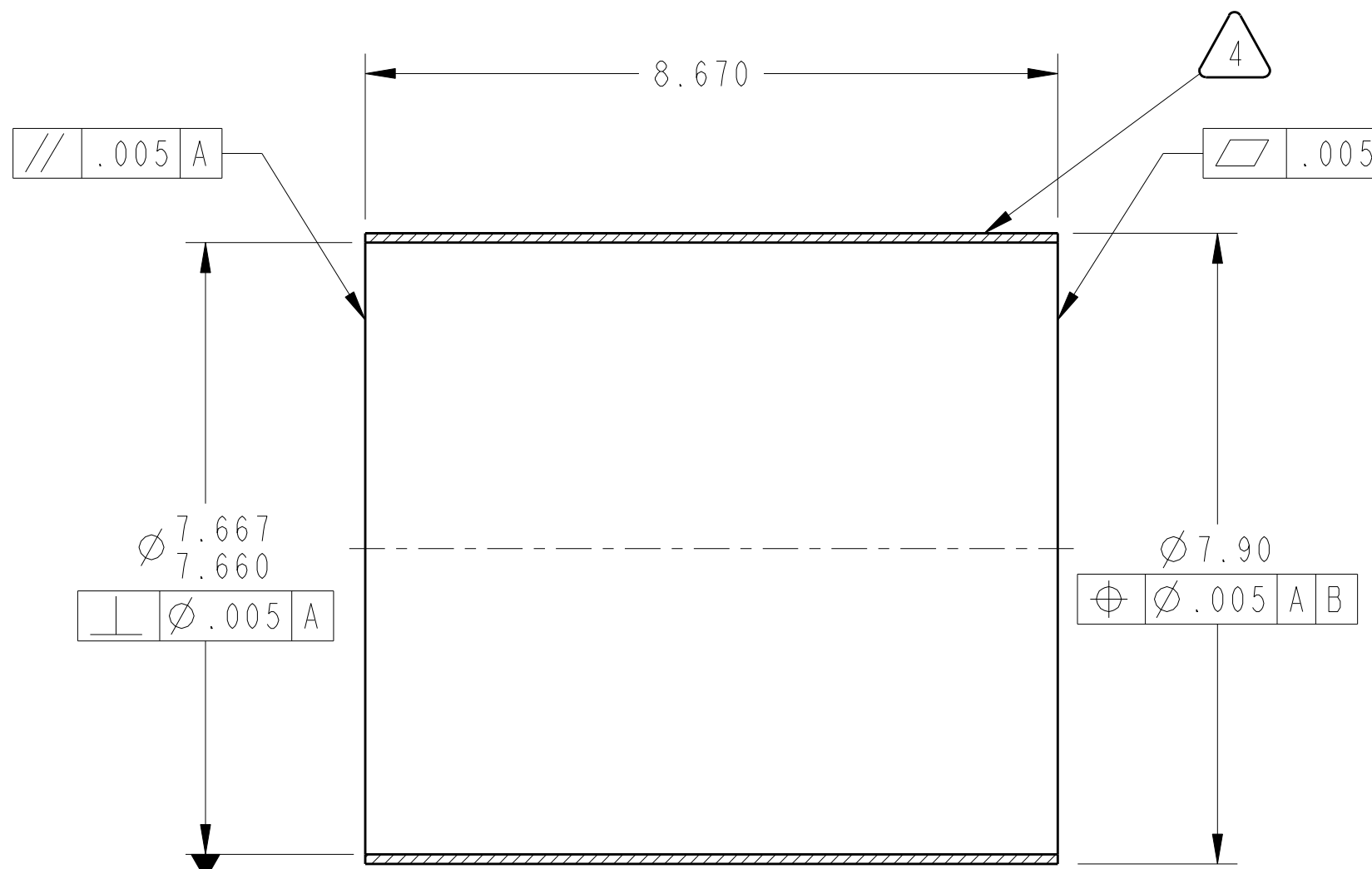
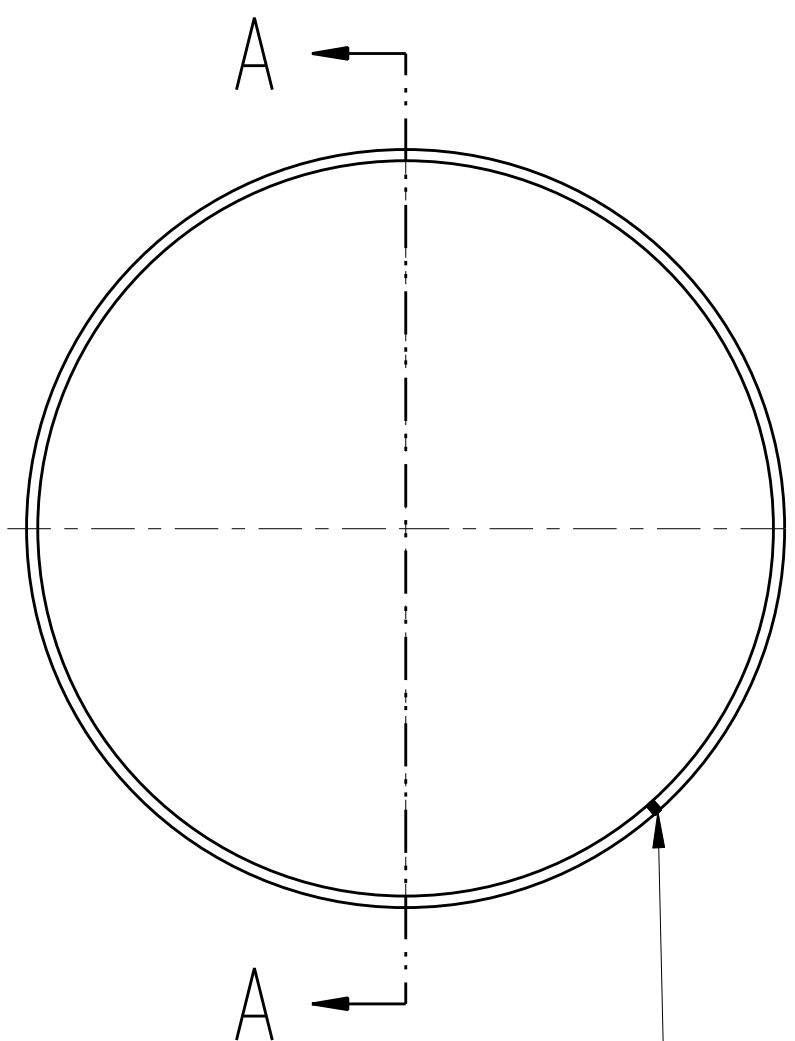
1. MATERIAL: TYPE 316N STAINLESS STEEL, PER ASTM SA-240.

