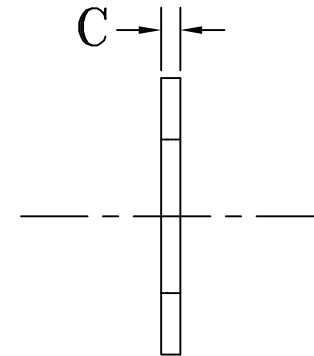
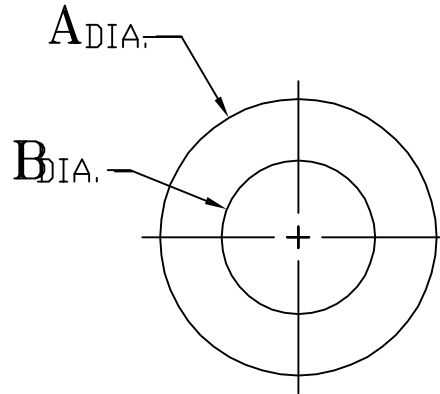


FOR GRADE 75 ALL-THREAD BAR
ASTM F-436 HARDENED
FLAT WASHERS

BAR SIZE	OUTSIDE DIA. A	INSIDE DIA. B	THICKNESS C
#8	2.250	1.250	5/32
#9	2.250	1.250	5/32
#10	2.500	1.375	5/32
#11	3.000	1.625	5/32
#14	3.375	1.875	7/32
#18	4.500	2.625	9/32
#20	5.000	2.878	9/32



MATERIAL: CONFORMS TO ASTM F-436.



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Customer: _____
Project: HARDENED FLAT WASHER - FOR GR. 75 ALLTHREAD REBAR

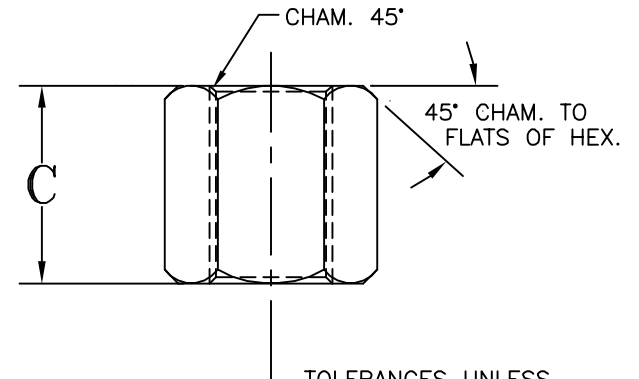
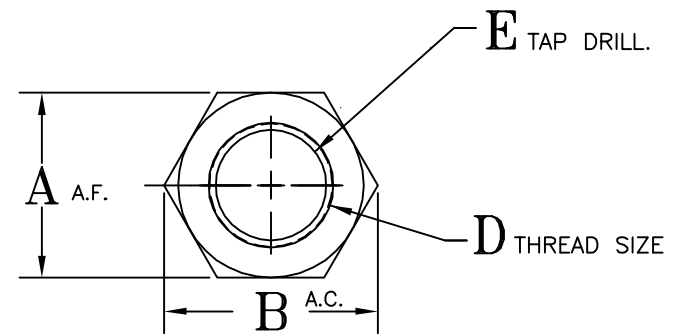
DRAWN BY:	RHT	ECO NO.:	650-1261
SCALE:	NTS.	C/O:	---
DATE:	10-12-95	APPRO BY:	---
SHEET NO.	TOTAL SHEETS	DESIGNED BY:	---
1	1	TECH REP:	---

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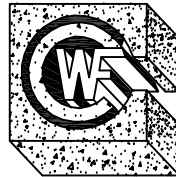
PRINT NO.:	REV:
1B-FA-2-114	-

LARR #25041

BAR SIZE & PITCH	A A.F.	B A.C.	C DIM.	D THREAD SIZE	E TAP DRILL DIA. +/- .005	MATERIAL:
#8-3.5	1.625	1.876	2.000	#8 GR.75	31/32"	1215
#9-3.5	1.875	2.116	2.000	#9 GR.75	1 5/64"	
#10-3	2.000	2.309	2.187	#10 GR.75	1 3/16"	12L14
#11-3	2.250	2.525	2.406	#11 GR.75	1 11/32"	
#14-3	2.875	3.321	3.250	#14 GR.75	1 5/8"	12L14 or 1018
	2.750	3.176	3.250			1215
#18-3	3.500	4.039	3.500	#18 GR.75	2 3/16"	12L14 or 1018
#20-2.75	4.000	4.62	4.000	#20 GR.75	2 7/16"	12L14 or 1215



