

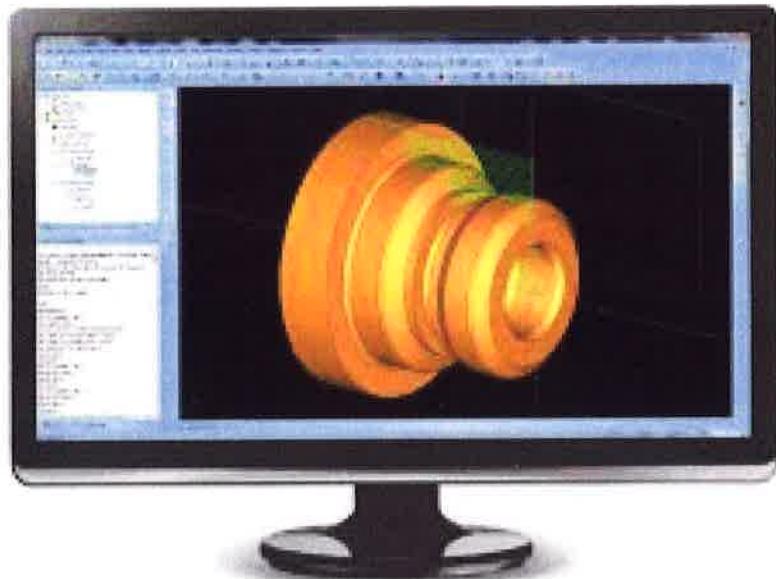


Department of Engineering Technology



COMPUTER INTEGRATED MANUFACTURING (CIM)

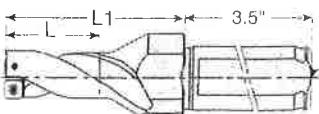
(MT-491) *Laboratory Manual*



STUDENT'S NAME:

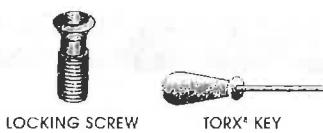
Prepared by Prof. J Goldenberg

DR Series Indexable Drills



REPLACEMENT PARTS

DESCRIPTION	MODEL	ORDER #	PRICE EACH
Locking Screw	SR34-508	19-617-923	\$3.83
Torx® Key	T-7/51	19-617-930	3.67



DRILLS

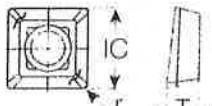
MODEL #	DIMENSIONS	USE SCREW #	USE TORX® KEY #	USE INSERT #	ORDER #	PRICE EACH
DR071-142-100-2	0.71" DIA. 1.42" L 2.67" L1	SR 34-508	T-7/51	XOMT 060204 or SOMT 060204	19-618-696*	\$301.99
DR079-157-100-2	0.79 1.57 2.89	SR 34-508	T-7/51	XOMT 060204 or SOMT 060204	19-618-698	301.99
DR081-163-100-2	0.81 1.63 2.98	SR 34-508	T-7/51	XOMT 060204 or SOMT 060204	19-625-811	336.41
DR083-165-100-2	0.83 1.65 3.00	SR 34-508	T-7/51	XOMT 060204 or SOMT 060204	19-618-393	336.41

*Limited Supply.

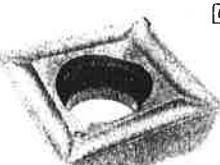
Carbide Inserts For DR Series Drills

◆ See Page 346 For Iscar Grade Chart.

INSERT #	GRADE	DIMENSIONS			ORDER #	PRICE EACH	
		I.C.	WIDTH	RADIUS		1-9 PCS.	10+ PCS.
XOMT 060204DT	IC-328	0.236"	0.1"	0.016"	19-620-387	\$9.68	\$8.71
SOMT 060204DT	IC-328	0.236	0.077	0.016	19-636-535	9.68	8.71



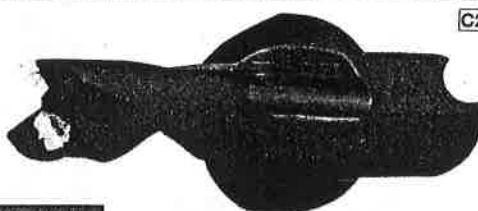
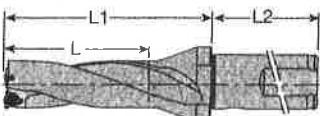
QUANTITY DISCOUNT



XOMT 060204DT

DZ Series Indexable Drills

Tool design provides more room in the flutes for better chip evacuation, especially on turning machines



DRILLS

MODEL #	DIA.	L	L1	L2	USE SCREW #	USE TORX® KEY #	USE INSERT #	ORDER #	PRICE EACH
DZ0937-2108-125-2.5	0.94"	2.11"	3.47"	3.70"	SR 14-560	T-8/51	WOLH 2.5-1	19-621-571	\$336.41
DZ0984-2214-125-2.5	0.98	2.21	3.60	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-572	336.41
DZ1000-2250-125-2.5	1.00	2.25	3.64	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-573	336.41
DZ1031-2320-125-2.5	1.03	2.32	3.71	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-574	378.45
DZ1062-2389-125-2.5	1.06	2.39	3.80	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-575	378.45
DZ1125-2531-125-2.5	1.13	2.53	4.09	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-576	378.45
DZ1187-2671-125-2.5	1.19	2.67	4.19	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-577	378.45
DZ1219-2743-125-2.5	1.22	2.74	4.32	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-578	420.50
DZ1250-2812-125-2.5	1.25	2.81	4.45	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-579	420.50
DZ1281-2882-125-2.5	1.281	2.88	4.56	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-580	420.50
DZ1312-2952-125-2.5	1.31	2.95	4.56	3.70	SR 14-560	T-8/51	WOLH 2.5-1	19-621-581	420.50
DZ1375-3094-150-3	1.38	3.09	4.76	4.00	SR14-562	T-10/51	WOLH 3-1	19-637-891	420.50
DZ1437-3233-150-3	1.44	3.23	5.00	4.00	SR14-562	T-10/51	WOLH 3-1	19-637-892	420.50
DZ1469-3305-150-3	1.47	3.31	5.00	4.00	SR14-562	T-10/51	WOLH 3-1	19-637-893	441.52
DZ1500-3375-150-3	1.50	3.36	5.12	4.00	SR14-562	T-10/51	WOLH 3-1	19-637-894	441.52
DZ1562-3514-150-3	1.56	3.51	5.31	4.00	SR14-562	T-10/51	WOLH 3-1	19-638-366	441.52
DZ1625-3656-150-3	1.63	3.66	5.43	4.00	SR14-562	T-10/51	WOLH 3-1	19-637-895	441.52
DZ1687-3796-150-3	1.69	3.8	5.69	4.00	SR14-562	T-10/51	WOLH 3-1	19-637-896	481.27
DZ1750-3937-150-3	1.75	3.94	5.79	4.00	SR14-562	T-10/51	WOLH 3-1	19-637-911	481.27
DZ1812-4077-150-4	1.81	4.08	6.06	4.00	SR 14-544/S	T-15/51	WOLH 4-1	19-637-912	481.27
DZ1875-4219-150-4	1.88	4.22	6.18	4.00	SR 14-544/S	T-15/51	WOLH 4-1	19-637-913	481.27
DZ1937-4358-150-4	1.94	4.36	6.44	4.00	SR 14-544/S	T-15/51	WOLH 4-1	19-637-914	524.58
DZ2000-4500-150-4	2.00	4.5	6.65	4.00	SR 14-544/S	T-15/51	WOLH 4-1	19-637-915	524.58
DZ2125-4781-150-4	2.13	4.78	7.04	4.00	SR 14-544/S	T-15/51	WOLH 4-1	19-637-916	524.58

APPLICATIONS:

- For use on CNC machining centers with thru-spindle or external coolant.
- For non-rotating CNC tools.

FEATURES:

- No spot or center drilling needed.
- Drill ranges from .625" to 2.125".
- Longer tool life than regular H.S.S. drills with higher speed and feed rates.
- Choice of drill depth: 2.5ø, 3ø or 4ø

REPLACEMENT PARTS

MODEL #	ORDER #	PRICE EACH
TORX® KEY		
T-8/51	19-623-699	\$5.28
T-10/51	19-618-879	5.60
LOCKING SCREW		
SR14-560	19-632-071	\$3.43
SR14-562	19-631-635	3.43
SR14-544/S	19-615-466	2.38

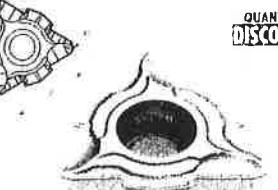
Carbide Inserts For DZ Series Drills

◆ See Page 346 For Iscar Grade Chart.

INSERT #	GRADE	DIMENSIONS			ORDER #	PRICE EACH	
		I.C.	W	R		1-9 PCS.	10+ PCS.
WOLH 2.5-1-SW	IC-328	0.315"	0.150"	0.016"	19-621-830	\$10.83	\$9.75
WOLH 3-1-SW	IC-328	0.394	0.150	0.016	19-625-484	11.90	10.71
WOLH 4-1-SW	IC-328	0.472	0.187	0.016	19-625-101	12.49	11.24



QUANTITY DISCOUNT



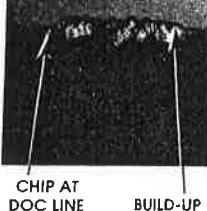
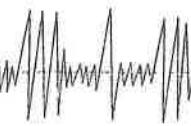
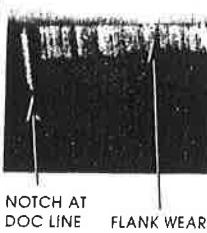
Valenite Grade Information

COATING PROCESS	VALENITE GRADE	ANSI CLASS	ISO CLASS	COATING	OPERATION	APPLICATION	APPLICATION MATERIALS
MTCVD	VP1120	C2, C3, C7	K05-20, P05-P20	TiCN/Oxide	Milling	Light Roughing to Finishing	Cast Irons
MTCVD	VP1130	C1, C2, C3	K20-K40	TiCN/Oxide	Milling	General Machining	Cast Irons, Ductile Irons
MTCVD	VP1310	C2, C3, C7	K05-20, P05-P20	TiCN/Oxide	Drilling	Light Roughing to Finishing	Cast Irons
MTCVD	VP1505	C2	K05-10	TiCN/Oxide/TiC	Turning	High Speed Finishing	Gray & Ductile Cast Irons, Steels
MTCVD	VP1510	C2, C3, C7	K05-20, P05-P20	TiCN/Oxide	Turning	Finishing to General Machining	Gray & Ductile Cast Irons, Steels
MTCVD	VP1710	C2, C3, C7	K05-20, P05-P20	TiCN/Oxide	Grooving	Finishing to General Machining	Steel, Cast Iron
MTCVD	VP5135	C5, C6	P25-40, M20-40	TiCN/Oxide/TiN	Milling	Rough & Poor Milling Conditions	Steel & Stainless Steel
MTCVD	VP5142	C5, C6	P25-P40, M20-30	TiCN/Oxide/TiN	Milling	General Purpose - Roughing	Carbon & Alloy Steels
MTCVD	VP5515	C6, C7, C2, C3	P10-25, K10-20	TiCN/Oxide/TiN	Turning	General Finishing	Steels
MTCVD	VP5525	C5, C6, C2	P15-35, M15-35	TiCN/Oxide/TiN	Turning	Semi-Finishing to Roughing	Steel, Stainless Steel
MTCVD	VP5535	C5, C1, C2	P25-40, M25-40	TiCN/Oxide/TiN	Turning	General Machining to Roughing	Steel, Stainless Steel
MTCVD	VP5715	C3, C6	P10-P25, K10-K20	TiCN/Oxide/TiN	Grooving	Finishing to General Machining	Steel, Iron
MTCVD	VP5735	C5, C6	P25-50, M25-40, S25-40	TiCN/Oxide/TiN	Grooving	General Machining to Roughing	Steel, Cast Iron
MTCVD	VP8335	C5, C6	P25-50, M25-40, S25-40	TiCN/Oxide/TiN	Drilling	Continuous and Interrupted Cuts	Steel & Stainless Steel
MTCVD	VP8535	C5, C6	P25-50, M25-40, S25-40	TiCN/Oxide/TiN	Turning	Semi-Finishing to Roughing	Steel, Stainless Steel
—	VP6020	C7, C8 Cermet	P01-P25	—	Milling	Finishing	Iron, Hardened Steels
—	VPB125	CBN	K01-15, H15-25	—	Grooving	Roughing to Finishing	Hardened Steels
—	VPC225	CBN	K01-15, H15-25	—	Turning	Semi-Finishing to Finishing	Aluminum All Si Content & Non-Ferrous
—	VPD705	PCD	N01-15	—	General Purpose	Roughing to Super Finishing	Aluminum All Si Content & Non-Ferrous
—	VPD720	PCD	N01-15	—	General Purpose	Roughing to Finishing	Non-Ferrous
—	VPUK10	C2	K05-10	—	Turning	Finishing	Irons, Steels
—	VPUK20	C2	M10-M25, K10-K30, N5-N25, S10-S20	—	General Purpose	General	Cast Irons, High Temp Alloys, Aluminum Alloys & Non-Ferrous
—	VPUP10	C2	M10-M20, S10-S20	—	Turning	Purpose	Hi-Temp
—	VPUP30	C5, C6	P20-30, M20-40	—	Milling	Finishing	Steel, Stainless Steel
—	VPUS10	C2, C3	N5-25, S5-20	—	Turning	Roughing, Interrupted Cuts, Thread & Groove	Non-Ferrous, High Temp
—	VPUS25	C2	M20-40	—	Turning, Milling	Light Roughing to Finishing	Stainless, Hi-Temp
PVD	VP1020	C2, C5	K10-K25, P10-P30, M10-M30, S15-S25, N10-N25	TiAlN/TiN	Milling	Roughing	Cast Irons
PVD	VP5005	C1, C7	P5-15, M5-15, K5-15, N5-15, S5-15	TiAlN/TiN	Ball Milling	Finishing	Stainless Steels, Steels
PVD	VP5007	C1, C7	P5-20, M5-20, K5-20, N5-20, S5-20	TiAlN	Milling	Finishing to Light Duty	Steel, Stainless Steel, Iron, Non-Ferrous, High Temp
PVD	VP5020	C2, C3, C6, C7	P10-30, M10-25, K10-20	TiAlN/TiN	Milling	Semi-Finishing, Finishing	Steels, Stainless Steels, Cast Irons, & Aluminum
PVD	VP5035	C5, C6	P30-P50, M20-40	TiAlN	Milling	Semi-Finishing to Roughing	Steels, Stainless Steels
PVD	VP5040	C1, C5	P25-50, M20-40	TiAlN/TiN	Milling	General Finishing to Roughing	Steels, Stainless Steels, & High Temp Alloys
PVD	VP5045	C1, C5	P25-50, M20-41	TiAlN/TiN	Milling	General Finishing to Roughing	Steels, Stainless Steels, & High Temp Alloys
PVD	VP5225	C2, C3, C6, C7	P10-30, M10-25, K10-20	TiAlN/TiN	Drilling	General Purpose	Steel
PVD	VP5320	C2, C3, C6, C7	P10-30, M10-25, K10-20	TiAlN/TiN	Drilling	General Purpose	Steel
PVD	VP5415	C2, C3, C7	K05-20, P05-P20	TiN	Threading	General Machining	Cast Irons, Ductile Irons
PVD	VP5815	C2, C5	K10-K25, P10-P30, M10-M30, S15-S25, N10-N25	TiAlN/TiN	Groove, Slot Mill	General Finishing to Light Roughing	Steels, Stainless Steels, Irons & High Temp Alloys
PVD	VP5820	C2, C5, C6	P15-40, M15-35, K20-40, S20-35, N15-30	TiAlN/TiN	Grooving	Roughing to General Finishing	Steels, Stainless Steels, Irons, High Temp & Non-Ferrous Alloys
PVD	VP5825	C2, C5, C6	P15-40, M15-35, K20-40, S20-35, N15-30	TiAlN/TiN	Grooving	Roughing to General Finishing	Steels, Stainless Steels, Irons, High Temp & Non-Ferrous Alloys
PVD	VP5845	C5, C6	P40-50, M30-45, S35-45	TiAlN/TiN	Slot Mill, Groove	Roughing to General Machining	Steels, Stainless Steels, & High Temp Alloys
PVD	VP7615	C2, C3	N5-25, S5-20	TiAlN/TiN	Turning	Semi-Finishing, Finishing	Aluminum Alloys, Non-Ferrous & High Temp Alloys
PVD	VP9610	C2	P5-15, M5-15, K5-15, N5-15, S5-15	TiAlN/TiN	Turning	Finishing	Steels, Stainless Steels, & High Temp Alloys
PVD	VP9615	C2, C5	K10-K25, P10-P30, M10-M30, S15-S25, N10-N25	TiAlN	Turning	Semi-Finishing	Irons, Steels, Stainless Steels, & High Temp Alloys
PVD	VP9620	C2	K20	TiN	Turning	Roughing	Cast Iron
PVD	VP9625	C2, C5	M30-M40	TiN	Turning	Roughing	Stainless Hi-Temp
COATED	VPZ205	Ceramic	H10	Coated Alumina Ceramic	Turning	Finishing	Hardened Steels, Select Steel & Iron Applications
COATED	VPZ215	Ceramic	H15	Coated Alumina Ceramic	Turning	Finishing with Mild Interruptions	Hardened Steels, Select Steel & Iron Applications

lenite Insert Geometry Application Data

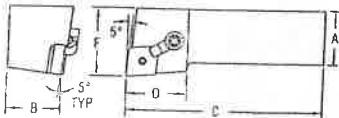
ANSI NEGATIVE	CHIPBREAKER PROFILE	MATERIAL	APPLICATION RANGE	FEATURES & BENEFITS
P2	<p>15° 0.012</p> <p>15° POSITIVE CUTTING ANGLE</p>	Steels Stainless Steels Cast Irons Non-Ferrous Material High Temperature Alloys Hardened Material	<p>DEPTH OF CUT 0.0 0.4 0.8 1.2 1.6 2.0 2.4 2.8</p> <p>FEED RATE 0.10 0.20 0.30 0.40 0.50</p>	<ul style="list-style-type: none"> Finishing applications. Good chip control on light cuts. <p>Main application area:</p> <ul style="list-style-type: none"> FEED = 0.002" - 0.016" DOC = 0.012" - 0.120"
M3	<p>6° 0.015</p> <p>6° POSITIVE CUTTING LAND ANGLE</p>	Steels Stainless Steels Cast Irons Non-Ferrous Material High Temperature Alloys Hardened Material	<p>DEPTH OF CUT 0.0 0.4 0.8 1.2 1.6 2.0 2.4 2.8</p> <p>FEED RATE 0.10 0.20 0.30 0.40 0.50</p>	<ul style="list-style-type: none"> Finishing to semi-finishing. Neutral land for greater edge strength. Medium to high feed rates. Good for slight to moderate interrupted cuts. <p>Main application area:</p> <ul style="list-style-type: none"> FEED = 0.004" - 0.017" DOC = 0.015" - 0.150"
M5	<p>7° 0.020</p> <p>7° POSITIVE CUTTING LAND ANGLE</p>	Steels Stainless Steels Cast Irons Non-Ferrous Material High Temperature Alloys Hardened Material	<p>DEPTH OF CUT 0.0 0.4 0.8 1.2 1.6 2.0 2.4 2.8 3.2</p> <p>FEED RATE 0.10 0.20 0.30 0.40 0.50</p>	<ul style="list-style-type: none"> General machining/semi-finishing to light-roughing. Wide range of materials. Positive cutting angle. Medium feed rates and medium depths of cut. <p>Main application area:</p> <ul style="list-style-type: none"> FEED = 0.005" - 0.023" DOC = 0.020" - 0.300"
R3	<p>0° 0.040</p> <p>NEUTRAL CUTTING LAND ANGLE</p>	Steels Stainless Steels Cast Irons Non-Ferrous Material High Temperature Alloys Hardened Material	<p>DEPTH OF CUT 0.0 0.4 0.8 1.2 1.6 2.0 2.4 2.8 3.2</p> <p>FEED RATE 0.10 0.20 0.30 0.40 0.50</p>	<ul style="list-style-type: none"> Roughing applications. Neutral land for strong edge. Suitable for interrupted cuts. Medium to high feed rates and depths of cut. <p>Main application area:</p> <ul style="list-style-type: none"> FEED = 0.008" - 0.030" DOC = 0.040" - 0.340"
WR	<p>6° 0.020</p> <p>6° POSITIVE CUTTING LAND ANGLE</p>	Steels Stainless Steels Cast Irons Non-Ferrous Material High Temperature Alloys Hardened Material	<p>DEPTH OF CUT 0.0 0.4 0.8 1.2 1.6 2.0 2.4 2.8</p> <p>FEED RATE 0.10 0.20 0.30 0.40 0.50</p>	<ul style="list-style-type: none"> Wiper geometry for finishing. Produces good surface finishes at high feed rates. Can be used to improve surface finish. Light to medium depths of cut. <p>Main application area:</p> <ul style="list-style-type: none"> FEED = 0.006" - 0.020" DOC = 0.020" - 0.080"
WE	<p>4° 0.030</p> <p>4° POSITIVE CUTTING LAND ANGLE</p>	Steels Stainless Steels Cast Irons Non-Ferrous Material High Temperature Alloys Hardened Material	<p>DEPTH OF CUT 0.0 0.4 0.8 1.2 1.6 2.0 2.4 2.8</p> <p>FEED RATE 0.10 0.20 0.30 0.40 0.50</p>	<ul style="list-style-type: none"> Wiper geometry for semi-finishing and finishing. Produces good surface finishes at high feed rates. Can be used to improve surface finish. Medium to heavy depths of cut. <p>Main application area:</p> <ul style="list-style-type: none"> FEED = 0.005" - 0.022" DOC = 0.030" - 0.200"
PM4	<p>20° 0.025</p> <p>20° POSITIVE CUTTING LAND ANGLE</p>	Steels Stainless Steels Cast Irons Non-Ferrous Material High Temperature Alloys Hardened Material	<p>DEPTH OF CUT 0.0 0.4 0.8 1.2 1.6 2.0 2.4 2.8</p> <p>FEED RATE 0.10 0.20 0.30 0.40 0.50</p>	<ul style="list-style-type: none"> Semi-finishing to medium machining. Positive geometry with neutral land. Low to medium feed rates/medium depths of cut. Good chip control on wide variety of applications. <p>Main application area:</p> <ul style="list-style-type: none"> FEED = 0.0035" - 0.0135" DOC = 0.025" - 0.140"

Valenite Failure Mode Guide

PROBLEM/FAILURE MODE	CAUSE	CONTROL ACTION/REMEDY	PROBLEM/FAILURE MODE	CAUSE	CONTROL ACTION/REMEDY
RAPID FLANK WEAR 	<ul style="list-style-type: none"> Excessive cutting speed Work material microstructure contains carbides 	<ul style="list-style-type: none"> Reduce cutting speed Use harder grade Select more Positive rake chipbreaker Flood cutting zone with coolant 	FRACTURE 	<ul style="list-style-type: none"> Improper selection of grade/ chipbreaker and/or cutting conditions 	<ul style="list-style-type: none"> Reduce feed rate Select tougher grade Select stronger chipbreaker Make sure set-up is as rigid as possible
CRATER 	<ul style="list-style-type: none"> Excessive cutting speed Ineffective use of coolant 	<ul style="list-style-type: none"> Reduce cutting speed & feed Select harder grade with oxide coating Select more positive rake chipbreaker Flood cutting zone with coolant 	THERMAL CRACKING 	<ul style="list-style-type: none"> Extreme variation in cutting temperatures Interrupted cut 	<ul style="list-style-type: none"> Reduce feed rate Increase cutting speed Select stronger chipbreaker
BUILT-UP EDGE, TORN FINISH, CHIP WELDING 	<ul style="list-style-type: none"> Low cutting speed Low feed rate Poor shearing action 	<ul style="list-style-type: none"> Increase cutting speed Select more positive rake chipbreaker Select tougher grade (use PVD coated insert) Flood cutting zone with coolant 	POOR SURFACE FINISH 	<ul style="list-style-type: none"> High feed rate Low cutting speed Nose radius too small 	<ul style="list-style-type: none"> Reduce feed rate Increase cutting speed Select more positive rake chipbreaker Flood cutting zone with coolant Use larger nose radius
EDGE CHIPPING 	<ul style="list-style-type: none"> Excessive Feed rate Interrupted cut 	<ul style="list-style-type: none"> Reduce feed rate Select tougher grade Select stronger chipbreaker Increase lead angle 	WORKPIECE CHATTER VIBRATION 	<ul style="list-style-type: none"> Poor set-up Improper insert selection 	<ul style="list-style-type: none"> Use sharp inserts Select more positive rake chipbreakers Increase feed rate Increase lead angle Use smaller nose radius
EXCESSIVE DEPTH-OF-CUT NOTCHING 	<ul style="list-style-type: none"> Scale part High work hardening materials 	<ul style="list-style-type: none"> Increase lead angle Increase cutting speed Select tougher grade Select stronger chipbreaker Vary depth-of-cut if possible 	UNACCEPTABLE CHIP CONTROL (LOW CARBON STEEL) 	<ul style="list-style-type: none"> Low feed rate Large nose radius 	<ul style="list-style-type: none"> Increase feed rate Select smaller nose radius Decrease lead angle

Technical Information Supplied By Valenite,

Valenite MCLNR/L Turning And Facing Toolholders



TOOLHOLDERS

MODEL #	DIMENSIONS				INSERT SIZE	RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
	A	B	C	D				
MCLNR/L 12-4A	0.75"	0.75"	1.000"	4.00"	1.19"	CN .. 432	25-100-002	25-100-036 \$82.00
MCLNR/L 12-4B	0.75	0.75	1.000	4.50	1.19	CN .. 432	25-100-004	25-100-038 82.00
MCLNR/L 16-3D	1.00	1.00	1.250	6.00	1.00	CN .. 322	25-100-006	— 78.50
MCLNR/L 16-4C	1.00	1.00	1.250	5.00	1.19	CN .. 432	25-100-008	25-100-042 87.00
MCLNR/L 16-4D	1.00	1.00	1.250	6.00	1.19	CN .. 432	25-100-010	25-100-044 87.00
MCLNR/L 16-5C	1.00	1.00	1.250	5.00	1.38	CN .. 543	25-100-012	— 87.00
MCLNR/L 16-5D	1.00	1.00	1.250	6.00	1.38	CN .. 543	25-100-014	25-100-048 87.00
MCLNR/L 16-6C	1.00	1.00	1.250	5.00	1.50	CN .. 643	25-100-016*	— 78.50
MCLNR/L 16-6D	1.00	1.00	1.250	6.00	1.50	CN .. 643	25-100-018	25-100-052* 78.50
MCLNR/L 20-4D	1.25	1.25	1.500	6.00	1.19	CN .. 432	25-100-020	25-100-054 123.80
MCLNR/L 20-5D	1.25	1.25	1.500	6.00	1.38	CN .. 543	25-100-022	25-100-056 123.80
MCLNR/L 20-6D	1.25	1.25	1.500	6.00	1.50	CN .. 643	25-100-024	25-100-058 123.80

*Limited Supply.

APPLICATIONS:

- For turning, facing and copying from light roughing to finishing.

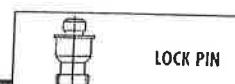
FEATURES:

- General purpose toolholder fitted with a negative insert.
- Top and hole clamping of insert guarantees good insert stability.

LEGEND

A: Shank	D: Head Length
B: Cutting Edge Height	F: Head Width
C: Overall Length	

REPLACEMENT PARTS



New sizes

QUANTITY DISCOUNT

E2

Valenite CNMG Carbide Inserts For MCLNR/L Toolholders

FEATURES:

GM General Machining Chipbreaker

- Double-sided general purpose insert.
- Strong cutting edge for reliability.
- Good for machining cast and forged surfaces.
- First choice for cast iron materials.
- Main application area:
FEED = .010" - .024" (0.20 - 0.61mm)
DOC = .040" - .200" (1.02 - 5.08mm)

GR General Roughing Chipbreaker

- Double-sided roughing insert.
- Extremely tough cutting edge.
- Best choice for interrupted cuts.
- Maximum chip control capability.
- Main application area:
FEED = .014" - .030" (0.35 - 0.76mm)
DOC = .080" - .300" (2.03 - 7.62mm)

GF General Finishing Chipbreaker

- Double-sided semi-finishing insert.
- Medium/high positive cutting land.
- Variable land around nose radius.
- Excellent profiling capabilities.
- Main application area:
FEED = .006" - .016" (0.15 - 0.40mm)
DOC = .010" - .100" (0.25 - 2.54mm)

LF Light Finishing Chipbreaker

- Double-sided fine finishing insert.
- High shear positive cutting land.
- Excels in light finishing operations.
- Produces excellent surface finish.
- Main application area:
FEED = .002" - .010" (0.05 - 0.25mm)
DOC = .005" - .080" (0.12 - 2.03mm)

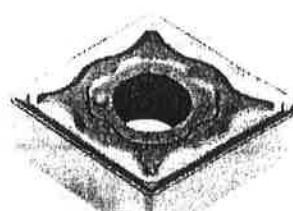
LM Light Machining Chipbreaker

- Double-sided general purpose insert.
- Medium positive cutting land.
- Wide chipbreaking application range.
- Recommended for carbon and alloy steels.
- Main Application Area:
FEED = .008" - .018" (0.20 - 0.46mm)
DOC = .025" - .200" (0.63 - 5.08mm)

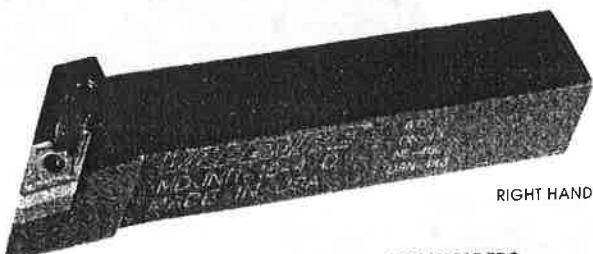
♦ See Page 364 For Valenite Grade Information.

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	ORDER #	PRICE EACH	1-9 PCS.	10+ PCS.
CNMG 322-LF	SV315	3/8"	0.125"	0.031"	0.150"	25-000-005*	\$9.06	\$7.25	
CNMG 322-F1	VP5515	3/8	0.125	0.031	0.150	25-000-402	9.56	7.65	
CNMG 322-M5	VP1510	3/8	0.125	0.031	0.150	25-000-011	9.56	7.65	
CNMG-432-M5	VP1510	1/2	0.187	0.031	0.202	25-000-016	14.50	11.60	
CNMG-432-M5	VP5525	1/2	0.187	0.031	0.202	25-000-017	14.50	11.60	
CNMG-432-M5	VP5515	1/2	0.187	0.031	0.202	25-000-018	14.50	11.60	
CNMG 432-F2	VP5525	1/2	0.187	0.031	0.202	25-000-027	14.50	11.60	
CNMG 432-LF	SV310	1/2	0.187	0.031	0.202	25-000-025*	13.38	10.70	
CNMG-432-F2	VP1510	1/2	0.187	0.031	0.202	25-000-019	14.50	11.60	
CNMG-432-M3	VP5515	1/2	0.187	0.031	0.202	25-000-023	14.50	11.60	
CNMG-432-M3	VP5525	1/2	0.187	0.031	0.202	25-000-024	14.50	11.60	
CNMG-433-M3	VP5515	1/2	0.187	0.046	0.202	25-000-026	14.50	11.60	
CNMG 543-GM	SV325	5/8	0.250	0.046	0.251	25-000-034*	21.50	17.20	
CNMG-543-M5	VP5525	5/8	0.250	0.046	0.251	25-000-036	23.25	18.60	
CNMG 543-M5	VP1510	5/8	0.250	0.046	0.251	25-000-039	23.25	18.60	
CNMG-543-M3	VP5525	5/8	0.250	0.046	0.251	25-000-037	23.25	18.60	
CNMG-643-R3	VP5525	3/4	0.250	0.046	0.315	25-000-046	31.38	25.10	
CNMG 643-LM	SV310	3/4	0.250	0.046	0.315	25-000-045*	29.00	23.20	
CNMG 643-M5	VP1510	3/4	0.250	0.046	0.315	25-000-048	31.38	25.10	
CNMG-643-M3	VP5525	3/4	0.250	0.046	0.315	25-000-047	31.38	25.10	

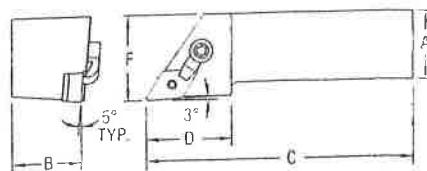
*Limited Supply.



Valenite MDJNR/L Turning And Profiling Toolholders



RIGHT HAND



TOOLHOLDERS

LEGEND:	
A: Shank	D: Head Length
B: Cutting Edge Height	F: Head Width
C: Overall Length	

MODEL #	A	B	F	C	D	INSERT SIZE	RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
MDJNR/L 12-4B	0.75"	0.75"	1.000"	4.50"	1.25"	DN .432	25-100-130	25-100-160	\$82.00
MDJNR/L 16-4C	1.00	1.00	1.250	5.00	1.29	DN .432	25-100-132	25-100-162	87.00
MDJNR/L 16-4D	1.00	1.00	1.250	6.00	1.29	DN .432	25-100-134	25-100-164	87.00
MDJNR/L 16-5D	1.00	1.00	1.250	6.00	1.50	DN .543	25-100-136	—	87.00
MDJNR/L 20-4D	1.25	1.25	1.500	6.00	1.29	DN .432	25-100-138	25-100-168	123.80

APPLICATIONS:

- For turning, facing and copying from roughing to finishing in all types of materials.

FEATURES:

- General purpose toolholder fitted with a negative 55° angle insert.
- Top and hole clamping of insert guarantees sturdiness in difficult machining.

REPLACEMENT PARTS

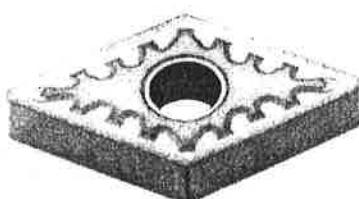
FOR TOOLHOLDER MODEL #	MODEL #	ORDER #	PRICE EACH	SHIM SEAT	LOCK PIN	CLAMP	CLAMP SCREW					
MDJNR/L 12-4B, 16-4C, 16-4D 20-4D, 24-4E, 85-4D	IDSN-443	55-920-287	\$6.24	NL-46L	55-920-147	\$11.15	CLI-20	55-920-324	\$7.22	XNS-48	55-920-114	\$3.34
MDJNR/L 16-5D, 20-5D, 24-5E 85-5D, 86-5E	IDSN-533	55-920-288	7.57	NL-58	55-920-148	11.61	CLI-12	55-920-320	7.22	XNS-510	55-920-118	3.55

Valenite DNMG Carbide Inserts For MDJNR/L Toolholders

QUANTITY DISCOUNT

E2

New sizes



FEATURES:

GM General Machining Chipbreaker

- Double-sided general purpose insert.
- Strong cutting edge for reliability.
- Good for machining cast and forged surfaces.
- First choice for cast iron materials.
- Main application area:
FEED = .010" - .024" (0.20 - 0.61mm)
DOC = .040" - .200" (1.02 - 5.08mm)

GR General Roughing Chipbreaker

- Double-sided roughing insert.
- Extremely tough cutting edge.
- Best choice for interrupted cuts.
- Maximum chip control capability.
- Main application area:
FEED = .014" - .030" (0.35 - 0.76mm)
DOC = .080" - .300" (2.03 - 7.62mm)

LM Light Machining Chipbreaker

- Double-sided general purpose insert.
- Medium positive cutting land.
- Wide chipbreaking application range.
- Recommended for carbon and alloy steels.
- Main application area:
FEED = .008" - .018" (0.20 - 0.46mm)
DOC = .025" - .200" (0.63 - 5.08mm)

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	ORDER #	PRICE EACH
						1-9 PCS.	10+ PCS.
DNMG-432-M5	VP1510	1/2"	0.187"	0.031"	0.202"	25-000-091	\$21.31
DNMG-432-M5	VP5525	1/2	0.187	0.031	0.202	25-000-092	21.31
DNMG 432-LM	SV310	1/2	0.187	0.031	0.202	25-000-100*	20.19
DNMG-432-M3	VP1510	1/2	0.187	0.031	0.202	25-000-093	21.31
DNMG 432-LM	SV325	1/2	0.187	0.031	0.202	25-000-101*	20.19
DNMG-432-M3	VP5525	1/2	0.187	0.031	0.202	25-000-094	21.31
DNMG-432-M3	VP5515	1/2	0.187	0.031	0.202	25-000-096	21.31
DNMG 543-GM	SV325	5/8	0.250	0.046	0.251	25-000-110*	31.94
DNMG 543-M8	VP5525	5/8	0.250	0.046	0.251	25-000-111	35.63
DNMG 543-R4	VP5515	5/8	0.250	0.046	0.251	25-000-114	35.63

*Limited Supply.

◆ See Page 364 For Valenite Grade Information.

Do you need...

Live Centers



See Pages 566-573

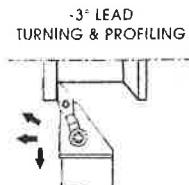
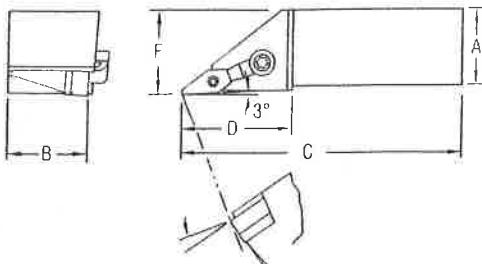
Drill Rods

See Pages 1232-1233

Lathe Chucks

See Pages 579-584

Valenite® MVJNR/L Turning And Profiling Toolholders



LEGEND:

A: Shank D: Head Length
B: Cutting Edge Height F: Head Width
C: Overall Length

TOOLHOLDERS

MODEL #	DIMENSIONS				INSERT SIZE	RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH	
	A	B	F	C	D				
MVJNR/L 12-3B	0.75"	0.75"	1.000"	4.50"	1.73"	VN . 332	25-100-070	\$82.00	
MVJNR/L 16-3C	1.00	1.00	1.250	5.00	1.73	VN . 332	25-100-072	87.00	
MVJNR/L 16-3D	1.00	1.00	1.250	6.00	1.73	VN . 332	25-100-074	87.00	
MVJNR/L 16-4C	1.00	1.00	1.250	5.00	1.94	VN . 442	25-100-076*	104.00	
MVJNR/L 16-4D	1.00	1.00	1.250	6.00	1.94	VN . 442	25-100-078	87.00	
MVJNR/L 20-3D	1.25	1.25	1.500	6.00	1.73	VN . 332	25-100-080	123.80	
MVJNR/L 20-4D	1.25	1.25	1.500	6.00	1.94	VN . 442	25-100-082	123.80	
MVJNR/L 24-3D	1.50	1.50	2.000	6.00	1.73	VN . 332	—	25-100-114	166.30
MVJNR/L 85-4D	1.00	1.25	1.250	6.00	1.94	VN . 442	—	25-100-118	101.65

*Limited Supply.

REPLACEMENT PARTS

FOR TOOLHOLDER MODEL #	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH
MVJNR/L 12-3B, 16-3C, 16-3D 20-3D, 24-3D MVJNR/L 16-4C, 16-4D, 20-4D 24-4E, 85-4D, 86-4D	IVSN-324	55-920-197	\$7.26	NL-34L	55-920-144	\$9.80	CLI-30	55-920-326	\$12.73	XNS-510	55-920-118	\$3.55
	IVSN-433	55-920-199	8.59	NL-46L	55-920-147	11.15	CLI-30	55-920-326	12.73	XNS-510	55-920-118	3.5

Valenite VNMG Carbide Inserts For MVJNR/L Toolholders

◆ See Page 364 For Valenite Grade Information.

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	ORDER #	PRICE EACH	
						1-9 PCS.	10+ PCS.	
VNMG-331-M3	VP5525	3/8"	0.187"	0.015"	0.150"	25-000-057	\$24.50	\$19.60
VNMG 332-LM	SV315	3/8	0.187	0.031	0.150	25-000-059*	22.00	17.60
VNMG 332-M6	VP5515	3/8	0.187	0.031	0.150	25-000-406	24.50	19.60
VNMG 332-M5	VP5515	3/8	0.187	0.031	0.150	25-000-061	24.50	19.60
VNMG-332-M3	VP5525	3/8	0.187	0.031	0.150	25-000-069	24.50	19.60
VNMG 442-V01	SV325	1/2	0.250	0.031	0.202	25-000-075*	26.44	21.15
VNMG 442-M6	VP5525	1/2	0.250	0.031	0.202	25-000-408	28.44	22.75

*Limited Supply.

Valenite Screw Down Type Carbide Inserts

New sizes

FEATURES:

LF Light Finishing Chipbreaker

- Double-sided fine finishing insert.
- High shear positive cutting land.
- Excels in light finishing operations.
- Produces excellent surface finish.
- Main application area:
FEED = .002" - .010" (0.05 - 0.25mm)
DOC = .005" - .080" (0.12 - 0.30mm)

QUANTITY DISCOUNT

E2



LM Light Machining Chipbreaker

- Double-sided general purpose insert.
- Medium positive cutting land.
- Wide chipbreaking application range.
- Recommended for carbon and alloy steels.
- Main application area:
FEED = .008" - .016" (0.20 - 0.46mm)
DOC = .025" - .200" (0.63 - 5.08mm)

QUANTITY DISCOUNT

E2

Toolholders
Page 419

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	ORDER #	PRICE EACH	
						1-9 PCS.	10+ PCS.	
CCGT 21.51-FH	VC929	1/4"	0.094"	0.015"	0.110"	25-000-180*	\$17.94	\$14.35
CCGT 21.51-PM2	VP9610	1/4	0.094	0.015	0.110	25-000-409	19.94	15.95
CCMT 21.51-2A	V1N	1/4	0.094	0.015	0.110	25-000-181*	11.19	8.95
CCMT 21.51-2A	VP5535	1/4	0.094	0.015	0.110	25-000-410	14.63	11.70
CCGT 32.51-FH	VC929	3/8	0.156	0.015	0.173	25-000-182*	20.19	16.15
CCGT 32.51-PM2	VP9610	3/8	0.156	0.015	0.173	25-000-411	22.38	17.90
CCMT 32.51-1A	VP5535	3/8	0.156	0.015	0.173	25-000-412	15.69	12.55
CCGT 432-PM2	VP5525	1/2	0.187	0.031	0.217	25-000-186	27.63	22.10

*Limited Supply.



CCG1



CCMT

FEATURES:

PM2, FH Finishing Chipbreakers

- Single sided, screw-down finishing insert.
- Positive cutting land for reduced forces.
- Broad chip control application range.
- Excellent profiling capabilities.
- Main application area:
FEED = .003" - .016" (0.08 - 0.41mm)
DOC = .005" - .100" (0.12 - 2.54mm)

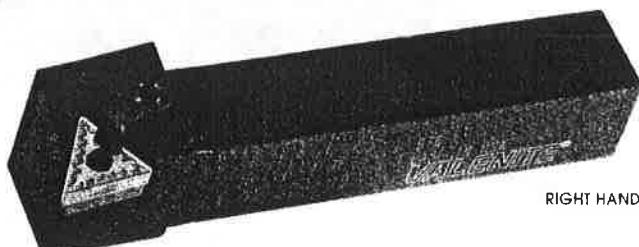
1A Positive Chipbreaker

- For general purpose, light duty operations.
- Main application area:
FEED = .005" - .013" (0.13 - 0.33mm)
DOC = .010" - .150" (0.25 - 3.80mm)

2A Positive Chipbreaker

- For fine finishing operations.
- Main application area:
FEED = .0025" - .011" (0.057 - 0.28mm)
DOC = .005" - .060" (0.13 - 1.52mm)

Valenite MTGNR/L Turning Toolholders

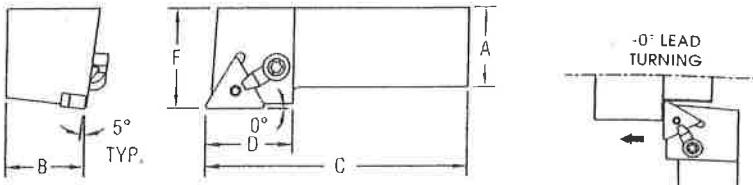


RIGHT HAND

LEGEND:

A: Shank D: Head Length
B: Cutting Edge Height F: Head Width
C: Overall Length

D1



TOOLHOLDERS

MODEL	DIMENSIONS				INSERT SIZE	RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
#	A	B	F	C	D			
MTGNR/L 08-2	0.50"	0.50"	0.625"	4.50"	0.97"	TN .. 22	25-100-190	25-100-224
MTGNR/L 10-2	0.62	0.62	0.750	4.50	0.97	TN .. 22	25-100-192	25-100-226*
MTGNR/L 10-3B	0.62	0.62	0.875	4.50	1.13	TN .. 322	25-100-194	25-100-228
MTGNR/L 12-3A	0.75	0.75	1.000	4.00	1.13	TN .. 322	25-100-196	—
MTGNR/L 12-3B	0.75	0.75	1.000	4.50	1.13	TN .. 322	25-100-198	25-100-232
MTGNR/L 16-3C	1.00	1.00	1.250	5.00	1.13	TN .. 322	25-100-200*	—
MTGNR/L 16-3D	1.00	1.00	1.250	6.00	1.13	TN .. 322	25-100-202	—
MTGNR/L 16-4C	1.00	1.00	1.250	5.00	1.38	TN .. 432	—	25-100-238
MTGNR/L 16-4D	1.00	1.00	1.250	6.00	1.38	TN .. 432	25-100-206	25-100-240
MTGNR/L 20-5D	1.25	1.25	1.500	6.00	1.50	TN .. 543	25-100-214	25-100-248
								123.80

*Limited Supply.

APPLICATIONS:

- For turning, roughing to finishing.
- Lead: 0°

FEATURES:

- General purpose toolholder with negative inserts.
- Top and hole clamping guarantees sturdiness.

REPLACEMENT PARTS

FOR TOOLHOLDER MODEL #	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH
MTGNR/L 08-2, 10-2	—	—	—	NL-23	55-920-140	\$9.80	CLI-19	55-920-322	\$9.00	XNS-36	55-920-112	\$3.10
MTGNR/L 10-3B, 12-3A, 12-3B	ITSN-333	55-920-162	\$6.06	NL-34L	55-920-144	9.80	CLI-6	55-920-316	7.22	XNS-36	55-920-112	3.10
16-3C, 16-3D	ITSN-433	55-920-165	8.48	NL-46	55-920-146	11.15	CLI-9	55-920-318	7.22	XNS-510	55-920-116	3.55
MTGNR/L 16-4C, 16-4D, 20-4D	ITSN-533	55-920-168	10.29	NL-58	55-920-148	11.61	CLI-9	55-920-318	7.22	XNS-510	55-920-116	3.55

Valenite TNMG Carbide Inserts For MTGNR/L Toolholders

QUANTITY DISCOUNT

E2

FEATURES:

GM General Machining Chipbreaker

- Double-sided general purpose insert.
- Strong cutting edge for reliability.
- Good for machining cast and forged surfaces.
- First choice for cast iron materials.
- Main application area:
FEED = .010" - .024" (0.20 - 0.61mm)
DOC = .040" - .200" (1.02 - 5.08mm)

LF Light Finishing Chipbreaker

- Double-sided fine finishing insert.
- High shear positive cutting land.
- Excels in light finishing operations.
- Produces excellent surface finish.
- Main application area:
FEED = .002" - .010" (0.05 - 0.25mm)
DOC = .005" - .080" (0.12 - 2.03mm)

LM Light Machining Chipbreaker

- Double-sided general purpose insert.
- Medium positive cutting land.
- Wide chipbreaking application range.
- Recommended for carbon and alloy steels.
- Main application area:
FEED = .008" - .018" (0.20 - 0.46mm)
DOC = .025" - .200" (0.63 - 5.08mm)



New sizes

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	ORDER #	PRICE EACH
						1-9 PCS.	10+ PCS.
TNMG 222-LF	SV310	1/4"	0.125"	0.031"	0.089"	25-000-120*	\$7.25 \$5.80
TNMG 222-F3	VP5515	1/4	0.125	0.031	0.089	25-000-420	7.88 6.30
TNMG 322-GM	SV325	3/8	0.125	0.031	0.150	25-000-130*	11.63 9.30
TNMG 322-M8	VP5525	3/8	0.125	0.031	0.150	25-000-131*	12.19 9.75
TNMG 322-M8	VP5515	3/8	0.125	0.031	0.150	25-000-422	12.56 10.05
TNMG 432-M5	VP1510	1/2	0.187	0.031	0.202	25-000-138	16.88 13.50
TNMG 432-M8	VP5525	1/2	0.187	0.031	0.202	25-000-139	16.88 13.50
TNMG 432-GM	SV325	1/2	0.187	0.031	0.202	25-000-145*	16.06 12.85
TNMG 432-M5	VP1510	1/2	0.187	0.031	0.202	25-000-424	16.88 13.50
TNMG 432-LM	SV325	1/2	0.187	0.031	0.202	25-000-155*	16.06 12.85
TNMG 432-M6	VP5525	1/2	0.187	0.031	0.202	25-000-426	16.88 13.50
TNMG 432-LM	SV315	1/2	0.187	0.031	0.202	25-000-156*	16.06 12.85
TNMG 432-M6	VP5515	1/2	0.187	0.031	0.202	25-000-428	16.88 13.50
TNMG 543-M5	VP5525	5/8	0.250	0.046	0.251	25-000-167	28.81 23.05
TNMG 543-LM	SV325	5/8	0.250	0.046	0.251	25-000-175*	28.13 22.50
TNMG 543-M5	VP5525	5/8	0.250	0.046	0.251	25-000-430	28.81 23.05

Limited Supply.

◆ See Page 364 For Valenite Grade Information.

Valentia Wiper Turning Inserts

W1, W2, W3 & W6 Wiper Geometry In CNMG, DNMG And WNMG Insert Styles

QUANTUM
PERFECT

BENEFITS:

- Allows faster feed rates and dramatically improved surface finishes.
- Finish OD turning with higher feed rates and improved productivity.
- Creates better surface finishes, often eliminating need for grinding.

New sizes

APPLICATIONS:

- Two different wiper geometries in three insert shapes to suit your application requirements.
- Strong cutting edge produces superior surface finishes, even at heavier semi-finishing depths of cut.

W1 Style

- For very light finishing.

W2 Style

- For general purpose finishing.

FEATURES:

- Unique wiper corner radius geometry wipes away peaks and valleys associated with turned finishes.
- Fits all the same toolholders as standard turning inserts.

W3 Style

- Used for finishing operations.
- Capable of producing quality finishes at high rates.
- Can be used at conventional feed rates for superior finishes.

W6 Style

- Used for semi-finish & finishing operations.
- Allows increased productivity while producing surfaces as good as those produced by conventional inserts.



CNMG-432-W1



CNMG-432-W2



WNMG-432-W1

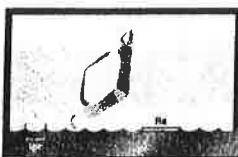


CNMG-432-W3



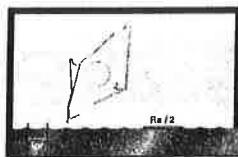
CNMG-432-W6

How Spectra HP Wiper Inserts Work



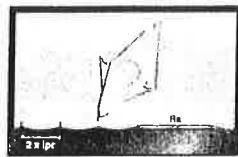
CONVENTIONAL INSERTS

Conventional inserts produce a certain finish (R_a) at a given feed rate (IPR). Using wiper inserts can improve feed rate or increase finish.



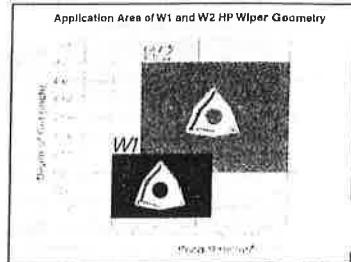
HP WIPER INSERTS- IMPROVED FINISH

Wiper inserts operating at the same feed rate (IPR) as conventional inserts can improve surface finish by up to 100%.



HP WIPER INSERTS- INCREASED PRODUCTIVITY

Wiper inserts can double the feed rate (IPR) while producing surfaces equal to those of conventional inserts.



Application Area of W1 and W2 HP Wiper Geometry

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	RECOMMENDED FEED RATE IPR	mm/rev	ORDER #	PRICE EACH 1-9 PCS.	10+ PCS.
W1 & W3 GEOMETRY										
CNMG 431 W1	SV515	1/2"	0.187"	0.015"	0.202"	0.007" - 0.012"	0.18 - 0.30	25-000-260*	\$14.75	\$11.80
CNMG 431-WN3	VP5515	1/2	0.187	0.015	0.202	0.006 - 0.024	0.15 - 0.61	25-000-380	14.50	11.60
CNMG 431 W1	SV525	1/2	0.187	0.015	0.202	0.007 - 0.012	0.18 - 0.30	25-000-262*	14.75	11.80
CNMG-432-W3	VP5515	1/2	0.187	0.031	0.202	0.006 - 0.020	0.02 - 0.08	25-000-263	16.69	13.35
CNMG-432-W3	VP5525	1/2	0.187	0.031	0.202	0.006 - 0.020	0.02 - 0.08	25-000-265	16.69	13.35
DNMG-432-W3	VP5515	1/2	0.187	0.031	0.202	0.006 - 0.020	0.02 - 0.08	25-000-267	24.50	19.60
DNMG 432 W1	SV525	1/2	0.187	0.031	0.202	0.007 - 0.018	0.18 - 0.45	25-000-270*	22.44	17.95
DNMG 432 WN3	VP5515	1/2	0.187	0.031	0.202	0.005 - 0.022	0.18 - 0.45	25-000-434	24.50	19.60
WNMG 332-W3	VP5515	3/8	0.187	0.031	0.150	0.005 - 0.020	0.13 - 0.50	25-000-388	13.69	10.95
WNMG 332 W1	SV525	3/8	0.187	0.031	0.150	0.010 - 0.022	0.25 - 0.56	25-000-278*	11.56	9.25
WNMG 332-W3	VP5515	3/8	0.187	0.031	0.150	0.006 - 0.020	0.25 - 0.56	25-000-436	13.69	10.95
WNMG 432 W1	SV515	1/2	0.187	0.031	0.202	0.010 - 0.022	0.25 - 0.56	25-000-284*	16.06	12.85
WNMG 432-WN3	VP5515	1/2	0.187	0.031	0.202	0.006 - 0.024	0.15 - 0.61	25-000-394	15.31	12.25
WNMG 432 W1	SV525	1/2	0.187	0.031	0.202	0.010 - 0.022	0.25 - 0.56	25-000-288*	15.88	12.70
W2 & W6 GEOMETRY										
CNMG-432-W6	VP5515	1/2"	0.187"	0.031"	0.202"	0.005" - 0.022"	0.03 - 0.20	25-000-289	\$16.69	\$13.35
CNMG-432-W6	VP5525	1/2	0.187	0.031	0.202	0.005 - 0.022	0.03 - 0.20	25-000-291	16.69	13.35
CNMG-433-W6	VP5515	1/2	0.187	0.046	0.202	0.005 - 0.022	0.03 - 0.20	25-000-293	16.69	13.35
CNMG-433-W6	VP5525	1/2	0.187	0.046	0.202	0.005 - 0.022	0.03 - 0.20	25-000-295	16.69	13.35
DNMG-432-W6	VP5515	1/2	0.187	0.031	0.202	0.005 - 0.022	0.03 - 0.20	25-000-297	24.50	19.60
DNMG-432-W6	VP5525	1/2	0.187	0.031	0.202	0.005 - 0.022	0.03 - 0.20	25-000-299	24.50	19.60
WNMG 332-W6	VP5515	3/8	0.187	0.031	0.150	0.009 - 0.024	0.22 - 0.23	25-000-398	13.69	10.95
WNMG 432 W2	SV515	1/2	0.187	0.031	0.202	0.012 - 0.025	0.30 - 0.64	25-000-304*	16.06	12.85
WNMG-432-W6	VP5515	1/2	0.187	0.031	0.202	0.005 - 0.022	0.03 - 0.20	25-000-305	17.63	14.10
WNMG-432-W6	VP5525	1/2	0.187	0.031	0.202	0.005 - 0.022	0.03 - 0.20	25-000-307	17.63	14.10

*Limited Supply.

GRADE	ISO CLASS	INDUSTRY CLASS	DESCRIPTION	APPLICATION	MATERIALS
SV515	P10 - P30 M05 - M25 K01 - K15	C2, C3 C6, C7	Thick CVD Coated Grade TiC + TiCN + Al ₂ O ₃ + TiN Coating Medium Duty Grade	Turning and Boring; Light Roughing to Finishing	Carbon and Alloy Steels, Gray Cast Irons, Heat Treated Steels
SV525	P15 - P35 M10 - M30 K15 - K30	C1, C6 C5, C6	Thick CVD Coated Grade TiC + TiCN + Al ₂ O ₃ + TiN Coating Medium Duty Grade Excellent Wear and Crater Resistance	Turning and Boring; Roughing, Semi-Finishing	Carbon and Alloy Steels, Gray Cast Irons, Heat Treated Steels

Valenite MWLNR/L Turning And Facing Toolholders
Accepts WNMG Style Inserts



Ideal all-round economical holder
for general turning operations

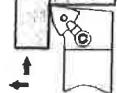
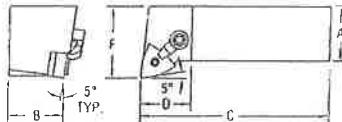
LEGEND:

A: Shank D: Head Length
B: Cutting Edge Height F: Head Width
C: Overall Length

D1

-5° Lead

Turning & Facing



APPLICATIONS:

- Roughing to finish turning and facing in all material types.

FEATURES:

- Industry standard M-style insert clamping system, pin and top clamp.
- Turn, face and profile all with one holder.

TOOLHOLDERS

MODEL #	A	B	C	D	INSERT SIZE	RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
MWLNR/L 12-3B	0.75"	0.75"	1.000"	4.50"	1.00"	WN_332	25-100-260	25-100-274 \$82.00
MWLNR/L 12-4B	0.75	0.75	1.000	4.50	1.13	WN_432	25-100-262	25-100-276 82.00
MWLNR/L 16-3D	1.00	1.00	1.250	6.00	1.00	WN_332	25-100-264	— 87.00
MWLNR/L 16-4D	1.00	1.00	1.250	6.00	1.13	WN_432	25-100-266	25-100-280 87.00
MWLNR/L 20-4D	1.25	1.25	1.500	6.00	1.13	WN_432	25-100-270*	25-100-284 123.80

*Limited Supply.

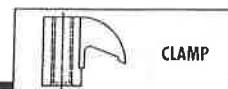
REPLACEMENT PARTS



SHIM SEAT



LOCK PIN



CLAMP

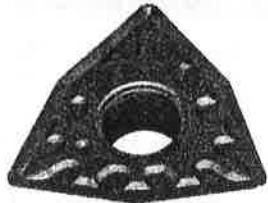


CLAMP SCREW

Valenite WNMG Carbide Turning Inserts For MWLNR/L Toolholders
80° Diamond Versatility With Six Cutting Edges

QUANTITY DISCOUNT

E2



New sizes

◆ See Page 364 For Grade Information.

◆ See Page 365 For Chipbreaker Information.

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	ORDER #	PRICE EACH
						1-9 PCS.	10+ PCS.
WNMG 331-M5	VP1510	3/8"	.187"	.015"	0.150"	25-000-321	\$11.88 \$9.50
WNMG 331-LF	SV315	3/8	.187	.015	0.150	25-000-322*	10.94 8.75
WNMG 331-M5	VP1510	3/8	.187	.015	0.150	25-000-440	11.88 9.50
WNMG 332-M5	VP5525	3/8	.187	.031	0.150	25-000-325	11.88 9.50
WNMG 431-F2	VP5515	1/2	.187	.015	0.202	25-000-329	14.56 11.65
WNMG 431-M5	VP5535	1/2	.187	.015	0.202	25-000-333	15.31 12.25
WNMG 432-GF	SV315	1/2	.187	.031	0.202	25-000-334*	14.56 11.65
WNMG 432-F3	VP5515	1/2	.187	.031	0.202	25-000-442	15.31 12.25
WNMG 432-F2	VP1510	1/2	.187	.031	0.202	25-000-337	15.31 12.25
WNMG 432-F2	VP5525	1/2	.187	.031	0.202	25-000-341	15.31 12.25
WNMG 432-M3	VP5515	1/2	.187	.031	0.202	25-000-339	15.31 12.25
WNMG 432-LM	SV310	1/2	.187	.031	0.202	25-000-342*	14.38 11.50
WNMG 432-M5	VP1510	1/2	.187	.031	0.202	25-000-444	15.31 12.25
WNMG 432-M3	VP5525	1/2	.187	.031	0.202	25-000-345	15.31 12.25
WNMG 432-M5	VP5515	1/2	.187	.031	0.202	25-000-347	15.31 12.25
WNMG 432-M5	VP1510	1/2	.187	.031	0.202	25-000-349	15.31 12.25
WNMG 432-M5	VP5525	1/2	.187	.031	0.202	25-000-351	15.31 12.25
WNMG 432-R3	VP5515	1/2	.187	.031	0.202	25-000-362	15.31 12.25
WNMG 433-M5	VP5515	1/2	.187	.046	0.202	25-000-355	15.31 12.25
WNMG 433-M5	VP1510	1/2	.187	.046	0.202	25-000-357	15.31 12.25
WNMG 433-M5	VP5525	1/2	.187	.046	0.202	25-000-359	15.31 12.25
WNMG 433-R3	VP5515	1/2	.187	.046	0.202	25-000-364	15.31 12.25

*Limited Supply.

BENEFITS:

- 50% more edges than standard CNMG inserts significantly reduces insert costs.

APPLICATIONS:

- Rough and finish OD turning and facing.
- Ideal cost saving general purpose insert for everyday turning operations.

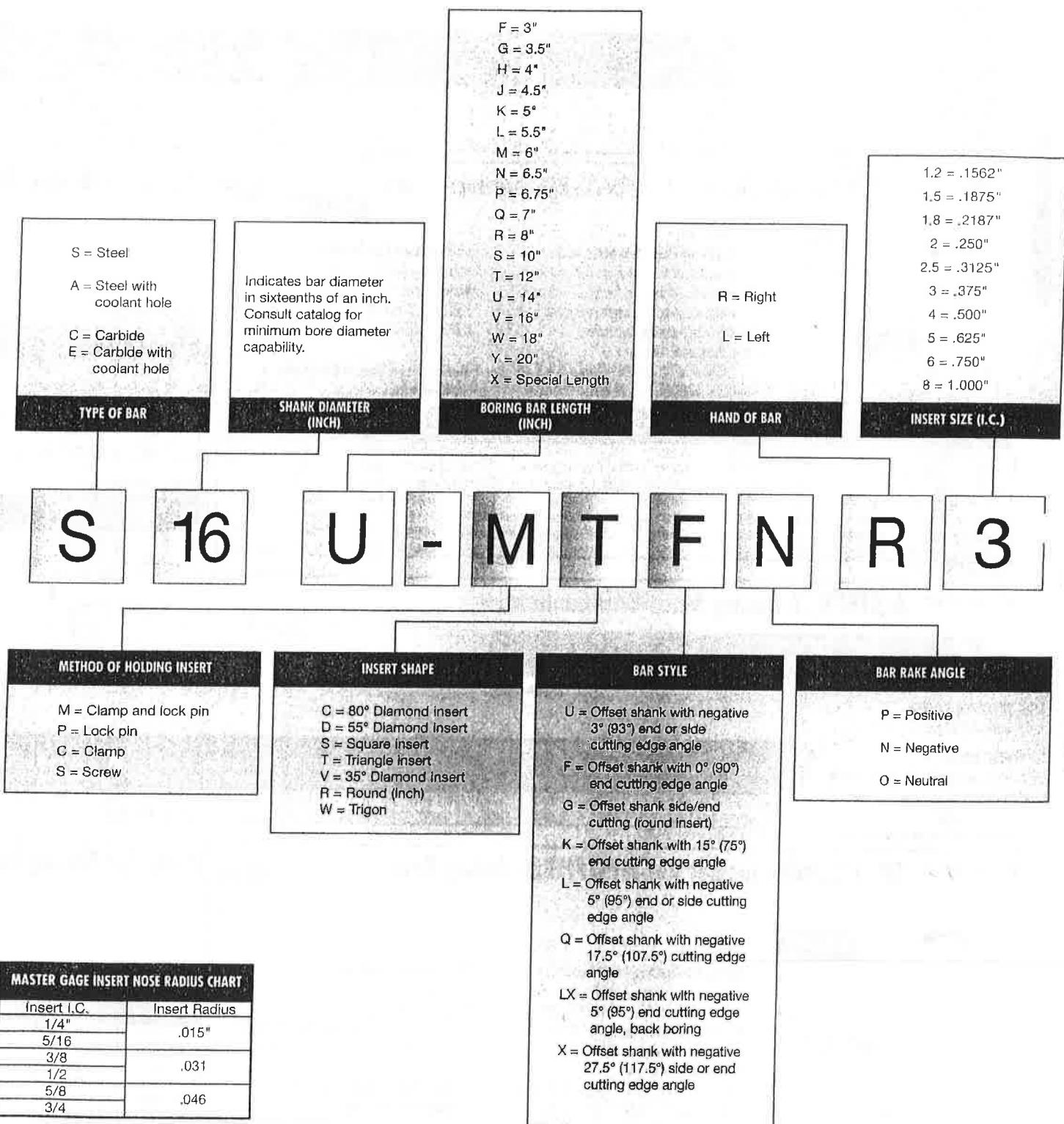
FEATURES:

- Eight cutting edges with the same versatility of a 4 edged CNMG insert.
- Insert design provide for a very strong cutting edge for maximum security.

Experience the Extech advantage. Your source for multimeters, tachometers, clamp meters, moisture meters and sound meters. See pages 859-860, 863-864, 866, 868 & 870.

EXTECH
INSTRUMENTS

Inch Straight Shank Boring Bar Nomenclature



Valenite A-SCLPR/L Boring Bars With Coolant Hole

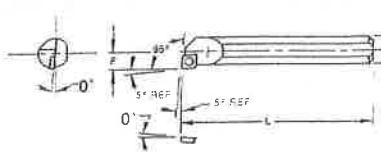


APPLICATIONS:

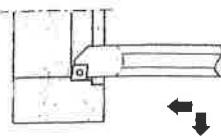
- Boring and facing.

FEATURES:

- Can use through the shank coolant.
- Able to both bore and face the bottom of a hole.
- Uses Torx® screw to secure insert.



-5° LEAD BORE & FACE
POSITIVE RAKE



D1

Valenite CP_T Carbide Inserts For A-SCLPR/L Boring Bars



CPGT



CPMT



CPMW

FEATURES:

PM2, FH Finishing Chipbreakers

- Single sided, screw-down finishing insert.
- Positive cutting land for reduced forces.
- Broad chip control application range.
- Excellent profiling capabilities.
- Main application area:
FEED = .005" - .013" (0.13 - 0.33mm)
DOC = .010" - .150" (0.25 - 3.80mm)

QUANTITY DISCOUNT

1A Positive Chipbreaker

- For general purpose, light duty operations.
- Main application area:
FEED = .005" - .013" (0.13 - 0.33mm)
DOC = .010" - .150" (0.25 - 3.80mm)

◆ See Page 364 For Valenite Grade Information.