2. 125 Ra ALL MACHINED SURFACES.

3. ALL WELDS TO BE FULL PENETRATION UNLESS OTHERWISE NOTED. ALL ROOT PASS WELDS SHALL BE GTAW. ALL SUBSEQUENT PASSES MAY BE COMPLETED BY ANY CONVENTIONAL METAL-ARC PROCESS.

4. ELECTROCHEMICAL ETCH DRAWING PART NUMBER 75105M77B105 ON SPECIFIED SURFACE PER SAE AS478, METHOD 7A, (ZONE D2).

5. DIMENSIONS APPLY WHEN THE PART IS IN THE CONSTRAINED CONDITION.



SECTION A - A

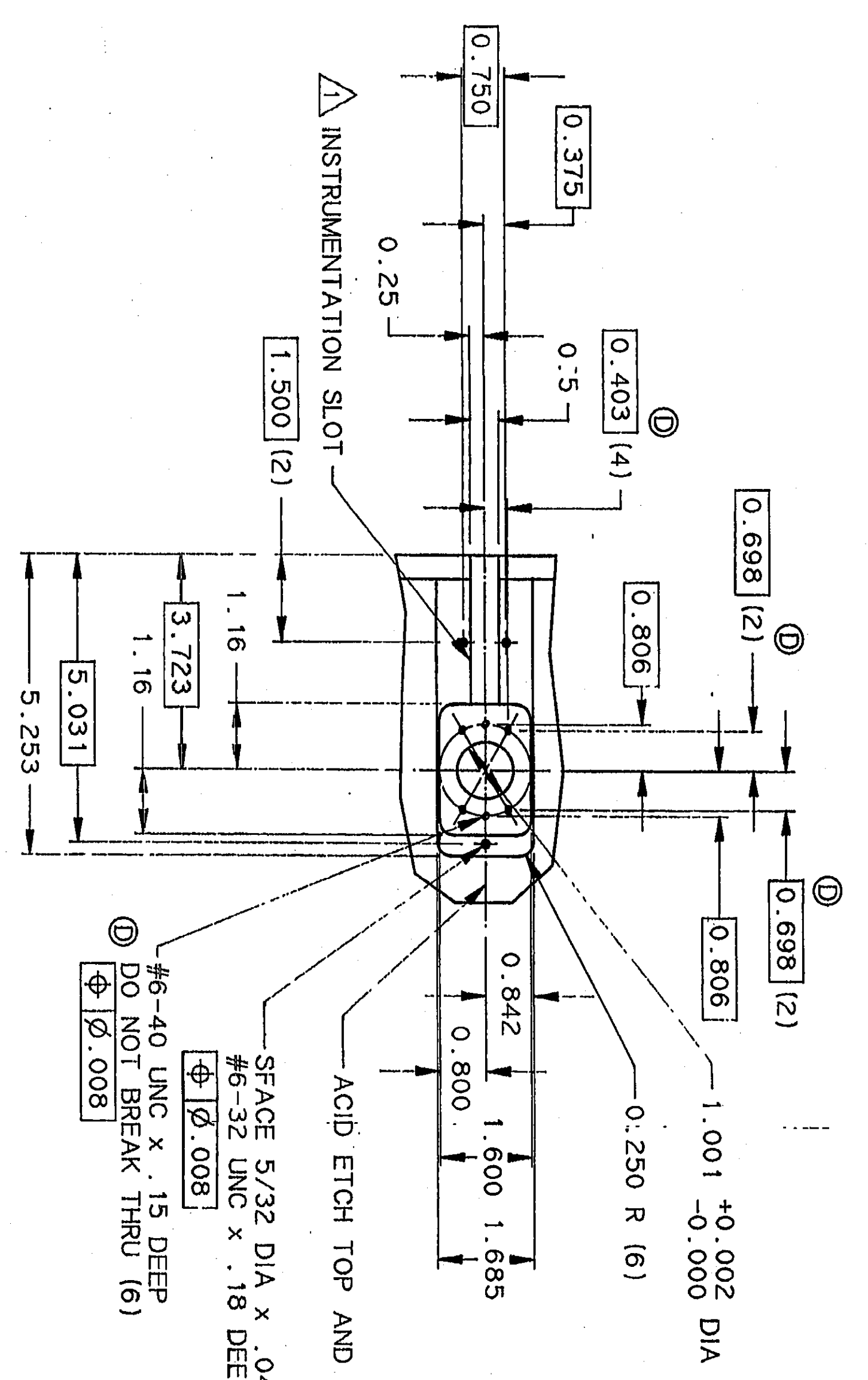
LONGITUDINAL SEAM WELD LOCATION AND NUMBER OPTIONAL ONE PIECE CONSTRUCTION OPTIONAL

CHG	ZONE	DESCRIPTION	APP/DATE
REVISIONS			
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION JOHN H. GLENN RESEARCH CENTER LEWIS FIELD CLEVELAND, OHIO		75105M77B105	
DUAL-FLOW NOZZLE ASSEMBLY		75105M77B100	
B105		SPACER - NOZZLE BYPASS ID	
SIZE	DRAWING NUMBER	REV	BLDG AREA
C	75105M77B105	-	145 -
SCALE:	INITIAL REL DATE	SHEET	DISCIPLINE
1/2	4/30/02	1 OF 1	MECHANICAL