TOLERANCES UNLESS OTHERWISE SPECIFIED
 .XX, +/- .02, .XXX +/- .010
 ANGLES +/- 0°-30°



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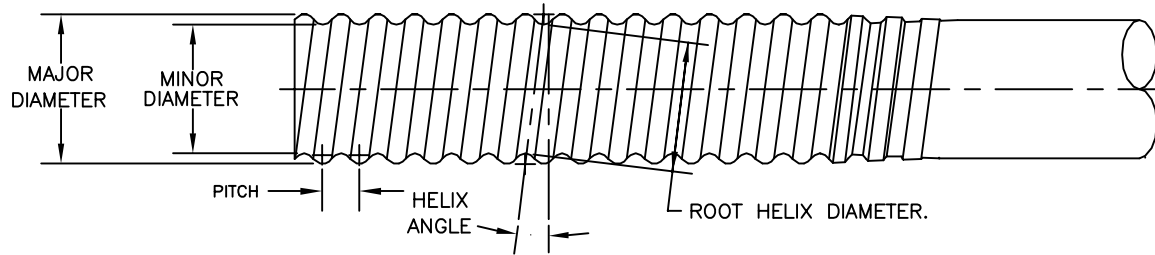
Customer: _____
 Project: GRADE 75, HEAVY DUTY HEX NUTS
 FOR TYPE II, ALL-THREAD REBAR.

DRAWN BY: RHT		ECO NO.: 650-1239
SCALE: NONE		C/O: ---
DATE: 6-8-95		APPRO BY: ---
SHEET NO.	TOTAL SHEETS	DESIGNED BY: ---
1	1	TECH REP: ---

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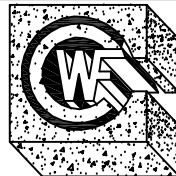
PRINT NO.: 1B-FA-2-112	REV: -
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LARR #25041



THREAD SIZE	MAT'L GRADE	PITCH	* ROOT HELIX DIAMETER	MINOR DIAMETER	MAJOR DIAMETER	HELIX ANGLE (DEG.-MIN.)
1"-3 1/2 (NOM.) #8 GR 75/60	HRS GR75/60	.2857	<u>.913</u> . <u>930</u>	<u>.921</u> . <u>903</u>	<u>1.075</u> <u>1.093</u>	5°-11'
1 1/8"-3 1/2 (NOM.) #9 GR 75	HRS GR 75	.2857	<u>1.040</u> <u>1.020</u>	<u>1.035</u> <u>1.015</u>	<u>1.210</u> <u>1.190</u>	4°-37'
1 1/4"-3 (NOM.) #10 GR 75	HRS GR 75	.3333	<u>1.154</u> <u>1.176</u>	<u>1.166</u> <u>1.143</u>	<u>1.327</u> <u>1.350</u>	4°-50'
1 3/8"-3 (NOM.) #11 GR 75	HRS GR 75	.3333	<u>1.309</u> <u>1.333</u>	<u>1.323</u> <u>1.299</u>	<u>1.507</u> <u>1.483</u>	4°-18'
1 3/4"-3 (NOM.) #14 GR 75	HRS GR 75	.3333	<u>1.542</u> <u>1.572</u>	<u>1.564</u> <u>1.534</u>	<u>1.824</u> <u>1.794</u>	3°-35'
2 1/4"-3 (NOM.) #18 GR 75	HRS GR 75	.3333	<u>2.117</u> <u>2.147</u>	<u>2.141</u> <u>2.111</u>	<u>2.401</u> <u>2.371</u>	2°-50'
2 1/2"-2.75 (NOM.) #20 GR 75	HRS GR 75	.3636	<u>2.356</u> <u>2.387</u>	<u>2.381</u> <u>2.350</u>	<u>2.676</u> <u>2.645</u>	2°-38'

* NOTE: ROOT HELIX DIAMETER: IS THE MINOR DIAMETER OF THE THREAD. MEASURED AT PITCH ANGLE WITH CALIPERS.



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Customer: _____
Project: TESKER SET-UP SHEET FOR GRADE 75/60 BARS.