Parts For Boring Bars

E2

TORX® SCREWS

MODEL #	ORDER #	PRICE EACH
PT-542T	25-200-228	\$4.97
PT-544T	25-200-230	4.97
PT-546T	25-200-232	4.97
PT-559T	25-200-234	4.97
PT-588T	25-200-236	6.09
PT-589T	25-200-238	4.97

TORX® WRENCHES

MODEL #	ORDER #	PRICE EACH
T-7	94-002-100	\$3.41
T-15	94-002-108	2.18

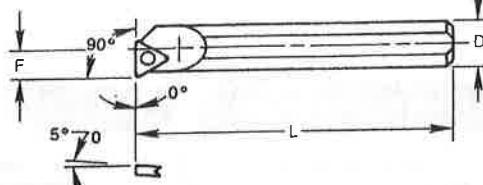
D1

Limited Supply.

Valenite A-STFPR/L Boring Bars With Coolant Hole



RIGHT HAND



D1

APPLICATIONS:

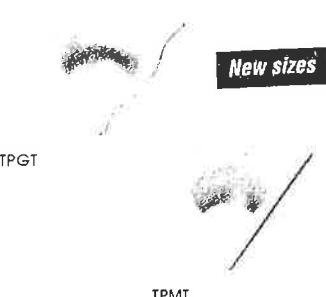
- Use for boring.

FEATURES:

- Can use through the shank coolant.
- Molded chipbreaker insert with three cutting edges.
- Uses Torx® screw to secure inserts.

Limited Supply.

Valenite TP_T Carbide Inserts For A-STFPR/L Boring Bars



New sizes

FEATURES:

PM2, FH Finishing Chipbreakers

- Single sided, screw-down finishing insert.
- Positive cutting land for reduced forces.
- Broad chip control application range.
- Excellent profiling capabilities.
- Main application area:
FEED = .003" - .016" (0.08 - 0.41mm)
DOC = .005" - .100" (1.12 - 2.54mm)

2A Positive Chipbreaker

- For fine finishing operations.
- Main application area:
FEED = .0025" - .011" (0.057 - 0.28mm)
DOC = .005" - .060" (0.13 - 1.52mm)

◆ See Page 364 For Valenite Grade Information.

Parts For Boring Bars

E2

TORX® SCREWS

MODEL #	ORDER #	PRICE EACH
PT-542T	25-200-228	\$4.97
PT-544T	25-200-230	4.97
PT-546T	25-200-232	4.97
PT-559T	25-200-234	4.97
PT-588T	25-200-236	6.09
PT-589T	25-200-238	4.97

TORX® WRENCHES

MODEL #	ORDER #	PRICE EACH
T-7	94-002-100	\$3.41
T-15	94-002-108	2.18

Limited Supply.

Valenite A-SDLXPR/L Boring Bars With Coolant Hole



APPLICATIONS:

- Use for back boring.

RIGHT HAND

FEATURES:

- Can use through the shank coolant.
- Can be used on through bores.
- Able to plunge, backface and bore.

Parts For Boring Bars D1

TORX® SCREWS

MODEL #	ORDER #	PRICE EACH
PT-542T	25-200-228	\$4.97
PT-544T	25-200-230	4.97
PT-546T	25-200-232	4.97
PT-559T	25-200-234	4.97
PT-588T	25-200-236	6.09
PT-589T	25-200-238	4.97

TORX® WRENCHES

MODEL #	ORDER #	PRICE EACH
T-7	94-002-100	\$3.41
T-15	94-002-108	2.18

Valenite A-SVQBR/L Boring Bars With Coolant Hole



APPLICATIONS:

- Use for boring and profiling.

RIGHT HAND

FEATURES:

- Lead angle is 3° with 35° insert.
- Can use through the shank coolant.
- Able to bore and face.
- Under cut for threads.
- Uses Torx® screw to secure insert.

MODEL #	DIMENSIONS							RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
	SHANK DIAMETER	MIN. BORE	F PROJECTION	OVERALL LENGTH	INSERT SIZE	USE TORX® SCREW #	USE TORX® WRENCH #			
A16T-SVQBR/L 3	1.000"	1.375"	0.750"	12.000"	VB..332	PT-544T	T-15	25-200-252	25-200-266	\$209.50
A24U-SVQBR/L 3	1.500	2.000	1.063	14.000	VB..332	PT-544T	T-15	—	25-200-270	310.00

Parts For Boring Bars D1

Valenite VB_T Carbide Inserts For A-SVQBR/L Boring Bars NEW LOWER PRICE ON SELECT ORDER NUMBERS*

FEATURES:

FL Finishing Inserts

- Single sided, screw-down finishing insert.
- High positive cutting land.
- Produces excellent surface finish.
- Excels in light finishing operations.
- Main application area:
FEED = .002" - .010" (0.05 - 0.24mm)
DOC = .005" - .080" (1.13 - 2.03mm)

1A Positive Chipbreaker

- For general purpose, light duty operations.
- Main application area:
FEED = .005" - .013" (0.13 - 0.33mm)
DOC = .010" - .150" (0.25 - 3.80mm)



QUANTITY DISCOUNT



New sizes

- ◆ See Page 364 For Valenite Grade Information.

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	APPLICATION	ORDER #	PRICE EACH	
								1-9 PCS.	10+ PCS.
VBGT 332-FL	SV315	3/8"	0.187"	0.031"	0.173"	Steel, Stainless Steel & Irons	25-000-250*	\$25.38	\$20.30
VBGT 332-FL	VC929	3/8	0.187	0.031	0.173	Low Carbons, High Temperature Alloys, 300 Stainless, Cast Iron, Aluminum & Copper Alloys	25-000-251*	23.31	18.65
VBGT 332-PF3	VP9610	3/8	0.187	0.031	0.173	Low Carbons, High Temperature Alloys, 300 Stainless, Cast Iron, Aluminum & Copper Alloys	25-000-467	27.44	21.
VBGT 332-FL	SV325	3/8	0.187	0.031	0.173	Steel & Cast Irons	25-000-252*	14.76	11.81
VBMT 332-1A	SV325	3/8	0.187	0.031	0.173	Steel & Cast Irons	25-000-255*	21.69	17.35
VBMT 332-1A	VP5525	3/8	0.187	0.031	0.173	Steel & Cast Irons	25-000-460	25.19	20.15
VBMT 332-PM4	VP5525	3/8	0.187	0.031	0.173	Steel & Cast Irons	25-000-253	25.19	20.15

TORX® SCREWS

MODEL #	ORDER #	PRICE EACH
PT-542T	25-200-228	\$4.97
PT-544T	25-200-230	4.97
PT-546T	25-200-232	4.97
PT-559T	25-200-234	4.97
PT-588T	25-200-236	6.09
PT-589T	25-200-238	4.97

TORX® WRENCHES

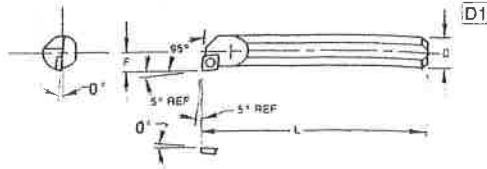
MODEL #	ORDER #	PRICE EACH
T-7	94-002-100	\$3.41
T-15	94-002-108	2.18

*Limited Supply & New Lower Price.

Valenite S-SCLPR/L Boring Bars



RIGHT HAND



D1

MODEL #	DIMENSIONS					INSERT SIZE	USE TORX® SCREW #	USE TORX® WRENCH #	RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
	D	MIN. BORE	F	L							
S06M-SCLPR/L 2	0.375"	0.500"	0.250"	6.000"	CP.21.51	PT-589T	T-7	25-200-122	25-200-138	\$81.00	
S08R-SCLPR/L 2	0.500	0.625	0.312	8.000	CP.21.51	PT-589T	T-7	25-200-124	25-200-140	85.75	
S10S-SCLPR/L 2	0.625	0.812	0.406	10.000	CP.21.51	PT-589T	T-7	25-200-126	25-200-142	95.50	
S12S-SCLPR/L 3	0.750	1.000	0.500	10.000	CP.32.52	PT-559T	T-15	25-200-128	25-200-144	111.50	

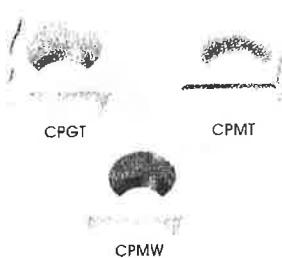
APPLICATIONS:

- Boring and facing.

FEATURES:

- Able to both bore and face the bottom of a hole.
- Uses Torx® screw to secure insert.

Valenite CP Carbide Inserts For A-SCLPR/L Boring Bars



FEATURES:

- PM2, FH Finishing Chipbreakers**
- Single sided, screw-down finishing insert.
 - Positive cutting land for reduced forces.
 - Broad chip control application range.
 - Excellent profiling capabilities.
 - Main application area:
FEED = .0025" - .011" (0.057 - 0.28mm)
DOC = .005" - .060" (0.13 - 1.52mm)

2A Positive Chipbreaker

- For fine finishing operations.
- Main application area:
FEED = .0025" - .011" (0.057 - 0.28mm)
DOC = .005" - .060" (0.13 - 1.52mm)

New Sizes

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	APPLICATION	ORDER #	PRICE EACH
							I-9 PCS.	10+ PCS.
CPGT 21.51-FH	SV315	1/4"	0.094"	0.015"	0.110"	Cast Iron/Steel	25-000-185*	\$12.81
CPGT 21.51-PM2	VP5515	1/4	0.094	0.015	0.110	Steel/Cast Iron	25-000-187	20.56
CPGT 21.51-PM2	VP5525	1/4	0.094	0.015	0.110	Steel/Stainless Steel	25-000-188	20.56
CPMT 21.51-2A	VP5535	1/4	0.094	0.015	0.110	Steel/Stainless Steel	25-000-464	14.06
CPMW 21.51	VP1510	1/4	0.094	0.015	0.110	Cast Iron	25-000-196	14.06
CPGT 32.52-FH	SV315	3/8	0.156	0.031	0.173	Cast Iron/Steel	25-000-205*	14.13
CPGT 32.52-PM2	VP5515	3/8	0.156	0.031	0.173	Steel/Cast Iron	25-000-206	22.63

*Limited Supply.

QUANTITY DISCOUNT

Parts For Boring Bars

E2

TORX® SCREWS

MODEL #	ORDER #	PRICE EACH
PT-542T	25-200-228	\$4.97
PT-544T	25-200-230	4.97
PT-546T	25-200-232	4.97
PT-559T	25-200-234	4.97
PT-588T	25-200-236	6.09
PT-589T	25-200-238	4.97

TORX® WRENCHES

MODEL #	ORDER #	PRICE EACH
T-7	94-002-100	\$3.41
T-15	94-002-108	2.18

D1

APPLICATIONS:

- Boring and profiling.

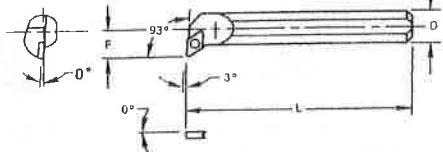
FEATURES:

- Able to bore and face.
- Under cut for threads.
- Uses Torx® screw to secure insert.

Valenite S-SDUPR/L Boring Bars



RIGHT HAND



D1

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	APPLICATION	ORDER #	PRICE EACH
							I-9 PCS.	10+ PCS.
S06M-SDUPR/L 2	0.375"	0.750"	0.375"	6.000"	DP..21.51	PT-589T	T-7	25-200-186
S08R-SDUPR/L 2	0.500	0.812	0.406	8.000	DP..21.51	PT-589T	T-7	25-200-188
S10S-SDUPR/L 2	0.625	1.000	0.500	10.000	DP..21.51	PT-589T	T-7	25-200-190
S12S-SDUPR/L 3	0.750	1.500	0.750	10.000	DP..32.52	PT-544T	T-15	25-200-192

Valenite DPGT Carbide Inserts For S-SDUPR/L Boring Bars



FEATURES:

FH Finishing Chipbreaker

- Single sided, screw-down finishing insert.
- Positive cutting land for reduced forces.
- Broad chip control application range.

- Excellent profiling capabilities.

- Main application area:
FEED = .003" - .016" (0.08 - 0.41mm)
DOC = .005" - .100" (1.12 - 2.54mm)

◆ See Page 364 For Valenite Grade Information.

E2

QUANTITY DISCOUNT

MODEL #	ORDER #	PRICE EACH
DPGT 21.51-FH	VC901	\$17.13
DPGT 21.51-PM2	VP9625	20.56
DPGT 32.52-FH	VC929	19.69
DPGT 32.52-PM2	VP9610	21.88

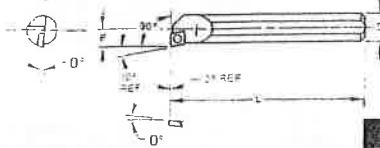
E2

*Limited Supply.

For rock solid workholding turn to Kurt. See pages 659-660 & 664.



S-SCFPR/L Boring Bars



APPLICATIONS:

- Use for boring.

FEATURES:

- Uses Torx® screw to secure insert.

MODEL	DIMENSIONS					RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
	D	MIN. BORE	F	L	INSERT SIZE	USE TORX® SCREW #	USE TORX® WRENCH #	
SO6M-SCFPR/L 2	0.375"	0.500"	0.250"	6.000"	CP.21.51	PT-589T	T-7	25-200-090
SO8R-SCFPR/L 2	0.500	0.625	0.312	8.000	CP.21.51	PT-589T	T-7	25-200-092
S1OS-SCFPR/L 2	0.625	0.812	0.406	10.000	CP.21.51	PT-589T	T-7	25-200-094
S12S-SCFPR/L 3	0.750	1.000	0.500	10.000	CP.32.52	PT-559T	T-15	25-200-096

Parts For Boring Bars

QUANTITY DISCOUNT

TORX® SCREWS

MODEL	ORDER #	PRICE EACH
PT-542T	25-200-228	\$4.97
PT-544T	25-200-230	4.97
PT-546T	25-200-232	4.97
PT-559T	25-200-234	4.97
PT-588T	25-200-236	6.09
PT-589T	25-200-238	4.97

TORX® WRENCHES

MODEL	ORDER #	PRICE EACH
T-7	94-002-100	\$3.41
T-15	94-002-108	2.18

Valenite CP_ _ Carbide Inserts For S-SCFPR/L Boring Bars

QUANTITY DISCOUNT

FEATURES:

PM2, FH Finishing Chipbreakers

- Single sided, screw-down finishing insert.
- Positive cutting land for reduced forces.
- Broad chip control application range.
- Excellent profiling capabilities.
- Main application area:
FEED = .003" - .016" (0.08 - 0.41mm)
DOC = .005" - .100" (1.12 - 2.54mm)

2A Positive Chipbreaker

- For fine finishing operations.
- Main application area:
FEED = .0025" - .011" (0.057 - 0.28mm)
DOC = .005" - .060" (0.13 - 1.52mm)

New sizes

◆ See Page 364 For Valenite Grade Information.

CPGT-FH



CPMT-2A

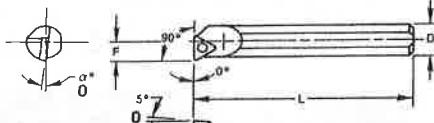
CPMW

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	APPLICATION	ORDER #	PRICE EACH	
								1-9 PCS.	10+ PCS.
CPGT 21.51-FH	SV315	1/4"	0.094"	0.015"	0.110"	Cast Iron/Steel	25-000-185*	\$12.81	\$10.25
CPGT 21.51-PM2	VP5515	1/4	0.094	0.015	0.110	Steel/Cast Iron	25-000-187	20.56	16.45
CPGT 21.51-PM2	VP5525	1/4	0.094	0.015	0.110	Steel/Stainless Steel	25-000-188	20.56	16.45
CPMT 21.51-2A	VP5535	1/4	0.094	0.015	0.110	Steel/Stainless Steel	25-000-464	14.06	11.25
CPMW 21.51	VP1510	1/4	0.094	0.015	0.110	Cast Iron	25-000-196	14.06	11.25
CPGT 32.52-FH	SV315	3/8	0.156	0.031	0.173	Cast Iron/Steel	25-000-205*	14.13	11
CPGT 32.52-PM2	VP5515	3/8	0.156	0.031	0.173	Steel/Cast Iron	25-000-206	22.63	18..

*Limited Supply.

Valenite S-STFPR/L Boring Bars

D1



APPLICATIONS:

- Boring.

FEATURES:

- Molded chipbreaker insert with three cutting edges.
- Uses Torx® screw to secure inserts.

MODEL	DIMENSIONS					RIGHT HAND ORDER #	LEFT HAND ORDER #	PRICE EACH
	D	MIN. BORE	F	L	INSERT SIZE			
SO6M-STFPR/L 2	0.375"	0.500"	0.250"	6.000"	TP.21.51	PT-589T	T-7	25-200-154
SO8R-STFPR/L 2	0.500	0.625	0.312	8.000	TP.21.51	PT-589T	T-7	25-200-156
S1OS-STFPR/L 2	0.625	0.812	0.406	10.000	TP.21.51	PT-542T	T-7	25-200-158
S12S-STFPR/L 3	0.750	1.000	0.500	10.000	TP.32.52	PT-544T	T-15	25-200-160

Parts For Boring Bars

QUANTITY DISCOUNT

TORX® SCREWS

MODEL	ORDER #	PRICE EACH
PT-542T	25-200-228	\$4.97
PT-544T	25-200-230	4.97
PT-546T	25-200-232	4.97
PT-559T	25-200-234	4.97
PT-588T	25-200-236	6.09
PT-589T	25-200-238	4.97

TORX® WRENCHES

MODEL	ORDER #	PRICE EACH
T-7	94-002-100	\$3.41
T-15	94-002-108	2.18

Valenite TP_ _ Carbide Inserts For S-STFPR/L Boring Bars

QUANTITY DISCOUNT

FEATURES:

PM2, FH Finishing Chipbreakers

- Single sided, screw-down finishing insert.
- Positive cutting land for reduced forces.
- Broad chip control application range.
- Excellent profiling capabilities.
- Main application area:
FEED = .003" - .016" (0.08 - 0.41mm)
DOC = .005" - .100" (1.12 - 2.54mm)

2A Positive Chipbreaker

- For fine finishing operations.
- Main application area:
FEED = .0025" - .011" (0.057 - 0.28mm)
DOC = .005" - .060" (0.13 - 1.52mm)

TPMW

◆ See Page 364 For Valenite Grade Information.

TPGT

TPMT-2A

INSERT #	GRADE	I.C.	THICKNESS	RADIUS	HOLE SIZE	APPLICATION	ORDER #	PRICE EACH	
								1-9 PCS.	10+ PCS.
TPMW 21.51	VP1510	1/4"	0.094"	0.015"	0.110"	Steel/Stainless Steel	25-000-231	\$13.25	\$10.1
TPGT 21.51-FH	SV325	1/4	0.094	0.015	0.110	Steel/Stainless Steel	25-000-233*	17.50	14.00
TPGT 21.51-PM2	VP5515	1/4	0.094	0.015	0.110	Steel/Cast Iron	25-000-236	18.94	15.15
TPGT 32.52-FH	SV325	3/8	0.156	0.031	0.173	Steel/Stainless Steel	25-000-235*	13.38	10.70
TPGT 32.52-PM2	VP5525	3/8	0.156	0.031	0.173	Steel/Stainless Steel	25-000-237	22.75	18.20
TPMT 32.52-2A	VIN	3/8	0.156	0.031	0.173	Steel/Stainless Steel	25-000-240	14.13	11.30

*Limited Supply.

Valenite S-MCLNR Boring Bars
Accepts CNMG Style Inserts • Right Hand



-3° LEAD
TURNING &
PROFILING

General purpose 80°
diamond boring bar

APPLICATIONS:

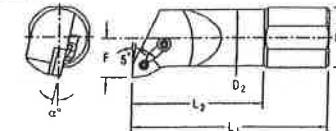
- Roughing to finish boring in all material types.

FEATURES:

- Industry standard M-style inserts clamping system, pin and top clamp.
- Boring and facing with standard CNMG inserts.

BORING BARS

MODEL #	DIMENSIONS							INSERT SIZE	USE SHIM SEAT #	USE LOCK PIN #	USE CLAMP #	USE CLAMP SCREW #	ORDER #	PRICE EACH
	D1	MIN. BORE	F	D2	α°	L1	L2							
S16T-MCLNR 4	1.00"	1.280"	0.640"	—	12°	12.00"	—	CN_432	—	NL-44	CLI-20	XNS-47	25-200-305	\$239.50
S20U-MCLNR 4	1.250	1.530	0.765	1.12"	12	14.00	3.00"	CN_432	—	NL-44	CLI-20	XNS-47	25-200-307	260.00
S24U-MCLNR 4	1.500	1.780	0.890	1.31	12	14.00	3.00	CN_432	ICSN-433	NL-46	CLI-20	XNS-47	25-200-309	289.00
S28U-MCLNR 4	1.750	2.030	1.015	1.56	12	14.00	4.00	CN_432	ICSN-433	NL-46	CLI-20	XNS-47	25-200-311	313.00
S32V-MCLNR 4	2.000	2.562	1.281	1.81	12	16.00	4.00	CN_432	ICSN-433	NL-46	CLI-20	XNS-47	25-200-313	340.00
S40V-MCLNR 4	2.500	3.062	1.531	2.31	10	16.00	4.00	CN_432	ICSN-433	NL-46	CLI-20	XNS-47	25-200-315	393.00



Left Hand Bars
Available, Please Call

Carbide Inserts
Page 367

REPLACEMENT PARTS

DESCRIPTION	MODEL #	ORDER #	PRICE EACH
Shim Seat	ICSN-433	55-920-180	\$7.36
Lock Pin	NL-44	55-920-143	9.80
Lock Pin	NL-46	55-920-146	11.15
Clamp	CLI-20	55-920-110	8.18
Shim Screw	XNS-47	55-920-115	3.34

Valenite S-MWLNR Boring Bars
Accepts WNMG Style Inserts • Right Hand



-3° LEAD
TURNING &
PROFILING

Ideal all-round economical
boring bar for general purpose
larger diameter boring

APPLICATIONS:

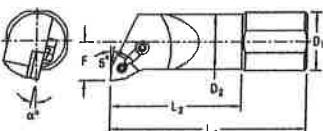
- Roughing to finish boring in all material types.

FEATURES:

- Industry standard M-style inserts clamping system, pin and top clamp.
- Boring and facing with economical, cost saving six-edged WNMG insert.

BORING BARS

MODEL #	DIMENSIONS							INSERT SIZE	USE SHIM SEAT #	USE LOCK PIN #	USE CLAMP #	USE CLAMP SCREW #	ORDER #	PRICE EACH
	D1	MIN. BORE	F	D2	α°	L1	L2							
S16T-MWLNR 3	1.000"	1.280"	0.640"	—	10°	12.00"	—	WNM_332	—	NL-33L	CLI-6	XNS-36	25-200-325	\$239.50
S16T-MWLNR 4	1.000	1.280	0.640	—	12	12.00	—	WNM_432	—	NL-44L	CLI-20	XNS-47	25-200-327	239.50
S20U-MWLNR 4	1.250	1.530	0.765	1.06	14	14.00	3.00	WNM_432	IWSN-432	NL-46	CLI-20	XNS-48	25-200-331	260.00
S24U-MWLNR 4	1.500	1.780	0.890	1.31	14	14.00	3.00	WNM_432	IWSN-432	NL-46	CLI-20	XNS-48	25-200-333	289.00
S232V-MWLNR 4	2.000	2.562	1.281	1.81	14	16.00	4.00	WNM_432	IWSN-432	NL-46	CLI-20	XNS-48	25-200-335	340.00



Left Hand Bars
Available, Please Call

Carbide Inserts
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REPLACEMENT PARTS

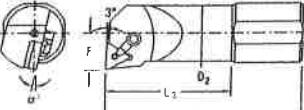
DESCRIPTION	MODEL #	ORDER #	PRICE EACH
Shim Seat	IWSN-322	55-920-300	\$6.27
Shim Seat	IWSN-432	55-920-302	7.18
Lock Pin	NL-33L	55-920-139	9.80
Lock Pin	NL-34L	55-920-144	9.80
Lock Pin	NL-44	55-920-143	9.80
Lock Pin	NL-46	55-920-146	11.15
Clamp	CLI-6	55-920-100	6.91
Clamp	CLI-20	55-920-110	8.18
Clamp Screw	XNS-36	55-920-112	3.10
Clamp Screw	XNS-38	55-920-113	3.10
Clamp Screw	XNS-47	55-920-115	3.34
Clamp Screw	XNS-48	55-920-114	3.34

Valenite S-MTUNR Boring Bars
Accepts TNMG Style Inserts • Right Hand



-3° LEAD
TURNING &
PROFILING

Most popular boring bar style
for larger diameter bores with
large depth of cut capacity



Left Hand Bars
Available, Please Call

Carbide Inserts
Page 370

REPLACEMENT PARTS

DESCRIPTION	MODEL #	ORDER #	PRICE EACH
Shim Seat	ITSN-433	55-920-165	\$8.48
Lock Pin	NL-33	55-920-141	9.80
Lock Pin	NL-33L	55-920-139	9.80
Lock Pin	NL-46	55-920-146	11.15
Clamp	CLI-7	55-920-102	6.91
Clamp	CLI-9	55-920-104	8.18
Clamp Screw	XNS-35	55-920-111	3.10
Clamp Screw	XNS-59	55-920-118	3.55

BORING BARS

MODEL #	DIMENSIONS							INSERT SIZE	USE SHIM SEAT #	USE LOCK PIN #	USE CLAMP #	USE CLAMP SCREW #	ORDER #	PRICE EACH
	D1	MIN. BORE	F	D2	α°	L1	L2							
S16T-MTUNR 32	1.00"	1.250"	0.625"	0.88"	12°	12.00"	2.50"	TN_322	—	NL-33	CLI-7	XNS-35	25-200-350	\$239.50
S16T-MTUNR 33	1.00	1.280	0.640	0.88	12	12.00	2.50	TN_332	—	NL-33L	CLI-7	XNS-35	25-200-352	239.50
S24U-MTUNR 4	1.500	1.780	0.890	1.31	10	14.00	3.00	TN_432	ITSN-433	NL-46	CLI-9	XNS-59	25-200-354	289.00

Valenite

MILL

Round Insert Copy End Mills

V500 Series Copy End Mills For Profiling And Die-Mold Applications

Short Or Long Versions Available In
1" & 1-1/2" Diameters, Please Call**REPLACEMENT PARTS**

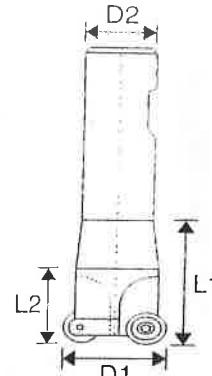
INSERT SIZE	TORX® DRIVER			INSERT SCREW		
	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH
RDMLT 07	TX207PLUS	25-300-320	\$14.49	DVF2833	25-300-330	\$5.67
RDMLT 08	TX208PLUS	25-300-240	14.49	DVF2910	25-300-331	3.57
RDMLT 10	TX215PLUS	25-300-321	21.28	DVF3503	25-300-332	3.15
RDMLT 12	TX215PLUS	25-300-321	21.28	DVF3504	25-300-333	3.71
RDMLT 16	TX220PLUS	25-300-322	21.28	DVF3020	25-300-334	9.87

APPLICATIONS:

- Face, end mill, plunge, ramp, copy and profile with the same cutter.
- Versatile end mills with extra secure cutting edge.
- Finishing and roughing applications.

FEATURES:

- Insert range from 7mm to 16mm diameters.

**END MILLS**

MODEL #	INSERT SIZE	# OF TEETH	MAXIMUM RPM	CUTTING DIAMETER D1	SHANK DIAMETER D2	HEAD DEPTH L2	REACH L1	ORDER #	PRICE EACH
V500A07050WB20	RDMLT 07	2	25,000	0.500"	0.625"	0.79"	2.00"	25-300-275	\$160.00
V500A08062WC20	RDMLT 08	2	25,000	0.625	0.750	0.98	2.25	25-300-276	182.50
V500A10075WD32	RDMLT 10	2	25,000	0.750	1.000	1.18	3.25	25-300-277	203.50
V500A12100WD32	RDMLT 12	2	22,000	1.000	1.000	1.18	3.25	25-300-278	218.50
V500A12100WD47	RDMLT 12	2	22,000	1.000	1.000	1.18	4.75	25-300-279	218.50
V500A12125WD47	RDMLT 12	2	22,000	1.250	1.000	0.59	4.75	25-300-280	248.00
V500A12150WD32	RDMLT 12	3	22,000	1.500	1.000	0.59	3.25	25-300-281	299.00
V500A16150WF47	RDMLT 16	2	20,000	1.500	1.500	1.57	4.75	25-300-282	276.00

Valenite

MILL

V500 Face Mills

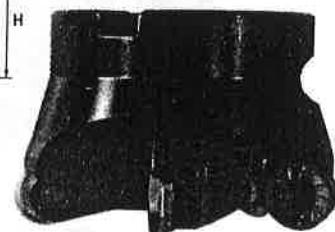
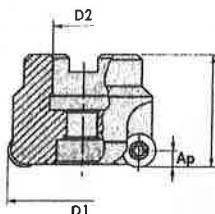
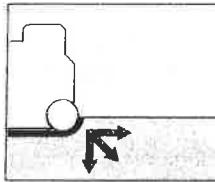
V500 Series Copy Face Mills

APPLICATIONS:

- Face mill, ramp, copy and profile with the same cutter.
- Versatile face mills with extra secure cutting edge.
- Finishing and roughing applications.

FEATURES:

- Uses strong 16mm diameter inserts.
- High number of indexes per insert for maximum economy.

See Above Ad For
Replacement Parts

Valenite

MILL

V500 Inserts

RDMLT Copy Milling Inserts With Chip Former

QUANTITY DISCOUNT

APPLICATIONS:

- Rough and finish copy milling.
- High feed applications.
- Extra strong round insert shape when extra edge security is required.

Grade VP 5040

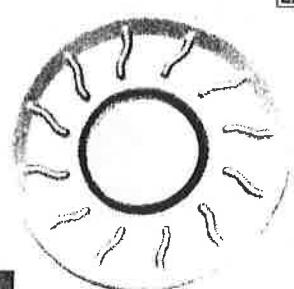
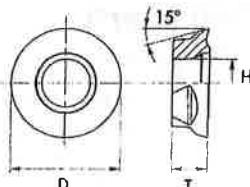
- For general purpose use.

Grade VP 5135

- For slower speed unfavorable conditions.

FEATURES:

- Select correct insert diameter to match cutter body.



INSERT #	DIMENSIONS			ORDER #	GRADE VP5040			ORDER #	GRADE VP5135		
	D	T	H		1-9 PCS.	10-29 PCS.	30+ PCS.		1-9 PCS.	10-29 PCS.	30+ PCS.
RDMLT07T1MOSN-61	0.275"	0.078"	0.098"	25-300-300	\$13.88	\$11.10	\$9.44	—	—	—	—
RDMLT08T2MOSN-61	0.315	0.109	0.110	25-300-302	13.88	11.10	9.44	25-300-310	\$13.88	\$11.10	\$9.44
RDMLT1003MOSN-F6-61	0.394	0.125	0.173	25-300-304	15.75	12.60	10.71	25-300-312	15.75	12.60	10.71
RDMLT12T3MOSN-F6-61	0.472	0.156	0.173	25-300-306	17.19	13.75	11.69	25-300-314	17.19	13.75	11.69
RDMLT1604MOSN-F6-61	0.63	0.187	0.224	25-300-308	21.25	17.00	14.45	25-300-316	21.25	17.00	14.45

Did you know that we carry a large selection of Jet® Machinery including mills, lathes, grinders and drill presses? See pages 490-511 & 543-546.

J E T

Valenite

MILL

V590 Square Shoulder Free Cutting End Mills

V590 Series End Mills For Knee Mills And Machining Centers

D1

**APPLICATIONS:**

- Use for shoulders, facing, ramping and helical interpolation.

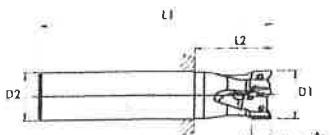
Replacement Parts
See Ad Below

FEATURES:

- True 90° shoulders eliminate secondary operations and "clean-up" cuts.
- Smooth cutting action, even on lower powered and manual machines.
- Insert size AP 10 available in 1/64ths or 1/32" radii.



AP07 & AP16 Inserts, Cutter Bodies & Integral CAT 40 Shanks Available, Please Call

**END MILLS**

MODEL #	CUTTING DIAMETER D1	SHANK DIAMETER D2	CUTTING DEPTH Ar	HEAD LENGTH L2	OVERALL LENGTH L1	# OF INSERTS	INSERT SIZE	ORDER #	PRICE EACH
AP 10 INSERT SIZE									
V590 A 10 062 WB09	0.625"	0.625"	0.350"	0.930"	3.00"	2	AP 10	25-300-210	\$192.50
V590 B 10 075 WC15	0.750	0.750	0.350	1.470	3.50	3	AP 10	25-300-213	242.00
V590 B 10 075 WC15	1.000	0.750	0.350	1.470	3.50	3	AP 10	25-300-214	242.00
V590 A 10 100 WD17	1.000	1.000	0.350	1.720	4.00	3	AP 10	25-300-216	283.00
AP 13 INSERT SIZE									
V590 A 13 100 WD17	1.000"	1.000"	0.480"	1.720"	4.00"	3	AP 13	25-300-219	\$283.00
V590 A 13 125 WE17	1.250	1.250	0.480	1.720	4.00	4	AP 13	25-300-222	325.00
V590 A 13 150 WE21	1.500	1.500	0.480	2.120	4.00	5	AP 13	25-300-225	333.00

Valenite

MILL

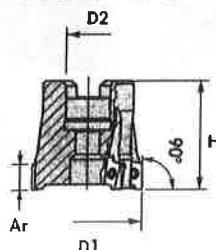
V590 Face Mills**V590 Series Face Mills For Knee Mills And Machining Centers**

D1

**APPLICATIONS:**

- Use same insert as V590 end mills.
- Use for facing, shoulders, ramping and helical interpolation.

AP16 Inserts & Face Mills Available, Please Call

**FACE MILLS**

MODEL #	CUTTING DIAMETER D1	ARBOR SIZE D2	CUTTING DEPTH Ar	OVERALL LENGTH H	# OF INSERTS	INSERT SIZE	ORDER #	PRICE EACH
AP 10 INSERT SIZE								
V590 A 10 0150 G05R	1.500"	0.750"	0.350"	1.500"	5	AP 10	25-300-229	\$333.00
AP 13 INSERT SIZE								
V590 A 13 0200 G06R	2.000"	0.750"	0.480"	1.500"	6	AP 13	25-300-230	\$412.00
V590 A 13 0250 G07R	2.500	0.750	0.480	1.750	7	AP 13	25-300-233	445.00
V590 A 13 0300 H09R	3.000	1.000	0.480	2.000	9	AP 13	25-300-236	529.00
V590 A 13 0400 K10R	4.000	1.500	0.480	2.000	10	AP 13	25-300-239	674.00

Valenite

MILL

V590 Inserts**V590 Square Shoulder Milling Inserts**

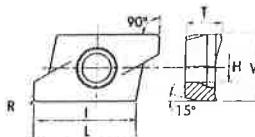
QUALITY DISCOUNT

Super tough and secure Grade 5040
for all-round applications

E2

**APPLICATIONS:**

- Insert generates true 90° square shoulders.
- End milling and face milling with smooth cutting action.

**FEATURES:****FEATURES:**

- Insert size AP 10 available in 1/64ths or 1/32" radii.
- PVD TiAlN/TiN coated with high positive pressed in chip former.

INSERT #	SIZE	L	T	R	GRADE	ORDER #	PRICE EACH
						1-9 PCS.	10+ PCS.
AP 100304 ER81	AP 10	0.385"	0.134"	0.016"	VP5040	25-300-245	\$17.19
AP 100308 ER81	AP 10	0.385	0.134	0.031	VP5040	25-300-248	17.19
AP 100308 ER31	AP 10	0.386	0.134	0.031	VP5020	25-300-246	17.19
AP 100308 ER81	AP 10	0.354	0.134	0.031	VP5020	25-300-247	17.19
AP 130408 ER31	AP 13	0.504	0.177	0.031	VP5040	25-300-251	18.06
AP 130408 ER31	AP 13	0.504	0.177	0.031	VP5020	25-300-252	18.06
AP 130408 ER81	AP 13	0.504	0.177	0.031	VP5020	25-300-253	18.06
AP 130408 ER81	AP 13	0.504	0.177	0.031	VP5040	25-300-254	18.06
AP 130408 FR11	AP 13	0.504	0.177	0.031	VPUK20	25-300-255	14.50
							11.60

Industry famous Super Tool, Inc. carbide tipped products.
See pages 92, 123, 218 & 301-302.

Super Tool, Inc.

Valenite® MILL V555 Face Mills & Pentagon Carbide Inserts
30° Lead • Optional Coolant Screws

BENEFITS:

- The pentagonal shape insert provides larger bearing surfaces, closer to the surface being machined, directly opposing the forces generated by the cut.
- Robust, .215" thick, insert has 30% more carbide than equivalent size square for longer tool life and increased protection of the insert seat & cutter body.
- Cutter bodies are contoured to take full advantage of Valenite's optional coolant screws.

Cost effective, strength, durability, performance and flexibility

APPLICATIONS:

- Positive, free cutting inserts are available in a variety of geometries and Valpro grades to cover all of your applications, over the range of part materials.

Grade VP5020

- Highly versatile milling grade with a multi-layer PVD TiAlN/TiN coating combined with micrograin substrate.
- Primarily used for finishing and semi-finishing operations on steels, stainless steels, cast irons, refractory alloys, titanium & aluminum alloys.

Grade VP5040

- Rough milling grade with a multi-layer PVD TiAlN/TiN coating combined with a tough substrate.
- For general machining and roughing steels & stainless steels.

Grade VP5135

- Milling grade with maximum toughness featuring TiCN/AL2O3/TiNMCVD coating and high cobalt substrate.
- It is ideal for rough milling and poor machining conditions on steels, stainless steel & high temperature alloys.

QUANTITY
DISCOUNT

Grade VPUK20

- Uncoated grade for finishing, semi-finishing and general machining of cast irons, high temperature alloys, aluminum alloys & non-ferrous materials.

- Reliable performance with good balance of wear resistance and toughness.

Grade VP1120

- General purpose milling grade.
- Features TiCN/AL2O3 coating with highly polished surface for increased lubricity.
- Primarily used for light roughing to finishing of irons.

FR/ER11

- For finishing.

ER41

- For semi-finishing.

ER51

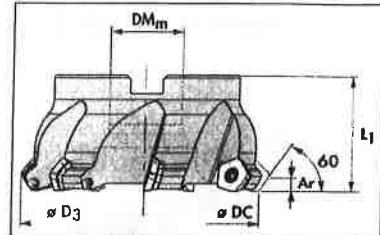
- For medium duty.

SR81

- For roughing.

FEATURES:

- (5) Cutting edges, competitively priced with (4) edge square inserts of equivalent size, with minimal change in D.O.C.
- Inserts supplied with a .031" radius.



INSERTS

INSERT #	GRADE	ORDER #	PRICE EACH	
			1-9 PCS.	10+ PCS.
PDMT 0905 DE SR81	VP5020	25-300-420	\$15.31	\$12.25
PDMT 0905 DE SR81	VP5135	25-300-421	15.31	12.25
PDMT 0905 DE SR81	VP1120	25-300-422	15.31	12.25
PDKT 0905 DE ER41	VP5020	25-300-423	17.13	13.70
PDKT 0905 DE ER41	VP5040	25-300-424	17.13	13.70
PDKT 0905 DE ER41	VP5135	25-300-425	15.94	12.75
PDKT 0905 DE ER41	VP1120	25-300-426	17.13	13.70
PDKT 0905 DE ER11	VP5020	25-300-427	17.13	13.70
PDKT 0905 DE ER11	VP1120	25-300-428	17.13	13.70
PDKT 0905 DE FR11	VPUK20	25-300-429	12.25	9.80
PDHX 0905 DE FR	VP5020	25-300-430	18.06	14.45
PDHX 0905 DE FR	VPUK20	25-300-431	14.50	11.60

SPARE PARTS

DESCRIPTION	MODEL #	ORDER #	PRICE EACH
Insert Screw	DVF2097	25-300-415	\$3.57
Torx® Driver	TX220PLUS	25-300-416	21.28

FACE MILLS

MODEL #	CUTTING DIAMETER DC	OVERALL DIAMETER D3	ARBOR SIZE DMm	HEIGHT L1	# OF INSERT	OP MAX.	INSERT SIZE	MAXIMUM RPM	OPTIONAL COOLANT SCREW	ORDER #	PRICE EACH
V555 A 09 0200 G04R	2.00"	2.35"	0.75"	1.50"	4	0.21"	PD...09...	19,000	PT 888	25-300-400	\$307.00
V555 A 09 0250 G05R	2.50	2.85	0.75	1.75	5	0.21	PD...09...	16,000	PT 888	25-300-401	363.00
V555 A 09 0300 H06R	3.00	3.35	1.00	2.00	6	0.21	PD...09...	14,000	PT 870	25-300-402	415.00
V555 A 09 0400 K07R	4.00	4.35	1.50	2.00	7	0.21	PD...09...	12,000	PT 890	25-300-403	506.00
V555 A 09 0500 K08R	5.00	5.35	1.50	2.38	8	0.21	PD...09...	10,000	PT 872	25-300-404	661.00
V555 A 09 0600 K09R	6.00	6.35	1.50	2.38	9	0.21	PD...09...	9,000	PT 872	25-300-405	742.00

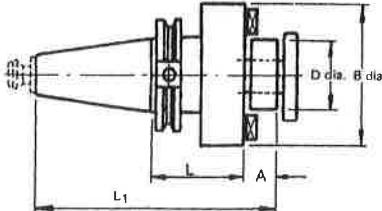
"V" Flange CNC Shell End Mill Adapters

Caterpillar #40 Taper

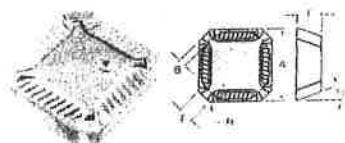
DO YOU NEED...
More Items Like These?
See Page 629.



DIMENSIONS		ORDER #	PRICE EACH	ORDER #	PRICE EACH
1/2"	1-3/8"	67-810-400	\$113.83	67-807-100	\$108.34
3/4	1-3/8	67-810-405	113.83	67-807-102	108.34
1	2-1/16	67-810-410	113.83	67-807-104	108.34
1-1/4	2-1/8	67-810-415	137.43	67-807-106	113.12
1-1/2	2-13/32	67-810-420	137.43	67-807-108	116.83



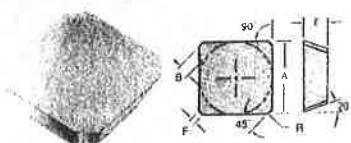
Valenite SEER & SEHN 45° Carbide Milling Inserts



SEER

APPLICATIONS:

- General all-round face milling with minimal cutting forces.
- Some great results regardless of machine type or condition.



SEHN

♦ Limited Supply.

Free cutting SEER molded geometry lowers cutting forces and controls chip away from cutting zone

QUANTITY
DISCOUNT

E2

FEATURES:

- Wide wiper flat on inserts generates improved milled surface finishes.

Coated Grade SM225

- For high speed applications.

SEER Inserts

- Chipformer pressed into insert face provide extra free cutting action.

Coated Grade SM245

- For all material types general purpose use.

Coated Grade V1N

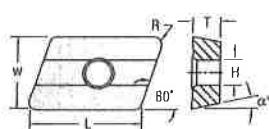
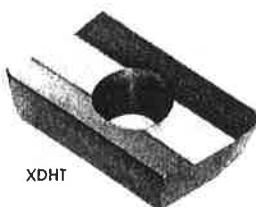
- For slower speeds in steels.

INSERT #	GRADE	DIMENSIONS					ORDER #	PRICE EACH	
		A	T	R	B	F		1-9 PCS.	10+ PCS.
SEER 42 AFER	SM225	1/2"	.125"	.044"	.056"	.094"	25-300-115	\$16.56	\$13.25
SEER 42 AFER	SM245	1/2	.125	.044	.056	.094	25-300-116	16.56	13.25
SEER 42 AFER	V1N	1/2	.125	.044	.056	.094	25-300-117	14.94	11.95
SEHN 42 AFSN	SM225	1/2	.125	.047	.057	.094	25-300-118	14.88	11.90
SEHN 42 AFSN	SM245	1/2	.125	.047	.057	.094	25-300-119	14.88	11.90
SEHN 42 AFSN	V1N	1/2	.125	.047	.057	.094	25-300-120	13.44	10.75

Valenite Carbide Inserts For SpectraMill™ M680 Indexable End Mills & Face Mills

QUANTITY
DISCOUNT

E2



INSERT SCREWS

MODEL #	ORDER #	PRICE EACH
PT-951T	25-300-060	\$8.12
PT-962T	25-300-061	2.66
PT-952T	25-300-062	2.66

CARBIDE INSERTS

INSERT #	GRADE	DIMENSIONS						ORDER #	PRICE EACH	
		L	T	R	W	H	α^*		1-9 PCS.	10+ PCS.
XDHT090308	THM	0.381"	0.125"	0.031"	0.25"	0.110"	15°	25-300-043*	\$12.42	\$10.35
XPHT160408	TN-450	0.635	0.187	0.031	0.375	0.172	11°	25-300-045*	17.50	14.00

*Limited Supply.

♦ See Page 364 For Valenite Grade Information.

Corrective Measures In Milling

Bad Surface Finish

- Reduce the feed per tooth to get the wiper edge to sweep the whole surface.
- Check that the inserts are well set in the milling cutter.
- Check the overhang and the flexion of the cutter holding system.
- Improve the rigidity of the tooling and check the clamping of the part.



Notch Wear Or Oxidation Wear

- Reduce the cutting speed (shock hardening materials).
- Select a more wear resistant grade.
- Increase the cutting speed (hard outside layer).
- Stop using coolant.



Plastic Deformation

- Reduce the cutting speed and the feed per tooth.
- Select a coated grade or a more wear resistant grade if you use already coated grades.



Thermal Cracks, Small Cracks Perpendicular To The Cutting Edge

- Reduce the cutting speed.
- Select a more thermal shock resistant grade.
- Stop using coolant or use a lot of coolant.
- Use compressed air to chase chips when full slot milling.



Flank Wear

- Reduce the cutting speed.
- Select a more wear resistant grade.
- Increase the feed per tooth.



Frittering

- Select an insert with a stronger edge and tougher grade.
- Reduce the feed per tooth at the beginning of the operation.
- Increase the cutting speed if frittering is due to a built-up edge.



Insert Breakage

- Reduce the feed per tooth.
- Select a tougher grade.
- Check the cutter relative position to the machined part (overhang & catching).



Vibrations

- Vibrations might be generated by unadapted cutting conditions or a lack of stiffness of the tool-part-machine system.
- Reduce the cutting speed, the depth of cut and the overhang.
- Increase the feed per tooth.
- Improve stability by selecting a cutter with a different pitch.

Valenite Centre-Dex® Indexable Center Cutting Drilling End Mills

Uses SECW And SD Inserts

BENEFITS:

- The industry standard for center cutting drilling end mills; high performance and economy in one tool.

APPLICATIONS:

- Plunge, drill, ramp and end mill all with the same tool.
- Can be used on knee mills as well as CNC machining centers.

FEATURES:

- Simple tool handling, one insert screw and Torx® wrench.
- Light cutting action in all feed directions.

END MILLS

CUTTING DIAMETER D1	SHANK DIAMETER D2	STYLE	OVERALL LENGTH L1	NECK LENGTH L2	# OF INSERTS	USE INSERT INSERT #	USE INSERT SCREW #	USE TORX® WRENCH #	MODEL	ORDER #	PRICE EACH
.480"	.500"	1	2.880"	1.000"	1	SECW 21.21	PT-594T	T-7	S-VMSP-048R-90CCC	25-300-165	\$85.25
.605	.625	1	3.310	1.250	1	SECW 2.51.51	PT-595T	T-8	S-VMSP-060R-90CCC	25-300-168	86.75
.730	.750	1	3.060	1.000	1	SD 322D	PT-618T	T-10	S-VMSP-073AR-90CCC	25-300-171	89.25
.730	.750	1	3.060	1.000	1	SD322D	PT-618T	T-10	SVMSP073AR90CCCEC	25-300-175	129.50
.980	.750	1	3.310	1.250	1	SD 422P	PT-318T	T-10	S-VMSP-098R-90CCC	25-300-174	94.25
1.500	1.250	2	1.820	1.820	2	SD422P	PT-318T	T-10	SVMSP150R90CCC	25-300-176	129.50
1.000	0.750	2	3.310	1.250	2	SD322P	PT-317T	T-10	SVMSP100R90CCC	25-300-177	103.00
1.000	1.000	2E	5.120	1.620	2	SD322P	PT-317T	T-10	SVMSP100R90CCCEC	25-300-178	142.50
1.125	0.750	2	3.310	1.250	2	SD322P	PT-317T	T-10	SVMSP112R90CCC	25-300-179	109.50
1.250	1.250	2	3.820	1.500	2	SD422P	PT-318T	T-10	SVMSP125R90CCC	25-300-186	118.00
1.250	1.250	2E	5.500	2.000	2	SD422P	PT-318T	T-10	SVMSP125R90CCCEC	25-300-187	161.50
2.000	1.250	2	3.820	1.500	2	SD532P	PT-319T	T-20	SVMSP200R90CCC	25-300-188	149.00

Valenite SECW And SD Centre-Dex® Carbide Milling Inserts

BENEFITS:

- The industry standard for center cutting drilling end mills; high performance and economy in one tool.

APPLICATIONS:

- Plunge, drill, ramp and end mill all with one tool and one insert.
- Can be used on knee mills as well as CNC machining centers.

New sizes

Grade SM245

- For all-round use.

Grade V1N

- For extra insert toughness.

Grade SM225

- For higher cutting speeds.

FEATURES:

- Screw down insert for unobstructed chip flow.
- Light cutting action in all feed directions.

◆ See Page 364 For Additional Coated Grade Information.

INSERT #	GRADE	A	T	R	B	H	a"	DIMENSIONS	ORDER #	PRICE EACH
									1-9 PCS.	10+ PCS.
SECW 21.21	SM245	1/4"	.078"	.015"	.045"	.110"	20°	25-300-190*	\$18.50	\$14.80
SECW 21.21	V1N	1/4	.078	.015	.045	.110	20	25-300-192*	16.31	13.05
SECW 2.51.51	V1N	5/16	.094	.015	.058	.134	20	25-300-196*	18.13	14.50
SECW 21.21	VP5142	.250	.078	.015	.045	.110	20	25-300-191	20.06	16.05
SECW 21.21	VP5045	.250	.078	.015	.045	.110	20	25-300-193	20.06	16.05
SECW 25.151	VP5142	.3125	.094	.015	.058	.134	20	25-300-195	22.13	17.70
SECW 25.151	VP5045	.3125	.094	.015	.058	.134	20	25-300-197	22.13	17.70
SD 322D-3P	SM245	3/8	.125	.031	.065	.158	15	25-300-198*	23.38	18.70
SD 322D-3P	V1N	3/8	.125	.031	.065	.158	15	25-300-200	20.69	16.55
SD 322D-3P	VP5045	.375	.125	.031	.065	.158	15	25-300-199	25.31	20.25
SD 422P-CM	SM225	1/2	.125	.031	.091	.178	11	25-300-202*	24.75	19.80
SD 422P-CM	SM245	1/2	.125	.031	.091	.178	11	25-300-204*	24.75	19.80
SD422P-CM	VP1130	.500	.125	.031	.091	.178	11	25-300-201	26.81	21.45
SD422P-CM	VP5142	.500	.125	.031	.091	.178	11	25-300-203	26.81	21.45
SD532P	VP5045	.625	.187	.031	.116	.217	11	25-300-205	35.94	28.75

*Limited Supply.

Chip Thinning When Using End Mills

The radial width of cut (W.O.C.) when using end mills influences the actual thickness of the chip being cut. If the chip is too "thin" the result can be rapid tool wear, vibration, and general rubbing instead of cutting. The best cutting results are normally achieved with a actual chip thickness per flute (tooth) of between .003" and .008" for most end milling operations.

When end milling where the width of cut is less than the diameter of the end mill, the feed-rate should be increased to compensate and make the chip thicker. Use the following calculation to determine the correct feed per flute (tooth) when end milling.

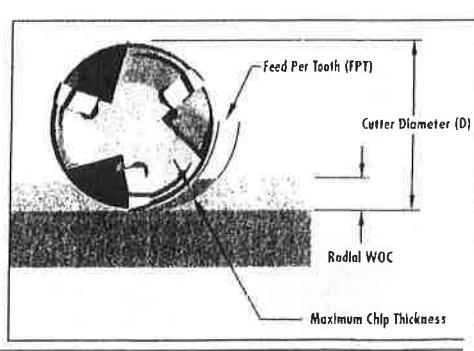
$$\sqrt{\frac{D}{W.O.C.}} \times (\text{Desired Chip Thickness}) = \text{Feed Per Flute}$$

Where: D = Cutter Diameter W.O.C. = Radical width of cut

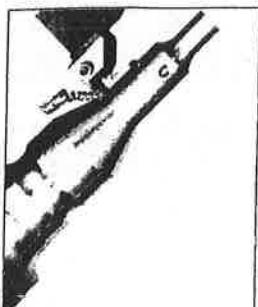
EXAMPLE: .750" diameter end mill cutting a radial width of .063" (on a side) where .004" actual chip thickness is desired.

$$\sqrt{\frac{.750}{.063}} = 3.45 \times .004" = .0138" \text{ FEED PER FLUTE}$$

If the end mill has 3 flutes and is running at 1,500 RPM the table feed should be: $3 \times .0138" \times 1,500 = 62$ inches per minute



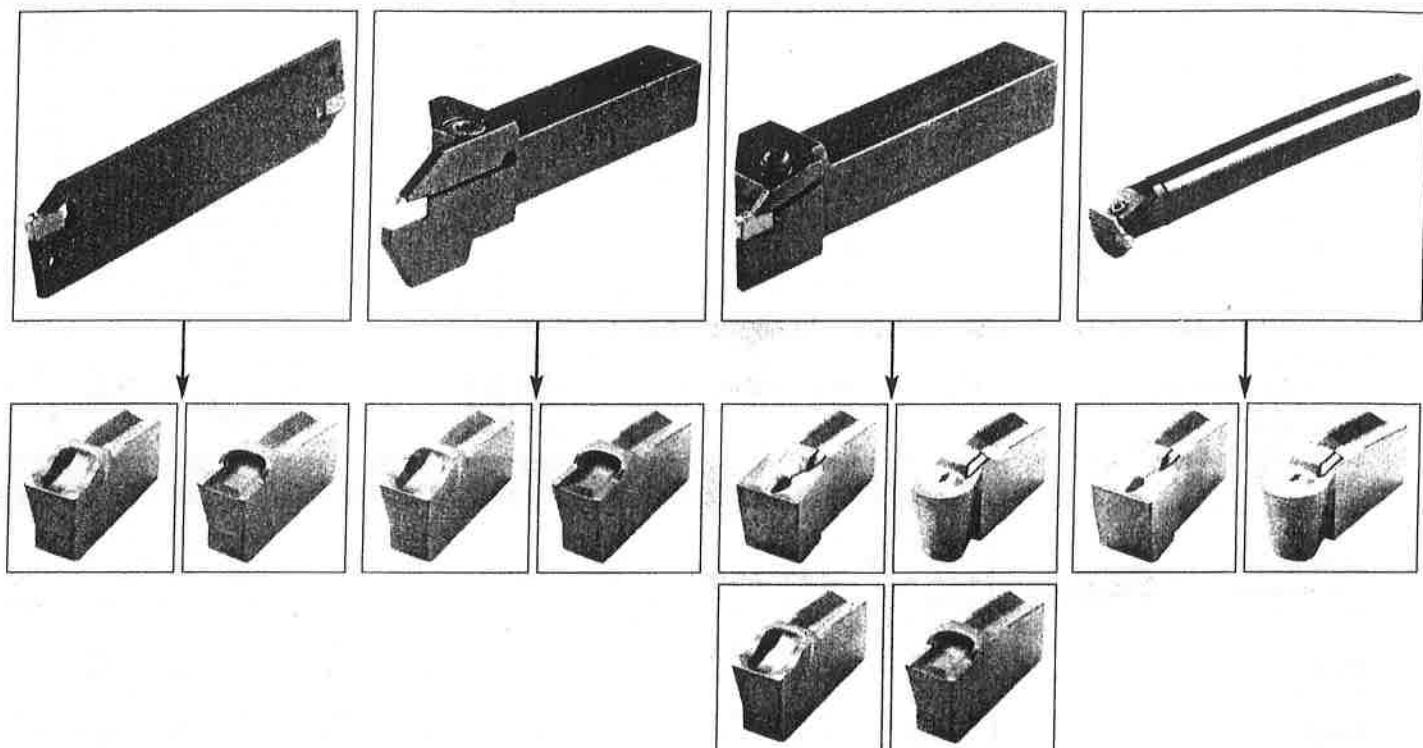
The New Force In High Performance Cut-Off & Grooving



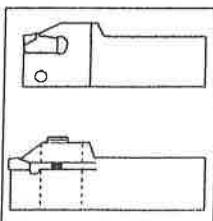
Valenite has introduced the most advanced system available for cut-off, grooving, turning and profiling. A total system of blocks, blades, toolholders and grooving bars along with a vast program of insert widths and styles. Ideal for standardizing on a single unbeatable tooling system for any shop. Even better, ValGroove™ inserts are completely interchangeable with an existing popular similar style European cut-off and grooving system.

One tool system can be used for cut-off, external and internal grooving, turning and profiling. Safe, secure and reliable with a complete program of holders and inserts in one single system.

ONE TOOL SYSTEM

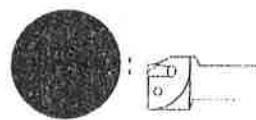


CUT-OFF TOOL APPLICATION GUIDELINES

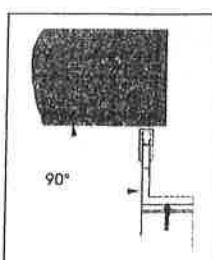
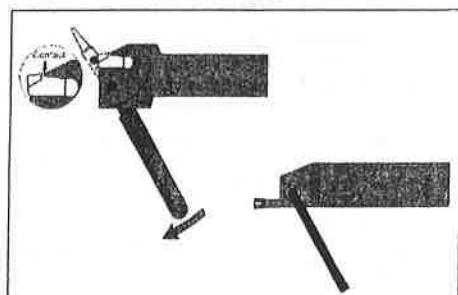


Insert Clamping:
Match the insert and toolholder seat size. Use the blade style for cut-off and screw clamp style for grooving and turning.

Center Height:
Always be sure the cut-off tool is within .004" of true center height. This is especially important for cutting off small diameters.

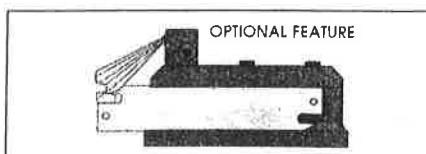


Mounting The Insert:
For wedge clamped holders, use the ValGroove™ wrench to install and extract the insert.
For screw clamped holders, use the Torx® key.



Mounting The Block And Blade Combination:
Be sure the blade meets the workpiece at 90° and with the shortest overhang possible.

Coolant:
For cut-off and grooving, be sure to use plenty of coolant directly on the top of the insert at the cutting edge.

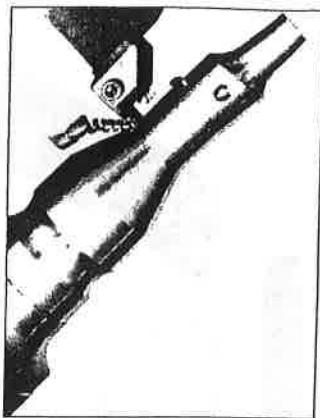


Valenite Val^{GROOVE™} Speeds And Feeds Recommendations

CUT-OFF AND GROOVING

MATERIAL TYPE	FEED/REV	COATED GRADES		UNCOATED GRADE VPUK20 CUTTING SPEED*
		VP5820 CUTTING SPEED*	VP5735 CUTTING SPEED*	
Steels	.003 - .012"	400 - 800 SFM	250 - 700 SFM	—
Stainless Steels	.002 - .010"	250 - 600	200 - 550	—
Cast Iron	.002 - .010"	250 - 650	—	150 - 275 SFM
Aluminum	.002 - .014"	500 - 2,000	—	400 - 1,500
High Temp Alloys	.002 - .007"	—	80 - 200	60 - 125

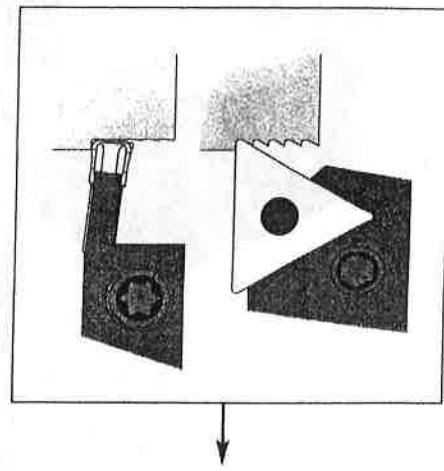
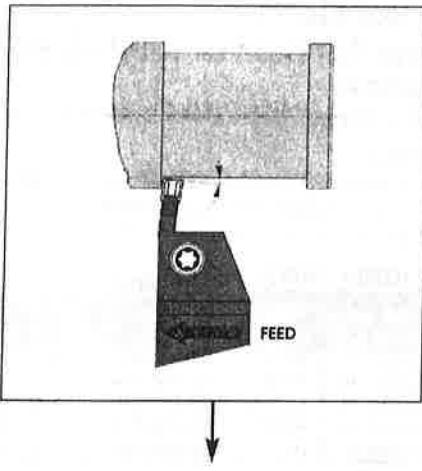
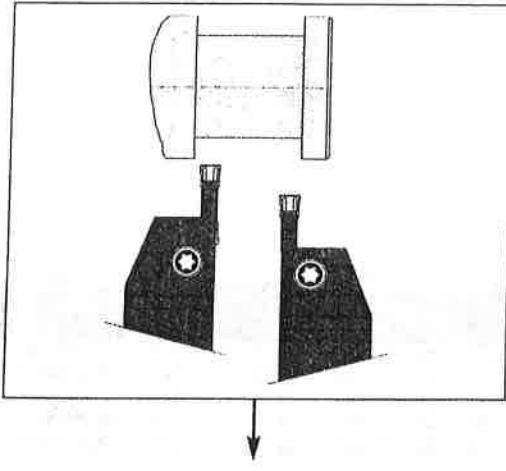
*Reduce cutting speeds by 25% for internal grooving.



TURNING AND PROFILING

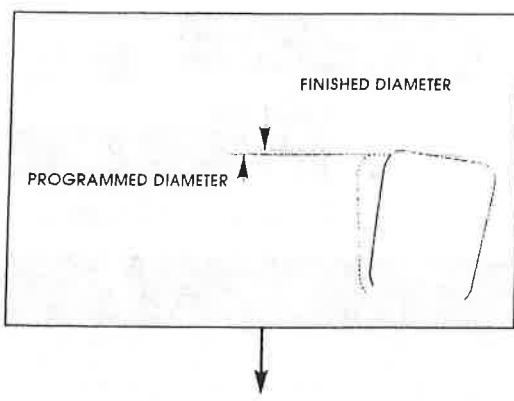
MATERIAL TYPE	FEED/REV	COATED GRADES		UNCOATED GRADE VPUK20 CUTTING SPEED
		VP5820 CUTTING SPEED	VP5735 CUTTING SPEED	
Steels	.004 - .018"	400 - 900 SFM	250 - 700 SFM	—
Stainless Steels	.004 - .016"	250 - 600	200 - 550	—
Cast Iron	.004 - .015"	225 - 650	—	150 - 275 SFM
Aluminum	.004 - .025"	500 - 2,000	—	400 - 1,500
High Temp Alloys	.004 - .010"	—	80 - 200	60 - 125

VALGROOVE APPLICATION TIPS



Turning And Profiling:

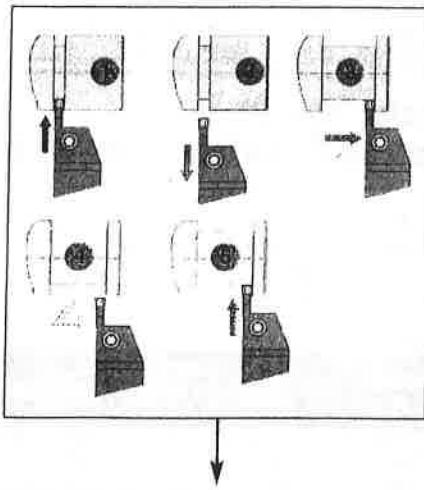
ValGroove™ screw clamped holders are designed to side-turn and profile, first choice should be the VG111 toolholders on page 360.



Compensating For Deflection When Turning:

Calculate the actual tool deflection by measuring the difference between planned and actual diameter achieved.

Turning Depth Of Cut And Feed Rates:
When used for side turning, ValGroove™ tools should be run at higher depths of cuts and feed rates to achieve the optimum results.

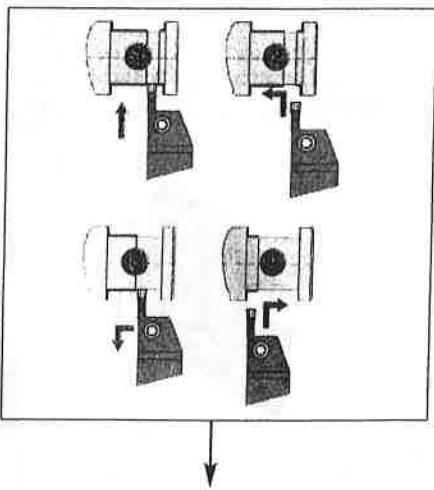


Roughing A Wide Groove:

For roughing a wide rough groove, follow the cutting path sequence 1-5 as shown.

Surface Finish:

The "wiper effect" achieved with ValGroove™ inserts produces a much better surface finish than with conventional inserts.



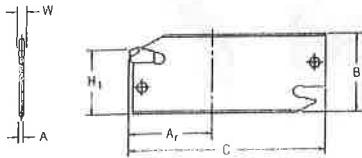
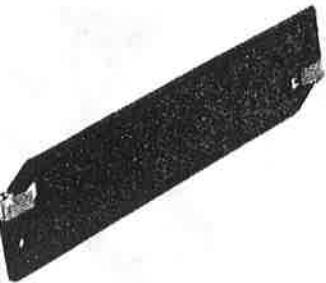
For Finish Machining A Wide Groove:

For finish machining a wide groove, follow the cutting path sequence 1-4 as shown.

Valenite Val GROOVE™

Cut-Off Blades

VG101 Series Double-Ended Cut-Off Blades



APPLICATIONS:

- For general cut-off block and blade type applications.