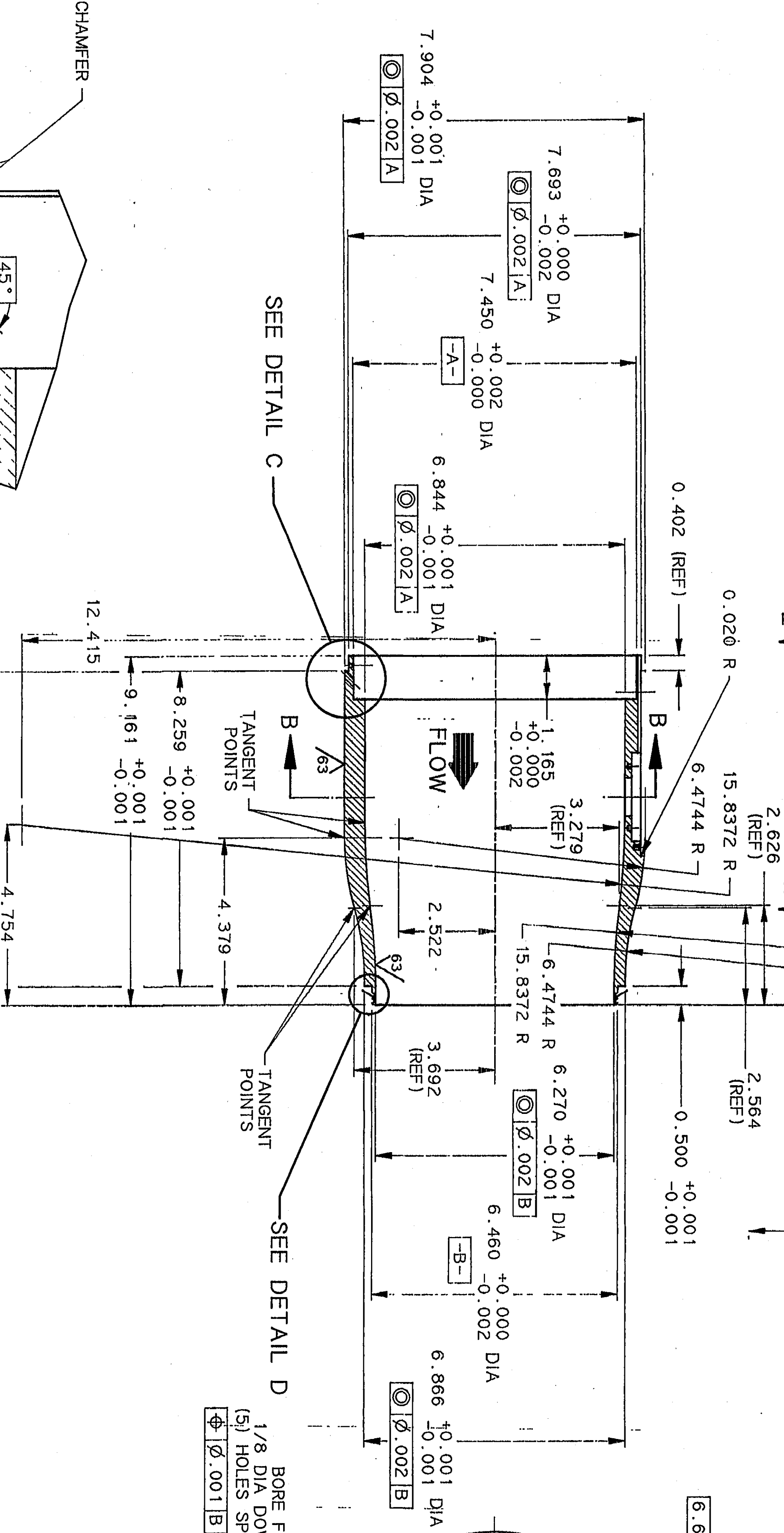
PRIOR TO USE VERIFY THE INTENDED PURPOSE IN PDM ("FOR" ATTRIBUTE)			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES		CONTRACT NAS3-00145 CONTRACTOR ZIN TECHNOLOGIES	
TOLERANCE ON		TASK ORDER	0064
.X	±	DRAFTER	ZIN/C. GRIFFITHS
.XX	± 0.01	ENGINEER	7740/P. TRIMARCHI
.XXX	± 0.005	DESIGNER	ZIN/C. GRIFFITHS
FRACTION	± -	DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994	
ANGULAR	± 0.50°		
BREAK EDGES	.01-.02		
PDM REL LEVEL: RELEASE		PDM REVISION: x.4	
PDM DATABASE: HFJER			
MODEL NAME: 75105M77B105_INSIDE_SPACER			
CHECK FOR ANY OUTSTANDING ECO'S PRIOR TO USE			

REV -
DRAWING NUMBER
75105M77B105

SIZE
C



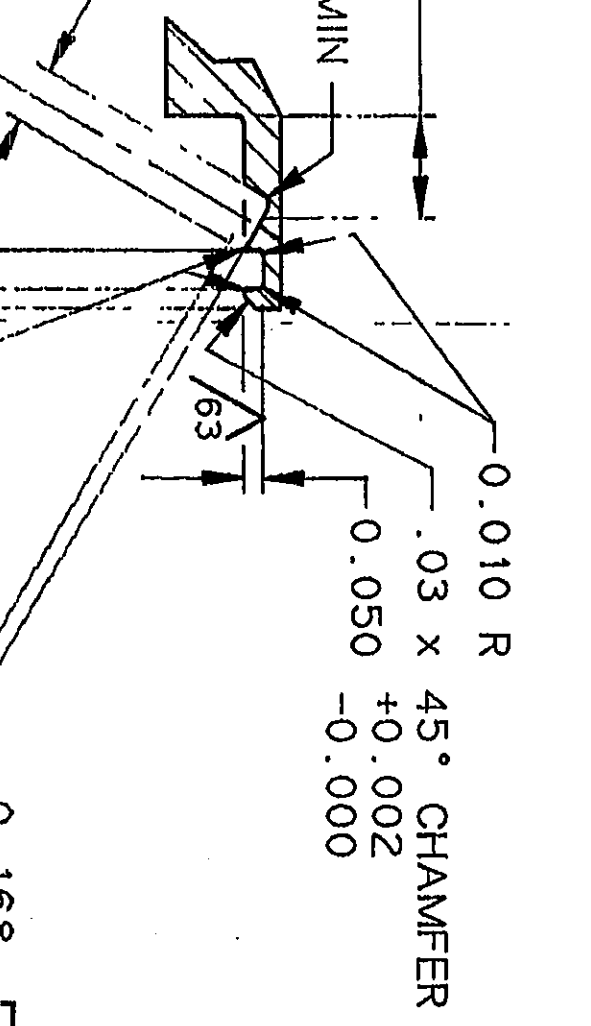
VIEW E-E
TYP DETAIL AT THETA =
0°.60°, 150°, 240°, AND 330°



