

FRONT ISOMETRIC VIEW

BACK ISOMETRIC VIEW

SEE SHEETS 9 AND 10 FOR NOTES

REVISIONS				
REV	SHEET/ZONE	DESCRIPTION	DATE	APPROVED
MULT		DATUM A WAS THE X-Y PSA PLANE, DATUM B WAS THE X-Z PSA PLANE, DATUM C WAS THE Y-Z PSA PLANE.		
2/B3		SR62525.8+1500.0 REFERENCE WAS SR62525.8+3000.0. DELETED 0.125 TOTAL RUNOUT ON BACK SURFACE SPHERICAL RADIUS.		
2/D2		ADDED ETCHING ZONE FROM G TO H		
2/MULT		ADDED PROBE POINT DATUM X, Y AND Z DATUM TARGETS.		
3/B1		6X R3.00/2.50 WAS 6X R1.00		
3/B5		RELOCATED SN MARKING AND NOTED IT AS EXISTING. R490.6 WAS R565.0. REMOVED 4mm DIAMETER MARKING CENTERED ON THE PRINCIPAL OPTICAL AXIS		
4/C2		ADDED 1.0x0.5 X 25° CHAMFER TO CONICAL TOOLING FEATURES		
4/C3		CONICAL FEATURE BASIC DIMENSIONS TO THEORETICAL VERTEX AND TOOLING BALL CENTER WERE BALL CONE CONTACT CIRCLE DIAMETER AND DISTANCE ALONG PSACRS Z. R3.00 WAS R1.00.		
5/MULT		ADDED ESPCRS X AND Y AXES TO VIEW F-F		
6/MULT		ADDED VIEW SHOWING PUCK ETCHING ZONES		
7/MULT		ADDED VIEW SHOWING EDGE SENSOR POCKET MARKING CHARACTERS		
8/A3		ADDED DETAIL W. OPTIMIZATION ZONE AROUND EDGE SENSOR FEET		
8/C1		0.50+0.00/-0.25X 45° WAS 0.50 X 45°	01/08/16	E. HANSEN
8/C6		ADDED PROFILE TOLERANCE TO RIGHT SIDE OF POCKET		
8/D1		ADDED POCKET BOTTOM OVERALL SURFACE PROFILE		
8/D3		R1.50 WAS R2.00		
8/C6, D6		REMOVED ARROW MARKINGS INDICATING BACK AND LEFT SURFACES OF POCKET		
8/MULT		ADDED EDGE SENSOR POCKET ZONES Z3 AND Z4		
8/MULT		DELETED DATUM G AS LEFT SURFACE F POCKET AND DATUM H AS BACK SURFACE OF POCKET		
9/MULT		ADDED VIEW Y AND ASSOCIATED SECTIONS SHOWING EDGE SENSOR POCKET INSPECTION POINTS		
10/C7		19.193 WAS 19.693		
10/C8		NOTE 7 WAS LOCAL NOTE. 4mm DIAMETER FEATURE IS SHOWN FOR REFERENCE ONLY AS A METHOD TO MAINTAIN MODEL ORIENTATION AFTER ROUNDING. CLOCKING MARKS ARE REMOVED DURING HEX CUTTING. FEATURE EXISTS AS PART OF THE CAD MODEL AND IS COINCIDENT WITH THE PRINCIPAL OPTICAL AXIS. THIS FEATURE SHALL NOT BE CUT OR ENGRAVED INTO THE ACTUAL MIRROR.		
11, 12/MULT		EXTENSIVELY REVISED NOTES.		
MULT		DELETED DIAPHRAGM BONDING FIXTURE TOOLING SLOT.		
2/C1		155.880+0.050 WAS 156.000 BASIC		
2/C2		DELETED .200 PROFILE TOLERANCE ON CYLINDRICAL SIDE OF POCKET		
2/D1		DELETED .050 PROFILE TOLERANCE ON 126.00 ID X 156.000 OD ANNULAR ZONE AT BOTTOM OF POCKET AND BOTTOM RADIUS. ETCHED ZONE G TO H WAS BOTTOM OF POCKET, RADIUS AND CYLINDRICAL SURFACE 5mm ABOVE BOTTOM OF POCKET.		
2/D2		R1.00 WAS R2.00		
10/B8		LOCAL NOTE 17: "CENTER POCKET BOTTOM FACE, RADIUS" WAS "CENTER POCKET CYLINDER"	03/15/18	E. HANSEN
10/C7		LOCAL NOTE 11: ((T_MEAN - 45) / 2) + 15.000 WAS 19.193 (T_MEAN / 45).		
MULT		MOVED ALL ETCHING REFERENCES AND NOTES TO M1S-001-04000, BONDED MIRROR ASSEMBLY. EXTENSIVELY REVISED NOTES. DATUM A WAS THE X-Y PSACRS PLANE, NOW DATUM X. DATUM B WAS THE CENTER POCKET DIAMETER. ADDED DATUMS Y AND Z. ADDED NEW DATUM A AS PLANE THROUGH TOOLING BALL CENTERS. ADDED NEW DATUM B AS BEST FIT CENTER OF TOOLING BALL CENTERS.		
2/B4		0.8 MICRON SURFACE FINISH WAS 0.4 MICRON		
9/A8		LOCAL NOTE 18: ADDED "CYLINDRICAL SURFACE BETWEEN POINTS G AND H, SHALL BE GROUND. GRINDING PROCESS QUALIFICATION SHALL DEMONSTRATE LESS THAN 20 MICRON SUBSURFACE DAMAGE DEPTH." 156.000+0.050/-0.110 WAS 156.000+0.050.	09/17/18	E. HANSEN
9/MULT		COMBINED NOTES 7 AND 17, AND MADE NOTE 7 INTENTIONALLY LEFT BLANK. REMOVED SUBSURFACE DAMAGE REQUIREMENT FROM NOTE 18. REMOVED 0.4 SURFACE FINISH CALLOUT ON NOTE 17.		
MULT		ADDED SURFACE FINISH CALLOUTS TO ALL GROUND SURFACES. NOTES 15, 17 AND Z9: "22 MICRONS MAXIMUM" WAS "15 MICRONS AVERAGE."		

REVISIONS				
REV	SHEET/ZONE	DESCRIPTION	DATE	APPROVED
A	1/B7	REMOVED " MARKING ON EDGE OF SEGMENT SHALL BE APPROXIMATELY CENTERED ACROSS THE THICKNESS" FROM END OF LOCAL NOTE 16	03/07/07	L. STEPP
	1/A8	MOVED ALL NOTES FROM SHEET 1 TO SHEET 4		
	1/A4-A5	ADDED PROPRIETARY STAMP AND THIRD ANGLE PROJECTION STAMP		
	2/A6,C3,C6	LOCAL NOTE 7 WAS LOCAL NOTE 8		
	2/B4	ADDED LOCAL NOTES 21 AND 22		
	2/C1	ADDED LOCAL NOTE 5 (2 PLACES)		
	2/C4	ADDED LOCAL NOTE 15. LOCAL NOTE 8 WAS LOCAL NOTE 7		
	2/C5,C6,D6	ADDED FIDUCIAL LABELS "FO," "FX," AND "FY"		
	2/C5,C8,D6	MODIFIED FIDUCIALS TO BE "BULLSEYES" INSTEAD OF CIRCUMSCRIBED CROSSES (SHOWN AS LARGE DIAMETER = 8MM, SMALL DIAMETER = 2MM)		
	2/C8	REMOVED -XPSA FIDUCIAL		
	2/D1	ADDED LOCAL NOTE 19		
	2/D8	ADDED 575.000+/-0.025 DIMENSION FOR FIDUCIAL F+Y		
	3/B1,D1,D3	ADDED LOCAL NOTE 20		
		ADDED SHEET 4		
B	4/D8	NOTE 3: "FINISHED PRIMARY MIRROR" WAS "POLISHED". (TMT.OPT.TEC.07.044) WAS "(HDC-280001-0003)"	03/26/08	V.STEPHENS C. BAFFES (TMT)
	4/D8	NOTE 4: REMOVED LOCAL NOTE DESIGNATION (FLAG). MOVED MATERIAL/THICKNESS TABLE TO BE WITHIN NOTE 4.		
	4/D8	NOTE 5: EXTENSIVELY REVISED FIRST SENTENCE		
	4/D8	NOTE 6: EXTENSIVELY REVISED		
	4/D8	CHANGED NOTE 6 TO A LOCAL NOTE (FLAG)		
	4/C8	NOTE 7: EXTENSIVELY REVISED		
	4/D8	NOTE 8: EXTENSIVELY REVISED		
	4/B8	NOTE 9: "(TMT.OPT.TEC.07.044) WAS "(HDB-280001-0003)"		
	4/B8	NOTE 13: "19.529" WAS "18.593"		
	4/B8	NOTE 14: "FINISHED PRIMARY MIRROR SEGMENT SPECIFICATION (TMT.OPT.SPE.07.002) WAS "SEGMENT SPECIFICATION DOCUMENT: TMT.OPT.SPE.07.002"		
	4/B8	NOTE 16: "(TMT.OPT.TEC.07.044) WAS "(HDB-280001-0003)"		
	4/A8	NOTE 17: DELETED "OR OTHER FEATURES". "PERMANENTLY MARKED" WAS "LOCATED". (TMT.OPT.TEC.07.044) WAS "(HDB-280001-0003)". ADDED "DESIGN OF FIDUCIALS IS TBD"		
	4/A8	ADDED NOTES 19, 20, 21, AND 22		
	1/A4	"NEXT ASSEMBLY 280-TMT-01-11000" WAS "PART NO. 280-TMT-01-01000"		
	1/A6	REMOVED PROPRIETARY PROPERTY STATEMENT		
	2/B2	CENTERED "Z_POCKET" IN BASIC DIMENSION BOX		
	2/B3	ADDED SR 62525.8+/-3000.0 DIMENSION AND .125 TOTAL RUNOUT GEOMETRIC TOLERANCE TO BACK SURFACE OF MIRROR		
	2/C1	"126.000 DIAMETER (AREA OF .100 PROFILE TOLERANCE)" WAS "139.500 DIAMETER (AREA OF .100 FLATNESS TOLERANCE)". 156.000 DIAMETER WAS 174.000		
	2/D1	.050 PROFILE TOLERANCE WAS 0.025		
	3/A4	"15.0" WAS "25.0"		
	3/B3	"25.0" WAS "50.0"		
C	3/B5	"R565.0" WAS "R590.0"	09/12/08	V.STEPHENS C. BAFFES (TMT)
	3/C3	ADDED 3X ASSEMBLY FEATURE AND ASSOCIATED DIMENSIONS, NOTE 21		
	3/C6,A7	ADDED SECTION H-H		
	4/B8	REV C LOCAL NOTE 11: "19.693" WAS REV B LOCAL NOTE 13: "19.529"		
	4/D8	NOTE 5: EXTENSIVELY REVISED. DELETED REV. B LOCAL NOTE 6.		
	4/MULT	RENUMBERED / DELETED / ADDED NOTES: NOTES 6-9 WERE NOTES 7-10. NOTES 10-16 WERE NOTES 12-18. NOTE 17 WAS NOTE 20. NOTE 18 WAS NOTE 21. NOTE 19 WAS NOTE 22. DELETED REV. B NOTE 19. ADDED REV C NOTES 20, 21		
	2,3/MULT	EXTENSIVELY RENUMBERED / DELETED / ADDED NOTES		
D	MULT	ADDED EDGE SENSOR INTERFACE POCKETS, ADDITIONAL REQUIRED DRAWINGS AND VIEWS, AND RELATED NOTES.	07/26/10	E. WILLIAMS
	1/A1, A3	DRAWING NUMBER WAS 280-TMT-01-01000, NEXT ASSEMBLY WAS 280-TMT-01-11000		
	3/B6	MODIFIED CIRCULAR CENTRAL DIAPHRAGM CLOCKING PIN ASSEMBLY FEATURE HOLE PLACEHOLDER TO BE A SLOTTED HOLE		
	3/MULT	ADDED THREE CONICAL TOOLING FEATURES, REPLACING "+" SHAPED PLACEHOLDER FEATURES		
	6,8/MULT	DELETED SHEET SHOWING GEOMETRIC DEFINITION OF EDGE SENSOR AXES (ESCRS-X, Y AND Z). CHANGED EDGE SENSOR POCKET LOCATIONS, ORIENTATIONS AND GEOMETRY TO BE DEFINED FROM AXES ESPCRS-X, Y AND Z. REDEFINED DATUMS D, E AND F USING THESE AXES.	09/07/12	E. WILLIAMS
	7,8/MULT	EXTENSIVELY RENUMBERED / MODIFIED / DELETED / ADDED NOTES		
	MULT	MODIFIED PLANAR DATUMS SO THAT SYMBOLOLOGY IS SHOWN ON PLANAR SURFACE INSTEAD OF NORMAL TO PLANE		
	MULT	ADDED SHEET 4 SHOWING DETAILS OF CONICAL TOOLING FEATURES AND SLOTTED CENTRAL DIAPHRAGM CLOCKING PIN ASSEMBLY FEATURE. RENUMBERED SUBSEQUENT SHEETS ACCORDINGLY. REMOVED FIDUCIAL AT MIRROR CENTER.		
F	2/MULT	ROTATED FIDUCIAL PATTERN 30 DEGREES CCW AND INCREASED DIAMETER.	10/27/12	E. WILLIAMS
	3/D7	CHANGED CONICAL SURFACE DIMENSIONING SO IT IS LOCATED FROM TOOLING BALL LINE OF CONTACT		
G	6/C1	GEOMETRIC TOLERANCE WAS PERPENDICULAR WITHIN 0.030 TO DATUM D AND FLAT WITHIN 0.020	07/22/13	E. WILLIAMS