FEATURES:

- Double-ended style provides 2X the holder life.
- Precision insert pocket with secure insert insertion and clamping.
- Available in two blade heights - 1.020" and 1.260".

CUT-OFF BLADES

MODEL #	SEAT SIZE	MAXIMUM DEPTH Ar	INSERT RANGE W	DIMENSIONS				ORDER #	PRICE EACH
				A	B	C	H1		
VG101-21-15	15	0.750"	.059"	0.047"	1.020"	4.33"	0.840"	25-400-000	\$99.00
VG101-25-15	15	1.250	.059"	0.047	1.250	5.90	0.980	25-400-002	99.00
VG101-21-20	20	1.378	.065" - .088"	0.059	1.020	4.33	0.840	25-400-004	99.00
VG101-21-25	25	1.378	.098 - .133	0.079	1.020	4.33	0.840	25-400-006	99.00
VG101-25-25	25	2.362	.098 - .133	0.079	1.260	5.91	0.980	25-400-008	99.00
VG101-21-30	30	1.378	.118 - .163	0.093	1.020	4.33	0.840	25-400-010	99.00
VG101-25-30	30	2.362	.118 - .163	0.093	1.260	5.91	0.980	25-400-012	99.00
VG101-21-40	40	1.378	.156 - .203	0.132	1.020	4.33	0.840	25-400-014	99.00
VG101-25-40	40	2.362	.156 - .203	0.132	1.260	5.91	0.980	25-400-016	99.00
VG101-25-50	50	2.362	.197 - .250	0.171	1.020	5.91	0.980	25-400-018	99.00
VG101-25-60	60	2.362	.236 - .315	0.211	1.260	5.91	0.980	25-400-020	99.00

Blades fully interchangeable
with other cut-off block systems

Cut-Off Inserts
Page 387

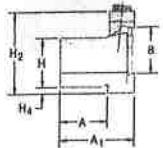
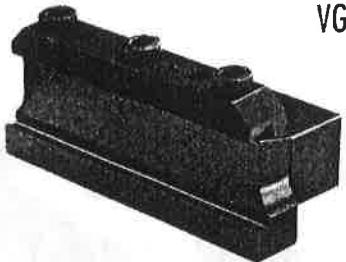
EXTRACTORS

FOR SEAT SIZE	MODEL #	ORDER #	PRICE EACH
15, 20, 25, 30	PT1211	25-400-024	\$19.04
40, 50, 60	PT1210	25-400-025	22.96

Valenite Val GROOVE™

VGTB Tool Blocks

VGTB Series Tool Blocks For VG101 Blades



APPLICATIONS:

- Ideal general purpose block for all blade-style cut-off applications.

FEATURES:

- Top clamping wedge fully removable for access to CNC turret clamping screws.
- Blade can be adjusted in block for optimum overhang.
- Full range of 3/4", 1", 1-1/4" or 1-1/2" shank sizes.

REPLACEMENT PARTS

FOR TOOL BLOCK MODEL #	MODEL #	HEX WRENCH		SCREW		WEDGE		PRICE EACH	
		ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH	MODEL #		
VGTB12-21	PT1212	25-400-040	\$5.18	PT1218	25-400-050	\$1.19	CL1221	25-400-060	\$110.95
VGTB16-21	PT1212	25-400-040	5.18	PT1219	25-400-051	1.12	CL1225	25-400-061	115.50
VGTB16-25	PT1212	25-400-040	5.18	PT1219	25-400-051	1.12	CL1225	25-400-061	115.50
VGTB20-25	PT1212	25-400-040	5.18	PT1219	25-400-051	1.12	CL1225	25-400-061	115.50
VGTB24-25	PT1212	25-400-040	5.18	PT1219	25-400-051	1.12	CL1225	25-400-061	115.50

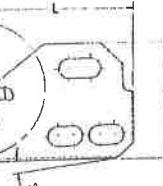
TOOL BLOCKS

MODEL #	MAX. DEPTH	BLADE REFERENCE	DIMENSIONS				ORDER #	PRICE EACH
			A	A1	H	H1		
VGTB12-21	1.38"	VG101-21-xx	0.73"	1.46"	0.750"	0.750"	3.15"	25-400-030 \$240.00
VGTB16-21	1.38	VG101-21-xx	1.03	1.7	1.000	1.000	4.72	25-400-032 252.00
VGTB16-25	2.36	VG101-25-xx	0.98	1.71	1.000	1.000	4.72	25-400-034 252.00
VGTB20-25	2.36	VG101-25-xx	1.23	1.96	1.250	1.250	4.72	25-400-036 255.00
VGTB24-25	2.36	VG101-25-xx	1.48	2.21	1.500	1.500	4.72	25-400-038 293.00

Valenite Val GROOVE™

Manchester Type Blades

VG123 Series Blades For Manchester Style Tools



FEATURES:

- Blade mounts directly in Manchester style tool blocks.
- No change in set-up center height.

Upgrade existing Manchester
holders for higher productivity

Cut-Off Inserts
Page 387

EXTRACTORS

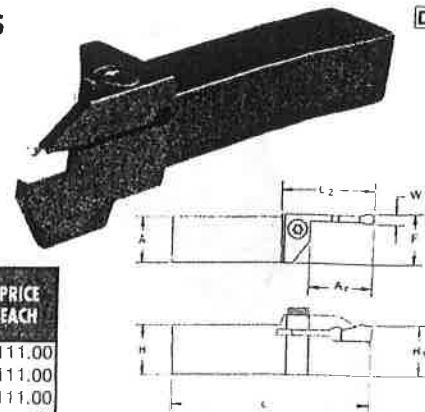
FOR SEAT SIZE	MODEL #	ORDER #	PRICE EACH
20, 30	PT1211	25-400-024	\$19.04
50, 60	PT1210	25-400-025	22.96

BLADES

MODEL #	SEAT SIZE	MAXIMUM BAR DIAMETER D-MAX	DIMENSIONS				ORDER #	PRICE EACH
			W	A	B	H1		
VG12340-20	20	3.00"	.065" - .088"	0.060"	2.250"	1.580"	3.06"	25-400-070 \$128.00
VG12327-20	20	2.00	.065 - .088	0.060	1.750	1.060	2.34	25-400-072 126.00
VG12340-30	30	3.00	.118 - .163	0.090	2.250	1.580	3.06	25-400-074 128.00
VG12327-30	30	2.00	.118 - .163	0.090	1.750	1.060	2.34	25-400-076 126.00
VG12336-30	30	3.00	.118 - .163	0.090	1.900	0.440	3.06	25-400-078 127.00
VG12340-50	50	3.00	.197 - .250	0.170	2.250	1.580	3.06	25-400-080 128.00
VG12327-50	50	2.00	.197 - .250	0.170	1.750	1.060	2.34	25-400-082 126.00
VG12356-60	60	5.00	.236 - .315	0.210	3.130	2.210	4.43	25-400-084 139.00

Screw Clamp Deep Grooving And Cut-Off Holders**VG109 Series Screw-Clamp Style Holders****REPLACEMENT PARTS**

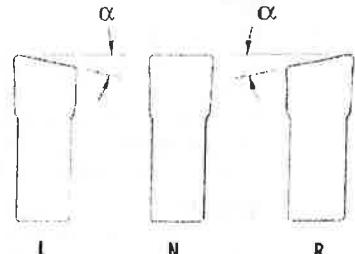
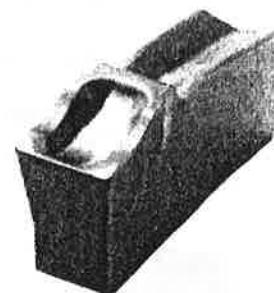
FOR SEAT SIZE	WRENCH			SCREW		
	MODEL #	ORDER #	PRICE EACH	MODEL #	ORDER #	PRICE EACH
15, 20, 25	PT1204T	25-400-130	\$4.97	PT1214T	25-400-136	.77
30	PT1205T	25-400-131	21.70	PT1215T	25-400-137	1.33
40, 50, 60, 80	PT1206T	25-400-132	22.12	PT1217T	25-400-138	.98

HOLDERS

MODEL #	SEAT SIZE	MAX. DEPTH A _r	INSERT RANGE W	DIMENSIONS			RIGHT HAND ORDER #	PRICE EACH	LEFT HAND ORDER #	PRICE EACH	
				A	F	H/H1					
VG109R/L 08-20	20	0.590"	.065" - .088"	0.500"	0.750"	0.500"	4.50"	25-400-100	\$111.00	25-400-101	\$111.00
VG109R/L 10-20	20	0.590	.065 - .088	0.625	0.875	0.625	4.50	25-400-102	111.00	25-400-103	111.00
VG109R/L 08-25	25	0.790	.098 - .133	0.500	0.750	0.500	4.50	25-400-104	111.00	25-400-105	111.00
VG109R/L 10-25	25	0.790	.098 - .133	0.625	0.875	0.625	4.50	25-400-106	111.00	25-400-107	111.00
VG109R/L 12-25	25	0.790	.098 - .133	0.750	1.000	0.750	5.00	25-400-108	128.00	25-400-109	128.00
VG109R/L 12-30	30	0.790	.118 - .163	0.750	1.000	0.750	5.00	25-400-110	128.00	25-400-111	128.00
VG109R/L 16-30	30	0.790	.118 - .163	1.000	1.250	1.000	6.00	25-400-112	136.00	25-400-113	136.00
VG109R/L 12-40	40	0.980	.156 - .203	0.750	1.000	0.750	5.00	25-400-114	128.00	25-400-115	128.00
VG109R/L 16-40	40	0.980	.156 - .203	1.000	1.250	1.000	6.00	25-400-116	136.00	25-400-117	136.00
VG109R/L 20-40	40	0.980	.156 - .203	1.250	1.500	1.250	6.00	25-400-118	166.00	25-400-119	166.00
VG109R/L 16-50	50	1.260	.197 - .250	1.000	1.250	1.000	6.00	25-400-120	136.00	25-400-121	136.00
VG109R/L 16-60	60	1.260	.236 - .315	1.000	1.250	1.000	6.00	25-400-122	136.00	25-400-123	136.00
VG109R/L 20-60	60	1.260	.236 - .315	1.250	1.500	1.250	6.00	25-400-124	166.00	25-400-125	166.00
VG109R/L 24-80	80	1.500	.315 - .394	1.450	1.500	1.500	8.75	25-400-126	234.00	25-400-127	234.00

Valenite Val GROOVE™ General Purpose Cut-Off Inserts
VSG-GG Style High Feed Cut-Off InsertsQUANTITY
DISCOUNT

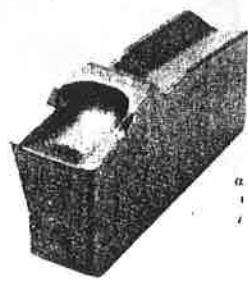
D3



MODEL #	GRADE	SEAT SIZE	DIMENSIONS		ANGLE α	ORDER #	PRICE EACH		
			WIDTH	RADIUS			1-9 PCS.	10-49 PCS.	50+ PCS.
VSG2.5N25-GG	VP5735	25	0.098" (2.50mm)	0.012" (.30mm)	0°	25-400-150	\$13.95	\$12.56	\$10.46
VSG2.5N25-GG	VP5820	25	0.098" (2.50mm)	0.012" (.30mm)	0°	25-400-152	13.95	12.56	10.46
VSG2.5N25-GG	VPUK20	25	0.098" (2.50mm)	0.012" (.30mm)	0°	25-400-154	11.15	10.04	8.36
VSG3.0N30-GG	VP5735	30	0.118" (3.00mm)	0.012" (.30mm)	0°	25-400-156	15.00	13.50	11.25
VSG3.0N30-GG	VP5820	30	0.118" (3.00mm)	0.012" (.30mm)	0°	25-400-158	15.00	13.50	11.25
VSG3.0N30-GG	VPUK20	30	0.118" (3.00mm)	0.012" (.30mm)	0°	25-400-160	12.00	10.80	9.00
VSG3.0L530-GG	VP5735	30	0.118" (3.00mm)	0.012" (.30mm)	5°	25-400-162	15.00	13.50	11.25
VSG3.0L530-GG	VP5820	30	0.118" (3.00mm)	0.012" (.30mm)	5°	25-400-164	15.00	13.50	11.25
VSG3.0L530-GG	VPUK20	30	0.118" (3.00mm)	0.012" (.30mm)	5°	25-400-166	12.00	10.80	9.00
VSG3.0R530-GG	VP5735	30	0.118" (3.00mm)	0.012" (.30mm)	5°	25-400-168	15.00	13.50	11.25
VSG3.0R530-GG	VP5820	30	0.118" (3.00mm)	0.012" (.30mm)	5°	25-400-170	15.00	13.50	11.25
VSG3.0R530-GG	VPUK20	30	0.118" (3.00mm)	0.012" (.30mm)	5°	25-400-172	12.00	10.80	9.00
VSG4.0N40-GG	VP5735	40	0.157" (4.00mm)	0.016" (.40mm)	0°	25-400-174	15.90	14.31	11.93
VSG4.0N40-GG	VP5820	40	0.157" (4.00mm)	0.016" (.40mm)	0°	25-400-176	15.90	14.31	11.93
VSG4.0N40-GG	VPUK20	40	0.157" (4.00mm)	0.016" (.40mm)	0°	25-400-178	12.70	11.43	9.53
VSG4.0L540-GG	VP5735	40	0.157" (4.00mm)	0.012" (.30mm)	5°	25-400-180	15.90	14.31	11.93
VSG4.0L540-GG	VP5820	40	0.157" (4.00mm)	0.012" (.30mm)	5°	25-400-182	15.90	14.31	11.93
VSG4.0L540-GG	VPUK20	40	0.157" (4.00mm)	0.012" (.30mm)	5°	25-400-184	12.70	11.43	9.53
VSG4.0R540-GG	VP5735	40	0.157" (4.00mm)	0.012" (.30mm)	5°	25-400-186	15.90	14.31	11.93
VSG4.0R540-GG	VP5820	40	0.157" (4.00mm)	0.012" (.30mm)	5°	25-400-188	15.90	14.31	11.93
VSG4.0R540-GG	VPUK20	40	0.157" (4.00mm)	0.012" (.30mm)	5°	25-400-190	12.70	11.43	9.53
VSG4.7N40-GG	VP5735	40	0.185" (4.70mm)	0.016" (.40mm)	0°	25-400-192	15.90	14.31	11.93
VSG4.7N40-GG	VP5820	40	0.185" (4.70mm)	0.016" (.40mm)	0°	25-400-194	15.90	14.31	11.93
VSG4.7N40-GG	VPUK20	40	0.185" (4.70mm)	0.016" (.40mm)	0°	25-400-196	12.70	11.43	9.53
VSG4.7R540-GG	VP5735	40	0.185" (4.70mm)	0.012" (.30mm)	5°	25-400-198	15.90	14.31	11.93
VSG4.7R540-GG	VP5820	40	0.185" (4.70mm)	0.012" (.30mm)	5°	25-400-200	15.90	14.31	11.93
VSG4.7R540-GG	VPUK20	40	0.185" (4.70mm)	0.012" (.30mm)	5°	25-400-202	12.70	11.43	9.53
VSG5.0N50-GG	VP5735	50	0.197" (5.00mm)	0.016" (.40mm)	0°	25-400-204	16.80	15.12	12.60
VSG5.0N50-GG	VP5820	50	0.197" (5.00mm)	0.016" (.40mm)	0°	25-400-206	16.80	15.12	12.60
VSG5.0N50-GG	VPUK20	50	0.197" (5.00mm)	0.016" (.40mm)	0°	25-400-208	13.45	12.11	10.09
VSG5.0L550-GG	VP5735	50	0.197" (5.00mm)	0.012" (.30mm)	5°	25-400-210	16.80	15.12	12.60
VSG5.0L550-GG	VP5820	50	0.197" (5.00mm)	0.012" (.30mm)	5°	25-400-212	16.80	15.12	12.60
VSG5.0L550-GG	VPUK20	50	0.197" (5.00mm)	0.012" (.30mm)	5°	25-400-214	13.45	12.11	10.09
VSG5.0R550-GG	VP5735	50	0.197" (5.00mm)	0.012" (.30mm)	5°	25-400-216	16.80	15.12	12.60
VSG5.0R550-GG	VP5820	50	0.197" (5.00mm)	0.012" (.30mm)	5°	25-400-218	16.80	15.12	12.60
VSG5.0R550-GG	VPUK20	50	0.197" (5.00mm)	0.012" (.30mm)	5°	25-400-220	13.45	12.11	10.09
VSG6.0N60-GG	5VP735	60	0.236" (6.00mm)	0.016" (.40mm)	0°	25-400-222	17.55	15.80	13.16
VSG6.0N60-GG	VP5820	60	0.236" (6.00mm)	0.016" (.40mm)	0°	25-400-224	17.55	15.80	13.16
VSG6.0N60-GG	VPUK20	60	0.236" (6.00mm)	0.016" (.40mm)	0°	25-400-226	14.05	12.65	10.54
VSG6.0L560-GG	VP5735	60	0.236" (6.00mm)	0.012" (.30mm)	5°	25-400-228	17.55	15.80	13.16
VSG6.0L560-GG	VP5820	60	0.236" (6.00mm)	0.012" (.30mm)	5°	25-400-230	17.55	15.80	13.16
VSG6.0L560-GG	VPUK20	60	0.236" (6.00mm)	0.012" (.30mm)	5°	25-400-232	14.05	12.65	10.54
VSG6.0R560-GG	VP5735	60	0.236" (6.00mm)	0.012" (.30mm)	5°	25-400-234	17.55	15.80	13.16
VSG6.0R560-GG	VP5820	60	0.236" (6.00mm)	0.012" (.30mm)	5°	25-400-236	17.55	15.80	13.16
VSG6.0R560-GG	VPUK20	60	0.236" (6.00mm)	0.012" (.30mm)	5°	25-400-238	14.05	12.65	10.54
VSG6.0N80-GG	VP5735	80	0.315" (8.00mm)	0.024" (.60mm)	0°	25-400-240	21.00	18.90	15.75
VSG6.0N80-GG	VP5820	80	0.315" (8.00mm)	0.024" (.60mm)	0°	25-400-242	21.00	18.90	15.75

- APPLICATIONS:**
- All-round extra strong and secure cut-off insert.
 - Use for cut-off applications when space is limited.
- Grade VP5735**
- For general purpose use.
- PVD Grade VP5820**
- For moderate feed rates and gummy materials.
- Uncoated Grade VPUK20**
- For slow speed manual machines.
- FEATURES:**
- Extra strong cutting edge ideal for cut-off to center.
 - Select 5° honed style inserts to minimize cut-off burr.

Valenite Val
GROOVE™



Light Feed-Low Force Grooving Cut-Off Inserts

VSG-LG Style Inserts For Light Feed And Cut-Off Of Tubing

D3
QUANTITY DISCOUNT

APPLICATIONS:

- Light feed free cutting geometry for cut-off of tubing and stainless steels.

Grade VP5735

- For general purpose.

PVD Grade VP5820

- For moderate feed rates and gummy materials.

Uncoated Grade VPUK20

- For slow speed manual machines.

FEATURES:

- Smaller corner radius for lower cutting forces on thin walled tubing.
- Select from 8° or 15° honed style inserts to minimize cut-off burr.

MODEL #	GRADE	SEAT SIZE	DIMENSIONS			ANGLE 0	ORDER #	PRICE EACH		
			W	R	0			1-9 PCS.	10-49 PCS.	50+ PCS.
VSG1.5N15-FG	VP5735	15	0.063" (1.60mm)	.004" (.101mm)	0°	25-400-247	\$13.50	\$12.15	\$10.13	
VSG1.5N15-LG	VP5820	15	0.059" (1.5mm)	.008" (.20mm)	0°	25-400-248*	\$12.80	\$11.52	\$9.60	
VSG1.5N15-FG	VPUK20	15	0.063" (1.60mm)	.004" (.101mm)	0°	25-400-249	\$13.50	\$12.15	\$10.13	
VSG2.0N20-FG	VP5735	20	0.079" (2mm)	.008" (.20mm)	0°	25-400-252*	\$12.80	\$11.52	\$9.60	
VSG2.0N20-FG	VP5820	20	0.063" (1.60mm)	.004" (.101mm)	0°	25-400-253	\$13.50	\$12.15	\$10.13	
VSG2.0N20-LG	VP5820	20	0.079" (2mm)	.008" (.20mm)	0°	25-400-254*	\$12.80	\$11.52	\$9.60	
VSG2.0N20-FG	VP5820	20	0.063" (1.60mm)	.004" (.101mm)	0°	25-400-255	\$13.50	\$12.15	\$10.13	
VSG2.0N20-LG	VPUK20	20	0.079" (2mm)	.008" (.20mm)	0°	25-400-256*	\$9.30	\$8.37	\$6.98	
VSG2.0N20-FG	VPUK20	20	0.063" (1.60mm)	.004" (.101mm)	0°	25-400-257	\$10.80	\$9.72	\$8.10	
VSG3.0N30-LG	VP5735	30	0.118" (3mm)	.011" (.30mm)	0°	25-400-258	\$15.00	\$13.50	\$11.25	
VSG3.0N30-LG	VP5820	30	0.118" (3mm)	.011" (.30mm)	0°	25-400-260	\$15.00	\$13.50	\$11.25	
VSG3.0N30-LG	VPUK20	30	0.118" (3mm)	.011" (.30mm)	0°	25-400-262	\$12.00	\$10.80	\$9.00	
VSG3.0L830-LG	VP5735	30	0.118" (3mm)	.008" (.20mm)	8°	25-400-264	\$15.00	\$13.50	\$11.25	
VSG3.0L830-LG	VP5820	30	0.118" (3mm)	.008" (.20mm)	8°	25-400-266	\$15.00	\$13.50	\$11.25	
VSG3.0L830-LG	VPUK20	30	0.118" (3mm)	.008" (.20mm)	8°	25-400-268	\$12.00	\$10.80	\$9.00	
VSG3.0R830-LG	VP5735	30	0.118" (3mm)	.008" (.20mm)	8°	25-400-270	\$15.00	\$13.50	\$11.25	
VSG3.0R830-LG	VP5820	30	0.118" (3mm)	.008" (.20mm)	8°	25-400-272	\$15.00	\$13.50	\$11.25	
VSG3.0R830-LG	VPUK20	30	0.118" (3mm)	.008" (.20mm)	8°	25-400-274	\$12.00	\$10.80	\$9.00	
VSG3.0L1530-LG	VP5735	30	0.118" (3mm)	.008" (.20mm)	15°	25-400-276	\$15.00	\$13.50	\$11.25	
VSG3.0L1530-LG	VP5820	30	0.118" (3mm)	.008" (.20mm)	15°	25-400-278	\$15.00	\$13.50	\$11.25	
VSG3.0L1530-LG	VPUK20	30	0.118" (3mm)	.008" (.20mm)	15°	25-400-280	\$12.00	\$10.80	\$9.00	
VSG3.0R1530-LG	VP5735	30	0.118" (3mm)	.008" (.20mm)	15°	25-400-282	\$15.00	\$13.50	\$11.25	
VSG3.0R1530-LG	VP5820	30	0.118" (3mm)	.008" (.20mm)	15°	25-400-284	\$15.00	\$13.50	\$11.25	
VSG3.0R1530-LG	VPUK20	30	0.118" (3mm)	.008" (.20mm)	15°	25-400-286	\$12.00	\$10.80	\$9.00	
VSG4.0N40-LG	VP5735	40	0.157" (4mm)	.016" (.40mm)	0°	25-400-288	\$15.90	\$14.31	\$11.93	
VSG4.0N40-LG	VP5820	40	0.157" (4mm)	.016" (.40mm)	0°	25-400-290	\$15.90	\$14.31	\$11.93	
VSG4.0L1540-LG	VP5735	40	0.157" (4mm)	.016" (.40mm)	15°	25-400-294	\$15.90	\$14.31	\$11.93	
VSG4.0L1540-LG	VP5820	40	0.157" (4mm)	.011" (.30mm)	15°	25-400-296	\$15.90	\$14.31	\$11.93	
VSG4.0R1540-LG	VP5735	40	0.157" (4mm)	.011" (.30mm)	15°	25-400-300	\$15.90	\$14.31	\$11.93	
VSG4.0R1540-LG	VP5820	40	0.157" (4mm)	.011" (.30mm)	15°	25-400-302	\$15.90	\$14.31	\$11.93	

*Limited Supply.

Valenite Val
GROOVE™

Precision Grooving And Profile Turning Toolholders

VG111 Series Screw-Clamp Style Holders

Grooving Inserts
Page 389

APPLICATIONS:

- For shallow precision grooving and profile/copy turning.
- O-Ring, snap-ring, relief grooving and high production shallow cut-off operations.
- Open wide grooves by plunging & side turning.

FEATURES:

- Precision clamping and insert indexing accuracy.
- Stable under side cutting forces when profile turning.
- Maximum stability due to short overhang.

REPLACEMENT PARTS

FOR SEAT SIZES	MODEL #	ORDER #	WRENCH			SCREW MODEL #	ORDER #	PRICE EACH
			FOR SEAT SIZES	MODEL #	ORDER #			
15, 20, 25, 30	PT1204T	25-400-130	\$4.97	PT1214T	25-400-136	\$.77		
40, 50, 60	PT1206T	25-400-132	22.12	PT1214T	25-400-136	.77		

TOOLHOLDERS

MODEL #	SEAT SIZE	MAX. DEPTH Ar	INSERT RANGE W	DIMENSIONS			RIGHT HAND ORDER #	PRICE EACH	LEFT HAND ORDER #	PRICE EACH
				A	F	H/HI L				
VG111R/L 12-20	20	0.320"	.065" - .088"	0.750"	1.000"	0.750" 4.500"	25-400-310	\$128.00	25-400-324	\$128.00
VG111R/L 10-25	25	0.400	.098" - .133	0.630	0.875	0.630 4.500"	25-400-312	\$111.00	25-400-326	\$111.00
VG111R/L 12-30	30	0.400	.118" - .163	0.750	1.000	0.750 4.500"	25-400-314	\$128.00	25-400-328	\$128.00
VG111R/L 16-30	30	0.400	.118" - .163	1.000	1.250	1.000 5.000	25-400-316	\$136.00	25-400-330	\$136.00
VG111R/L 12-40	40	0.510	.156" - .203	0.750	1.000	0.750 4.500"	25-400-318	\$128.00	25-400-332	\$128.00
VG111R/L 16-40	40	0.510	.156" - .203	1.000	1.250	1.000 5.000	25-400-320	\$136.00	25-400-334	\$136.00
VG111R/L 16-60	60	0.630	.236" - .315	1.000	1.250	1.000 5.000	25-400-322	\$136.00	25-400-336	\$136.00

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GROOVE™

Internal Grooving Bars

VG117 Grooving Boring Bars

Grooving Inserts
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MODEL #	SEAT SIZE	MAX. DEPTH Ar	INSERT RANGE F	DIMENSIONS			RIGHT HAND ORDER #	PRICE EACH	LEFT HAND ORDER #	PRICE EACH
				D	Dmin.	L				
VG117R/L 16-20	20	0.197"	.065" - .088"	0.697"	1.000"	1.260" 8"	25-400-340	\$243.00	25-400-365	\$243.00
VG117R/L 16-25	25	0.236	.098" - .133	0.732	1.000	1.970 8"	25-400-344	\$243.00	25-400-368	\$243.00
VG117R/L 20-25	25	0.236	.098" - .133	0.800	1.250	1.970 10"	25-400-346	\$312.00		
VG117R/L 16-30	30	0.236	.118" - .163	0.728	1.000	1.970 8"	25-400-350	\$243.00	25-400-374	\$243.00
VG117R/L 20-30	30	0.236	.118" - .163	0.870	1.250	1.970 10"	25-400-352	\$312.00	25-400-376	\$312.00
VG117R/L 20-40	40	0.319	.156" - .203	0.949	1.250	2.360 10"	25-400-356	\$312.00	25-400-380	\$312.00
VG117R/L 20-50	50	0.315	.197" - .250	0.945	1.250	2.360 10"	25-400-360	\$312.00	25-400-384	\$312.00
VG117R/L 20-60	60	0.394	.236" - .315	1.024	1.250	2.760 10"	25-400-362	\$312.00	25-400-386	\$312.00

APPLICATIONS:

- For shallow precision internal grooving and internal O-Ring, snap-ring and relief grooves.

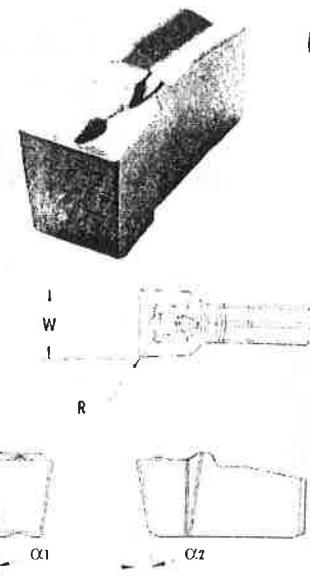
FEATURES:

- Precision clamping and insert indexing accuracy.
- Internal coolant-through feature for cooling and chip dispersal.

Precision Grooving Inserts

VSG-PG Precision Grooving Inserts

MODEL #	GRADE	SEAT SIZE	DIMENSIONS		ORDER #	PRICE EACH		
			W	R		1-9 PCS.	10-49 PCS.	50+ PCS.
VSG1.85N20-PG	VP5735	20	0.073" (1.85mm)	0.0075" (.19mm)	25-400-400	\$14.20	\$12.78	\$10.65
VSG1.85N20-PG	VP5820	20	0.073" (1.85mm)	0.0075" (.19mm)	25-400-402	14.20	12.78	10.65
VSG1.98N20-PG	VP5735	20	0.078" (1.98mm)	0.008" (.20mm)	25-400-406	14.20	12.78	10.65
VSG1.98N20-PG	VP5820	20	0.078" (1.98mm)	0.008" (.20mm)	25-400-408	14.20	12.78	10.65
VSG2.24N20-PG	VP5735	20	0.088" (2.24mm)	0.008" (.15mm)	25-400-412	14.20	12.78	10.65
VSG2.24N20-PG	VP5820	20	0.088" (2.24mm)	0.008" (.15mm)	25-400-414	14.20	12.78	10.65
VSG2.67N25-PG	VP5735	25	0.105" (2.67mm)	0.008" (.15mm)	25-400-418	14.65	13.19	10.99
VSG2.67N25-PG	VP5820	25	0.105" (2.67mm)	0.008" (.15mm)	25-400-420	14.65	13.19	10.99
VSG3.10N25-PG	VP5735	25	0.122" (3.10mm)	0.008" (.20mm)	25-400-424	14.65	13.19	10.99
VSG3.10N25-PG	VP5820	25	0.122" (3.10mm)	0.008" (.20mm)	25-400-426	14.65	13.19	10.99
VSG3.18N25-PG	VP5735	25	0.125" (3.18mm)	0.008" (.15mm)	25-400-430	14.65	13.19	10.99
VSG3.18N25-PG	VP5820	25	0.125" (3.18mm)	0.008" (.15mm)	25-400-432	14.65	13.19	10.99
VSG3.30N25-PG	VP5735	25	0.130" (3.30mm)	0.008" (.15mm)	25-400-436	14.65	13.19	10.99
VSG3.30N25-PG	VP5820	25	0.130" (3.30mm)	0.008" (.15mm)	25-400-438	14.65	13.19	10.99
VSG3.96N30-PG	VP5735	30	0.156" (3.96mm)	0.008" (.20mm)	25-400-442	15.75	14.18	11.81
VSG3.96N30-PG	VP5820	30	0.156" (3.96mm)	0.008" (.20mm)	25-400-444	15.75	14.18	11.81
VSG4.15N30-PG	VP5735	30	0.163" (4.15mm)	0.008" (.15mm)	25-400-448	15.75	14.18	11.81
VSG4.15N30-PG	VP5820	30	0.163" (4.15mm)	0.008" (.15mm)	25-400-450	15.75	14.18	11.81
VSG4.80N40-PG	VP5735	40	0.189" (4.80mm)	0.008" (.20mm)	25-400-454	16.70	15.03	12.53
VSG4.80N40-PG	VP5820	40	0.189" (4.80mm)	0.008" (.20mm)	25-400-456	16.70	15.03	12.53
VSG5.15N40-PG	VP5735	40	0.203" (5.15mm)	0.008" (.15mm)	25-400-460	16.70	15.03	12.53
VSG5.15N40-PG	VP5820	40	0.203" (5.15mm)	0.008" (.15mm)	25-400-462	16.70	15.03	12.53
VSG6.00N50-PG	VP5735	50	0.236" (6.00mm)	0.008" (.20mm)	25-400-466	17.65	15.89	13.24
VSG6.00N50-PG	VP5820	50	0.236" (6.00mm)	0.008" (.20mm)	25-400-468	17.65	15.89	13.24
VSG6.35N60-PG	VP5735	60	0.250" (6.35mm)	0.008" (.20mm)	25-400-472	18.40	16.56	13.80
VSG6.35N60-PG	VP5820	60	0.250" (6.35mm)	0.008" (.20mm)	25-400-474	18.40	16.56	13.80
VSG6.48N60-PG	VP5735	60	0.255" (6.48mm)	0.008" (.20mm)	25-400-478	18.40	16.56	13.80
VSG6.48N60-PG	VP5820	60	0.255" (6.48mm)	0.008" (.20mm)	25-400-480	18.40	16.56	13.80
VSG7.92N60-PG	VP5735	60	0.321" (7.92mm)	0.008" (.20mm)	25-400-484	18.40	16.56	13.80
VSG7.92N60-PG	VP5820	60	0.321" (7.92mm)	0.008" (.20mm)	25-400-486	18.40	16.56	13.80
VSG9.52N80-PG	VP5735	80	0.375" (9.52mm)	0.012" (.30mm)	25-400-490	22.05	19.85	16.54
VSG9.52N80-PG	VP5820	80	0.375" (9.52mm)	0.012" (.30mm)	25-400-492	22.05	19.85	16.54
VSG10.0N80-PG	VP5735	80	0.394" (10.00mm)	0.012" (.30mm)	25-400-496	22.05	19.85	16.54
VSG10.0N80-PG	VP5820	80	0.394" (10.00mm)	0.012" (.30mm)	25-400-498	22.05	19.85	16.54

**APPLICATIONS:**

- Precision O-Ring, snap-ring and relief grooves.
- Side turning and opening up of grooves.

Grade VP5735

- For general purpose use.

PVD Grade VP5820

- For moderate feed rates and gummy materials.
- Inserts have pressed in chip control.

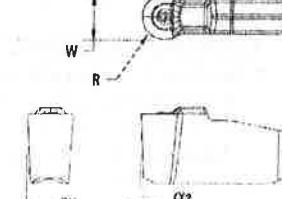
FEATURES:

- Precision inserts widths: ±0.0008"
- Inserts have pressed in chip control.

Valenite Val GROOVE™ Precision Radius Grooving Inserts

VSG-RG Full Radius Grooving Inserts

MODEL #	GRADE	SEAT SIZE	DIMENSIONS		ORDER #	PRICE EACH		
			W	R		1-9 PCS.	10-49 PCS.	50+ PCS.
VSG3.18N30-RG	VP5735	30	0.125" (3.180mm)	0.0625" (1.59mm)	25-400-556	\$15.75	\$14.18	\$11.81
VSG3.18N30-RG	VP5820	30	0.125" (3.180mm)	0.0625" (1.59mm)	25-400-558	15.75	14.18	11.81
VSG3.30N30-RG	VP5735	30	0.130" (3.300mm)	0.065" (1.65mm)	25-400-562	15.75	14.18	11.81
VSG3.30N30-RG	VP5820	30	0.130" (3.300mm)	0.065" (1.65mm)	25-400-564	15.75	14.18	11.81
VSG3.96N40RG	VP5735	40	0.156" (3.960mm)	0.078" (1.98mm)	25-400-568	16.70	15.03	12.53
VSG3.96N40RG	VP5820	40	0.156" (3.960mm)	0.078" (1.98mm)	25-400-570	16.70	15.03	12.53
VSG4.75N40-RG	VP5735	40	0.187" (4.750mm)	0.0935" (2.37mm)	25-400-574	16.70	15.03	12.53
VSG4.75N40-RG	VP5820	40	0.187" (4.750mm)	0.0935" (2.37mm)	25-400-576	16.70	15.03	12.53
VSG5.0N40-RG	VP5735	40	0.197" (5.000mm)	0.098" (2.50mm)	25-400-580	16.70	15.03	12.53
VSG5.0N40-RG	VP5820	40	0.197" (5.000mm)	0.098" (2.50mm)	25-400-582	16.70	15.03	12.53
VSG6.0N50-RG	VP5735	50	0.236" (6.000mm)	0.118" (3.00mm)	25-400-586	17.65	15.89	13.24
VSG6.0N50-RG	VP5820	50	0.236" (6.000mm)	0.118" (3.00mm)	25-400-588	17.65	15.89	13.24
VSG6.35N50-RG	VP5735	50	0.250" (6.350mm)	0.125" (3.18mm)	25-400-592	17.65	15.89	13.24
VSG6.35N50-RG	VP5820	50	0.250" (6.350mm)	0.125" (3.18mm)	25-400-594	17.65	15.89	13.24
VSG7.93N60-RG	VP5735	60	0.312" (7.930mm)	0.156" (3.96mm)	25-400-598	18.40	16.56	13.80
VSG7.93N60-RG	VP5820	60	0.312" (7.930mm)	0.156" (3.96mm)	25-400-600	18.40	16.56	13.80
VSG9.53N80-RG	VP5735	80	0.375" (9.530mm)	0.1875" (4.76mm)	25-400-604	22.05	19.85	16.54
VSG9.53N80-RG	VP5820	80	0.375" (9.530mm)	0.1875" (4.76mm)	25-400-606	22.05	19.85	16.54
VSG10.0N80-RG	VP5735	80	0.394" (10.000mm)	0.197" (5.00mm)	25-400-610	22.05	19.85	16.54
VSG10.0N80-RG	VP5820	80	0.394" (10.000mm)	0.197" (5.00mm)	25-400-612	22.05	19.85	16.54

**APPLICATIONS:**

- Precision O-Ring, snap-ring and relief grooves.
- Side turning and opening up of grooves.

Grade VP5735

- For general purpose use.

PVD Grade VP5820

- For moderate feed rates and gummy materials.
- Inserts have pressed in chip control.

FEATURES:

- Precision inserts widths: ±0.0008"

- Inserts have pressed in chip control.

Parlec brand machining solutions. The highest quality tool holding and machine accessories in the business. See pages 624-627 & 657.

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Famous Brand Performance Without The Famous Brand Price

INDUSTRY COMPARISON

C8	C8	C7	C7	C6	C6	C5	C5	C5	M05	M10	M15	M20	M30	M40	C4	C3	C3	C3	C2	C2	C1	C1												
Cutting speed - Wear resistance												Cutting speed - Wear resistance																						
Feed - Toughness												Feed - Toughness																						
TURNING																																		
PC 614												PC 614																						
PC 514												PC 514																						
KIC 214												KIC 214																						
PC 61												KIC 21																						
MILLING																																		
PC 684 M												PC 684 M																						
PC 584 M												PC 584 M																						
PC 68 M												KIC 18 M																						
PC 58 M												KIC 18 M																						



Turning & Milling Grades

Turning

PC 614

FINISHING

- Coated grade TiN-TiCN-Al2O3-TiN, total thickness approximately 0.0004". The combination of a thick coating and a superficially cobalt enriched substrate (C6-C7) gives PC 614 a high wear resistance and a good edge strength. Range of application C7-C6/M10-M30/C3-C2 for negative inserts. General purpose grade from light roughing to finishing of steels, hardened steels, cast steels, stainless steels and ductile cast irons.

PC 514

ROUGHING, SEMI-FINISHING

- Finishing for 7° positive inserts. Coated grade TiN-TiCN-Al2O3-TiN total thickness approximately 0.0004". The combination of a thick coating and a superficially cobalt enriched substrate (C6-C5) gives PC 514 a high wear resistance, ability to be used in unfavorable conditions (interrupted cuts) and an excellent edge strength. Range of application C6-C5/M20-M35/C2-C1 for negative inserts. First choice grade from roughing to semi-finishing of steels, hardened steels, cast steels, stainless steels and ductile cast irons.

PC 61

ROUGHING, SEMI-FINISHING

- Uncoated tough grade especially developed for turning range of application C7-C5. General purpose grade from roughing to semi-finishing of steels, hardened steels and cast steels.

KIC 214

ROUGHING, SEMI-FINISHING

- Coated grade TiN-TiCN-Al2O3-TiN, total thickness approximately 0.0004". The combination of wear resistance coating and a substrate (C7-C3) gives KIC 214 high wear resistance and a good edge strength. Range of application C8-C7/C3-C2. Grade developed for roughing and semi-finishing of grey cast irons, nodular cast irons and malleable cast irons.

KIC 21

ROUGHING, SEMI-FINISHING

- Uncoated grade especially developed for turning, good wear resistance. Range of application C3. Grade for roughing and semi-finishing of grey cast irons, nodular cast irons and short chips malleable cast irons. Can also be used for aluminum alloys, graphite, plastic, rubber and wood.

Milling

PC 684 M

SEMI-FINISHING, FINISHING

- CVD-MT coated grade TiN-TiCN-Al2O3-TiN, total thickness approximately 0.0003". The Al2O3 intermediate layer associated to a tough substrate (C7) especially developed for milling applications gives PC 684M an excellent resistance to thermal shocks and wear. Range of application C7-C6/M20-M30. Use wet or dry. Recommended grade for semi-finishing and finishing of steels, hardened steels, cast steels and stainless steels.

PC 584 M

ROUGHING, SEMI-FINISHING

- CVD-MT coated grade TiN-TiCN-Al2O3-TiN, total thickness approximately 0.0003". The Al2O3 intermediate layer associated to a tough substrate (C6) especially developed for milling applications gives PC 584M an excellent resistance to thermal and mechanical shocks as well as wear. Good edge security. Range of application C6-C5/M25-M40. Use wet or dry. Recommended grade for roughing and semi-finishing of steels, hardened steels, cast steels and stainless steels.

PC 68 M

GENERAL PURPOSE

- First choice uncoated tough grade developed for milling applications, good edge security at moderate speed. Range of application C7-C6. Grade for roughing and semi-finishing of steels, hardened steels, cast steels and stainless steels.

PC 58 M

VERY TOUGH

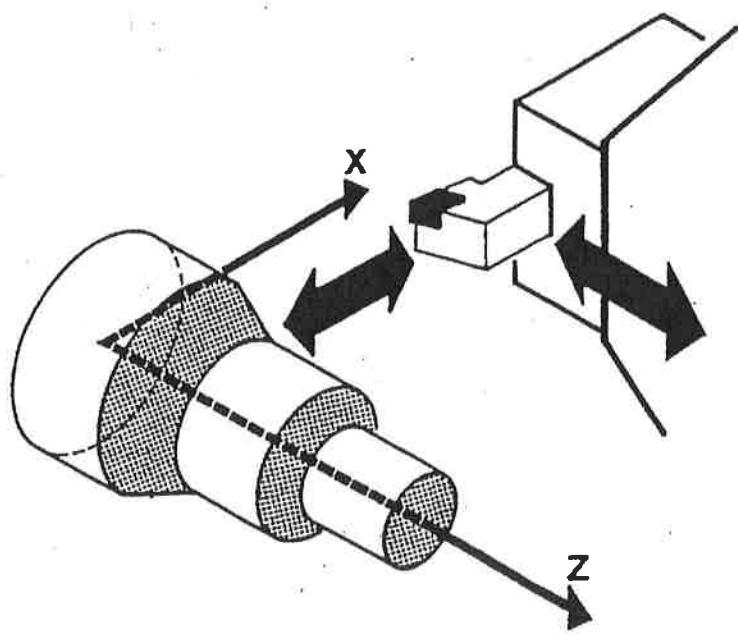
- Uncoated extremely tough grade developed for milling applications, recommended for rectangular inserts. Range of application C6-C5. Recommended grade for roughing and semi-finishing of steels, hardened steels, cast steels and stainless steels.

KIC 18 M

WEAR RESISTANCE

- Uncoated grade for wear developed for milling applications offers good wear resistance. Range of application C3-C2. Grade for light roughing and finishing of grey cast irons, nodular cast irons and short chips malleable cast irons. Can also be used for aluminum alloys, graphite, plastic, rubber and wood.

FUNDAMENTAL CONCEPTS OF CNC LATHE PROGRAMMING



MT-491

CNC TURNING FUNDAMENTALS

CNC lathes share the same two-axis coordinate system. This allows for the transfer of CNC programs among different machines, since all measurements are derived from the same reference points.

Basically in CNC turning there is a primary (horizontal) axis and a secondary (vertical) axis. Refer to Figs. 2-13, 2-14, and 2-15, where you can see that the primary axis is labeled Z and the secondary X.

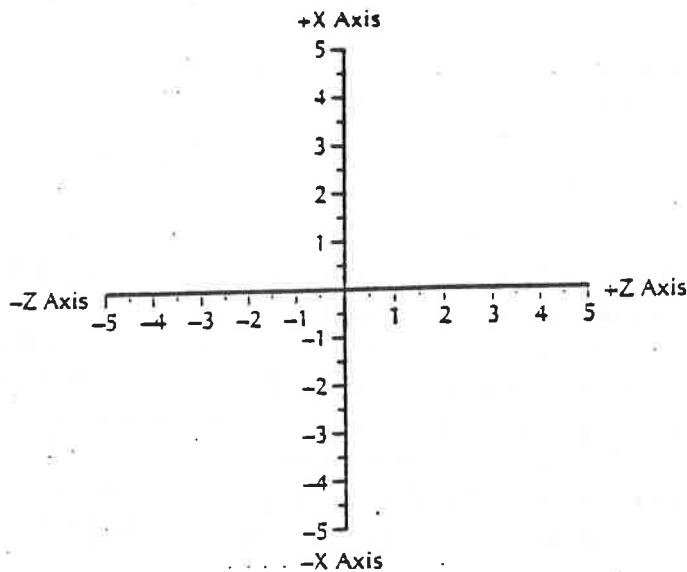


Figure 2-13 The XZ Cartesian coordinate system. Notice how the Z-axis is the horizontal and the X-axis is the vertical. The origin point is at $X0,Z0$ (the intersection of the X- and Z-axes). Also notice how each axis has a + and a - side. By taking the distance from $(X0,Z0)$, and the direction (in the + or - direction), you can accurately locate any point in this graph.

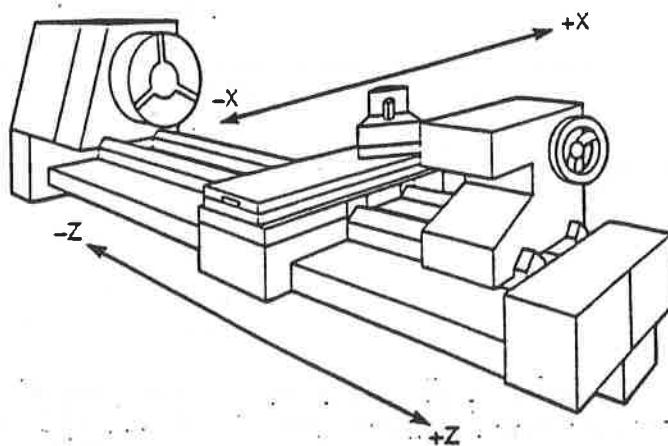


Figure 2-14 Relating the Cartesian graph to a CNC lathe. The major axis always runs through the spindle, so the Z-axis is the long one, while the X-axis is perpendicular to the Z-axis.

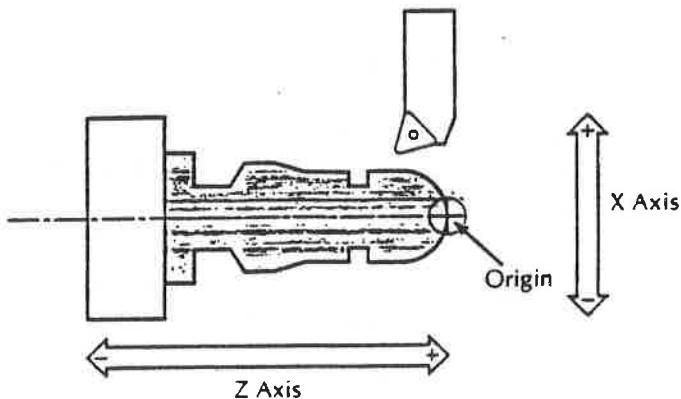


Figure 2-15 Merging the Cartesian graph with a lathe part.
Notice how the Z-axis runs through the center of the part, while
the X-axis is perpendicular. The origin point is at the intersection
of the X- and Z-axes at the center of the end of the workpiece.

It is also important to remember that on most CNC machines, the lathe tool post is on the top, or backside, of the machine, unlike on a conventional lathe. This is why the tool is shown above the part.

When locating points on a profile, you need not use the entire four quadrant system. Any turned part is symmetrical about the Z-axis, so only its top half is required in a drawing. Compare Figs. 2-16 and 2-17 to see how the Cartesian graph is modified to better suit the lathe application.

When measuring X and Z coordinates, use a central reference point. Start all measurements at this reference point, the origin point (X_0, Z_0). For our

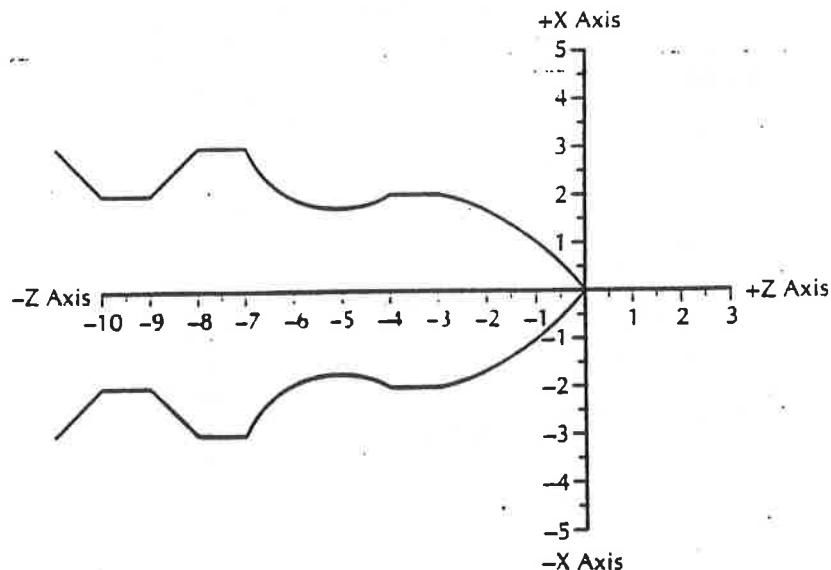


Figure 2-16 Notice how the part sits on the graph: the origin point is at the center of the end of the part. The Z-axis mirrors the part, so only the top half of the part is required. (We use the top half of the profile, since this is where the tool is.)

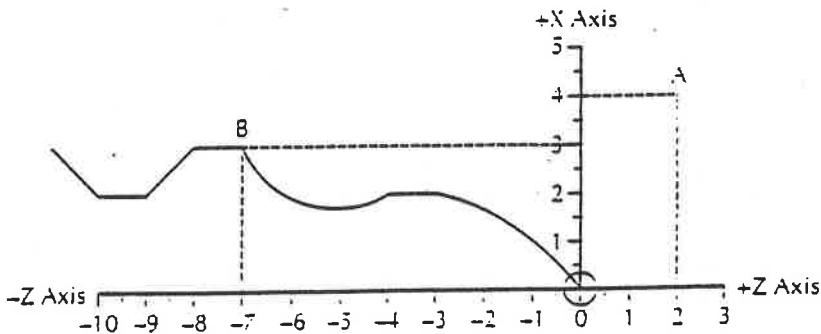


Figure 2-17 A typical lathe part drawing. Notice how the whole profile fits in one quadrant and how all X values are positive, while all Z values are negative.

purposes, the origin point is located at the center right-hand endpoint of the workpiece. Keep in mind that at times the center left-hand endpoint of the workpiece is used.

DIAMETER VERSUS RADIUS PROGRAMMING

Diameter programming relates the X-axis to the diameter of the workpiece. Therefore if the workpiece is 5 in. outside the diameter and you want to command an absolute move to the outside, you would program X5.

Radius programming relates the X-axis to the radius of the workpiece. Therefore with the same size workpiece of 5 in., you would program X2.5 to move the tool to the outside.

Although many controllers can work in either mode, diameter programming is the most common and is the default with CNCez. To change to radius programming, edit the DIAMETER PROGRAMMING option to FALSE in the TURNING.CNF file in the TURNING directory. Keep in mind that all samples and step-by-step examples are based on diameter programming.

ABSOLUTE COORDINATES FOR TURNING

When measuring points on a profile, you will usually find it easier to relate each point to the origin point. Coordinates found in this way are called absolute coordinates, since all values are absolute (from the origin point). The following section explains how to find points using absolute coordinates (see Fig. 2-18).

Finding Absolute Coordinates

When plotting points using absolute coordinates, always start at the origin point (X0,Z0). Then travel along the Z-axis until you reach a point directly

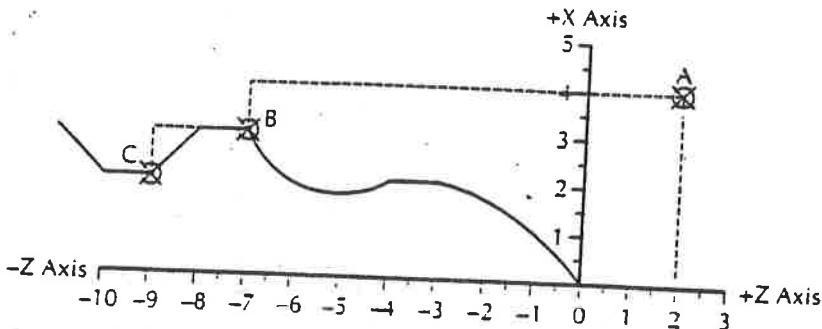


Figure 2-18 There are three points on this graph: A, B and C.

below the point you are trying to plot. Write down the Z value, then go up until you reach your point. Write down the X value. You now have the XZ coordinate for that point. Remember, travel left or right first along the Z-axis, then up or down X-axis.

Example: Find point A.

1. Start at (X_0, Z_0) .
2. Travel right until you are below point A.
3. Move up to point A.

The diametrical XZ coordinates for point A are (X_8, Z_2) .

The radial XZ coordinates for point A are (X_4, Z_2) .

Example: Find point B.

1. Start at (X_0, Z_0) .
2. Travel along the Z-axis to a point below point B.
3. Move up to point B.

The diametrical XZ coordinates for point B are (X_6, Z_{-7}) .

The radial XZ coordinate for point B are (X_3, Z_{-7})

Example: Find point C.

1. Start at (X_0, Z_0) .
2. Travel along the Z-axis until you are below point C.
3. Move up the X-axis until you are at point C.

The diametrical XZ coordinates for point C are (X_4, Z_{-9}) .

The radial XZ coordinates for point C are (X_2, Z_{-9}) .

INCREMENTAL COORDINATES FOR TURNING

The second method for finding points in a Cartesian coordinate system is by using incremental coordinates. This method is used rarely.

Incremental coordinates use each successive point to measure the next coordinate. Instead of constantly referring back to the origin point, the incremental method refers to the previous point, like stepping stones across a lake. The following section explains how to find incremental coordinates (see Fig. 2-19).

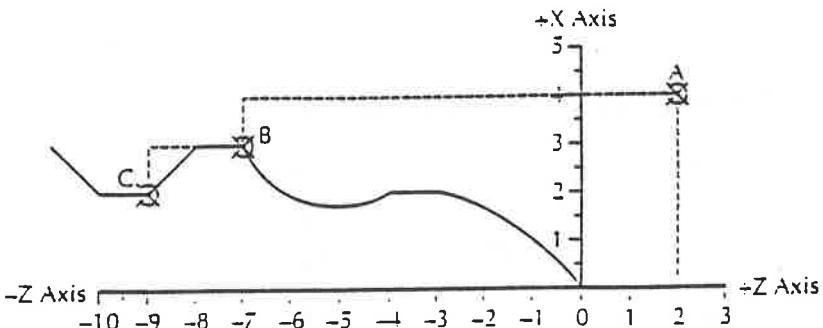


Figure 2-19 Incremental coordinate example. The start point is (X0,Z0).

FINDING INCREMENTAL COORDINATES

Starting with the origin point, each point in turn is the reference point for the next coordinate. This method is easier to use when you are plotting many closely placed points.

Keep in mind that some controllers use G90 and G91 to change the controller mode between absolute and incremental, while other controllers do not have G90 and G91 and instead use X and Z for absolute programming and U and W for incremental. To accommodate both standards, this controller will accept both methods of programming (G90 absolute is the default).

Example: Find point A.

1. Starting at the origin point, travel along the Z-axis until you are below point A.
2. Move up the X-axis until you reach point A.

The diametrical XZ coordinates for point A are (X8,Z2).

The radial XZ coordinates for point A are (X4,Z2).

Example: Find point B.

1. Starting at point A, travel along the X-axis until you are below (or above) point B.
2. Move up (or down) the X-axis until you are at point B.

The diametrical XZ coordinates for point B are (X-2,Z-9).

The radial XZ coordinates for point B are (X-1,Z-9).

Example: Find Point C.

1. Starting at point B, travel along the Z-axis until you are below (or above) point C.
2. Move up (or down) the X-axis to find the X coordinate.
The radial XZ coordinates for point C are (X-2,Z-2)
The radial XZ coordinates for point C are (X-1,Z-2)

EXERCISES

Refer to Fig. 2-20 to complete the following exercises.

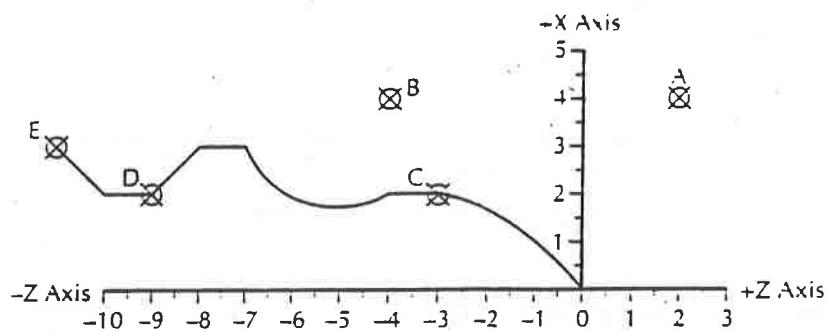


Figure 2-20

Exercise 1: Using Incremental Coordinates

Find the diametrical X and Z points A through E.

A: X____Z____

B: X____Z____

C: X____Z____

D: X____Z____

E: X____Z____

Exercise 2: Using Absolute Coordinates

Find the X and Z coordinates for the given points A through E.

A: X____Z____

B: X____Z____

C: X____Z____

D: X____Z____

E: X____Z____

LETTER ADDRESSES

Letter addresses are variables used in G- and M-codes. Most G-codes contain a variable, defined by the programmer, for each specific function. Each letter used in CNC programming is called an address or word. The words used for programming are as follows:

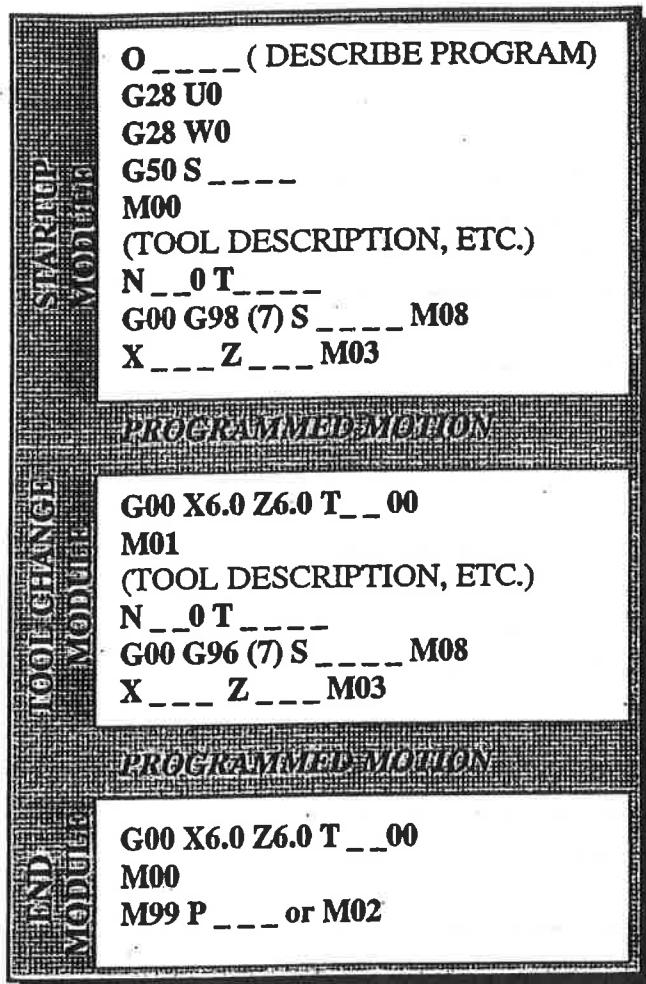
- F Assigns a feedrate
- G Preparatory function
- I X-axis location of ARC center
- K Z-axis location of ARC center
- M Miscellaneous function
- N Block number (specifies the start of a block)
- P Start Block
Dwell time
- Q Block End
- D Depth
- R Radius
- S Sets the spindle speed
- T Specifies the tool to be used
- A Tool Angle
- U X stock
- W Z stock
- X X-axis Coordinate
- Z Z-axis Coordinate

Word addresses are described in more detail next.

Letter	Address	Description
F	Feedrate	Specifies a feedrate in feed (inches or millimeters) per minute or feed per revolution.
		In threading, designates the thread pitch. Note that some controllers use F to designate the thread lead.
G	Preparatory function	Specifies a preparatory function. Allows for various modes (for example, rapid and feed) to be set during a program.
M	Miscellaneous code	Controls coolant on/off, spindle rotation, and so on.
N	Block number	Specifies a block, or sequence, number. Used for program line identification.
	MT-491	Allows the programmer to organize each line and is helpful while you are editing. In CNCEZ, increments by five to allow

Letter	Address	Description
I	X value for G02/G03	Specifies the X distance and direction from a start point to a center point in the X-axis (see G02 and G03).
K	Z value for G02/G03	Specifies the Z distance and direction from a start point to a center point in the Z-axis (see G02 and G03).
	Dwell time	Also can specify the final depth of a thread during threading operations.
P	Start block	Used within multiple repetitive cycles to specify the block number of the first block of the finish pass definition.
	Block end	Can also specify the length of time in seconds in a dwell command (see G04).
Q	Depth	Used within multiple repetitive cycles to specify the block number of the last block of the finish pass definition.
R	Radius	For circular interpolation, replaces the I and K to provide an easier way to designate the radius of a circular movement.
S	Spindle speed	Specifies the spindle speed in revolutions per minute or surface units (feet or meters) per minute.
T	Tool number	Specifies the turret library position and the offset register number to which to be indexed. (For example, to index to station #3 and call offset #3, program T0303.)
A	Tool angle	Used in a threading cycle to specify the tool angle.
U	X stock	Used in multiple repetitive cycles (see G70 and G71) to specify the amount of stock to be left on the face for finishing.
W	Z stock	Used in multiple repetitive cycles (see G70 and G71) to specify the amount of stock to be left on the face for finishing.
X	X-axis	Designates a coordinate along the X-axis.
Z	Z-axis	Designates a coordinate along the Z-axis.

PROGRAMMING FORMAT FOR "0T" CONTROL



"O" (NOT ZERO) + UP TO 4 DIGITS **PROGRAM #**
G28 U0 **ZERO RETURN IN "X" DIRECTION**
G28 W0 **ZERO RETURN IN "Y" DIRECTION**
G50 **WITH RPM LIMITS MAX SPEED**
PROGRAMMED STOP
"()" **MEANS COMMENTS**
"N" **BLOCK #, T__ IS TOOL#, __ IS OFFSET #**
G00 - **RAPID TRAVERS, G96 - CONSTANT SURF. SP.**
X+Z MOVEMENT WITH SPINDLE ON

**RAPID TO TURRET CLEAR. POS., CANCEL OFF.
OPTIONAL STOP WITH SWITCH 'ON'**

**PROGRAMMED STOP
RETURN TO N____ OR END OF PROGRAM**

G00 Rapid positioning mode (modal)
G01 Linear interpolation mode (modal)
G02 Circular interpolation (CW)
G03 Circular interpolation (CCW)
G04 Dwell used with "U" ie: G04 U1000 = 1 sec
G20 Inch designation
G21 Metric designation
G28 Reference point return
G32 Equal Lead cutting
G34 Variable Lead Cutting
G40 Tool nose R Compensation Cancel
G41 Tool nose R Compensation Left
G42 Tool nose R Compensation Right

G50 Speed limit and Coordinate setting
G70 Finish Cycle for G71, G72, G73
G71 OD or ID Roughing Cycle
G72 Face Roughing Cycle
G73 Pattern Cutting
G74 Drill Cycle
G75 Cut-off Cycle
G76 Threading Cycle
G96 Constant Surface Speed
G97 Fixed RPM
G98 Feed in Inch per Minute
G99 Feed in Inch per Rev.