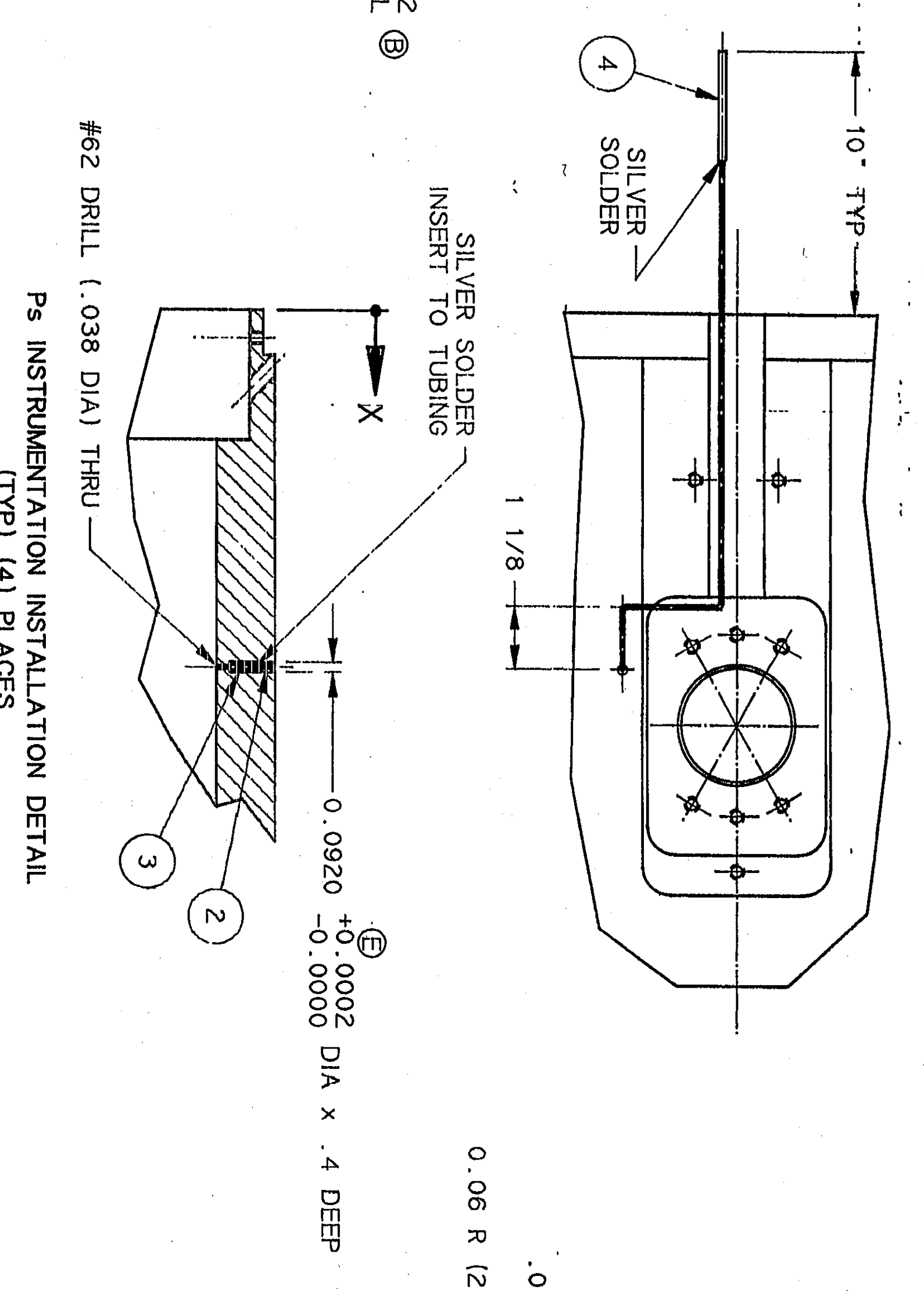
SECTION A-A

TABLE 1: P5 TAP LOCATIONS

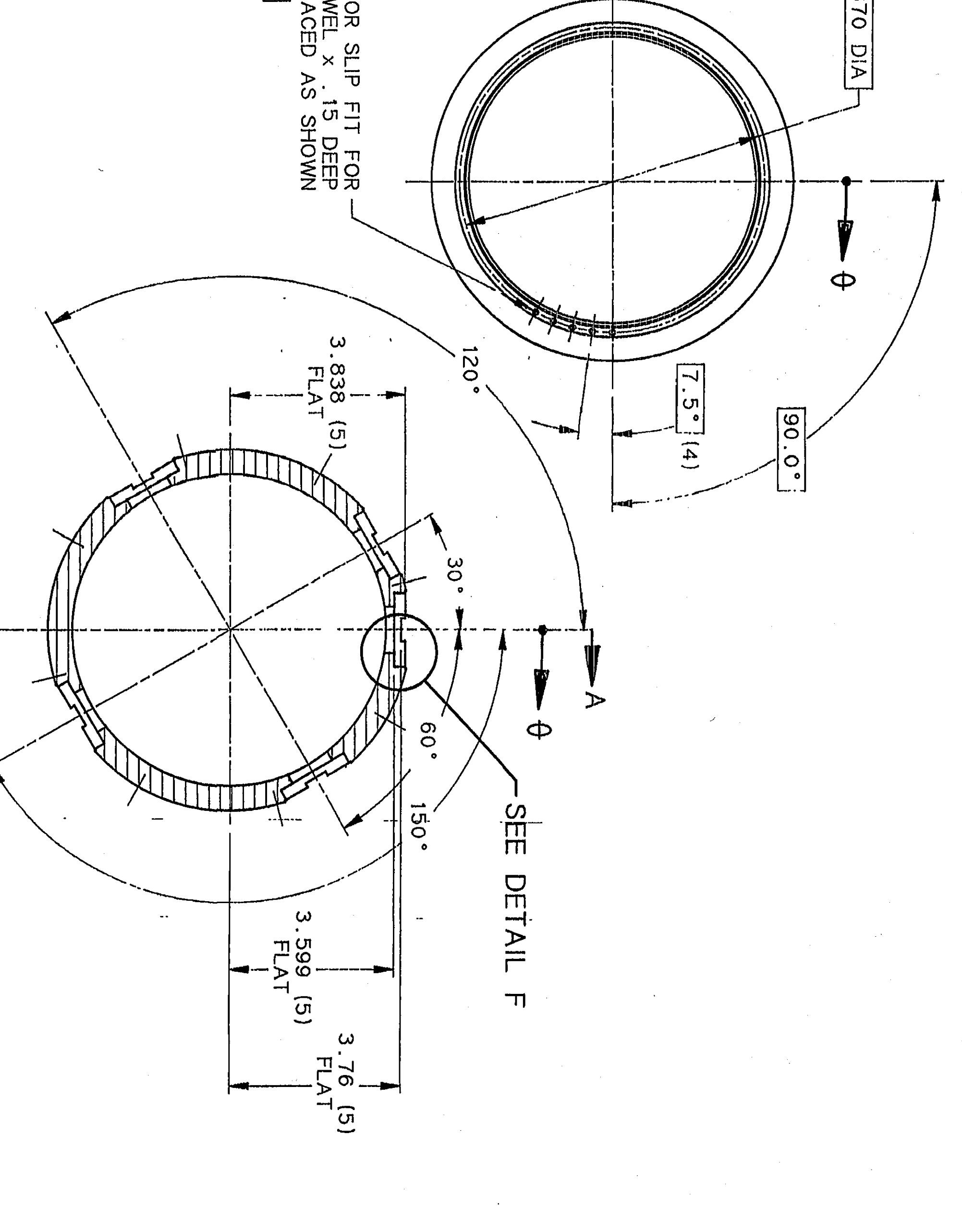
TAP NO.	X	THETA	INSP
2-10	3.243	75°	DA
2-11	3.243	165°	DA
2-12	3.243	255°	DA
2-13	3.243	345°	DA



DETAIL D