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN MILLIMETERS
-TOLERANCES-
DECIMALS ANGULAR = +/- .30'
X = +/- 1.0
XX = +/- .30
XXX = +/- .100

SURFACE FINISH
SEE NOTES

NEXT ASSEMBLY
M1S-001-04000

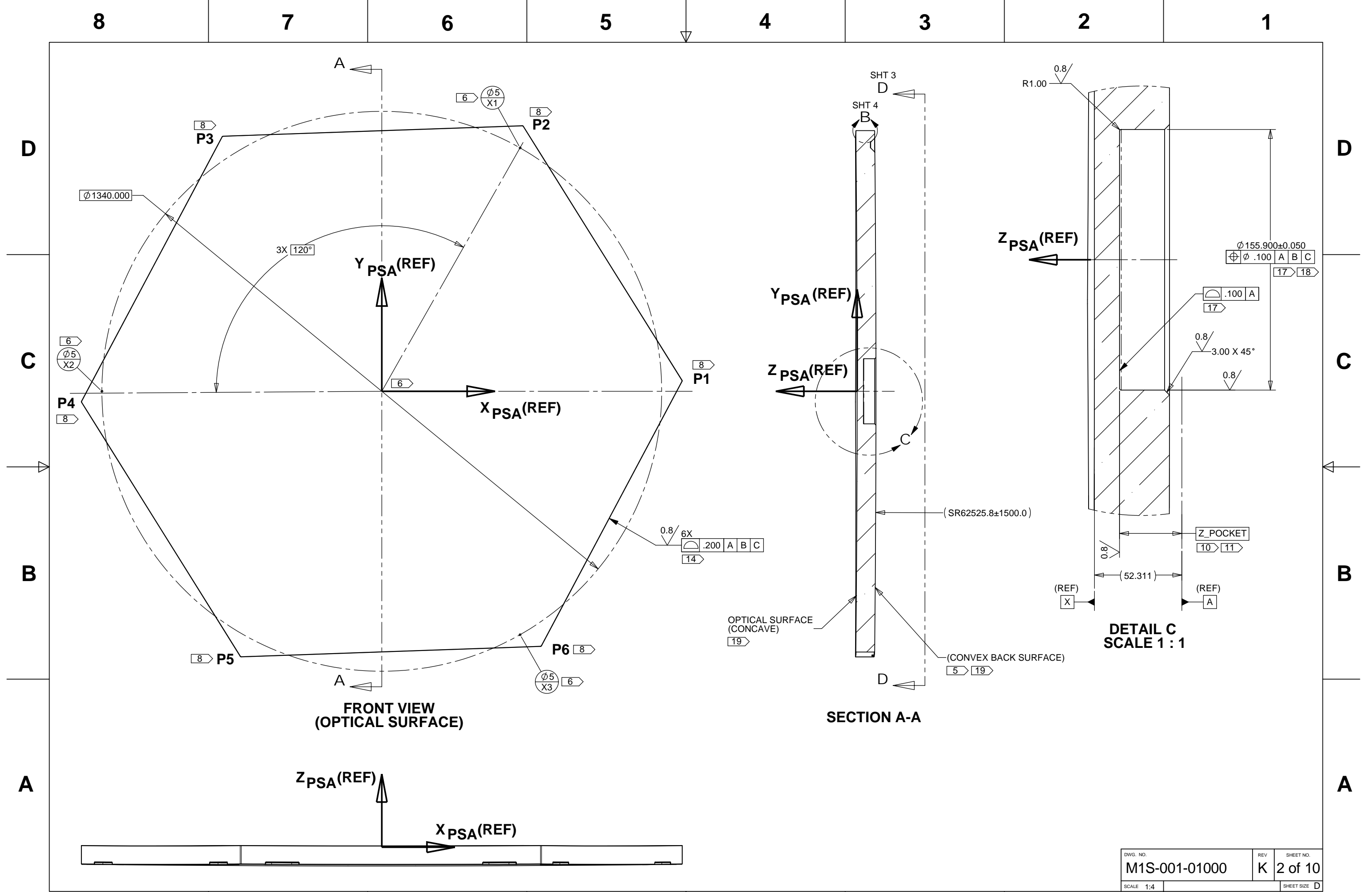
CAD GENERATED DRAWING.
DO NOT MANUALLY UPDATE
DO NOT SCALE DRAWING

SIGNATURE	DATE
Designer Alan Tubb	3/5/2007
Drawn Alan Tubb	3/5/2007
Checked Eric Williams	3/5/2007
Engineer Eric Williams	3/5/2007
Approved Eric Williams	3/5/2007