M00 Programmed Stop
M01 Optional Stop with switch 'ON'
M02 End of Program Return to Start
M03 Spindle ON Forward
M04 Spindle ON Reverse
M05 Spindle Stop
M08 Coolant ON

M09 Coolant OFF
M25 Tailstock Forward
M26 Tailstock Back Off
M28 Tailstock return to Home
M30 Program Rewind
M68 Chuck Close
M69 Chuck Open

LAB EXERCISE

1. What does the preparatory function G00 command do? _____

2. How is tool nose radius compensation called? _____

3. Give an example of a linear feed move. _____

4. What does the address U stand for when a G71 command is programmed?

5. What does a G76 command specify? _____

6. Which G-code and additional letter address are used to call up a dwell cycle? _____

7. Write an example start line for a G74 peck drilling cycle. _____

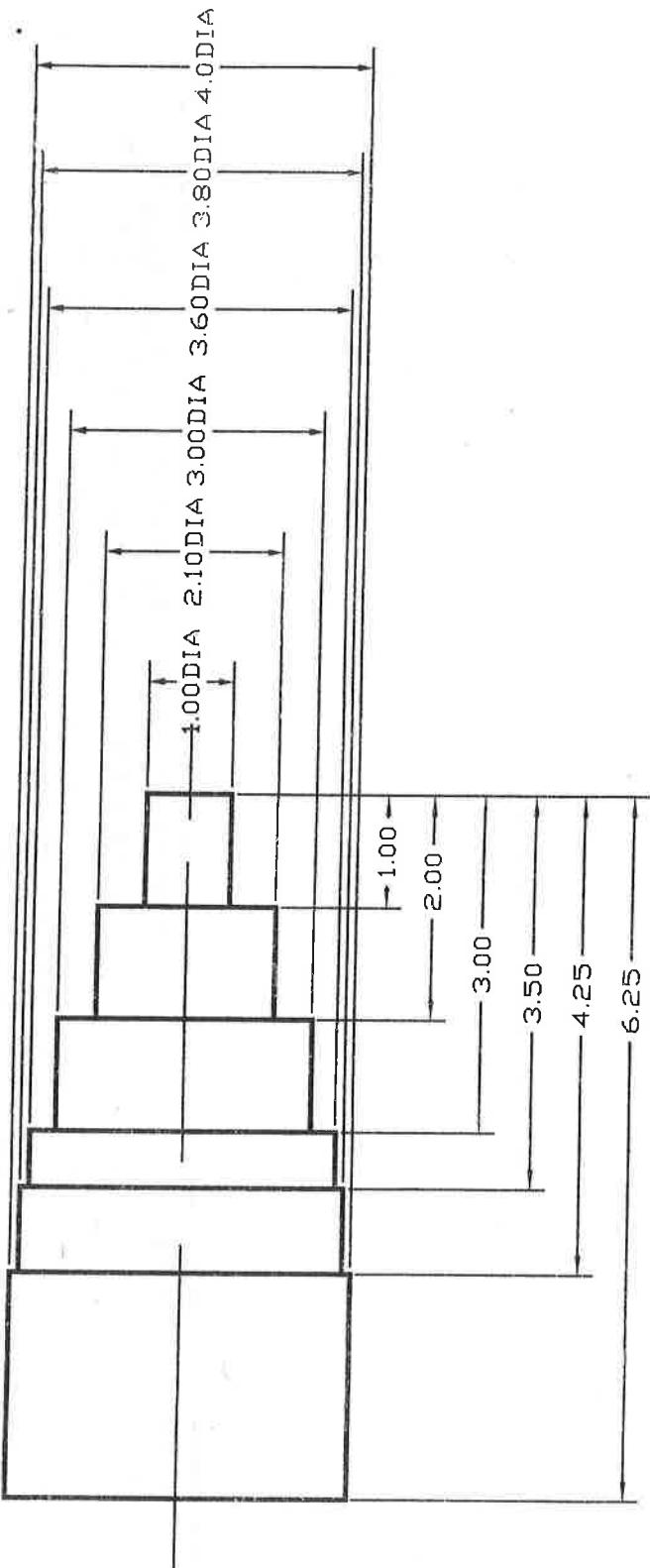
8. Which M-code is used to specify spindle on clockwise? _____

CNC LATHE LAB PROJECTS



MT-491

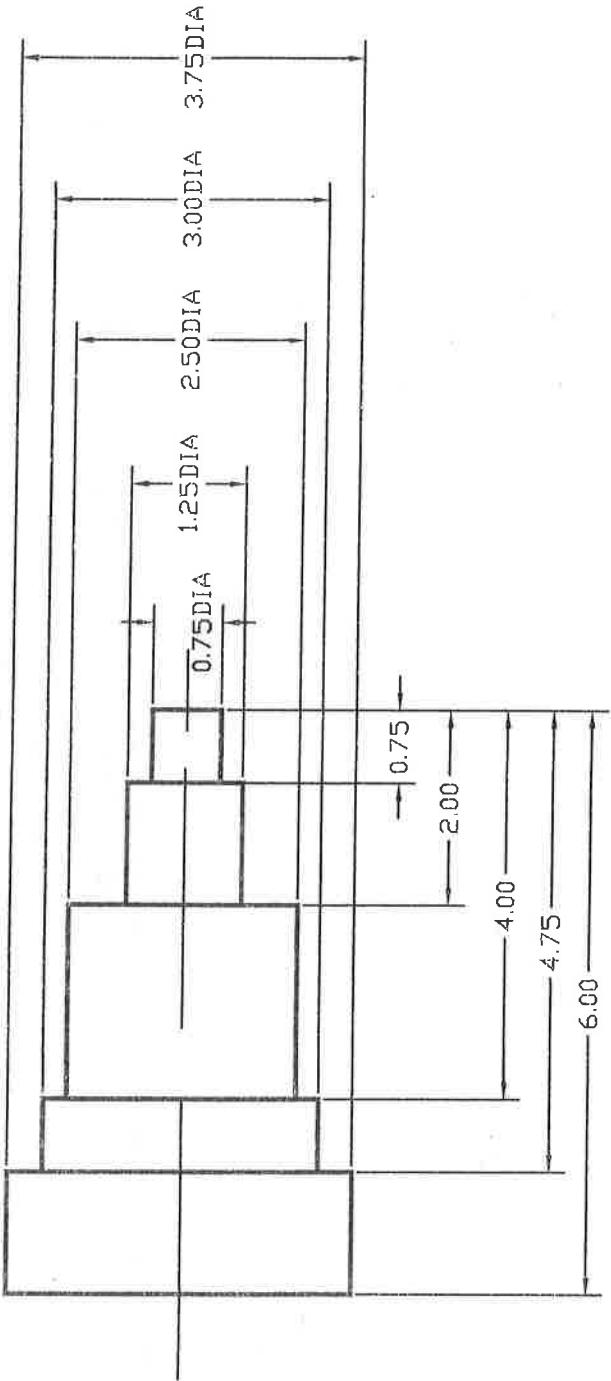
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PART	CLASS EXERCISE 1		
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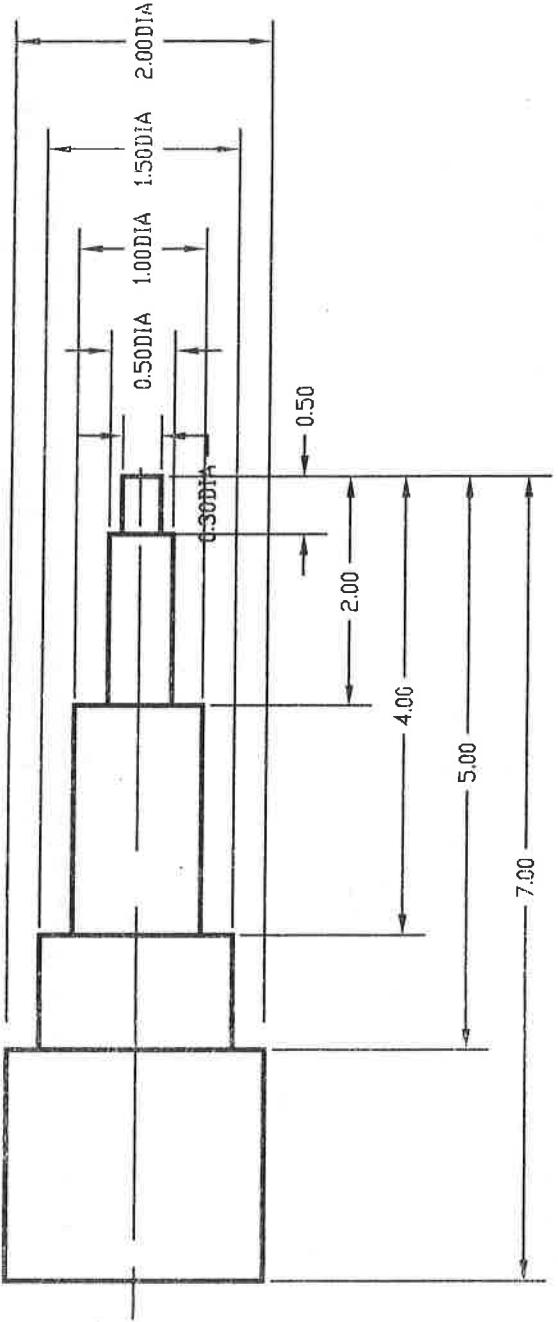


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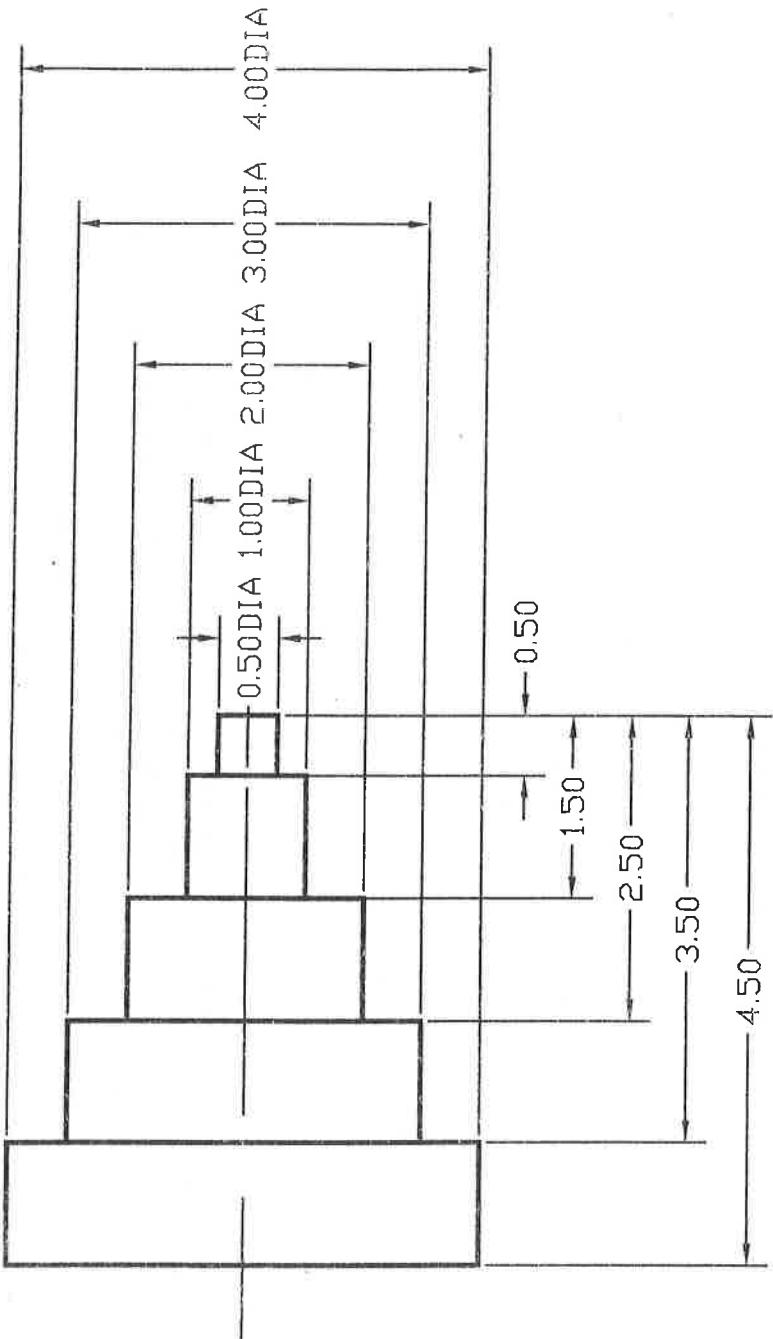
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1 PLACE DECIMAL ± 0.005
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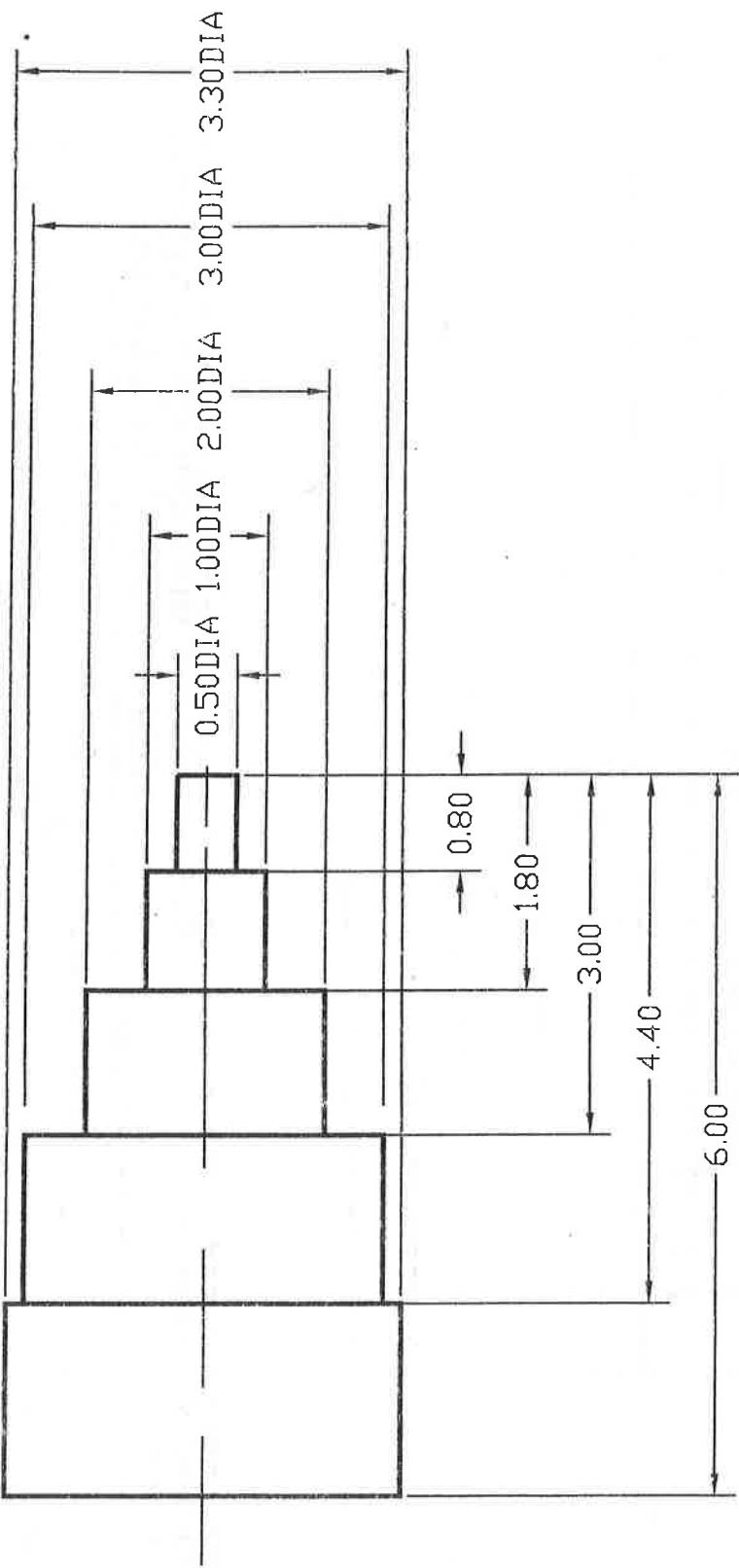


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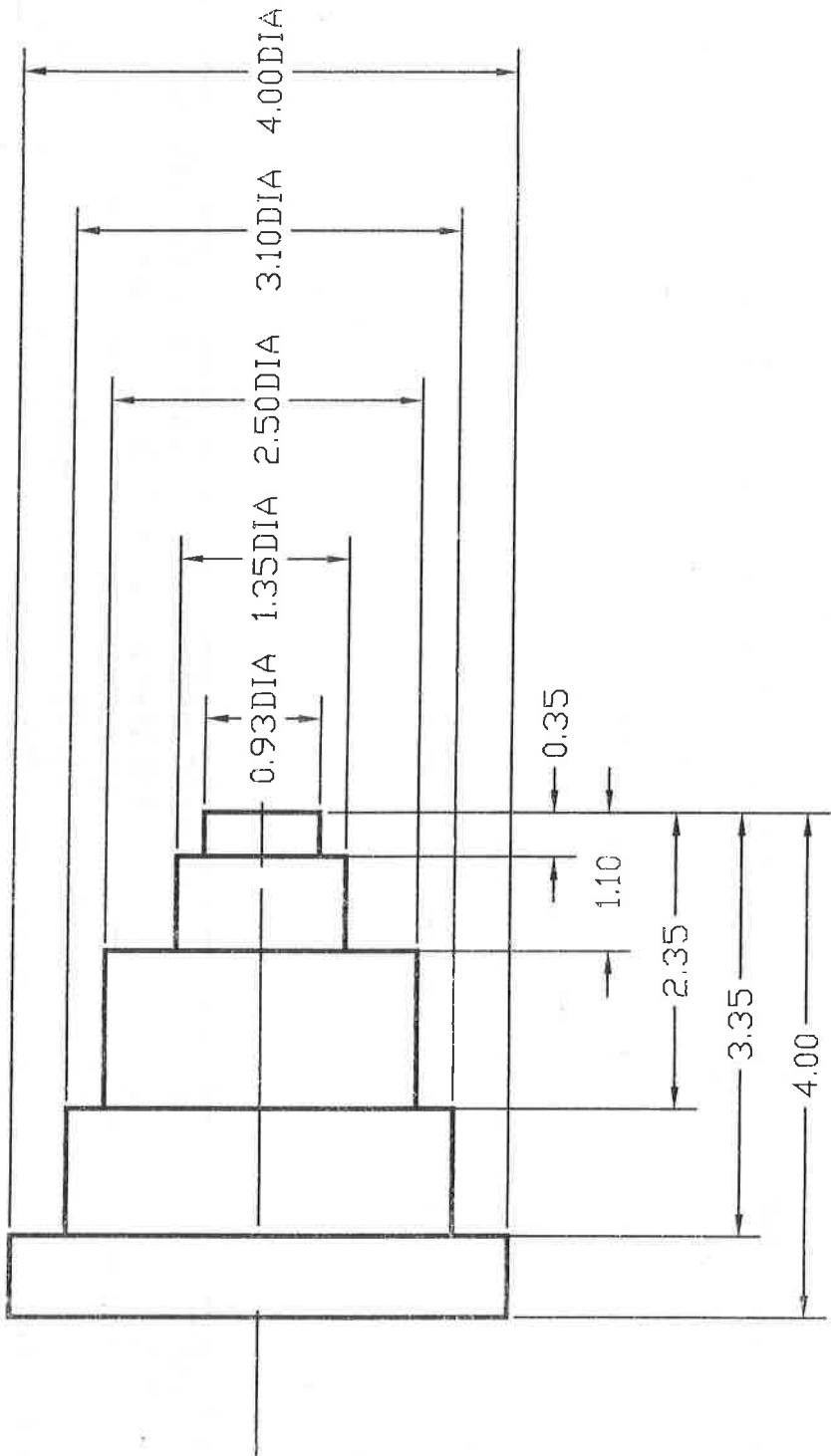
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CLASS EXERCISE	5		
MATERIAL	No PER ASSEMBLY		MT-491

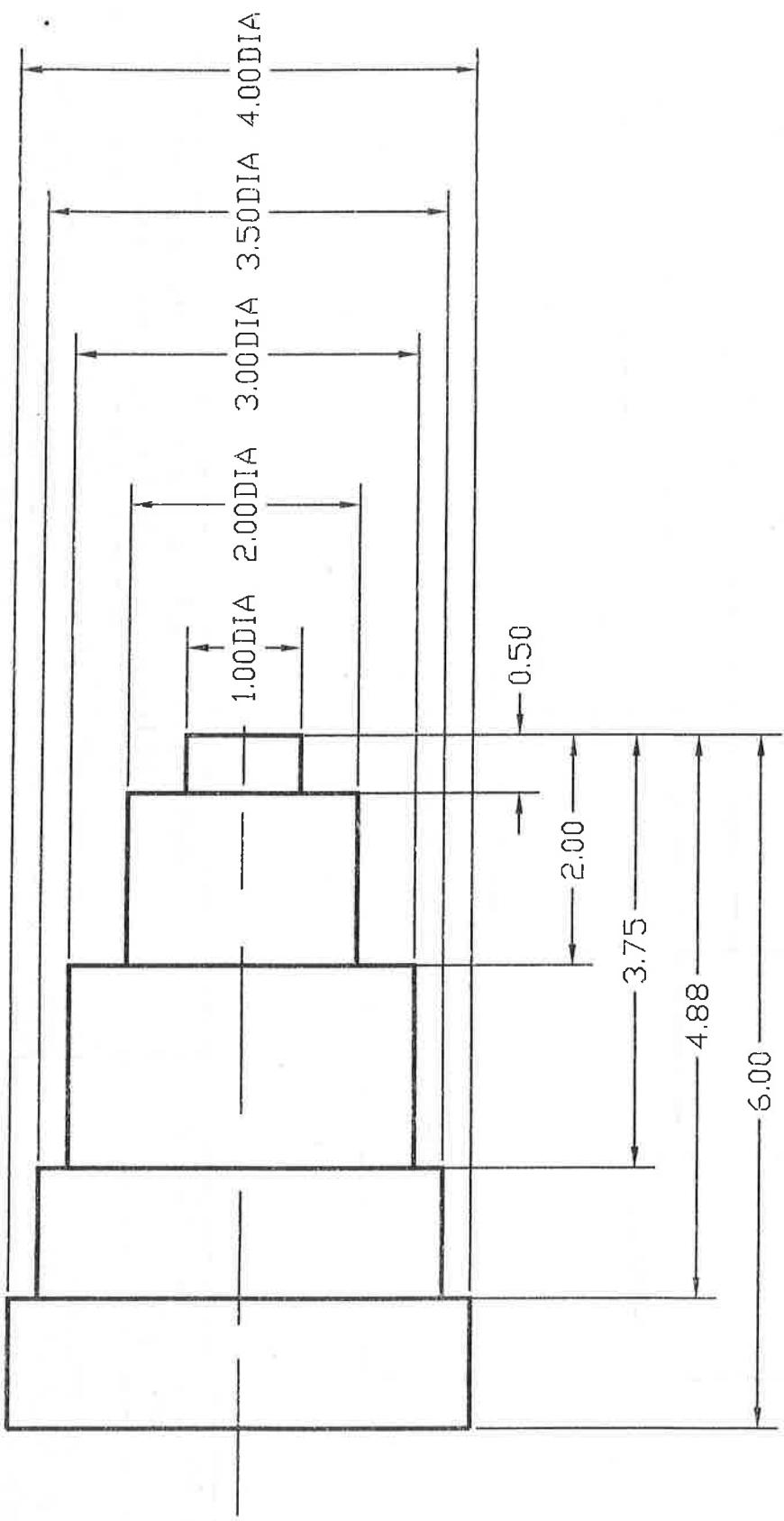


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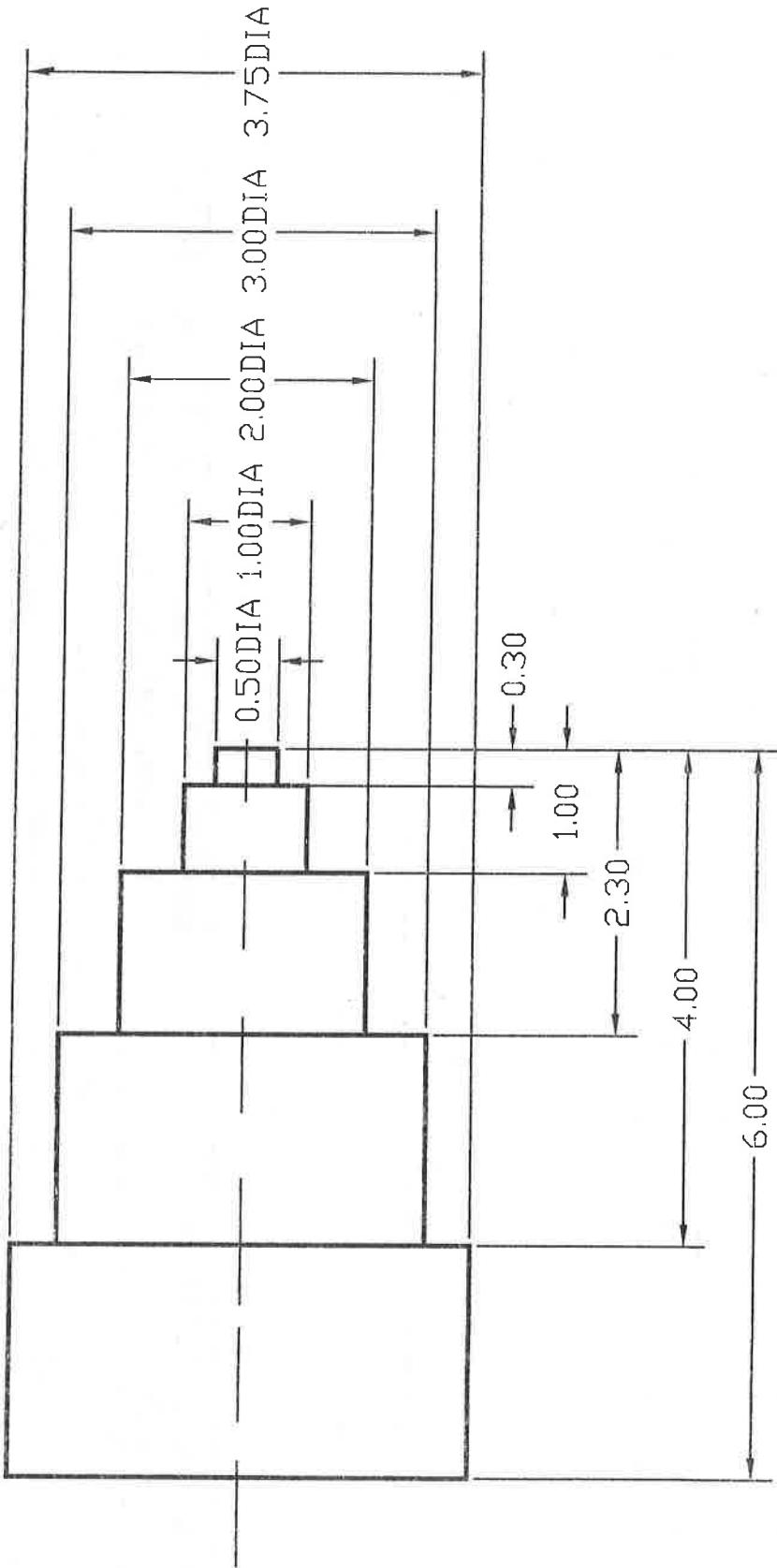
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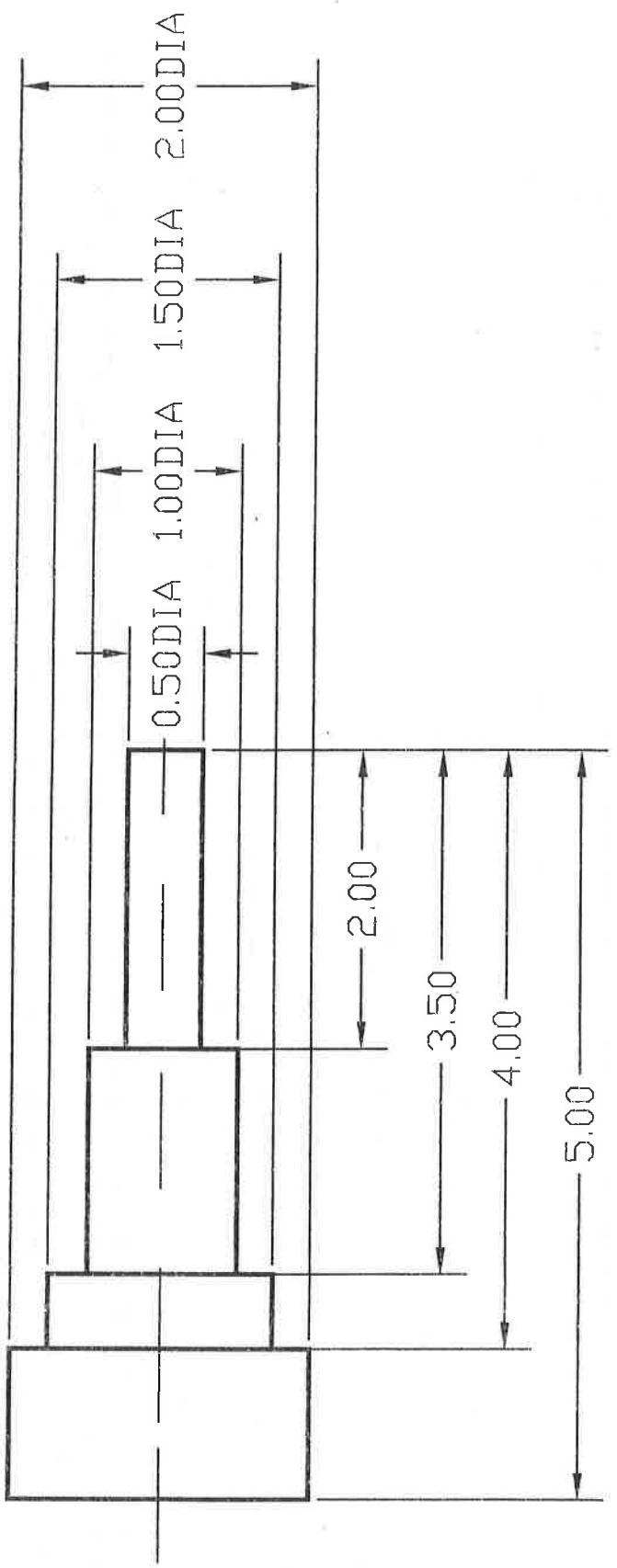
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PART			7
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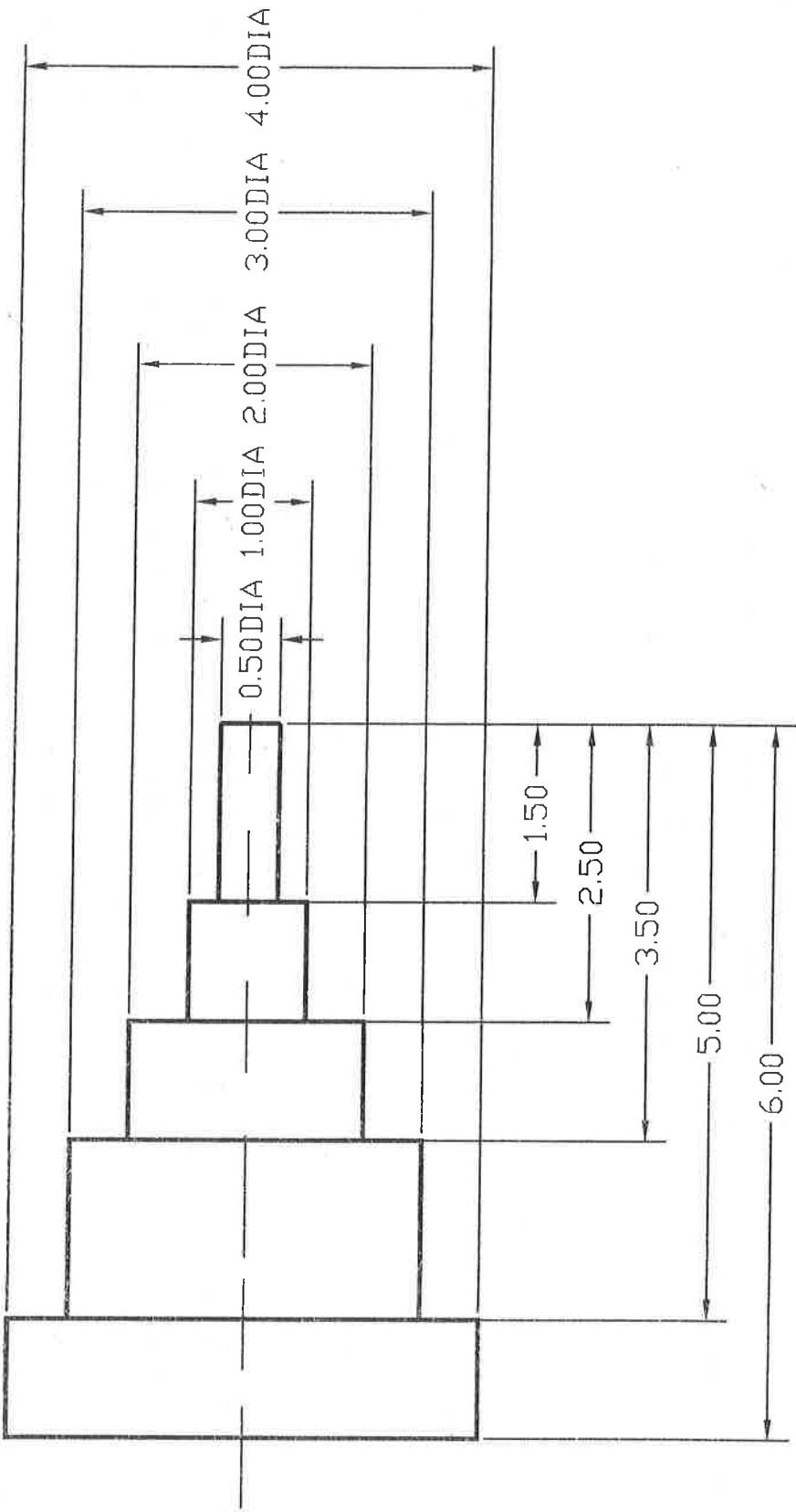
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PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE	8
			MT-491



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1 PLACE DECIMAL ±0.02			MT-491
1 PLACE DECIMAL ±0.005			
ANGULAR ±0.5°	No PER ASSEMBLY		

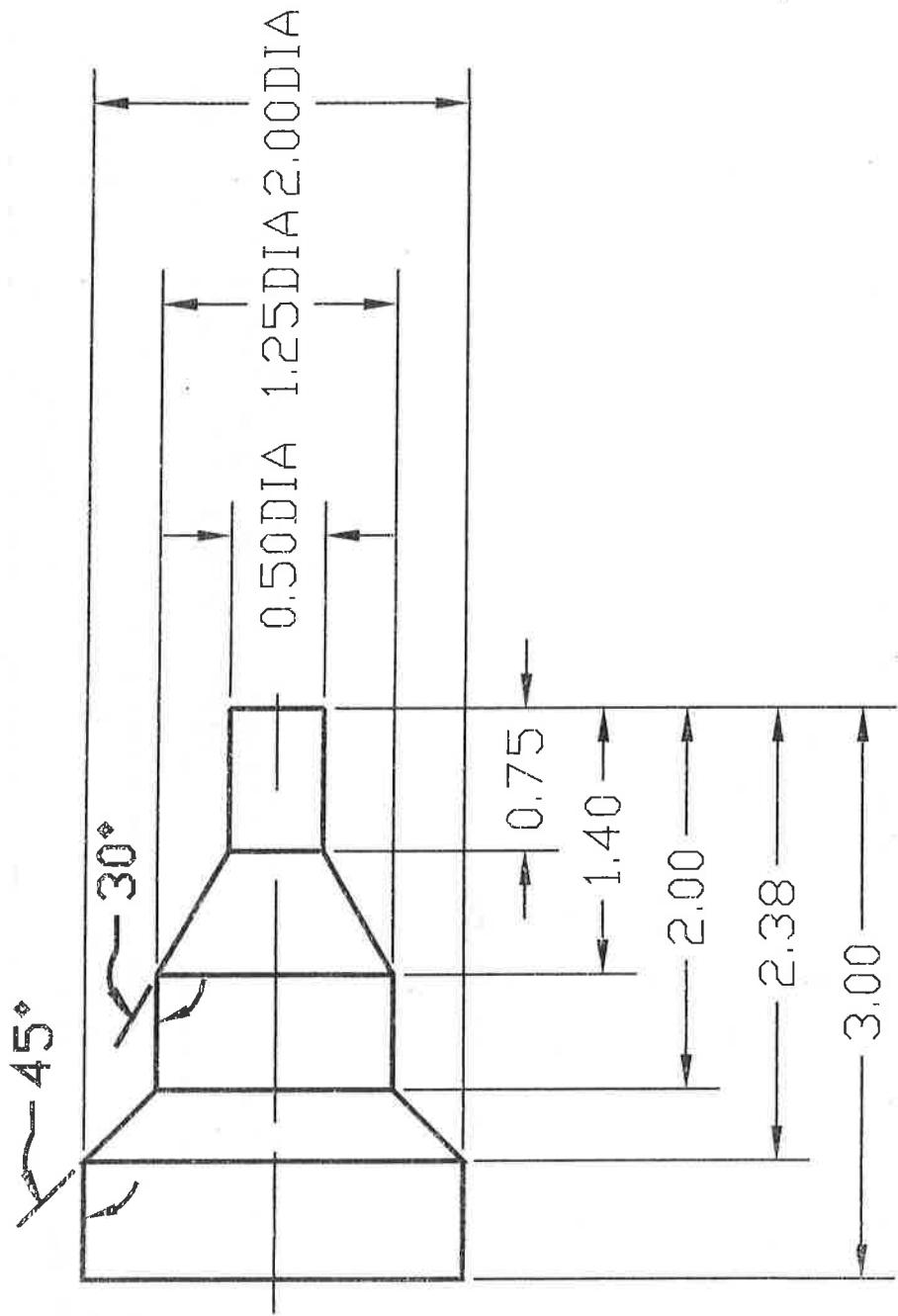


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			MT-491

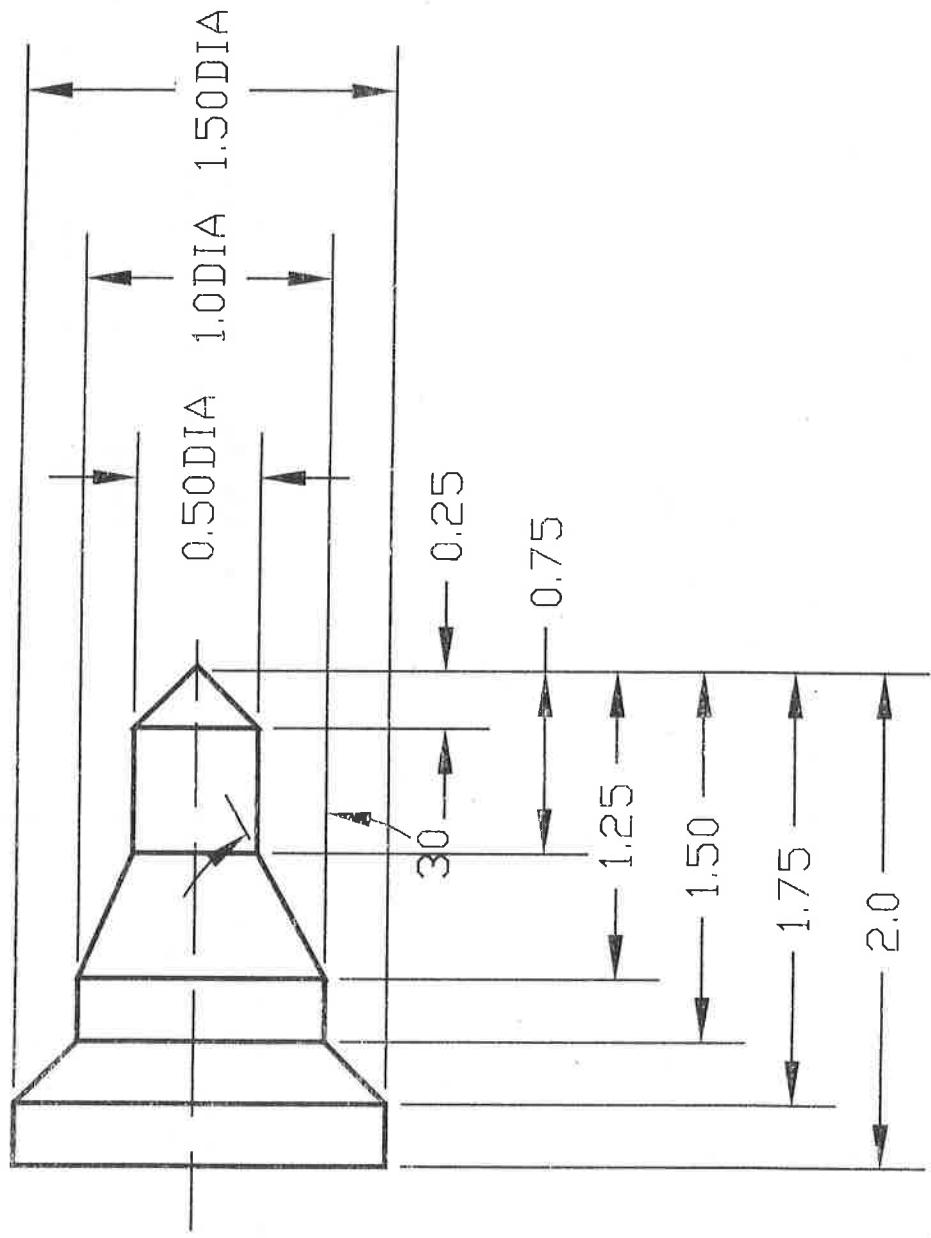


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1 PLACE DECIMAL ± 0.005
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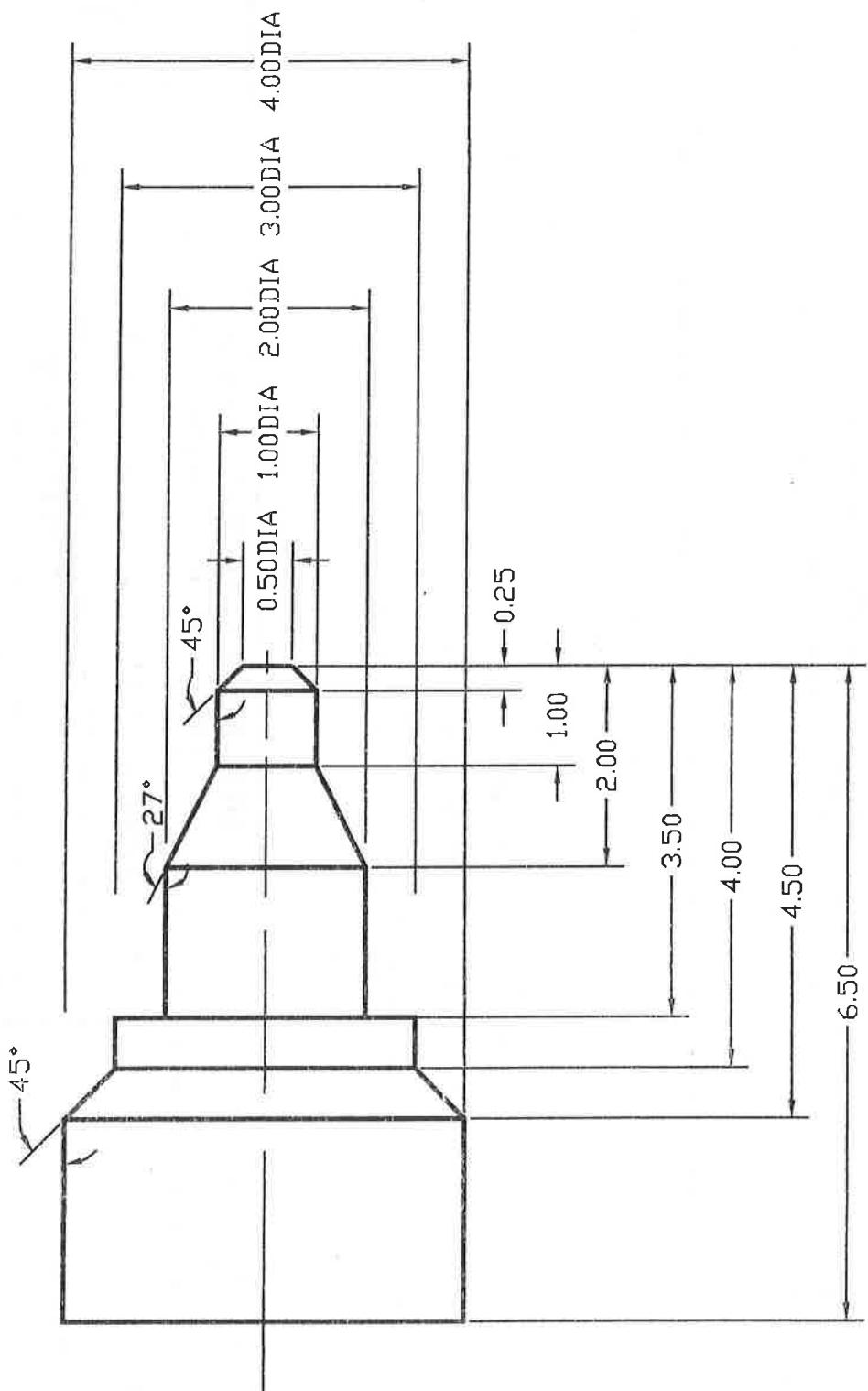
SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY		CLASS EXERCISE 1
			MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

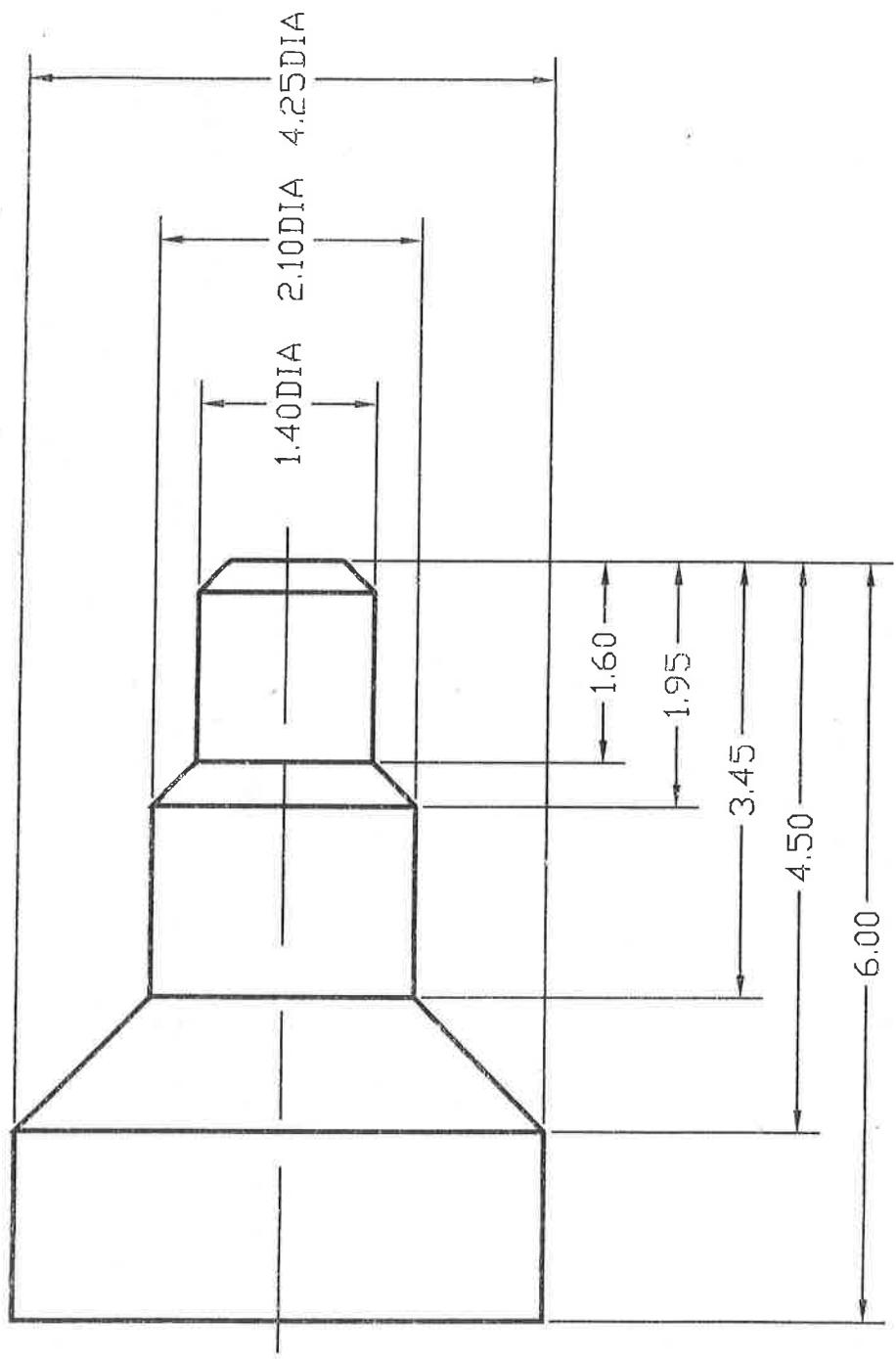
SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE	2
			MIT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

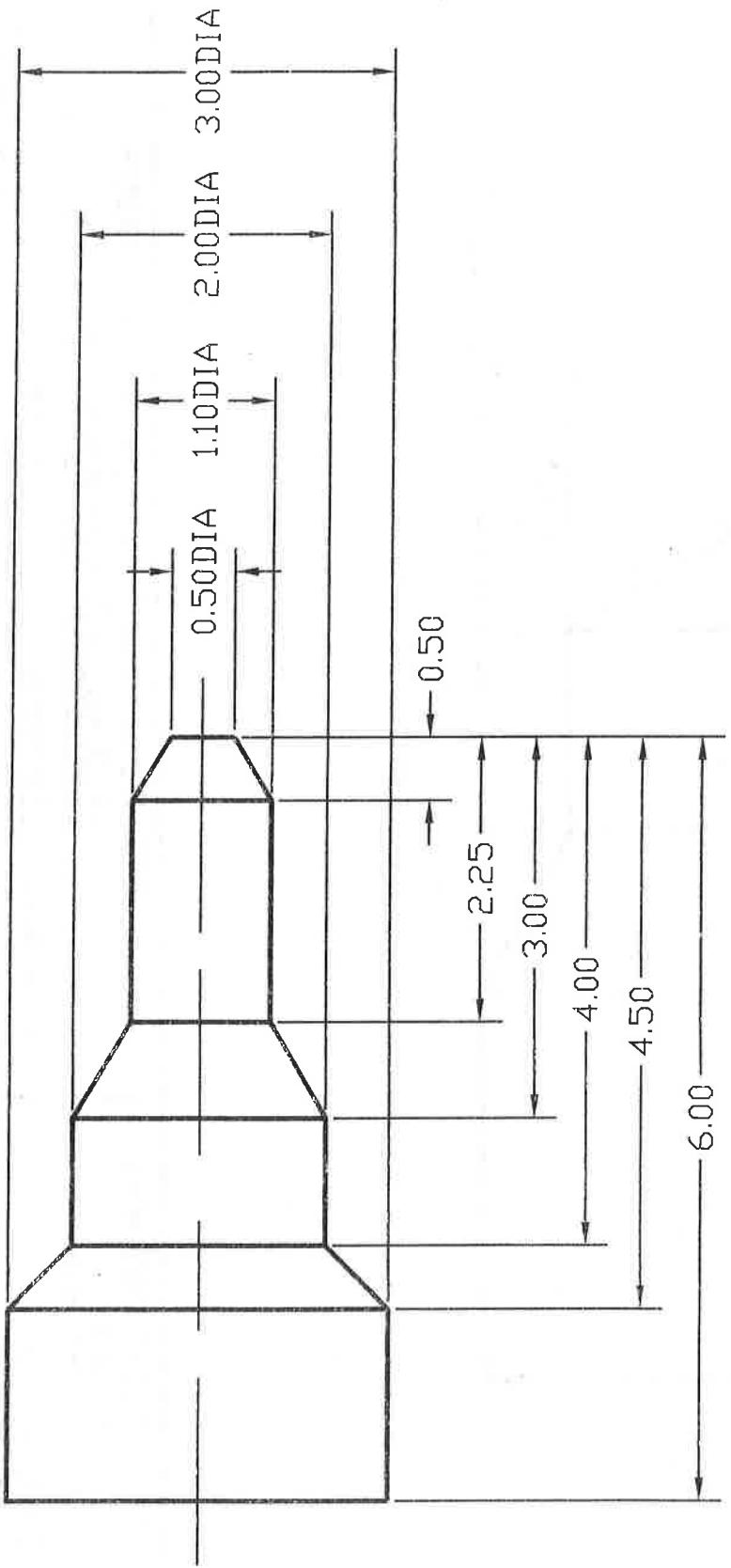
SCALE	NONE	STATION NO.	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE	3		
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY PROF. GOLDENBERG
PART		CLASS EXERCISE 3	
MATERIAL	No PER ASSEMBLY		MT-491

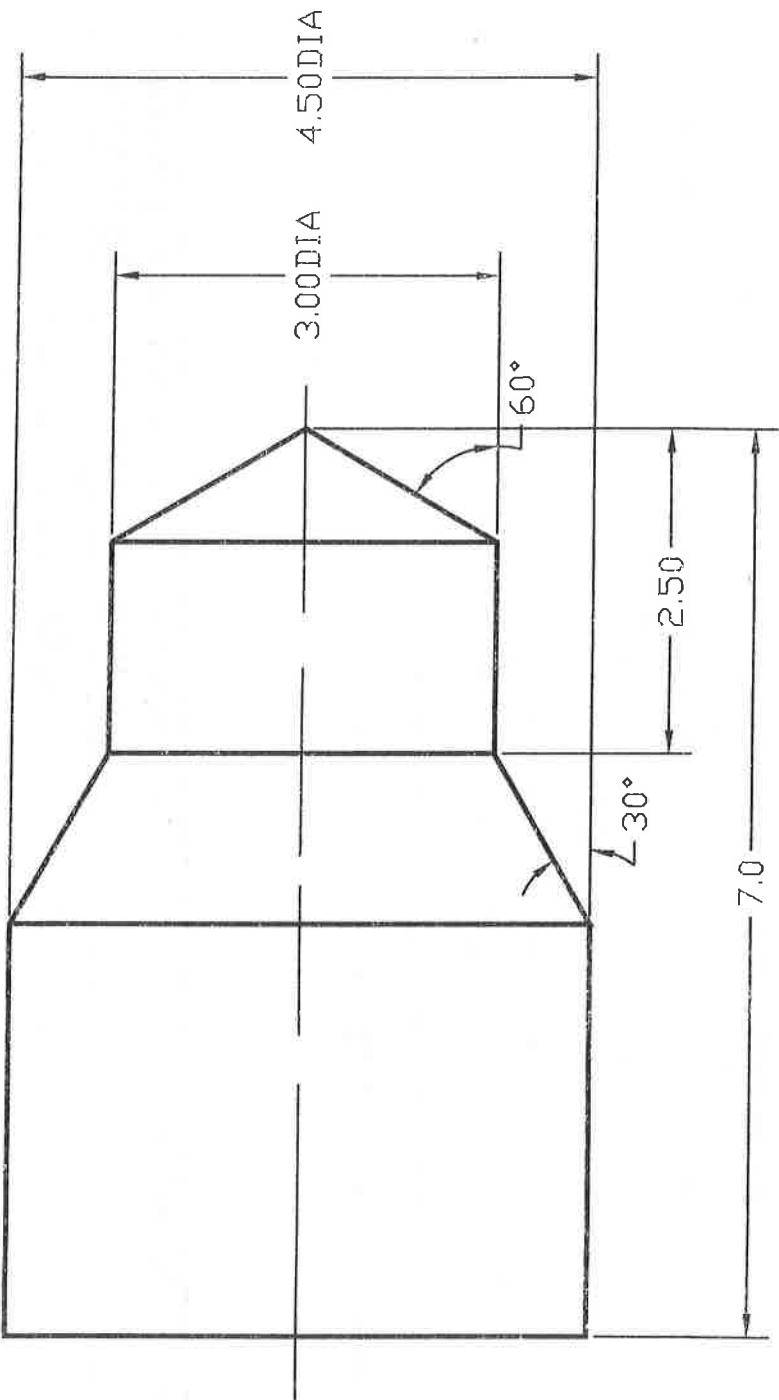


DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE	3		
MATERIAL	No PER ASSEMBLY		MT-491

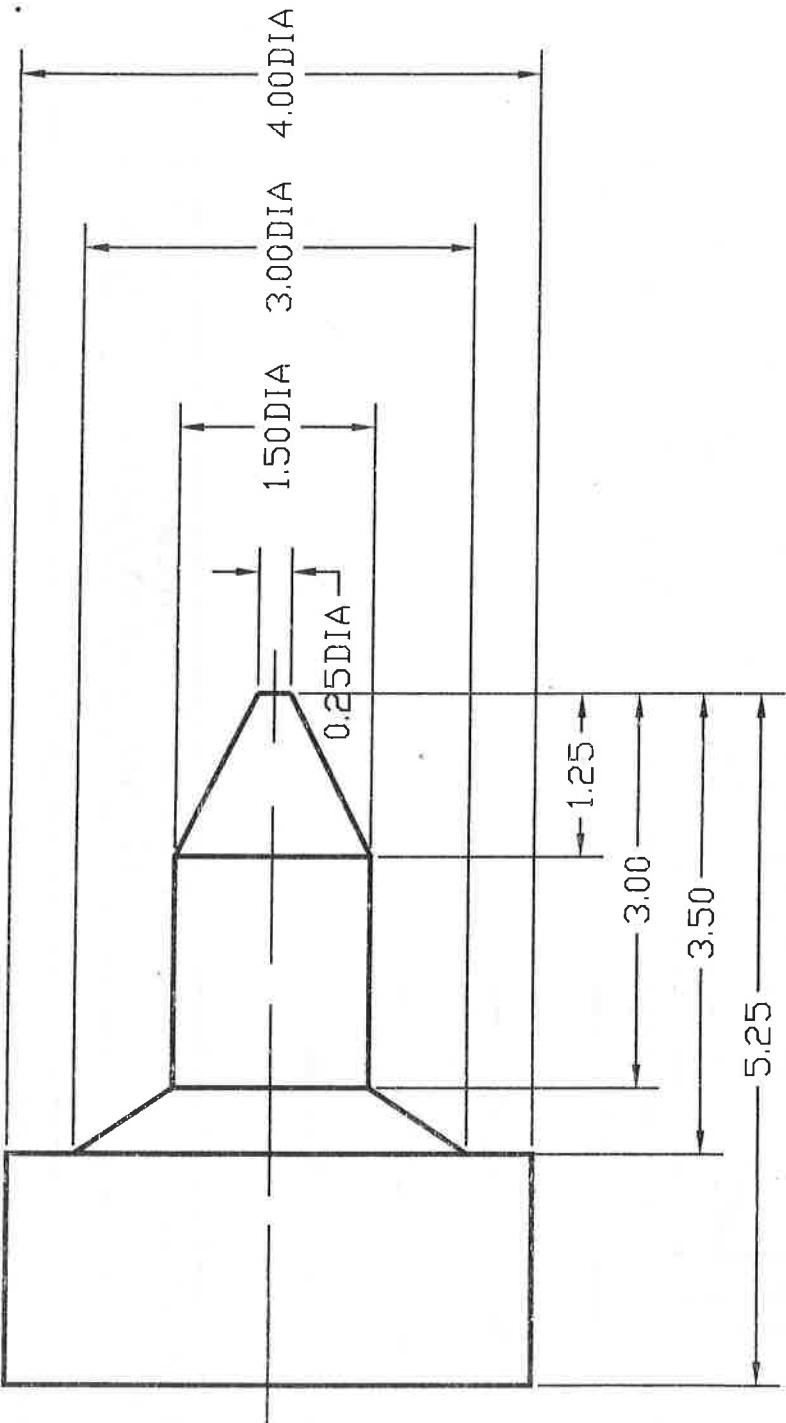


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

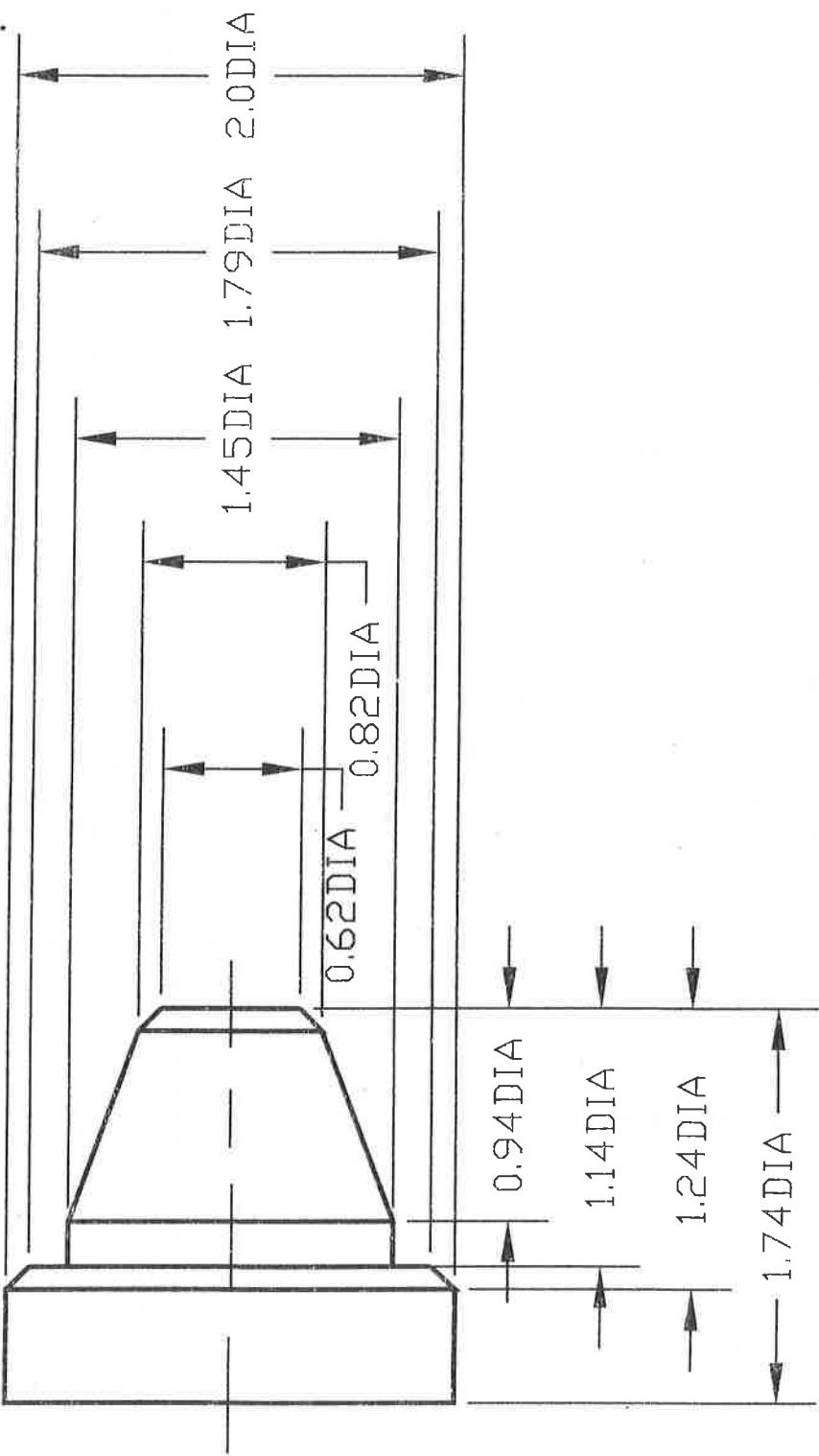
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DATE	ELAPSED TIME	CHECKED BY	
PART	PROF. GOLDENBERG		
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE 3	
		MT-491	



**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE
SPECIFIED

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE	3		
MATERIAL	No PER ASSEMBLY		MT-491

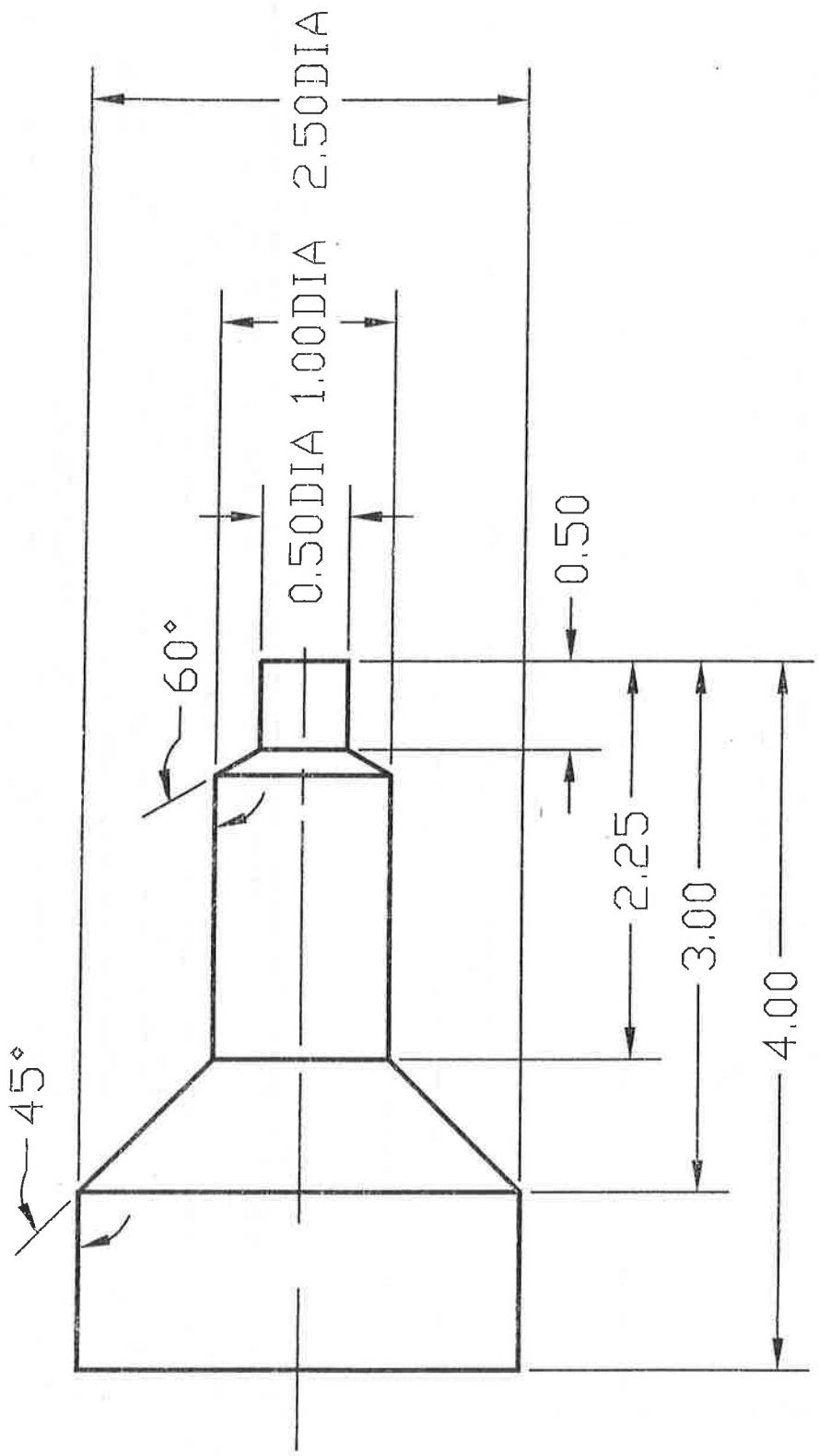


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
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ANGULAR $\pm 0.5^\circ$