DRAWN BY: RHT	ECO NO.: 500-1102
SCALE: NONE	C/O: ---
DATE: 4-25-96	APPRO BY: ---
SHEET NO. 1	TOTAL SHEETS 1
DESIGNED BY: ---	
TECH REP: ---	

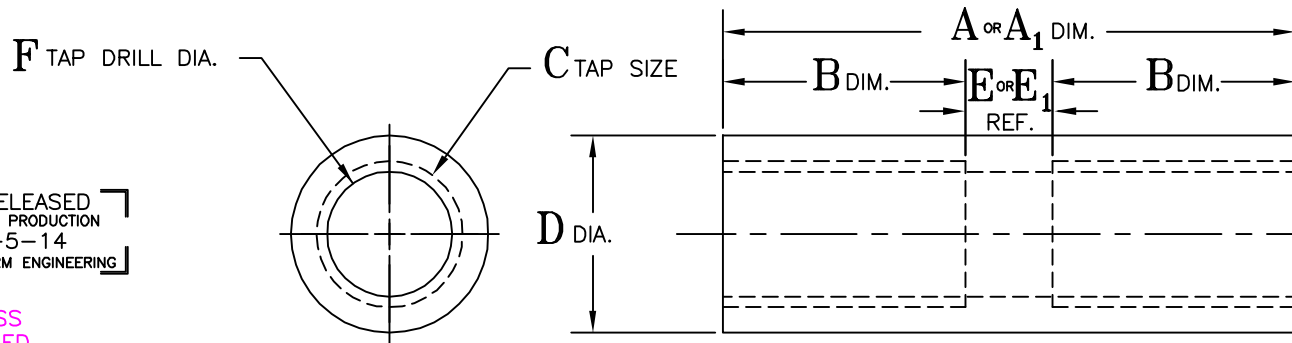
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PRINT NO.: 1B-FA-1-106	REV: -
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LARR #25041

BAR SIZE	A DIM.	A ₁ DIM. Ⓜ	B DIM.	C DIM.	D DIA.	E REF.	E ₁ REF. Ⓜ	F TAP DRILL DIA.	MATERIAL	(ALTERNATE) MATERIAL
#8-3.5	4.50	--	2.00	1" NOM.	1.625	.50	--	31/32"	* 11L44	1144
#9-3.5	5.00	--	2.25	1 1/8" NOM.	1.875	.50	--	1 5/64"	11L44,1215	
#10-3	5.50	--	2.50	1 1/4" NOM.	2.000	.50	--	1 3/16"	11L44,1215	
#11-3	6.00	--	2.75	1 3/8" NOM.	2.250	.50	--	1 11/32"	11L44,1215	
#14-3	10.50	7.88	3.50	1 3/4" NOM.	2.875	3.50 Ⓞ	.813	1 5/8"	1215	1026 TUBING
#18-3	Ⓞ 12.00	9.13	4.13	2 1/4" NOM.	3.500	3.75 Ⓞ	.875	2 3/16"	12L14,1018	
	Ⓞ 12.00	9.13	4.13	2 1/4" NOM.	3.250	3.75 Ⓞ	.875		A311 CLASS B 1144, STRESS PROOF.	
#20-2.75	14.00	9.50	4.25	2 1/2" NOM.	4.000	5.50	1.00	2.438	1215	--
	14.00	9.50	4.25	2 1/2" NOM.	4.250	5.50	1.00	2.438	12L14	

3.



- NOTES:
- A₁ & E₁ DIMENSIONS ARE FOR SINGLE POINT THREADING ONLY. FOR MORE INFORMATION REFER TO SINGLE POINT DETAIL PRINTS.
 - *1215 STEEL IS ACCEPTABLE FOR THIS SIZE IF THE YIELD STRENGTH EQUALS OR EXCEEDS 75 KSI.
3. 1026 CDS SEAMLESS TUBING, A-519.