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TMT M1
POLISHED SEGMENT

DWG. NO.	REV	SHEET NO.
M1S-001-01000	K	1 of 10
SCALE 1:6		SHEET SIZE D



DWG. NO.	REV	SHEET NO.
M1S-001-01000	K	2 of 10
SCALE 1:4	SHEET SIZE D	

8

7

6

5

4

3

2

1

D

C

B

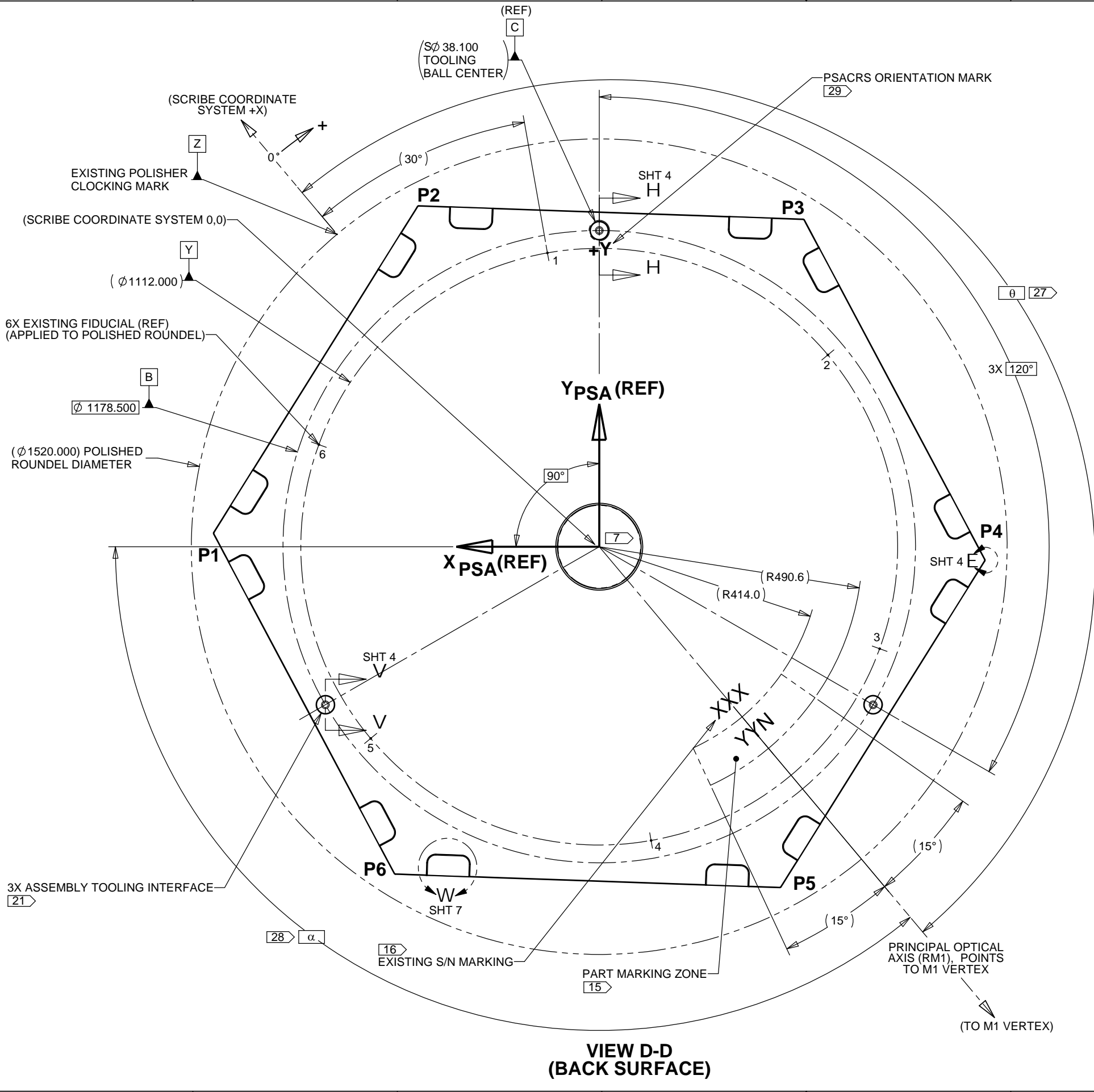
A

D

C

B

A



**VIEW D-D
(BACK SURFACE)**

TABLE A

ANGLE FROM PRINCIPAL OPTICAL AXIS TO PSACRS X AXIS

MIRROR TYPE	ANGLE α
1	90.000
2	120.000
3	90.000
4	109.107
5	130.893
6	90.000
7	103.898
8	120.000
9	136.102
10	90.000
11	100.893
12	113.413
13	126.587
14	139.107
15	90.000
16	98.948
17	109.107
18	120.000
19	130.893
20	141.052
21	90.000
22	97.589
23	106.102
24	115.285
25	124.715
26	133.898
27	142.411
28	90.000
29	96.587
30	103.898
31	111.787
32	120.000
33	128.213
34	136.102
35	143.413
36	90.000
37	95.818
38	102.216
39	109.107
40	116.330
41	123.670

MIRROR TYPE	ANGLE α
42	130.893
43	137.784
44	144.182
45	90.000
46	95.209
47	100.893
48	106.996
49	113.413
50	120.000
51	126.587
52	133.004
53	139.107
54	144.791
55	90.000
56	94.715
57	99.826
58	105.295
59	111.052
60	116.996
61	123.004
62	128.948
63	134.705
64	140.174
65	145.285
66	94.307
67	98.948
68	103.898
69	109.107
70	114.504
71	120.000
72	125.496
73	130.893
74	136.102
75	141.052
76	145.693
77	107.480
78	112.411
79	117.457
80	122.543
81	127.589
82	132.520