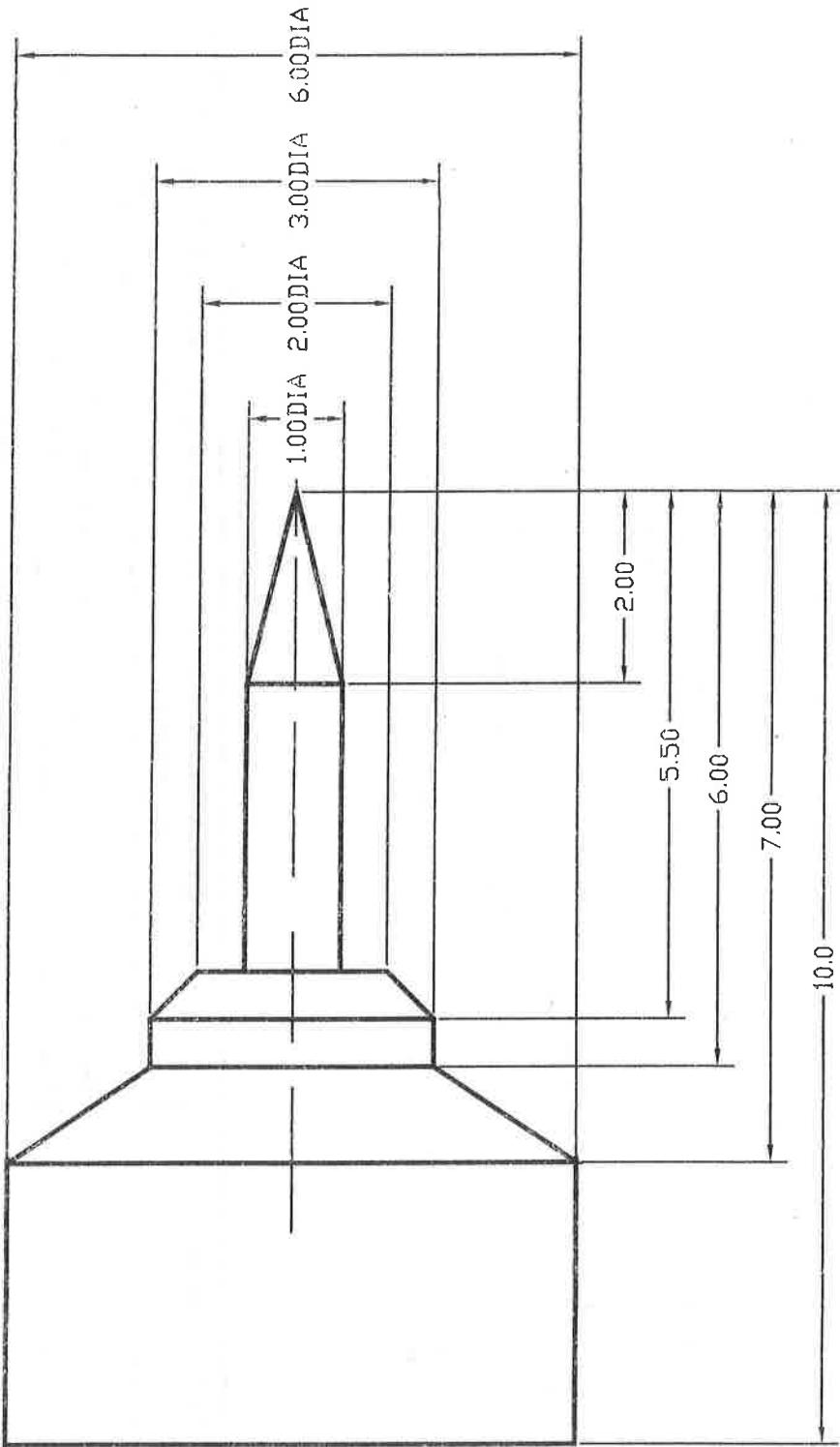
DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART		CLASS EXERCISE	15
MATERIAL	No PER ASSEMBLY		MT-491



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1 PLACE DECIMAL ± 0.1	SCALE DATE PART	NONE ELAPSED TIME	STATION No DRAWN BY	PROF. GOLDENBERG
1 PLACE DECIMAL ± 0.02				
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ANGULAR $\pm 0.5^\circ$	MATERIAL	No PER ASSEMBLY	CLASS EXERCISE 2	MIT-491

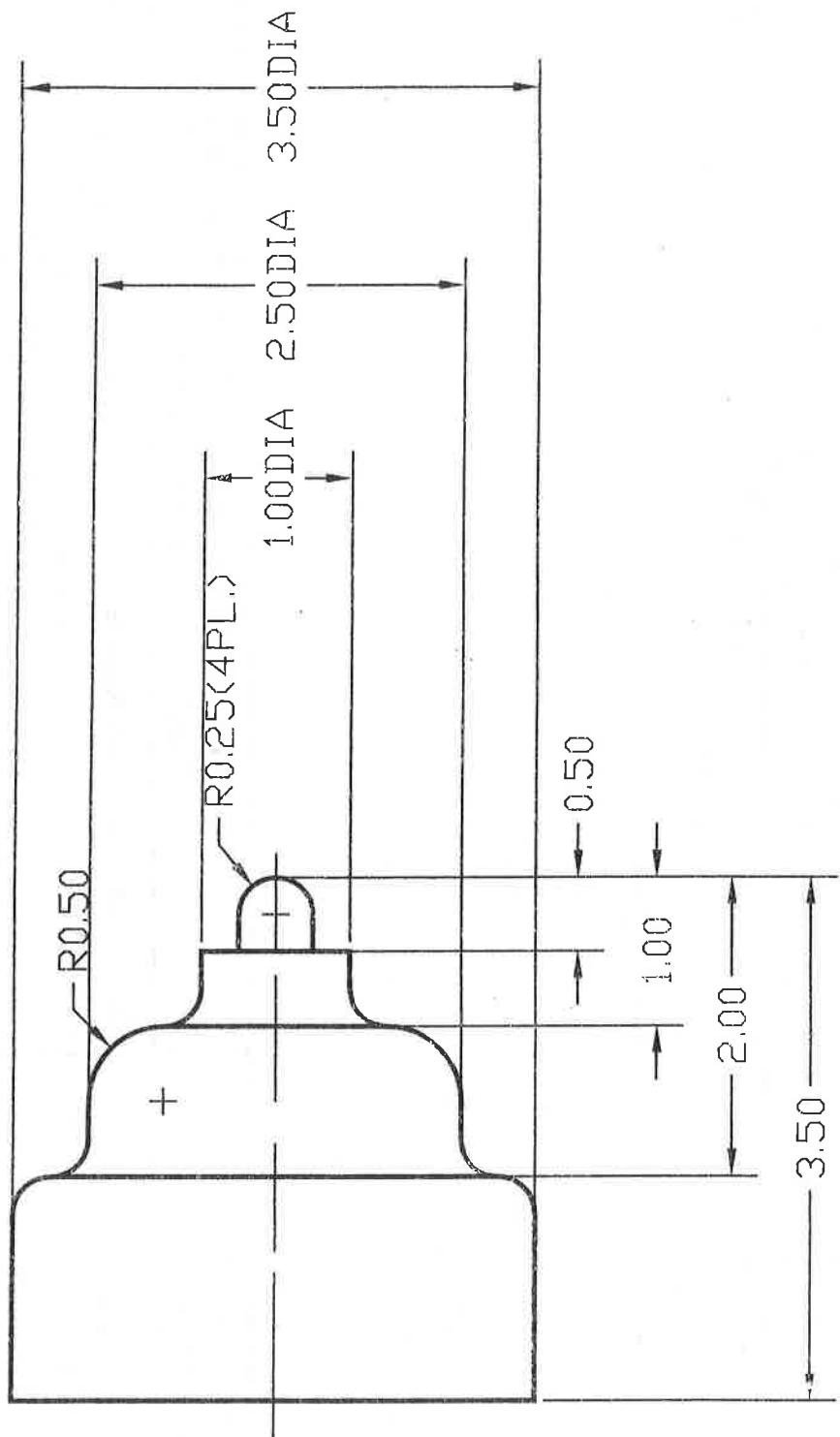


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY		CLASS EXERCISE 3
			MT-491

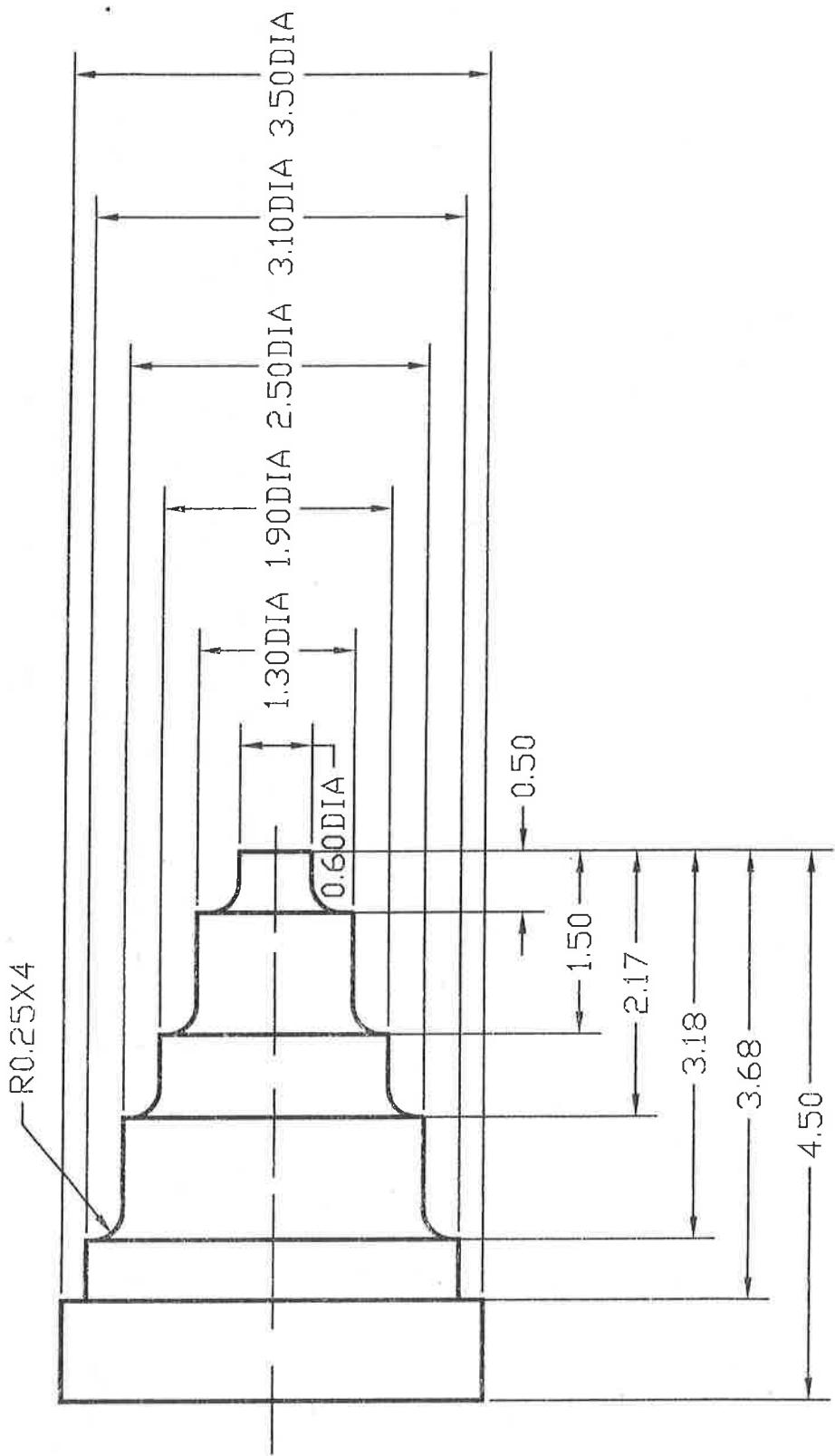


TOLERANCE UNLESS OTHERWISE
SPECIFIED

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1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

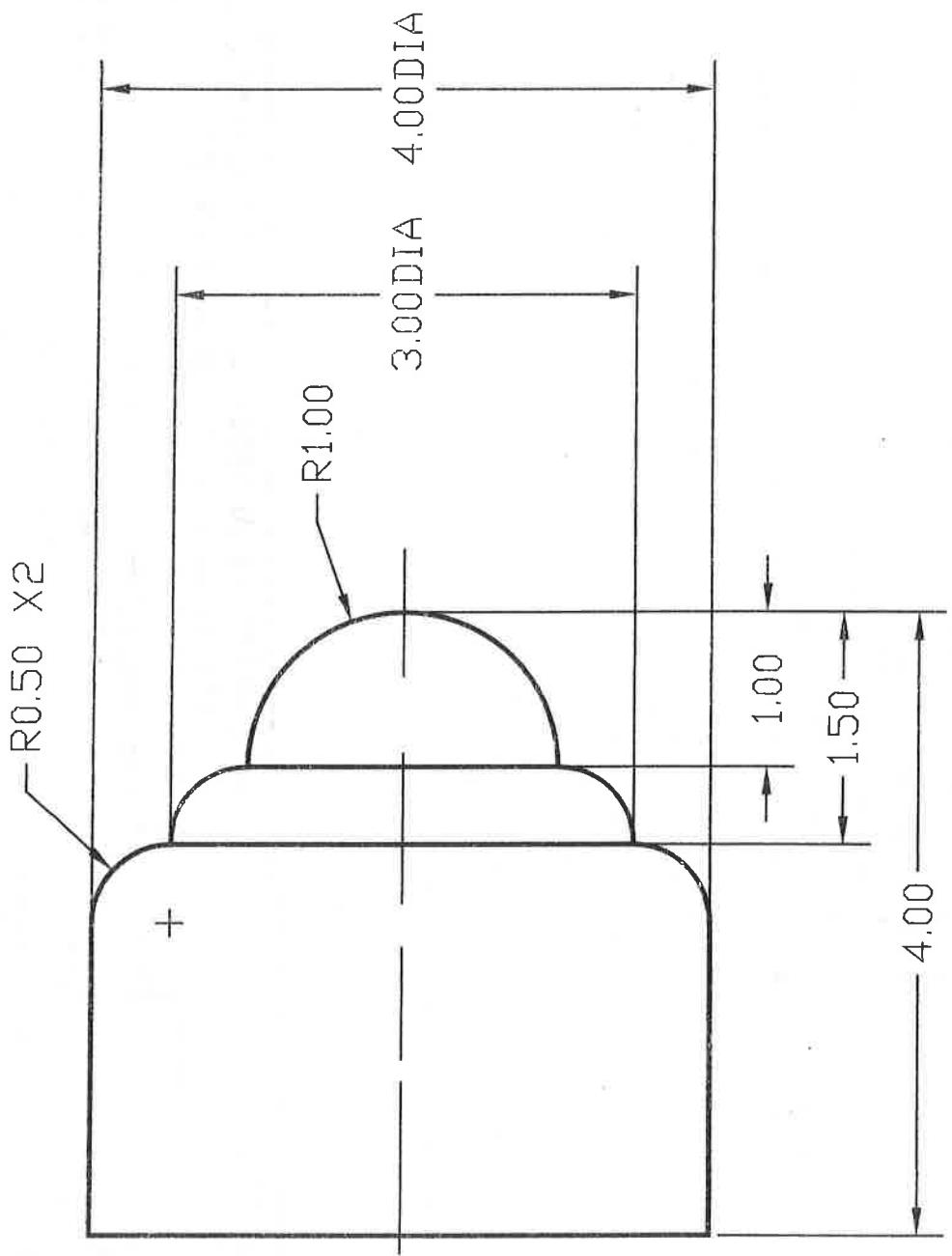
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DATE			CHECKED BY PROF. GOLDENBERG
PART			CLASS EXERCISE 1
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

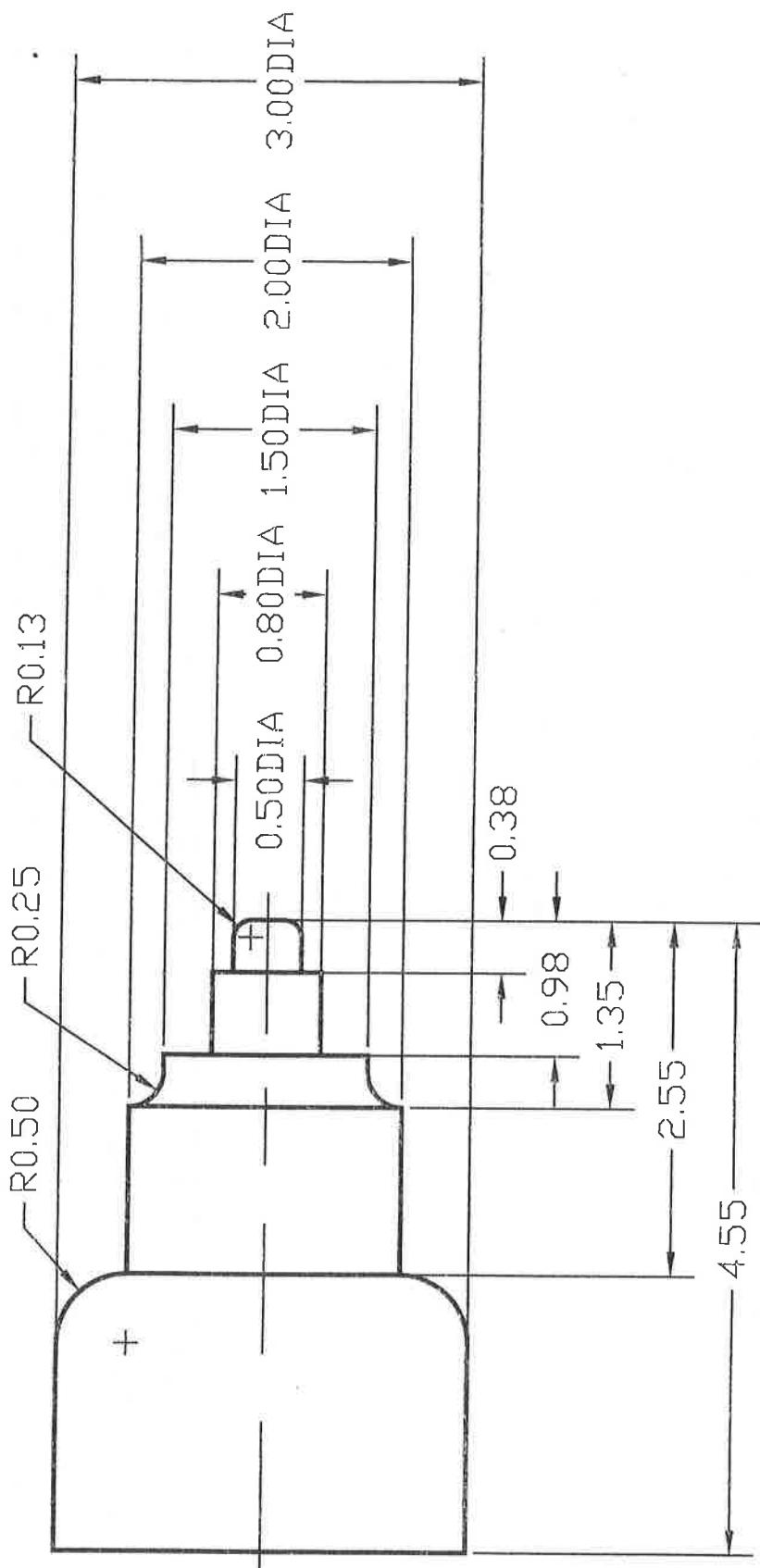
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DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE	2
			MT-491



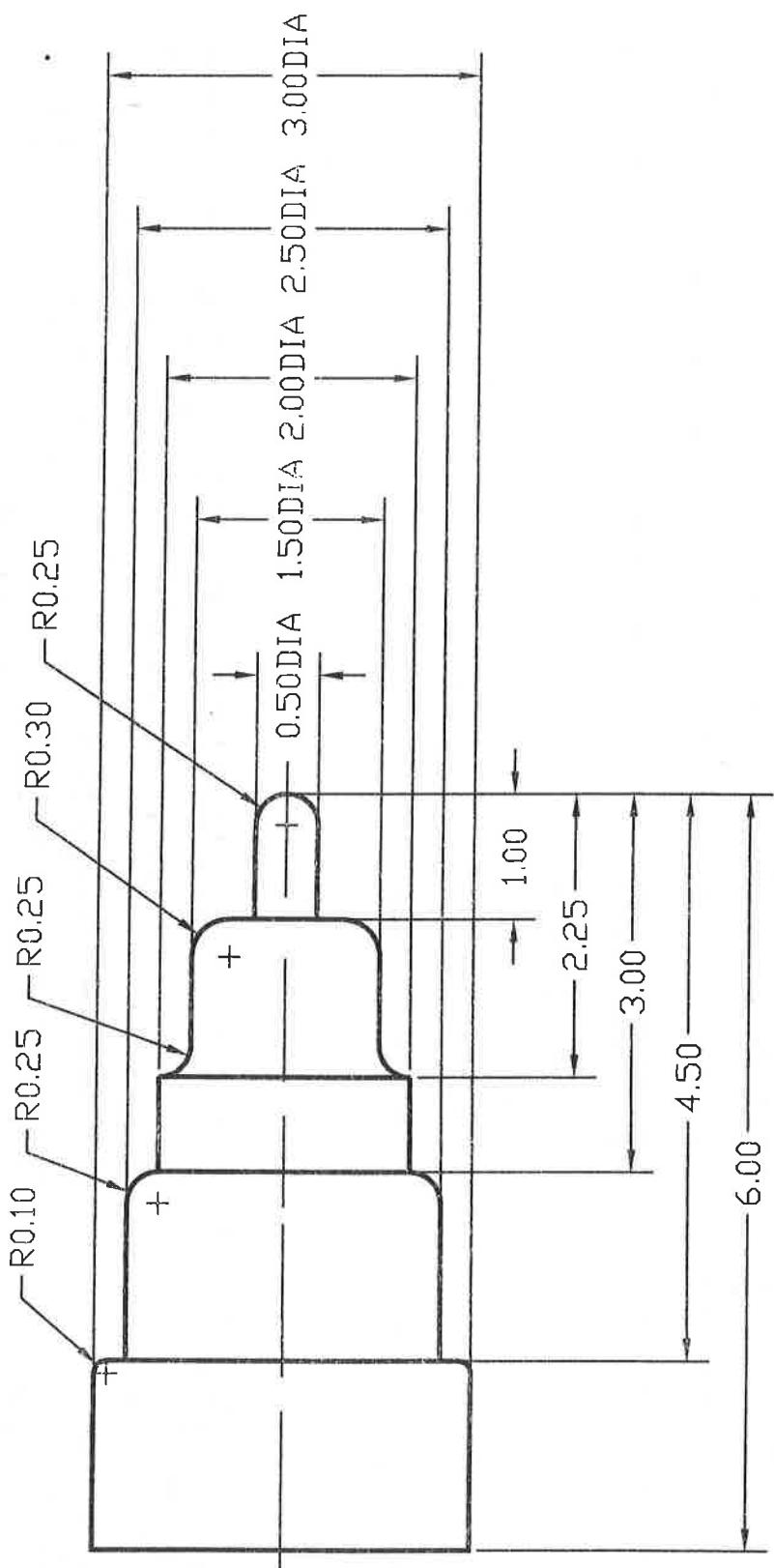
**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE
SPECIFIED

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE SPECIFIED		DEPARTMENT OF MECHANICAL ENGINEERING TECHNOLOGY AND DESIGN DRAFTING		
SCALE	NONE	STATION No	DRAWN BY	
DATE		ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART			CLASS EXERCISE	
MATERIAL	No PER ASSEMBLY			MT-491
1 PLACE DECIMAL ± 0.1				
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ANGULAR $\pm 0.5^\circ$				

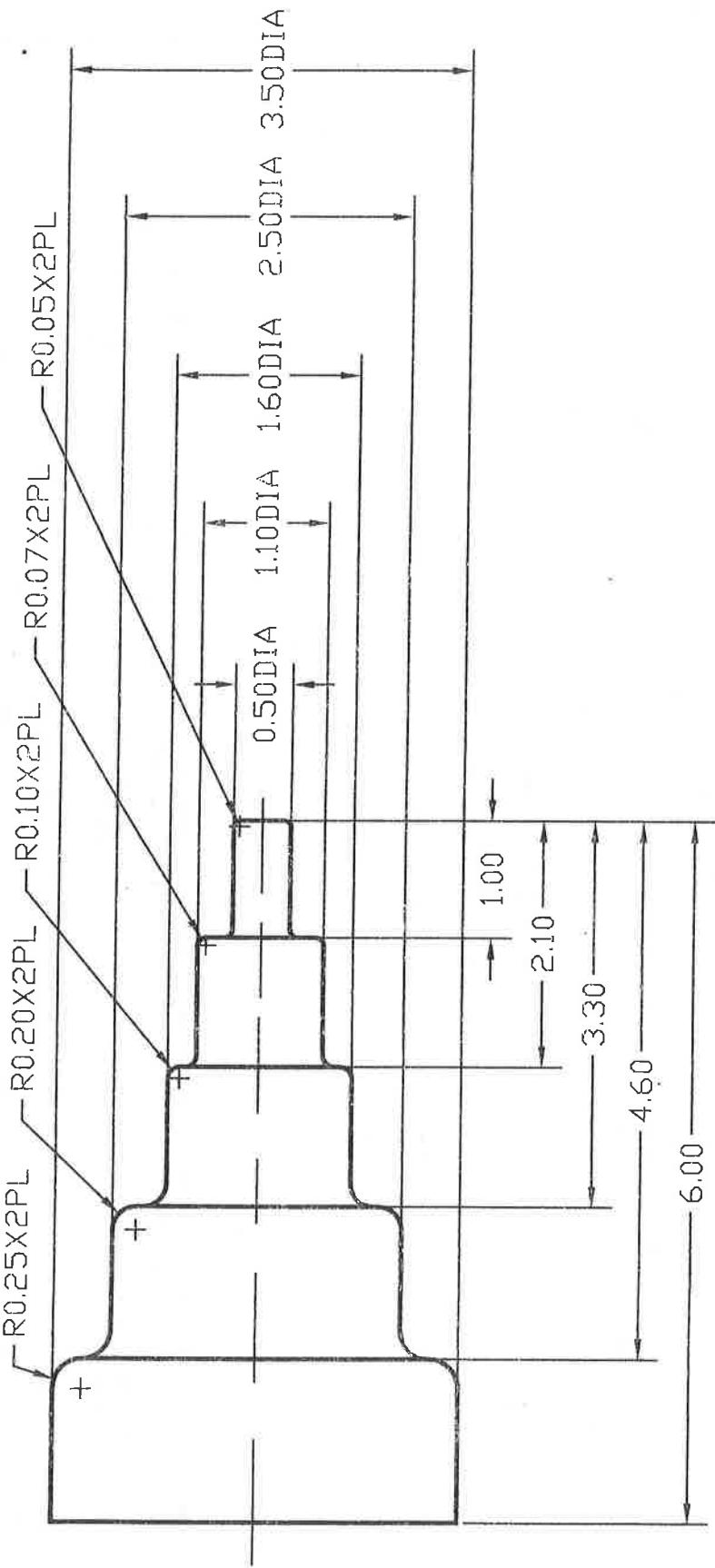


TOLERANCE UNLESS OTHERWISE
SPECIFIED

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ANGULAR $\pm 0.5^\circ$

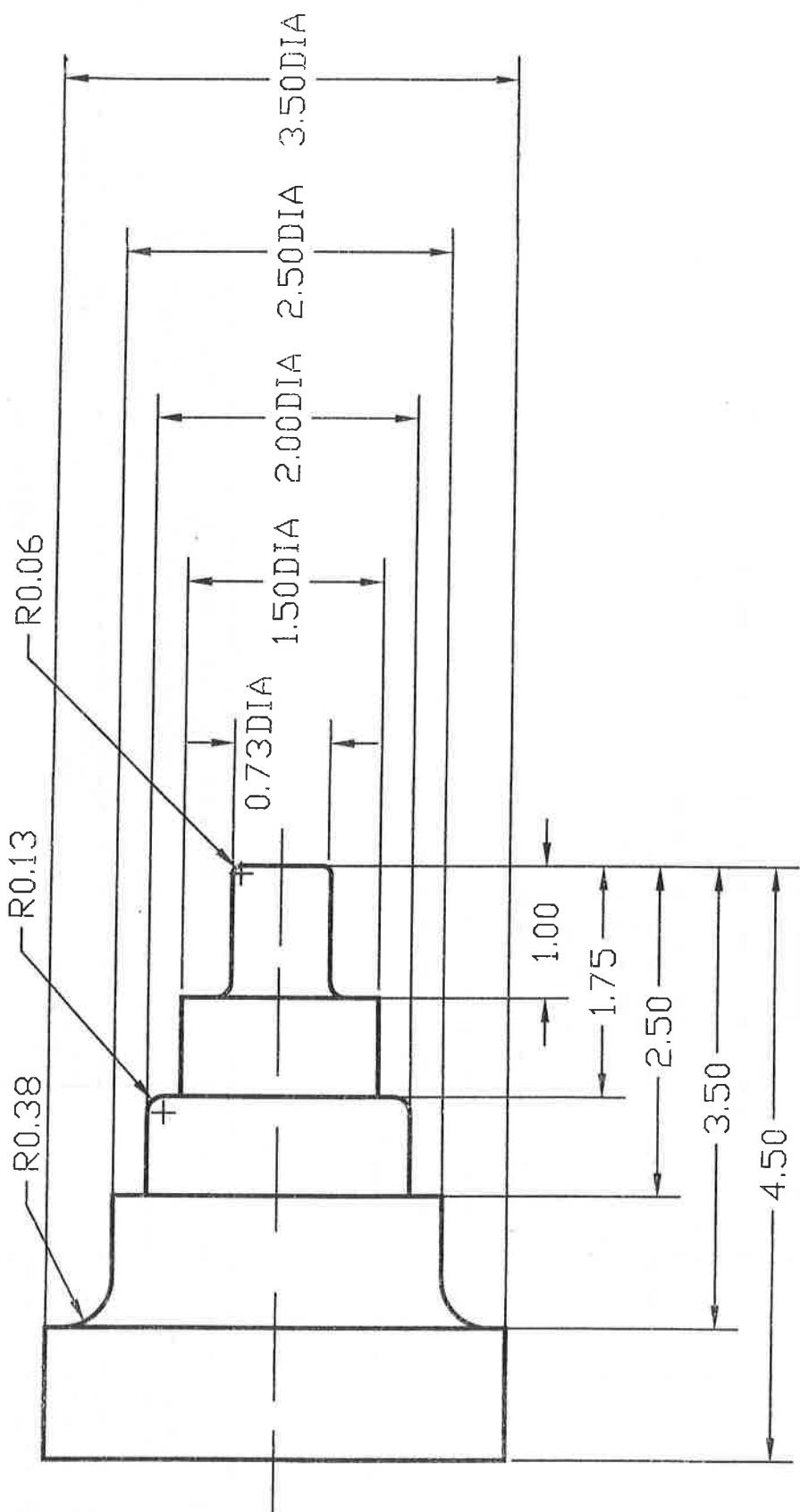
DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED	TIME	CHECKED BY
PART	PROF. GOLDENBERG		
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY	No PER ASSEMBLY	MT-491



TOLERANCE UNLESS OTHERWISE SPECIFIED		DEPARTMENT OF MECHANICAL ENGINEERING TECHNOLOGY AND DESIGN DRAFTING		
SCALE	NONE	STATION No	DRAWN BY	
DATE		ELAPSED TIME	CHECKED BY PROF. GOLDENBERG	
PART			CLASS EXERCISE	
MATERIAL	No PER ASSEMBLY		MT-491	

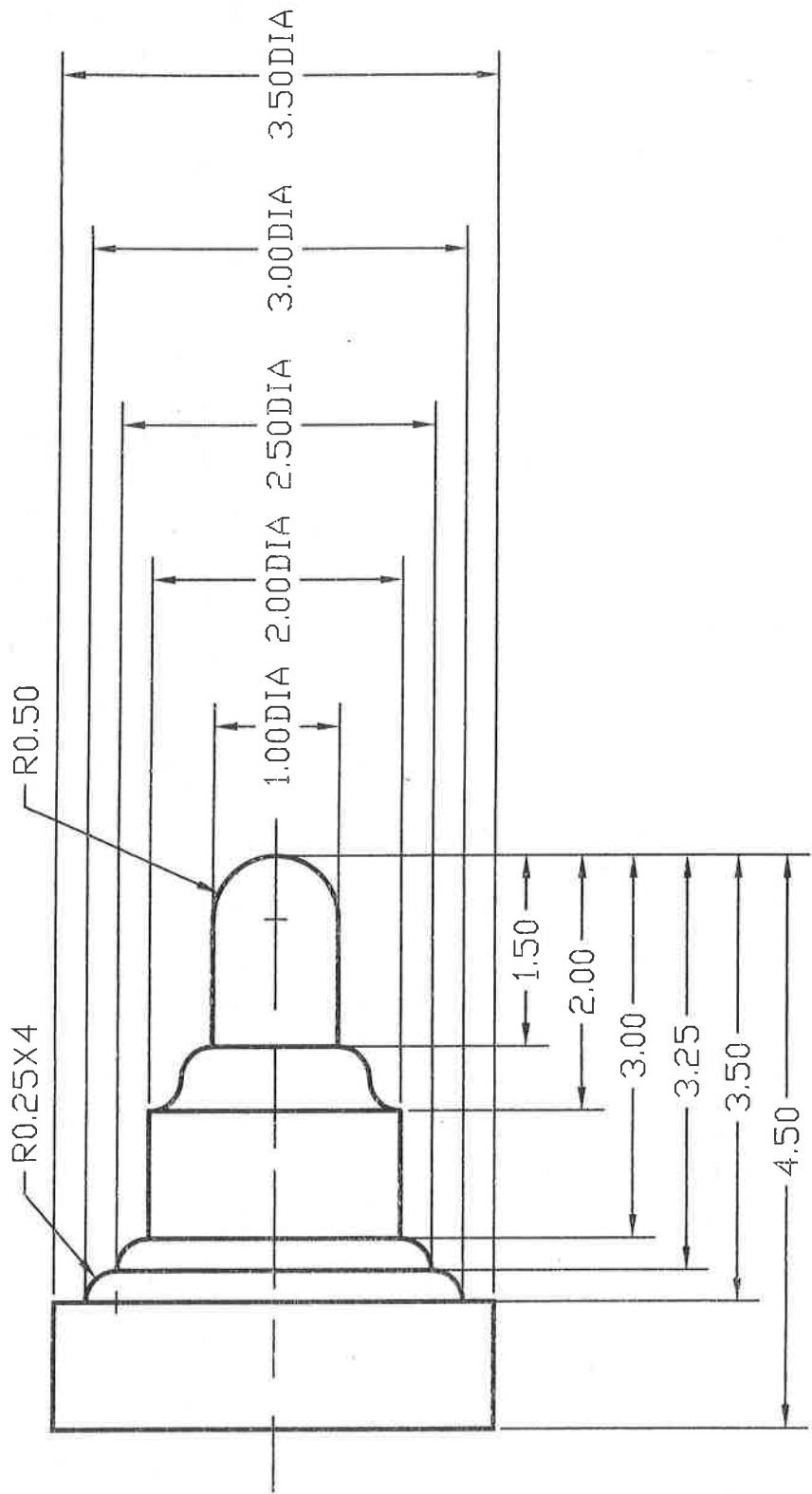
1 PLACE DECIMAL ± 0.1
 1 PLACE DECIMAL ± 0.02
 1 PLACE DECIMAL ± 0.005
 ANGULAR $\pm 0.5^\circ$



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

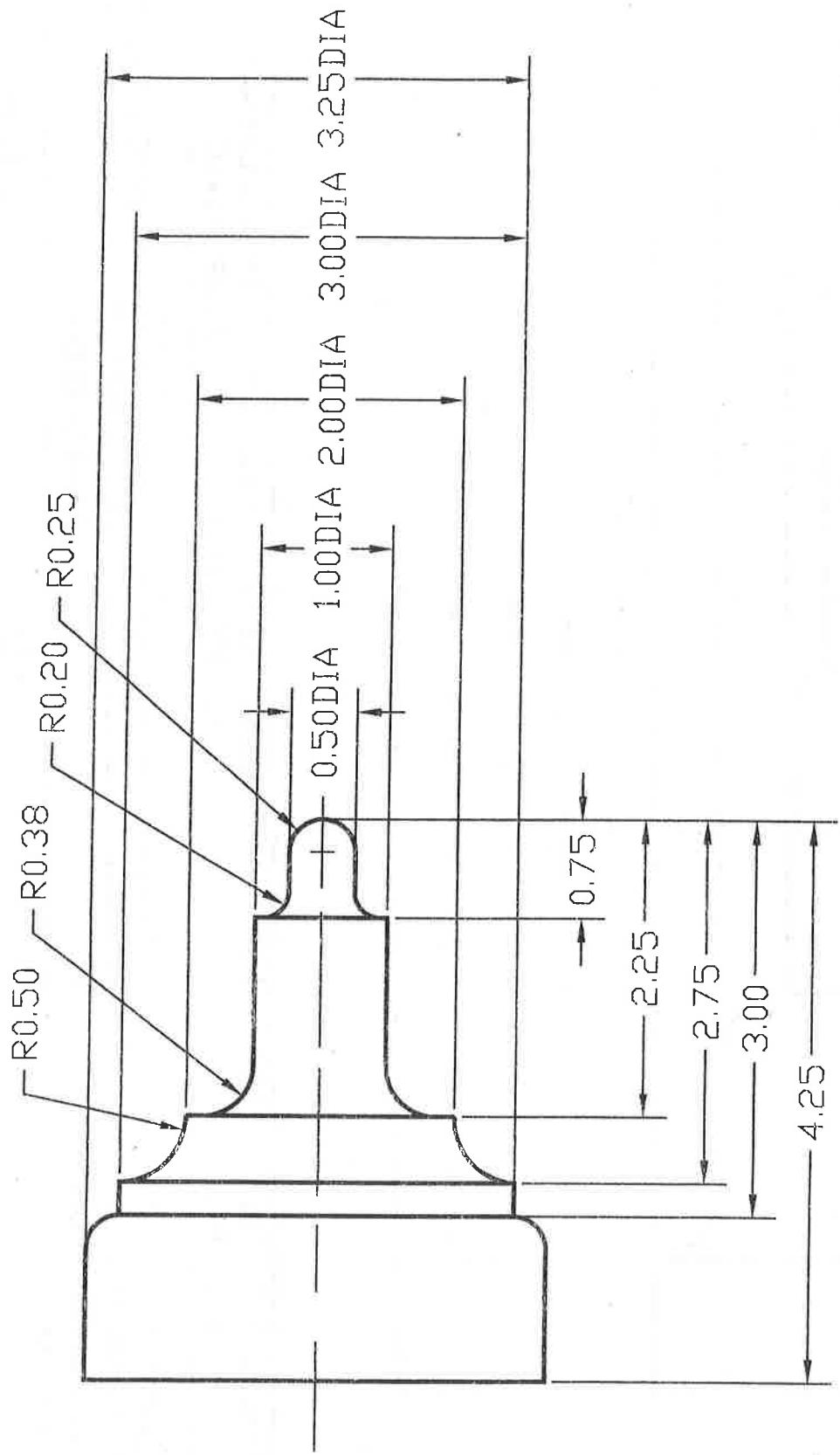
SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED	TIME	CHECKED BY
PART	PROF. GOLDENBERG		
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY		
	MT-491		



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE	MT-491

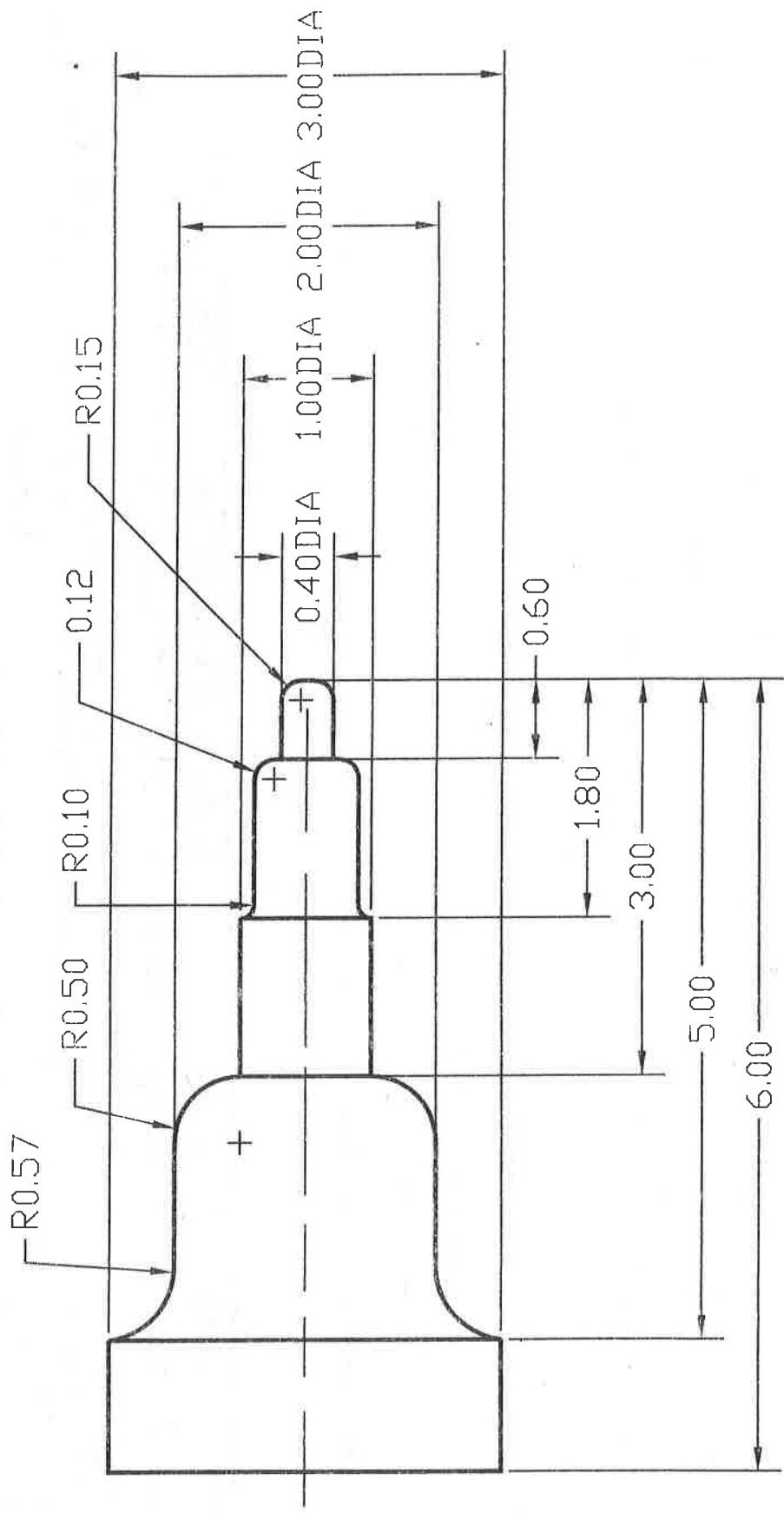


**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

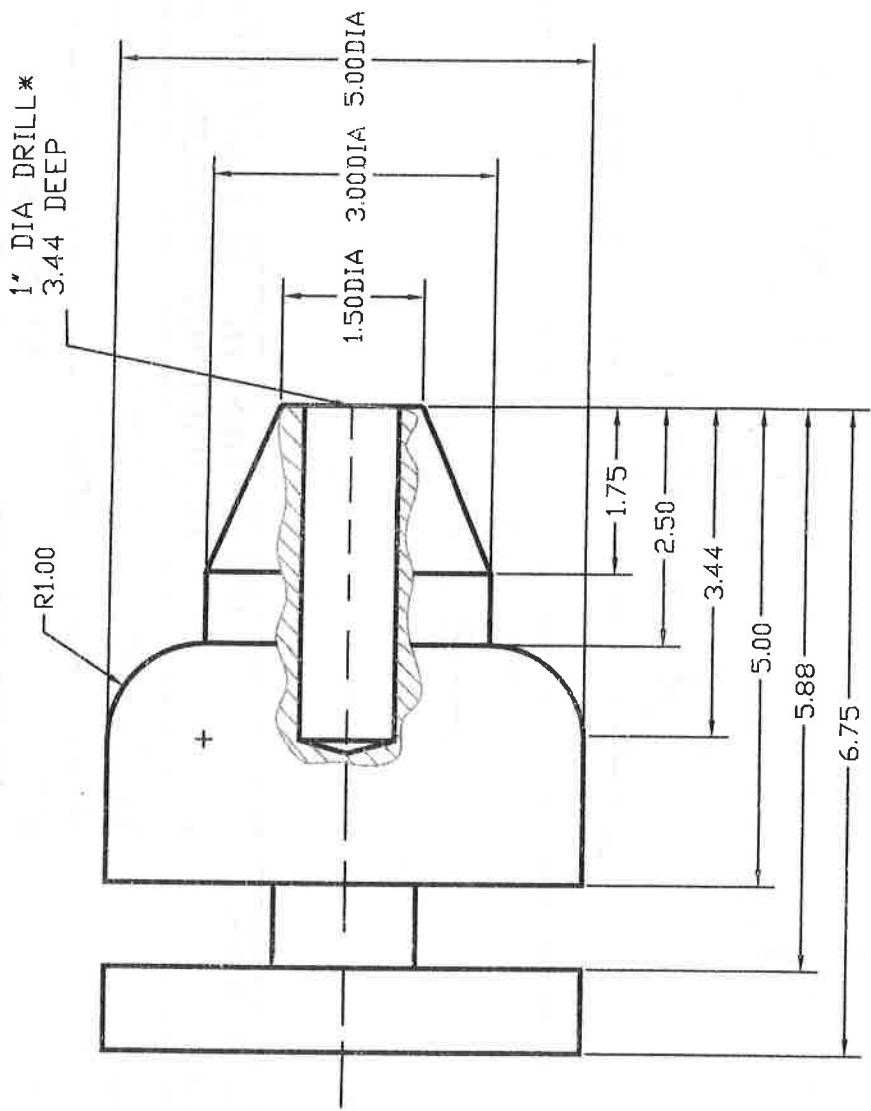
SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY PROF. GOLDENBERG
PART			CLASS EXERCISE
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION NO	DRAWN BY
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PART			PROF. GOLDENBERG
			CLASS EXERCISE
MATERIAL	No PER ASSEMBLY		MT-491

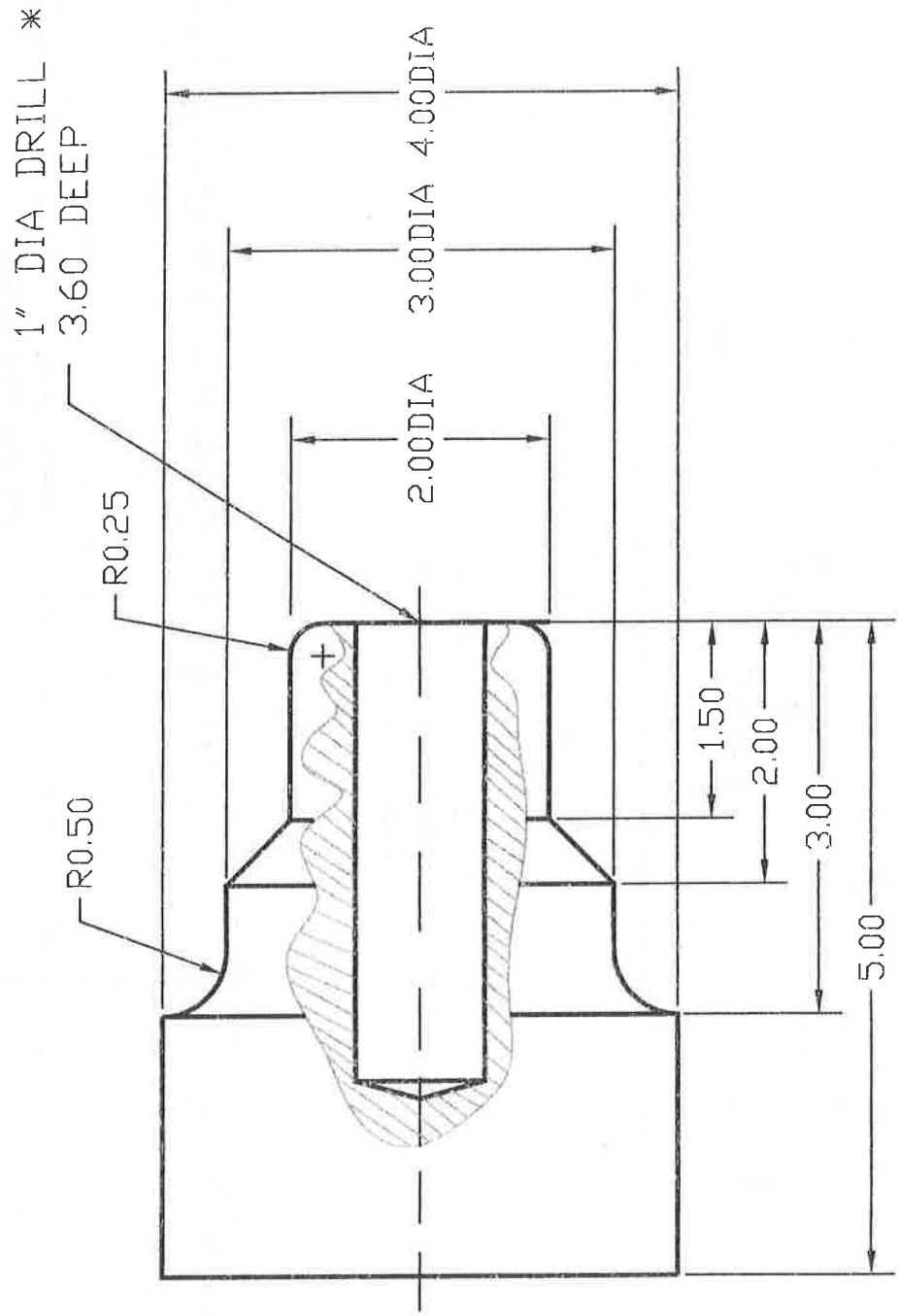


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY		MT-491

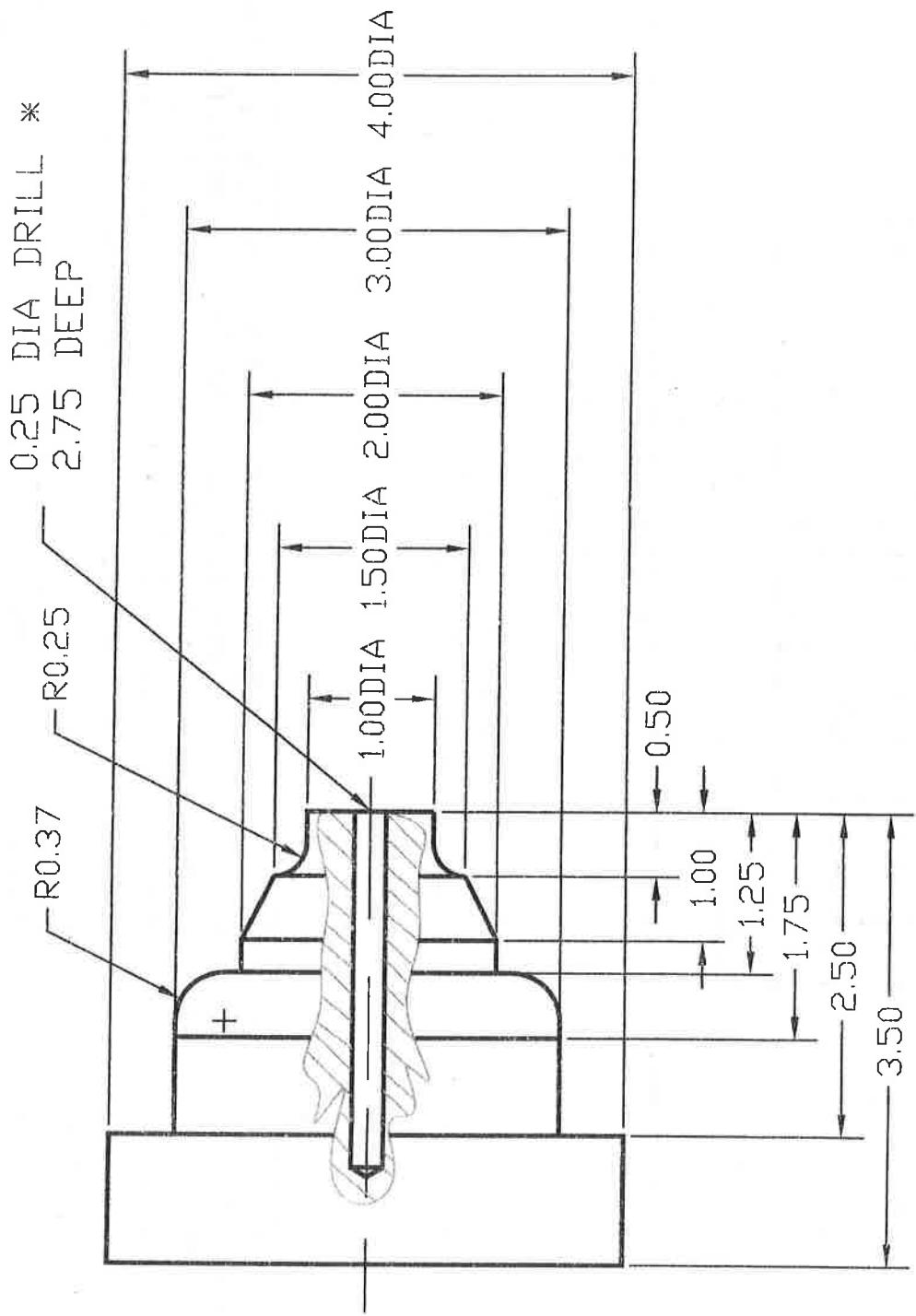


TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

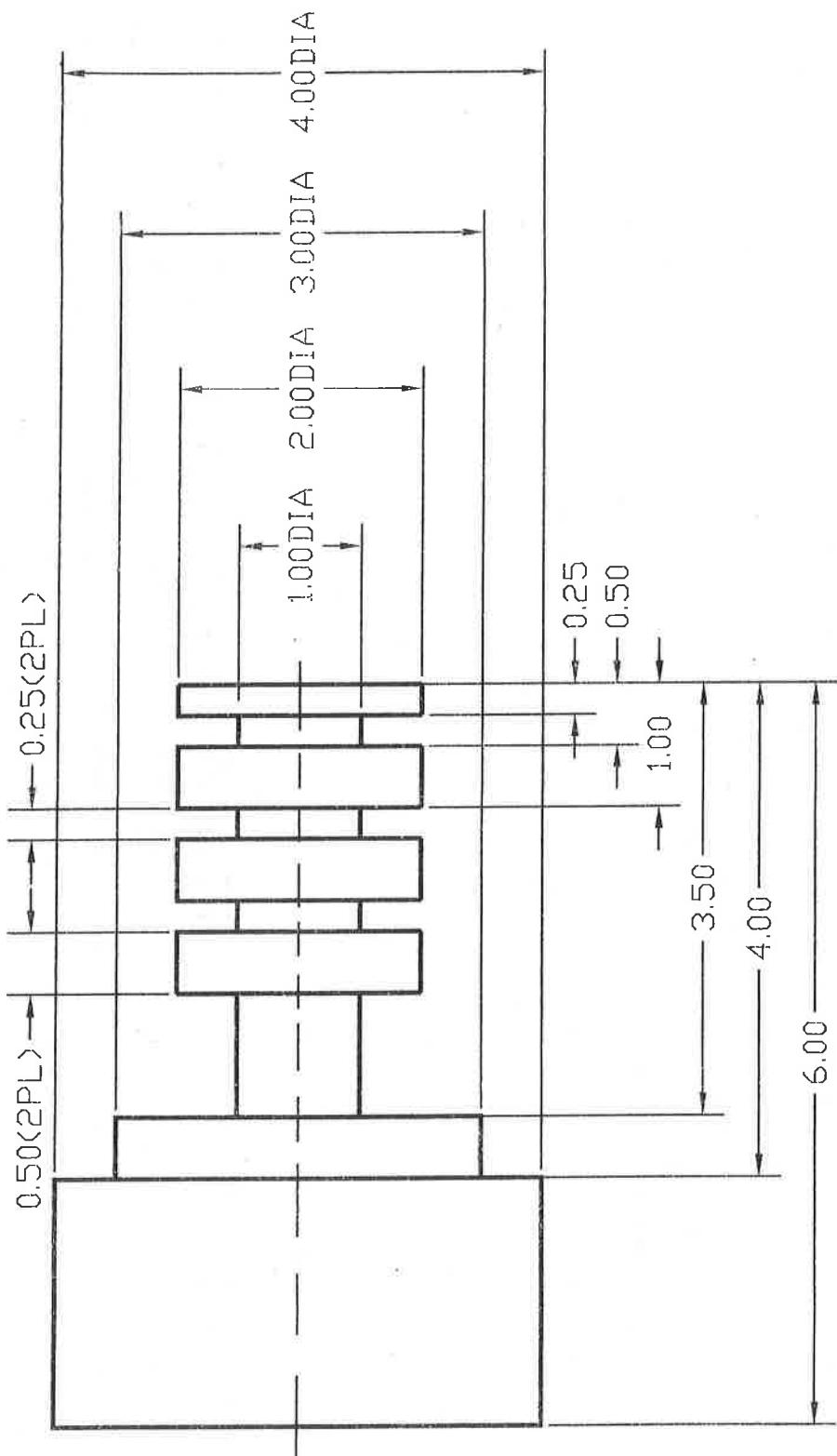
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DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY	MT-491	

1 PLACE DECIMAL ± 0.1
 1 PLACE DECIMAL ± 0.02
 1 PLACE DECIMAL ± 0.005
 ANGULAR $\pm 0.5^\circ$



DEPARTMENT OF MECHANICAL ENGINEERING TECHNOLOGY AND DESIGN DRAFTING

1 PLACE DECIMAL	± 0.1	SCALE	NONE	STATION No	DRAWN BY
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1 PLACE DECIMAL	± 0.005	PART			PROF. GOLDENBERG
ANGULAR	$\pm 0.5^\circ$				
					CLASS EXERCISE
		MATERIAL		No PER ASSEMBLY	
					MT-491

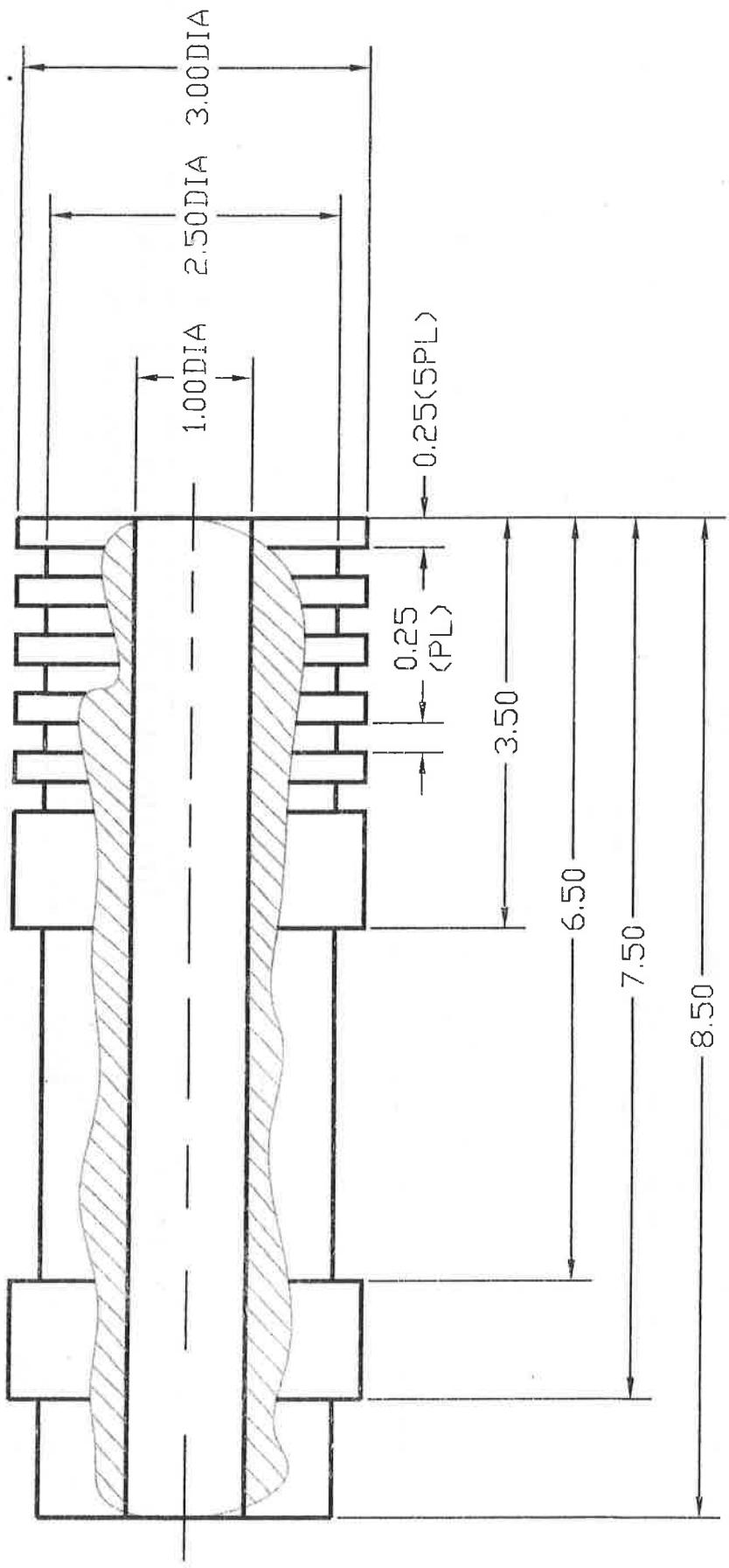


TOLERANCE UNLESS OTHERWISE
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1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

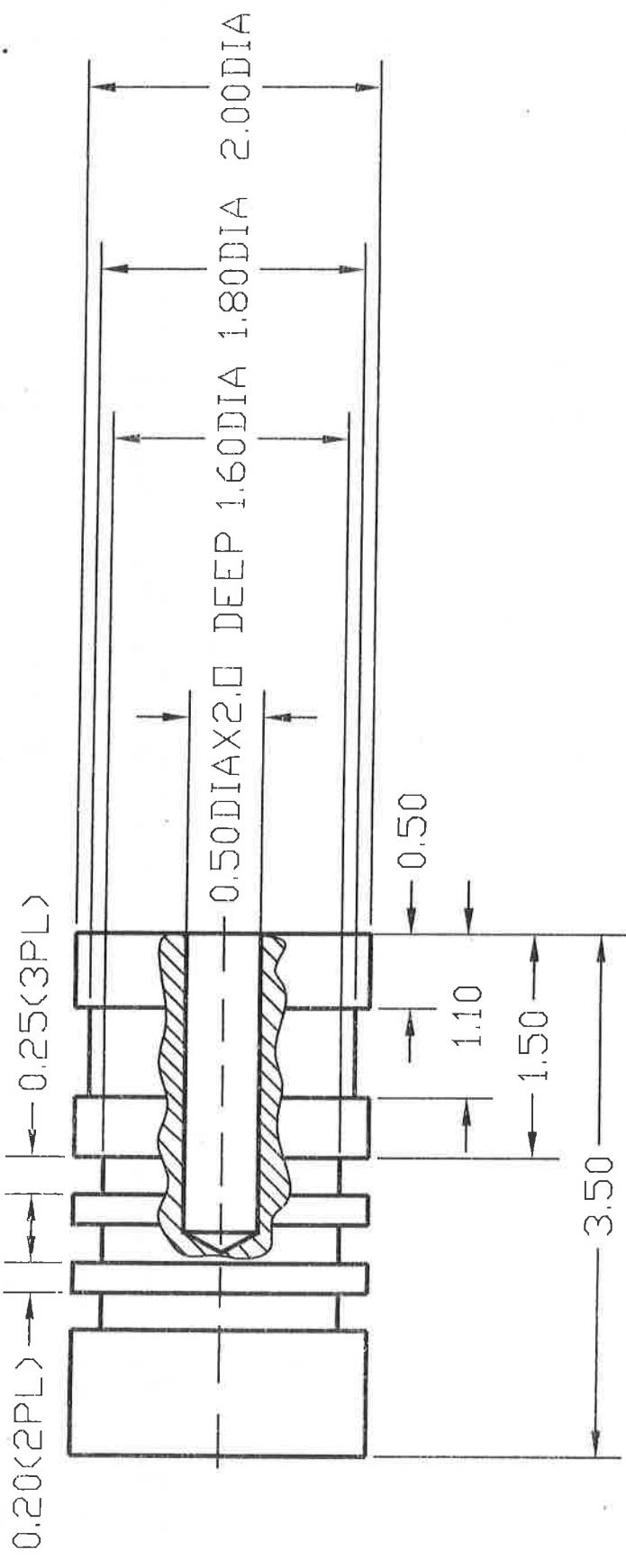
DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING TECHNOLOGY AND DESIGN DRAFTING			
SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
			CLASS EXERCISE
MATERIAL	No PER ASSEMBLY		MT-491

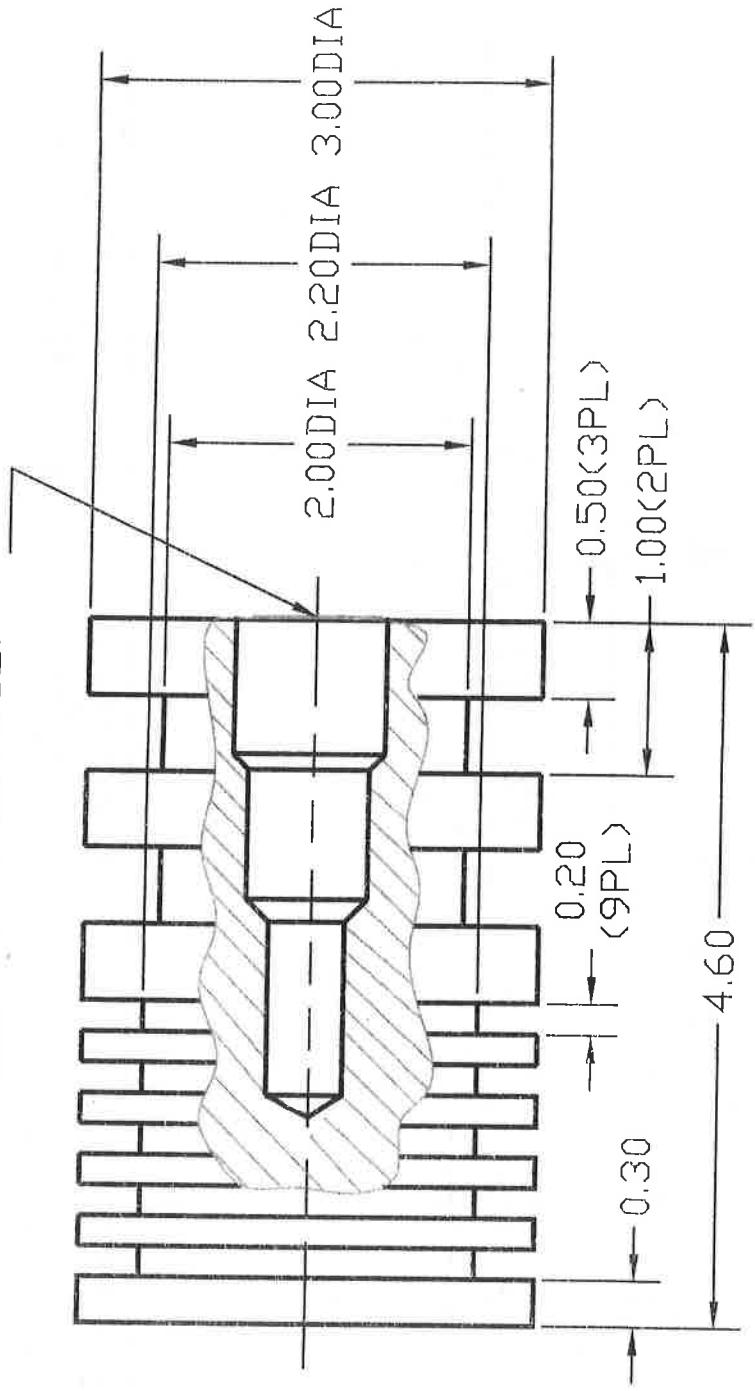


TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	Nc PER ASSEMBLY	CLASS EXERCISE	MT-491