RELEASED FOR PRODUCTION
6-5-14
WILLIAMS FORM ENGINEERING

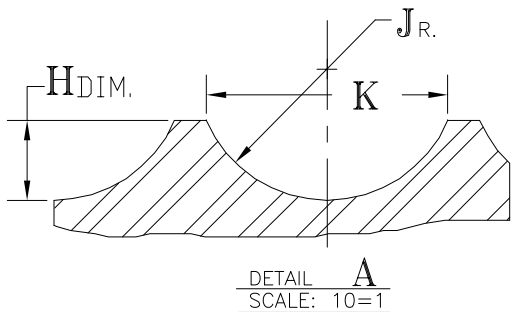
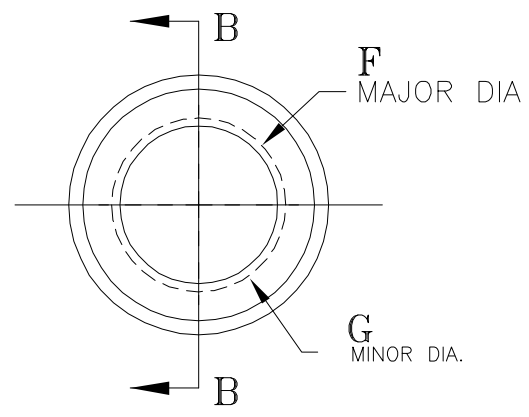
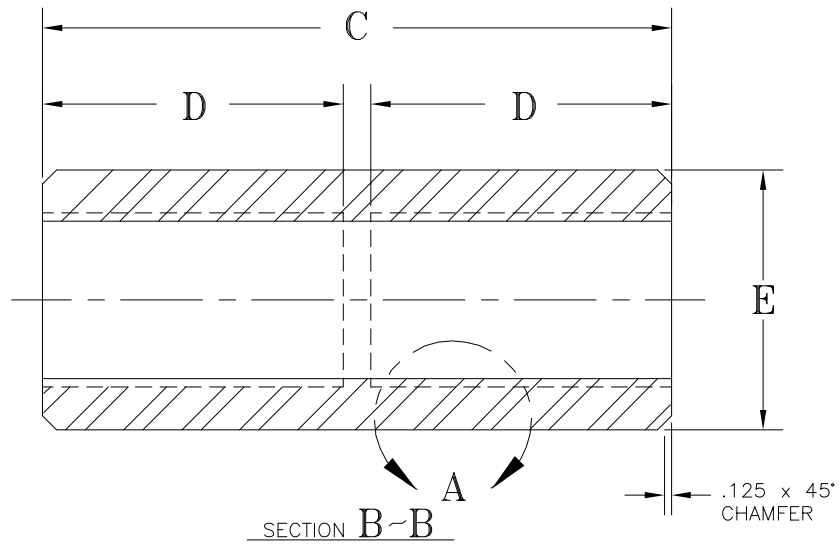
TOLERANCES UNLESS OTHERWISE SPECIFIED
.XX, +/- .03, .XXX +/- .005
ANGLES +/- 0°-30'

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CUSTOMER PROJECT
FULL STRENGTH STOP-TYPE / COUPLINGS
FOR GR 75, ALL-THREAD-REBAR, TYPE II

DRAWN BY: RHT	ECO NO.650-1249
SCALE NONE	CHK.BY.
DATE 6-13-95	APPR.BY.
SHEET NO. 1	OF 1
PRINT NO.	
1B-FA-2-132	-

LARR #25041



2 1/2"	65	2.280	9.38	4.25	4.250	2.783	2.575	1.313	.3333	.120
1 3/4"	45	1.813	Ⓔ 8.00	3.88	3.000	2.205	1.830	.094	.2857	.136
1 3/8"	36	1.438	5.75	2.63	2.375	1.605	1.460	.073	.2500	.120
1 1/4"	32	1.281	5.25	2.38	2.125	1.454	1.305			
1"	26	1.047	4.25	1.88	1.750	1.189	1.070			
DIA IN.	DIA. MM	DRILL DIA.	C	D	E	F	G	H	K	J
NOMINAL SIZE										