8

7

6

5

4

3

2

1

8 7 6 5 4 3 2 1

D

C

B

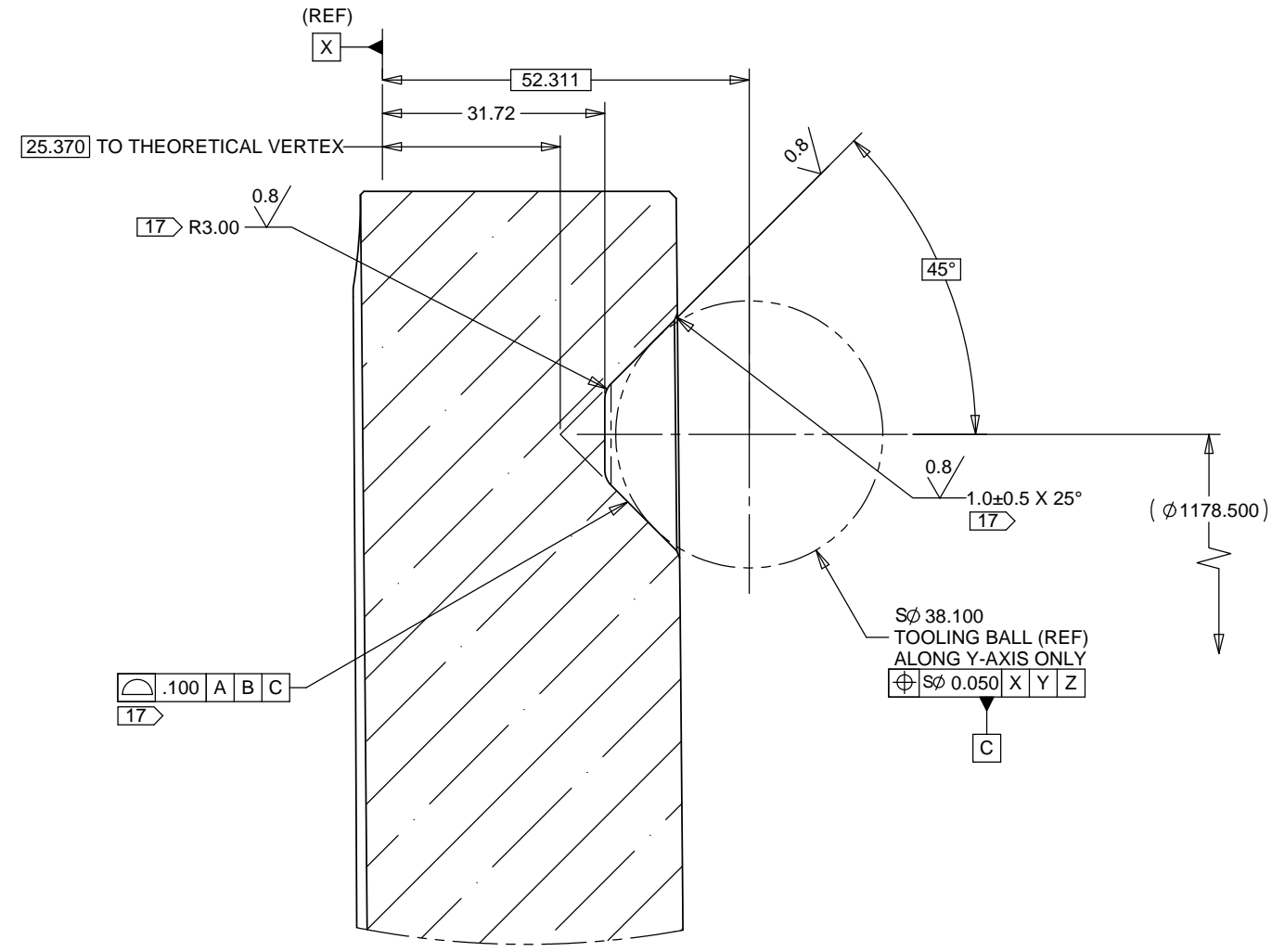
A

D

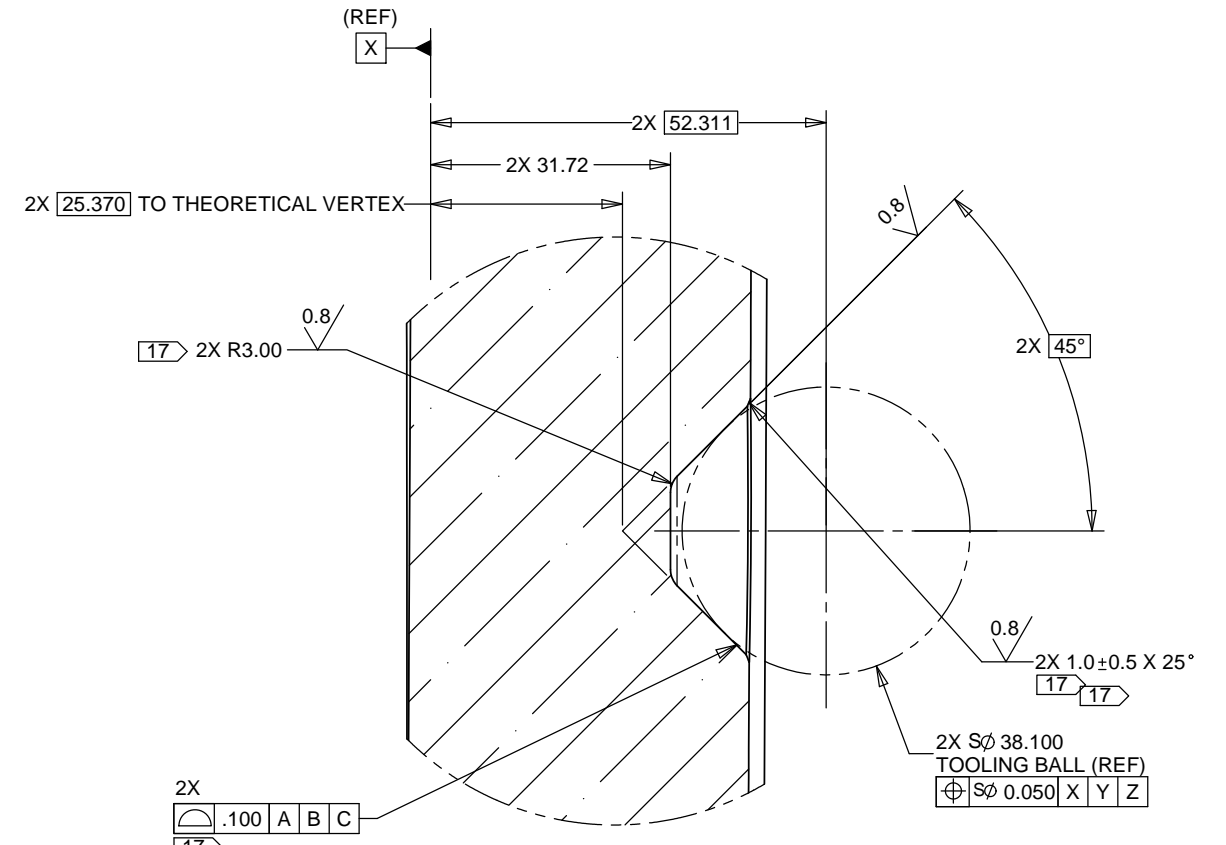
C

B

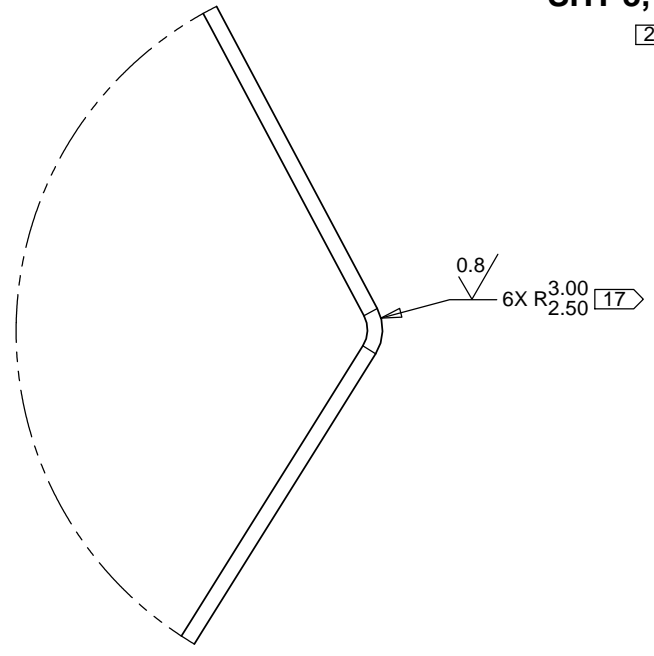
A



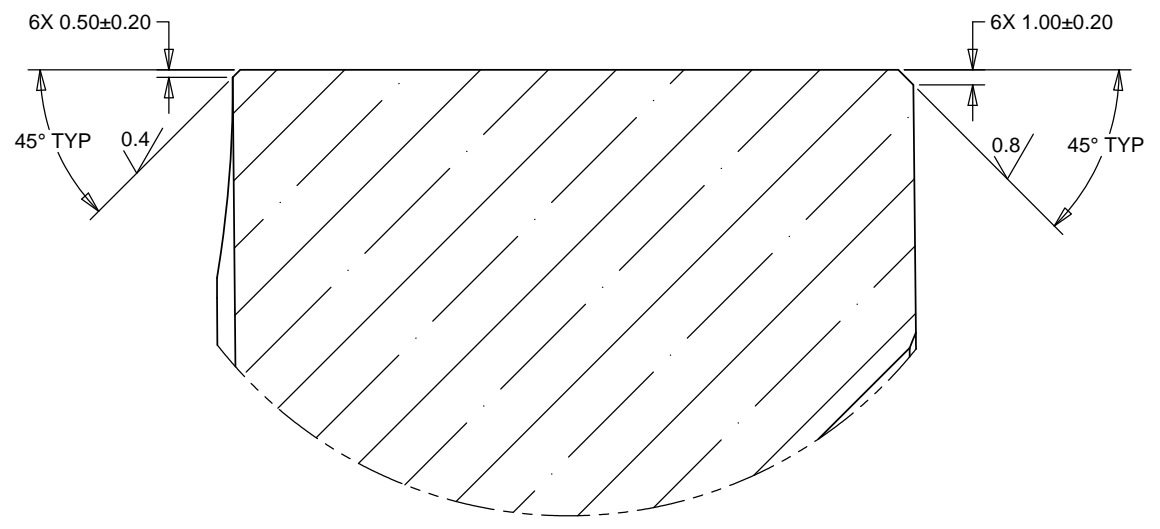
SECTION H-H
SHT 3, ZONE D6
21



SECTION V-V
SHT 3, ZONE B7
21



DETAIL E
SCALE 4 : 1
SHEET 3, ZONE C4



DETAIL B
SCALE 4 : 1
SHEET 2, ZONE D3
17

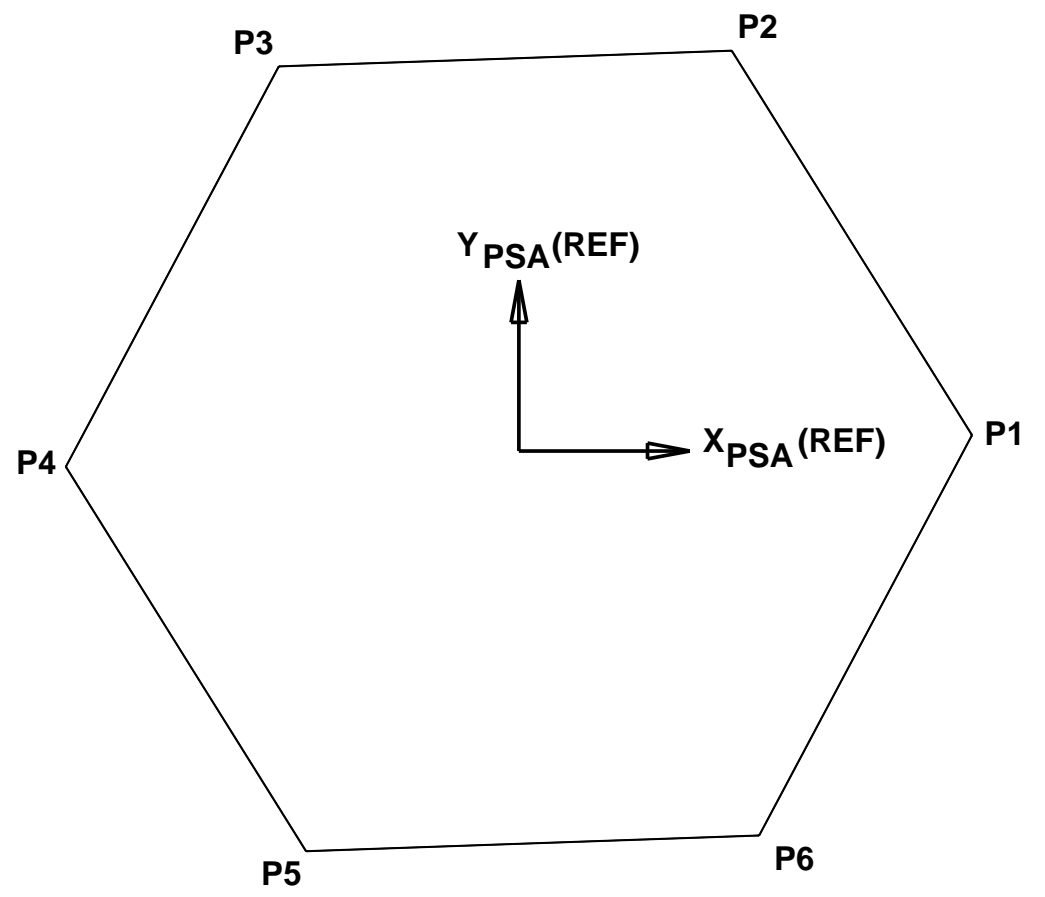
8 7 6 5 4 3 2 1

DWG. NO. M1S-001-01000	REV K	SHEET NO. 4 of 10
SCALE 2:1	SHEET SIZE D	

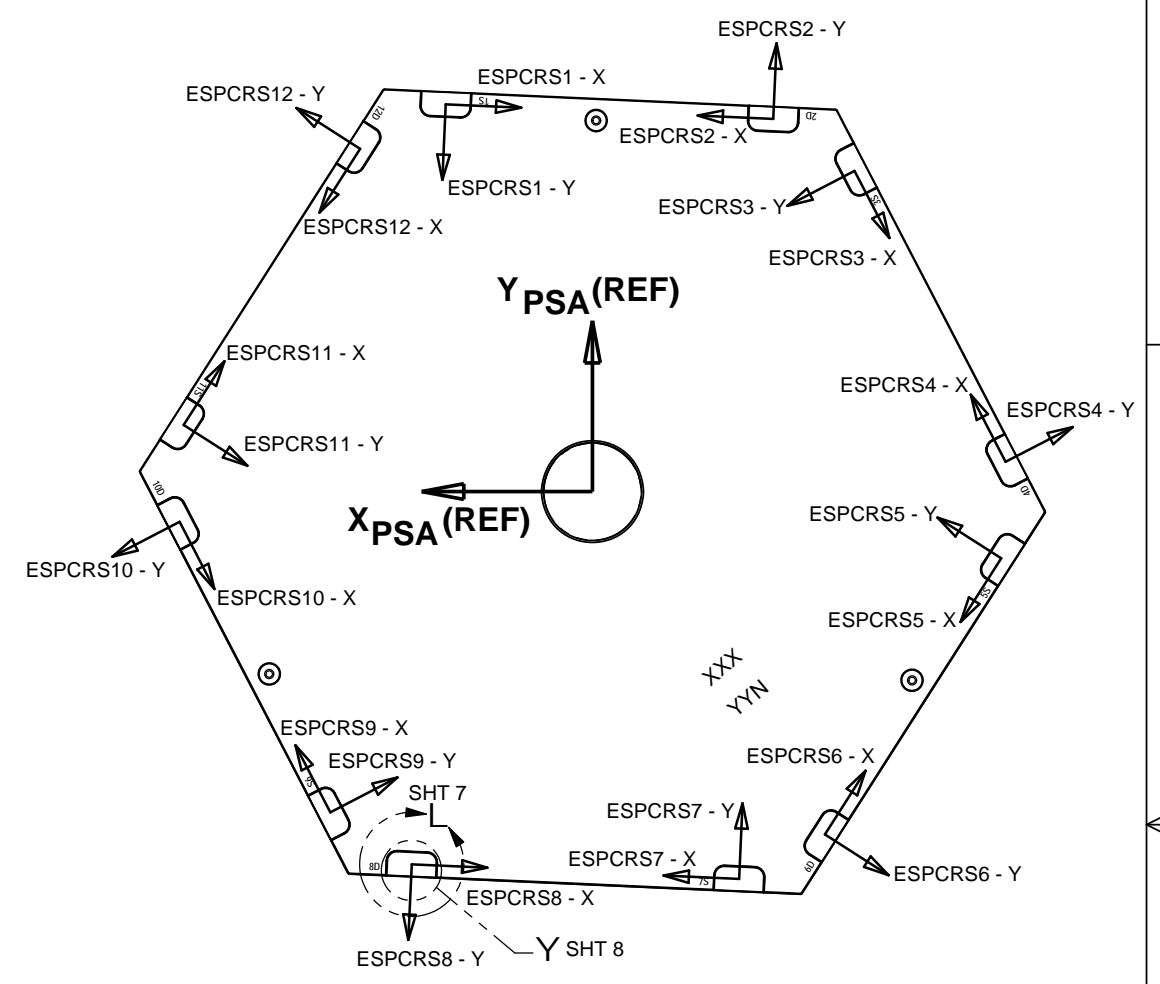