DRILL 0.5 X 3.13 DEEP
 DRILL 0.87 X 2.0 DEEP
 DRILL 1.0 X 1.0 DEEP

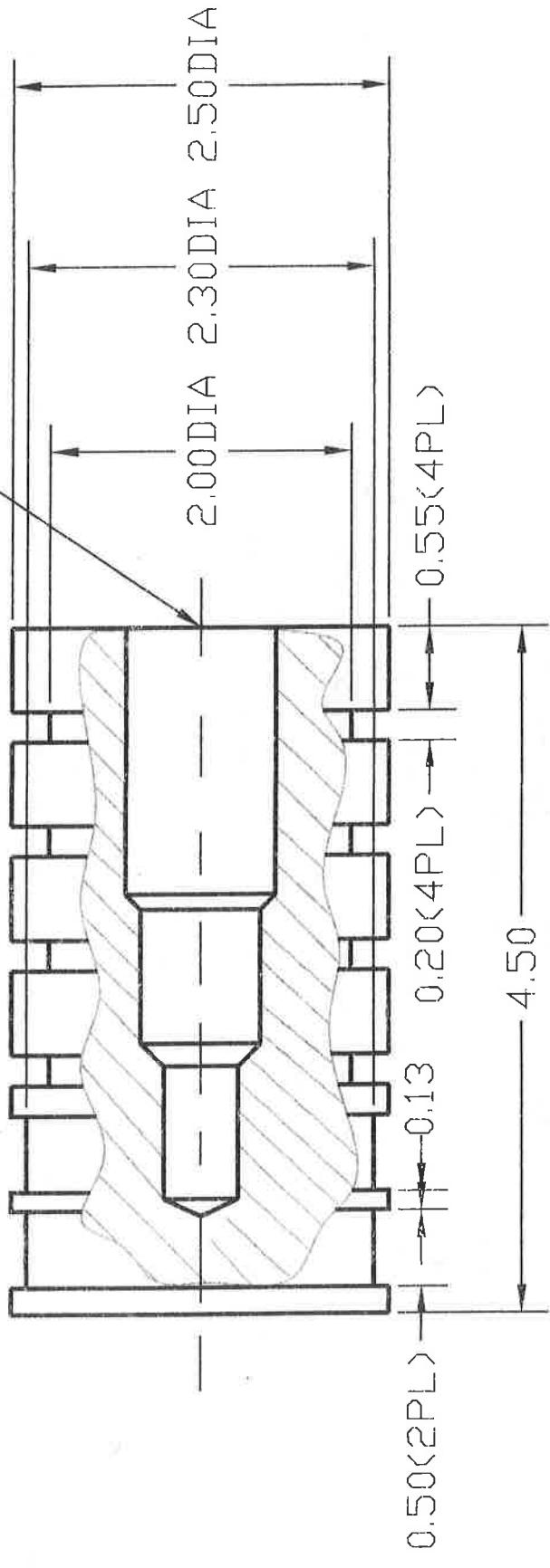


TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

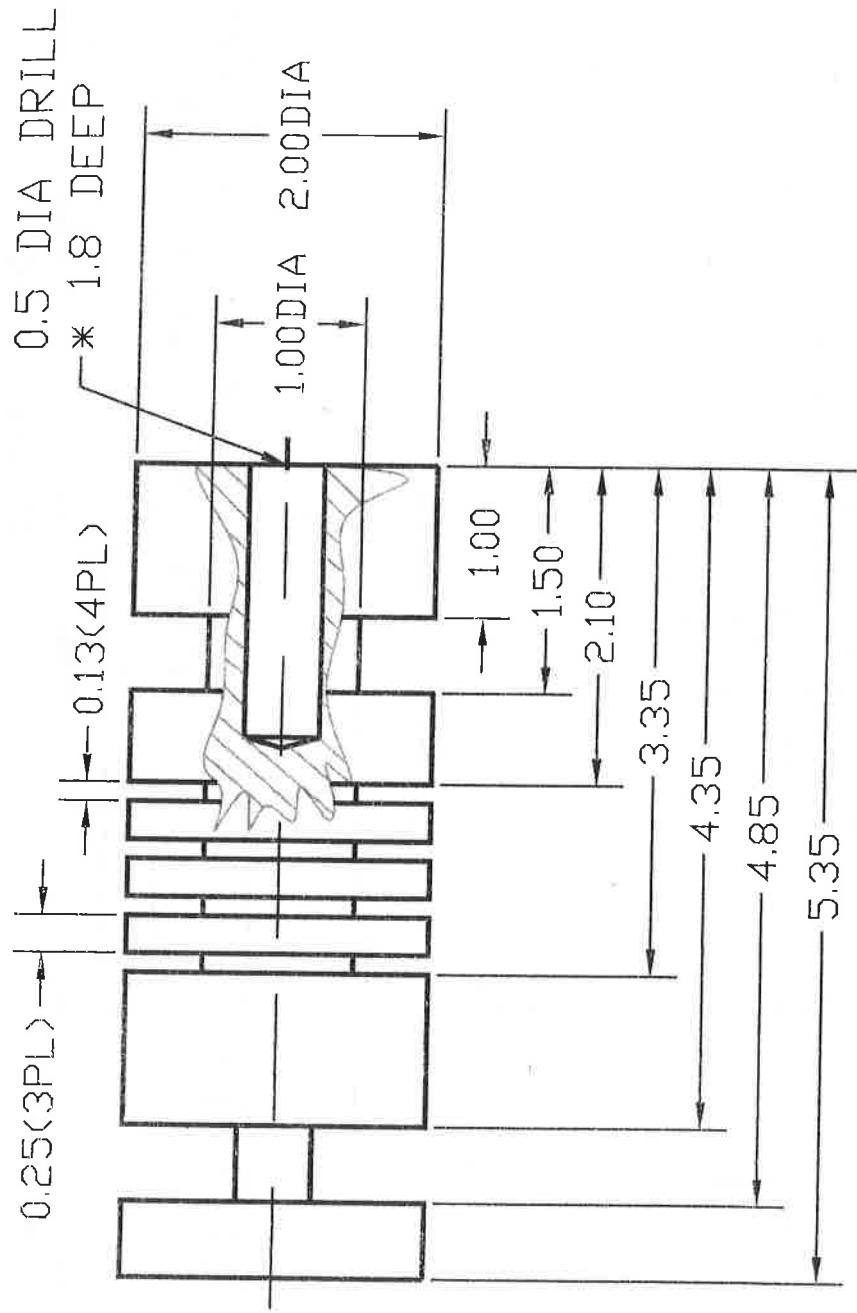
SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY		MT-491

DRILL 1.0 X 1.75 DEEP
 DRILL .75 X 2.6 DEEP
 DRILL .5 X 3.5 DEEP



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TECHNOLOGY AND DESIGN DRAFTING**

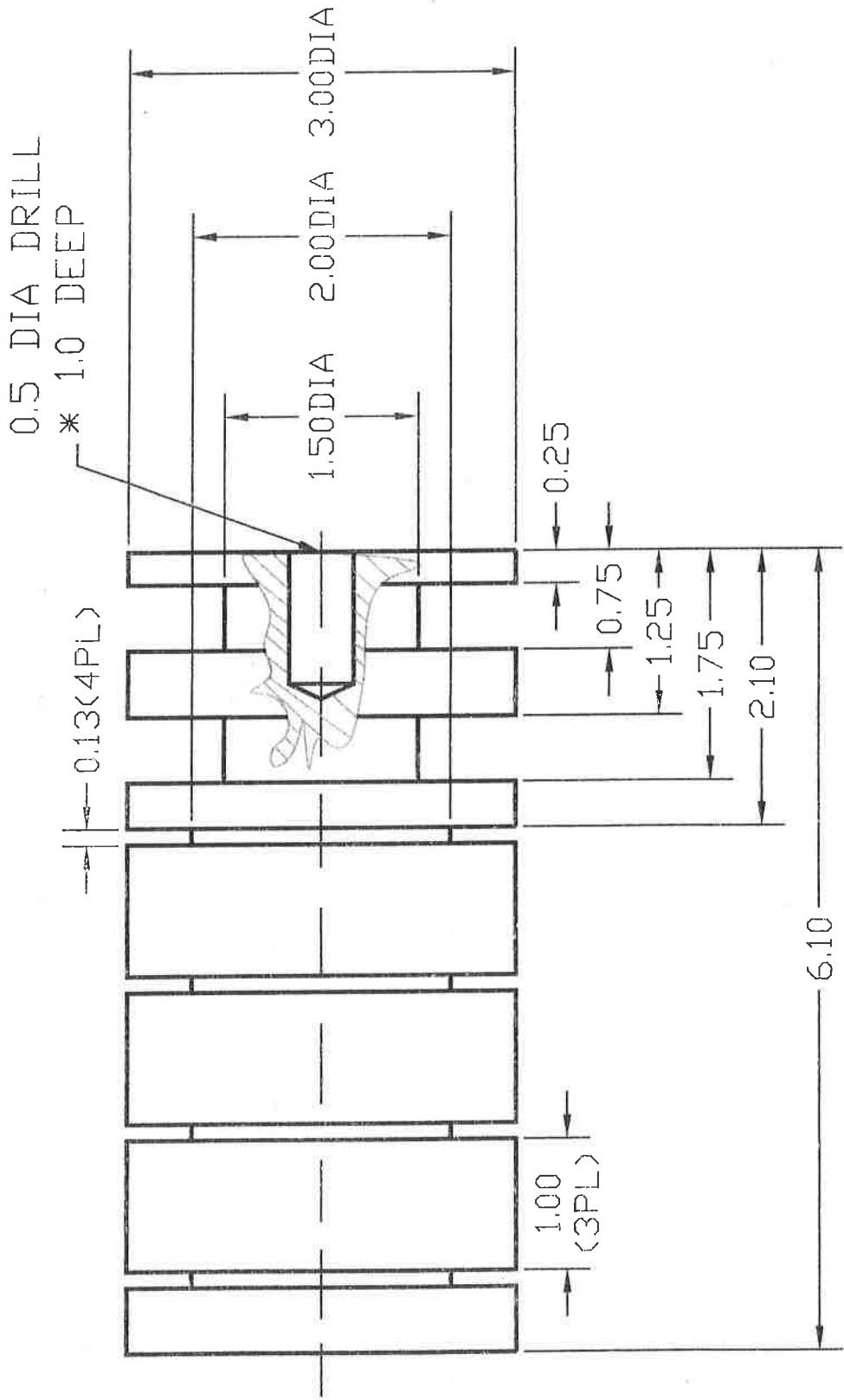
TOLERANCE UNLESS OTHERWISE SPECIFIED	SCALE	NONE	STATION No	DRAWN BY
1 PLACE DECIMAL ± 0.1	DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
1 PLACE DECIMAL ± 0.02	PART	CLASS EXERCISE		
1 PLACE DECIMAL ± 0.005	MATERIAL	No PER ASSEMBLY		MT-491
ANGULAR $\pm 0.5^\circ$				



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY		MT-491

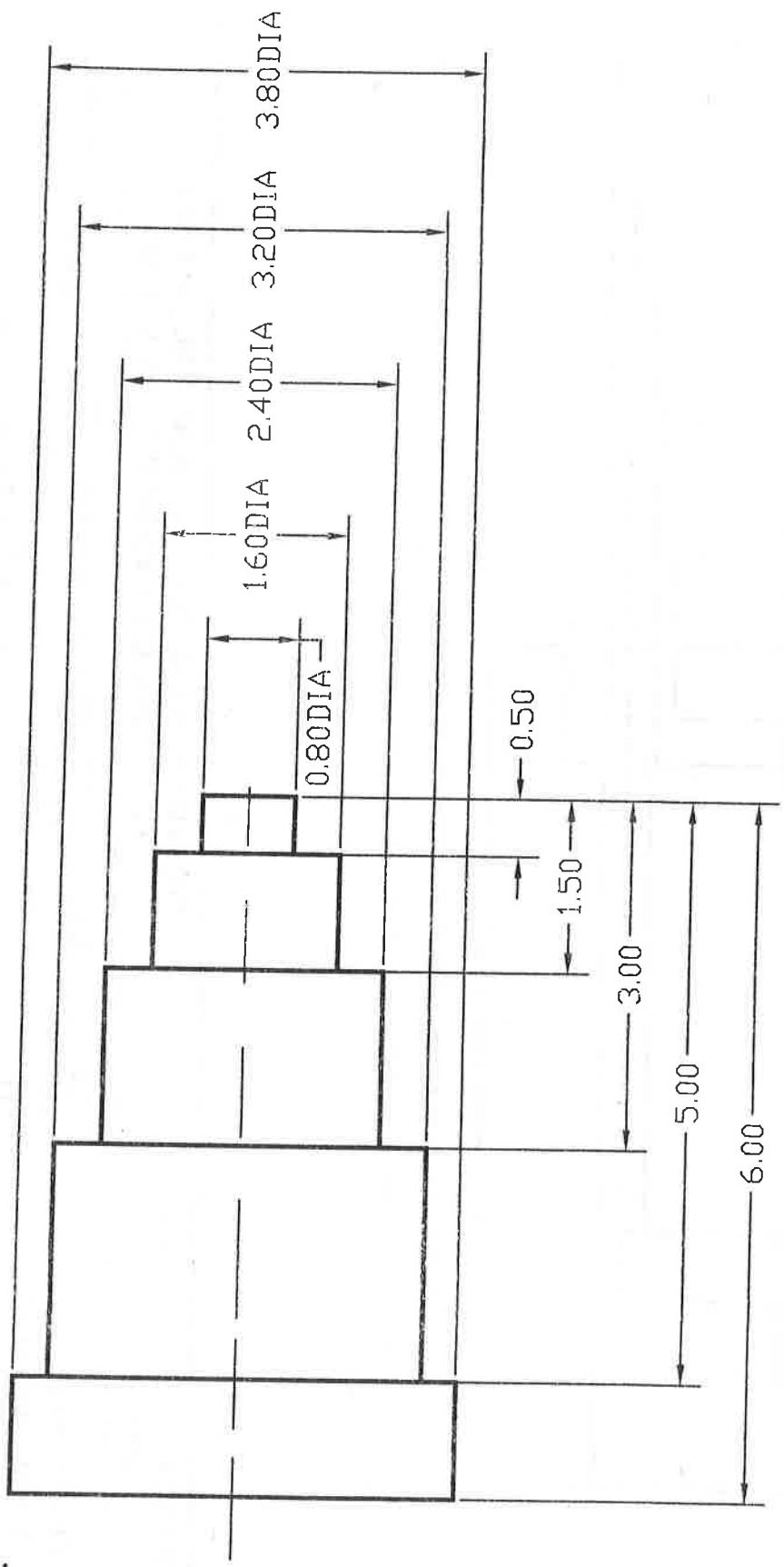


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION NO ELAPSED TIME	DRAWN BY
DATE			PROF. GOLDENBERG
PART	CLASS EXERCISE		MT-491
MATERIAL	No PER ASSEMBLY		

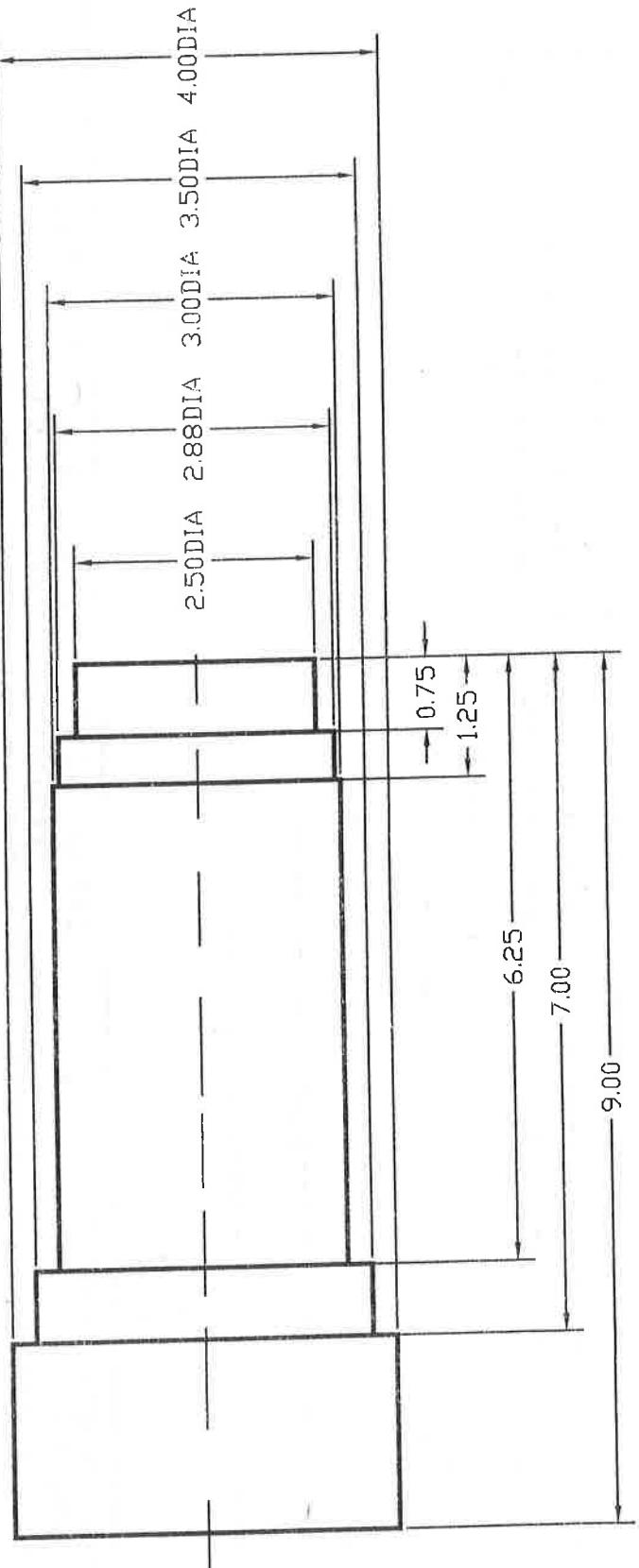


**TOLERANCE UNLESS OTHERWISE
SPECIFIED**

1 PLACE DECIMAL ± 0.1
 1 PLACE DECIMAL ± 0.02
 1 PLACE DECIMAL ± 0.005
 ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME		CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE	11
			WT-491

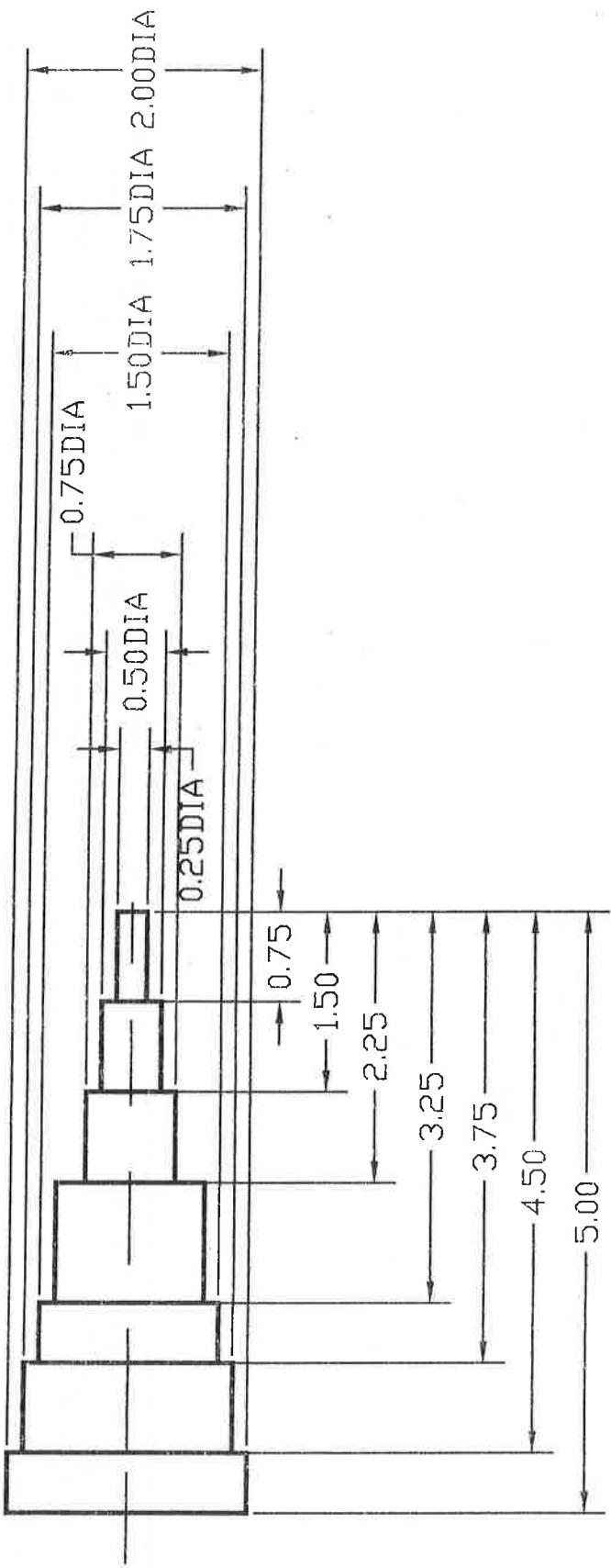


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

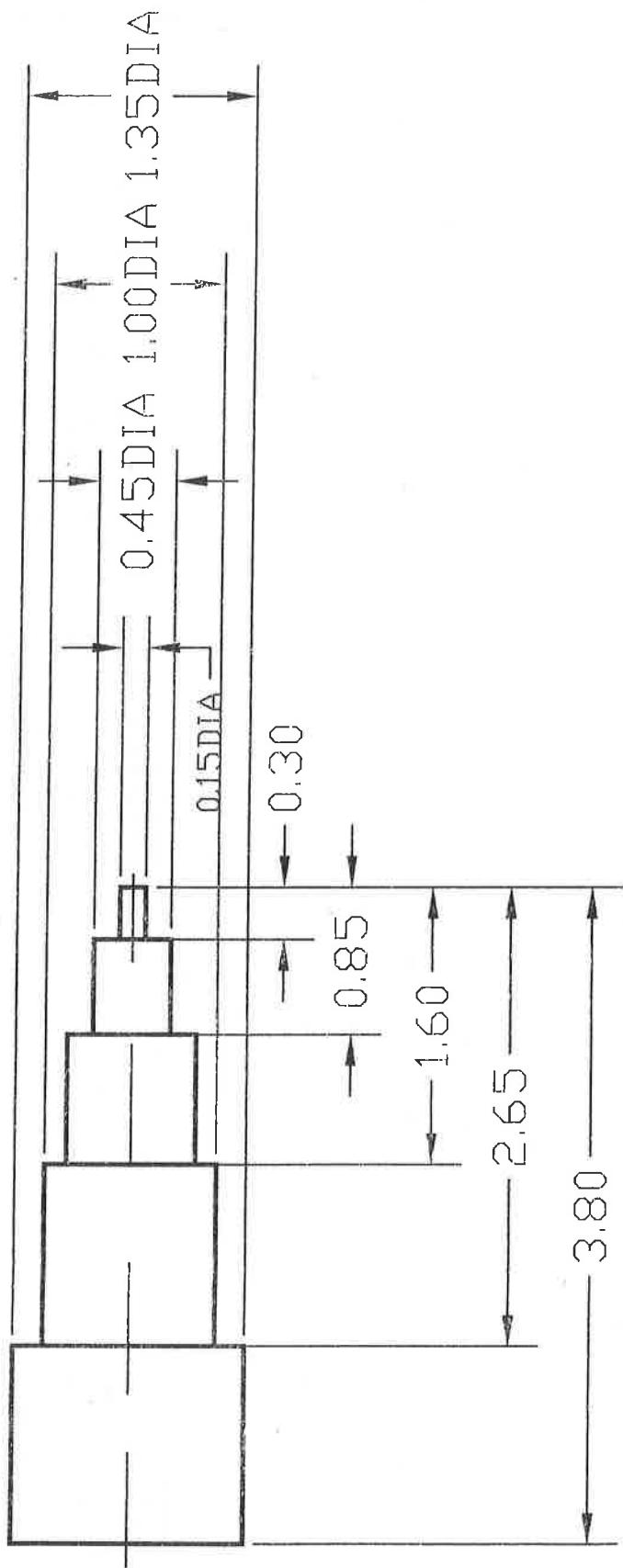
SCALE	NONE	STATION No	DRAWN BY
			PROF. GOLDENBERG
PART	CLASS EXERCISE 12		
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART	PROF. GOLDENBERG		
CLASS EXERCISE 13			
MATERIAL	No PER ASSEMBLY	No PER ASSEMBLY	MT-491

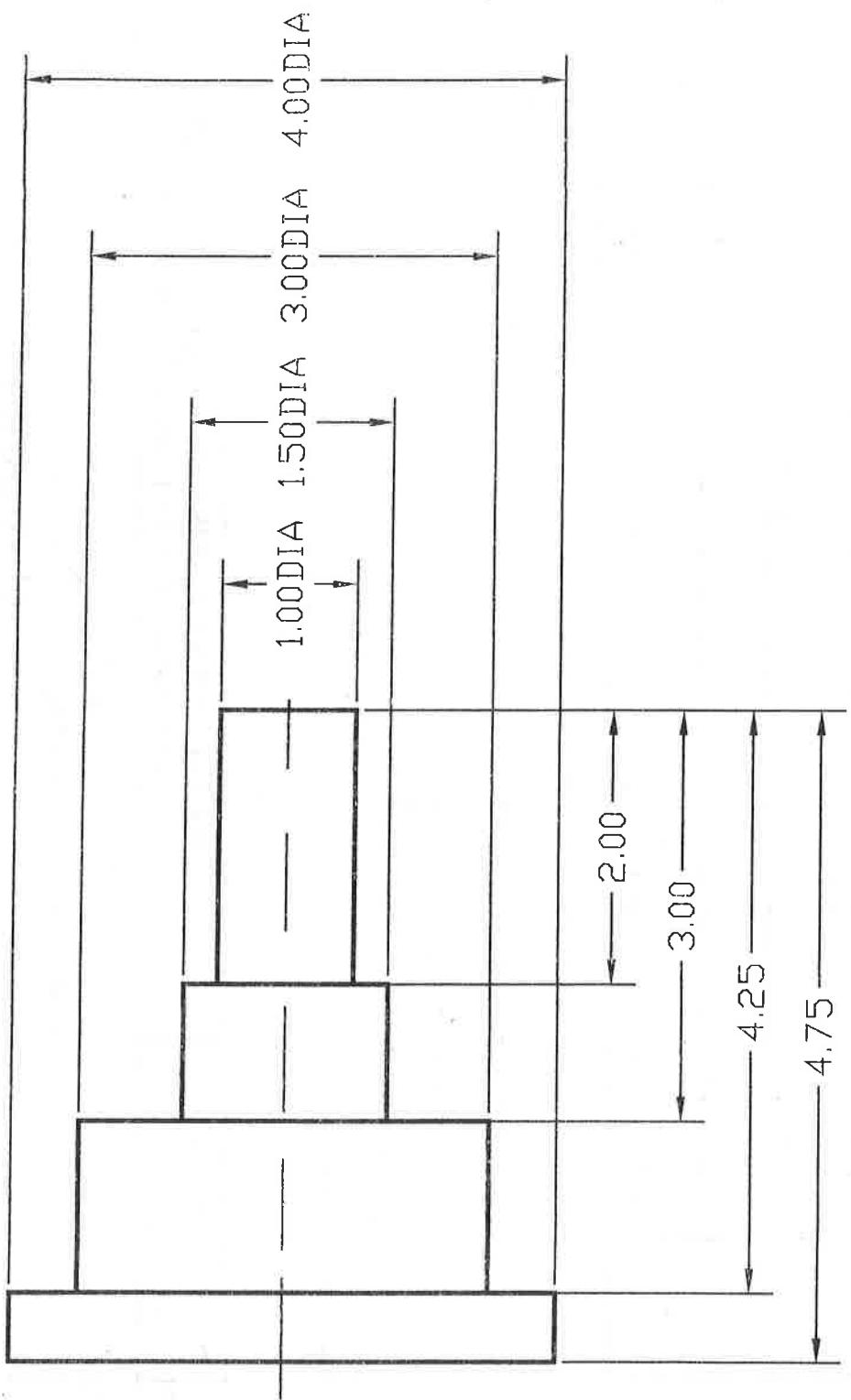


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
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 ANGULAR $\pm 0^{\circ}$

DEPARTMENT OF MECHANICAL ENGINEERING TECHNOLOGY AND DESIGN DRAFTING

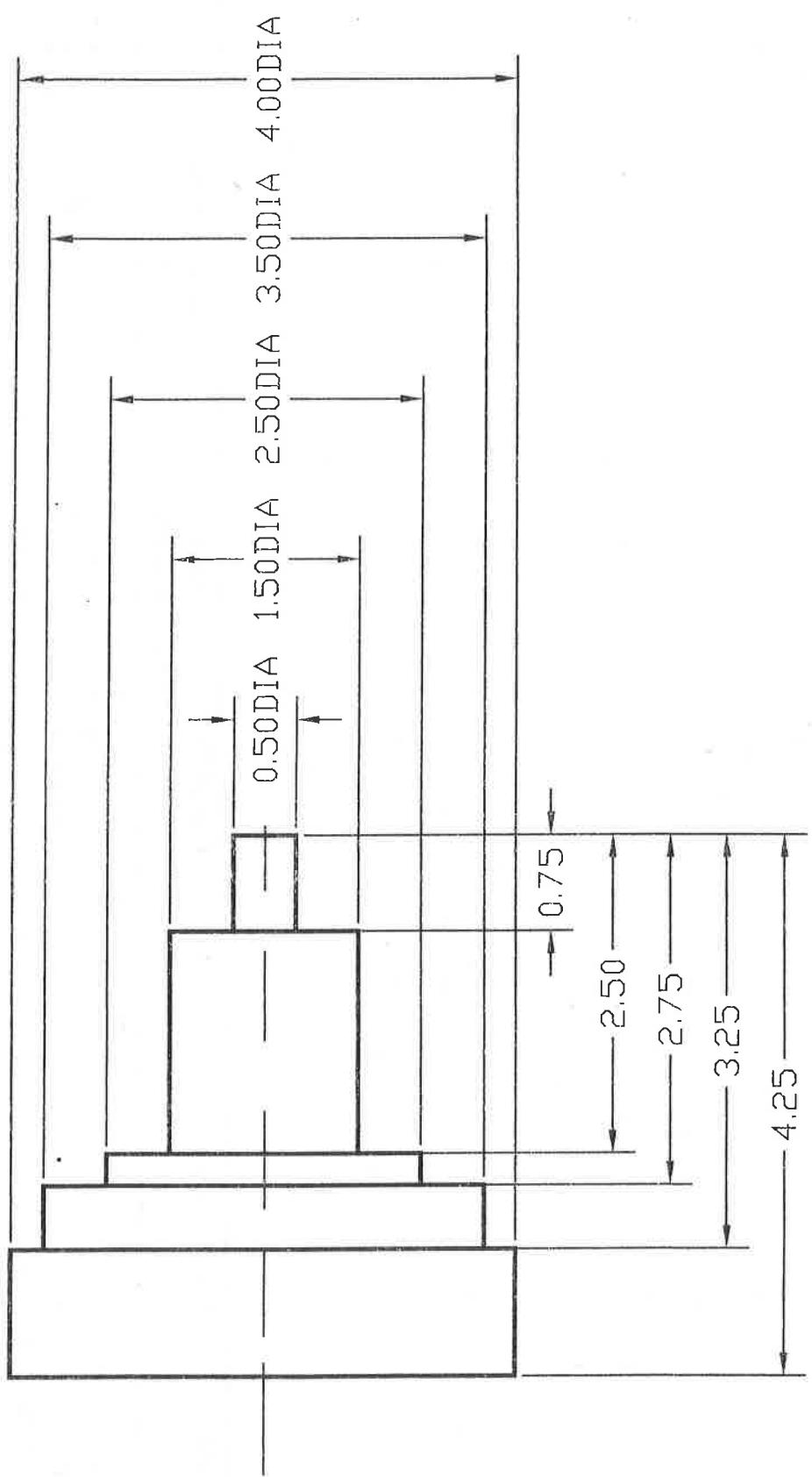
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1 PLACE DECIMAL	± 0.02	DATE		ELAPSED	PROF. GOLDENBERG
PART				TIME	CHECKED BY
					CLASS EXERCISE 14
MATERIAL				No PER ASSEMBLY	MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

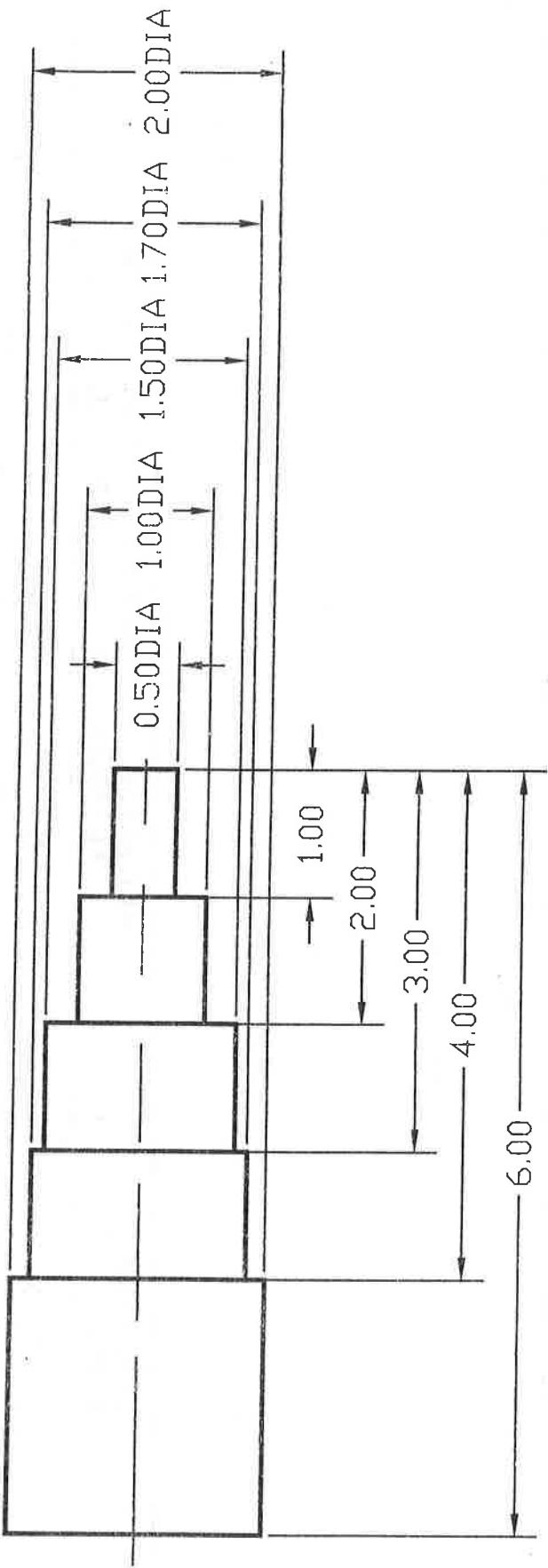
SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED	TIME	CHECKED BY
PART	PROF. GOLDENBERG		
1 PLACE DECIMAL ±0.1	CLASS EXERCISE 15		
1 PLACE DECIMAL ±0.02	MT-491		
1 PLACE DECIMAL ±0.005			
ANGULAR ±0.5°			



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

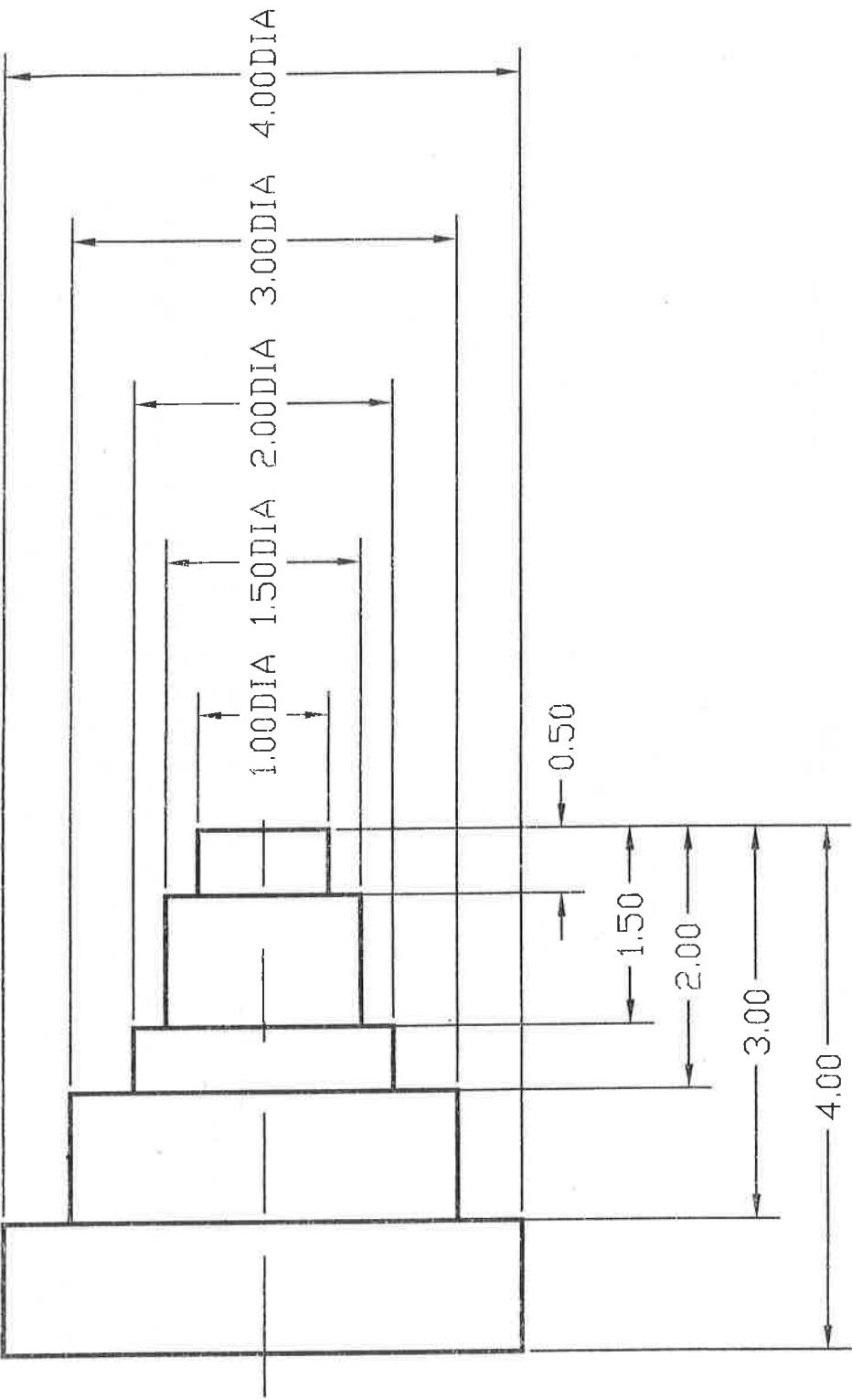
SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART	CLASS EXERCISE 16		PROF. GOLDBERG
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED	TIME	CHECKED BY
PART	PROF. GOLDENBERG		
CLASS EXERCISE 18			MT-491
MATERIAL	No PER ASSEMBLY		

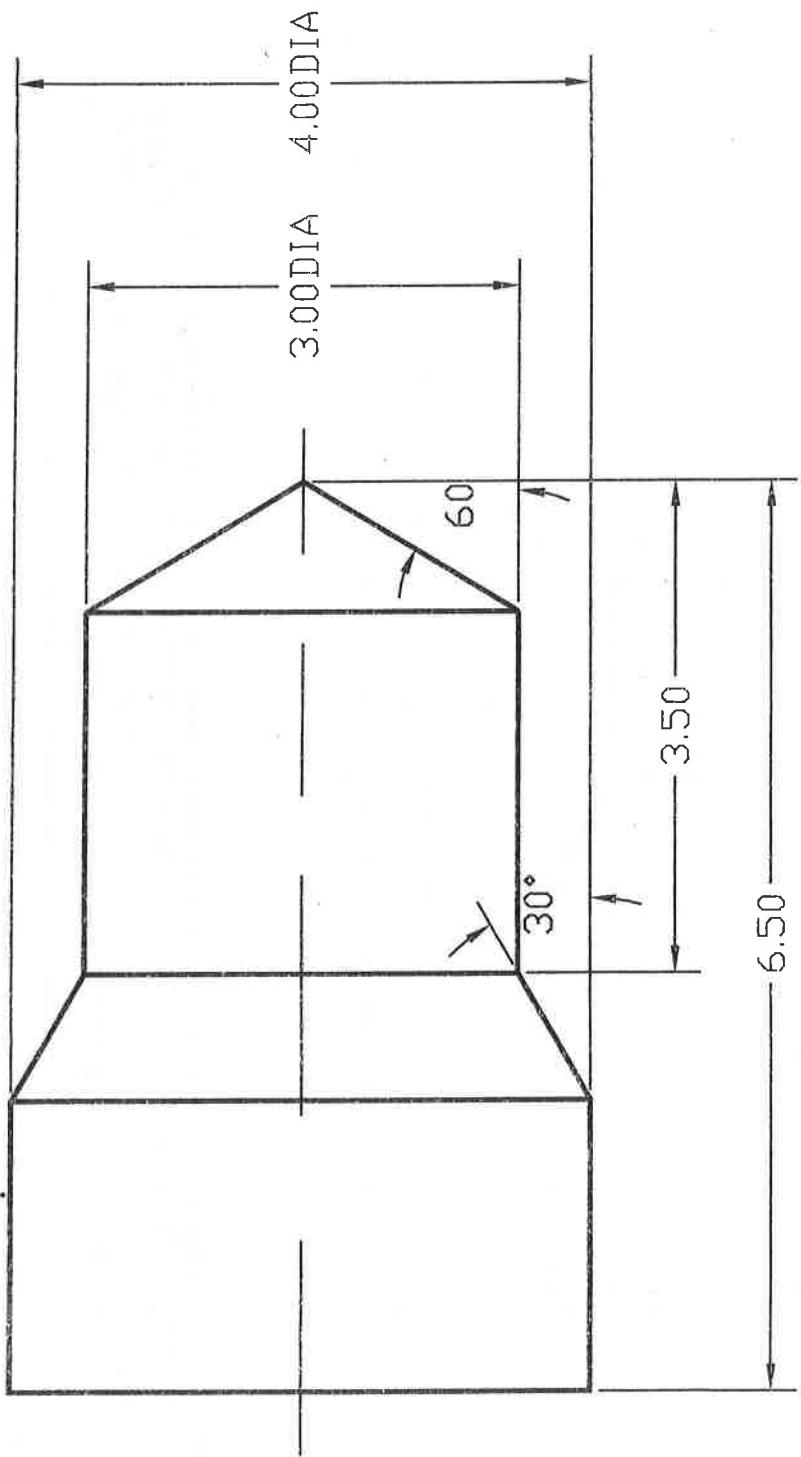


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY PROF. GOLDENBERG
DATE		CHECKED BY	
PART		CLASS EXERCISE 17	
MATERIAL	No PER ASSEMBLY		MT-491

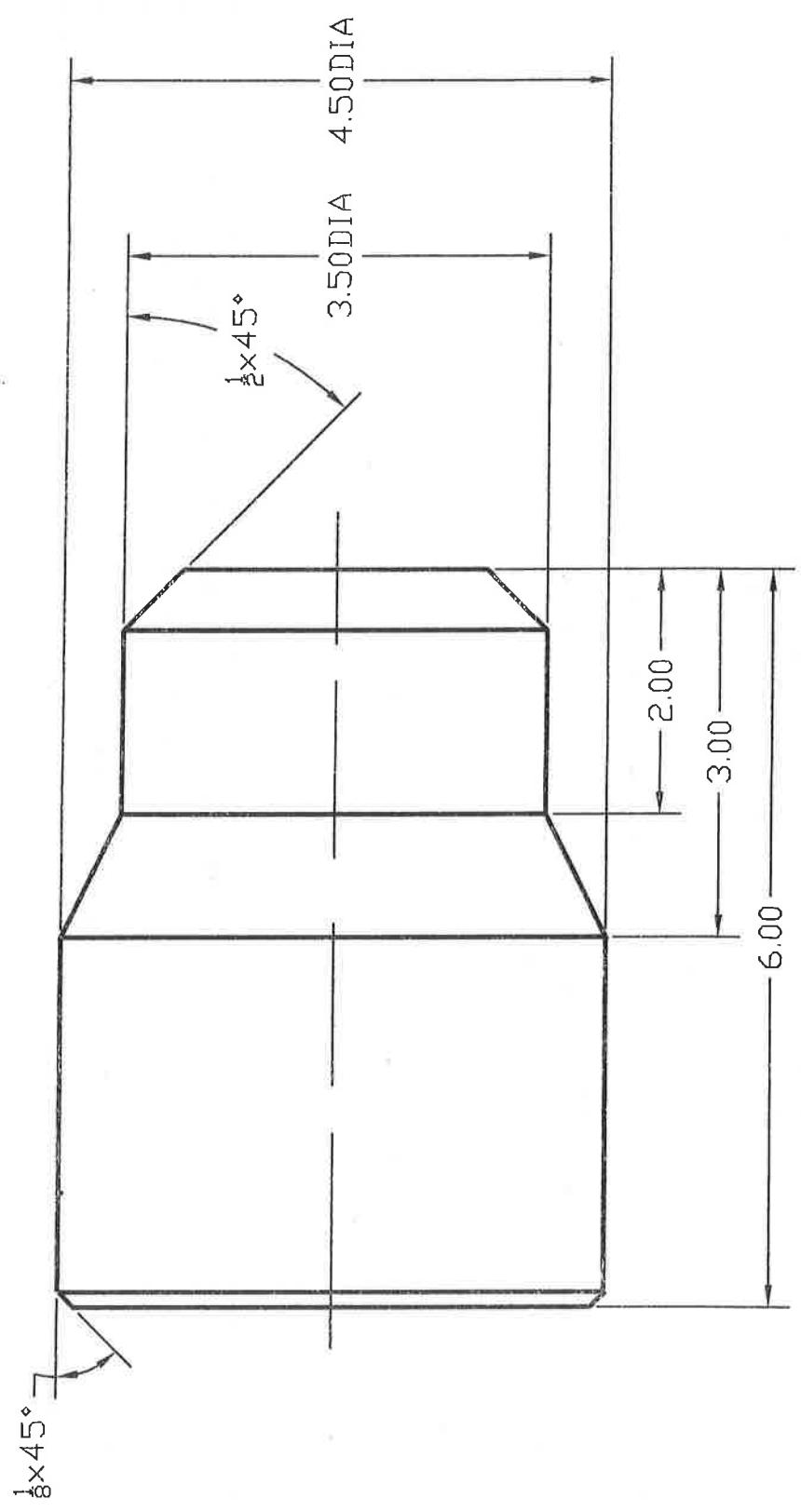


**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

**TOLERANCE UNLESS OTHERWISE
SPECIFIED**

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
 $\pm 0.5^\circ$
ANGULAR

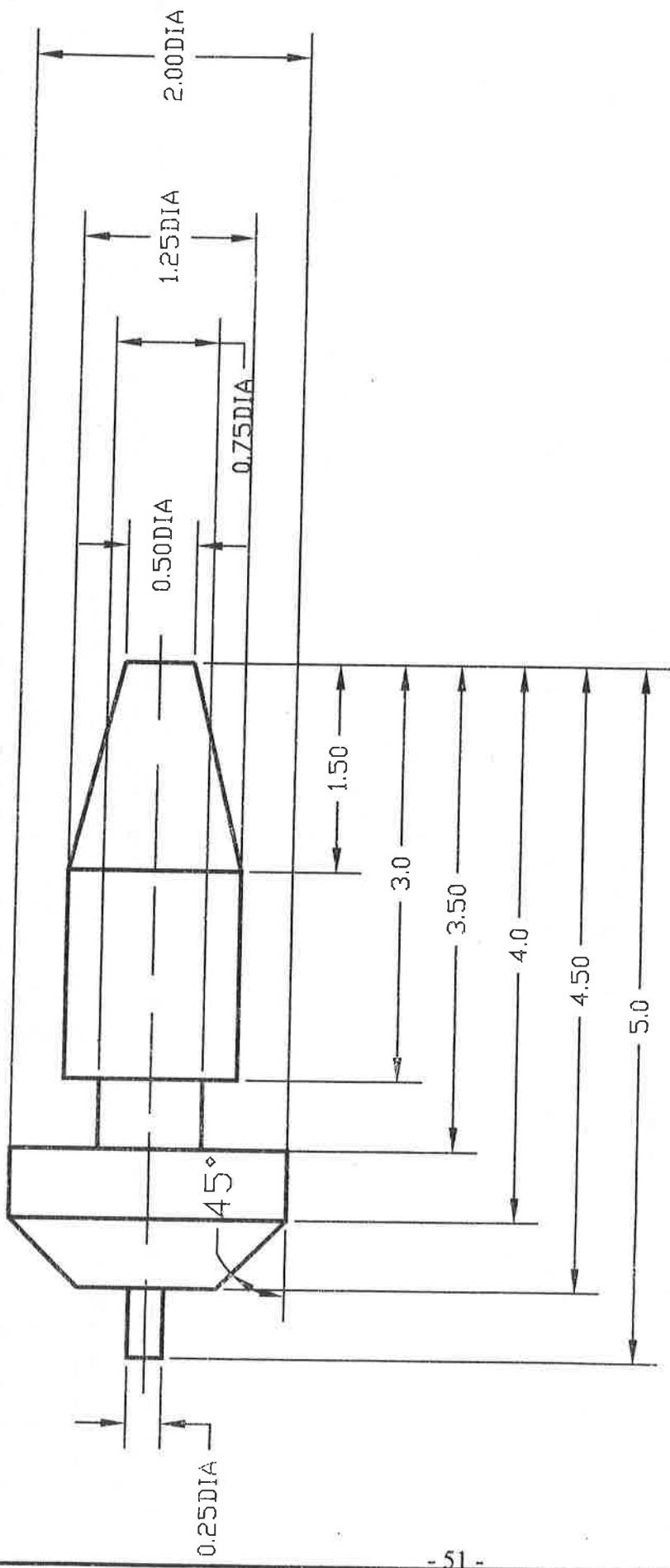
SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART	CLASS EXERCISE 3		
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION NO.	DRAWN BY
DATE	ELAPSED TIME		CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE 3	MT-491

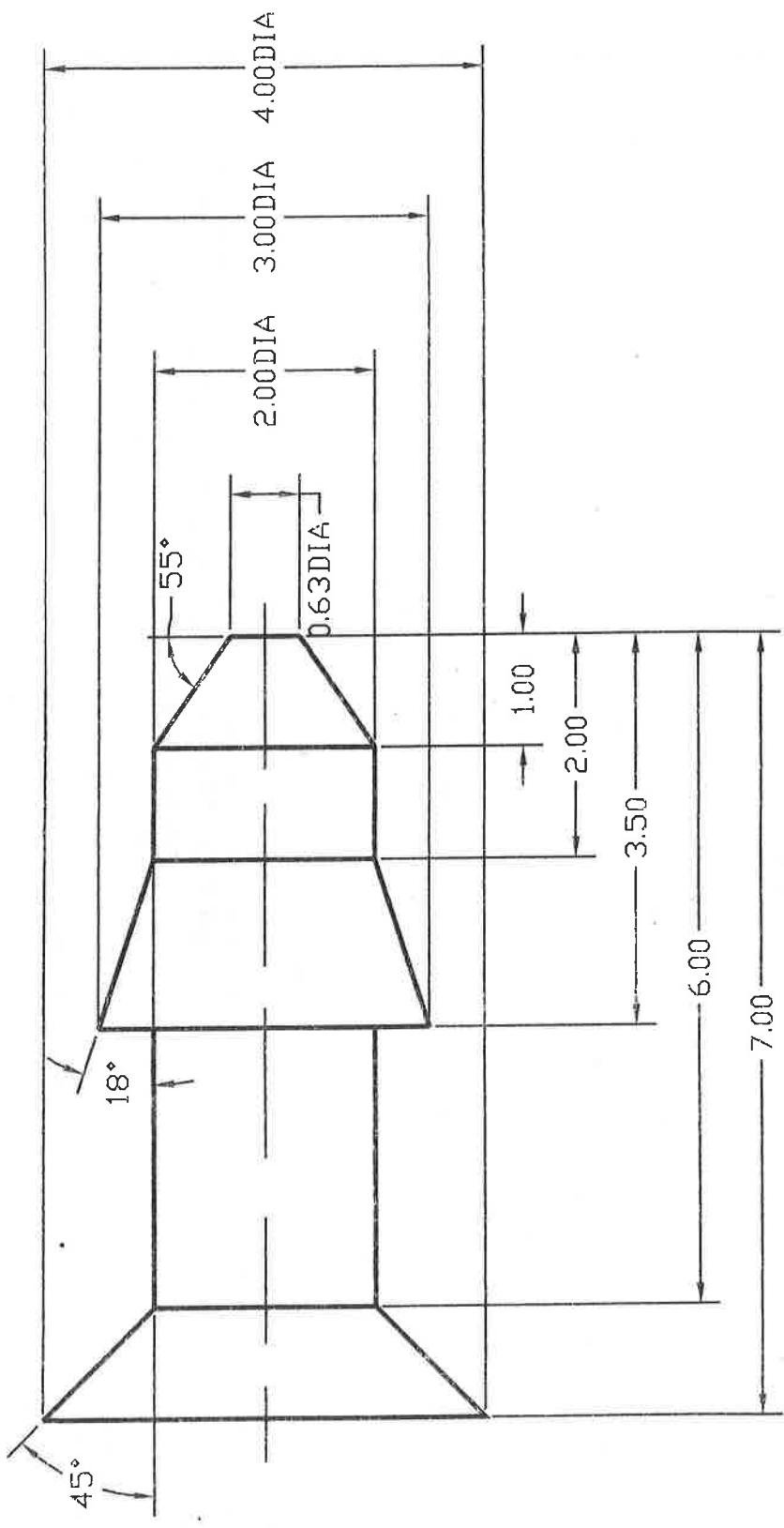


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY PROF. GOLDENBERG
DATE		CHECKED BY	
PART			CLASS EXERCISE 14
MATERIAL	No PER ASSEMBLY		MT-491

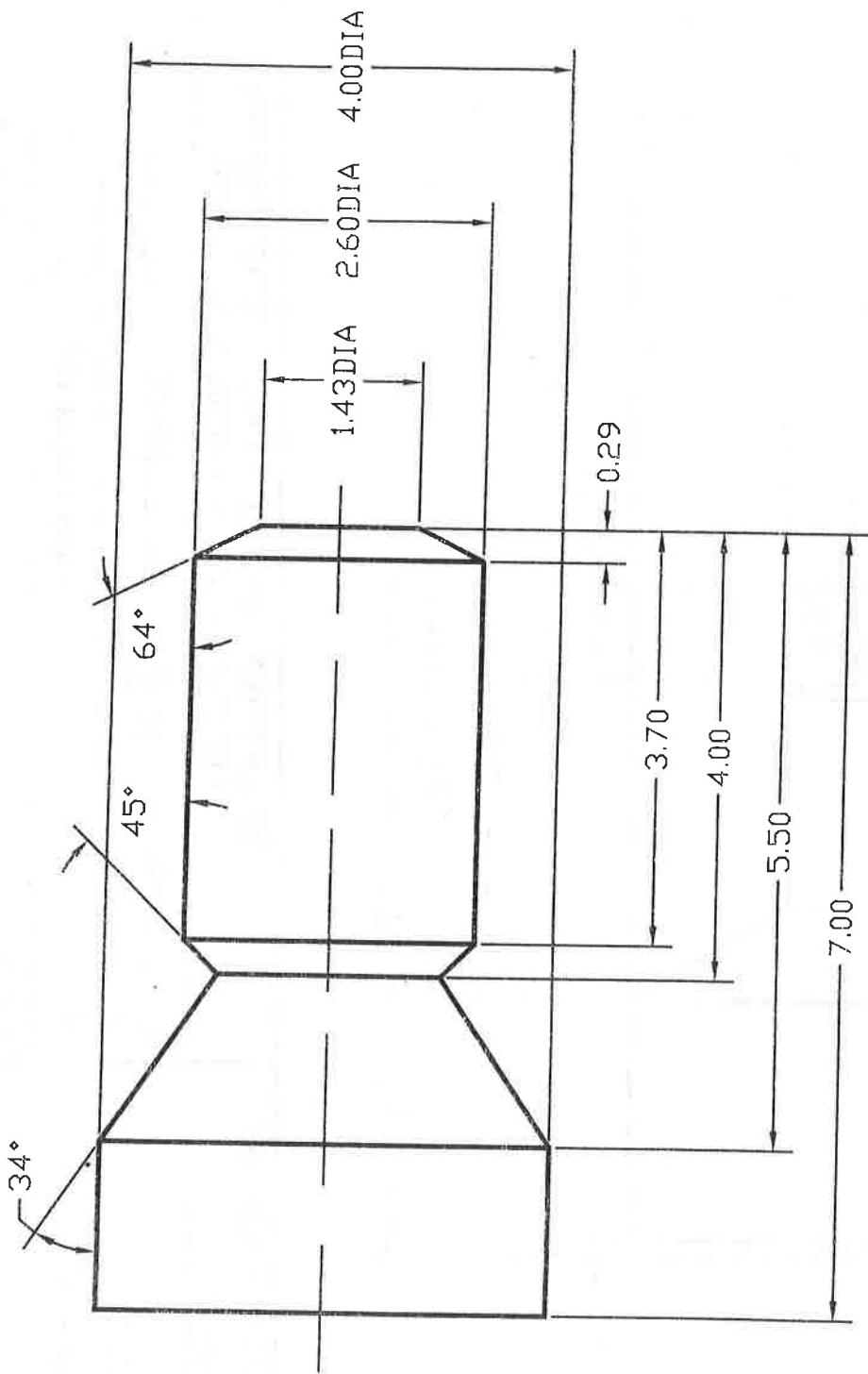


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY		CLASS EXERCISE 3
			MT-491

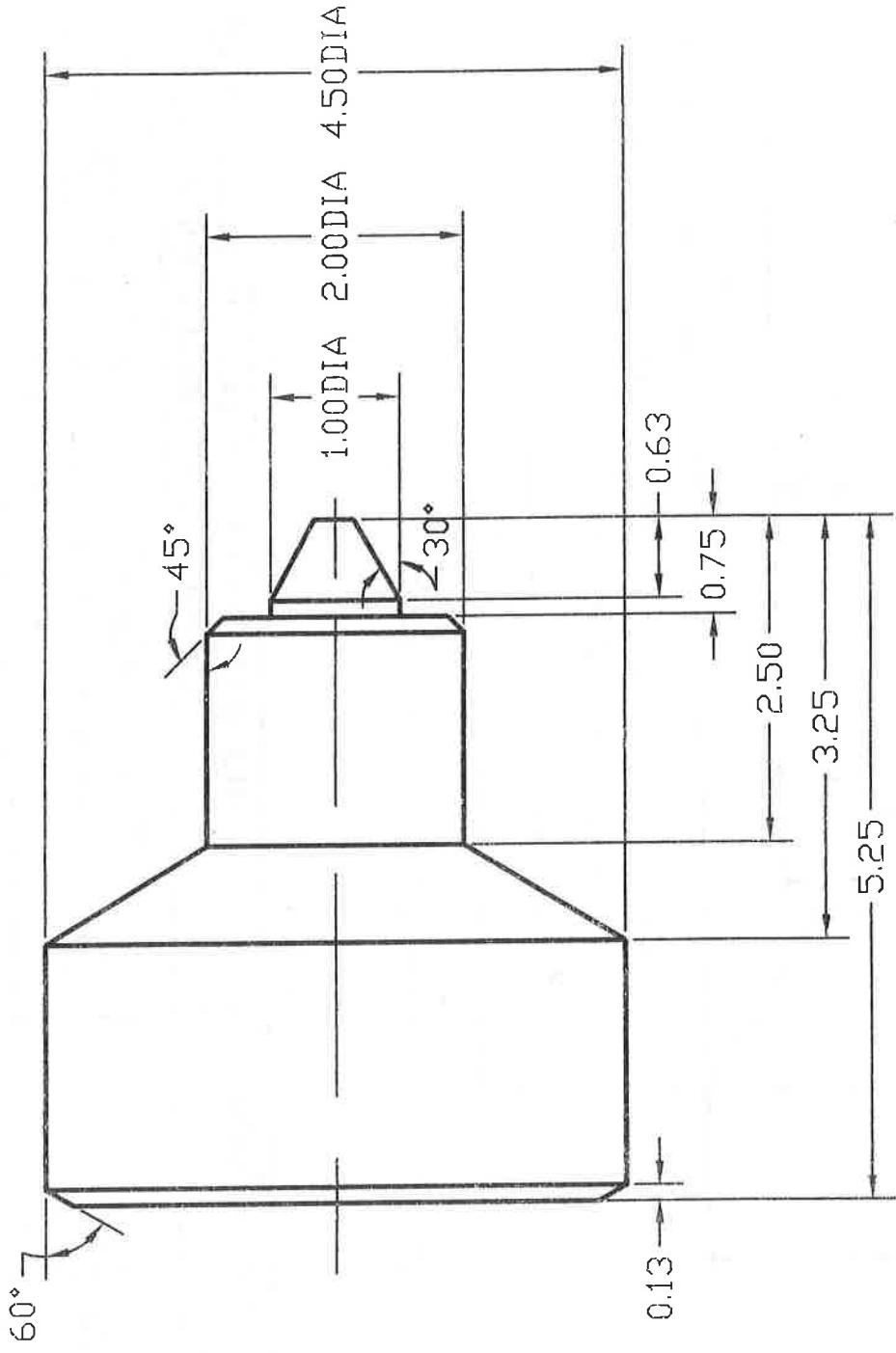


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE	3		
MATERIAL	No PER ASSEMBLY		MT-491

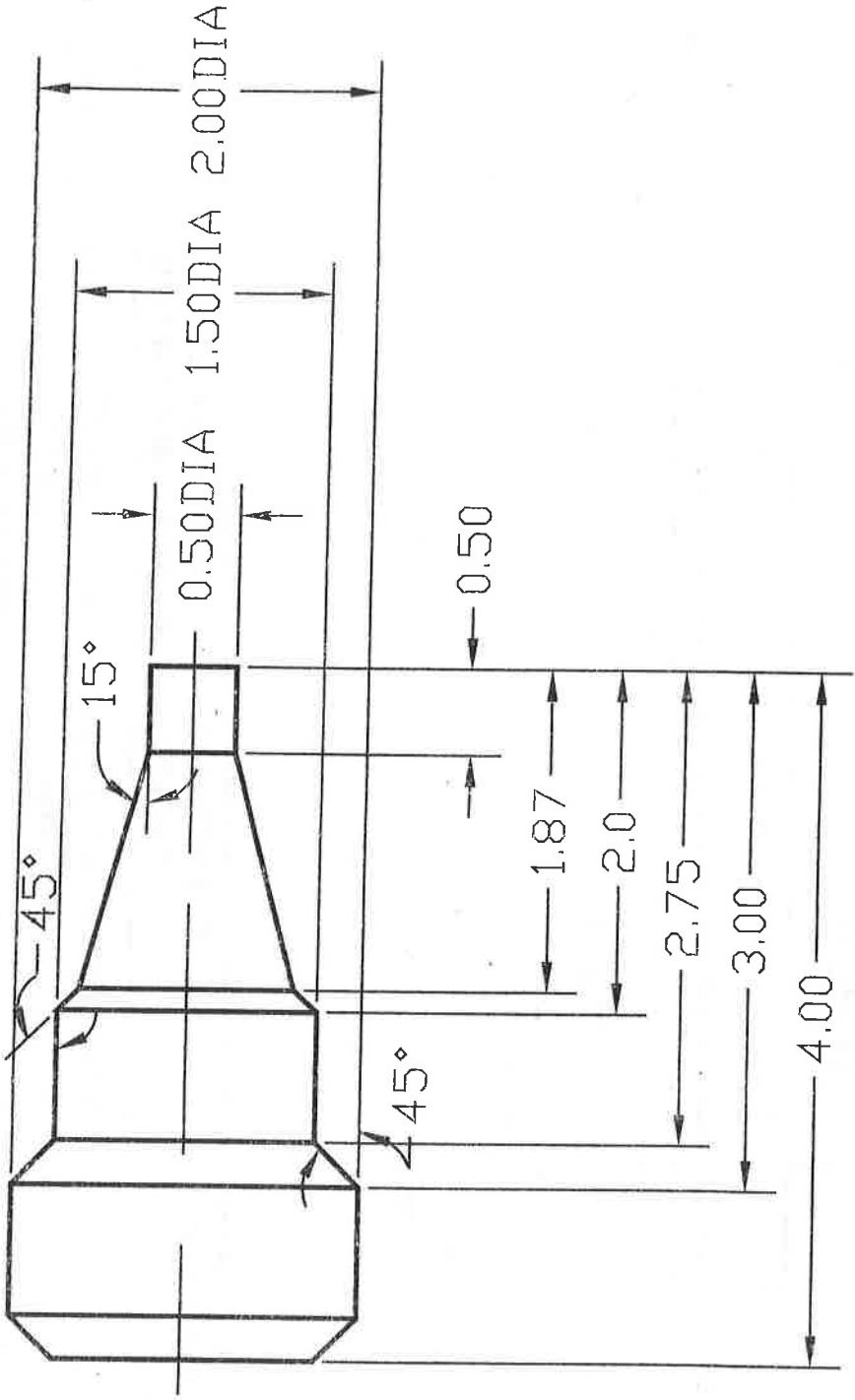


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART	CLASS EXERCISE 3		
MATERIAL	No PER ASSEMBLY	MT-491	