E	3-31-93	RHT	---	REVISED TO 8.00
D	8-10-92	RHT	---	REDRAWN ADDED 1 3/4" SIZE
REV	DATE	NAME	CHK.	CHANGE DESCRIPTION

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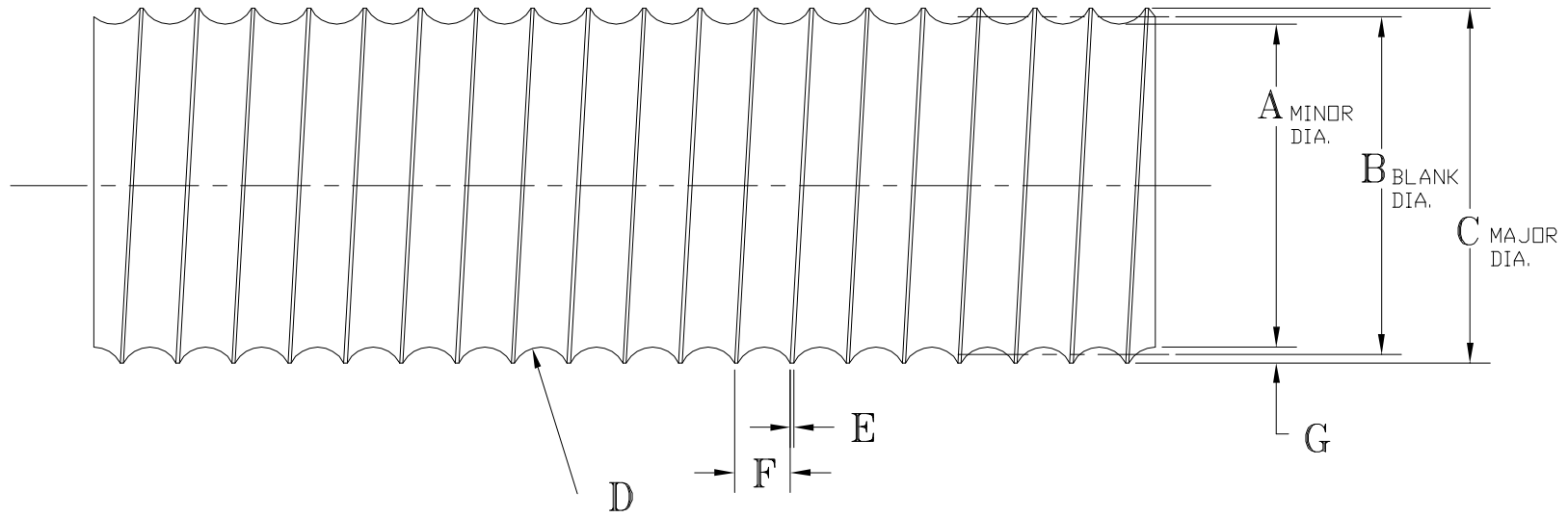
Customer: WFEC
Project: STRESS PROOF COUPLING FOR 150 KSI ALL-THREAD-BAR

DRAWN BY: RHT
DATE: 8-10-92
SCALE: ----
TECH REP: ----
C/O: ----
CHECKED BY: ----
ECO NO: 410-1071
SHEET 1 of 1
PRINT NO: 1B-FC-1-101
REV: ----

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LARR #25041

A	8-10-92	RHT	--	REDRAWN AND ADDED 1 3/4" SIZE
	REV. DATE	NAME	CHK.	CHANGE DESCRIPTION



2 1/4"	3	2.519	2.605	2.740	.125	.333	.085	.113	2.40	65
1 3/4"	3 1/2	1.777	1.843	1.964	.142	.0270	.2857	.094	2.83	45
1 3/8"	4	1.419	1.473	1.563	.125	.0227	.2500	.072	3.09	36
1 1/4"	4	1.262	1.316	1.406					3.46	32
1"	4	1.026	1.080	1.170					4.21	26
NOMINAL DIA.	PITCH	A DIM. MINOR DIA.	B DIM. BLANK DIA.	C DIM. MAJOR DIA.	D DIM. RAD.	E DIM. PITCH	F DIM.	G DIM. THREAD HEIGHT	HELIX ANGLE	MINIMUM ROOT DIA. -mm NOMINAL



8165 GRAPHIC DR, BELMONT, MI 49306, PH: 616.866.0815 - FX: 616.8661890

Customer: WFEC
 Project: 150 KSI ALL-THREAD-BAR

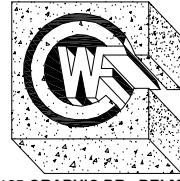
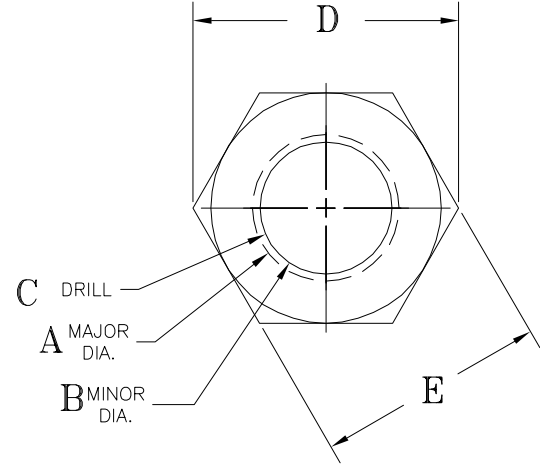
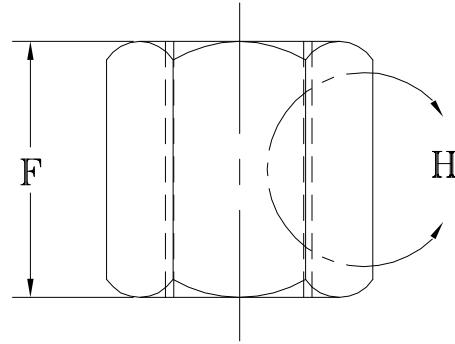
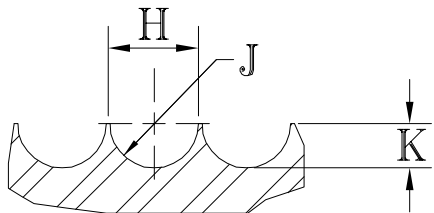
DRAWN BY: RHT
 DATE: 8-10-92
 SCALE:
 TECH REP:
 CIO:
 CHECKED BY:
 ECO NO: 410-1072
 SHEET 2 of 6