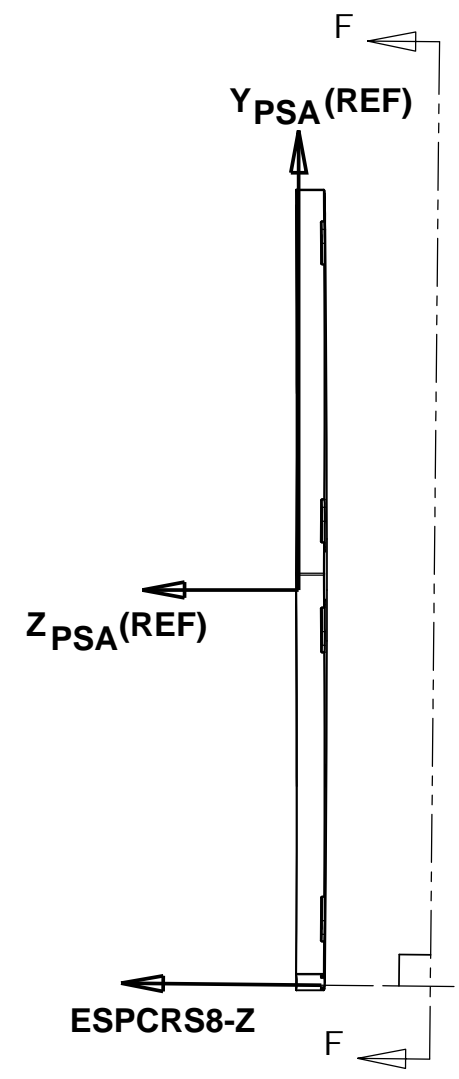
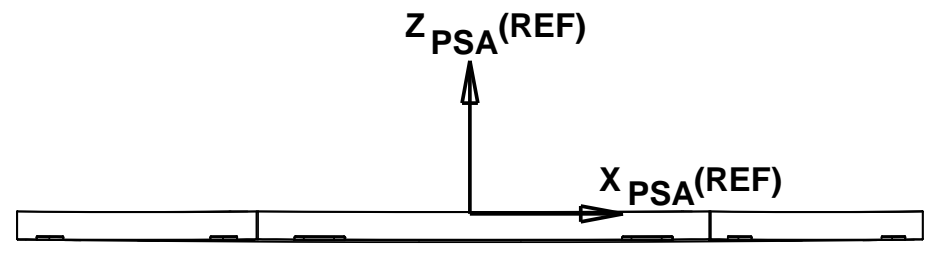
8 7 6 5 4 3 2 1

D
C
B
A

D
C
B
A



FRONT VIEW
(OPTICAL SURFACE)



VIEW F-F
NORMAL TO ESPCRS8-Z

DWG. NO. M1S-001-01000	REV K	SHEET NO. 5 of 10
SCALE 1:6	SHEET SIZE D	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

D

D

C

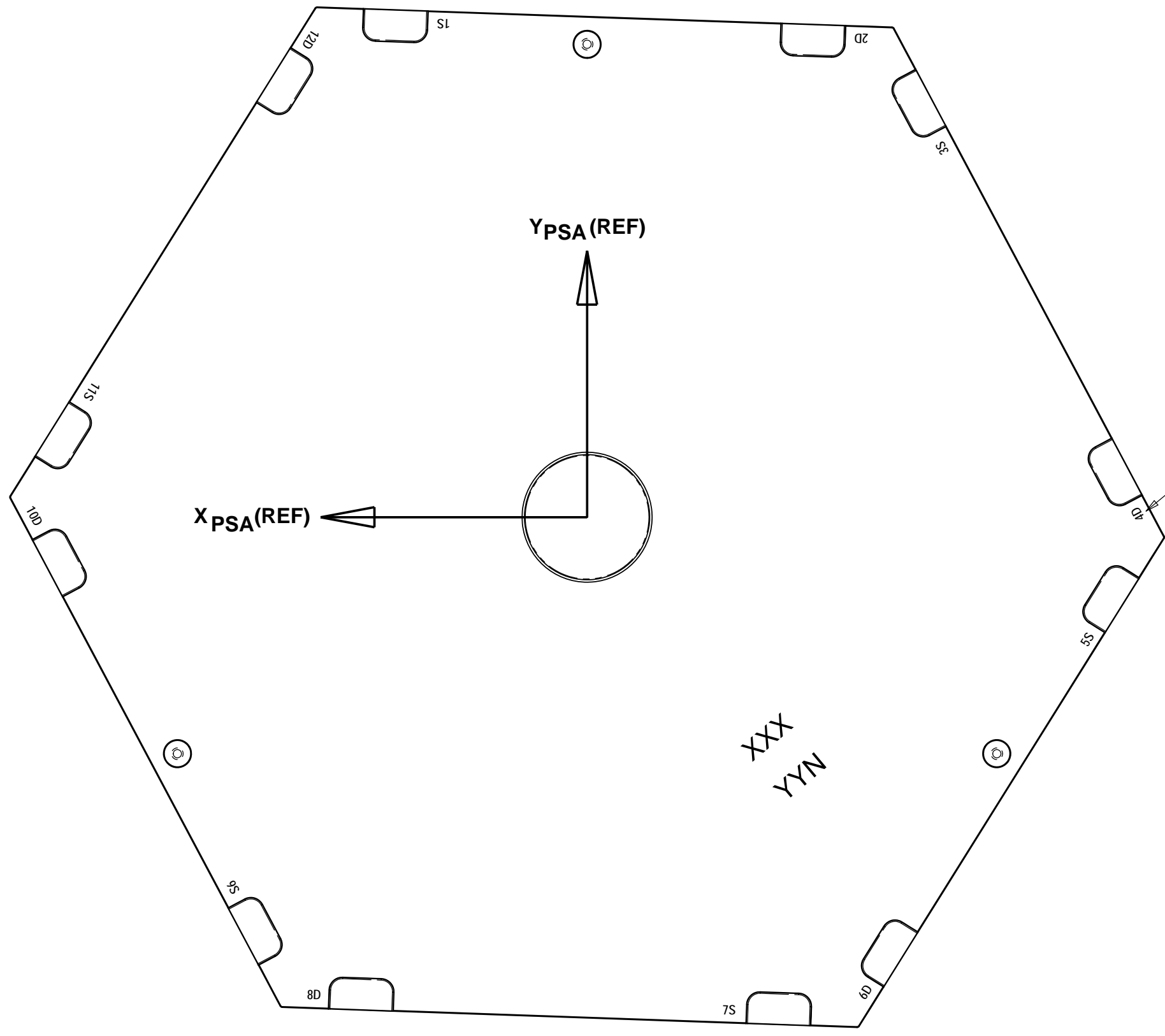
C

B

B

A

A



BACK VIEW
EDGE SENSOR POCKET MARKING

13

DWG. NO. M1S-001-01000	REV K	SHEET NO. 6 of 10
SCALE 1:3	SHEET SIZE D	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