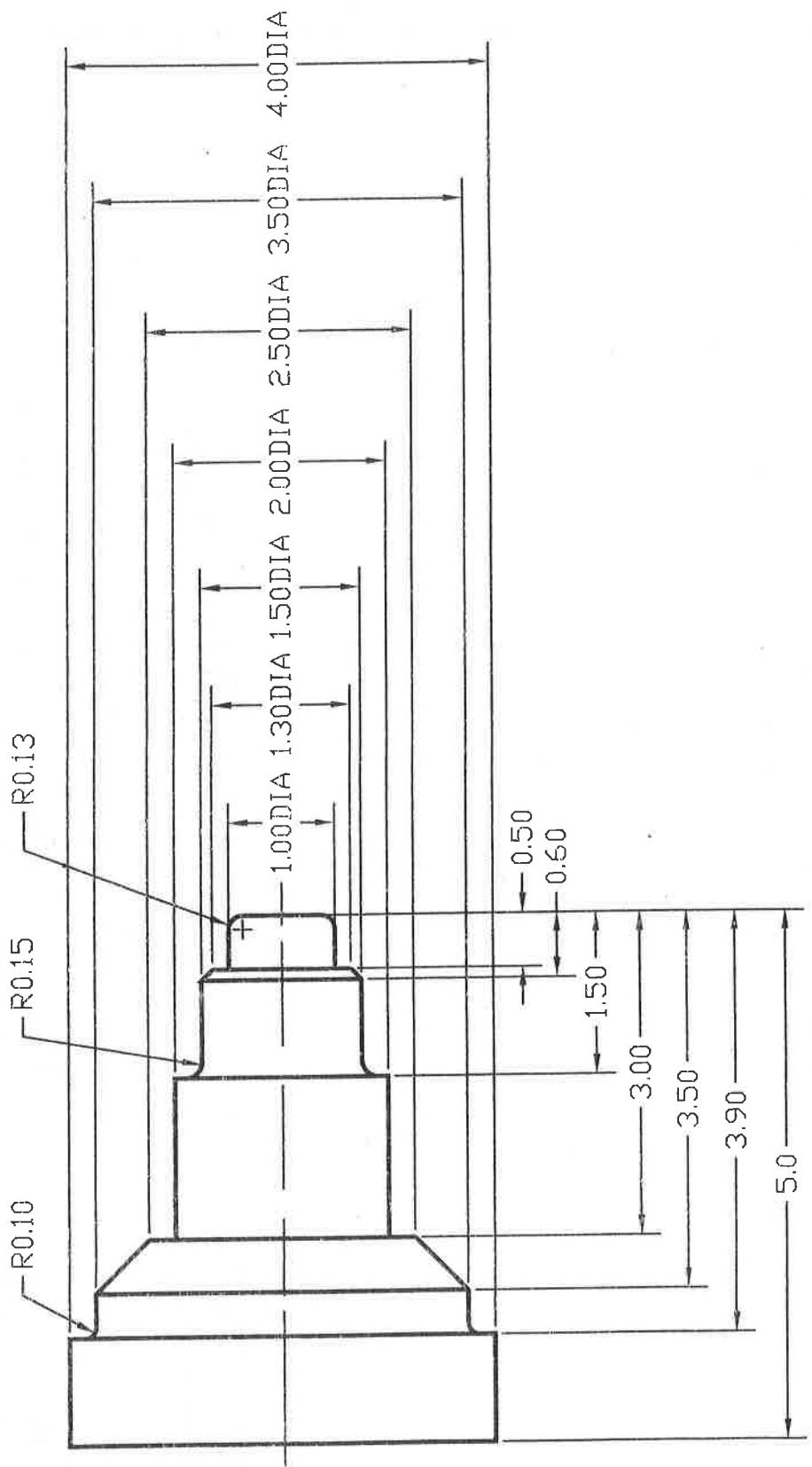


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE	3		
MATERIAL	No PER ASSEMBLY		MT-491

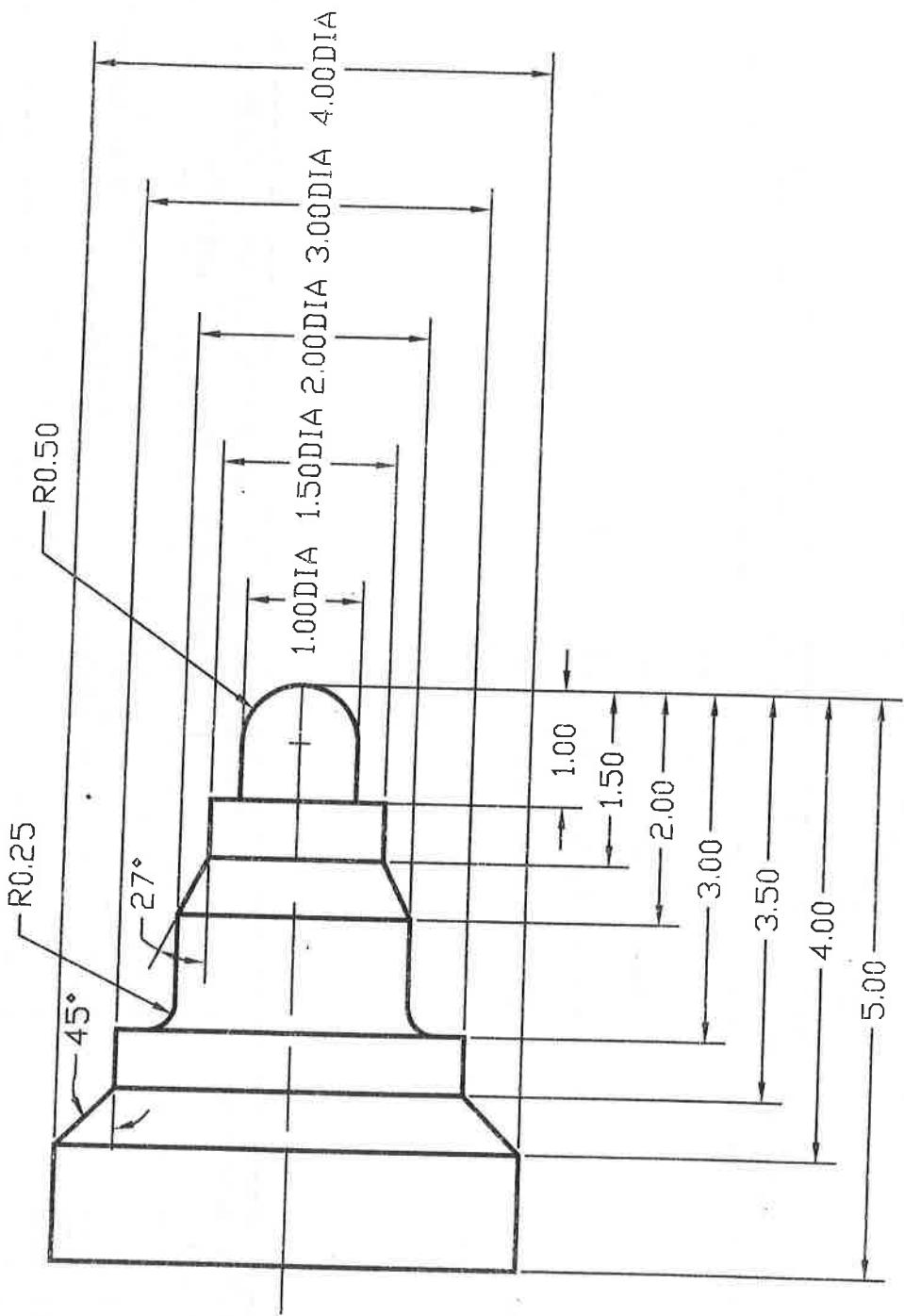


**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

**TOLERANCE UNLESS OTHERWISE
SPECIFIED**

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
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ANGULAR $\pm 0.5^\circ$

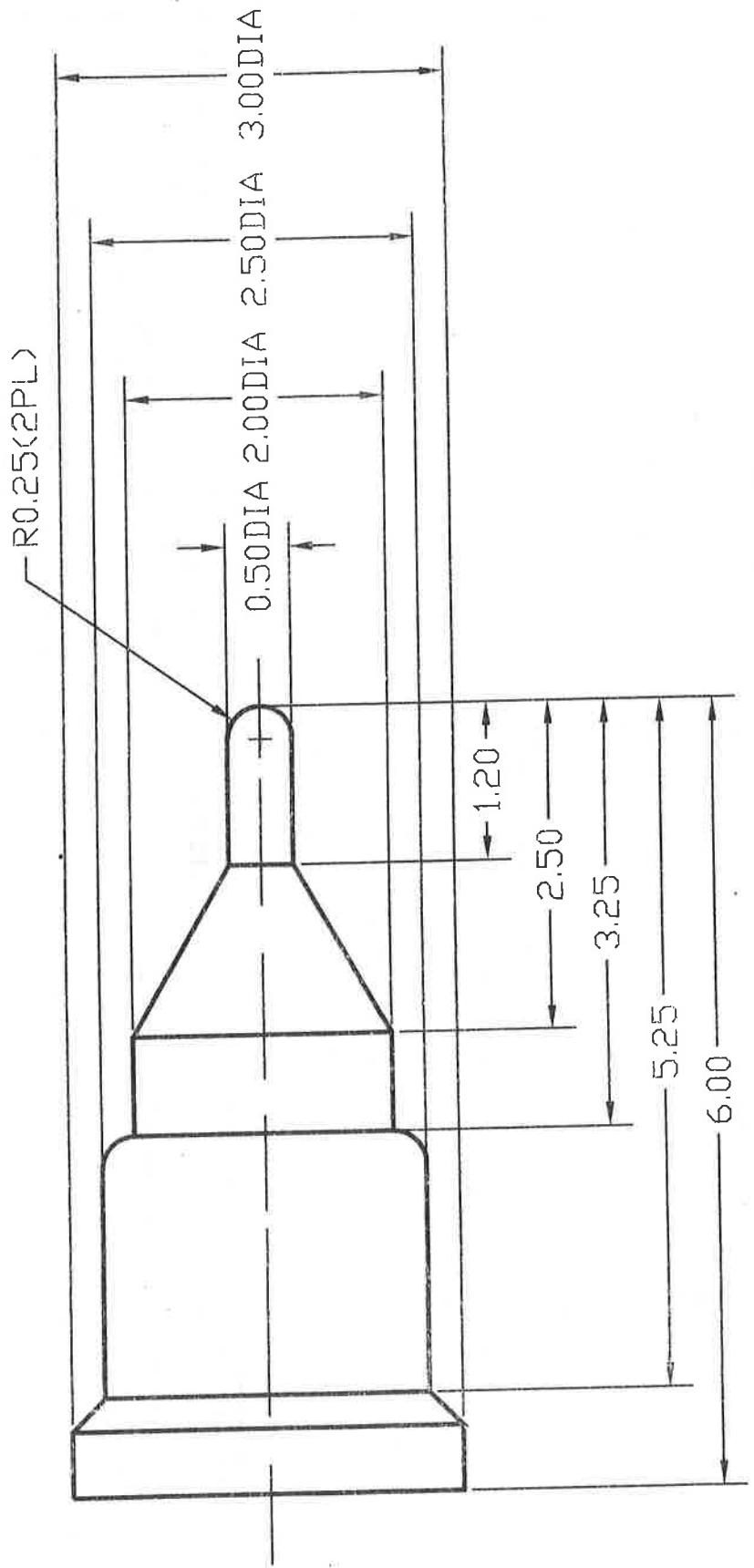
SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED	TIME	CHECKED BY
PART	PROF. GOLDENBERG		
MATERIAL	No PER ASSEMBLY		CLASS EXERCISE
			MT-491

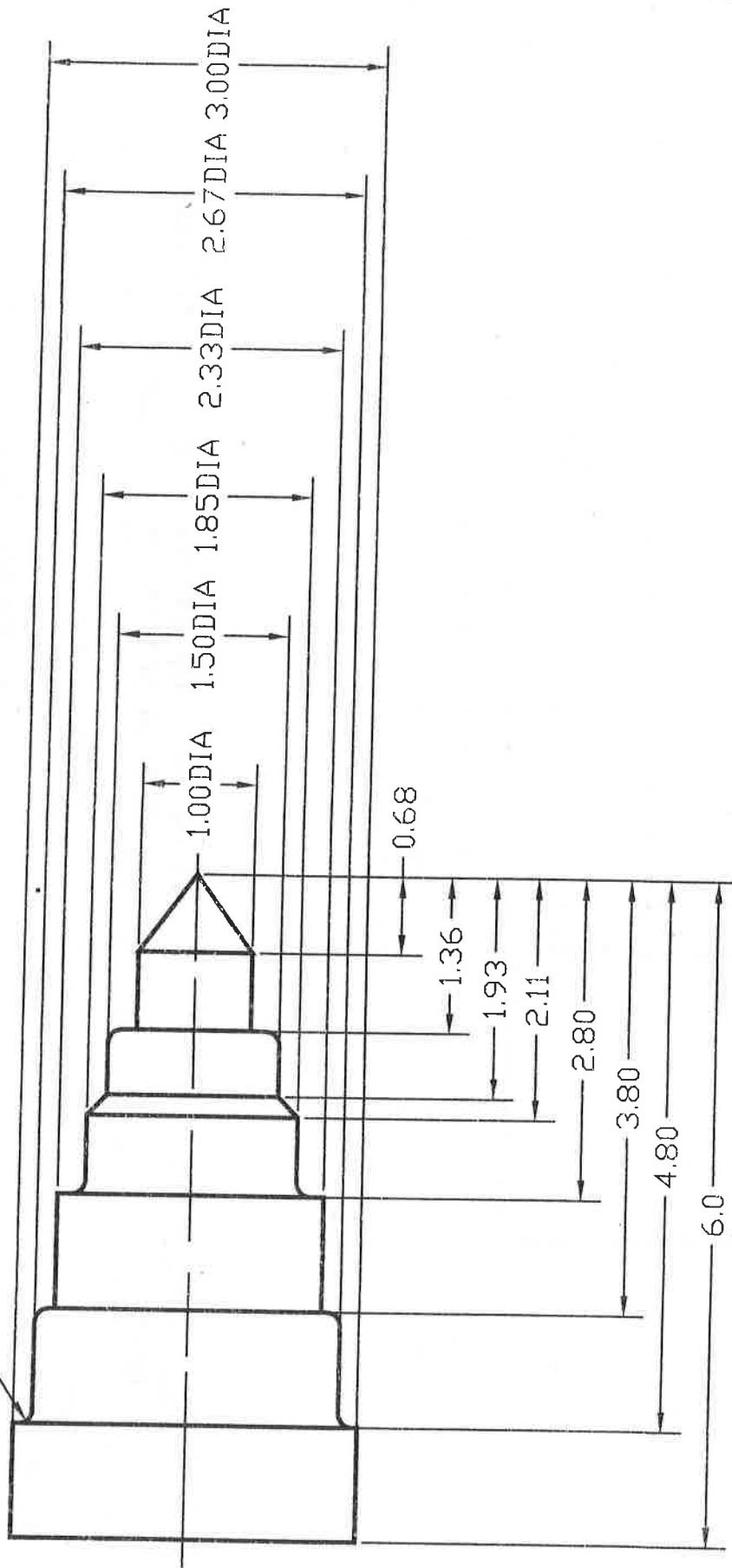


**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE
SPECIFIED

SCALE	NONE	STATION No	DRAWN BY
1 PLACE DECIMAL ± 0.1			
DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491

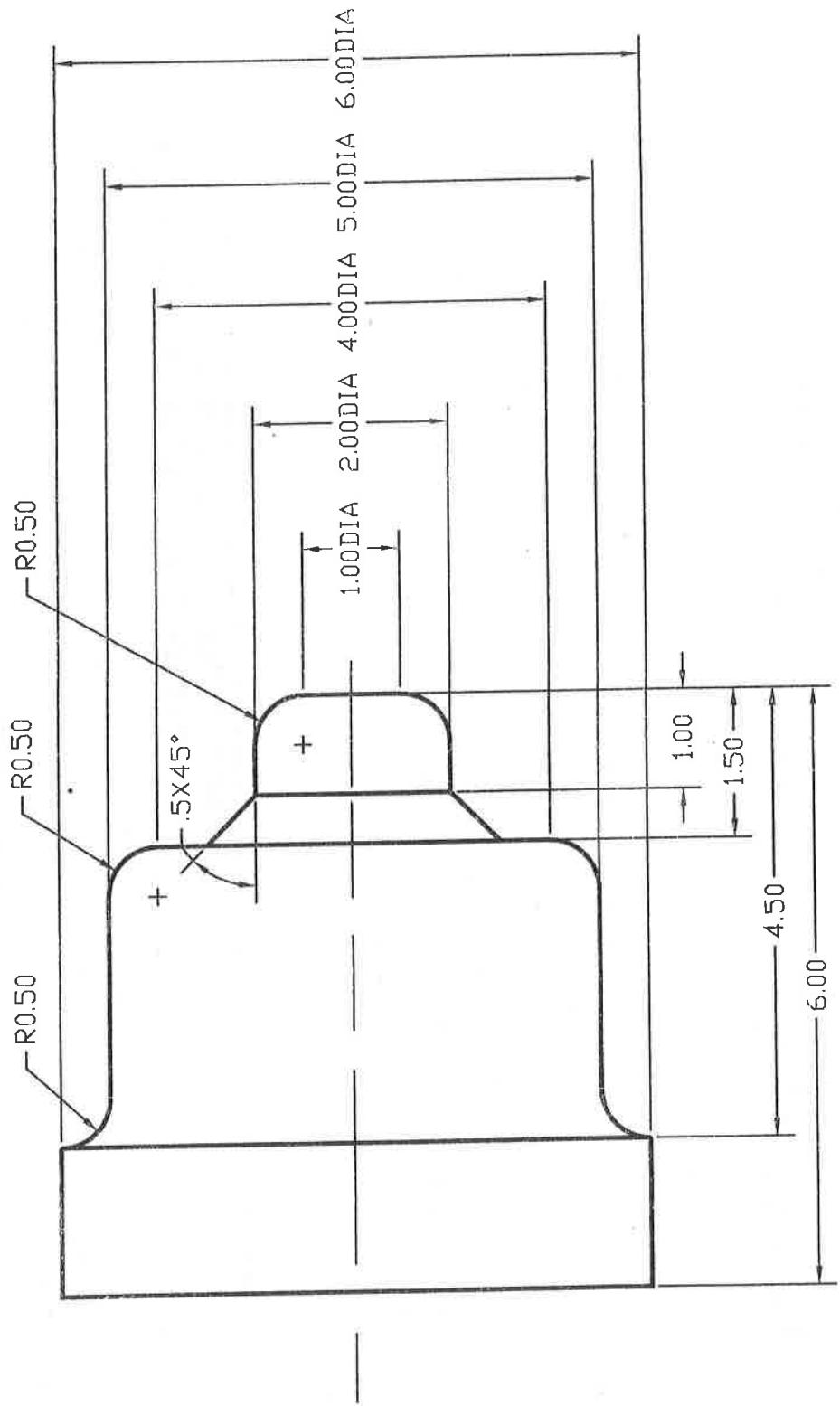
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TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED	TIME	CHECKED BY
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491

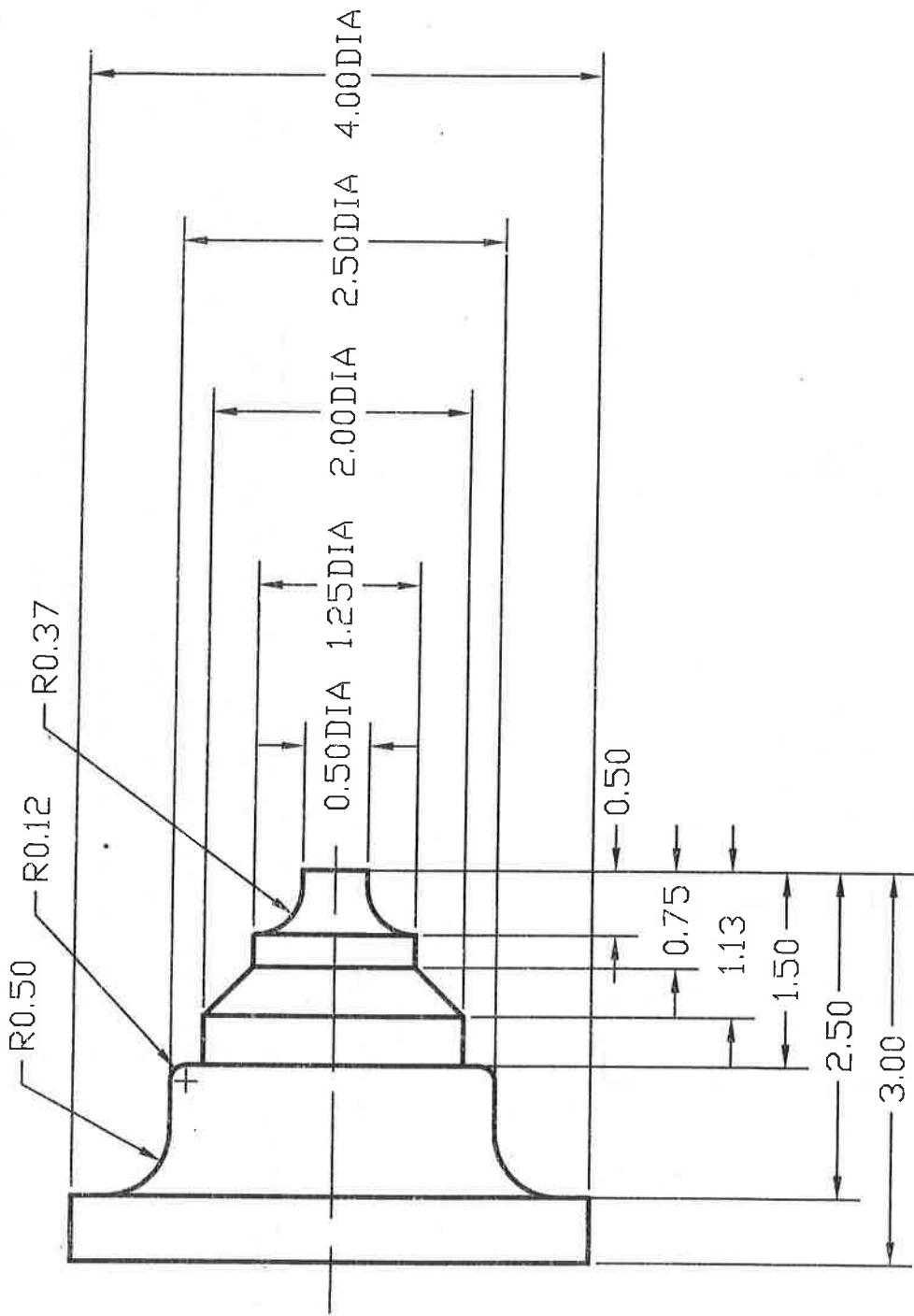


**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

**TOLERANCE UNLESS OTHERWISE
SPECIFIED**

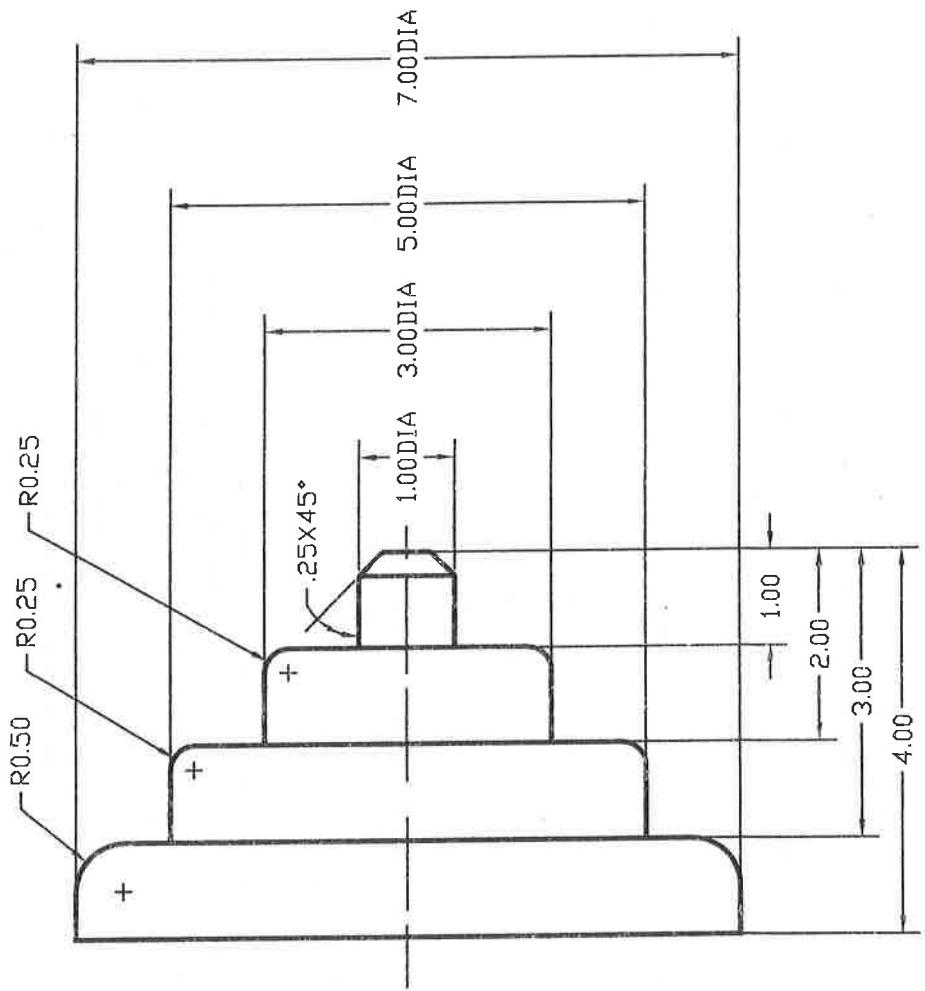
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1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491



**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE SPECIFIED	SCALE	NONE	STATION No	DRAWN BY
1 PLACE DECIMAL ± 0.1	DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
1 PLACE DECIMAL ± 0.02	PART	CLASS EXERCISE		
1 PLACE DECIMAL ± 0.005	MATERIAL	No PER ASSEMBLY		MT-491
ANGULAR $\pm 0.5^\circ$				

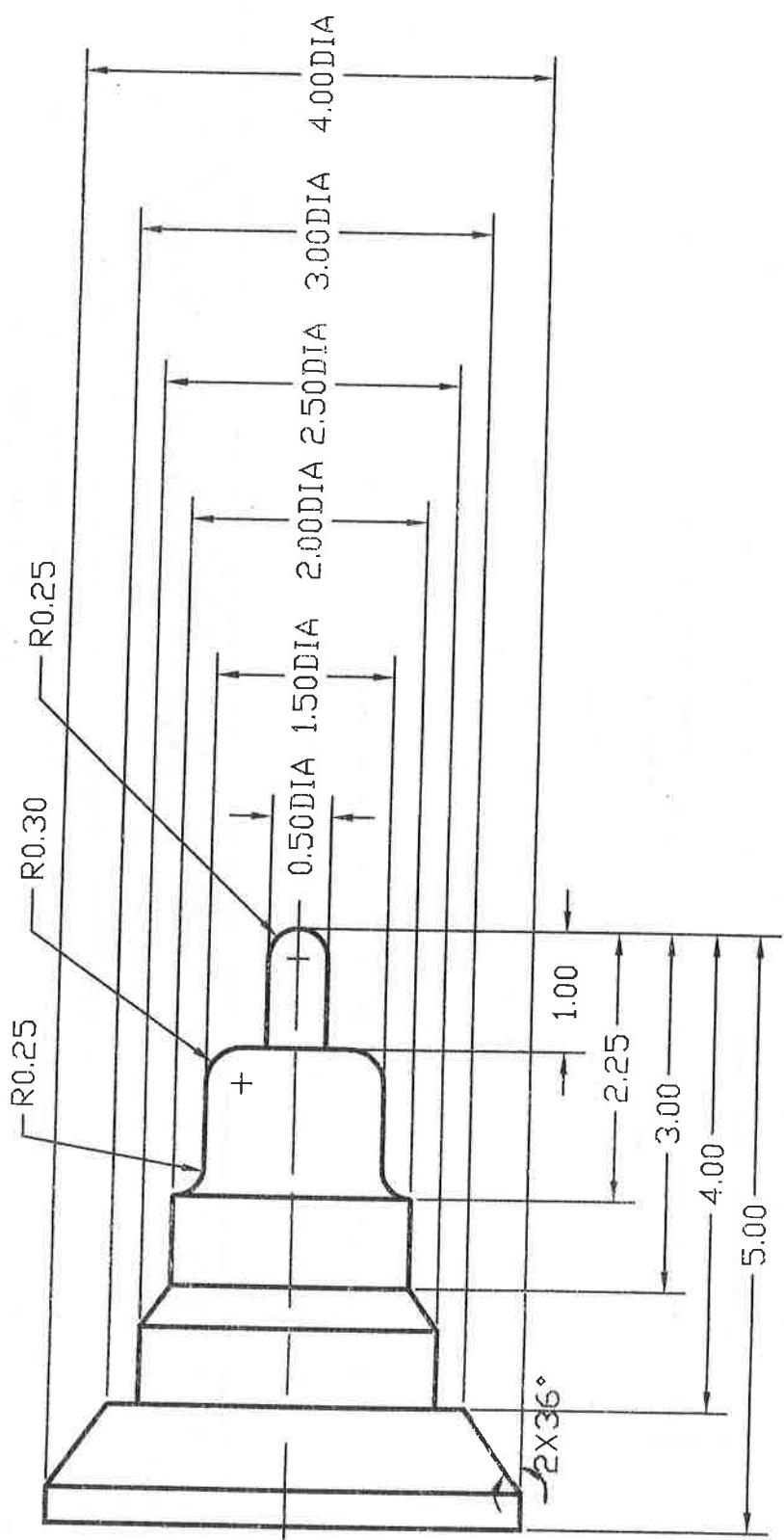


**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

**TOLERANCE UNLESS OTHERWISE
SPECIFIED**

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE	MT-491

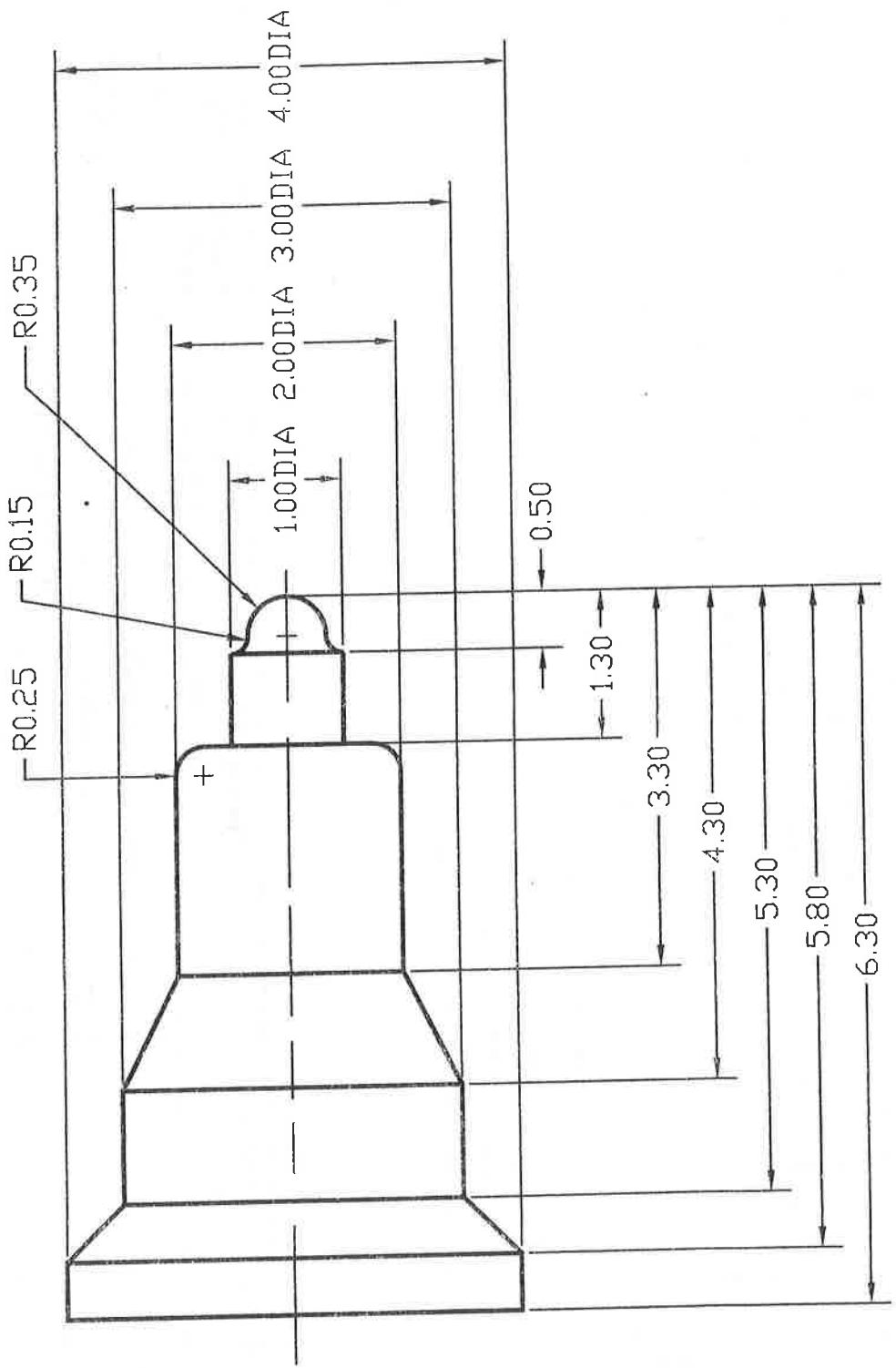


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME		CHECKED BY
PART	PROF. GOLDENBERG		
MATERIAL	No PER ASSEMBLY	CLASS EXERCISE	MT-491

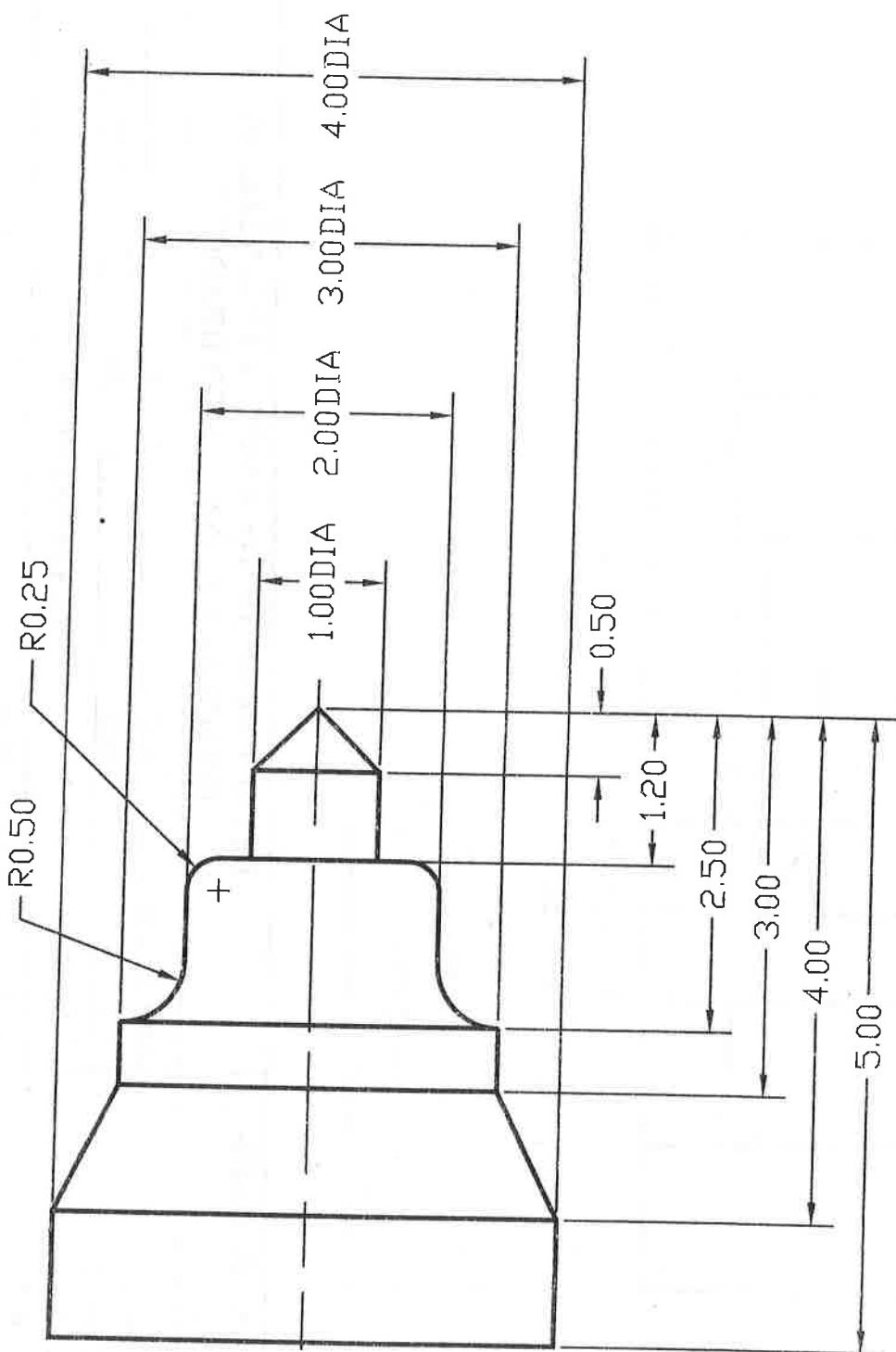


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME	PART	CHECKED BY
CLASS EXERCISE			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY		MT-491

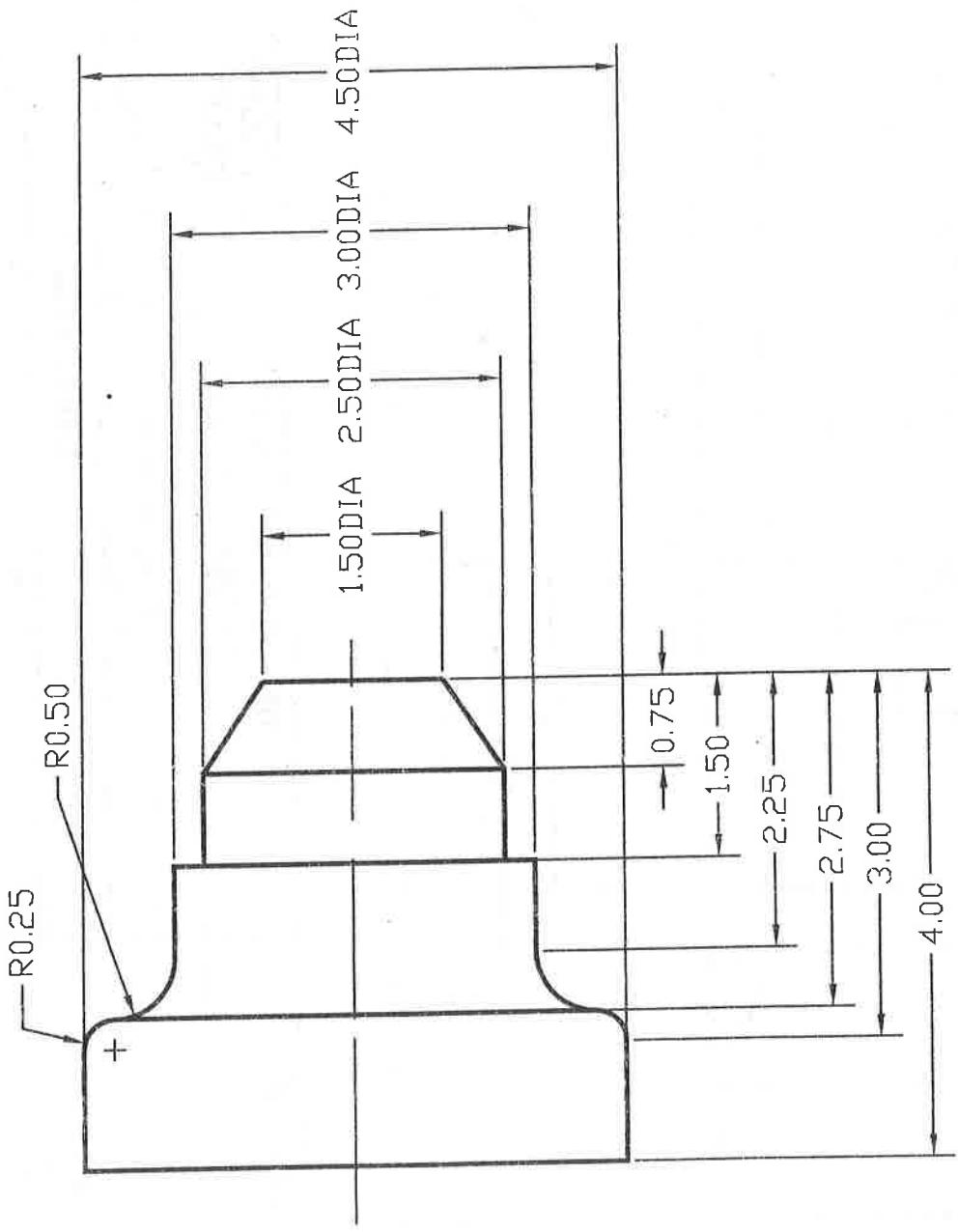


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
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1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY		MT-491

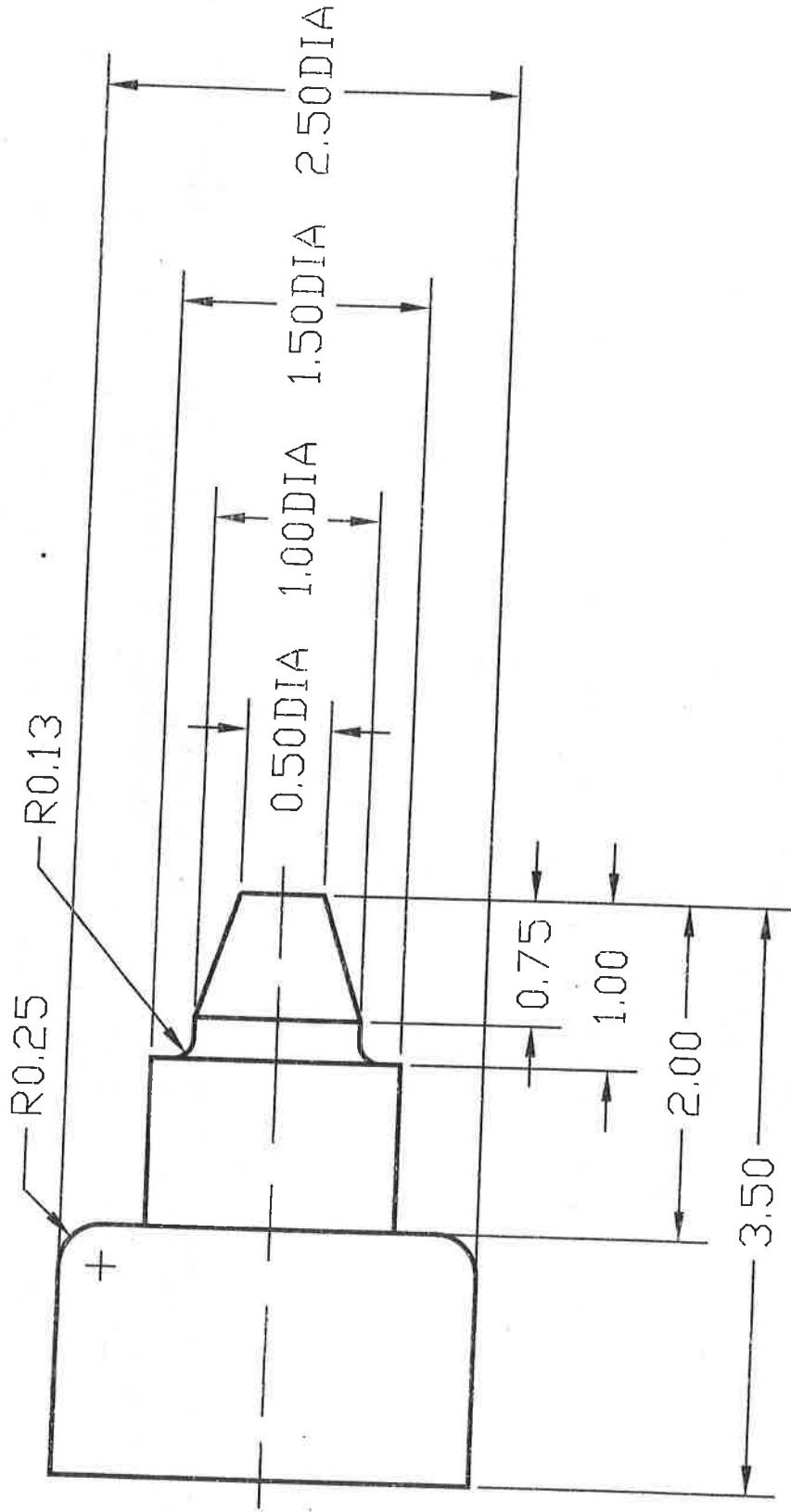


TOLERANCE UNLESS OTHERWISE
SPECIFIED

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ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
			CLASS EXERCISE
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
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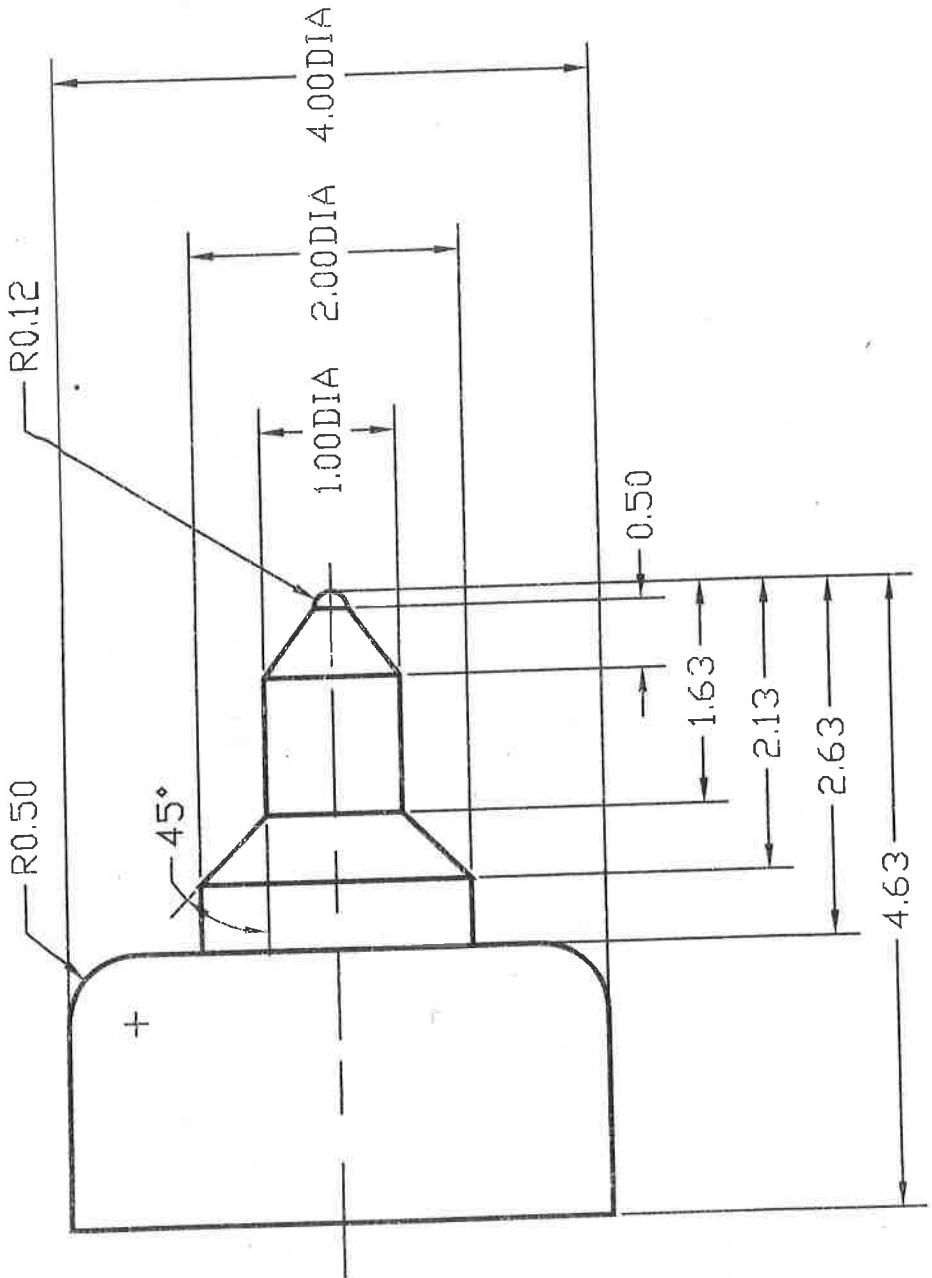
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ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
			PROF. GOLDENBERG
PART			

CLASS EXERCISE

MATERIAL	No PER ASSEMBLY
	MT-491

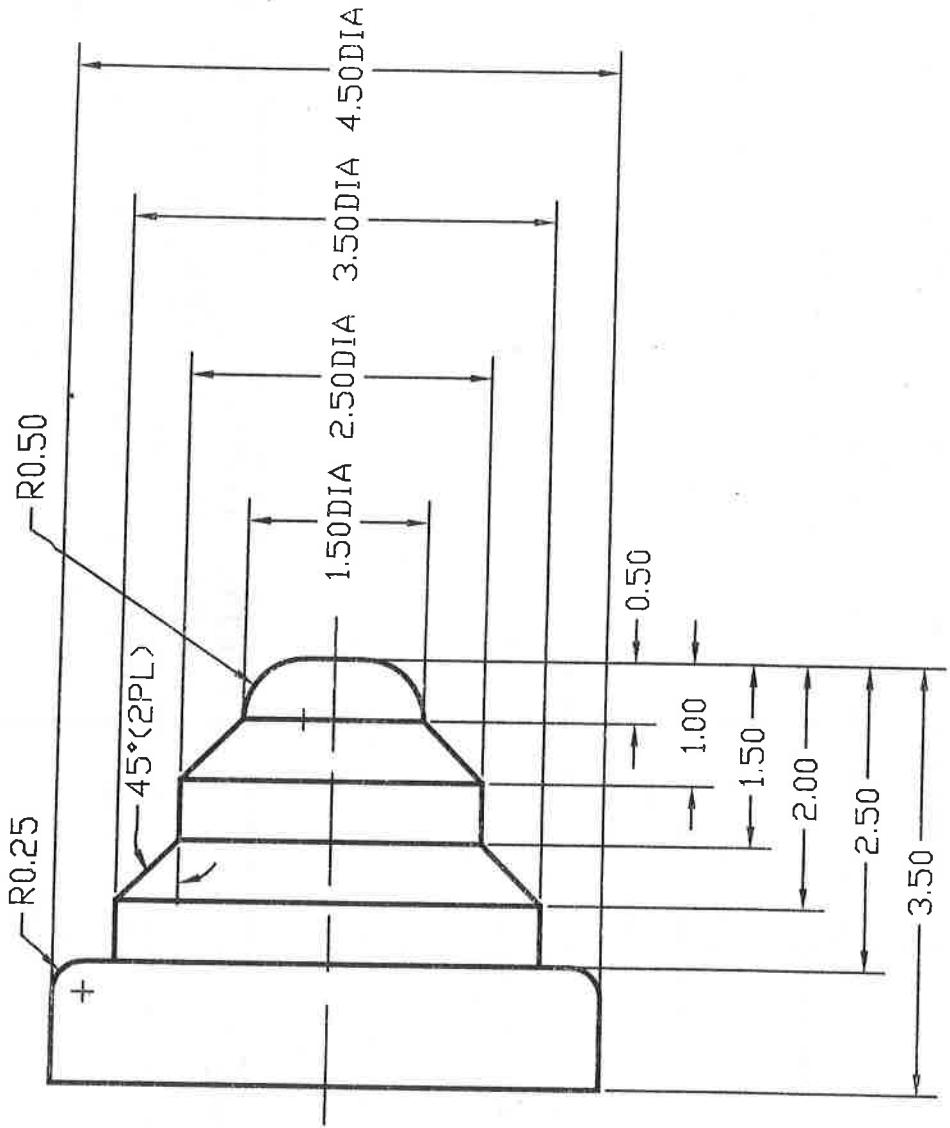


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
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ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
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DATE		ELAPSED TIME	CHECKED BY
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MIT-491

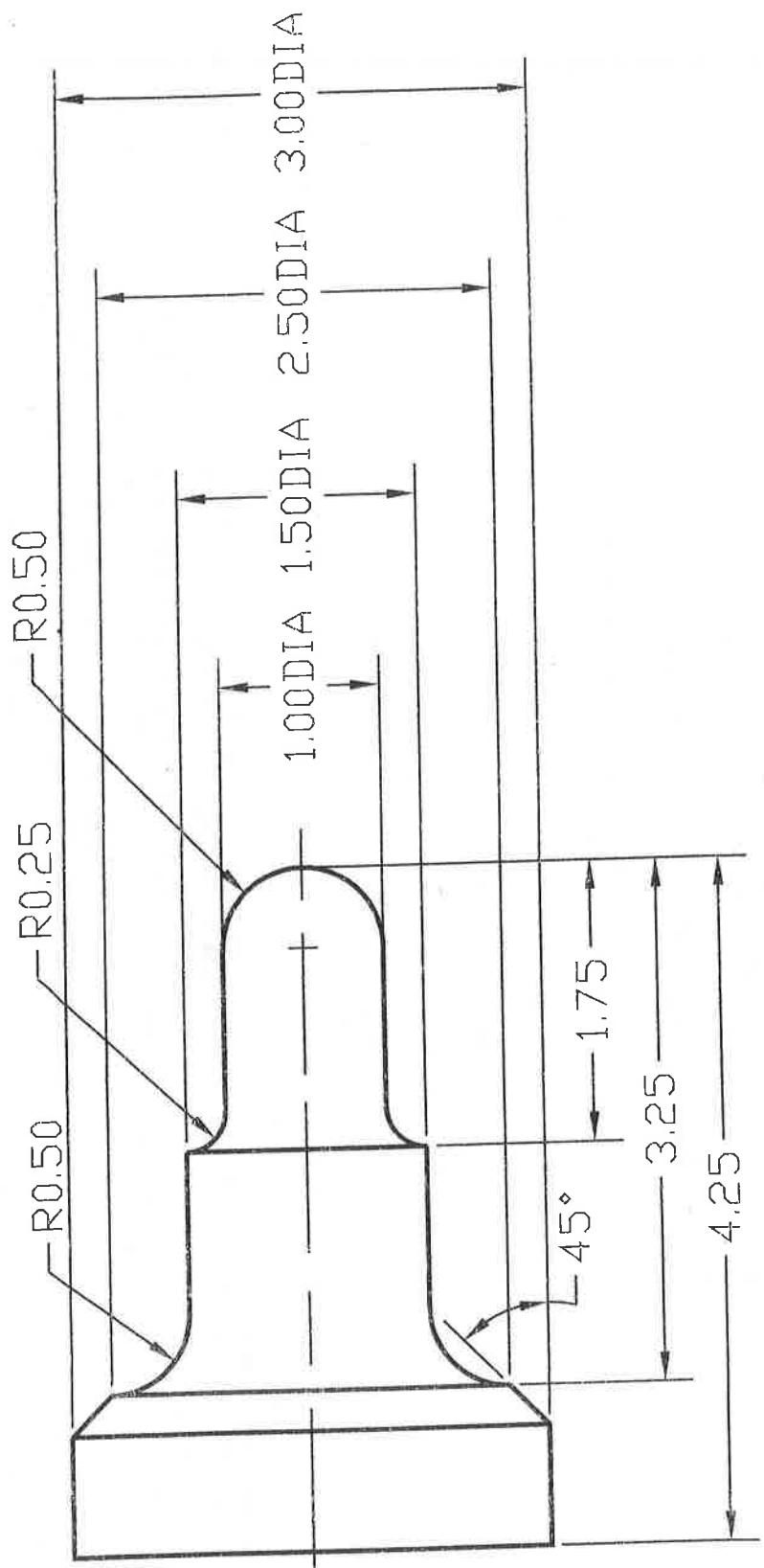


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
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ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
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MATERIAL	No PER ASSEMBLY		CLASS EXERCISE
			MT-491

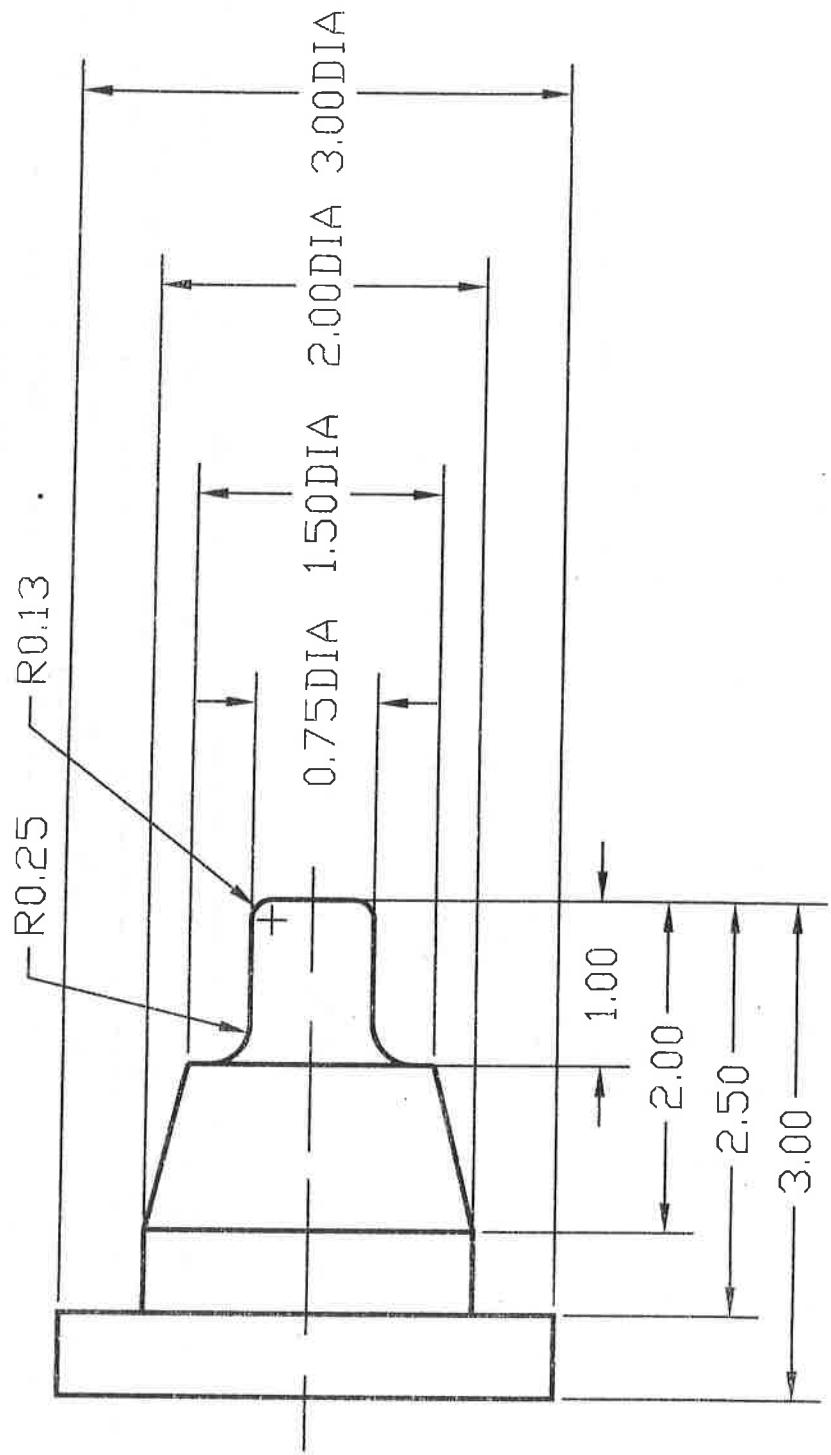


TOLERANCE UNLESS OTHERWISE
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1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
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ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
			PROF. GOLDENBERG
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491

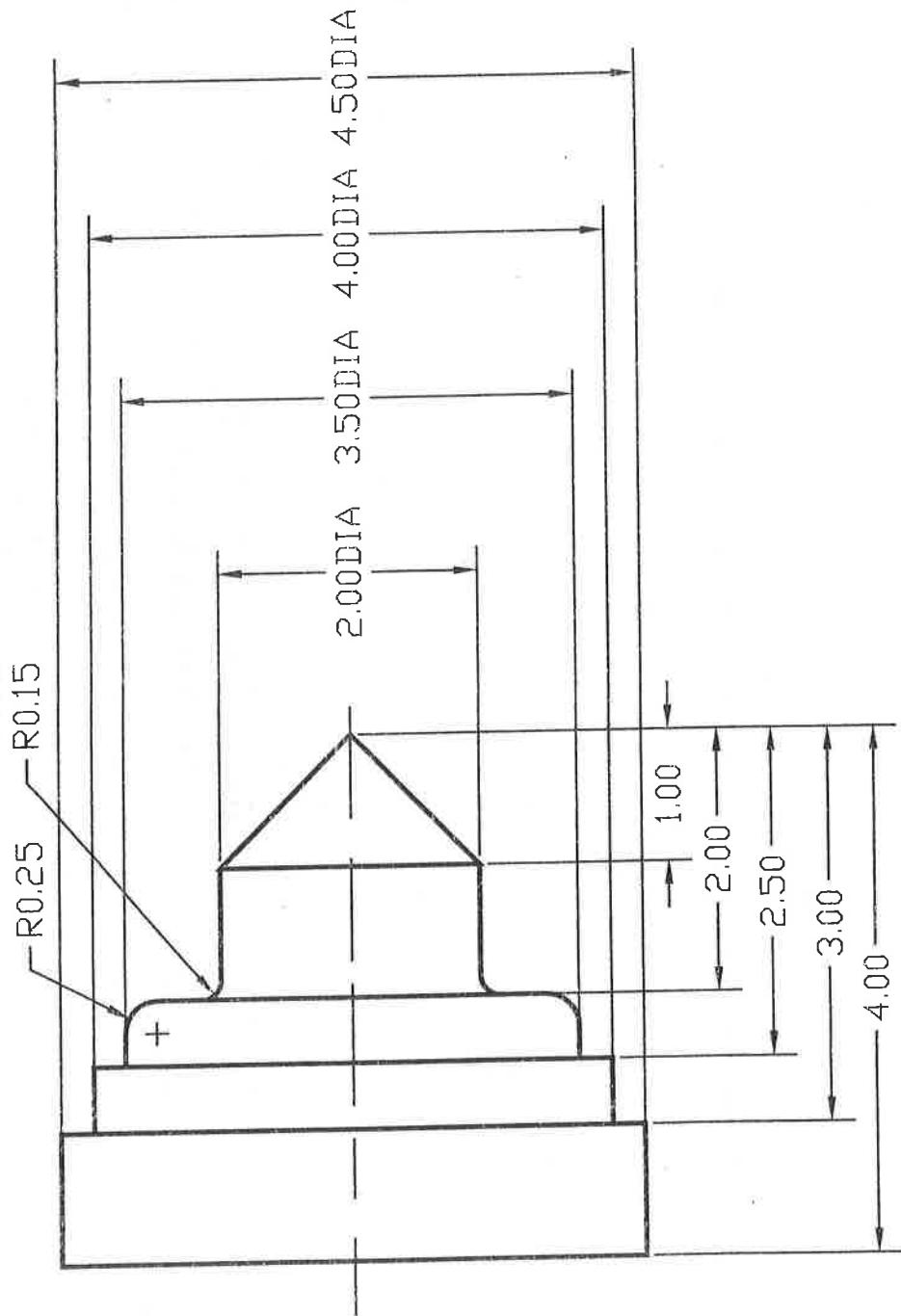


TOLERANCE UNLESS OTHERWISE
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1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
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ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
			CLASS EXERCISE
MATERIAL	No PER ASSEMBLY		MT-491

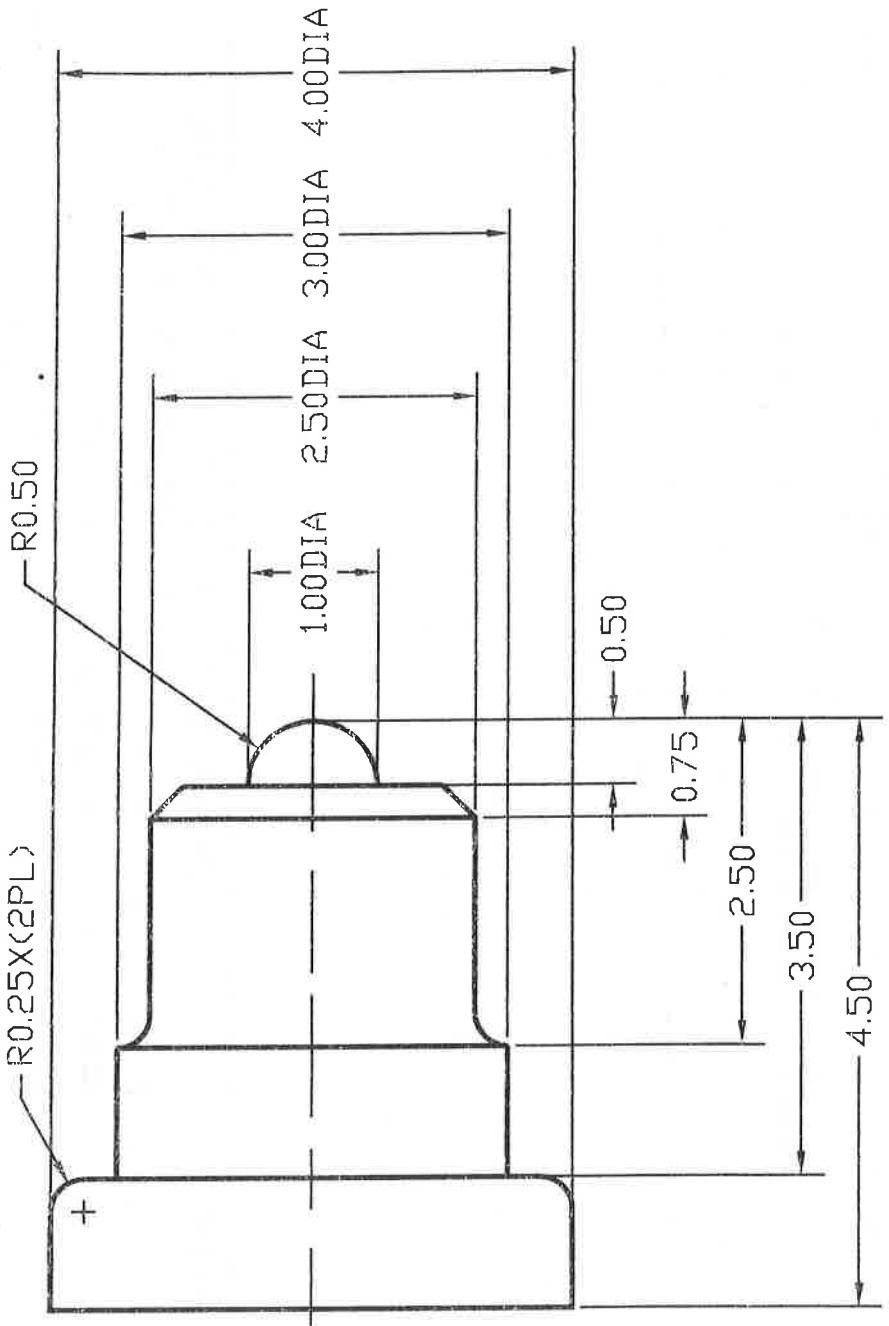


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
1 ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491