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PRINT NO: 1B-FC-1-101
 REV:

LARR #25041

NOMINAL SIZE		NOMINAL TAP	MAJOR DIA.	MINOR DIA.	DRILL HOLE	ACROSS CORNERS	ACROSS FLATS	THICK-NESS	PITCH DIM.	THREAD RADIUS	THREAD HEIGHT
DIA. IN.	DIA. MM	COIL	A	B	C	D	E	F	H	J	K
1"	26	1" -4	1.183"	1.070"	1.047"	2.02"	1.75"	2.00"	.250"	.120"	.073"
1 ¼"	32	1 ¼" -4	1.449"	1.305"	1.281"	2.60"	2.25"	2.50"	.250"	.120"	.073"
1 ⅜"	36	1 ⅜" -4	1.600"	1.460"	1.438"	2.89"	2.50"	2.75"	.250"	.120"	.073"
1 ¾"	46	1 ¾" -3.5	2.020"	1.830"	1.813"	2.46"	3.00"	3.50"	.286"	.142"	.094"
2 ½"	65	2 ½" -3	2.775"	2.575"	2.565"	4.90"	4.25"	4.75"	.333"	.120"	1.313"



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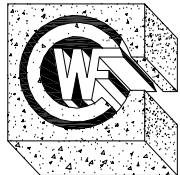
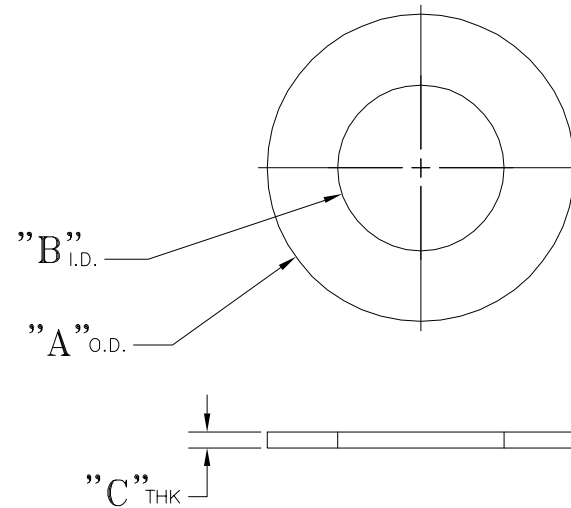
Customer: WFEC
Project: STRESS PROOF HEX NUTS FOR 150
KSI ALL-THREAD-BAR

DRAWN BY: RHT	SCALE:
DATE: 410-1073	TECH REP:
CIO:	CHECKED BY: TP
ECO NO.: 410-1073	SHEET 3 of 6
PRINT NO.: 1B-FC-1-101	REV: -

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LARR #25041

NOMINAL SIZE		OUTSIDE DIA.	INSIDE DIA.	THICK-NESS
DIA IN.	DIA. MM	"A"	"B"	"C"
1"	26	2.25"	1.25"	.156"
1 1/4"	32	2.75"	1.50"	.156"
1 3/8"	36	3.00"	1.63"	.156"
1 3/4"	46	3.75"	2.13"	.188"
2 1/2"	65	5.00"	2.88"	.281"



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Customer: WFEC
Project: HARDENED STEEL WASHER FOR 150
KSI ALL-THREAD-BAR

DRAWN BY: RHT	SCALE:
DATE: 410-1073	TECH REP:
CIO:	CHECKED BY: TP
ECO NO.: 410-1074	SHEET 4 of 6
PRINT NO.: 1B-FC-1-101	REV: -

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LARR #25041