D

C

B

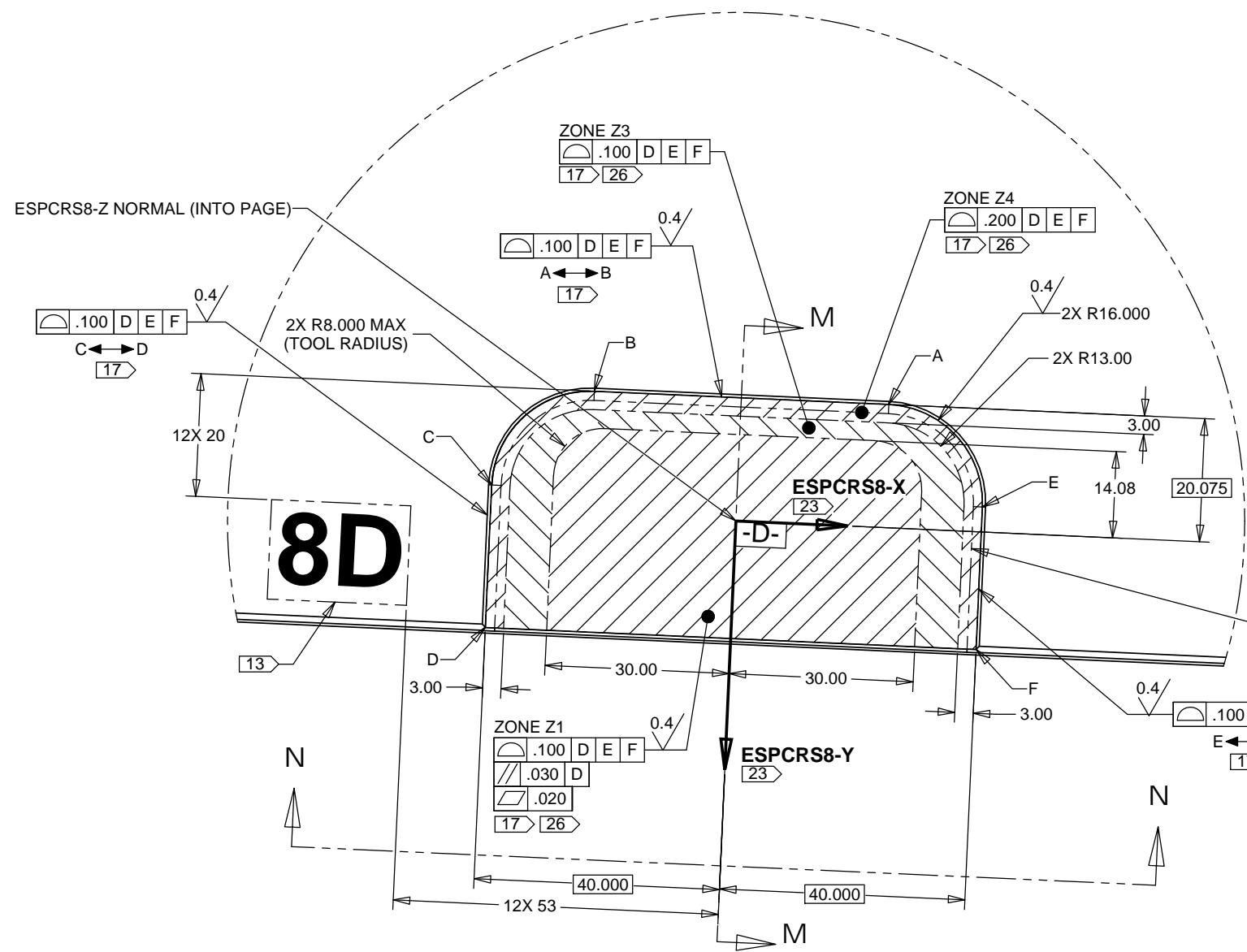
A

D

C

B

A



8D

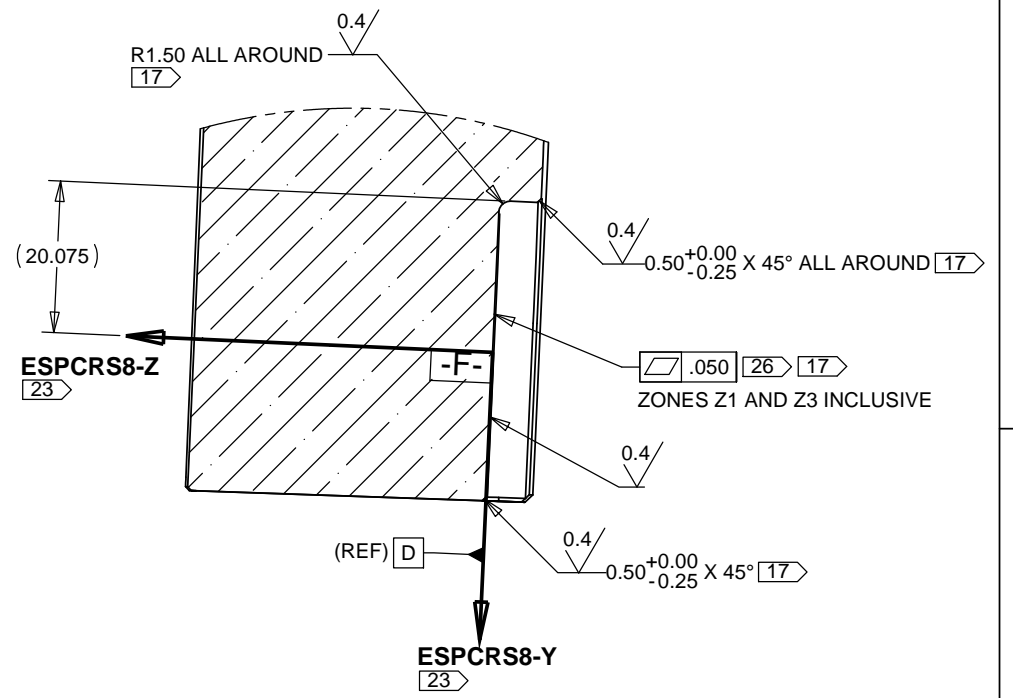
ZONE Z3
 .100 D E F
 17 26

ZONE Z4
 .200 D E F
 17 26

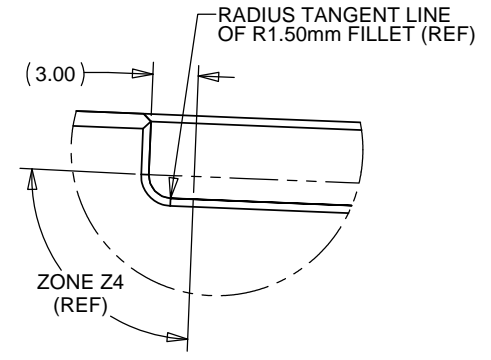
.100 D E F
 17 26

.100 D E F
 17 26

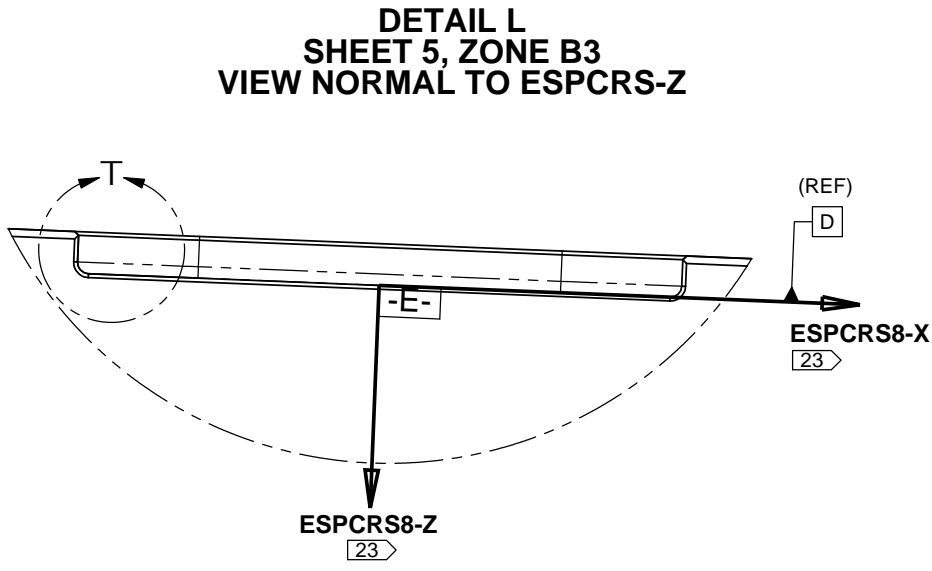
ZONE Z1
 .100 D E F
 .030 D
 .020
 17 26



**SECTION M-M
 VIEW NORMAL TO ESPCRS-X**

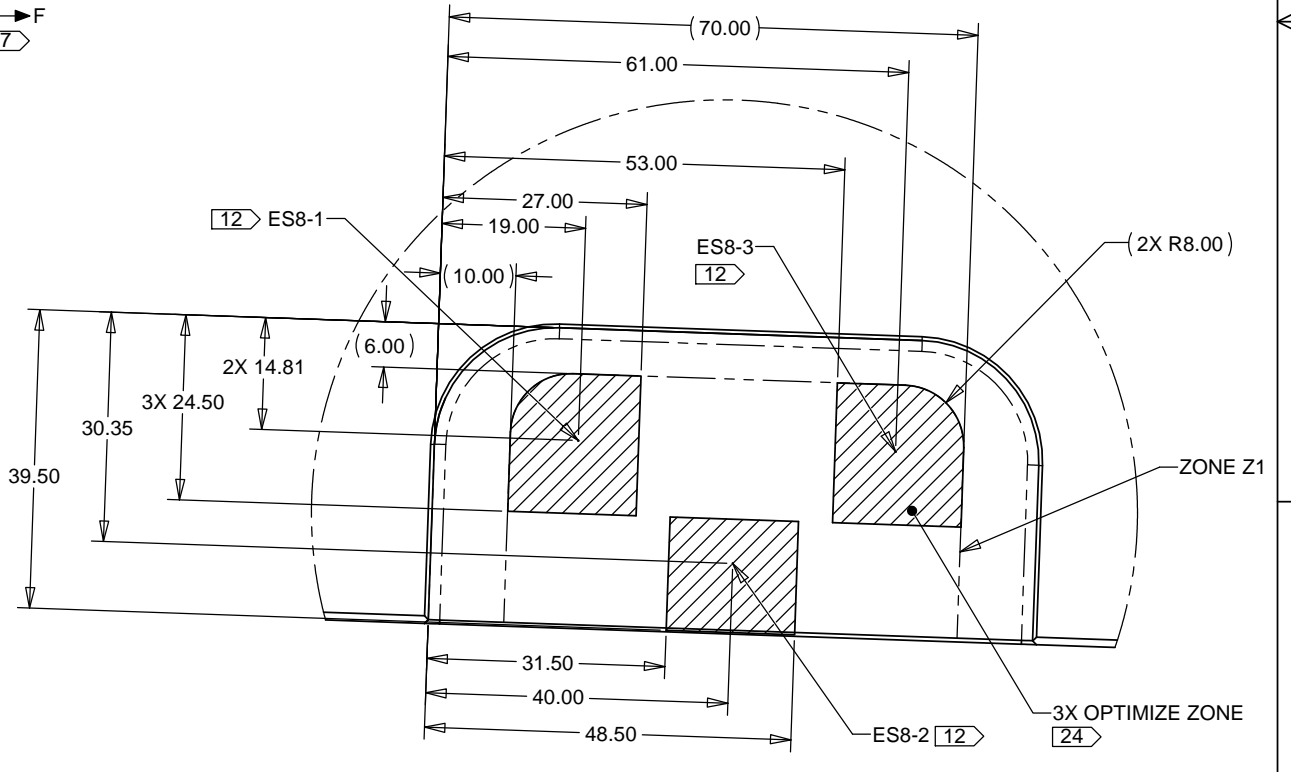


**DETAIL T
 SCALE 4:1**



**DETAIL L
 SHEET 5, ZONE B3
 VIEW NORMAL TO ESPCRS-Z**

**SECTION N-N
 VIEW NORMAL TO ESPCRS-Y**



**DETAIL W
 SHEET 3, ZONE B7**

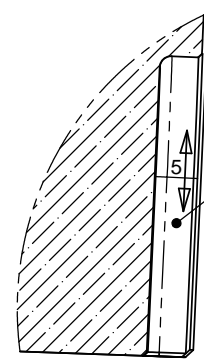
DWG. NO. M1S-001-01000	REV K	SHEET NO. 7 of 10
SCALE 2:1	SHEET SIZE D	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