SCALE: 4/1



DETAIL F
SCALE: 2/1



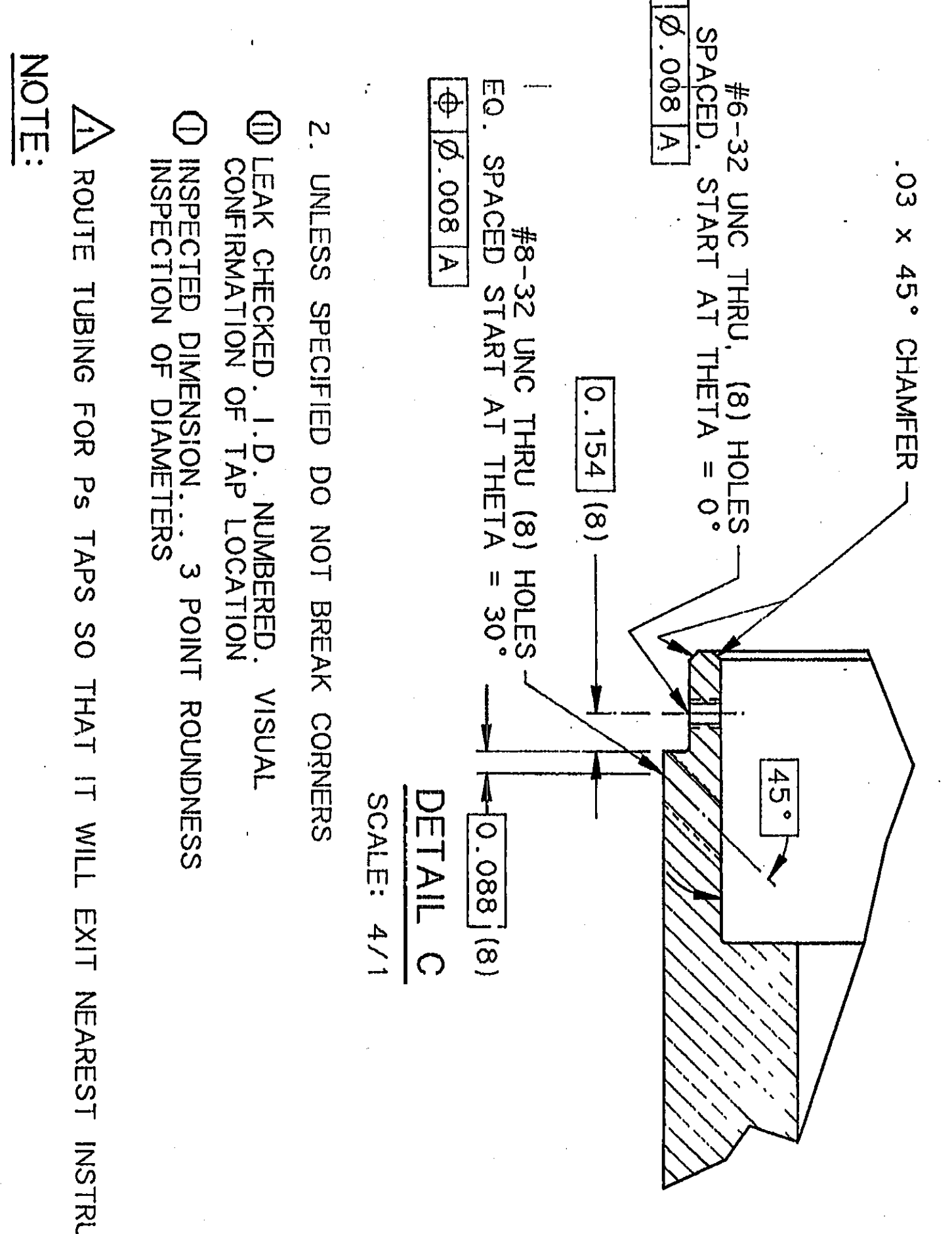
SECTION B-B

TABLE 2: REVISIONS

REV.	DATE	DESCRIPTION
1		ISSUED FOR FABRICATION
2		ISSUED FOR FABRICATION
3		ISSUED FOR FABRICATION
4		ISSUED FOR FABRICATION