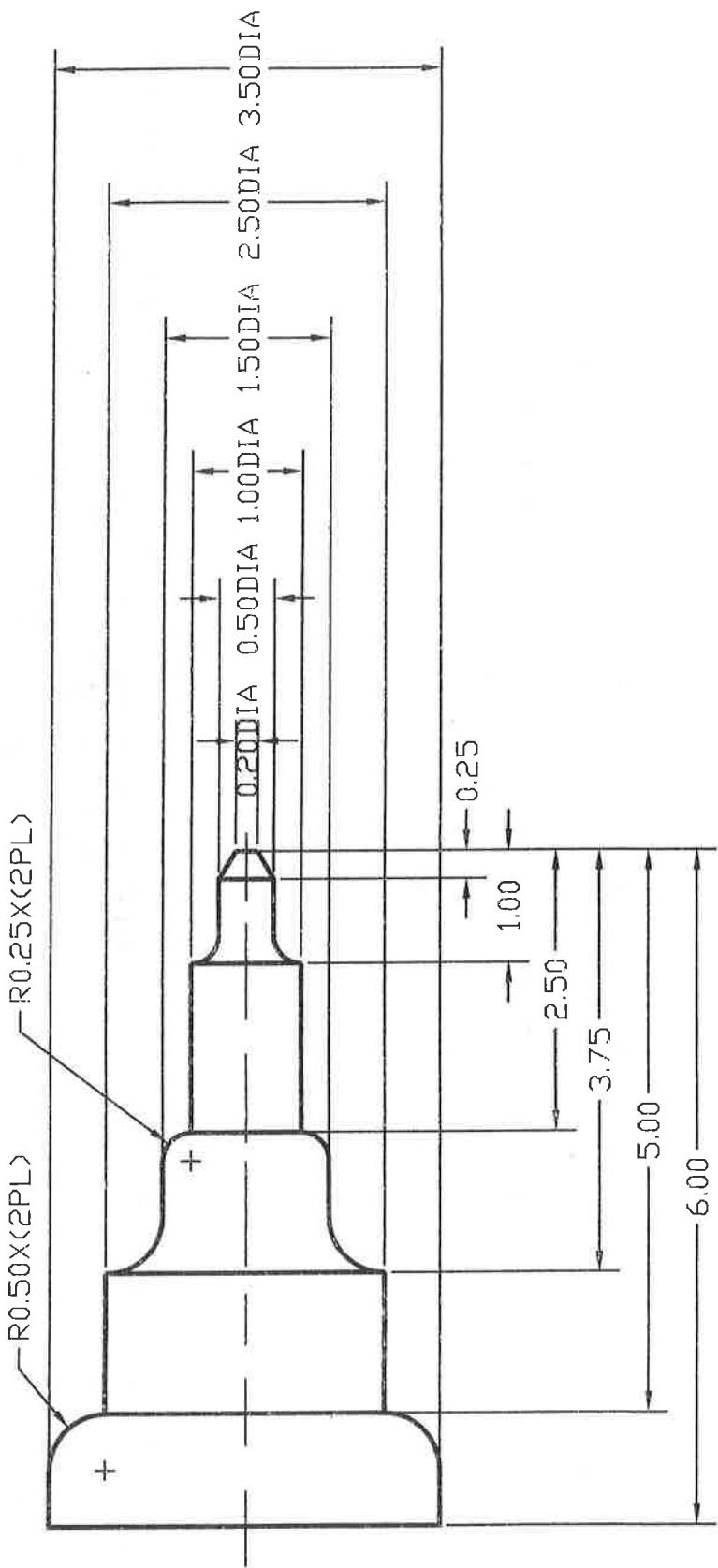


TOLERANCE UNLESS OTHERWISE
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ANGULAR $\pm 0.5^\circ$

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY		CLASS EXERCISE
			MT-491

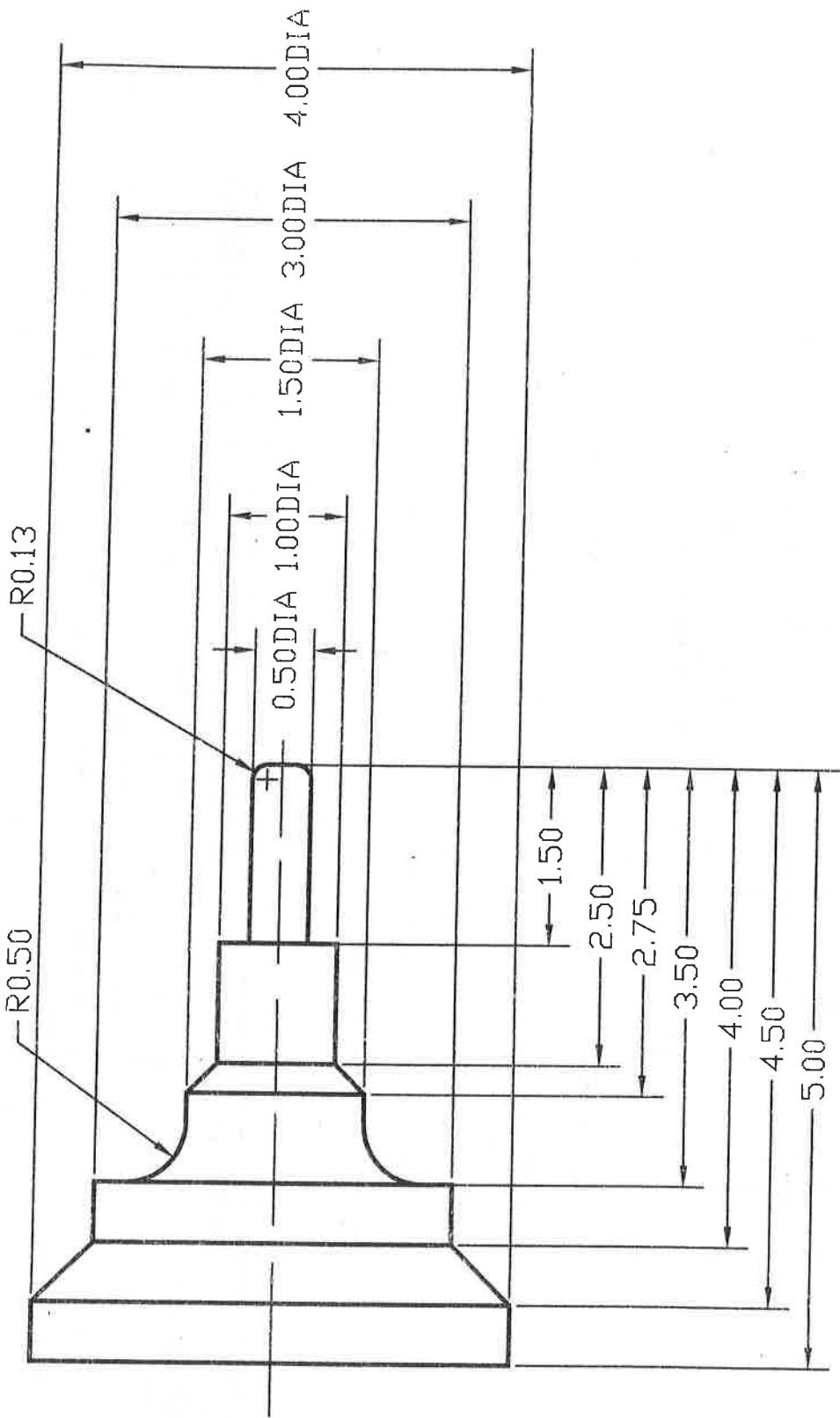


DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

TOLERANCE UNLESS OTHERWISE
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ANGULAR $\pm 0.5^\circ$

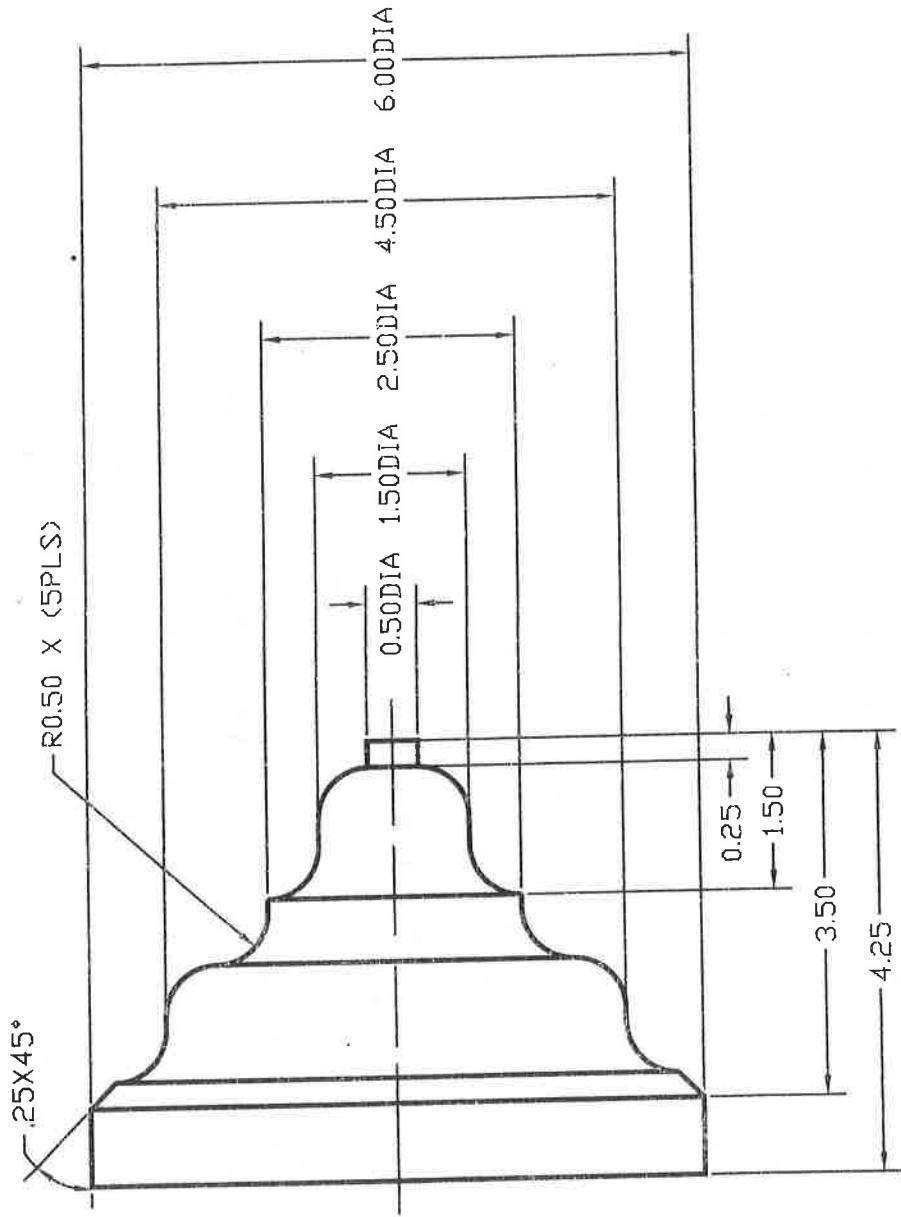
SCALE	NONE	STATION No	DRAWN BY
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491



TOLERANCE UNLESS OTHERWISE
SPECIFIED

DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
MATERIAL	No PER ASSEMBLY		CLASS EXERCISE
			MT-491



**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

**TOLERANCE UNLESS OTHERWISE
SPECIFIED**

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
1 ANGULAR $\pm 0.5^\circ$

SCALE NONE STATION No
DATE ELAPSED TIME

DRAWN BY
PROF. GOLDENBERG

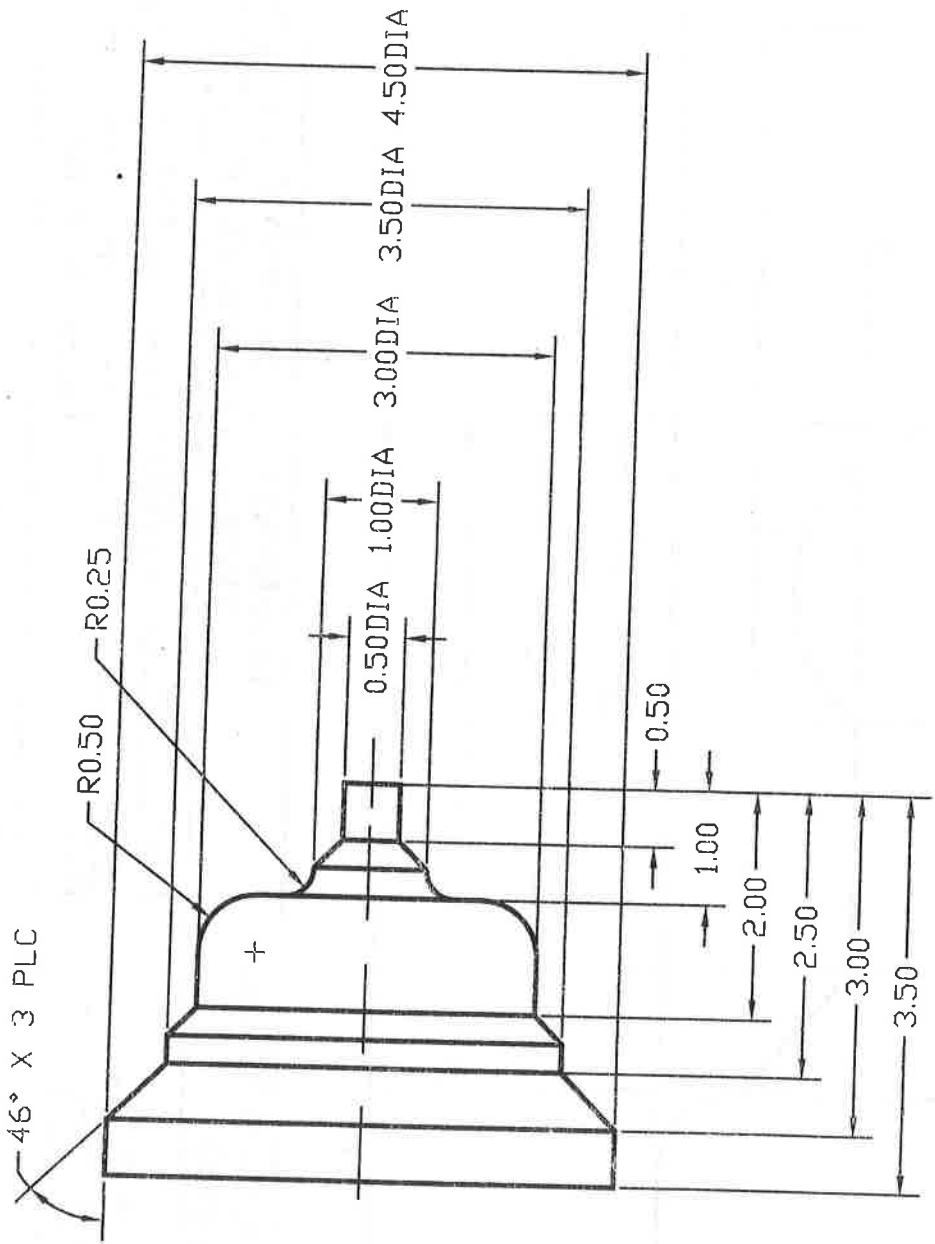
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PART

CLASS EXERCISE

MATERIAL No PER ASSEMBLY

MT-491



**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE
SPECIFIED

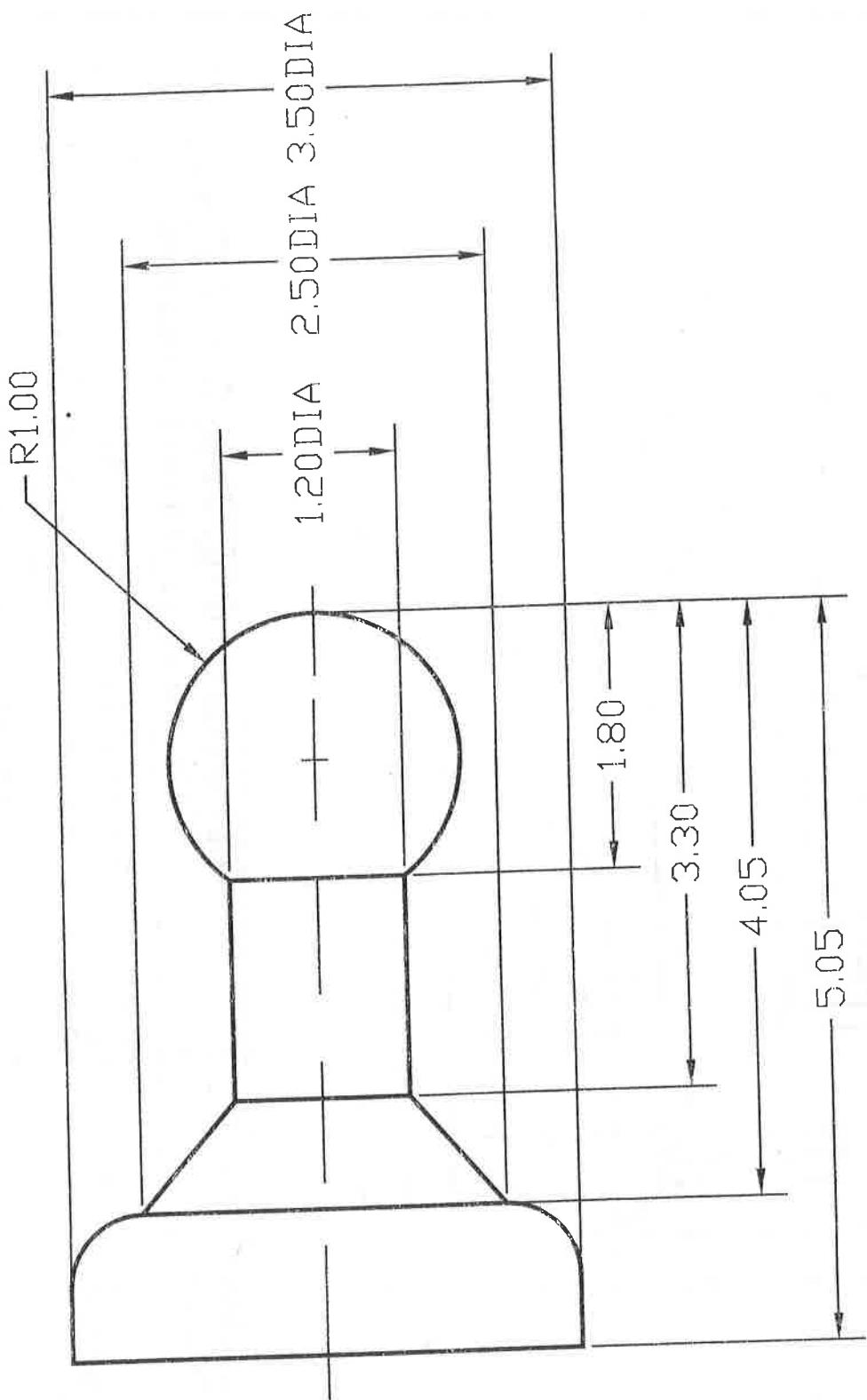
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ANGULAR $\pm 0.5^\circ$

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			
PART			CHECKED BY PROF. GOLDENBERG

CLASS EXERCISE

MATERIAL	No PER ASSEMBLY
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MT-491

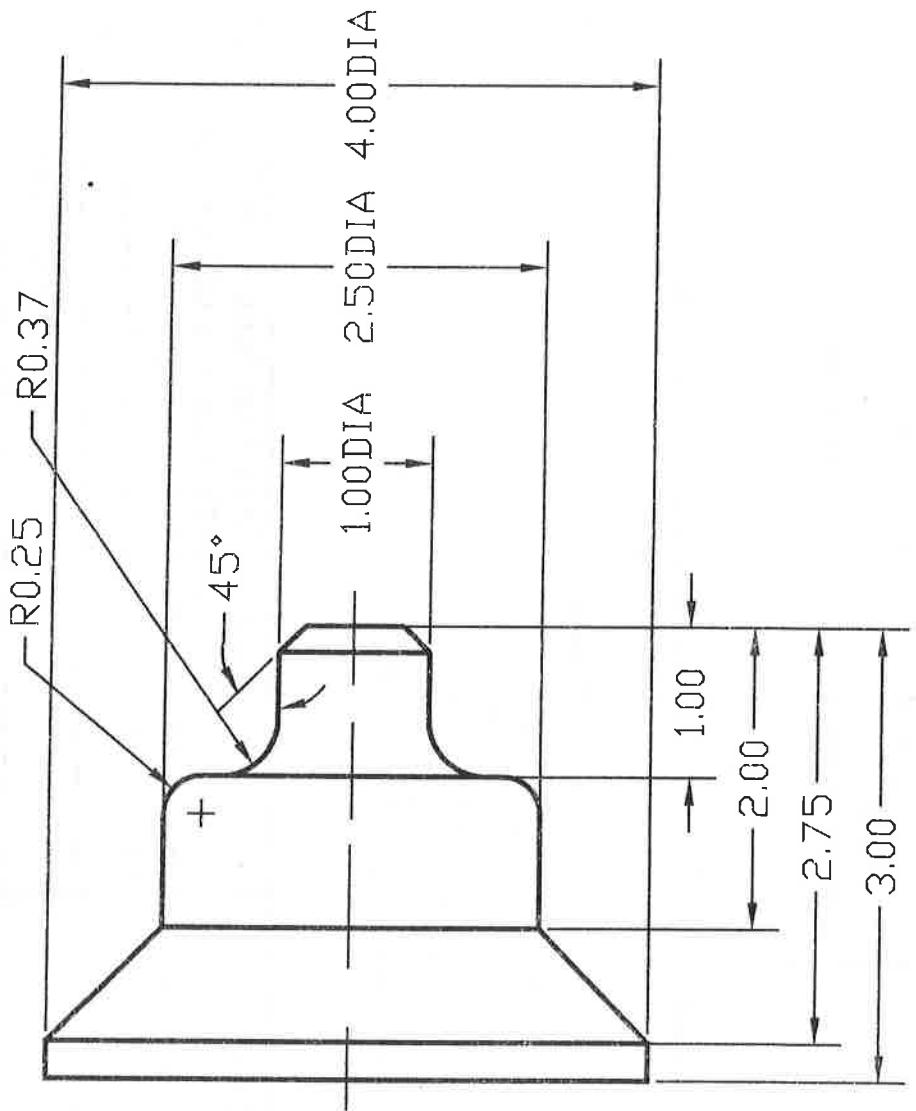


DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

TOLERANCE UNLESS OTHERWISE
SPECIFIED

SCALE	NONE	STATION No	DRAWN BY
			PROF. GOLDENBERG
DATE		ELAPSED TIME	CHECKED BY
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491

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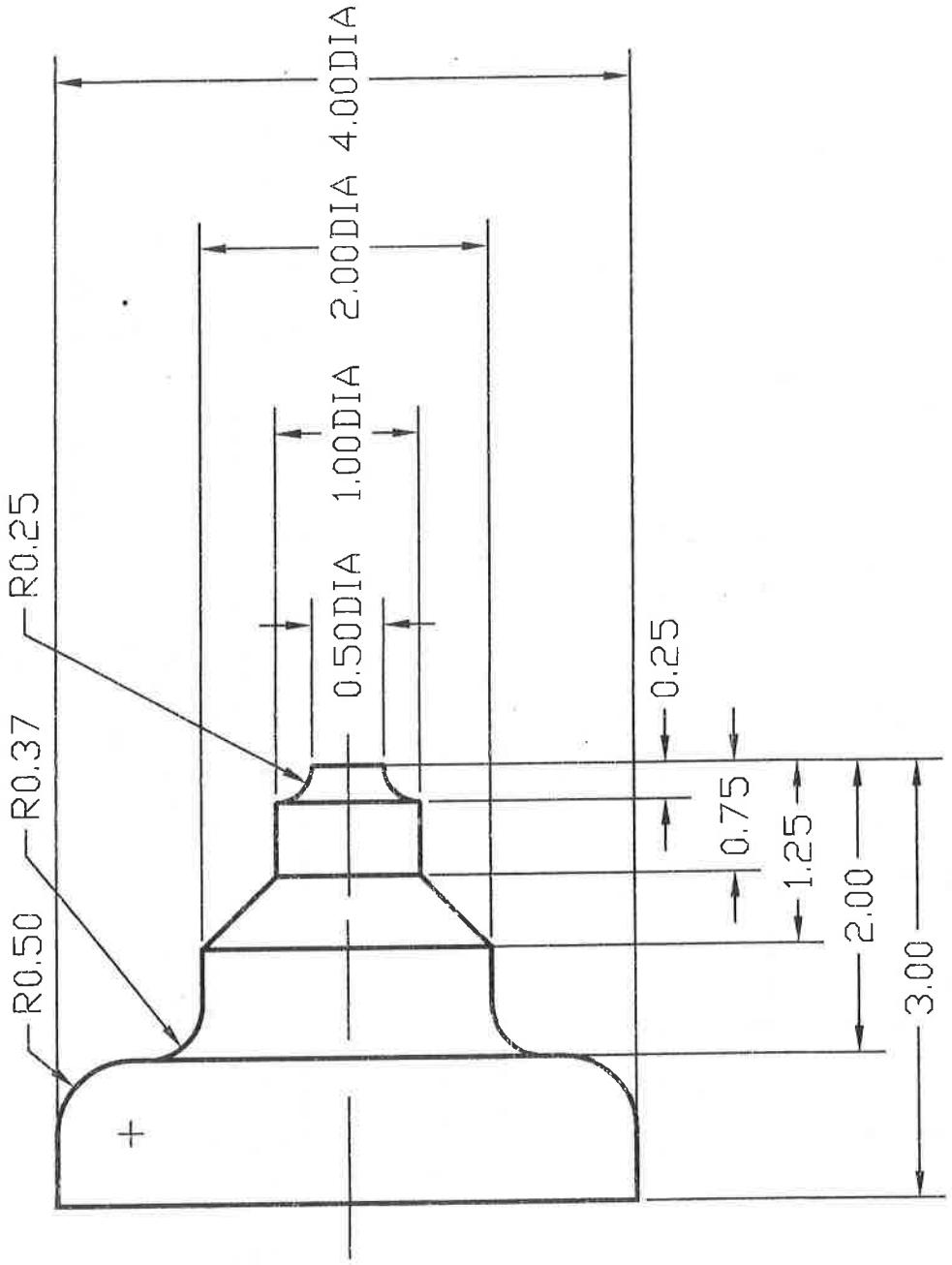


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TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
DATE			CHECKED BY
PART			PROF. GOLDENBERG
CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY		MT-491

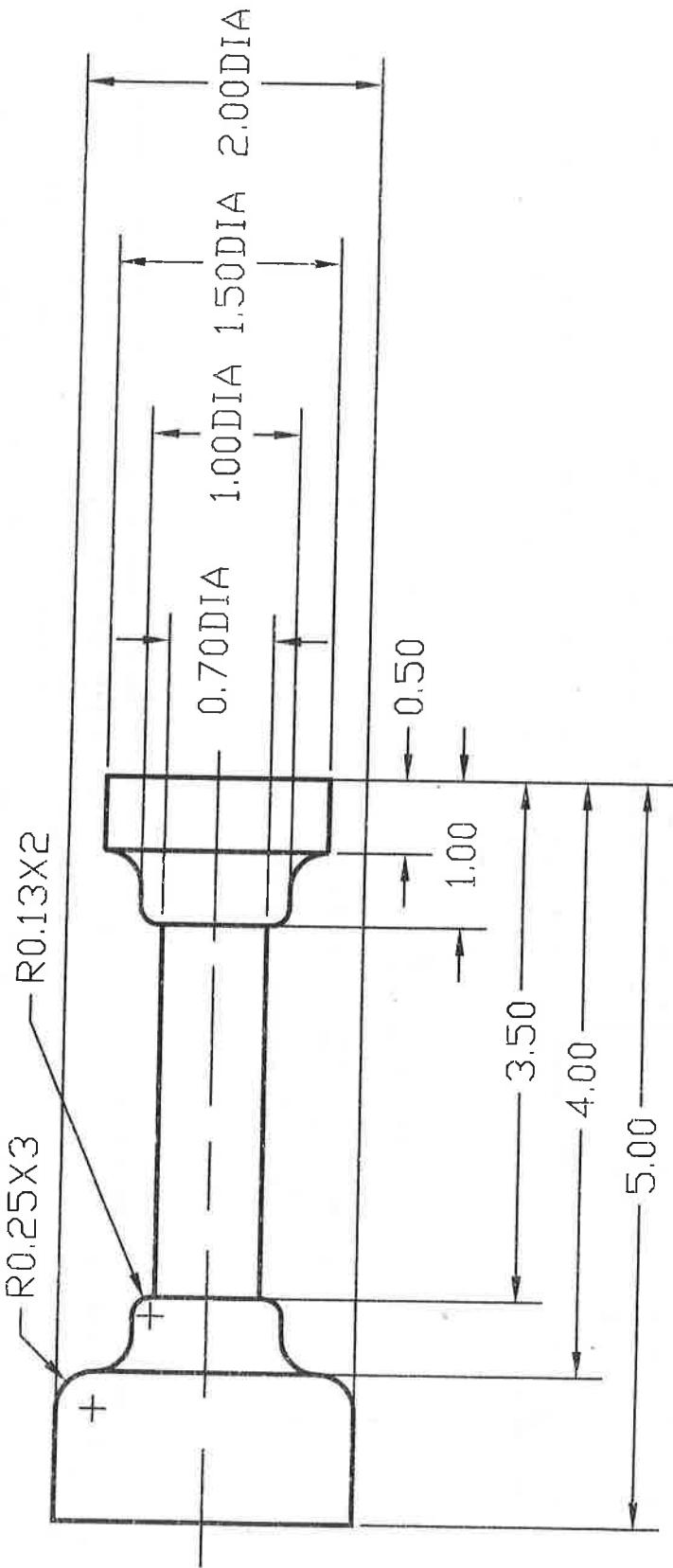


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TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
			PROF. GOLDENBERG
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491

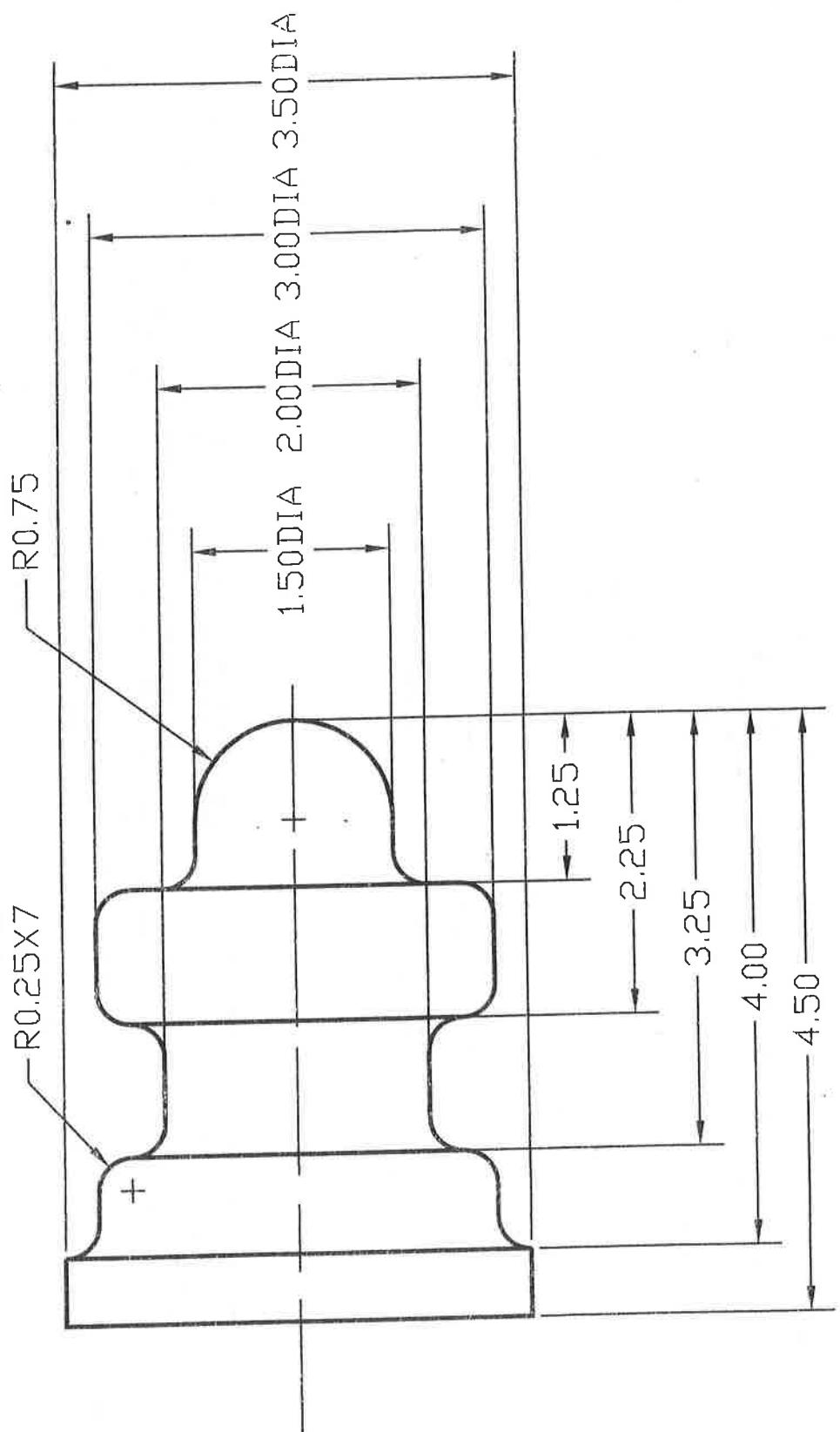


TOLERANCE UNLESS OTHERWISE
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1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
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DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE		ELAPSED TIME	CHECKED BY
PART			PROF. GOLDENBERG
		CLASS EXERCISE	
MATERIAL	No PER ASSEMBLY		MT-491

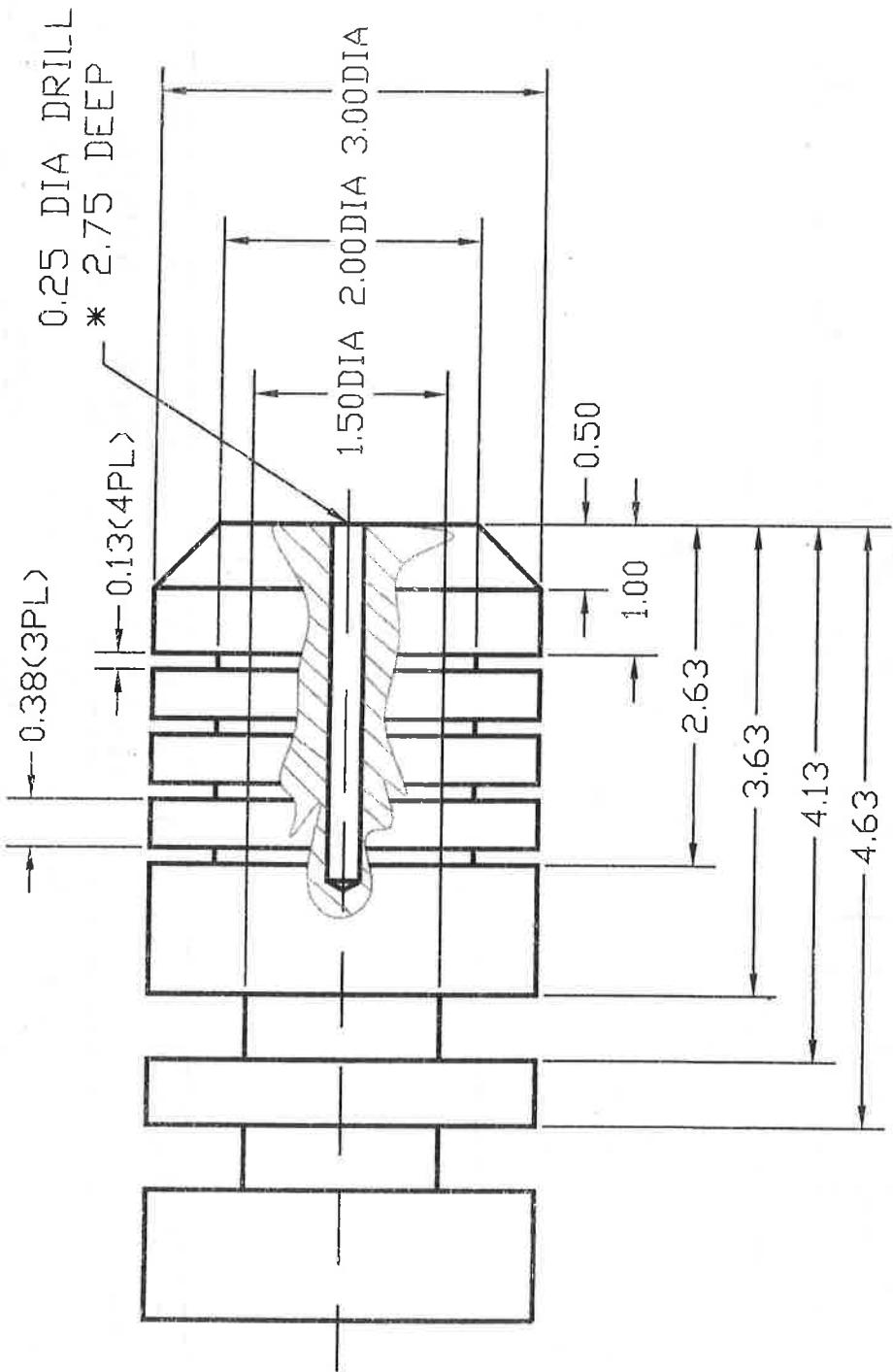


**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

**TOLERANCE UNLESS OTHERWISE
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1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
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ANGULAR $\pm 0.5^\circ$

SCALE	NONE	STATION NO	DRAWN BY
DATE	ELAPSED TIME	CHECKED BY	PROF. GOLDENBERG
PART	CLASS EXERCISE		
MATERIAL	No PER ASSEMBLY		MT-491

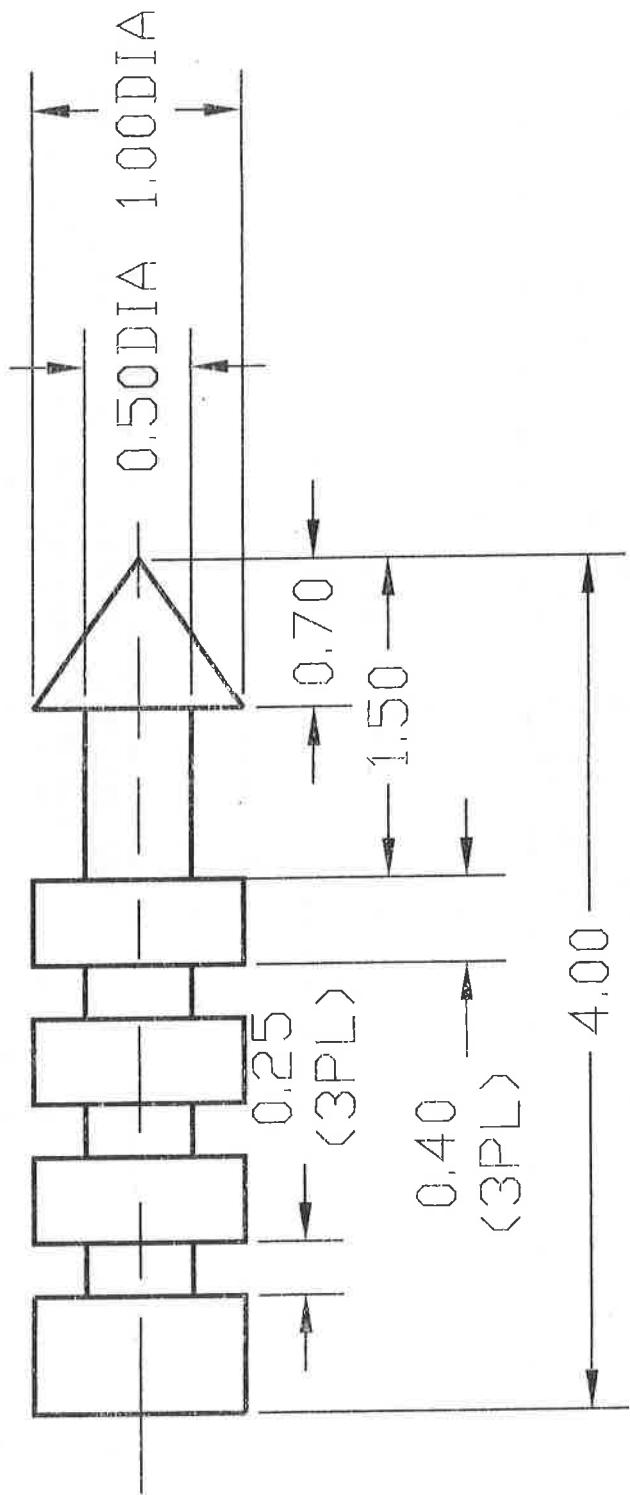


TOLERANCE UNLESS OTHERWISE
SPECIFIED

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ANGULAR
 $\pm 0.5^\circ$

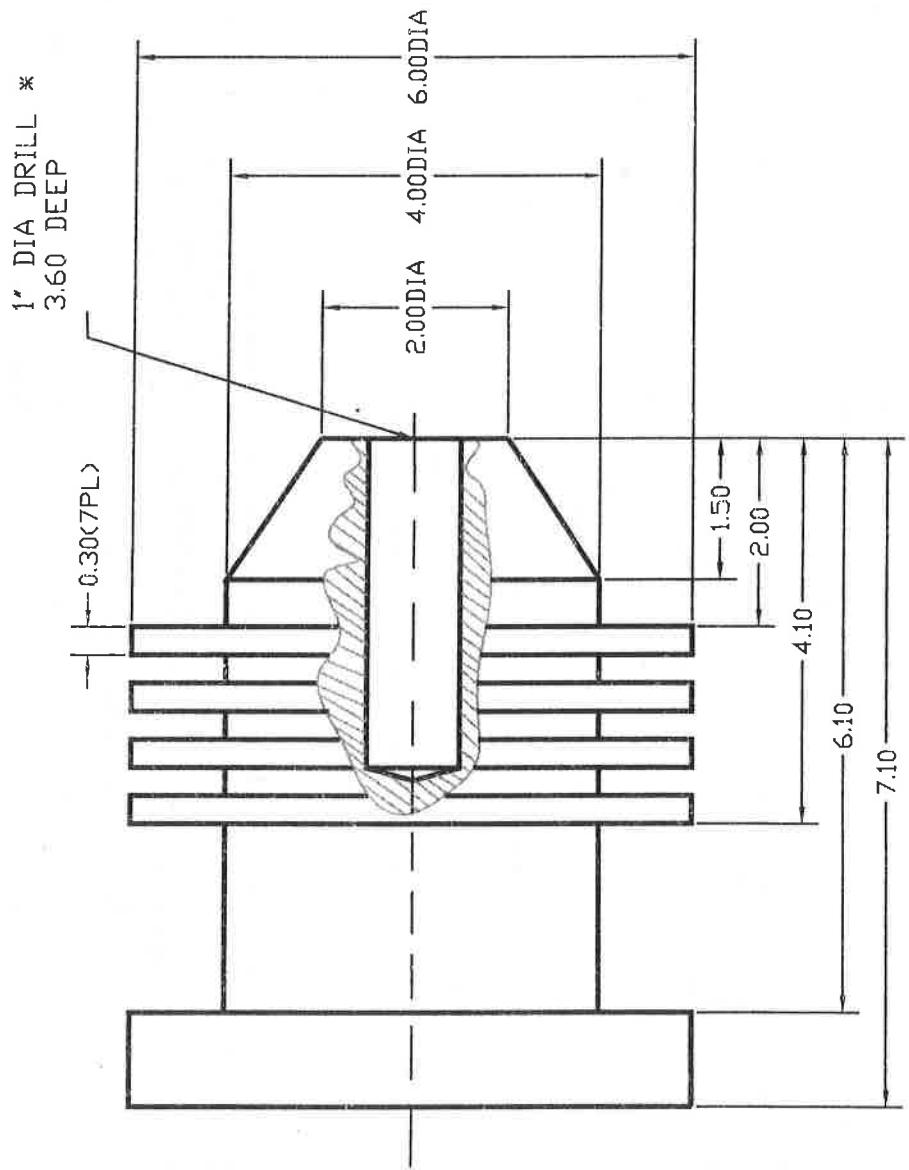
DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING

SCALE	NONE	STATION No	DRAWN BY
DATE	ELAPSED TIME	TIME	CHECKED BY
PART	PROF. GOLDENBERG		
MATERIAL	No PER ASSEMBLY		CLASS EXERCISE
			MT-491



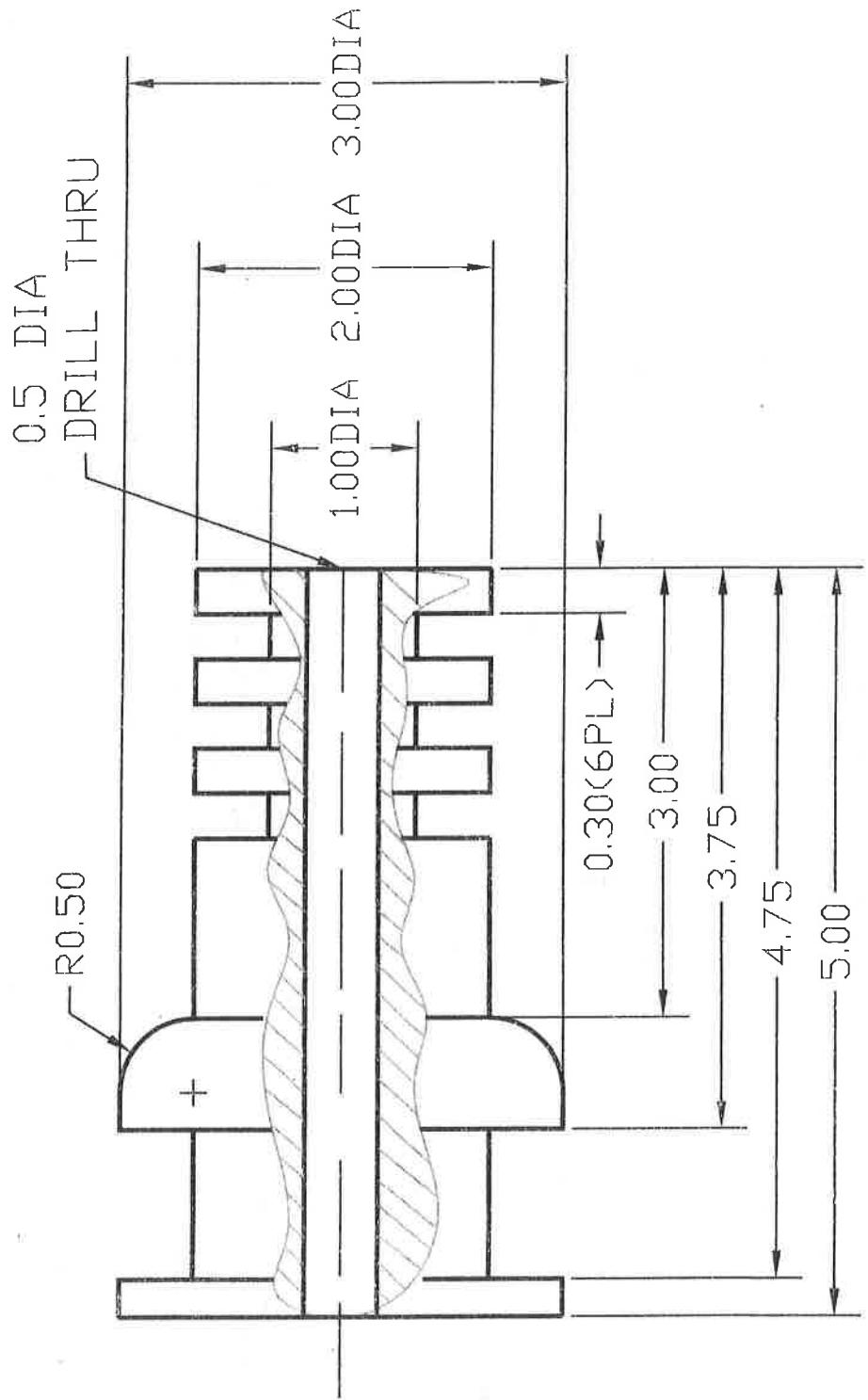
**DEPARTMENT OF MECHANICAL ENGINEERING
TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE SPECIFIED		SCALE	NONE	STATION No	DRAWN BY
		DATE		ELAPSED TIME	CHECKED BY
		PART			PROF. GOLDENBERG
		CLASS EXERCISE			
MATERIAL	No PER ASSEMBLY				MT-491



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TECHNOLOGY AND DESIGN DRAFTING**

TOLERANCE UNLESS OTHERWISE SPECIFIED	SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY
1 PLACE DECIMAL ± 0.1	DATE			CHECKED BY
1 PLACE DECIMAL ± 0.02	PART			PROF. GOLDENBERG
1 PLACE DECIMAL ± 0.005	MATERIAL	No PER ASSEMBLY		CLASS EXERCISE
ANGULAR $\pm 0.5^\circ$				MT-491

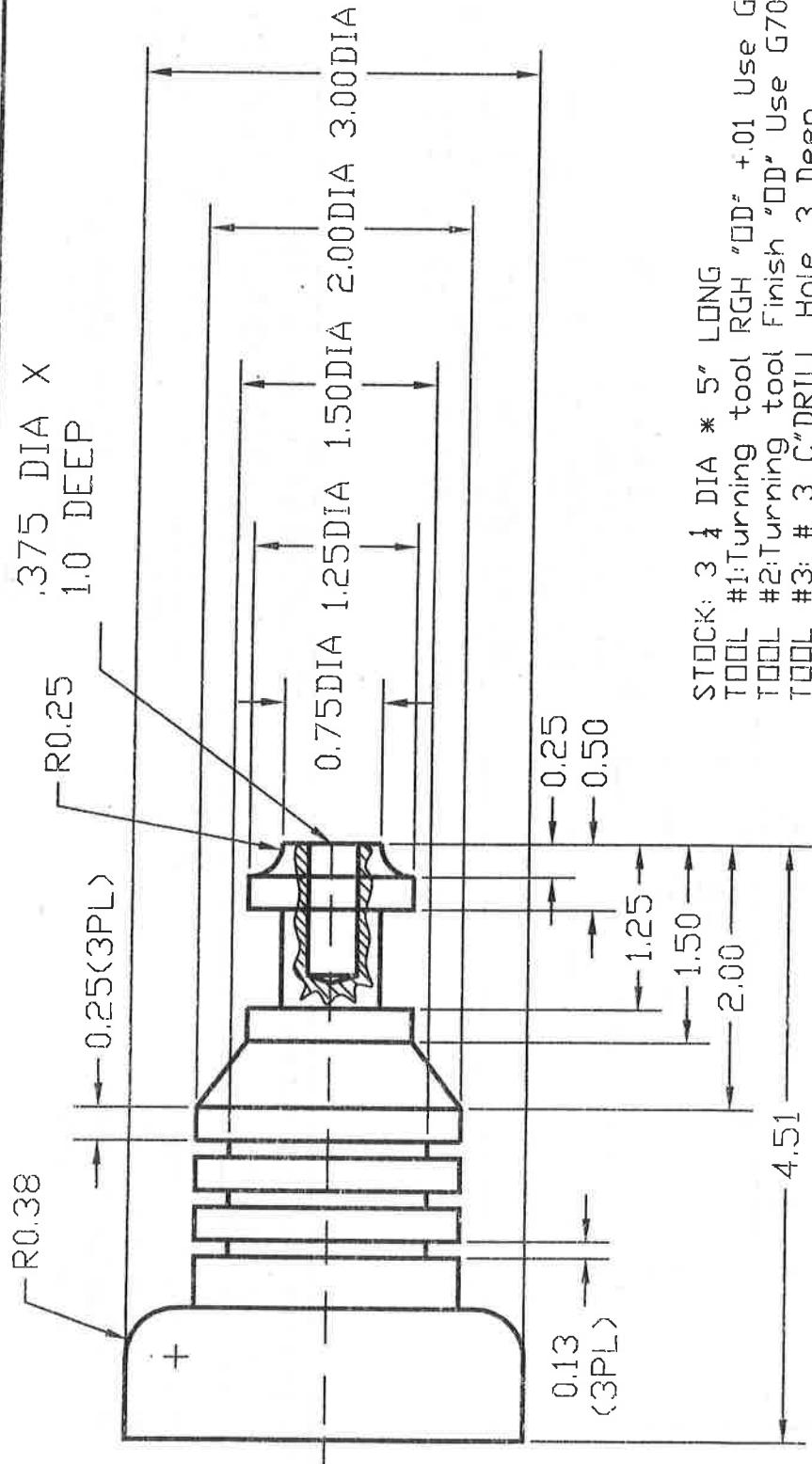


TOLERANCE UNLESS OTHERWISE
SPECIFIED

1 PLACE DECIMAL ± 0.1
1 PLACE DECIMAL ± 0.02
1 PLACE DECIMAL ± 0.005
ANGULAR $\pm 0.5^\circ$

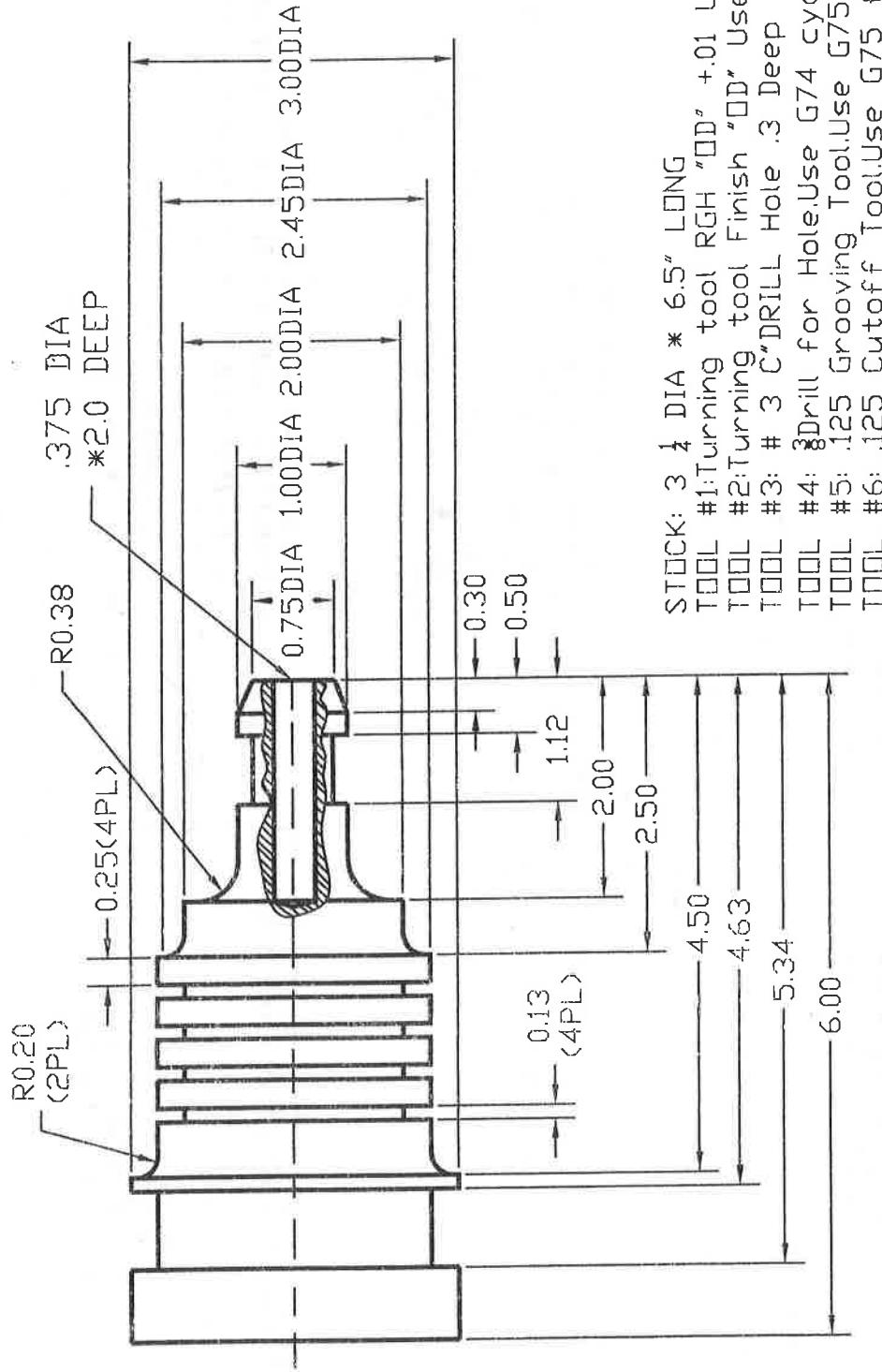
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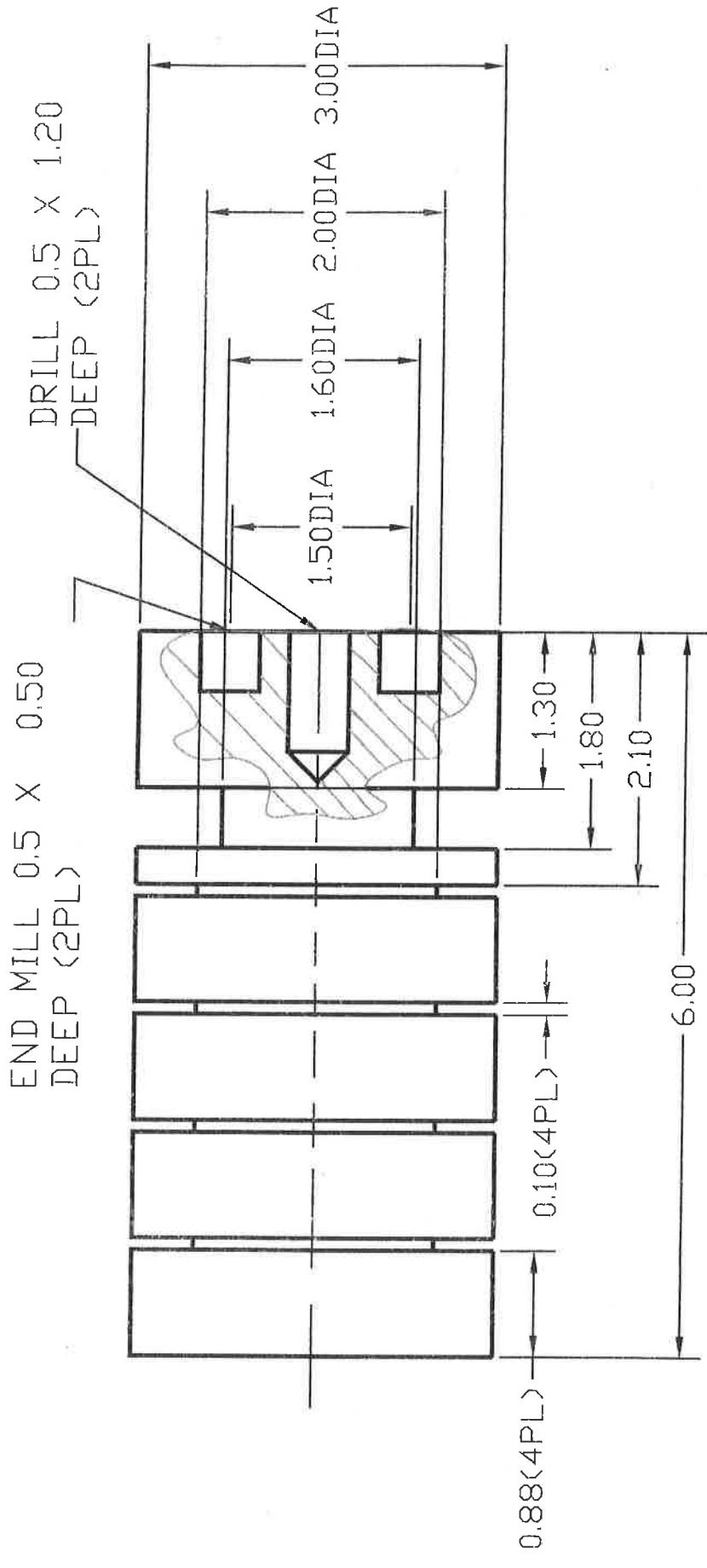


TOLERANCE UNLESS OTHERWISE
SPECIFIED

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TOLERANCE UNLESS OTHERWISE SPECIFIED	SCALE	NONE	STATION No ELAPSED TIME	DRAWN BY PROF. GOLDENBERG
1 PLACE DECIMAL ± 0.1	DATE			CHECKED BY
1 PLACE DECIMAL ± 0.02	PART			CLASS EXERCISE
1 PLACE DECIMAL ± 0.005	MATERIAL	No PER ASSEMBLY		
ANGULAR $\pm 0.5^\circ$				MT-491

REQUIREMENTS FOR SUBMITTING MT-491 PROJECTS



You are required to submit a folder with (5) projects as described in the project outlines given to you:

Content: each project must include a page for:

- *Program outline;*
- *Drawing with dimensions;*
- *Programming code;*
- *Screen print of the machined part.*

Note: *you might be asked to present a Predator motion simulation and inspection for all or some of your projects.*

The following format should be followed:

- ✓ *Cover page, which includes:*
 - *The number of the course (MT-491);*
 - *The name of the course (Computer Controlled Manufacturing);*
 - *Teachers name (Prof. J. Goldenberg);*
 - *Your name;*
 - *Semester (Fall, Spring); Year*
- ✓ *Table of Content with page numbers;*
- ✓ *Introduction;*
- ✓ *Content as described above (with page numbers);*
- ✓ *Conclusion;*
- ✓ *Bibliography (if you used any outside sources for the project);*

The report should be bound in a folder with a clear front page.

*Note: In order to receive credit for this class, submit your report
not later than the last Laboratory class.*

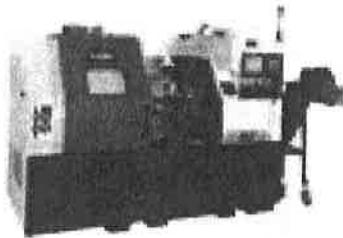
MT-491



Program #1 outline

1. Design a part made out of a 4" diameter, 6" long bar. Use AutoCAD or Mastercam for design purposes.
2. Part should have (5) five cylinders with different length and diameters.
3. Dimension the part.
4. Use thicker lines for part outline and thinner for dimensions
5. Use 3 tools to rough, finish, cut-off the part.
6. Leave +.02 on all the surfaces for finishing.
7. Use:
 - S1500 and F.008 for roughing;
 - S2200 and F.004 for finishing;
 - S1000 and F.006 for cut-off
8. Write a program named "project1" to machine the part you designed.
Note: "0" XZ is on the face of the part.
9. Type in the program and verify the motion by use of the simulator.
10. Document the project.
11. Save all information in a folder.

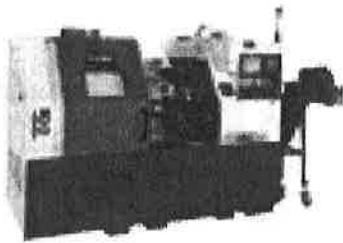
MT-491



Program #2 outline

1. Design a part made out of a 4" diameter, 7" long bar. Use AutoCAD or Mastercam for design purposes.
2. Part should have (2) cylinders and (3) angular surfaces (cones, chamfers) with different length and diameters positioned in different order.
3. Dimension the part.
4. Use thicker lines for part outline and thinner for dimensions
5. Use 3 tools to rough, finish, cut-off the part.
6. Leave +.02 on all the surfaces for finishing.
7. Use:
S1200 and F.01 for roughing;
S2000 and F.005 for finishing;
S800 and F.007 for cut-off
8. Write a program named "project2" to machine the part you designed.
Note: "0" XZ is on the face of the part.
9. Type in the program and verify the motion by use of the simulator.
10. Document the project.
11. Save all information in a folder.

MT-491



Program #3 outline

1. Design a part made out of a 3" diameter, 6" long bar. Use AutoCAD or Mastercam for design purposes.
2. Part should have minimum (5) cylinders and (4) internal and/or external radial surfaces with different length and diameters.
3. Dimension the part.
4. Use thicker lines for part outline and thinner for dimensions
5. Use 3 tools to rough, finish, cut-off the part (.125 wide).
6. Leave +.01 on all the surfaces for finishing.
7. Use:
S1400 and F.012 for roughing;
S2200 and F.006 for finishing;
S800 and F.005 for cut-off
8. Write a program named "**PROJECT3**" to machine the part you designed. Note: "0" XZ is on the face of the part.
9. Type in the program and verify the motion by use of the simulator.
10. Document the project.
11. Save all information in a folder.

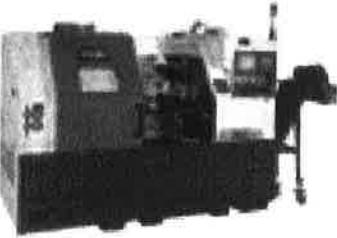
MT-491



Program #4 outline

1. Design a part made out of a 4" diameter, 5" long bar. Use AutoCAD or Mastercam for design purposes.
2. Part should have minimum (5) cylinders (2) angular surfaces and (2) internal and/or external radial surfaces with different length and diameters.
3. Dimension the part.
4. Use thicker lines for part outline and thinner for dimensions
5. Keep chuck length to 1".
6. Use 3 tools to rough, finish, cut-off the part.
7. Leave +.015 on all the surfaces for finishing.
8. Use:
S1800 and F.010 for roughing;
S2000 and F.004 for finishing;
S1000 and F.004 for cut-off
9. While using **G70**, **G71** and **G75** cycles write a program named "**PROJECT4**" to machine the part you designed. In roughing cycle depth of cut should be .150. Note: "0" XZ is on the face of the part.
10. Type in the program and verify the motion by use of the simulator.
11. Document the project.
12. Save all information in a folder.

MT-491



Program #5 outline

1. Design a part made out of a 3" diameter, 6" long bar. Use AutoCAD or Mastercam for design purposes.
2. Part should have minimum (4) .2 wide grooves, (2) minimum .5 wide grooves and a hole with (3) different diameters.
3. Dimension the part.
4. Use thicker lines for part outline and thinner for dimensions
5. Submit design for approval
6. Keep chuck length to 1".
7. Create a table with tools and operations (similar to the one on the board) .
8. While using **G74** and **G75** cycles write a program named "**PROJECT5**" to machine the part you designed.
10. Type in the program and verify the motion by use of the simulator.
11. Document the project.
12. Save all information in a folder.