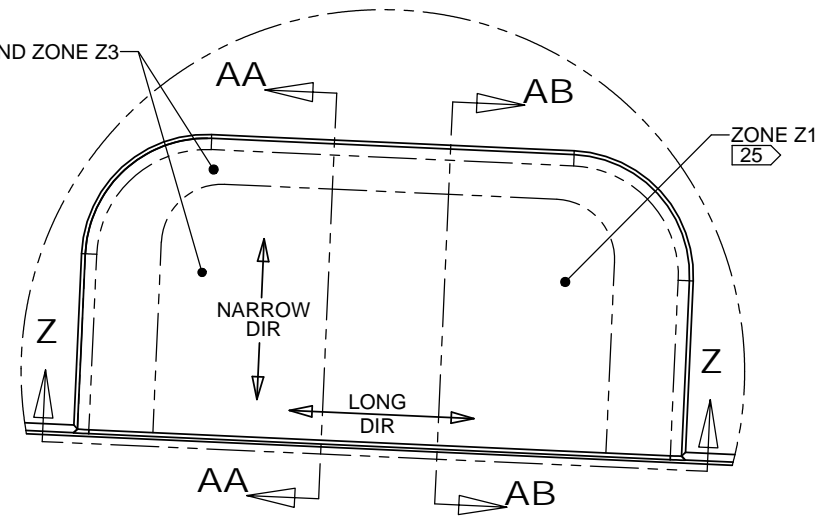
D

D



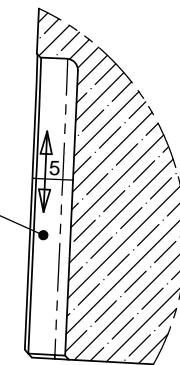
SECTION AB-AB
POCKET RIGHT SIDE FACE
INSPECTION PROBE POINTS

SURFACE INSPECTION
PROBE POINTS, 2X5 PATTERN
25



DETAIL Y
POCKET BOTTOM FACE
INSPECTION PROBE POINTS
SHEET 5, ZONE B2

SURFACE INSPECTION
PROBE POINTS, 2X5 PATTERN
25



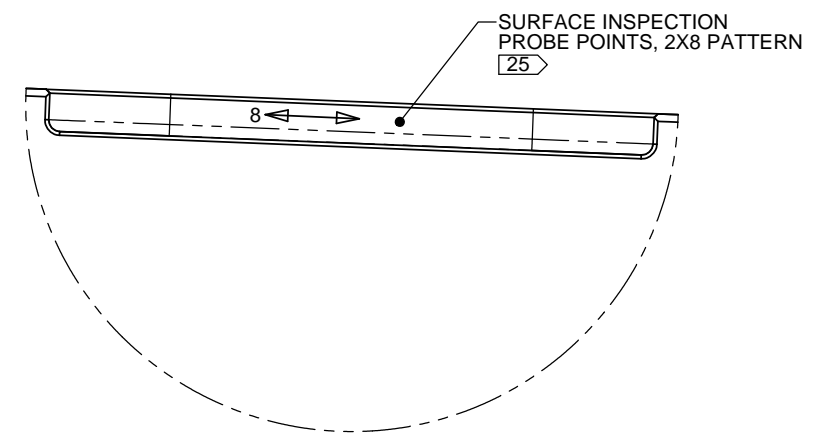
SECTION AA-AA
POCKET LEFT SIDE FACE
INSPECTION PROBE POINTS

C

C

B

B



VIEW Z-Z
POCKET BACK FACE
INSPECTION PROBE POINTS

SURFACE INSPECTION
PROBE POINTS, 2X8 PATTERN
25

A

A

8 7 6 5 4 3 2 1

DWG. NO. M1S-001-01000	REV K	SHEET NO. 8 of 10
SCALE 2:1	SHEET SIZE D	

8

7

6

5

4

3

2

1

NOTES: UNLESS OTHERWISE SPECIFIED

- 1. ALL DIMENSIONS IN MILLIMETERS.
- 2. DIMENSIONS AND TOLERANCING SHALL BE INTERPRETED PER ASME Y14.5M-2009. DATUM -D-, -E- AND -F- SYMBOLOGY SHALL BE INTERPRETED PER ANSI Y14.5 - 1982 TO CLEARLY ILLUSTRATE THE DATUMS AS THE PLANE CONTAINING THE ESPCRS X, Y AND Z COORDINATE AXES.
- 3. THIS DRAWING IS COMPLETE ONLY WHEN USED IN CONJUNCTION WITH THE TMT ROUNDEL POLISHING SPECIFICATION (TMT.OPT.SPE.15.002) AND THE SEGMENTATION DATABASE (TMT.OPT.TEC.07.044).
- 4. SURFACE TEXTURE PER ANSI/ASME Y14.36M-1996.

5 FOR REFERENCE: INDICATED CONVEX BACK SURFACE SHALL BE GROUND AND POLISHED AS SPECIFIED ON DRAWING M1S-001-01001.

6 DATUMS -A-, -B-, -C-, -X-, -Y- AND -Z- SHALL BE DEFINED AS DESCRIBED BELOW:

DATUM -A- IS THE PLANE THROUGH THE CENTERS OF THE THREE 1.500" DIAMETER TOOLING BALLS

DATUM -B- IS THE BEST FIT CIRCLE THROUGH THE CENTERS OF THE THREE 1.500" DIAMETER TOOLING BALLS.

DATUM -C- IS THE INDICATED TOOLING BALL CENTER POINT. THE CENTER POINT IS THEORETICALLY COINCIDENT WITH THE PSACRS Y-Z PLANE.

DATUM -X- IS DEFINED USING THE Z COORDINATES OF THREE S1 PROBE POINTS LOCATED AT 60, 180 AND 300 DEGREES AS FOLLOWS, OR ALTERNATE METHOD APPROVED BY TMT:

X_1 = MEASURED_HEIGHT_OF_PROBE_POINT1 - ZPSA_PP1 = 0
 X_2 = MEASURED_HEIGHT_OF_PROBE_POINT2 - ZPSA_PP2 = 0
 X_3 = MEASURED_HEIGHT_OF_PROBE_POINT3 - ZPSA_PP3 = 0

FOR REFERENCE: DATUM -X- IS COINCIDENT WITH THE PSACRS X-Y PLANE, WHICH IS REFERENCED BY THE SEGMENTATION DATABASE TO DEFINE SEGMENT BASIC DIMENSIONS AND THEORETICAL OPTICAL SURFACE SHAPE.

DATUM -Y- IS THE THEORETICAL OPTICAL PRESCRIPTION CENTERED ON BEST FIT CENTER OF THE SIX FIDUCIALS.

DATUM -Z- IS THE EXISTING POLISHER CLOCKING MARK.

7 THE PSA COORDINATE REFERENCE SYSTEM ORIGIN IS A POINT ON THE OPTICAL SURFACE. AFTER THE INITIAL PROCESSING OF THE SEGMENT, IN-PROCESS METROLOGY SHALL REPORT THE LOCATION OF THIS POINT RELATIVE TO FIDUCIALS ON THE SEGMENT.

8 HEXAGON CORNER POINTS (P1-6) ARE DEFINED IN THE SEGMENTATION DATABASE (TMT.OPT.TEC.07.044). CORNER POINT COORDINATES ARE TO BE TREATED AS BASIC DIMENSIONS PRIOR TO ADDING CHAMFERS AND RADII.

9. SEGMENT THICKNESS SHALL BE MEASURED AT THE SIX CORNERS AND RECORDED AS T1 - T6. MEASUREMENT SHALL BE MADE WITHIN 10mm OF THE CORNER. THICKNESS SHALL ALSO BE MEASURED AT THE CENTER AND RECORDED AS T7 PRIOR TO MACHINING CENTRAL DIAPHRAGM POCKET.

10 MEAN SEGMENT THICKNESS (T_MEAN) SHALL BE DEFINED USING THE SEVEN MEASURED THICKNESS VALUES FROM NOTE 9 AS FOLLOWS:
T_MEAN = (T1 + T2 + T3 + T4 + T5 + T6 + 6 * T7) / 12

11 THE CENTRAL POCKET DEPTH IS DETERMINED BASED ON THE MEASURED MEAN SEGMENT THICKNESS DETERMINED IN NOTE 10. THE POCKET DEPTH DIMENSION "Z_POCKET" IS CALCULATED AS 37.311 + ((T_MEAN - 45) / 2). THE DIMENSION "Z_POCKET" SHALL BE TREATED AS A BASIC DIMENSION.

12 MEASURE AND RECORD MIRROR THICKNESS WITHIN ±0.025mm AT THE THREE EDGE SENSOR FOOT CENTERS OF CONTACT SHOWN FOR EACH EDGE SENSOR POCKET, AS VIEWED FROM THE BACK SURFACE.

13 MARK SEGMENT IN AREA INDICATED WITH EDGE SENSOR IDENTIFIER USING BLACK 2 COMPONENT PERMANENT EPOXY INK, ENTHONE M SERIES, OR EQUIVALENT UPON PRIOR APPROVAL FROM TMT. IDENTIFIER SHALL BE OF THE FORM "nD" or "nS" WHERE n IS THE NUMBER OF THE EDGE SENSOR. "D" REPRESENTS A DRIVE HALF, AND "S" REPRESENTS A SENSE HALF. CHARACTER HEIGHT SHALL BE 12±/3MM. SENSOR MARKINGS (1-12) SHALL BE AS SHOWN ON SHEET 8 AND APPLIED PER TMT PROCEDURE TBD.