TABLE 3: MATERIALS

QTY	ITEM	DESCRIPTION
4	4	TUBING .065 DIA X 1" LONG SST
4	3	6070-673-SS INSERT
2	2	TUBING .035 DIA X 1/8" RECD SST
1	1	CHARGING STA 4.16 SST



DETAIL C
SCALE: 4/1

NOTE:
△ ROUTE TUBING FOR P5 TAPS SO THAT IT WILL EXIT NEAREST INSTRUMENTATION SLOT

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
A	ISSUED FOR FABRICATION		
B	ISSUED FOR FABRICATION		
C	ISSUED FOR FABRICATION		
D	ISSUED FOR FABRICATION		
E	ISSUED FOR FABRICATION		
F	ISSUED FOR FABRICATION		

CADAM DRAWING
DO NOT REVISE MANUALLY

CONTRACT: NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LEWIS RESEARCH CENTER
CLEVELAND, OHIO

PROJECT: AST 9" TO 14" TRANSITION SECTION
TASK: CHARGING STATION - CORE DUCT

DESIGNER: [Signature]
CHECKED: [Signature]
APPROVED: [Signature]

DATE: 03/20/96

DRAWING NUMBER: CE-645708
SHEET 01 OF 01

MESA NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
LEWIS RESEARCH CENTER
CLEVELAND, OHIO

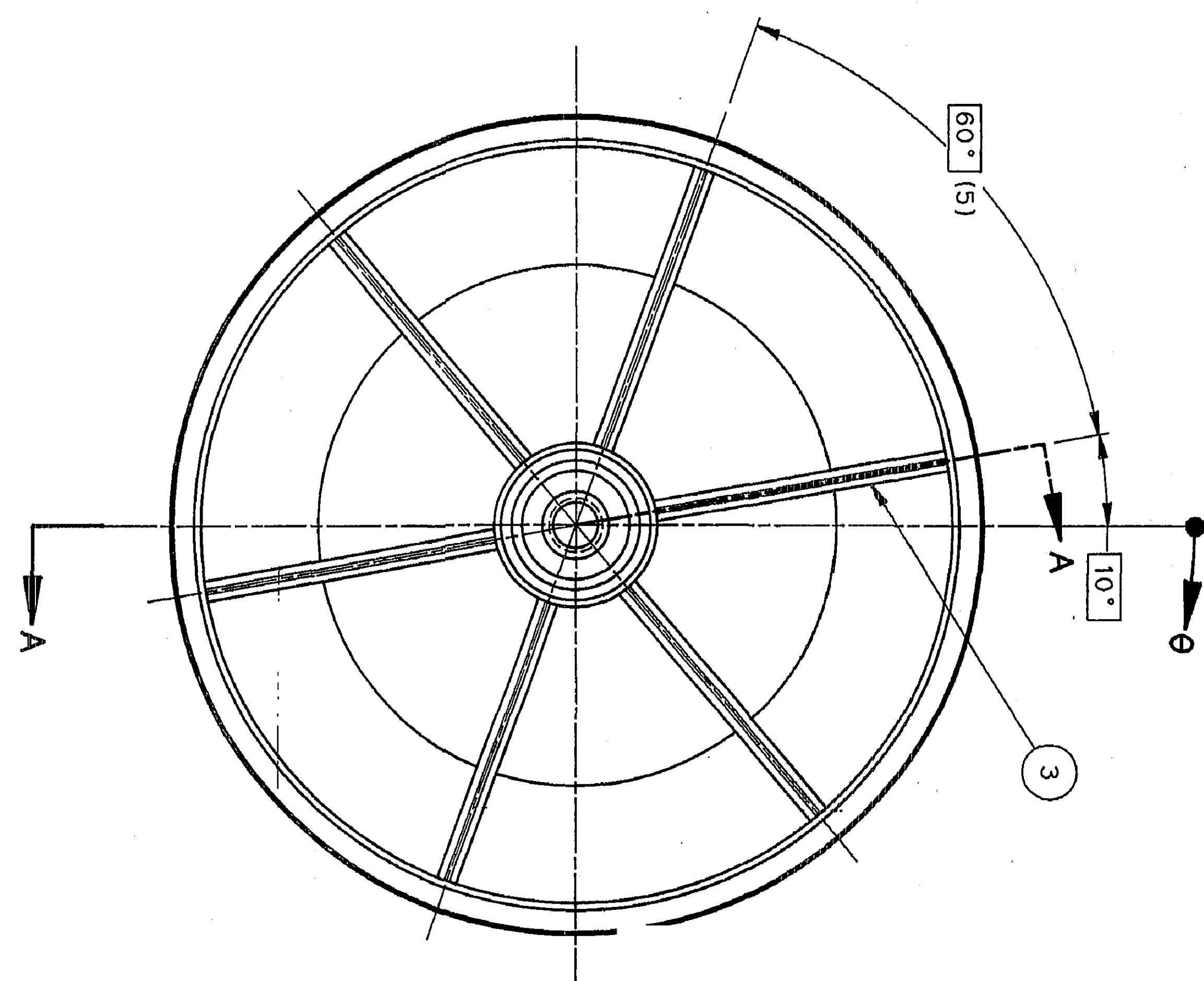
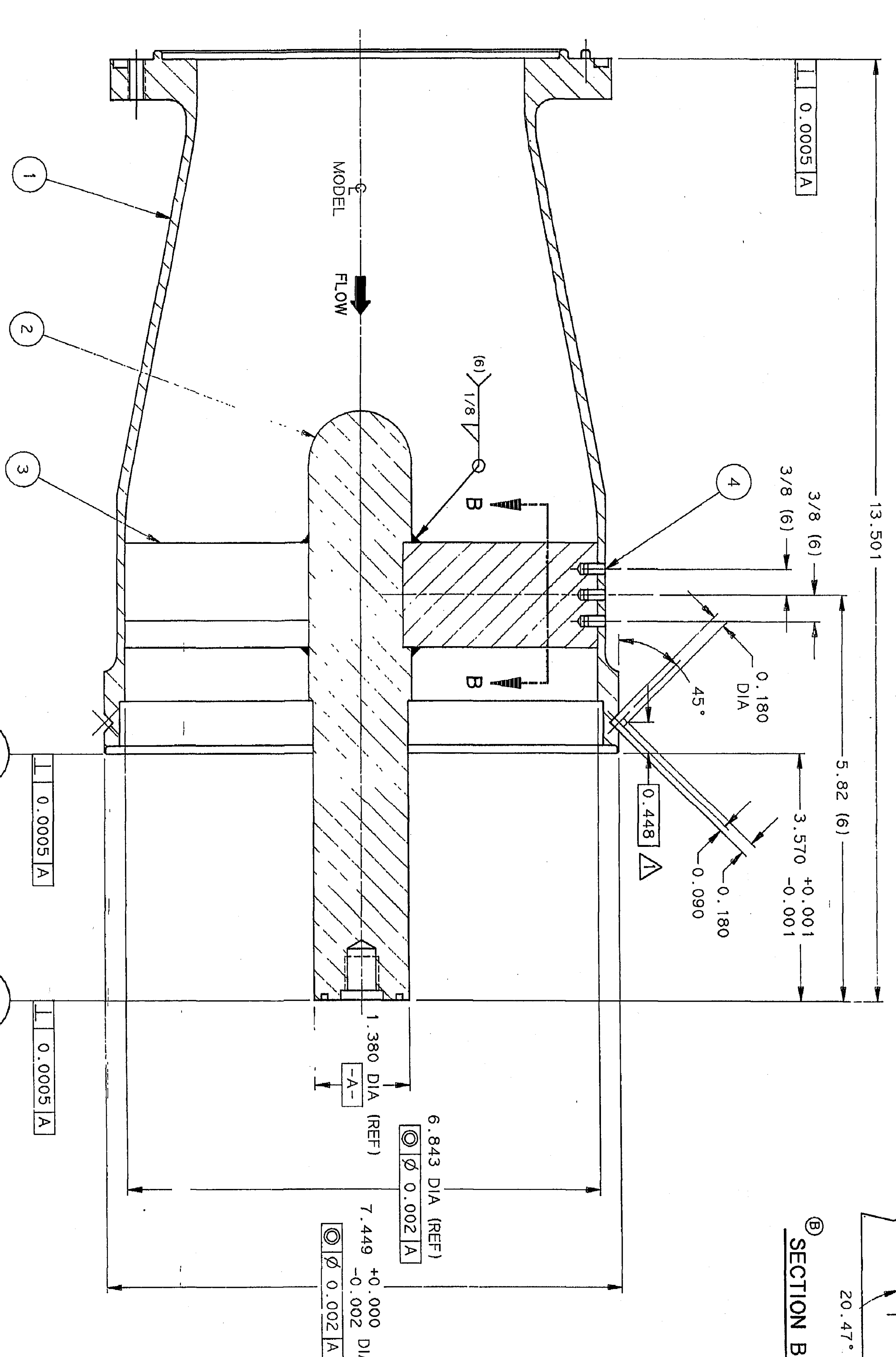
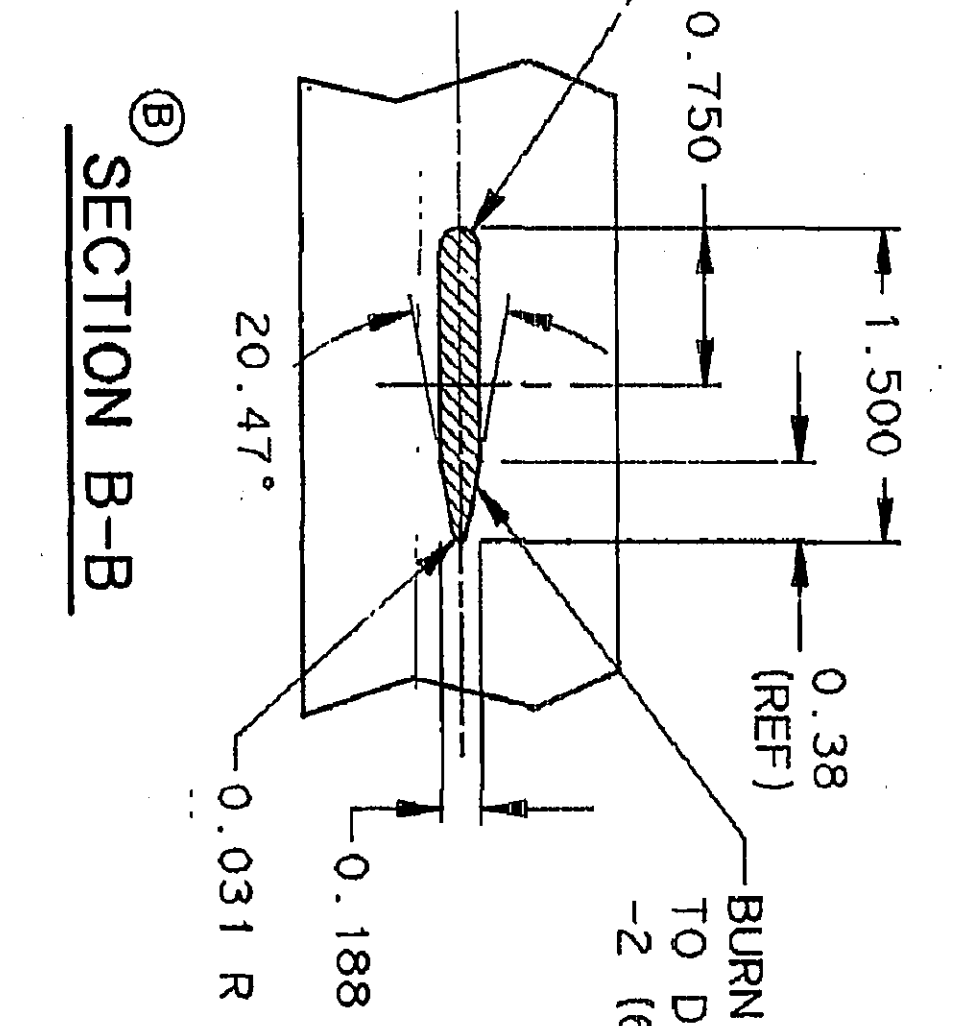
AST 9" TO 14" TRANSITION SECTION
CHARGING STATION - CORE DUCT