14 SEGMENT EDGES CAN BE FINISHED EITHER BY DIAMOND-SAW CUTTING OR BY FIXED ABRASIVE GRINDING. THE EDGES SHALL MEET THE PROFILE AND SURFACE ROUGHNESS REQUIREMENTS SPECIFIED ON THIS DRAWING. THE EDGE FINISHING PROCESS SHALL BE APPROVED BY TMT.

15 ENGRAVE USING FIXED ABRASIVE OR GRIT BLAST IN INDICATED ZONE WITH 20-30mm HIGH CHARACTERS "YYN" (WHERE "YY" IS THE SEGMENT TYPE AND "N" IS A UNIQUE COUNTRY OF ORIGIN LETTER). PART MARKING SHALL BE LOCATED AND ORIENTED AS SHOWN, CENTERED ON THE PRINCIPAL OPTICAL AXIS WITHIN ±3mm AND PERPENDICULAR TO THE PRINCIPAL OPTICAL AXIS WITHIN ±3mm. ENGRAVING METHOD SHALL BE PERMANENT. METHOD SHALL NOT RESULT IN SIGNIFICANT SUBSURFACE DAMAGE NOR LEAVE SHARP EDGES. FIXED ABRASIVE GRAIN SIZE SHALL BE 22 MICRONS MAXIMUM. CORNER RADIUS OF FIXED ABRASIVE TOOL, IF USED, SHALL BE 0.25mm OR LARGER. METHOD SHALL BE APPROVED BY TMT.

16 EXISTING SEGMENT IDENTIFICATION APPLIED ON POLISHED ROUNDEL. SEE DRAWING M1S-001-01001.

17 CENTER POCKET SIDE, BOTTOM FACE, RADIUS AND CHAMFER; SEGMENT EDGE CHAMFERS AND CORNER RADII; TOOLING INTERFACE COUNTERSINKS, CHAMFERS AND RADII; AND EDGE SENSOR POCKET SURFACES, CHAMFERS AND RADII SHALL HAVE A SMOOTH GROUND FINISH. THESE FEATURES SHALL MEET THE DIMENSIONAL TOLERANCE AND SURFACE ROUGHNESS REQUIREMENTS SPECIFIED ON THIS DRAWING. IN ORDER TO MINIMIZE SUBSURFACE DAMAGE, GRINDING SHALL BE DONE IN STEPS USING PROGRESSIVELY SMALLER ABRASIVE GRAINS. EACH GRINDING STEP SHALL REMOVE MATERIAL TO A DEPTH OF AT LEAST 1.5X THE GRAIN SIZE OF THE PREVIOUS GRINDING STEP. THE FINAL GRINDING STEP SHALL UTILIZE AN ABRASIVE GRAIN SIZE OF 22 MICRONS MAXIMUM. GRINDING PROCESS QUALIFICATION SHALL DEMONSTRATE LESS THAN 20 MICRON SUBSURFACE DAMAGE DEPTH. PROCESS SHALL BE APPROVED BY TMT.

18 FOR REFERENCE ONLY: POCKET DIAMETER SHOWN IS 0.100mm SMALLER THAN FINAL (NOMINAL) DIAMETER. THE CYLINDRICAL SIDE OF THE POCKET WILL BE ETCHED, REMOVING 20 TO 50 MICRONS OF MATERIAL, DURING BONDED MIRROR ASSEMBLY (M1S-001-04000). THE FINAL DIAMETER OF THE POCKET AFTER ETCHING SHALL BE 156.000 +0.050/-0.110, AS SHOWN ON M1S-001-04000.

19 FOR REFERENCE: OPTICAL SURFACE AND BACK SURFACE COSMETICS SHALL BE AS SPECIFIED IN THE TMT ROUNDEL POLISHING SPECIFICATION (TMT.OPT.SPE.15.002).

20. INTENTIONALLY LEFT BLANK.

21 ASSEMBLY FEATURE: ASSEMBLY TOOLING KINEMATIC LOCATING FEATURES. TOOLING KINEMATIC LOCATING FEATURES SHALL BE MACHINED PRIOR TO HEX CUTTING, MACHINING EDGE SENSOR POCKETS AND MACHINING THE CENTRAL DIAPHRAGM POCKET IN ORDER TO ESTABLISH THE PSACRS.

22. VIEWS SHOWN ON SHEET 7 DETAIL THE DIMENSIONS, LOCATION AND ORIENTATION FOR 1 OF THE 12 EDGE SENSOR INTERFACES. THE LOCATION AND ORIENTATION OF EACH OF THE 12 INTERFACES IS UNIQUE.

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DWG. NO. M1S-001-01000	REV K	SHEET NO. 9 of 10
SCALE 1:1	SHEET SIZE D	

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NOTES: UNLESS OTHERWISE SPECIFIED (CONTINUED)

23) COORDINATES OF THE EDGE SENSOR POCKET ORIGINS AND UNIT VECTORS DEFINING THE EDGE SENSOR POCKET COORDINATE SYSTEMS ARE SPECIFIED IN THE SEGMENTATION DATABASE (TMT.OPT.TEC.07.044). THESE COORDINATES ARE REFERENCED FROM THE PSACRS AND SHALL BE TREATED AS BASIC DIMENSIONS. FOR EACH POCKET, THE UNIT VECTORS DEFINE DATUMS -D-, -E- AND -F- AS FOLLOWS:

DATUM -D- SHALL BE THE ESPCRS-X / ESPCRS-Y PLANE
DATUM -E- SHALL BE THE ESPCRS-X / ESPCRS-Z PLANE
DATUM -F- SHALL BE THE ESPCRS-Y / ESPCRS-Z PLANE

THE EDGE SENSOR POCKET GEOMETRY SHALL BE DEFINED RELATIVE TO DATUMS -D-, -E- AND -F-. THE EDGE SENSOR POCKET BOTTOM FACE IS NORMAL TO THE THEORETICAL ESPCRS-Z AXIS, AND COINCIDENT WITH THEORETICAL DATUM -D-, WITHIN THE SPECIFIED TOLERANCES.

24) TOOL PATH SHALL BE OPTIMIZED TO PROVIDE MAXIMUM COPLANARITY AND SUPERIOR SURFACE FINISH WITHIN THE THREE RECTANGULAR ZONES INDICATED, 3mm ALL AROUND THE ACTUAL EDGE SENSOR FOOTPRINT.

25) EDGE SENSOR POCKET SURFACES SHALL BE INSPECTED USING CMM BY PROBING AT THE NUMBER OF POINTS SPECIFIED HEREIN AFTER ALL FABRICATION IS COMPLETE. ZONE Z1 SHALL BE PROBED AT 50 EQUALLY (APPROXIMATELY) SPACED POINTS (10 POINTS IN THE LONG DIRECTION AND 5 POINTS IN THE NARROW DIRECTION). ZONES Z1 AND Z3 INCLUSIVE SHALL BE PROBED AT 98 EQUALLY (APPROXIMATELY) SPACED POINTS (14 POINTS IN THE LONG DIRECTION AND 7 POINTS IN THE NARROW DIRECTION). POCKET SIDES SHALL BE PROBED AT 10 POINTS (TWO SETS OF 5 APPROXIMATELY EQUALLY SPACED POINTS IN THE LONG DIRECTION). POCKET BACK SURFACE SHALL BE PROBED AT 16 POINTS (TWO SETS OF 8 APPROXIMATELY EQUALLY SPACED POINTS IN THE LONG DIRECTION). SUPPLIER MAY PROPOSE ALTERNATIVE INSPECTION PLAN. POCKET INSPECTION PLAN SHALL BE APPROVED BY TMT.

26) THE BOTTOM SURFACE OF EACH EDGE SENSOR POCKET CONTAINS THREE SEPARATELY TOLERANCED ZONES THAT SHALL BE WITHIN THE TOLERANCES SPECIFIED. ZONE Z1 IS THE EDGE SENSOR MOUNTING SURFACE. THE EDGE SENSOR BOOT BASE MOUNTING FEET MAY ALSO PROTRUDE INTO THIS ZONE. ZONE Z3 IS PRIMARILY THE EDGE SENSOR BASE PAD CONTACT SURFACE. ZONE Z4 EXTENDS FROM THE POCKET EDGE ACROSS THE FILLET RADIUS AND ONTO THE BOTTOM SURFACE TO A DISTANCE 1.5mm INWARD. SURFACE DISCONTINUITIES WITHIN THE SPECIFIED TOLERANCE, SUCH AS SMALL STEPS, ARE PERMITTED IN ZONE 4. ZONES Z1 AND Z3 (EXCLUDING ZONE Z4) SHALL BE WITHIN THE FLATNESS SHOWN ON SHEET 7, ZONE D1.

27) OPTICAL PRESCRIPTION MAY HAVE A CLOCKING OFFSET WITH RESPECT TO THE DATUM Z FIDUCIALS (SCRIBE COORDINATE SYSTEM); HOWEVER, THE DIRECTION (SIGN) AND ANGLE (θ) OF THE CLOCKING SHALL BE SPECIFIED IN THE DELIVERED DATA PACKAGE WITH A TOLERANCE OF $\pm 130 \mu\text{Rad}$.

28) ANGLE ALPHA (α) DEFINES THE ANGLE BETWEEN THE PSACRS X AXIS AND THE PRINCIPAL OPTICAL AXIS (RM1) FOR EACH SEGMENT TYPE.

29) ENGRAVE USING FIXED ABRASIVE OR GRIT BLAST IN INDICATED ZONE WITH 20-30mm HIGH CHARACTERS "Y". PART MARKING SHALL BE LOCATED AND ORIENTED AS SHOWN, CENTERED ON THE PSACRS +Y AXIS $\pm 3\text{mm}$. ENGRAVING METHOD SHALL BE PERMANENT. METHOD SHALL NOT RESULT IN SIGNIFICANT SUBSURFACE DAMAGE NOR LEAVE SHARP EDGES. FIXED ABRASIVE GRAIN SIZE SHALL BE 22 MICRONS MAXIMUM. CORNER RADIUS OF FIXED ABRASIVE TOOL, IF USED, SHALL BE 0.25mm OR LARGER. METHOD SHALL BE APPROVED BY TMT.

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DWG. NO.	REV	SHEET NO.
M1S-001-01000	K	10 of 10
SCALE 1:1	SHEET SIZE D	

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