DATE: 03/20/96

DRAWING NUMBER: CE-645708
SHEET 01 OF 01

FULL R (6) RADIAL LOCATIONS EQUALLY SPACED

BURN SLOTS FOR STRUTS TO DEPTH REQ'D IN ITEM -2 (6) PLACES



NOTES:

(8) HOLES EQUALLY SPACED STARTING AT THETA = 0°

QTY	ITEM	PART NO.	DESCRIPTION	SEPARATION	LIST OF MATERIALS
18	4		DOWEL PIN	1/8" DIA x 5/16" LG. 304 ST STL	
6	3	Z043-801	STRUT	CORE	
1	2	Z043-405	EXTENSION	TALCONE	
1	1	Z043-004	INNER RING	CORE CENTERBODY	

QTY	ITEM	PART NO.	DESCRIPTION	SEPARATION	LIST OF MATERIALS
1	1		WELDMENT - CORE/TALCONE EXTENSION		

ASE AERO SYSTEMS ENGINEERING, INC.
359 EAST FILLMORE AVENUE, ST. PAUL, MINNESOTA 55107 • USA

FLUIDYNE AEROTEST GROUP
12005 SCHEMEL LINE RD., PLUMCROFT, MINNESOTA 55125 • USA

ALLISON

CONTRACTOR
LEWIS RESEARCH CENTER
CLEVELAND, OHIO

CONTRACT
AST 9" TO 14" TRANSITION SECTION

WELDMENT - CORE/TALCONE EXTENSION

DRAWING NUMBER
CF-645686

SCALE: NONE

DATE
03/20/96

REV. STAT
90-1/NA/1R

SHEET 01 OF 01

NO. OF CADM MODELS CADM UNITS

AERO RASTER

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED	RESE
-	A	REVISED PICTORIAL	31MAY95	WMAW	-
-	B	REVISED SECTION B-B	31MAY95	WMAW	-
-	C	REVISED PICTORIAL & ITEM 4	11MAY95	WMAW	-

CADAM DRAWING MANUALLY DO NOT REVISE

SCALE: NONE

SHEET 01 OF 01

1

The provisions and clauses in the RFQ are those in effect through FAC 05-20.

The NAICS Code and the small business size standard for this procurement are 332721 AND 500 respectively. The offeror shall state in their offer their size status for this procurement.

All responsible sources may submit an offer which shall be considered by the agency.

Delivery to the NASA Glenn Research Center, 21000 Brookpark Road, Cleveland, OH 44135 (Receiving, Bldg. 21) and is required within 140 days ARO. Delivery shall be FOB Destination.

The DPAS rating for this procurement is DO-C9.

Offers for the items(s) described above are due by November 30, 2007, 4:30 p.m. local time and maybe mailed or faxed to Marilyn D. Stolz, 21000 Brookpark Road, M.S. 500-306, Cleveland, OH 44135 and must include, solicitation number, FOB destination to this Center, proposed delivery schedule, discount/payment terms, warranty duration (if applicable), taxpayer identification number (TIN), identification of any special commercial terms, and be signed by an authorized company representative. Offerors are encouraged to use the Standard Form 1449, Solicitation/Contract/Order for Commercial Items form found at URL:
<http://server-mpo.arc.nasa.gov/Services/NEFS/NEFSHome.tml>

Offerors shall provide the information required by FAR 52.212-1 (SEPT 2006), Instructions to Offerors-Commercial Items, which is incorporated by reference. Addenda to FAR 52.212-1 are as follows: None.

If the end product(s) offered is other than domestic end product(s) as defined in the clause entitled "Buy American Act -- Supplies," the offeror shall so state and shall list the country of origin.

FAR 52.212-4 (FEB 2007), Contract Terms and Conditions-Commercial Items is applicable. Addenda to FAR 52.212-4 are as follows: [None.

FAR 52.212-5 (JUNE 2007), Contract Terms and Conditions Required To Implement Statutes or Executive Orders-Commercial Items is applicable and the following identified clauses are incorporated by reference:

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

52.233-3, Protest After Award (Aug 1996) (31 U.S.C. 3553) 52.233-4, Applicable Law for Breach of Contract Claim (Oct 2004) (Pub. L. 108-77, 108-78)

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

52.203-6, Restrictions on Subcontractor Sales to the Government (Jul 1995), with Alternate I (Oct 1995) (41 U.S.C. 253g and 10 U.S.C. 2402); 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (July 2005) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a); 52.219-8, Utilization of Small Business Concerns (May 2004) (15 U.S.C. 637(d)(2) and (3)); 52.219-14, Limitations on Subcontracting (Dec 1996) (15 U.S.C. 637(a)(14)); 52.222-3, Convict Labor (June 2003) (E.O. 11755); 52.222-21, Prohibition of Segregated Facilities (Feb 1999); 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246); 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212); 52.222-36, Affirmative Action for Workers with Disabilities (Jun 1998) (29 U.S.C. 793); 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212); 52.225-1, Buy American Act—Supplies (June 2003) (41 U.S.C. 10a-10d), 52.225-13, Restrictions on Certain Foreign Purchases (Feb 2006) (E.o.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury); 52.232-34, Payment by Electronic Funds Transfer—Other than Central Contractor Registration (May 1999) (31 U.S.C. 3332).

The FAR may be obtained via the Internet at URL:
<http://www.acquisition.gov/far/index.html>

The NFS may be obtained via the Internet at URL:
<http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>

All contractual and technical questions must be in writing (e-mail or fax) to Marilyn D. Stolz not later than November 26, 2007. Telephone questions will not be accepted.

[INCLUDE ONE OF THE FOLLOWING]
[IF SELECTION WILL BE BASED ON LOWEST PRICE TECHNICALLY ACCEPTABLE SOURCE SELECTION PROCESS (FAR 15.101-2)] Selection and award will be made (on an aggregate basis) [DELETE IF NOT AN AGGREGATE AWARD] to the lowest priced, technically acceptable offeror, with acceptable past performance (delete if past performance will not be considered)]. Technical acceptability will be determined by review of information submitted by the offeror which must provide a description in sufficient detail to show that the product offered meets the Government's requirement.

[OR]